BS01

EXCISION OF LAPAROSCOPIC PORT SITES INCREASES THE LIKELIHOOD OF WOUND METASTASES IN AN EXPERIMENTAL MODEL

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Background:

Case reports of patients developing tumour metastases at port sites following laparoscopic surgery have prompted the development of preventive strategies to address this potential problem, including local excision of the port sites. Whilst this strategy is currently used clinically, its efficacy has not been established.

Methods:

24 immune competent Dark Agouti rats underwent laparoscopy and standardized intraperitoneal laceration of an implanted abdominal flank tumour, using an established laparoscopic cancer model. Rats were randomized to either control (n=12) or wound excision (n=12) groups. Both groups underwent laparoscopy using CO2 insufflation, and 2 mini-laparoscopy ports. In the wound excision group one of the port site wounds was excised following desufflation of the abdominal cavity. One week later the port site wounds were excised for histological examination.

Results:

Wound involvement with tumour was significantly more common following wound excision, compared with untreated controls (9 of 12 versus 2 of 12, p=0.002). In the wound excision group, tumour metastases arose preferentially in the excised port site wound.

Conclusions:

This study suggests that excision of laparoscopy port site wounds following laparoscopic surgery for cancer does not prevent the subsequent development of port site tumors. Furthermore, the excision of port sites may actually increase the risk of tumour metastases arising in port sites, suggesting that the clinical application of this strategy should be re-evaluated.

BS02

INCREASED TUMOR SPREAD AFTER CONVERSION FROM LAPAROSCOPIC TO OPEN SURGERY

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Background:

In up to 20% of tumor resection laparoscopic surgery is forced to convert to conventional open technique based on diverse complicated intra-abdominal conditions. Concerning the effect of conversion from laparoscopic to open surgery on tumor growth and spread only few data are available. In terms of conversion stronger surgical manipulation and longer total operating time could have an important impact on the immune function and tumor growth.

Methods:

60 male WAG/Rij rats were randomised into four groups: laparotomy (Open, n = 15), laparoscopy (CO2, n = 14), early and late conversion from laparoscopy to laparotomy after 30 minutes (CV 30, n = 15) and after 60 minutes (CV 60, n = 15). Metastasis were induced by intrasplenic tumor cell (50,000 cells, CC531) inoculation during procedure. Total operating time was 90 minutes. Regarding CV 60 total operating time was 120 minutes. 28 days following surgery tumor growth was evaluated regarding number, diameter and cancer index of tumor nodes. Data were analysed by Kruskal-Wallis Test.

Results:

After late conversion (CV 60) total tumor growth was significantly increased compared to laparoscopy and laparotomy ($p < 0.05$). There was no significant difference between Open, CO2 and CV 30. CV 30 showed less tumor growth than CV 60.

Conclusions:

Conversion from laparoscopic to open surgery might result in stronger tumor growth than laparoscopic surgery (CO2) or conventional open surgery without conversion. From the oncological view an early decision for conversion seems to be strongly recommended.

BS03

RAPID FLOW CO2 LAPAROSCOPY AEROSOLISES CANCER CELLS INTO PERITONEAL CAVITY BUT NOT PORT SITES IN A NEW RAT MODEL

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Background: The role of CO2 in the pathogenesis of tumor recurrences after laparoscopy remains controversial. This study was designed to determine if rapid flow of CO2 contributed to the dispersal of free cancer cells during laparoscopy in a new rat model.

Methods: A novel rat model of desufflation without trocar was developed and 55 Fischer rats were randomised into three groups: A (rapid flow of CO2 at 0.67L/min, n=20), B (slow flow at 0.44L/min, n=20) and C (gasless laparoscopy, n=15). CO2 was vented via a portless surgical valve that filtered cells. After suspending the abdominal wall, half of the animals in each group (non-recovery) were injected intraperitoneally with 7.5 x 106 immunolabelled rat colon cancer cells (RCC2) while the other half (recovery), received 7.5 x 106 viable RCC2 prior to insufflation or gasless laparoscopy. Non-recovery animals were killed after insufflation and parietal peritoneal and port site specimens were examined for RCC2 by fluorescence microscopy (FM) and flow cytometry (FC). The recovery animals were killed at four weeks for evidence of wound recurrence.

Results: Nine of ten non-recovery animals in A had RCC2 on FM or FC compared to two in each of non-recovery B and C (p=0.018). Two of these nine also had RCC2 in their portless valves. Two recovery A animals developed wound recurrence at 4 weeks compared to zero in the other groups (p=0.315)

Conclusions: Rapid flow of CO2 aerosolised free cancer cells into the peritoneal cavity but not the port sites, thus supporting a role for CO2 in the intraperitoneal dispersal of free tumour but not port site recurrence.

BS04

EFFECT OF SURGICAL TRAUMA ON EPCAM VACCINE INDUCED TUMOR SPECIFIC CELL CYTOTOXICITY AND ANTIBODY PRODUCTION

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Surgical trauma inhibits immune function. Our goal was to study the effect of surgical intervention on the development of a specific immune response to EpCAM, a tumor associated protein. Methods: EpCAM protein and the adjuvant MPLA were incorporated in alginate beads. Control beads contained alginate only. The beads were implanted 3 weeks before surgery in all mice. The following experimental groups (n=5) were included: anesthesia control + control beads (AC-contr), anesthesia control + vaccine beads (AC-vac), open surgery + control beads (OS-contr), open surgery + vaccine beads (OS-vac), CO2 pneumopertioneum (pneumo) + control beads (CO2-contr) and CO2 pneumo + vaccine beads (CO2-vac). Following surgery, mice were inoculated with EpCAM transfected C26 (C26-EpCAM) cells. Tumors were allowed to grow 5 weeks. Subsequently, blood was obtained, mice sacrificed, their splenocytes isolated and frozen. The concentration of anti-EpCAM IgG in plasma was determined by ELISA. EpCAM specific killing was assayed by flow cytometry using PI staining and fluorescently labeled C26-EpCAM cells. Student's t-test was used for statistical analysis. Results All immunized mice developed greater cytotoxic response to C26-EpCAM than their respective controls: AC-vac, vs AC-contr, ($p<0.02$), OS-vac, vs OS-contr, ($p<0.01$) and CO2-vac, vs CO2-contr, ($p<0.02$). However, anti-EpCAM IgG increased significantly in AC-vac, 3.12+/-0.78 ug/ml vs AC-contr, 0.02+/-0.04 ug/ml ($p<0.01$) and in CO2-vac, 1.22+/-0.73 ug/ml vs CO2-contr, 0.02+/-0.04 ug/ml ($p<0.01$), but not in OS-vac, 0.64±1.06 ug/ml vs OS-contr, 0.002+/-0.64. (Tumor growth is subject of a separate abstract.) Conclusions Perioperatively administered encapsulated EpCAM-MPLA vaccine induces specific cell mediated and antibody mediated immune response in the setting of anesthesia alone or C02 pneumo. Although vaccination in the open surgery mice also induced a cell-mediated response, a diminished antibody response was observed after laparotomy.

BS05

THE HYPOXIC PNEUMOPERITONEUM INDUCES AUGMENTED MALIGNANT POTENTIAL VIA NF-KB MEDIATED METALLOPROTEASE UPREGULATION PF Ridgway MD, S Olsen MD, P Ziprin MD, PA Paraskeva MD, DH Peck PhD, AW Darzi MD., Academic Surgical Unit, Imperial College Faculty of Medicine, St. Mary's Hospital, London, UK

Background: The hypoxic pneumoperitoneum causes an increased malignant potential in vitro although the antecedent mechanism is unclear. The authors hypothesise that Matrix Metalloproteases (MMP), lacking a hypoxic response element, are up regulated via a Nuclear Factor kappa B (NF-kB) dependant pathway.

Methods: The Colonic (SW1222) tumour cell line was exposed to a gas displacement hypoxic model at various time points. Breast (MDA-MB231) cells were used to evaluate adenocarcinoma specificity. Invasion across a Matrigel coated 8um Transwell filters as well as cell viability was assessed using a MTS non-radioactive cell proliferation assay (Promega). Activity of MMP 2 and 9 were assessed using gelatin zymography. Expression of tissue inhibitor of metalloproteases 1 (TIMP-1) was quantified using ELISA (Biotrak). NF-kB Inhibition of zymography and invasion assays were performed using SN50 (Biomol). Electromobility Band Shift Assays were utilised to characterise the NF-kB response to hypoxia, together with western blotting for its inhibitor, Ik-B. Data was analysed using Mann Whitney U and Kruskal-Wallis Tests.

Results: Both tumour lines demonstrated augmented invasion over 72 hours ($p<0.01$ all groups). Concomitant significant increase in MMP 2 and 9 activity was observed in the SW1222 cells, MMP 9 and 103kDa gelatinase in MDA-MB231s ($p<0.01$). TIMP-1 expression was significantly lower in the hypoxic group ($p<0.05$). NF-kB demonstrated a band shift in response to hypoxia, with levels of Ik-B significantly decreased on western blotting ($p<0.001$). The increased MMP activity and invasion of cells was attenuated by the addition of SN50 ($p<0.001$ and $p<0.05$ respectively).

Conclusions: Hypoxia induces an increased invasive capacity via MMP up regulation mediated by NF-kB without loss in cell viability. This provides a novel mechanism explaining the increased malignant phenotype of cells exposed to an in vitro pneumoperitoneum.

BS06

ETIOLOGY OF INTESTINAL METAPLASIA AT THE GASTROESOPHAGEAL JUNCTION: GASTROESOPHAGEAL REFLUX DISEASE, H. PYLORI, OR BOTH? Nagammapudur S. Balaji, MD*, Steven R. DeMeester, MD**, Kumari S. Wickramasinghe, MD***, Jeffrey A. Hagen, MD*, Jeffrey H. Peters, MD*, Tom R. DeMeester, MD* Departments of Surgery*, Cardiothoracic Surgery**, and Pathology***, The University of Southern California, Los Angeles, California

Introduction: Intestinal metaplasia occurs in the esophagus as a consequence of gastroesophageal reflux disease, and in the stomach secondary to H. pylori infection. The etiology of intestinal metaplasia limited to the gastroesophageal junction, or cardia, (CIM) is disputed. We hypothesize that CIM has dual etiologies: gastroesophageal reflux in some, H. pylori infection in others, and that cytokeratin immunostaining will help differentiate between these two etiologies

Methods: We defined CIM as the presence of intestinal metaplasia within cardiac mucosa on biopsy from an endoscopically normal appearing gastroesophageal junction. Thirty patients with CIM who had multiple biopsies taken from the esophagus, gastroesophageal junction, and stomach were identified. Tissue blocks from biopsies taken at the gastroesophageal junction were sectioned and immunostained for cytokeratins 7 and 20. The cytokeratin 7/20 staining of the CIM in each patient was determined to be either a Barrett's or non-Barrett's pattern. H. pylori infection was assessed by Giemsa staining of antral biopsies.

Results: H. pylori infection was present in 16 patients. A Barrett's cytokeratin 7/20 staining pattern in the CIM was present in only 46% of the H. pylori positive patients, compared to 86% in the 14 patients with CIM and no H. pylori ($p=0.025$). Objective evidence of reflux disease was present in 71% of patients with CIM and no H. pylori compared to 31% of patients with H. pylori.

Conclusions: The two different patterns of cytokeratin 7/20 staining found in patients with CIM support the concept of dual etiologies for CIM. A Barrett's staining pattern was associated with objective evidence of gastroesophageal reflux and the absence of H. pylori, suggesting that cytokeratin 7/20 immunostaining is useful to determine the likely etiology of CIM.

BS07

ALTERATIONS OF T LYMPHOCYTE SUBSETS AND TH1/TH2 BALANCE FOLLOWING LAPAROSCOPY-ASSISTED DISTAL GASTRECTOM Kyuzo Fujii, M.D., Kazuhiro Yasuda,M.D., Masafumi Inomata,M.D., Norio Shiraishi,M.D.,Yosuke Adachi,M.D., Seigo Kitano, M.D.
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abstract: [Objective] Postoperative immunosuppression is less in laparoscopic surgery than open surgery. There is no report about the alterations of the circulating T lymphocyte and natural killer (NK) cell subsets following laparoscopy-assisted distal gastrectomy (LADG) and conventional open distal gastrectomy (ODG) for early gastric cancer. The aim of this study was to compare the immunosuppression after LADG to ODG.

[Materials and methods] Patients with early gastric cancer were divided into two groups, LADG group (n=10) and ODG group (n=10) . Blood was taken on the preoperative day, the first, third and seventh postoperative days and T lymphocytes were separated for flow cytometric analysis. Measured surface markers were CD3, CD4, CD8, CD25, CD45RO, HLA-DR and CD57. In addition, intracellular cytokines such as IFN-gamma, IL-4 were measured for evaluation of Th1/Th2 balance using flow cytometry for five patients from each group.

[Results] Patients in both groups were well matched for clinicopathological backgrounds. On the first postoperative day, WBC count was significantly increased in ODG group (12500 vs 11600 /mm3, $p<0.05$) . In all of cell surface markers, there was no significant difference between two groups. In measurement of intracellular cytokines, IFN-gamma reflecting cell mediated immune function was increased postoperatively and the relative ratio for preoperative values were significantly increased on the first and third postoperative day about 5.4 and 7.8 times in LADG group (1.2 and 1.65) than CDG (0.22 and 0.21) . IL-4 reflecting humoral immune function was increased in CDG group postopratively, but not significantly.

[Conclusions] Cell mediated immune function was preserved after LADG than ODG. LADG seems to be a better technique from the viewpoint of anti-cancer immunity.

BS08

COMPARISON OF OPEN VS LAPAROSCOPIC, INTRACORPOREALLY HAND-SEWN SMALL BOWEL ANASTOMOSIS—ASSESSMENT OF LOCAL LEUKOCYTE INFLAMMATORY REACTION USING CONFOCAL LASER-SCANNING MICROSCOPY IN THE PORCINE MODEL

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In this study we compared the healing characteristics of laparoscopic, intracorporeally hand-sewn anastomoses with the ones created with open technique in pigs. The local inflammatory reaction, with resulting polymorphonucleocyte (PMN) activation, was evaluated by measuring their oxygen free radical (OFR) production with cerium capture cytochemistry. The reaction of OFR-s with cerium CeCl3 results in laser reflectant cerium-perhydroxide precipitation was detectable histologically by reflectance confocal laser scanning microscopy (CLSM).

This study involved 15 pigs divided into two anastomotic groups: laparoscopic (LAP; n=10) and open (OPEN; n=5); in each animal 2 handsewn side-to-side small-bowel anastomoses were performed. Subject animals (2 LAP; 1 OPEN) were sacrificed on the 1st, 3rd, 7th, 14 th, and 28 th days postoperatively. Control animals (LAP; n=1, OPEN n=1) underwent the same surgical procedures as their experimental counterparts except for the anastomoses; they were sacrificed 1st day postoperatively. Upon sacrifice of each animal blood samples were taken from the regional mesenteric vein draining the intestinal anastomoses, and the isolated live PMNs underwent cerium cytochemistry studies. PMNs were imaged by CLSM, and reflectance signals of OFR-derived intracellular cerium perhydroxide deposits were quantified by image analysis. Reflectance pixel density values per cell surface units (RPD) were statistically evaluated. Control animals, as well as phorbol myristate acetate (PMA)-stimulated PMNs (representing strong leukocyte activation) were also evaluated.

Anastomotic samples were studied histologically. No morbidity was found in either of the 2 groups and morphological characteristics of the anastomotic samples also showed no significant differences between the two groups. The creation of intestinal anastomoses resulted in strong regional PMN activation in 24h, (LAP 193.3+/-24.7; OPEN 285.6 +/-26.4 RPD) with OFR production comparable to PMA stimulation (258.5 +/- 60.8 RPD). The PMN activation values declined at later time points (3, 7, 14, 28 days) with no significant differences between the laparoscopic (162.7 +/-39.6; 76.9 +/-17.3; 52.8 +/-8.4; 53.2 +/-7.4 RPD) and open (108.7 +/-17.8; 109.8 +/-14.7; 45.6 +/-3.9; 31.8 +/-7.7 RPD respectively) groups. The control operation alone resulted in low PMN activation (LAP 41.7 +/-4.1; OPEN 38.9 +/-8.4 RPD). The laparoscopic small-bowel anastomosis has similar characteristics regarding PMNs functions to the open one. Both are associated with rapid, strong, but transient regional PMN activation declining slowly with time.

BS09

EFFECT OF HEATED HUMIDIFIED GAS DURING PNEUMOPERITONEUM. Minoru Matsuda, M.D., Ph.D.*, Y. Oikawa, M.E. **, K. Onodera, M.D., Ph.D *, S. Kasai, M.D., Ph.D.* Second Department of Surgery, Asahikawa Medical College, Asahikawa, Japan*. Kiyota Hospital, Sapporo, Japan**.

Introduction: Recently, several animal studies showed that the core body temperature falls during pneumoperitoneum. However, the relationship among the body temperature, intraperitoneal temperature and humidity is not well evaluated. The purpose of this study is to investigate the effects of heated humidified gas for hypothermia prevention. **Materials and methods:** Seven pigs weighing 30kg were generally anesthetized and divided in two groups. The first group had cold CO2 gas insufflation (24deg., 1% relative humidity) while another group had heated humidified gas (37deg., 100%) insufflation. Moreover, these 2 groups were divided to with and without gas leakage group (10 l/min). The intraabdominal humidity was measured by a humidity probe through 15-mm trocar. Esophageal and intraabdominal temperature were also measured with 5 minutes interval by thermometer. The study was continued for more than 2 hours. The statistical analyses were performed by ANOVA and FisherÕs test. **Results:** 1. Cold gas group (C group): Intraabdominal temperature and humidity were stabilized after 10 minutes (36.0deg., 98.0%) and the core temperature after 2 hours insufflation was 36.0deg. 2. Cold gas with leakage group (CL group): Intraabdomminal temperature and humidity were significantly lower than C group (30.1deg, 88.9%, $p<0.05$). Core temperature was dropped to 0.2deg (n.s.). 3. Heated Humidified gas group (H group): Intraabdominal temperature, humidity and core temperature were 36.0deg., 98.6%, and 36.0deg. 4. Heated Humidified with gas leakage group (HL group): Intraabdomminal temperature and humidity were significantly higher than CL group (36.1deg., 100%, $p<0.05$). There were no significant differences in core temperature between H group and HL group (36.1deg). Conclusion: Cold CO2 insufflation with gas leakage caused the decreasing of intraabdominal temperature and humidity. These unexpected phenomenons could be prevented by using heated humidified gas insufflation.

BS10

ISCHEMIA/REPERFUSION WITH CO2 PNEUMOPERITONEUM IN A PORCINE MODEL Gamal Mostafa, MD, Brent Matthews, MD, Didier Dreau, PhD, Catherine Austin, Mareva Foster, Cathy Culberson, B Todd Heniford, MD, Carolinas Medical Center, Charlotte, North Carolina

Prolonged periods of intestinal ischemia may lead to reperfusion injury. The purpose of this study was to determine if prolonged CO2 pneumoperitoneum alters systemic cytokine response and to determine if the cytokine response is associated with local (intestine) or remote (lung) organ damage.

Under general anesthesia, CO2 pneumoperitoneum (15 mmHg) was maintained for 4 hours in domestic pigs (CO2P group). After the pneumoperitoneum (ischemic) period, the animals (n=8) were reperfused for 2 hours. Sham animals (n=8) underwent general anesthesia without CO2 pneumoperitoneum for 4 hours and 2 hours of reperfusion. Arterial and venous blood was sampled every 30 minutes for lactate (mmol/L), TNF-alpha (pg/ml), and IL-1 beta (pg/ml). Evans blue dye was injected (30 mg/kg) immediately prior to reperfusion. Bronchoalveolar lavage (BAL) was performed after reperfusion for quantitative evaluation of Evans blue dye extravasation and a permeability index (PI) was calculated. Random midgut and lung samples were examined histologically for evidence of villous damage (intestine) and polymorphonuclear (PMN) infiltration (lung).

Significant elevations ($p<0.05$) in lactate levels were observed in the CO2P group compared to sham animals 30 minutes after initiation of pneumoperitoneum through 30 minutes after reperfusion. TNF-alpha in the CO2P group peaked higher (1747 vs 777 pg/ml) and was elevated at all time intervals compared to the sham group but never reached significance. IL1 beta was below detectable limits in all animals. The Evans blue dye PI was similar ($p=0.88$) and no evidence of increased PMN infiltration or acute villous injury was detected in either group.

In the porcine model, 4 hours of CO2 pneumoperitoneum resulted in lactic acidemia and systemic release of TNF-alpha consistent with an ischemic insult. No acute local or distant organ damage was identified. Further studies are needed to determine the clinical significance of this response.

BS11

THE PERCENTAGE OF CD31+ T CELLS DECEASES AFTER OPEN BUT NOT LAPAROSCOPIC SURGERY IN HUMANS Irena Kirman, M.D., Ph.D., Vesna Cekic, R.N., Natalia Poltaratskaia, M.S., Zishan Asi, B.A., Daniel Finegold, M.D., Richard L. Whelan M.D., Department of Surgery, Columbia University, New York, NY

Efficient killing of tumor cells and bacterial pathogens depends on, among other things, T cells that migrate from the circulation to the peripheral tissues; migrating T cells are known to express the CD31 antigen. This study was undertaken to determine the impact of open and laparoscopic colorectal surgery on the percentage of circulating T cells expressing CD31(CD3+CD31+) which are capable of migration. Materials: 17 colon cancer patients undergoing open surgery (OS) and 15 similar patients undergoing laparoscopic-assisted resection (LS) were studied. Peripheral blood was collected in heparinized tubes preoperatively (preOP) and on postoperative days 1 (POD1) and 3 (POD3). Mononuclear cells (PBMC) were isolated from heparinized blood by gradient centrifugation and frozen. Shortly before the analysis, PBMC were thawed, washed, stained with labeled antibodies to CD31 (anti-CD31-phycoerythrin) and CD3 (anti-CD3-CyChrom) and analyzed by flow cytometry. Statistical analysis was performed using a paired Student's t-test and Spearman's correlation coefficient. Results: In the OS group, the percentage of CD3+CD31+ cells was significantly lower in POD1 samples (18.8+/-9.2%, $p<0.01$) and POD3 samples(19.0+/-9.0%, $p<0.01$) when compared to the preOP results (28.2+/-12.6%). LS surgery did not result in a significant change in the percentage of these T cells; preOP (24.2+/-11.8%), POD1 (26.9+/-8.3%), and POD3 (22.1+/-9.4%). There was a significant correlation between the decrease in the percentage of CD3+CD31+ cells and the length of incision in the OS group ($r=0.515$, $p<0.01$). Conclusions The percentage of T lymphocytes capable of transendothelial migration, CD3+CD31+ cells decreases following open but not laparoscopic surgery and may be related to incision length. This may compromise T cell function in the peripheral tissues in the postoperative period.

BS12

LAPAROSCOPIC STAGING OF PANCREATIC TUMOURS INDUCES INCREASED INVASIVE CAPACITY WHICH MAY BE BLOCKED BY A SPECIFIC GELATINASE INHIBITOR, PAUL F RIDGWAY MD, PAUL ZIPRIN MD, DAVID H PECK PhD, ARA W DARZI MD, ACADEMIC SURGICAL UNIT, IMPERIAL COLLEGE FACULTY OF MEDICINE, ST. MARY'S HOSPITAL, LONDON, UK

Introduction: Laparoscopy and laparoscopic ultrasound has a well defined role in staging patients with pancreatic malignancy. The effect of the hypoxic pneumoperitoneum induction on tumour biology is unknown. The authors investigated whether an in vitro pneumoperitoneum augments the invasive capacity of pancreatic tumours and elucidate a mechanism by which this may occur.

Methods: A pancreatic (PSN-1) adenocarcinoma cell line was exposed to an in vitro pneumoperitoneum (Carbon Dioxide (CO2) or Helium) or left in normal growth conditions (Control). Cells were non-enzymatically harvested and placed in invasion assays. These were performed over 72 hours using Matrigel coated 8um Transwell filters and analysed using MTS colorimetric assay. Gelatin zymography was employed to assess the level of Matrix Metalloproteases (MMP) 2 and 9 (Gelatinase A and B) secretion. Expression of Tissue inhibitor of metalloproteases 1 (TIMP-1) was performed using ELISA (Biotrak). Inhibition of invasion assays was performed using a specific gelatinase inhibitor (MMPI; Calbiochem). The results were analysed using nonparametric statistical methodology (Mann Whitney U and Kruskal-Wallis Tests).

Results: The invasive capacity of pancreatic tumour cells is augmented versus control in both Helium ($p<0.05$) and CO2 ($p<0.001$) groups. Concomitant significant up regulation of the Gelatinases, and down regulation of TIMP-1 is demonstrated. This effect is attenuated by the addition of a specific gelatinase inhibitor ($p<0.05$)

Conclusions: These results indicate the invasive capacity of pancreatic tumour cells is augmented by laparoscopic staging in vitro. This is in part be mediated by increased gelatinase activity and may be attenuated by the addition of specific inhibitors.

BS13

COMPARISON OF THE ONCOLOGICAL EFFECTS AMONG DIFFERENT INSUFFLATION GASES IN RATS Takeshi Okita MD, Hideyuki Ishida, MD, Nobuo Murata MD, Daijo Hashimoto MD. Department of Surgery, Saitama Medical Center, Saitama Medical School 1981 Kamoda, Kawagoe, Saitama, 350-8550, Japan

(Purpose) There have been few data comparing oncological effects among different insufflation gases even though some investigators demonstrated that the use of carbon dioxide gas may be hazardous for laparoscopic tumor surgery. This study compared the survival of tumor-beraing rats, proliferating activity of intraabdominal tumor cells, and phagocytotic activity of peritoneal macrophages among 3 different insufflation gases. **(Materials and Methods)** (Ex-1, n=24) Immediately after intraperitoneal inoculation of 5X106 AH 130 cells, male Donryu rats (200-220g) were randomized to receive pneumoperitoneum with CO2, He, or air at 10 mmHg for 60 min or to serve as a control without pneumoperitoneum. The mean number of beads phagocytosed by each macrophage per rat was determined. (Ex-2, n=24) Immediately after intraperitoneal inoculation of AH 130 cells, pneumoperitoneum with one of the 3 different gases or no insufflation was performed. Seven days after the procedures, peritoneal fluid was collected and the S-phase faction of AH 130 cells was determined using a flowcytometry. (Ex-3, n=24) A total of 6X109 latex beads (1.1 um) were injected intraperitoneally 24 hr following pneumoperitoneum with 3 different gases or no insufflation and peritoneal macrophages were harvested 1 hr after injection of the beads. (Results) (Ex-1) The survival time was shorter in rats with insufflation gases (He,CO2,and air),compared with that in control rats (P<0.01). (Ex-2)The S-phase fractions of groups HE and air were significantly lower than those of the other two groups (P<0.05) (Ex-3) There were no significant differences in the number of phagocytosed beads among the groups. **(Conclusions)** These results suggest that:(1) the choice of gas may affect the proliferation of tumor cells,(2) insufflation itself may promote tumor spread.

BS14

COMPARISON OF THE ONCOLGICAL EFFECTS BETWEEN GASLESS PROCEDURE AND CARBON DIOXIDE PNEUMOPERITONEUM IN RATS Masaru Yokoyama MD, Hideyuki Ishida, MD, Nobuo Murata MD, Daijo Hashimoto MD., Department of Surgery, Saitama Medical Center, Saitama Medical School1981 Kamoda, Kawagoe, Saitama, 350-8550, Japan

(Purpose) There are few data comparing oncological benefits between a gasless procedure (GP) and pneumoperitoneum (PP). This study compared the survival of tumor-bearing rats, intraperitoneal, phagocytotic activity of peritoneal macrophages, and proliferating activity of intraabdominal tumor cells between GP and PP. **(Materials and Methods)** Male Donryu rats (160-200g) and ascites hepatoma AH 130 cells were used. (Ex-1, n=45) Immediately after intraperitoneal inoculation of AH 130 cells (5X106 cells), rats were randomized to receive either abdominal wall lifting (gasless group) for 60 min, carbon dioxide pneumoperitoneum at 10 mmHg for 60 min (pneumoperitoneum group), or anesthesia only (control group). Rats were followed until death. (Ex-2, n=33) Rats received the 3 different procedures immediately after intraperitoneal injection of a total of 6X109 latex beads (diameter:1.1 um). At the end of the procedures, peritoneal macrophages were harvested to determine the mean number of beads phagocytosed by each macrophage per rats. (Ex-3, n=28) Immediately after intraperitoneal inoculation of AH 130 cells, the 3 different procedures were performed. Seven days after the procedures, peritoneal fluid was collected and the S-phase faction of AH 130 cells was determined using flowcytometry. **(Results)** (Ex-1) The PP group demonstrated significantly shorter survival, compared with the other 2 groups (P<0.05). (Ex-2) The number of beads phagocytosed by each macrophage per rat tended to be greater in the GS group (P=0.05). (Ex-3)The S-phase fraction was 30.5∞}3.7 in the GS group, 44.8∞}1.6 in the PP group, and 39.3∞}2.3 in the control group (P<0.05). (Conclusions) Compared with the gasless procedure, pneumoperitoneum promoted the proliferative activity of intraperitoneal tumor cells and tended to deteriorate the phagocytitic activity of intraperitoneal macrophages. These mechanisms may have caused the shorter survival of rats undergoing pneumoperitoneum in this animal model.

Foregut-S001

NATIONAL TRENDS IN UTILIZATION AND OUTCOMES OF ANTI-REFLUX SURGERY Samuel R. G. Finlayson MD, MPH; John D. Birkmeyer, MD; William S. Laycock, MD, Department of Surgery, Dartmouth-Hitchcock Medical Center, Lebanon, NH; VA Outcomes Group, White River Jct., VT; Dartmouth Medical School, Hanover, NH

Background: Although many case series have addressed outcomes of anti-reflux surgery, no national population-based reports have been published. In this study, we use national discharge data to examine utilization and outcomes before, during, and after the introduction of laparoscopic anti-reflux surgery.

Methods: Using ICD-9 codes, we identified all anti-reflux procedures (n=24,592) performed from 1990 to 1997 in hospitals participating in the Nationwide Inpatient Sample, the largest all-payer inpatient care database in the United States. Using sampling weights and US Census data, we then calculated the national population-based rate of anti-reflux surgery for each year and examined secular trends in utilization, in-hospital mortality, splenectomy (a technical complication), and length of hospital stay. Using a coding algorithm, we also estimated the proportion of procedures performed via the laparoscopic, open abdominal, and thoracic approach for each year.

Results: From 1990 to 1997, the population-based annual rate of anti-reflux surgery increased from 4.4 to 12.0 per 100,000 adults. A substantial increase in utilization was observed from 1993 to 1995, but annual rates before and after this period were relatively stable. From 1990 to 1997, age-adjusted in-hospital surgical mortality decreased from 1.4% to 0.7% (p=0.02), splenectomy rates decreased from 3.7% to 1.4% (p<0.01), and median length of stay decreased from 7 to 2 days (p<0.01). The proportion of anti-reflux procedures performed laparoscopically increased from 0.5% to 65%, and the proportion of procedures performed using a thoracic approach decreased from 12% to 1%.

Conclusions: With the dissemination of the laparoscopic approach, the population-based rate of anti-reflux surgery has more than doubled. At the same time, operative risks associated with anti-reflux surgery have declined considerably.

Foregut-S002

OBJECTIVE MEASURES OF SLEEP QUALITY BEFORE AND AFTER LAPAROSCOPIC NISSEN FUNDOPLICATION. Jonathan Cohen MD, Amir Arain MD, Paul Harris PhD, Daniel Byrne MS, Leena Khaitan MD, Michael Holzman MD, Kenneth Sharp MD, William Richards MD., Section of Surgical Sciences, Vanderbilt University, Nashville, TN.

Subjective pilot data suggest that sleep quality improves following lap Nissen fundoplication (LNF). The purpose of this study was to define the objective sleep pathology associated with GERD and to determine if LNF could correct this pathology.

We studied six patients with GERD at baseline and at 10 weeks following LNF, as well as six age/sex-matched controls, using esophageal pH and EEG sleep data. EEG data were acquired using 10-20 method, then interpreted by a neurologist blinded to patient identity. Data are presented as means ± SD (Wilcoxon signed rank test).

A night arousal was recorded each time a subject entered sleep stage 0. Reflux episodes were defined as a pH<4 measured 5cm above the LES. Deep sleep was defined as any stage deeper than stage 1, including rapid eye movement sleep.

	Controls (N=6)			Patients (N=6)			*P* b/w groups at F/U
	Baseline	Follow-up	*p*	Pre-op	Post-op	*p*	
Reflux episodes	0.3± 0.5	0.2±0.4	ns	20.0±23.1	0.0±0.0	0.04	0.32
Night arousals	29.8±7.5	28±36	ns	29.5±6.7	16.5±9.4	0.03	0.01
Hrs deep sleep	4.8±1.1	5.2±1.5	ns	5.3±1.2	6.23±0.8	0.04	0.20
GSRS GERD Score	35.8±42.6	23±30.1	ns	177.3±70.3	20±19.8	0.03	0.94

Based upon validated sleep survey, patients had significantly quieter sleep, felt more rested in the morning, and felt they had the sleep they needed following LNF (p<0.05).

Patients with nocturnal symptoms of GERD have increased night arousals and get fewer hours of deep sleep when compared with matched controls. LNF returns sleep patterns to baseline objectively and subjectively.

Foregut-S003

LAPAROSCOPIC REPAIR OF LARGE HIATAL HERNIA. MID-TERM FOLLOW UP. Barry Salky, MD L.Brian Katz, MD Anthony Vine, MD Mark Reiner, MD, Daniel Makalansky, MD, Division of Laparoscopic Surgery, Department of Surgery,and Department of Radiology Mount Sinai Hospital, New York, New York

There is controversy regarding the efficacy of laparoscopic repair of large hiatal hernia. To that end, the authors are reviewing their prospective database of 187 patients with large hiatal hernia operated from 1992 through February 2001(allowing at least 6 months follow-up). There were 32 Type II, 136 Type III, and 19 Type IV hernias. Since complete hernia sac excision was incorportated into the procedure(1994), all cases have been completed laparoscopically(162 of 162). Nissen fundoplication was performed only when GERD was a prominent symptom(n=68). Mean age was 68. Operative time improved over time(mean 144 minutes). Routine post-op barium swallow revealed an immediate recurrence rate of 3%. Each patient was re-operated on postop day 1 successfully. LOS was 1.4 days. Mean follow-up is 3.8 years(range 6 months to 9 years). Ninety percent of patients are asymptomatic relative to their pre-operative complaints(independent telephone interview). Barium swallow and /or endoscopy are being obtained on all available patients to document status of repair and will be reported on collection of data. Preliminary results objectively show 83% success, but all patients contacted have not yet had x-rays or endoscopy. In conclusion, laparoscopic repair of large hiatal hernia is safe and feasible. Dissection and removal of the hernia sac from the mediastinum is important. Independent telephone assessment data are favorable. Objective midterm recurrence data are being collected.

Foregut-S004*

FIRST YEAR EXPERIENCE OF PATIENTS UNDERGOING THE STRETTA PROCEDURE. Hugh Houston, M.D., Leena Khaitan, M.D., Stefan Scholz, M.D., Michael Holzman, M.D., Kenneth Sharp, M.D., William Richards, M.D., Department of Surgery, Vanderbilt University Medical Center, Nashville, TN

The Stretta procedure is a new, totally endoscopic treatment for GERD, where radiofrequency energy is delivered to the smooth muscle of the LES.

Forty-one patients undergoing the Stretta procedure between August 2000 and August 2001 were prospectively evaluated. Under an IRB approved protocol, patients were studied preoperatively and postoperatively with esophageal manometry, 24-hour pH testing, SF12 surveys, and GERD specific questionnaires (QOLRAD).

Results are reported as mean±SEM. All procedures were performed on an outpatient basis; 33 were under conscious sedation and 8 were under general anesthesia. Prior to treatment, patients had a mean LES pressure of 24.3±2.9 mmHg, Johnson-Demeester score of 33.6±4.6 mmHg, and % time reflux 6.2±0.9. QOL RAD scores were significantly improved at 3 months (3.7±0.3 to 5.1±0.5, p<0.04) and 6 months (5.0±0.4, p<0.01). Physical SF12 scores were also significantly improved at 6 months (26.3±3.2 to 32.7±4.2, p<0.01). Mental SF12 scores were improved at 3 months (43.4±2.8 to 52.2±4.0, p<0.03) but not at 6 months. Eight patients returned for esophageal manometry and 24-hour pH testing at a mean of 7.4 months. There was a trend towards decreased esophageal acid exposure (6.2% to 4.8%), but this was not statistically significant. There was no significant change in mean LES pressure (24.3±2.9 to 23.8±4.2, p=0.64). Eighteen of 29 patients (62%) available for 3 months follow-up and 10 of 17 patients (56%) available for 6 months follow-up were completely off proton pump inhibitors. The only complication related to Stretta was a case of gastroparesis 10 days post-op which resolved completely.

The Stretta procedure is a promising new endoscopic treatment for GERD. It significantly improves GERD symptoms and quality of life while eliminating the need for proton pump inhibitors in the majority of patients.

Foregut-S005

TAILORED APPROACH TO ZENKER'S DIVERTICULA Giovanni Zaninotto M.D., Narne Surendra° M.D., Mario Costantini M.D., Daniela Molena M.D., Giuseppe Portale M.D., Umberto Basili, Michela Costantino Ph D., Ermanno Ancona M.D. Dept. of Medical and Surgical Sciences, ° Dept of Head and Neck Surgery, University of Padova, School of Medicine, Padova Italy

Surgical therapy for Zenker's diverticula (ZD) has been substantially modified, since the introduction of trans-oral diverticulostomy (TOD) with the endostapler. However, there is no evidence that TOD offers better long-term results than open surgery (upper esophageal sphincter myotomy and diverticulectomy or diverticulopexy - UESMD). Since 1993, 58 patients (43 males, 15 females, median age 70.5, range 36-95, years) presented with ZD. Symptoms (dysphagia and regurgitation) were prospectively collected and scored from 0 (absence of symptoms) to 8 (severe daily symptoms). UES pressure, relaxations and intrabolus pressures were recorded by esophageal manometry in 49 patients. Twenty-four patients, median age 76 years (range 36-95), were assigned to TOD on the basis of operative risk, size of ZD (> 3 cm), and - in 6 cases - the patient's preference. UESMD was performed in 34 patients (median age 69, range 41-94). No mortality was observed in either group, but 5 patients in the UESMD group had postoperative complications ($p<0.05$) (2 leakages from diverticulectomy, both healing with conservative treatment). The hospital stay was shorter in the TOD group than after UESMD, i.e. 5 (2-19) vs 9 (4-16) days, $p< 0.001$. Post-operative esophageal manometry was performed in 8 TOD patients and 18 UESMD patients, and showed a statistically significant reduction in UES pressure ($p<0.05$), improved UES relaxation and lower intrabolus pressure in both groups. During follow-up (41 months, range 1-101), 3 patients died of other causes and 2 were lost; regurgitation improved similarly in both groups, but 3/20 patients in the TOD group still complained of severe dysphagia as opposed to 0/33 in the UESMD group ($p<0.05$). In conclusion, TOD is a safe, quick and effective solution for most patients with ZD, but upper esophageal sphincter myotomy with diverticulectomy or diverticulostomy assures better long-term results, especially for dysphagia, and should be recommended for younger, fit patients and in case of small size diverticula.

Foregut-S006

LAPAROSCOPIC ESOPHAGOGASTRIC DEVASCULARIZATION IN BLEEDING VARICES Amr Helmy, MD, Ibrahim AbdelKader Salama, MD, S. D. Schwaitzberg, MD, National Liver Institute Menouphyia University, Shiben El Kom, Egypt and Dept of Surgery New England Medical Center, Boston, MA

Background: Bleeding from esophageal varices is the major cause of death in patients, with portal hypertension. The ideal surgical procedure should effectively control bleeding, and maintain liver function with low rates of encephalopathy. Based on this objective, laparoscopic devascularization of the lower esophagus and upper stomach was studied.

Methods: 18 (6 emergent/12 elective) patients were prospectively studied who underwent laparoscopic esophagogastric devascularization procedure for variceal hemorrhage. The diaphragmatic hiatus and esophagus is dissected. The lower 7-8 cm of esophagus is then devascularized. Devascularization of gastric fundus is accomplished by meticulous dissection and ligation of the short gastric vessels. The hepatogastric ligament is opened, permitting identification and isolation/ligation of left gastric vessels. The dissection and ligation of the vessels at lesser curvature proceeds up to diaphragmatic hiatus with devascularization of the external varices from the retroperitoneum or mediastinum at the GE junction.

Results: Mean OR time was 111min (80-140 min). Mean blood loss was 388 ml (150-650ml). ICU stay averaged 48 hours with a mean hospitalization of 11 days. Liver function and coagulation parameters remained stable post operatively. Duplex sonography on the portal and splenic veins revealed patency in all patients. The flow velocity in portal vein fell from 15.5±4.1cm/sec to 13.4±3.5cm/sec postoperatively. {P= 0.021} Splenic vein velocity was unchanged. Bleeding recurred in 6 patients (30%) and was retreated. Grade 1 encephalopathy developed in one patient. Follow-up endoscopy (8-24months) demonstrated substantial reduction in variceal grade.

Conclusion: Laparoscopic devascularization of the lower esophagus and the upper stomach is technically feasible and promising. Rapid recovery and control of variceal hemorrhage is accomplished in most patients without exposing the patient to hazards of open surgery.

Colorectal-S007

LONG TERM RESULTS OF LAPAROSCOPIC VERSUS OPEN RESECTIONS FOR RECTAL CANCER ON 115 UNSELECTED PATIENTS
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Aims of this study were to compare long-term outcome in unselected patients (pts) undergoing either laparoscopic (LR) or open rectal resection (OR) for cancer.
One hundred-fifteen elective pts recovered from may 1992 to august 2000 were included in this prospective non randomized study, 75 underwent LR whereas 40 were treated by OR. Each patient receveid a written consent and the location in each group (laparoscopic or open) was related to the patient' s choice. In both groups, excluding T1 cases, the patients were treated with preoperative radiotherapy (5.040 cGy) and chemotherapy in selected cases. Long-term outcome were compared between the two groups.
Follow-up time of both group ranged between 12 and 98 months (mean, 43.8 months). Out of 115 pts, excluding palliative resection, conversion to open surgery and not related to cancer mortality, 81 pts (48 LR, 33 OR) were considered. One pts in LR group (2%) was drop-out. No wound recurrence was observed. The local recurrence after LR was 20.8% vs 18.2% after OR ($p=0.687$). Distant site metastases occurred in 16.6% in LR group vs 21.2% in OR group ($p=0.53$). Cumulative survival probability (CSP) in LR group vs OR group was 0.709 vs 0.606 ($p=0.528$), respectively. CPS for Duke' s stage B and C in LR group vs OR group was 0.722 vs 0.584 ($p=0.546$) and 0.500 vs 0.417 ($p=0.649$), respectively. Thirty LR pts (62.5%) and 20 OR pts (60.6%) are disease free. In our laparoscopic group long-term results were comparable to those for conventional open group and these results occurred not only in patients with an early stage of rectal cancer (stage Duke' s B), but also in stage Duke' s C. The main limit of the present study is the low number of patients enrolled. These preliminary data, however indicate that the laparoscopic technique does not increase the risk of local recurrences and metastases in a long-term period of follow-up.

Colorectal-S008

TRANSANAL ENDOSCOPIC MICROSURGERY (TEM) AND RADICAL SURGERY FOR EARLY RECTAL CANCER, RETROSPECTIVE CASE-MATCHING STUDY. Wooyong Lee, M.D., Dooseok Lee, M.D., S I Choi, M.D., HoKyung Chun, M.D., Department of Surgery, Samsung Medical Center, Sungkyunkwan University, School of Medicine, Seoul, Korea

Recently Transanal endoscopic microsurgery(TEM) has been accepted as a treatment of early rectal cancer for its benefits. The purpose of this study was to study the adequacy of TEM for rectal cancer limited to the rectal wall by comparing the 5-year disease free survival rate and 5-year survival rate of TEM and radical surgery for T1 and T2 rectal cancer without lymph node metastasis.

Between Oct 1994 and Dec 2000, 74 patients had TEM and 100 patients had radical surgery for rectal cancers, which were lymph node metastasis negative, T1 and T2 lesion, mod- to well-differentiated, within 15cm from anal verge and with negative margins. during the same period. Between two groups, there were not different in age, sex, tumor location and follow up period ($p>0.05$). We excluded the patients who had pre or post operative radiotherapy or chemotherapy. We performed retrospective study using their medical records and telephone interview. We used Student t-test and Kaplan-Meier methods for statistical evaluation.

The mean distance of tumor from anal verge was 6.7cm and 7.5cm for TEM and radical surgery groups respectively ($P>0.05$). However the mean size of tumor was 23.5mm for TEM group and 37.8mm for radical surgery group ($p<0.05$). In the TEM group, 52cases (70.3%) were T1 lesion and 22cases (29.7%) were T2 lesion and in radical groups, 17cases (17%) were T1 lesion and 83 (83%) cases were T2 lesion. Five year disease free survival rate for stage T1 cancer was 90.9% for TEM group and 100% for radical group($p=0.925$) and for stage T2 cancers, it was 76.9% for TEM group and 91.0% for radical group($p=0.017$). There was no statistical significance for 5-year disease free survival rate for both T1 and T2 tumors between two groups ($p=0.07$, $p=0.47$). There is significantly increased risk of local recurrence after TEM for stage T2 tumors. Therefore careful selection of the patients required for TEM and when proper muscle layer invasion is noted from pathology, conversion to radical surgery should be considered during the opereation.

Colorectal-S009*

TRANSANAL ENDOSCOPIC EXCISION FOR RECTAL ADENOMAS: Costanza Cocilovo, MD., Lee E. Smith, MD., Thomas Stahl, MD., Jennifer Douglas, MD., Department of Colon and Rectal Surgery, Washington Hospital Center, Washington, DC.

Transanal endoscopic microsurgery (TEM) is a minimally invasive surgical technique for performing local excision of rectal lesions in the mid and upper rectum, which would otherwise be inaccessible for local excision by the direct transanal approach. In the absence of this approach, low anterior resection (LAR) would be required, which is major abdominal surgery. The justification for excising adenomas of the colon and rectum is their malignant potential, which correlates with the size of the lesion.

This retrospective review examines our experience using TEM for excision of adenomas of the rectum from February 1991 to August 2001. The decision to employ TEM is based on diameter and a precise localization of the upper margin of the lesion. A total of 56 adenomas were removed. The average diameter was 4.9 cm (range 3-8cm) and the average distance from the anal verge was 7.92 cm (range 5-12 cm). Carcinoma in situ was seen in 7 lesions, and the remaining lesions were benign. Morbidity was minimal, with one conversion to an open procedure for an intra-peritoneal perforation which required a low anterior resection. No patient required transfusion and there was no mortality. The hospital stay was short, with half of the patients being discharged the same day. The average cost from July 1996 to December 1999 was $7,775 for a TEM versus $34,018 for a LAR. Subsequent follow-up averaged 38.8 months (range 1-100 months), during which time 2 patients had recurrence of their adenomas. These were successfully treated with re-excision.

In conclusion, TEM is an accurate, safe and relatively inexpensive technique when compared to low anterior resection. For the treatment of rectal adenomas this technique significantly reduces the proportion of adenomas requiring abdominal surgery.

Colorectal-S010

ENDOSCOPIC MUCOSAL RESECTION FOR ADVANCED NON-POLYPOID COLORECTAL ADENOMA AND EARLY STAGE CARCINOMA U. Bergmann M.D., A. Stanescu M.D., H.G. Beger M.D., Department of General Surgery, University Clinic Ulm, Ulm, Germany

Purpose: Endoluminal treatment of gastrointestinal neoplastic lesions has become a capable alternative to surgical procedures. Endoscopic mucosal resection (EMR) techniques were evaluated in the usefulness of the treatment of flat and sessile colorectal adenomas and early stage carcinoma. Patients and Methods: Fifty-seven patients (32 female, 25 male) with non-polypoid colorectal lesions (n=71, size > 10mm) were included into the study. Tumor location, shape and size were determined by videoendoscopy and chromoendoscopy using indigo-carmine dye. In malignant lesions depth of the tumor was determined by endoscopic ultrasound. Resection was performed in case of adenoma or carcinoma limited to the mucosal or upper submucosal layer. EMR was performed using snare resection (SR) after submucosal saline injection. If SR could not be applied, e.g. due to the location or the size of the lesion, endoscopic aspiration mucosectomy (EAM) or EMR using a cap-fitted endoscope (EMRC) were performed. Results: Lesion size ranged from 10 to 50mm. Complete resection was achieved in 59 of 61 adenoma and 6 of 8 early carcinoma. Pathological examination showed adenoma in 59 (with severe atypia 15), carcinoma in situ in two and T1-carcinoma in four cases. Due to non lifting-sign, EMR was not performed in two tumors. After surgical resection pathological examination revealed a T2-adenocarcinoma in both cases. Resection was incomplete in two of 61 adenoma with positive resection margins. Complications occurred in three patients, with two bleeding successfully treated by endoscopic clipping and one perforation requiring open surgery. All patients with completely resected adenoma (n=59) or early stage carcinoma (n=6) remained free of recurrence during a mean follow up of 15 month (range 3 to 30 months). Conclusion: Advanced colorectal adenoma and early stage carcinoma can be safely and effectively resected by endoscopic mucosal resection.

Colorectal-S011

PREDICTING CONVERSION IN LAPAROSCOPIC COLORECTAL SURGERY: FELLOWSHIP TRAINING IS AN ADVANTAGE Christopher M. Schlachta MD, Joseph Mamazza MD, Steven Burpee MD, Kenneth Pace MD, Eric C. Poulin MD, The Centre for Minimally Invasive Surgery, St, Michael's Hospital, Toronto, Canada

OBJECTIVES: To prospectively validate a previously developed model for predicting conversion in laparoscopic colorectal surgery. To evaluate the impact of fellowship training.

METHODS: A simple, clinical model for predicting conversion in laparoscopic colorectal surgery was previously developed based on a multivariable logistic regression analysis of 367 procedures performed prior to 1998. This model awarded one point each for risk factors: malignancy, weight 60+ kg, weight 90+ kg and surgeon experience of 50 cases or less. This model was prospectively applied to the next 248 procedures performed by the same group, including 53 performed by one new fellowship trained surgeon.

RESULTS: Patients in the follow-up group were more likely to have malignancy (56% vs. 44%, p=0.007) and obesity (median 71.0 kg vs. 66.0 kg, p<0.001). The rate of conversion in the follow-up group was unchanged (8.9% vs. 9.0%, p>0.05). While the expected trends toward increasing risk of conversion with weight level and malignancy were observed, the model did not distinguish well between groups at risk for conversion. Contrary to the model, however, the fellowship trained surgeon had a conversion rate that was not higher than the other more experienced surgeons (7.3% vs. 9.3%, p>0.05) despite being in his early experience, and operating on patients that were more obese (median 75.0 kg vs. 70 kg, p=0.02) and more likely to have malignancy (59% vs. 55%, p>0.05). Recalculated conversion scores excluding the inexperience penalty for the fellowship trained surgeon demonstrated a good fit of the model with conversion rates for scores 0, 1, 2, and 3+ points of 6.5%, 7.5%, 9.6% and 15.0%.

CONCLUSION: Fellowship training appears to eliminate the learning curve for laparoscopic colorectal surgery. This model continues to be a valid predictor of conversion to open surgery if the inexperience penalty is excluded for a fellowship trained surgeon. This model now requires validation by other centres.

Colorectal-S012

AGE AND TYPE OF PROCEDURE INFLUENCE THE CHOICE OF PATIENTS FOR LAPAROSCOPIC COLECTOMY: B.Sklow, MD; E.Birnbaum, MD; T.Read, MD; R.Fry, MD; J.Fleshman, MD. Washington University School of Medicine, Section of Colon & Rectal Surgery

PURPOSE: The aim of this retrospective, case-matched, controlled study was to determine the benefit of laparoscopic-assisted colectomy (LC) between the elderly (>75 years of age) and the young (<75 years of age) compared to an open colectomy (OC) control group.

METHODS: A retrospective review of 39 patients greater than 75 years of age and 38 patients less than 75 years of age that underwent LC for colorectal cancer between 1991 and 1999 was performed. LC patients were matched with an open control group for procedure, age, gender, year of procedure, and surgeon. Procedures included right colectomy, left colectomy, anterior resection of rectosigmoid, and abdominoperneal resection. Anesthesia time, operative time, postoperative narcotic usage (NU), return of bowel function (RBF), length of stay (LOS), and indepedence at discharge were compared in the entire group of 154 patients.

RESULTS: Mean ages were 81.4 and 81.8 for LC and OC for age > 75 and 62.9 and 62.7 for LC and OC for age < 75. Morbidity was similar between LC and OC for either age group. Mean anesthesia time and operative time were significantly longer ($p < 0.05$) for LC compared to OC (46.8 vs. 39.3, 159.3 vs. 111.7) for age > 75 and for age < 75 (47.1 vs. 40.3, 182.8 vs. 135.5). LC achieved faster recovery in both age groups: RBF (3.9 vs. 4.9, age > 75; 4.2 vs. 5.0, age < 75) and LOS (6.1 vs. 7.8, age > 75; 6.1 vs. 7.7, age < 75) ($p < 0.05$). Fewer patients required assistance at discharge in the LC age < 75 group ($p < 0.05$). Left LC in age > 75 and right LC for age < 75 provided faster recovery ($p < 0.05$).

CONCLUSION: The advantages of LC over OC are the same for the elderly and the young. There may be a selective benefit of laparoscopic righ colectomy in the young and laparoscopic left colectomy in the elderly.

Colorectal-S013

LONG TERM OUTCOME AND HEALTH RELATED QUALITY OF LIFE AFTER LAPAROSCOPIC AND OPEN COLECTOMY FOR BENIGN DISEASE Klaus Thaler, MD, Adam Dinnewitzer, MD, Jonathan Efron, MD, Anthony Vernava III, MD, Eric Weiss, MD, Juan Nogueras, MD, Steven Wexner, MD, Cleveland Clinic Florida, Weston, FL

The aim of this study was to compare laparoscopic colectomy (LC) and open colectomy (OC) for long-term outcome and health related quality of life (HRQL) and determine the validity of a generic tool to assess HRQL for postoperative follow up.

49 patients with elective LC by right hemicolectomy (RH) or sigmoid resection (SR) for benign polyps or uncomplicated diverticular disease were compared to 50 OC matched controls. Follow up was obtained by postal questionnaire for recurrence and surgical complications. HRQL was assessed by SF-36 Physical and Mental Component Summary Score (PCS, MCS) and SF-36 Health Survey measuring 8 health-quality domains [physical and social functioning (PF, SF), general health perception (GH), physical and emotional role limitations (RP, RE), body pain (BP), vitality (VT) and mental health (MH)].

Groups were matched for age, gender, body mass index, ASA classification, and diagnosis. Significant differences were noted for resection type (26RH: 23SR in LC vs 16RH:34SR in OC((p=0.03) and length of follow up (42.1+- 25.2 months in LC vs 59.6+-37.4 in OC(p=0.04) but were not predictive of outcome. No differences were noted in recurrence or surgical complications and none of the SF-36 Health Survey domains nor PCS and MCS had significant differences related to HRQL. Multivariate analysis showed postoperative hernia is predictive of lower SF36 scores in PF (p=0.03), VT (p=0.03), SF (p=0.008), MH (p=0.02) and MCS (p=0.008). Small bowel obstruction was associated with lower scores in BP(p=0.0006), GH(p=0.005), VT(p=0.03), SF(p=0.004), RE(p=0.01), MH(p=0.0002), and MCS(p=0.0001).

LC is equivalent to OC for specific indications in long-term outcome and HRQL. SF-36 is a valid tool to measure postoperative HRQL with responsiveness to changes in objective outcome measures.

Colorectal-S014

LAPAROSCOPIC APPENDECTOMY IN THE YOUNG: A FALLACY Jorge A. Lagares-Garcia, MD; Brian Bansidhar, DO; Richard Moore, MD.

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The introduction of laparoscopic techniques has shortened the length of hospital stay and cost. Controversial results have been achieved in laparoscopic appendectomy (LA).

The objective of this study was to retrospectively evaluate the results of LA and open appendectomy (OA) in relatively healthy young patients <50 years old compared to the older counterparts.

All patients that underwent appendectomy between 1996-2000 were retrospectively analyzed. Demographic data and hospitalization cost as well as length of hospital stay were included. For analytical purposes patients were divided to two groups: younger (<50) versus older (>50). Statistical analysis was performed using Student's t test and Chi-square for continuous and non-continuous variables, respectively; p<0.05 was considered statistically significant.

A total of 405 patients were available for analysis. The average age was 35 years and 42% females. Thirty nine patients underwent LA and 366 had OAs. The rate of LA was 14% in females versus 6% in males (P<0.05).

In the younger patients ASA, length of the procedure, operating room and total costs did not differ between LA and OA. Length of stay was 2.7 days in both groups (p>0.05). The older counterparts, however, had a significantly shorter length of stay in the LA group (2.5 days) when compared to the OA group (6 days) (p<0.05). Total hospitalization cost was also significantly lower in the LA group ($13,448) in comparison to the OA group ($21,730) (p<0.05). No differences were noted in the length of the operation, ASA or operating room charge.

Our results indicate a lack of benefit in cost containment and length of stay in patients 50 years old or younger when LA is used. In older patients, a decrease in the overall cost and length of hospital stay is significantly noted. The benefit of LA in younger patients is diminished probably due to the decreased comorbidity and higher tolerance to stress than in the older group.

Colorectal-S015*

THE USE OF ENTERAL STENTS IN MALIGNANT COLONIC AND GASTRIC OUTLET OBSTRUCTION Christine A. Ely, M.D., Maurice E. Arregui, M.D., Department of Surgery, St. Vincent's Hospital, Indianapolis, IN

GOALS: Enteral stenting is emerging as a viable treatment option for malignant obstructions of the GI tract. They are approved for palliation of malignant colonic or gastric outlet obstruction, as well as for preoperative decompression in acute malignant colonic obstruction, allowing one stage operation. We describe our experience and a review of the literature.

METHODS: This is a retrospective chart review on 8 patients in whom 10 stents were placed.

RESULTS: Six stents were placed in 5 patients with malignant gastric outlet obstruction. Technical success was achieved in 100%, and 5/5 (100%) patients were clinically improved. One stent was replaced due to obstruction from tumor ingrowth. Follow up to hospice (one patient 30 days after stenting) or death (3 patients in 30-86 days) showed all stents to be patent. The fifth patient did well for 2 weeks and then was lost to follow up. Four stents were placed in 3 patients with colonic obstruction. One was for palliation of an obstructing metastatic ovarian cancer, and 2 for preoperative decompression of rectal cancer and diverticulitis. Technical success was achieved in 100%, and 3/3 obstructions were relieved. One stent stenosed and required replacement. This stent was patent until the patient's death 28 days later. One perforation occurred, requiring colostomy. The other patient who recieved a preoperative stent had a successful one stage resection. Review of the literature regarding both gastric outlet and colonic stenting shows overall technical success rates as high as 100%, 80-100% improvement in obstructive symptoms, and 0-30% complication rate. Major complications include perforation (0-16%), and bleeding.

CONCLUSION: Enteral stenting is effective in relieving malignant obstruction but with a risk for perforation. This should be considered as an option to gastroenteric bypass, colostomy or resection in debilitated patients.

Outcomes & Endocrine Surgery-S016

SAGES OUTCOMES DATA REVEAL SOME SURPRISES

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Introduction:The SAGES Outcomes Initiative established a national database in 1999. The goal was to provide a vehicle for surgeons to accumulate meaningful data about their surgical activity and procedure outcomes.

Methods: Through a secure internet site, participants entered core data on all patients undergoing laparoscopic or open surgery at the time of operation. Procedure specific data was accumulated for cholecystectomy (LC and OC), inguinal hernia and fundoplication (LF and OF). A second data set was collected at the time of follow up. Individual data and a summary of national data were available through the website for contemporaneous review.

Results: 3319 cases were entered by 72 surgeons between May, 1999 and August, 2001. 873 LC and OC were entered. 25% of these cases were first-assisted by a nonphysician. 11% did not have documented gallstones. 3% of LC's were converted to OC. 49% had intraoperative cholangiogram, of which 18% revealed significant findings. 7 major CBD injuries (0.8%) and 116 complications were reported. Follow up in 521 patients (59%), revealed symptomatic improvement in 96%.. In the GERD report, 1019 procedures were entered , 26% of whom had undergone previous fundoplication. 43% had esophageal amplitude < 30mmHg and 24% had <70% peristalsis. LF was completed in 99% of patients with < 1% complication rate. Mean operative time was 137 minutes. Of 632 patients (62%) with follow up, 98% reported symptomatic improvement.

Conclusion: The SAGES outcomes initiative allows surgeon to be involved in data collection about their practice. It provides surprising average data on the practice of surgery which are more useful for setting benchmarks than published data from the surgical elite. Improvements in the tool will include better methodology for complete data capture, and periodic auditing to insure data completeness and accuracy.

Outcomes & Endocrine Surgery-S018

LAPAROSCOPIC ADRENALECTOMY: A PROSPECTIVE EVALUATION OF 151 PROCEDURES. Colm J O'Boyle, Peter C Sedman, #C Raj Kapadia, *William A Brough, Christopher MS Royston., Departments of upper gastrointestinal and minimally invasive surgery. # Airedale General Hospital, Keighley, *Stepping Hill Hospital, Stockport and Hull Royal Infirmary, Hull, UK.

We report our experience with laparoscopic transperitoneal adrenalectomy. From November 1993 to August 2000, one hundred and fifty one laparoscopic adrenalectomies were attempted in 132 patients who presented with symptomatic adrenal masses or who had an incidental large mass diagnosed during investigations for other complaints. All perioperative and follow-up data was prospectively recorded on a dedicated unit database.

The median age was 52 years (18-77years). Seventy six percent were female. Lesions were left-sided in 48% of patients and bilateral in 14%. Indications for resection were: Conn's syndrome (54), phaeochromocytoma (27), Cushings disease (13), non-functioning adenoma (14), congenital adrenal hyperplasia (2), cortisol-producing adenoma (5), combined Cushings and Conn's syndrome (1) primary or metastatic carcinoma (7), benign cyst/ lipoma (8), no lesion (1). Median size of the lesions was 3.0cm (0.5-20cm). Median operating time was 65min (30-170min). Conversion to an open procedure was necessary in 10 patients (8%). Minor morbidity occurred in 9 patients (7%). Major morbidity occurred in 2 patients (Pancreatitis, Peritonitis). Median hospital stay was 3 days (1-16 days). At median follow-up of 28 months (1-94months) five patients (4%) have persistent hypertension. No patient has evidence of recurrent hormonal excess.

Laparoscopic removal of the adrenal gland should be considered the surgical procedure of choice in experienced centres. It requires a high degree of technical expertise and should remain within the remit of the advanced laparoscopic surgeon.

Outcomes & Endocrine Surgery-S019*

COMPARATIVE STUDY OF THYROIDECTOMIES: ENDOSCOPIC SURGERY VERSUS CONVENTIONAL OPEN SURGERY, Yoshifumi Ikeda Hiroshi Takami, M.D., Masanori Niimi, M.D., Ph.D., Shigenao Kan, M.D. and Susumu Kodaira, M.D., Department of surgery, Teikyo University School of Medicine, Tokyo, Japan

Introduction: We compare two types of endoscopic thyroidectomy and conventional open surgery with regard to surgical invasiveness and patients' complaints after surgery.

Patients and Methods: Endoscopic thyroidectomies using either an anterior chest approach or an axillary approach or conventional open surgery were performed. Each procedure was performed in 15 patients matched for age, gender and tumor size. We compared the operating time, intraoperative blood loss and the degree of pain on the first postoperative day to assess the surgical invasiveness of each procedure. Three months after surgery, the presence of hypesthesia and paresthesia in the neck, discomfort in swallowing, and the cosmetic results were investigated to assess the nature of the patients' complaints.

Results: The mean operating time and intraoperative blood loss was 145 minutes and 25ml for the anterior chest approach, 175 and 30 for the axillary approach and 84 and 36 for open surgery, respectively. Three patients (20%) treated using the anterior chest approach, 5 patients (33%) treated using the axillary approach, and 4 patients (27%) received open surgery complained of neck or anterior chest pain on the first postoperative day. Three months after surgery, none of the patients received an endoscopic thyroidectomy complained of hypesthesia or paresthesia in the neck or of discomfort in swallowing. Among the patients underwent open surgery, 10 patients (67%; $p<0.01$) complained discomfort in the neck and 5 patients (33%) complained of discomfort in swallowing. All of the patients treated using the axillary approach were satisfied with the cosmetic results. However, 3 patients (20%) treated using the anterior chest approach and 11 patients (73%; $p<0.01$) underwent open surgery complained abut the cosmetic results.

Conclusions: The incidence of postoperative complaints after endoscopic surgery is significantly lower than that after open surgery. Superior cosmetic results can be obtained using the axillary approach, compaired to those obtained with other procedures.

Outcomes & Endocrine Surgery-S020

MINIMALLY INVASIVE VIDEO-ASSISTED PARATHYROIDECTOMY
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The standard surgical procedure for parathyroidectomy consists of bilateral cervical exploration and visualisation of all parathyroid glands. Improved preoperative localisation techniques and the availability of intraoperative intact parathyroid hormone (iPTH) monitoring allow the approach of single adenomas with minimally invasive techniques.

Patients with primary hyperparathyroidism (pHPT) and one unequivocally enlarged parathyroid gland in the preoperative ultrasound and 99mTc-SestaMIBI scintigraphy underwent minimally invasive videoassisted parathyroidectomy by an anterior approach. Intraoperatively, a rapid chemiluminescense immunoassay was used to measure iPTH levels shortly before and 5, 10 and 15 minutes after excision of the adenoma. The operation was considered successful, when a greater than 60% decrease in pre-excision iPTH levels was observed after 15 minutes.

Between November 1999 and August 2001, 28 out of 70 patients with pHPT were eligible for a minimally invasive approach. In all but 3 cases the adenoma was removed successfully applying the new technique. However, in 4 patients intraoperative iPTH monitoring showed no sufficient decrease in iPTH values. Here, subsequent cervical exploration revealed 1 double adenoma and 3 hyperplasias respectively.

Despite the use of high resolution ultrasound and 99mTc-SestaMIBI scintigraphy, the presence of multiple glandular desease can not be ruled out completely. Intraoperative iPTH monitoring to ensure operative success is indispensible for a minimally invasive approach. However, in approximately 40% of cases, minimally invasive parathyroidectomy represents an excellent alternative to the conventional technique.

Outcomes & Endocrine Surgery-S021

LAPAROSCOPIC VS OPEN SUBTOTAL GASTRECTOMY IN DISTAL GASTRIC CANCER: PROSPECTIVE RANDOMIZED STUDY WITH FIVE-YEAR FOLLOW UP. Cristiano G. S. Huscher MD, Eldo Ermenegildo Frezza MD, Carmine Napolitano MD, Francesco Crafa MD, Marco Lirici e Achille Recher MD, Department of Surgery, Ospedale S. Giovanni, Roma, Italy and Loyola University Chicago, Illinois

The aims of this study were to evaluate the efficacy of R2 dissection applied with the open and laparoscopic techniques, to assess the role of endoscopic surgery in subtotal gastrectomy and to compare overall survival (OS) and quality of the oncological resection. We randomized the patients to one of two groups. The first group had an open (OG) and the second, a laparoscopic (LG) surgical approach. Randomization was performed in a single-blind fashion by the team who admitted the patient. The surgeon was made aware of the randomization at the operating table.

Seventy patients with preoperative diagnosis of gastric cancer were considered for gastrectomy between November 1992 and February 1996. Fifty-nine patients underwent surgery for gastric cancer and were assigned either to (OG) consisting of 29 patients operated with the laparotomy approach, or to (LG) 30 patients operated with the laparoscopic approach. The overall survival (OS) at 64±16 months was 59% (n=17) in the OG, and 60% (n=18) in the LG. The rates of disease-free survival (DSF) were 59% and 60% in the OG and the LG, respectively at 64±16 months. The total rate of recurrence of the disease was 34% (n=10) in the OG and 30% (n=9) in the LG. All patients with recurrence died of their primary disease. The operation performed was R1 resection in 18 patients (n=9 in OG and n=9 in LG) and R2 in 41 (n=20 in OG and 21 in LG). Operative time was 196±21 min in the OG and 168±30 min in the LG; estimated blood loss (EBL) was 391±136 ml and 229±144 ml in the OG and the LG, respectively. Patients resumed eating by post-operative day 7±2 in the OG and 5±0.5 in the LG.

Laparoscopic subtotal gastrectomy for distal gastric cancer, when performed by an experienced laparoscopic surgeon, is safe and good oncological procedure.

Hepatobiliary-S024

LAPAROSCOPIC COMMON BILE DUCT EXPLORATION—LESSONS LEARNED FROM > 10 YEARS EXPERIENCE. Joseph B. Petelin, M.D., Department of Surgery, University of Kansas School of Medicine, Kansas City Kansas.

From September 21, 1989 through August 13,2001, 3450 patients presented to the author with symptomatic biliary tract disease. Laparoscopic cholecystectomy(LC) was attempted in 3418 of them, (99.1%), and completed in 3401, (99.5%). Laparoscopic cholangiograms(IOC) were performed in 3291 patients(96.3%). Forty-six patients, (1.3%), underwent pre-operative ERCP, and 31 patients, (0.9%), underwent postoperative ERCP. Laparoscopic common bile duct exploration (LCDE) was attempted in 317 cases, and completed successfully in 312, (98.4%).

Mean operating times for all patients undergoing laparoscopic cholecystectomy with or without cholangiograms or common bile duct exploration (LCDE) was 68 minutes. Mean length of stay was 21 hours. Mean operating times for patients not undergoing LCDE was 52 minutes, and mean length of stay was 19 hours.

Ductal exploration was performed via the cystic duct in 264, (83.3%) of cases, and through a choledochotomy in 53, (16.7%) of the cases. T-Tubes were used in patients in whom there was concern for possible retained debris or stones, distal spasm, pancreatitis, or general poor tissue quality secondary to malnutrition or infection.

In cases where choledochotomy was used, placement o f aT-tube occurred in 35, (66%), and primary closure without a T-Tube occurred in 18, (34%). There were no complications in the group of patients who underwent choledochotomy and primary ductal closure without T-Tube placement or in the group in whom T-Tubes were placed.

Conclusions: Common bile duct stones still occur in approximately 10% of patients. These stones are identified by IOC. IOC can be performed in over 99% of cases of LC. LCDE successfully clears these stones in more than 98% of cases. Most LCDEs in this series were performed via the cystic duct because of the stone characteristics and ductal anatomy. Selective laparoscopic placement of T-Tubes in patients requiring choledochotomy appears to be a safe and effective alternative to routine T-Tube drainage of the ductal system. The role of ERCP +/- S has returned to its status in the pre-laparoscopic era.

Education & Measuring Results-S026

OVERVIEW OF THE METRICS FOR OBJECTIVE ASSESSMENT OF SURGICAL SKILLS WORKSHOP: SETTING STANDARDS FOR TRAINING AND EVALUATION OF SURGICAL TECHNICAL SKILLS. Richard Satava, Alfred Cuschieri, Jack Jakimowicz, Ara Darzi, Gehard Buess, Anthony Gallagher, Stephen Deane, Jeffery, Hamdorf, Gerald Fried, Glenn Regher, Adrian Park, Randy Haluck, David Nahrwold, Leroy Heinrichs, Harrith Hasson, Thomas Krummel , Yale University, Ninewells Hospital and Medical School, Catharina Hospital, St. Mary's Imperial College, Univerity of Tuebingen, Queens University Belfast, University of New South Wales, University of Perth, McGill University, University of Toronto

INTRODUCTION: Recent advances in both surgical simulators and the methodology of objective assessment have provided powerful tools to improve training, reduce errors and improve patient outcomes. Unfortunately, every researcher uses different terms, different methods and measurement tools, and have outcomes that cannot be compared to other researchers. Standardization is necessary to clarify and unify this discipline. **METHOD:** An international workshop was convened using a modified Delphi methodology. Subject matter experts who had published scientifically rigorous evaluations of surgical simulators (both real and virtual reality) in peer reviewed journals and were accepted authorities in their respective surgical education research disciplines reviewed the currently available simulators (and simulation methodologies) for technical skills assessment, reached consensus of basic definitions of terms, constructed a classification (taxonomy) of the simulators and proposed a first order approximation of the types of measurements which were needed for technical skills. With this fundamental infrastructure into place, the available simulators and methodologies were matched to the measurements of the types of abilities, skills, tasks and procedures that are required for technical skills, creating a matrix of available systems and methodologies which are available to surgical educators and residency program directors to create a basic core curriculum for teaching basic surgical technical skills. RESULTS: Consensus definitions of ability, skills, tasks and procedures were used as the four categories in the taxonomy. The available simulators were classified as to which of the four categories of metrics they measured. In addition, there was identification of measurements for which there were no current simulators. Those validated measurements of the simulators are available in tabular form as a pick and choose menu for educators and program directors.

Education & Measuring Results-S027*

PROSPECTIVE RANDOMIZED EVALUATION OF SURGICAL RESIDENT PROFICIENCY WITH LAPAROSCOPIC SUTURING FOLLOWING COURSE INSTRUCTION. Kristi L. Harold, M.D., Brent D. Matthews, M.D., Charles L. Backus, D.O., Broc Pratt, M.D., Ronald F. Sing, D.O., B. Todd Heniford, M.D., Department of Surgery, Carolinas Medical Center, Charlotte, North Carolina

Laparoscopic suturing is required to develop competency in advanced laparoscopy. Patients benefit from residents having experience with this skill prior to applying it clinically. The aim of this study was to determine the impact of simple course instruction.

Our 17 general surgery residents were given manuals detailing laparoscopic suturing. One week later they performed a suture on a training model. Time (sec), accuracy (mm), and knot strength (lbs) were recorded. They were blindly randomized into intervention (IG, n=9) and control groups (CG, n=8). IG attended a 60-min. course with a lecture, video, and individual proctoring. Two weeks later they performed a stitch with standard laparoscopic instruments, and a stitch with a suturing assist device (SAD). Statistical analysis was performed by Wilcoxon rank sum.

Despite randomization IG was slower than CG (732.4sec vs. 500.2sec, p=0.10). The IG decreased suturing time from the 1st to 2nd stitch (732.4sec to 257.6sec), and CG decreased from 500.2sec to 421.8sec. Time to perform the 2nd stitch was not significant between groups (257.6sec vs. 421.8sec, p=0.46), but time reduced between the 1st and 2nd stitch was highly significant (IG=478.8sec vs.CG=78.4sec, p=0.001). Using the SAD for the 3rd suture, IG and CG decreased their times when compared to both the first and second suture. The difference in time reduction from 1st to 3rd sutures was significant (599.9sec vs. 323.9sec, p=0.02). The CG was able to perform almost as quickly as the IG with the suturing device (176.3sec vs. 133.4sec, p=0.11). The IG improved accuracy between the 1st and 2nd stitch (4.7mm to 2.6mm, p=0.26); the CG accuracy did not change. Knot strength was not different in any test.

Surgery residents can improve laparoscopic suturing skill with a short didactic course and minimal individual proctoring. A SAD can decrease the time to perform an intracorporeal tie by inexperienced surgeons without compromise of knot strength.

Education & Measuring Results-S028*

DETERMINANTS OF COMPETENCY JUDGMENTS BY EXPERIENCED LAPAROSCOPIC SURGEONS Gina L. Adrales, M.D., Uyen B. Chu, M.D., Michael B. Donnelly, Ph.D., Donald B. Witzke, Ph.D., Jim D. Hoskins, B.S., Michael J. Mastrangelo, Jr., M.D., Alejandro Gandsas, M.D., and Adrian E. Park, M.D., Center for Minimally Invasive Surgery, University of Kentucky, Lexington, Kentucky

Although technical competence is a cornerstone of the discipline of surgery, the definitive criteria for determining competence remain elusive. The purpose of this study was to identify the criteria used by individual laparoscopic surgeons to determine competence.

We assessed the laparoscopic skills and competence of 27 subjects with varying levels of experience using an inanimate model of a laparoscopic appendectomy. The subjects were observed and videotaped while performing a laparoscopic appendectomy. In a blinded fashion, the test videotapes were rated by five laparoscopic faculty in four categories, including clinical judgment and respect for tissue, dexterity and the economy of movement, serial/simultaneous complexity (flow of the operation), and spatial orientation. The raters were then asked to assess overall competence. The competence ratings were correlated with ratings in the skill categories. These correlational analyses included both point-biserial correlations and stepwise logistic regression.

For two raters, serial complexity had the highest correlation to competence assessment (coefficient 0.741, 0.728). The competence assessments of the remaining three raters correlated best with one of three different skill assessments including, spatial orientation (0.698), clinical judgment (0.775), or dexterity (0.760). The results of a logistic regression analysis indicated that 88 to 92% of individuals could be correctly classified as competent or incompetent by the standard used by each rater. The alpha coefficient for the competency assessment by the raters was 0.85, indicating that there was general agreement among the raters in judging competence.

Each of the four components scored in the study are important in determining competence, although the degree of importance varied with each rater's assessment. The differences suggest that competence is a complex entity but one that can be reliably judged by experienced raters.

Education & Measuring Results-S029

OPERATIVE END PRODUCT, PROCEDURE EFFECTIVENESS AND SURGEONS FORARM WORK LOAD COMPARING INLINE TO PISTOLGRIP HANDLES DURING SUTURING IN A LAPAROSCOPIC PHYSICAL SIMULATION MODEL Miro Uchal, M.D., Jan Brogger, M.D., Rimantas Rukas, M.D., Bjorn Karlsen, M.D., Roberto Bergamaschi, M.D., Ph.D., Department of Clinical Neurophysiology, Haukeland University Hospital, Bergen, Norway and Department of Research and Development, SSSF Teaching Hospital, Forde, Norway

OBJECTIVE The aim was to compare inline (ILH) with pistolgrip (PGH) with regard to product quality, procedure effectiveness, and surgeon forearm workload while suturing in a laparoscopic simulator. **METHODS** A 90% power crossover design at alpha 0.05 required a sample of 46. Block randomisation generated ILH-PGH or PGH-ILH sequence allocation. Population consisted of voluntary laparoscopic surgeons pretested with MIST-VR. Assignment generator was separated from executor. Tasks were suturing of perforated ulcer on foam stomach placed in a simulator. Olympus tm ILH and Wisap tm PGH needleholders were compared. Product quality was measured by tissue damage, accuracy error, water leak; procedure effectiveness by OR time and time motion analysis including goal (GDA) and non goal directed actions (NGDA); surgeon workload by electromyogram (EMG) of six forearm and thumb muscles. Assessor and statistician were blind to surgeon identity and handle type. Nonparametric, McNemar and t-tests were used for binary, ordinal and continuous variables, respectively. **RESULTS** 46 surgeons with a median of 36 MIST-VR score performed tasks as allocated. All variables but one were significantly different comparing 1st to 2nd task ignoring handle type. There was no evidence of significantly unequal carryover effect when comparison was stratified by ILH-PGH or PGH-ILH sequence. When comparing ILH to PGH regardless of task order there were significant differences in leak rates (24 vs 40 percent p=0.02) and tissue damage (mean 0.1 vs 0.2 mm p=0.06). Accuracy error (median 1 vs 0 mm p=0.2), OR time (median 186 vs 176 sec p=0.7), GDA (median 25 vs 29 p=0.3), NGDA (median 1 vs 1 p=0.09) and EMG (median 1.6 vs 1.7 root mean square amplitude p=0.9) were not significantly different comparing ILH to PGH. **CONCLUSION** The use of PGH when compared to ILH for suturing in a laparoscopic simulator resulted in poorer quality of operative end product as witnessed by increased leak rates and tissue damage. There were no differences in procedure effectiveness and surgeons forearm workload between handle types.

Education & Measuring Results-S030

EVALUATING MINIMALLY INVASIVE SURGERY (MIS) TRAINING USING LOW COST MECHANICAL SIMULATIONS: RELIABILITY AMONG SURGEON RATINGS Uyen B. Chu, M.D., Gina L. Adrales, M.D., Jim D. Hoskins, B.S., Donald B. Witzke, Ph.D., Michael B. Donnelly, Ph.D., Michael J. Mastrangelo, Jr., M.D., Alejandro Gandsas, M.D., Adrian E. Park,M.D. Center for Minimally Invasive Surgery, University of Kentucky, Lexington, Kentucky

Objective: To develop, test, and validate the efficacy of inexpensive mechanical MIS model simulations for training faculty, residents, and medical students. We hoped to demonstrate that the MIS skill acquired using models could be rated reliably by trained and experienced MIS surgeon raters.

Methods: We developed three renewable models that represent difficult or challenging segments of laparoscopic procedures (appendectomy [LA], cholecystectomy [LC], and inguinal hernia [LH]). We videotaped 10 students, 12 surgical residents and 1 surgeon receiving training on each of the models and again during their post-training evaluation session. Five MIS surgeons then assessed the evaluation session performance. For each simulation we asked them to rate overall competence (COM) and four skills: clinical judgment—respect for tissue (CJ), dexterity—economy of movement (DEX), serial/simultaneous complexity (SSC), and spatial orientation (SO). We computed intra-class correlation (ICC) coefficients to determine the extent of agreement (i.e., reliability) among their ratings.

Results: We obtained ICC values of 0.81, 0.84, and 0.74 for COM ratings on LA, LC, and LH respectively. We also obtained ICC values for the same three models for CJ 0.89, 0.83 0.75; DEX 0.89, 0.86, 0.88; SSC 0.82, 0.82, 0.82; and SO 0.87, 0.86, 0.86, respectively.

Conclusions: We were encouraged that we obtained very high reliability of performance ratings for competence and surgical skills in a mechanical simulator. Typically, faculty evaluations of residents in the operating room are much less reliable. In contrast, when faculty observe residents in a controlled, standardized environment their ratings are very reliable.

Education & Measuring Results-S031

ANALYSIS OF ERRORS IN LAPAROSCOPIC SURGICAL PROCEDURES: A NEW METHODOLOGY Neal E. Seymour, M.D., Anthony G. Gallagher, Ph.D., Sanziana A. Roman, M.D., Michael K. O'Brien, M.D., Dana K. Andersen, M.D., Richard M. Satava, M.D., Department of Surgery, Yale University School of Medicine, New Haven, CT

The determination of laparoscopic surgeon ability is essential to training error avoidance. A standardized method of procedure analysis is described which measures error and addresses potential problems of bias and complexity.

8 operative events were defined as errors associated with the excisional phase of laparoscopic cholecystectomy (following division of cystic structures) by 4 laparoscopic surgeons and a behavioral scientist. These consisted of 1) failure to progress, 2) gallbladder injury, 3) liver injury, 4) incorrect plane of dissection, 5) burn non-target tissue, 6) tearing tissue, 7) instrument out of view, 8) attending surgeon takeover. After review of practice videotapes of surgical resident-performed procedures, consensus on the identification of these errors was achieved among the same surgeons. The interrater agreement at the end of this training phase was 84-96% on 3 consecutive trials. 14 study videotapes of gallbladder excision were then observed independently by the attending surgeon reviewers, who were blinded to identity of surgeon and resident involved in each case. The procedure was broken down into a scoring matrix with 1 minute segments and each of the 8 errors reported for each minute.

Interrater reliability was determined as reported by Kazdin. Interrater agreement was 84-92% for all error catagories. No significant difference in interrater agreement between training and study phases was observed.

The accurate assessment of error is the first step in training error avoidance in laparoscopic surgery. The present study demonstrates that a high level of interrater agreement can be achieved by defining and then training recognition of important error events. Although association of the technical errors defined above with adverse clinical events has not been shown, by extension of this simple and reliable analysis tool to other procedures it should be feasible to define behaviors leading to adverse clinical outcomes.

New Approaches-S032

A PROSPECTIVE ANALYSIS OF 211 ROBOTIC ASSISTED SURGICAL PROCEDURES The Academic Robotics Group, consisting of Mark A Talamini MD, William Chapman MD, W. Scott Melvin MD, Santiago Horgan MD Johns Hopkins Univ Sch of Med Dept of Surgery, Baltimore MD; Dept of Surgery East Carolina Univ, Charlotte, NC; Dept of Surgery Ohio State Univ, Columbus OH; Dept of Surgery Univ of Illinois Sch of Med, Chicago, Ill

OBJECTIVE

The Academic Robotics Group prospectively studied 211 robotically assisted operations to assess the safety and utility of robotically assisted surgery.

METHODS

All operations took place at one of four member institutions between June, 2000 and June 2001 using the recently FDA approved daVinci robotic system (Intuitive Surgical). A variety of procedures were undertaken, including antireflux surgery (69), cholecystectomy (36), Heller myotomy (26), bowel resection (17), donor nephrectomy (15), left internal mammery artery mobilization (14), gastric bypass (7), splenectomy (7), adrenalectomy (6), exploratory laparoscopy (3), pyloroplasty (4), gastrojejunostomy (2), distal pancreatectomy (1), duodenal polypectomy (1), esophagectomy (1), gastric mass resection (1), and lysis of adhesions (1).

RESULTS

Average operating room time was 188 minutes (range 45 to 387, s.d.= 83), surgical time 143 minutes (range 35 to 462, s.d.=63), and robot time 90 minutes (range 12 to 235, s.d.=47). Median length of stay was 1 day (range 0 to 37). There were 8 (4%) technical complications during procedures, 5 minor (4 hook cautery dislodgement, 1 slipped robotic trocar) and 3 major (system malfunctions, 2 of which required conversion to standard laparoscopy). In all cases, technical problems caused only operating room delay, without apparent altered outcome. There were medical/surgical complications in 9 patients (4%). Six (3%) were considered major, including one death unrelated to the robotic procedure.

CONCLUSIONS

These results of robotic assisted surgery compare favorably with those of conventional laparoscopy with respect to mortality, complications, and length of stay. Robotic assisted surgery is safe and effective, and is a new reality for American surgery. The role of these devices in surgery will expand as the technology evolves.

New Approaches-S033

LAPAROSCOPIC GASTRECTOMY WITH RADICAL LYMPH NODE DISSECTION WITH INTRAOPERATIVE NAVIGATION USING 3D ANGIO CT IMAGES RECONSTRUCTED AS LAPAROSCOPIC VIEW. Shuji Takiguchi,M.D., Mitsugu Sekimoto,M.D., Yasuhiro Miyake,M.D., Yoshiyuki Fujiwara,M.D.,Takushi Yasuda,M.D. Shigeyuki Tamura,M.D. Masahiko Yano,M.D., *Seishi Kumano, M.D., *Tonson Kim, M.D., Morito Monden,M.D. Department of Surgery and Clinical Oncology, *Department of Radiology, Graduate School of Medicine, Osaka University, Osaka, Japan

Introduction: We had performed laparoscopic gastrectomy with extended radical lymphnode dissection for gastric cancer. Because the vessels of the stomach were complicated, laparoscopic lymph node dissection for gastric cancer was considered to be difficult. Therefore, intraoperative navigation system would be necessary during lymph node dissection. Recent enhanced volume rendering CT could make 3D angio images clearly. This advanced radiological technology could provide us 3D angio CT images reconstructed as the same view that would be observed by the laparoscope inserted to the abdominal cavity. In this paper we report laparoscopic gastrectomy with radical lymph node dissection using this advanced radiological technology.

Methods: 3D angio CT images from the celiac axis to the proper hepatic artery were reconstructed to two types preoperatively. First type was only 3D angio images that were reconstructed as laparoscopic view. The other type that was 3D angio images with pancreas body image was prepared for intraoperative navigation. Two monitors were placed over the shoulder of the patient during this surgery. One monitor controlled by the image mixer (Olympus.Co, Japan) projected the laparoscopic images with picture in picture of 3D CT angio images. The operator navigated the surgery with reference to this monitor during lymph node dissection. Result: 3D angio CT clearly showed all vessels that were needed to perform laparoscopic lymph node dissection for gastric cancer, so we understood the anatomy of the vessels preoperatively. 3D angio CT reconstructed as laparoscopic view was useful for laparoscopic navigation surgery.

New Approaches-S034

LAPAROSCOPIC APPROACH IN ABDOMINAL EMERGENCIES: A DECENNIAL EXPERIENCE, Ferdinando Agresta:, M.D., Ivan Michelet, M.D., Natalino Bedin, M.D., Department of Surgery, Ospedale Civile, Vittorio Veneto (TV), Italy

Laparoscopy (LAPS) is fast becoming the preferred surgical approach to a number of different pathologies because it allows the condition to be correctly diagnosed and treated at the same time. In emergency abdominal situations, both critical components of operative treatment - exploration to identify the causative pathology and performance of an appropriate operation - can often be accomplished gently via LAPS. Aim of the present work is to illustrate retrospectively the results of a case-control experience of LAPS vs. open surgery carried out at our institution for abdominal emergencies.

Between January 1992 and July 2001 a total of 790 patients (mean age 25.2) underwent emergent and/or urgent surgery. Among them, 473 (59.87%) were operated on laparoscopically (acute small bowel obstruction: 25 cases; gastro-duodenal ulcer disease: 22 cases; biliary system disease: 112 cases; pelvic disease: 302 cases; colonic perforations - iatrogenic or not: 12 cases), according to the presence of a well-trained surgical team. We decided not to treat patients with LAPS who had a history of previous abdominal approaches to malignant disease, a history of more than two major abdominal surgeries or massive bowel distension. We did not consider peritonitis to be a contraindication to LAPS. The laparoscopic group conversion rate was 6.5% and was mainly due to the presence of dense intraabdominal adhesions. Major complications ranged as high as 2.7% with a postoperative mortality of 0.8%. A definitive diagnosis was provided in 96.6 % cases, with the possibility to treat 93.4% of them by laparoscopy.

Even if limited by its retrospective feature, the present experience shows that laparoscopic approach to abdominal emergencies is as safe and effective as conventional surgery, has a higher diagnostic yield and allows for lesser trauma and a more rapid postoperative recovery. Such features make laparoscopy a challenging alternative to laparotomy. It may represent a positive solution to the problems of managing emergencies abdominal situations.

New Approaches-S036

LAPAROSCOPIC LATERAL ADRENALECTOMY VS OPEN POSTERIOR ADRENALECTOMY FOR THE TREATMENT OF BENIGN ADRENAL TUMORS. Klaus K.J. Hallfeldt, M.D., Stefan Schmidbauer, M.D., Felix Hohenbleicher, M.D., Arnold Trupka, M.D., Chirurgische Klinik Innenstadt, Ludwig-Maximilians Universitaet, Munich, Germany

In the present study we compared laparoscopic transabdominal adrenalectomy in the lateral position to the coventional open posterior technique which was routinely used by our institution in the pre-laparoscopic era.

40 laparoscopic adrenalectomies (LA) carried out between July 1998 and August 2001 were compared to 30 open posterior operations (PA) performed between July 1994 and June 1998. In all cases, the indication for surgery was a benign lesion smaller than 7cm.

In both groups (LA/PA), age, gender, average tumor size (3.8/3.7) and tumor types (Aldosteron-Producing-Adenomas: 14 / 8; Cushing's Syndrome: 12 / 8; Pheochromocytomas: 6/ 7; Incidentalomas: 4 / 4; Others: 4 / 3) were similar. Statistically significant differences ($p<0,05$) were observed in favour of the laparoscopic procedure regarding the intraoperative blood loss (260 vs 380ml), postoperative narcotic equivalents (2,9 vs 6,4) morbidity (13 vs 27%) and length of hospital stay (7 vs 10 days). Average operating time was significantly longer for laparoscopic adrenalectomy (140 vs 110 min). There were two conversions to open adrenalectomy due to diffuse bleeding. Following laparoscopic adrenalectomy, we observed 1 major complication (postoperative bleeding from the spleen making a laparotomy necessary) and 4 minor complications (1 small retroperitoneal hematoma, 2 subcostal nerve irritations, 1 pleural effusion). Posterior adrenalectomy resulted in 1 major (wound infection) and 7 minor complications (2 subcutaneous hematomas, 2 nerve irritations, 2 pleural effusions, 1 dystelectasis).

Laparoscopic adrenalectomy is a safe and reliable procedure, displaying all the common advantages of minimal access surgery. In our institution it has become the standard technique employed for benign adrenal desease. However, the operation is technically demanding, and as adrenal surgery is rare it should be restricted to centers with special interest in laparoscopic and endocrine surgery.

New Approaches-S037*

LAPAROSCOPIC MANAGEMENT OF SYMPTOMATIC ACHALASIA WITH EPIPHRENIC DIVERTICULUM. E Fraiji Jr., MD; M Banasiak; M Bloomston MD; L Carey MD; E Zervos MD; S Goldin MD; M Wallace LPN; AS Rosemurgy MD, University of South Florida , Tampa, Florida

Objective: Traditionally, symptomatic achalasia with epiphrenic diverticulum was treated with thoracotomy, resection, and Heller myotomy. We undertook this study to evaluate outcome after laparoscopic diverticulectomy, myotomy and fundoplication.

Methods: From 1999 to 2001, six patients, of average age 60 years, with symptomatic achalasia and epiphrenic diverticulum underwent laparoscopic diverticulectomy, Heller myotomy, and partial fundoplication. Preoperative evaluation included upper endoscopy and esophagogram/ timed barium study. Intraoperative endoscopy was undertaken in all patients to guide the extent of myotomy and to avoid narrowing the esophageal lumen with diverticulectomy. Postoperative esophagogram was obtained in all patients. Dysphagia and heartburn were graded by patients on a scale of 0 (asymptomatic) to 5 (maximum symtoms) before and after the operation. Mean follow up was 9 months (range 1-17).

Results: Dor fundoplication was undertaken in five patients while Toupet fundoplication was undertaken in one. There was one intraoperative complication- an esophagotomy that was laparoscopically repaired and buttressed with a Dor fundoplication. There was no evidence of leak on postoperative contrast study(ies). One patient developed postoperative pneumonia that progressed to empyema requiring decortication. Patient reported dysphagia decreased from 4.5 +- 0.8 (mean +-SD) to 1.8 +- 1.7, ($P<.05$ by Mann-Whitney U test) while heartburn decreased from 4.3 +- 0.8 to 1.3 +- 1.3 ($P<.05$). All patients reported improvement in symptoms after operation.

Conclusion: Esophageal diverticulectomy with Heller myotomy and partial fundoplication can be safely accomplished laparoscopically with endoscopic assistance. Although technically challenging, this laparoscopic approach reduces dysphagia associated with achalasia and esophageal diverticula while limiting symptoms of gastroesophageal reflux.

Education & Training-S038*

RESIDENCY TRAINING IN ADVANCED LAPAROSCOPIC SURGERY IN THE UNITED STATES. Lynn Wojtasik MD; Quynhanh Pham, MD; Naveed Ahmed, MD; Vedantum Chari, MD; Raphael Chung, MD. Department of Surgery, Huron Hospital, Cleveland Clinic Health System, Cleveland, Ohio.

Advanced laparoscopic surgery, defined as the less commonly performed procedures, has been included in residency training but the results have not been assessed systematically. **Method**: From the data collected by the American Board of Surgery and Residency Review Committee, we examined the operative statistics for the following laparoscopic operations from 1994-2000, and performed regression analysis for trends and growth rates.
Results: National totals (except 6th column, mean±SE/resident in 2000)

	94	96	00	r^2	growth(#/yr)	#/resident
Anti-reflux procedures	579	2130	5341	.95	713	5.4±7
Gastrostomy	409	464	1403	.82	153	1.4±3
Partial gastrectomy	68	101	126	.13	6.5 *	0.1±1
Vagotomy ± drainage	70	78	1757	.35	-2.3*	0±0
Proximal vagotomy	31	23	282	.56	53	0±0
Enterolysis	--	--	928	.10	346	0.9±2
Enterectomy	368	409	302	.0	-13*	0.3±1
Ileostomy	--	--	149	1.0	118	0.2±1
CBDE	352	694	878	.72	85	0.9±2
Partial colectomy	923	1092	1755	.74	122	1.8±3
Splenectomy	76	294	957	.96	140	1.0±1
Retroperit. Lymphadect	94	183	294	.93	29	0.3±1

r^2 =regression correlation coefficient; growth=slope; *=n.s.; otherwise p<0.01
Conclusion: Large SE's of means suggests uneven distribution as few programs have sufficient training material. Of these advanced procedures, anti-reflux is the most common and has the largest growth, partial colectomy is a distant second growing at a much slower rate. Some are in decline (V&D, enterectomy). Changes in incidence of disease (e.g. peptic ulcers), scarcity of patients (e.g., conditions requiring elective splenectomy), competition from fellowship training (e.g., colon resections), are factors that may limit the surgical residents' experience.

THE LAPAROSCOPIC PROFICIENCY OF THE SURGICAL GRADUATES OF THE UNITED STATES. Quynhanh Pham, MD; Lynn Wojtasik, MD; Naveed Ahmed, MD; Vedantum Chari, MD; Raphael Chung, MD. Department of Surgery, Huron Hospital, Cleveland Clinic Health System, Cleveland, Ohio.

Although much resource has been devoted to laparoscopic training for young surgeons, the fruits of such labor has not been analyzed. In this study we delineated the laparoscopic capability of the current surgical graduates, traced its growth over the past 7 years, and made short term projections based on growth rates. **Method**: The residents' operative logs collected by the Residency Review Committee and American Board of Surgery was the sole source of data. From 1994 through 2000, laparoscopic operations/resident are tabulated and subjected to regression analysis, and the growth rate (slope or change/year) for each calculated.
Results: mean laparoscopic operations/resident over entire training

	94	00	r^2	Growth(#op/yr)	p
Cholecystectomy	42	84	.97	6.9	.001
CBDE	0	0.9	.84	.1	.0091
Appendectomy	3	8.5	.98	.9	.0008
Nissen	0.6	5.4	.97	.7	.0007
Hernia repair	3	5.6	.09	1.3	n.s.
Partial colectomy	0.9	1.8	.87	.1	.0081
Expl laparoscopy	2	4.7	.98	.5	.0002
Splenectomy	0	1	.97	.2	.0001
Total	51.5	111.9	.96	10.5	.0001

Conclusion: A graduate in 2000 performed significantly more laparoscopic operations than one in 1994, both in numbers and variety, in a continuing growth trend. The growth rates provide a guide as to which operations training programs should strive to teach, as graduates entering practice are likely to stay within their competency, venturing outside of their comfort zone much latter. Besides cholecystectomy, programs should teach appendectomy, fundoplication, herniorrhaphy and exploratory laparoscopy.

Note: This presentation will include data from both abstracts above.

Education & Training-S039*

MIS TRAINING IN CANADA: A SURVEY OF GENERAL SURGERY RESIDENTS. Patrick M. Chiasson, MD, David E. Pace,MD, Christopher M. Schlachta, MD, Joseph Mamazza, MD, Eric C. Poulin, MD,The Centre for Minimally Invasive Surgery, St. Michael's Hospital, Toronto, ON, Canada.

The purpose of this study was to assess the resident's perspective of MIS surgical training within Canadian academic surgical departments.

A pre-tested questionnaire was distributed to the general surgery residents of participating Canadian academic surgical departments. It addressed their career plans, training in both basic and advanced MIS procedures, the factors affecting this training, and the role of the MIS surgeon. Two separate mailings were carried out to improve our response rate.

14/16 residency programs participated in this survey. 237/388 (61%) of residents responded to the survey. The respondents were evenly distributed according to level of training. Residents expect to perform both basic (219/237 (92%)) and advanced (124/236 (53%)) MIS procedures upon completion of their residency. However, only 42/233 (18%) felt that their MIS training would be adequate. 215/236 (91%) of residents felt that it was the academic department's responsibility to teach advanced MIS procedures, however only 59/232 (25%) believed that a department consisting of open sub-specialty surgeons could meet this mandate. Using a 5 point Likert scale, the most important factors influencing their training included limited advanced case volume (median = 5), limited opportunity in the OR (median = 5), a lack of attending surgeon interest (median = 4), limited OR time (median = 4), and a lack of surgical department support (median = 4) Residents were concerned about their ability to acquire these skills once they finished their training (median = 4). 231/234 (99%) felt that there was an important role for a MIS surgeon within the academic setting (median = 5).

The rapid development of MIS has generated complex issues for resident training within the present Canadian academic surgical environment.

Education & Training-S040*

TRAINING THE NOVICE IN LAPAROSCOPY: MORE CHALLENGE IS BETTER. Mohamed R. Ali, MD, Yvonne Mowery, Brian Kaplan, MD, Eric J. DeMaria, MD, Department of Surgery, Medical College of Virginia, Richmond, Virginia.

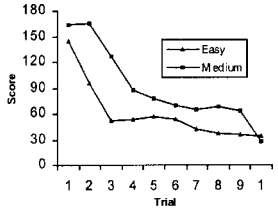
Virtual reality simulation is effective in training the complete novice to perform basic laparoscopic skills.

Using the MIST-VR laparoscopic station, twenty-seven honors high school students, with no previous surgical experience, were tested at the easy level, prospectively randomized to eight training sessions at the easy (Group A, n=14) or the medium (Group B, n=13) level, and then all retested at the easy level. Scores were based on speed, accuracy, and error. ANOVA and t-tests (α=0.05) were used for statistical analyses.

	Baseline		Final		Change (%)	
Task	A	B	A	B	A	B
AcquirePlace (AP)	75.9	78.9	20.1	15.7*	66.9	74.9
Diathermy (D)	69.8	72.2	32.5	28.7*	50.1	57.4
ManipDiath (MD)	199.1	233.4	67.1	53.7*	57.8	71.7*
TransferPlace (TP)	75.4	96.4	26.3	22.4	60.2	72.1*
Traversal (T)	144.4	163.6	34.2	27.4*	70.6	81.3*
WithdrawInsert (WI)	53.2	63.3	20.9	18.0*	52.9	64.9

* p<0.05

Mean scores for each task are tabulated, with a lower score signifying a better result. Both groups were statistically similar at baseline. All scores improved significantly (50.1% to 81.3%) over the period of training (p<0.05). As the chart indicates, group B scores were significantly higher than group A scores throughout training (p<0.05). However, on final testing, the mean scores of group B were significantly better than those of group A for all tasks except TP (p=0.054). The variances within each group also decreased with time, implying that students attained similar levels of proficiency. Scores reached plateau after an average of 4 trials in group B compared to only 2 trials in group A (ANOVA, α=0.05). Subjects in group B also improved more from baseline to final scores than group A in all tasks, statistically significant in MD, TP, and T (p<0.05).



Virtual simulation is an effective laparoscopic training tool for the novice, providing significant improvement in skill levels over a relatively short period of time. More difficult training seems to predict greater improvement over time and better final skill levels.

Education & Training-S041*

SETTING THE PASS/FAIL SCORE FOR THE MISTELS SYSTEM. Dennis R Klassen M.D., Shannon A. Fraser M.D., Liane S. Feldman M.D., Gabriela A. Ghitulescu M.D., Donna Stanbridge RN, Gerald M. Fried M.D., Division of General Surgery, McGill University, Montreal, Quebec, Canada.

The McGill Inanimate System for Training and Evaluation of Laparoscopic Skills (MISTELS) was developed to assess laparoscopic skills and to score them objectively. This system has been described previously. The purpose of the present study is to determine a pass/fail threshold.

One hundred and forty three individuals were tested and grouped according to their clinical competency in laparoscopic surgery. The non-competent group (NC) consists of medical students and surgical residents in their first two years of training (PGY1-2) (n=71). The competent group (C) consists of surgical residents in their last year of training, laparoscopy fellows, and practicing laparoscopic surgeons (n=72). The Mann-Whitney U-test was used to evaluate differences in task performance between groups.

There is a significant difference in total scores, and the 5 individual MISTELS task scores ($p<0.0001$) between non-competent and competent laparoscopic surgeons. By setting specific pass/fail total score thresnolds (cutoff scores), competent surgeons can be discriminated from non-competent ones (see Table).

Cutoff Score	250	260	270	280	290	300
NC %Pass	27	24	20	17	15	15
C % Pass	92	89	87	85	82	80

The MISTELS total score frequency distribution curves for non-competent and competent laparoscopic surgeons are separate enough that a pass/fail score can be set which gives a passing score to competent laparoscopic surgeons, and a failing one to non-competent ones.

Education & Training-S042*

THE BLUE DRAGON - A SYSTEM FOR OBJECTIVE LAPAROSCOPIC SKILL ASSESSMENT. Marco Barreca+, M.D., Jacob Rosen++, Ph.D., Lily Chang+, M.D., Jeffrey D. Brown+++ BSE, Blake Hannaford++, Ph.D., Mika Sinanan+, M.D., Ph.D. +Departments of Surgery, ++Electrical Engineering, and +++Bioengineering. University of Washington. Seattle, WA.

Evaluation of trainee minimally invasive surgical (MIS) skills is based on the judgment of experienced surgeons during actual surgical procedures. For both surgeon and observer, MIS tasks require a complex synthesis between 2-D visual information and force-displacement effects of surgical tools on tissue. The aim of this study is to develop a system for objectively decomposing MIS tasks to illustrate and categorize performance of surgeons at different levels of training.

The Blue DRAGON is a system for acquiring kinematics and dynamics of laparoscopic instruments during performance of surgical tasks. It includes 2 four-bar mechanisms equipped with position sensors. Each tool is instrumented with a 3-axis force/torque (F/T) sensor located at the proximal end of the tool shaft and a force sensor inserted into the handle which measure the F/T at the hand/tool interface. The surgical tasks are decomposed in states that correspond to fundamental tool/tissue interactions based on tool kinematics and associated F/T. Surgeons at different levels of training (n=30, 5xR1-R5, and 5 experts) performed 6 MIS tasks in an animal model.

Using a Markov statistical analysis, each task was deconstructed and analyzed. These data show that major differences exist among surgeons at different levels of training. These are: (i) type of tool/tissue interactions, (ii) transition between tool/tissue interactions applied, (iii) time spent performing tool/tissue interactions, (iv) overall completion time, and (v) F/T magnitudes applied with tools. F/T magnitude is task and experience-dependent, with higher F/Ts applied by novices during tissue manipulation and lower during tissue dissection compared to expert surgeons. The increased efficiency of experts is demonstrated by shorter tool tip displacements, shorter period of time spent in the 'idle' state, and application of sufficient F/T to decisively accomplish the task.

Statistical patterns of technical expertise in MIS surgery can be objectively defined. Provision of this feedback to trainees may improve safety and efficiency in MIS.

Education & Training-S043

COMPARISON OF ECONOMIC AND ECOLOGIC IMPACTS OF DISPOSABLE VERSUS REUSABLE INSTRUMENTS FOR LAPAROSCOPIC CHOLECYSTECTOMY, Stefan Adler, Dipl.-Biol.; Martin Scherrer, Dipl.-Ing.; Franz Daschner, Prof. Dr. med.

Institute for Environmental Medicine and Hospital Epidemiology, University Hospital Freiburg

Background: The economic and ecological effects of using disposable versus reusable instruments in laparoscopic cholecystectomy were compared. Special consideration was given to processing reusable instruments in washer disinfectors and the resultant cost of sterilization.

Methods: With the help of surgeons those instruments frequently used in the disposable form were identified. Thus of all the instruments used in laparoscopic cholecystectomy, the disposable and reusable versions of trocars, scissors and Veress cannula were compared. The costs for purchase, reprocessing (Cleaning, Sterilization), personnel and disposal where taken into account. The ecological data where examined considering waste amount, energy and water consumption.

Results: In the case under examination, performing laparoscopic cholecystectomy with disposable instruments is 19-times more expensive than with reusable instruments. The higher cost of using disposable instruments is primarily due to the purchase price of the instruments. Processing reusable instruments has little significance in terms of cost, while the cost disposing of disposable instruments is the least significant factor. The number of laparoscopic cholecystectomies performed per year does not substantially influence cost. The assessment of the ecological consequences shows in our opinion that reusable instruments are ecologically advantageous.

Conclusions: In view of the upward pressure of costs in hospitals, disposable instruments should only be used in laparoscopic cholecystectomy if they offer clear advantages over reusable instruments.

Esophageal Surgery-S046

A TEN -YEARS EXPERIENCE WITH LAPAROSCOPIC NISSEN FUNDOPLICATION D Zacharoulis M.D., C J OBoyle M.D., H H Kumar M.D., B DobbinsM.D., P C SedmanM.D., W A Brough M.D., C MS Royston M.D., Division of Upper Gastrointestinal and Minimally Invasive Surgery, Hull Royal Infirmary, Kingston-upon-Hull,United Kingdom

AIM: The aim of the study is to report our 10-year experience with Laparoscopic Nissen Fundoplication (LNF) for the treatment of the gastroesophageal reflux disease (G.E.R.D.). Emphasis is given to the complications and long term follow up.

METHODS: Between December 1991 and August 2001, 820 patients underwent LNF. Perioperative and follow-up data were recorded prospectively on a dedicated Microsoft Access database and were analysed for the purpose of this study.

RESULTS: The median follow-up was 4.8 years. Five-year follow-up was obtained on 337 patients of whom 90% reported excellent symptomatic relief and required no antireflux medication. Seven year follow-up was available for 205 patients of whom 92% reported excellent symptomatic relief. Intraoperative conversion was necessary in 9 patients (1.1%). Nineteen patients (2.3%) died during the follow-up period (16 deaths were unrelated to surgery). Post-operative wind-related symptomatology occurred in 451 patients (55%) . Initial dysphagia was observed in 298 patients(36.3%). Persistent dysphagia requiring endoscopic dilatation or reoperation occurred in 27 (3.3%) and 7(0.9%) patients respectively. Reoperation was necessary for intrathoracic stomach migration in 11 patients (1.3%), at varying intervals post-operatively. Twelve patients (1.5%) experienced recurrent reflux symptoms of which 8 underwent redo fundoplication.

CONCLUSION: 360 deg LNF with division of the short gastric vessels is a safe, effective and durable method for the treatment of G.E.R.D. Overall morbidity and mortality rates are low.Higher rates of perioperative morbidity occur during the early experience of the centre.

Esophageal Surgery-S050

ESOPHAGEAL CANCER: A LAPAROSCOPIC APPROACH TO STAGING AND RESECTION, David E. Pace, M.D., Patrick M. Chiasson, M.D., Christopher M. Schlachta, M.D., Eric C. Poulin, M.D., Joseph Mamazza, M.D., The Centre for Minimally Invasive Surgery, St. Michael's Hospital, University of Toronto, Toronto, Ontario

The purpose of this report is to describe the surgical management of patients with esophageal carcinoma using minimally invasive techniques and report on early outcomes of patients following laparoscopic esophagectomy.

Data was obtained from a prospectively collected computer database of 32 consecutive patients referred for surgery with a diagnosis of esophageal carcinoma between August 1996 and June 2001. Staging laparoscopy was performed in all patients. If curable disease was found, a laparoscopic esophagectomy was attempted. Follow-up data was obtained from the patients office chart and, if incomplete, from patients, their family, or their family physician.

Thirteen patients (40.6%) had incurable disease based on staging laparoscopy (6 had tumour invading local structures, 6 had bulky tumour involvement of celiac nodes, and 1 had diffuse peritoneal carcinomatosis). Laparoscopic esophagectomy was attempted in 19 patients (12 males and 7 females). Median operative time was 380 minutes (range of 230 to 445) and median operative blood loss was 400 cc (range of 100 to 1000). Two cases were converted. Median hospital stay was 12 days (range of 7 to 40) and median ICU stay was 2 days (range 1 to 39). Four patients (21.5%) suffered major postoperative complications and twelve patients (63.2%) suffered minor complications that did not affect length of stay. There was one in-hospital mortality (5.3%). Delayed complications occurred in 7 patients (38.6%). Proximal and distal resection margins were tumour free in all cases. Average number of lymph nodes excised was 10 (range of 2 to 30). There was one stage 0, three stage 1, six stage 2A, three stage 2B, and six stage 3 tumours. Four year survival with a median follow-up of 12.2 months was 44.0%.

Staging laparoscopy can spare some patients with esophageal cancer unnecessary surgery. Laparoscopic esophagectomy can be performed with acceptable morbidity and mortality. Further validation is required.

Esophageal Surgery-S051

LOWER ESOPHAGEAL SPHINCTER AUGMENTATION VIA INJECTION OF A BIOCOMPATIBLE POLYMER: ACCURACY OF IMPLANTATION ASSESSED BY ESOPHAGECTOMY

Jeffrey H. Peters MD and David Silverman MD, University of Southern California, Los Angeles CA

Introduction: Endoscopic lower esophageal sphincter (LES) augmentation is undergoing clinical trial as an alternative to pharmacologic and laparoscopic treatments for gastroesophageal reflux disease. Safety and efficacy of LES augmentation depend upon accurate placement of the implant into the wall of the esophagus. To date no study has demonstrated the prevalence and location of the intended implant.

Methods: The study group consisted of 9 patients with underlying esophageal disease severe enough to warrant esophagectomy. Three to four implants of 1-2 cc of Enteryx (a biocompatible ethylene-vinyl alcohol copolymer dissolved in dimethyl sulfoxide with micronized Tantalum as a radiopaque marker) were placed at the squamocolumnar junction of each patient via a 4 mm, 23-gauge needle under endoscopic guidance. Fluoroscopy was utilized in all patients to facilitate endoscopic placement. Outcome measures included the prevalence and location of successful implantation into the wall of the esophagus.

Results: Thirty of thirty-four implants (88%) were successfully placed into the wall of the esophagus. The remaining four were found lying subserosally or attached to the exterior of the GEJ. Fluoroscopically, the implants tended to coalesce forming arcs or a ring around the GEJ. Histologic examination revealed implantation into the deep submucosa contiguous with the circular muscle and within the muscularis propria in all patients, with implants occasionally extending into the subserosa (Figure). There were no untoward reactions identified.

Conclusions: Endoscopically directed implantation of a biocompatible polymer into the esophageal wall can be accomplished with a high degree of accuracy. Injection via 4 mm needle results in material placed into the along and within the muscular layers of the esophagus.

Esophageal Surgery-S052*

EFFECTIVENESS OF LAPAROSCOPIC FUNDOPLICATION IN RELIEVING GERD SYMPTOMS AND ELIMINATING ANTI-REFLUX MEDICAL THERAPY. PK Papasavas, MD, DJ Gagné, MD, RJ Keenan, MD, PF Caushaj, MD, RS Macherey, RN, TS Santucci, RN, S Bartley, RR, RJ Landreneau, MD. Minimally Invasive Surgical Program, West Penn Allegheny Health System, Pittsburgh, Pennsylvania.

Recent medical literature suggests that anti-reflux surgery should not be advised with the expectation of elimination of medical treatment. We reviewed our results with laparoscopic fundoplication as a means of eliminating GERD symptoms, improving quality of life, and freeing patients from chronic medical treatment of GERD.

225 patients who underwent laparoscopic fundoplication (Nissen 184, Toupet 41) were followed for at least 2 years. All patients underwent preop endoscopy, barium studies, esophageal manometry, and 24-hour pH analysis. Preop and postop (0-10 severity) visual analogue scoring scale was utilized to evaluate symptoms of heartburn, regurgitation, chest pain and the sense of well being. A GERD score (0-32) as described by Jamieson was also utilized. The need for GERD medications before and after surgery was assessed. Unpaired two-tailed t-test and Fisher's exact test was utilized.

Mean scores on a visual analogue scale ranging from 0-10 severity

	N	Heartburn	Regurgitation	Reflux Score†	Chest Pain	Well Being
Pre-op	225	8.4±2.7	7.1±3.5	26±5.5	2.9±3.8	5.7±2.1
2 years	225	1.8±3.1*	0.9±2.3*	4.2±6.8*	1.3±2.8*	7.9±2.1*

*† Jamieson GERD score (0-32 range); *p values<0.01*

Despite the fact that 24% of patients were still on proton pump inhibitors at 2 years after surgery, 87% of the patients had a greater than 50% reduction of their preop heartburn and regurgitation scores. 12 patients (5.3%) required repeat fundoplication for recurrent symptoms (n=7) or postop dysphagia (n=5). There was no age or gender difference in operative success, nor in the outcome between partial and complete fundoplication.

Laparoscopic fundoplication can successfully eliminate GERD symptoms and improve quality of life. Significant reduction in the need for chronic GERD medical treatment beyond two-years of anti-reflux surgery can be anticipated.

Esophageal Surgery-S053

QUALITY OF LIFE, SYMPTOMATIC OUTCOME AND PATIENTS SATISFACTION AFTER LAPAROSCOPIC REFUNDOPLICATION IN GASTROESOPHAGEAL REFLUX DISEASE PATIENTS WITH FAILED PRIMARY ANTIREFLUX SURGERY: A 3 TO 5 YEARS FOLLOW-UP

Frank Alexander Granderath MD, Thomas Kamolz PhD, Ursula Maria Schweiger MD, Heinz Wykypiel jr. MD, Rudolph Pointner MD

Institutions: Department of General Surgery, Hospital Zell am See,Zell am See,Austria; Department of General Surgery, University of Innsbruck,Innsbruck,Austria

Introduction: Quality of life and patients satisfaction has been shown to be an important issue to estimate outcome of laparoscopic antireflux surgery (LARS). Aim of this study was to evaluate quality of life data, patients satisfaction and change of symptoms in 27 patients who underwent laparoscopic redo-surgery after failed primary open or laparoscopic antireflux surgery 3 to 5 years after surgery.

Methods and procedures: Between March 1995 and June 1998, 27 consecutive patients with a mean age of 57 years (range 35 to 78) underwent laparoscopic refundoplication for failed primary open or laparoscopic antireflux surgery. Quality of life was evaluated using the Gastrointestinal Quality of Life Index (GIQLI). Additionally, patients satisfaction and symptomatic outcome was evaluated using a standardized questionnaire.

Results: Three to five years after laparoscopic refundoplication, patients quoted their quality of life (GIQLI) in an overall score of 113.4 points, which is comparable to that of patients who underwent primary laparoscopic antireflux surgery. 25 (92.6%) patients estimated their satisfaction with the redo-procedure as very good and would undergo surgery again if necessary. These patients are free of antireflux medication at follow-up. Two (7.4%) patients reported about rare episodes of heartburn, which could be treated successfully with proton pump inhibitors. Four (14.(%) patients reported about episodes of regurgitation, but did not have an decreased quality of life because of it. Seven (25.9%) patients suffer from mild to moderate dysphagia 5 years postoperatively, the other patients (74.1%) do not have any dysphagia at follow-up.

Conclusion: Laparoscopic refundoplication after primary failed antireflux surgery results in a high patients satisfaction and significant improvement of patients quality of life with good to excellent symptomatic outcome for a follow-up period of 3 to 5 years after surgery.

Esophageal Surgery-S054*

LONG TERM RESULTS FOLLOWING LAPAROSCOPIC LYSIS OF ADHESIONS AND PLACEMENT OF SEPRAFILM FOR INTRACTABLE ABDOMINAL PAIN. Leena Khaitan, M.D., Stefan Scholz, M.D., Hugh Houston, M.D., William Richards, M.D., Vanderbilt University Medical Center, Nashville, TN

Introduction: Surgical treatment of patients who suffer from chronic abdominal pain resulting from intra-abdominal adhesions is controversial. We report our experience with treatment of this difficult patient population with laparoscopic lysis of adhesions (LOA) and placement of *Seprafilm* (PoS).

Methods: 19 consecutive patients, 2 male and 17 female, underwent laparoscopic LOA and PoS between 7/98 and 7/01. Patients with abdominal pain due to irritable bowel syndrome, hernias, or endometriosis were excluded. Patients had undergone 6.4 previous abdominal procedures (range 1-14) and 2.3 previous LOA's (range 0-10). Patients suffered from chronic, intractable abdominal pain for at least 4 months (range 4-180). 8 patients had obstructive symptoms preoperatively.

Results: 16 patients underwent a completely laparoscopic procedure and 3 were converted to open due to dense adhesions. Perioperative complications include 2 patients who developed enterocutaneous fistulae, and 1 patient with intra-abdominal hematoma. At follow up (mean 9.6 months, range 1-32), 14 patients (73.7%) are completely off of all pain medications. 12 of these patients are completely symptom free. Two are taking NSAID's as needed and 3 require round the clock narcotics. Three patients have been re-admitted with small bowel obstruction that has been managed non-operatively. One patient had diagnostic laparoscopy for recurrent pain 6 months postop and had no intra-abdominal adhesions.

Conclusion: Obstructive symptoms and chronic intractable abdominal pain are relieved in most patients following this approach and suggests that further adhesion formation is probably prevented with this technique. Laparoscopic LOA and PoS is an excellent approach to this challenging patient population with symptoms due to intra-abdominal adhesions.

Esophageal Surgery-S055*

DETERMINING THE LOCATION OF THE GASTROESOPHAGEAL JUNCTION DURING ANTIREFLUX SURGERY, Lily Chang, M.D., Marco Barreca, M.D., Carlos A. Pellegrini, M.D., Department of Surgery, University of Washington Medical Center, Seattle, Washington

Intraoperative endoscopy (IOE) is not routinely performed during operations on the gastroesophageal junction (GEJ). IOE provides accurate information about the length of the esophagus and grade of the flap valve. The purposes of this study are to establish (1) whether laparoscopy correctly identifies the GEJ as compared to IOE, and (2) if endoscopic features may indicate the need to modify the created fundoplication or to change the planned surgical procedure.

Fifty consecutive patients underwent IOE during an operation for GERD (n=42), paraesophageal hernia (PHE) (n=2) or complications of a previous antireflux operation (n=6). The endoscopic and the laparoscopic location of the GEJ were determined after mobilization of the cardia. The endoscopic features of the wrap were determined after completion of the fundoplication. A fundoplication that was redundant, too tight, asymmetric, or spiraled were considered significant findings.

The endoscopic and the laparoscopic GEJ corresponded in 65% of the observations, and were within 1 cm in 26% of cases. The endoscopic GEJ was more than 1 cm proximal to the laparoscopic one in 9% of patients (mean difference=1.2cm+/-0.9cm). The wrap was judged redundant or too tight in 2 cases and asymmetric in 3 instances. 93.5% of patients had grade 2 or greater flap valve, and all had grade 1 valve after fundoplication. In 3 cases the fundoplication was modified solely on the endoscopic appearance. In one case, IOE identified an unrecognized esophageal diverticulum changing our plan from a redo Nissen fundoplication to a transhiatal esophagectomy.

Endoscopic and laparoscopic GEJ are essentially the same in the majority of patients. When they do not correspond, the endoscopic GEJ is usually higher, perhaps having implications in the recognition of the short esophagus. Post-fundoplication endoscopic features may facilitate the creation of a fundoplication. Moreover, IOE clarifies difficult cases and assists in planning the procedure.

Esophageal Surgery-S056

PHRENOESOPHAGEAL LIGAMENT REIMPLANTATION AROUND THE DISTAL ESOPHAGUS DURING FUNDOPLICATION REDUCES LONG TERM RECURRENT REFLUX AND COMPLICATIONS Leslie Nathanson MB ChB, Royal Brisbane and Wesley Hospitals, Brisbane, Australia

Initial control of acid exposure to the distal esophagus following fundoplication and abolition of heartburn and regurgitation occur in over 95 percent of patients. Long term follow up show a small but appreciable rate of recurrent reflux, hiatal disruption with symptoms of wrap migration into the chest or paraesophageal herniation and sometimes associated dysphagia. One of the reasons for this pattern of failure may be loss of the segment of intra-abdominal esophagus which migrates above the diaphragm, impairing the antireflux repair. Another factor contributing to paraesophageal herniation around the wrap appears to be incomplete hiatal margin re-adherence to the esophagus postoperatively.

Following meticulous dissection of the hiatus with separation of the phrenoesophageal ligament circumferentially from the esophagus the author then sutures the crural pillars posteriorly. The phrenoesophageal ligament is then re-implated by non absorbable suture into the esophagus 4cm above the percieved junction with stomach. Fundoplication is completed by a short 2cm Nissen Wrap over a 60F bougie.

A non randomised comparison of 636 patients operated on by the author with 100 months follow up showed documented recurrent reflux in 1.1% with reimplantation (352) vs 3.9% in those without (284), ($p<0.01$ Cox regression). Long term stricture, severe dysphagia, paraesophagaeal herniation occurred in 0.9% with reimplantation vs 2.5 % without ($P<0.01$).

These data suggest that additional anchoring of the esophagus by phrenoesophageal ligament reimplantation may decrease long term recurrence of reflux and troublesome complications.

Esophageal Surgery-S057

LAPAROSCOPIC APPROACH IS SUPERIOR TO THORACOSCOPIC APPROACH FOR THE TREATMENT OF ESOPHAGEAL ACHALASIA.

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Objective: To investigate the operative results, relief of disphagia and the gastroesophageal reflux in patients treated with left thoracoscopic Heller myotomy (THM) or with laparoscopic Heller myotomy (LHM). We evaluate retrospectively our experience with THM and LHM.

Methods: Sixteen patients underwent THM alone and 17 underwent LHM with a partial fundoplication Dor (n=10) or only closure of the angle of His (n=7). In LHM group the miotomy was performed simply with stretching and tearing of the circular muscular fibres employing laparoscopic graspers.

Results: Mean operating room time were 222 min. (range 120-288) for THM group and 150 min. (range 60-192) for LHM group (p=0.0001). The mean blood loss was 100 ml in both THM and LHM. There were two mucosal injury during THM (12.5%) and two in the LHM group (11.7%). Conversion to an open procedure took place in 2 THM operations (12.5%). Average hospital-stay was 5.1+-2.2 days for THM group and 2+-1 days for LHM group (p=0.0001). Followup data for LHM (median 35.5 months, range 12-84) and THM (median 18.5 months, range 4-45) revealed persistent or recurrent dysphagia in six patients (37.5%) of THM group and in 1 patient (5.8%) of LHM group (p<0.04). Heartburn developed in 5 patients (31.2%) after THM and in 1 patient (5.8%) after LHM (p=NS). Regurgitation developed in 4 patients (25%) after THM and in 1 patient (5.8%) after LHM (p=NS). The mean esophageal diameter was reduced from a preoperative value of 50.8+-7.6 mm to a postoperative value of 37.2+-6.9 mm in THM group and from 54.5+-5.7 mm to 27.1+-3.3 mm in LHM group (p=0.0001). The LES basal pressure decreased significantly from 30.1+-5.07 to 15.3+-2.1 in THM group and from 32.1+-5.9 to 10.5+-1.7 in LHM group (p=0.0001).

Conclusion: LHM is associated with lesser operating room time and shorter hospital stay. LHM was superior to THM in relieving dysphagia. LHM with a partial fundoplication should be considered the primary treatment for esophageal achalasia.

Esophageal Surgery-S058

LAPAROSCOPIC REPAIR OF TRAUMATIC DIAPHRAGMATIC INJURIES.

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The purpose of this study was to evaluate the feasibility of laparoscopic repair for traumatic diaphragmatic hernias.

Laparoscopic repair of a traumatic diaphragmatic hernia was attempted in 14 patients between January 1997 and August 2001. There were 10 males and 4 females with a mean age of 35 years (range, 15-63). Eight patients suffered a blunt injury and 6 patients a penetrating injury. Laparoscopic repair was attempted in 5 patients during their hospitalization for the traumatic injury (mean 2 days; range, 2-5) and 9 patients had chronic diaphragmatic hernias (mean 89 months; range 5-420). The chronic diaphragmatic hernias presented with abdominal pain (9/9), or vomiting (3/9).

Eleven traumatic diaphragmatic hernias were completed laparoscopically and 3 required conversion. For the laparoscopically repaired diaphragmatic injuries, 3 defects were repaired using ePTFE. The mean length of the diaphragmatic defects was 5 cm (range, 2-12). The mean operative time was 145 minutes (range, 55-200), mean estimated blood loss was 110 cc (range, 30-500), and postoperative length of stay was 5 days (range, 2-12). There were no intraoperative complications, but 3 patients developed pulmonary complications (atelectasis/pneumonia). Follow-up was available in 9 patients. There have been no documented recurrences after a mean follow-up of 11 months (range, 1 week -24 months. Reasons for conversion (n=3) were a reluctance to laparoscopically suture a transverse diaphragmatic lacerations greater than 10 cm in length above the esophageal hiatus (n=2) and a splenic laceration requiring laparotomy for hemorrhage. The 3 patients repaired via laparotomy were discharge on postoperative days 6, 7, and 8, respectively.

Laparoscopy is an alternative approach to repair acute and chronic diaphragmatic injuries. Large traumatic diaphragmatic hernias adjacent or including the esophageal hiatus are best approached via laparotomy.

Hepatobiliary Surgery-S059*

LAPAROSCOPIC ULTRASOUND IS CAPABLE OF REPLACING OPERATIVE CHOLANGIOGRAPHY

Sheena Tranter M.D., Michael Thompson M.D., Department of Surgery, Southmead Hospital, Bristol, England, U.K.

AIMS: Intra-operative cholangiography(IOC)is time consuming, requires radiation & sometimes fails, in contrast to laparoscopic ultrasound(LUS),a comparatively quick, safe/non-invasive technique.All previous studies assessing the potential of LUS as an alternative to IOC in demonstrating ductal stones were non-blinded in nature.The aim of this study is to rectify that weakness by blinding the observer.

METHODS:LUS was performed by the same operator, blinded to the clinical details of 121 patients undergoing laparoscopic cholecystectomy.IOC, performed by a different operator, was subsequently attempted in all patients.Data recording the demonstration of the ductal system & the presence or absence and number/size of ductal stones recorded by each technique were collected prospectively.The final arbiter was the demonstration of CBDS (number/size) removed at LCDE (43 cases) or at subsequent ERCP(1 case of a missed stone).Mean follow up was 9 months.

RESULTS:LUS succeeded in adequately visualising the CBD in 97.5% of cases compared to a success rate of 82.6% for IOC.7 of the 10 IOC failures were related to difficulty cannulating the cystic duct. LUS correctly identified stones in 42 of the 43 patients with CBDS. No stones were demonstrated in the remaining 78 cases(sensitivity 98%;specificity 100%;PPV 100%;NPV 99%).40 of the 43 patients with CBDS were accurately demonstrated by IOC, whereas IOC incorrectly demonstrated 1 patient of the 78 patients without stones(sensitivity 93%;specificity 99%;PPV 98%;NPV 96%).Both LUS and IOC under-estimated the total number of CBDS in 19% of patients, however LUS accurately determined the stone size in 93% of cases,IOC in 88% of cases.

CONCLUSIONS:LUS had a higher success rate of bile duct visualisation than IOC & was a more sensitive/specific method of detecting CBDS.LUS is comparable to IOC in detecting the size/number of the ductal stones.LUS is therefore a satisfactory alternative to cholangiography in the detection of bile duct stones.

Hepatobiliary Surgery-S060*

EFFECTIVENESS AND LONG TERM RESULTS OF LAPAROSCOPIC COMMON BILE DUCT EXPLORATION

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Introduction: Laparoscopic common bile duct exploration (LCBDE), in our institution, has become the treatment of choice for patients with choledocholithiasis who require laparoscopic cholecystectomy (LC). We have followed a policy of routine cholangiography and aggressive clearance of the common bile duct (CBD) through LCBDE. We report our data on the effectiveness and long term results of LCBDE.

Methods: Medical charts were reviewed for all patients undergoing LCBDE at St. Vincent Hospital over an 11 year period (1990-2001). All patients who underwent LC were considered candidates for LCBDE. Results: LCBDE was attempted in 346 patients. Mean age was 60.9+-19 years. Females comprised 65% of patients and 50% of patients had prior abdominal surgery. LCBDE was performed at the time of elective LC in 105 (30%) patients and as an urgent procedure in 241 (70%) patients. LCBDE was performed via the cystic duct in 270 (78%) patients, and a choledochotomy was carried out in 76 (22%) patients. Choledochoscopy was used in all cases with a combination of laser lithotripsy, basket or balloon extraction. A T-tube was placed in 38 (50%) of the choledochotomy cases and 38 underwent primary suture closure. Operative time averaged 127+-54 minutes and post-op length of stay was 1.9+-1.7 days. LCBDE was converted to open in 10 (2.9%) patients. Morbidity was 10%, which included 9 patients (3%) with retained stones. There were no mortalities and no long term strictures or biliary complications were noted.

Conclusions: A policy of routine cholangiography and LCBDE for CBD stones was effective in clearing the bile duct and avoiding further hepatobiliary instrumentation in the vast majority of patients undergoing LC. LCBDE can be performed with little morbidity and mortality and should be the procedure of choice for treating choledocholithiasis in the acute or elective setting.

Hepatobiliary Surgery-S061*

LONG-TIME FOLLOW-UP AFTER LAPAROSCOPIC COMMON BILE DUCT EXPLORATION IN 175 PATIENTS

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Introduction:

One of the arguments against laparoscopic common bile duct exploration (LCBDE) has been the potential risk of creating bile duct injury due to the technical difficulty of the procedure. The aim of this study was to evaluate the long-term safety after LCBDE.

Methods:

During the period 1992-1999 175 patients underwent LCBDE under the guidance of one of two surgeons. The study was a combined retrospective review of all patient records and a prospective evaluation of the patient's status in year 2000. Long-term follow-up, based on a mailed questionnaire focusing on presumptive late complications, such as development of signs from bile duct strictures or retained stones was assessed. The median age of the patients at the time of surgery was 46 years (range 26-80). In 128 patients a transcystic duct exploration was done, while 47 patients underwent supraduodenal choledochotomy.

Results:

Fourteen procedures had to be converted. Retained ductal stones was postoperatively observed in eight patients. Intraoperative complications were restricted to three patients and postoperative complications occurred in 11 patients. There was no mortality related to the procedures.

The questionnaire was sent to 169 of the 175 patients (four patients were dead of causes unrelated to the biliary surgery and two patients were lost to follow-up).The median follow up was 36 month (range 6-72)

The questionnaire was returned by 152 patients (90%) . No patients have undergone surgery or endoscopic treatment for any type of biliary injury or late stricture. Recurrent CBDS has occurred in one patient. One patient was readmitted to surgery one year after the LCBDE because of an abdominal infection. At laparotomy a retained intraabdominal gallstone with abscess formation was found.

Conclusion:

From our data's LCBDE seems to be a safe procedure without any increased risk for late bile duct complications.

Hepatobiliary Surgery-S062

INCIDENCE AND SURGICAL MANAGEMENT OF MIRIZZI SYNDROME DURING LAPAROSCOPIC CHOLECYSTECTOMY Markus Schäfer1,2, M.D., Roger Schneiter1, Lukas Krähenbühl1,2, M.D., SALTS Group1 and Dep. of Visceral and Transplantation Surgery, University of Zürich2, Zürich, Switzerland

Biliary obstruction due to external compression of impacted gallstones in the gallbladder neck or cystic duct is known as Mirizzi syndrome (MS). Two main types are described: In type 1, there is only external compression of the hepatic duct, while type 2 is characterized by the presence of a bilio-biliary fistula between the gallbladder and the hepatic or common bile duct. Since laparoscopic cholecystectomy replaced open removal of the gallbladder, MS has regained its relevance concerning the minimal invasive approach.

The data (prospectively collected by the Swiss Association of Laparoscopic and Thoracoscopic Surgery Study Group) of 13,023 patients undergoing laparoscopic cholecystectomy from 1/1995 to 12/1999 were analyzed with special interest to Mirizzi syndrome.

Among 13,023 laparoscopic cholecystectomies in 39 cases (14 males, 25 females, mean age 61 years) a MS has been found (incidence 0.3%). Whereas 33 patients revealed a type 1 (85%), the remaining 6 patients had a type 2 (15%). A gallbladder carcinoma was detected in 4 patients only in type 1 (incidence 10.3%). No significant difference was observed in age, sex preoperative symptoms and laboratory findings between patients with type 1 or type 2. Eleven patients underwent laparoscopic cholecystectomy only, 27 cases were converted to an open approach (71%), mostly including intraoperative cholangiography and open bile duct exploration. One patient had a primary open approach. In 3 patients with a type 2 a hepatico-jejunostomy was performed, while the remaining 3 patients received simple closure and drainage (T-tube) of the biliary fistula. The overall complication rate (intra- and postoperative complications) was 20.5%. There was no death.

Although the Mirizzi syndrome represents an uncommon entity, it must be recognized intraoperatively by laparoscopic surgeons. Conversion to an open approach was needed in 71% of all cases for patient's safety. In contrast to some series in the literature, the coincidence of gallbladder cancer was low.

Hepatobiliary Surgery-S063*

THE DEGREE OF BILIARY REFLUX IN PATIENTS WITH COMMON BILE DUCT STONES AND AFTER ENDOSCOPIC SPHINCTEROTOMY Sheena Tranter M.D., Michael Thompson M.D., Department of Surgery, Southmead Hospital, Bristol, England, U.K.

AIMS: Patients with common bile duct stones(CBDS)have higher levels of biliary trypsin, a marker of pancreatico-biliary reflux into the CBD,compared to a control population.Reflux after endoscopic sphincterotomy(ES)has not yet been studied in this way.The aim of this study is to determine whether there is an objective difference in the degree of reflux after ES compared to patients with & without CBDS.

METHODS: 0.5 mls of bile aspirate obtained during cystic duct cannulation of 56 patients undergoing laparoscopic cholecystectomy +/- ductal exploration were analysed to determine the degree of reflux in each sample reflected by the activity levels of chymotrypsin,lipase & amylase.The enzymatic content of the bile was determined & comparisons made between the following 5 patient groups. a)no existing evidence of previous/current CBDS(n=14); b)jaundice/colic + previous CBDS(n=7); c)pancreatitis + previous CBDS(n=7); d)current ductal stones(n=23) & e)patients who had undergone a previous ES(n=5).

RESULTS: Patients with no previous history of CBDS & those with a history of previous CBDS presenting with jaundice/colic had negligible amounts of all three enzymes.Patients with current CBDS had a mild elevation of amylase & trypsin levels(4.1 & 2.2 activity units),whereas the levels of amylase and trypsin in those who had undergone ES were moderately elevated(18.5 & 10.4 activity units: $p<0.05$).In contrast, patients who had a history of pancreatitis and previous ductal stones had a significant elevation of amylase, trypsin and chymotrypsin levels(136,61.8&6 activity units:$p<0.001$).

CONCLUSIONS: Pancreatic reflux,assessed by bile enzyme activity levels,occurs to a greater degree in patients following ES than those with current CBDS.This suggests that ES with division of the biliary sphincter results in a further increase of duodeno-biliary reflux above the degree of reflux that would be expected from the presence of CBDS. The highest degree of reflux occurs following pancreatitis.

Hepatobiliary Surgery-S064

LAPAROSCOPIC RADIOFREQUENCY OF HEPATOCELLULAR CARCINOMA WITH CIRRHOSIS Roberto Santambrogio, M.D., Marco Montorsi, M.D., Paolo Bianchi, M.D., Gian Paolo Cornalba#, M.D., Massimo Zuin°, M.D., and Mauro Podda°, M.D., Clinica Chirurgica, °Cattedra di Medicina Interna and # Unità di Radiologia Diagnostica Interventistica, Ospedale San Paolo - University of Milan, Milan - Italy

The laparoscopic approach to radiofrequency interstitial thermal ablation (RITA) of hepatocellular carcinoma (HCC) with intraoperative ultrasound guidance was proposed with the aim of obtaining additional information for a neoplastic staging and effective treatment of the HCC in patients with a difficult percutaneous approach. Between December 1997 and June 2001, we enrolled 79 patients with HCC. Sixty patients had cirrhosis due to hepatitis C, 9 due to hepatitis B and the remaining 10 had an alcoholic cirrhosis. The Child-Pugh class was A in 47 cases, B in 23 and C in only 1. Forty-six patients had a solitary lesion, 26 had two lesions and 7 had three lesions. The mean diameter of the tumours was 29+-11 (range: 10-50 mm). Diagnostic work-up with extracorporeal US and spiral CT was used. A power-color- doppler system (Aloka SSD 1700, Aloka Co. Ltd., Tokyo, Japan) with a flexible LUS probe was used for ultrasound examination. The device for RITA consisted of a 100-W, 500 kHz monopolar RITA generator (CC-1, Radionics, Burlington, Mass). Twenty-five per cent of the cases revealed new malignant HCC. A total of 109 lesions were treated by RITA: the mean operative time was 78.9+-22 min. There was no operative mortality. Operative morbidity was: a hemoperitoneum from a trocar access, a hematoma at the trocar sites in 13 cases, 2 transient episodes of acute encephalopathy, and, in 3 other cases, a mild ascites well-controlled by diuretics. The mean hospital stay was 3.4+-1.8 days. The mean follow-up was 14+-12 months. At spiral CT, a complete response with a 100% necrosis was achieved in 64 out of 75 patients examined (85%). The 3-years actuarial survival curve was 70%. Laparoscopic RITA may be proposed in selected cases as those with lesions adjacent to important structures or difficult to visualise percutaneously and those with multiple tumors where additional malignant nodules are more prone to be detected by intraoperative ultrasound and treated in the same session.

Hepatobiliary Surgery-S065

HAND-ASSISTED LAPAROSCOPIC SEGMENTECTOMY IN RECURRENT PYOGENIC CHOLANGITIS. C.N. Tang, C.H. Chau, J.P.Y. Ha, W.T. Siu & M.K.W. Li, Department of Surgery, Pamela Youde Nethersole Eastern Hospital, 3 Lok Man Road, Chai Wan, Hong Kong SAR, China.

Frequent attack of cholangitis is the hallmark of recurrent pyogenic cholangitis (RPC) and this is particularly common in patients with intrahepatic strictures and stones. Among various treatment options, resection of the atrophic liver segment, together with stone lithotripsy, is the most effective approach and is associated with the lowest recurrence rate.

This study was to assess the technical feasibility and safety of hand-assisted laparoscopic segmentectomy in patients with RPC.

From February 2000 to August 2001, patients with RPC and with evidence of frequent cholangitis, segmental liver atrophy and multiple intrahepatic ductal stones located in the left lateral segment were selected for hand-assisted laparoscopic segmentectomy. Patients were excluded if there were (1) evidence of malignant transformation, (2) bilateral intrahepatic ductal stone and (3) stone located in postero-superior segments. The preoperative investigations included percutaneous US, ERCP, CT scan and EHIDA nuclear scintigraphy. Hand-assisting technique was employed and with the stone-harbouring segment resected laparoscopically using "laparoscopic hand", ultrasonic shear and ultrasonic surgical aspirator (Sonopet). The stone distribution was firstly outlined by laparoscopic ultrasound (LUS) and stone clearance was confirmed by operative choledochoscopy and LUS again. All patients would then be followed up with regular liver function test and imaging study if required.

Seven patients had the hand-assisted laparoscopic segmentectomy attempted. There were 6 female and 1 male of mean age 54.7 (28-69). Six patients (85.7%) could have the operation successfully performed. There was 1 open conversion due to bleeding from left hepatic vein. The mean operating time was 228.6 minutes (175-290 minutes). Average blood loss was 425.7 ml (200-1000 ml). Median postoperative stay was 7 days (5-60 days). There was 1 patient developed postoperative bile leak and bilio-pleural fistula, whom recovered with combined endoscopic and percutaneous drainage. The remaining 6 patients recovered uneventfully and had no cholangitic attack upon a mean follow-up of 8.3 months.

The preliminary results did confirm the feasibility and the potential advantage of hand-assisted laparoscopic segmentectomy in patients with RPC. Skill refinement and improvement of ancillary technology might further improve the results and this hand-assisting laparoscopic technique could be part of the armamentarium of a liver surgeon.

Hepatobiliary Surgery-S066

LAPAROSCOPIC CHOLECYSTECTOMY IN CIRRHOTIC PATIENTS
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Although cirrhosis has been regarded as a controindication to laparoscopic cholecystectomy, there is increasing evidence that patients with moderate cirrhosis may undergo laparoscopic cholecystectomy with result superior to those of open cholecystectomy. The purpose of this study was to evaluate the safety of laparoscopic cholecystectomy in cirrhotic patients comparing the risks and benefits of performing open cholecystectomy and laparoscopic cholecystectomy.

A retrospective review of the records of 22 laparoscopic cholecystectomy on cirrhotic patients, Child-Pugh A and B, from January 1995 to July 2001was performed.

No deaths occurred. Conversion to open cholecystectomy was necessary in 2 cases because of insufficient visualization of the biliary anatomy. The average operative time was 115 minutes and was significantly shorter compared with patients underwent open cholecystectomy. None of the patients required blood transfusion. Intraoperative problems occurred in two patients for liver bed bleeding. Postoperative morbidity occurred in 36% of patients and included hemorrhage, wound complications, intraabdominal collections and cardiopulmonary complications, but were all controlled. The patients were dismissed in an average period of 4 days.

We believe laparoscopic cholecystectomy can be performed safely in selected cirrhotic patients Child-Pugh A and B with indication for surgery. Laparoscopic cholecystectomy is associated with significant but acceptable morbidity. Laparoscopic cholecystectomy offers several advantages over open cholecystectomy: lower morbidity, shorter operative time and reduced hospital stay.

Hepatobiliary Surgery-S067*

CAN PRESENT TECHNOLOGY BE INTEGRATED TO FACILITATE LAPAROSCOPIC LIVE DONOR HEPATECTOMY? Edward Lin, DO, Samer G. Mattar, MD, L. Rodrigo Gonzalez, MD, Steven P. Bowers, MD, K.R. Venkatesh, MD, C. Daniel Smith, MD, Emory Endosurgery Unit, Emory University School of Medicine, Atlanta, GA

OBJECTIVE: To determine the technological requisites for performing laparoscopic-assisted live donor hepatectomy (LLDH) that ensure adequate graft size and preserves vascular and biliary anatomy.

METHODS: Six adult sheep (mean 50 kg) underwent general anesthesia and left LLDH. A laparoscopic ultrasound probe (5-7.5 MHz, BK Medical) was used to map out the vascular anatomy, and define the line of transection. Hilar and parenchymal dissection was performed using standard laparoscopic instruments, with the aid of an ultrasonic tissue dissector (Autosonix, USSC), an ultrasonic dissector-aspirator device (CUSA, ValleyLab), an impedance feedback bipolar cautery (Ligasure, ValleyLab), a heat-saline coagulator (TissueLink, TissueLink Medical) and endoscopic linear staplers. A robotic arm (Aesop, Computer Motion) was used for camera control and a hand-assist device (Pneumosleeve, Dexterity) was used for liver retraction and graft extraction.

RESULTS: Laparoscopy afforded optimal magnification and resolution of the anatomy. Laparoscopic ultrasound accurately mapped the vascular structures and facilitated dissection. Parenchymal dissection was best performed using the CUSA and Autosonix devices, while Ligasure and TissueLink were equally effective in controlling bleeding from small surface vessels. Portal and hepatic veins were divided most precisely with articulating endoscopic staplers. Mean operating time was 5.2 hours (+- 0.5) and estimated blood loss was 300 cc (+- 67). Mean graft size was 44% of total liver weight and vascular preservation in the graft was confirmed by back-table perfusion.

CONCLUSIONS: It is feasible to perform LLDH with present technology. The availability of laparoscopic hemostatic adjuncts facilitates the operation. Ultrasound venous mapping and the use of endoscopic staplers contributed decisively to avoiding hemorrhagic mishaps.

Bariatric Surgery-S068

LAPAROSCOPIC GASTRIC BANDING FOR MASSIVE SUPER OBESITY
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Since February 1996 the author has performed 919 gastric bandings. This study reviews the outcome of laparoscopic gastric banding for 65 patients for massive super obesity with a BMI greater than 60.

Twenty-Four males and 41 females; age 21 - 69 yrs (37 yrs); weight 155 to 335 kg (192 kg); BMI 60 - 101 (65). Six patients had previous gastric stapling; 2 patients were bedridden. All bands were inserted laparoscopically. Two patients had concurrent excision of massive pannus. Hospital stay 3 days (1 - 6 days) with the exception of the 2 patients with the excision of pannus - 5 days and 47 days.

Five patients had an awake intubation and 6 patients were monitored overnight in ICU. There was no hospital mortality; 30 day mortality was 0. No pulmonary emboli nor cardiac abnormalities. Five of the 6 bands removed had a previous gastric stapling. All were removed after 2 years. These 6 patients were converted to a BPDDS. Two patients were lost to follow-up after one year.

Weight loss - 6 months (65) BMI 58 (47 - 85); 12 months (58) BMI 49 (33 - 75); 18 months (46) BMI 42 (32 - 65); 24 months (33) BMI 39 (29 54); 36 months (22) BMI 33 (29 - 52); 48 months (14) BMI 36 (28 - 51); 60 months (4) BMI 35 (27 - 44).

Laparoscopic gastric banding is very suitable for massive obesity and is a genuine minimaly invasive procedure in these very big, often very ill patients. Weight loss is very satisfactory and is maintained at five years.

Bariatric Surgery-S069*

TWO-STAGE LAPAROSCOPIC BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH: AN ALTERNATIVE APPROACH TO SUPER-SUPER MORBID OBESITY Christine A. Chu, M.D., Michel Gagner, M.D., Theresa Quinn, M.D., David C. Voellinger, M.D., John J. Feng, M.D., William B. Inabnet, M.D., Daniel Herron, M.D., Alfons Pomp, M.D., Department of Surgery, Minimally Invasive Surgery Center, Mount Sinai School of Medicine, New York, NY

Introduction: Laparoscopic biliopancreatic diversion with duodenal switch (LBPD-DS) is technically challenging, time consuming and carries a disconcerting 37% morbidity and 11% mortality for patients with a BMI>60kg/m2. In an attempt to reduce these numbers, we have separated the restrictive and malabsorptive aspects of the procedure into two operative stages.

Method: 102 LBPD-DS were performed between 9/2000-7/2001. Seven of them were done in two stages. Data were prospectively collected and retrospectively reviewed.

Results: Four women and three men with an average age of 43 (30-64) were included in this cohort. At time of initial laparoscopic sleeve gastrectomy, the average weight was 406.9 lbs. with a BMI of 62.5. The average excess weight was 268.1 lbs. This operation resulted in an average (+-SD) 32.4+-5% excess weight loss. The average time interval between the two procedures was 202 days. The average BMI at time of the second procedure, laparoscopic duodeno-ileostomy, ileo-ileostomy, was 48.0. At 3 weeks follow-up, 5 out of 7 patients had an average weight of 289.2 lbs. and a BMI of 44.6. The total excess weight loss was 41.6+-9%. Three patients had a 3 months follow-up. Their average BMI was 40.5 with a total excess weight loss of 52.1+-11%. The average operative time for the two procedures was, respectively, 109 and 161 minutes. The total length of hospital stay was a mean of 6 days. There was minimal blood loss using the laparoscopic technique. There was no morbidity or mortality in this cohort.

Conclusion: Laparoscopic sleeve gastrectomy with interval laparoscopic duodeno-ileostomy, ileo-ileostomy is a safe and effective procedure. There is a drastic reduction in the morbidity and mortality using this approach compared with our historical cohort. A two-stage laparoscopic BPD-DS is an alternative to the traditional one-stage approach for selected patients with super-super morbid obesity.

Bariatric Surgery-S070*

LAPAROSCOPIC MANAGEMENT OF COMPLICATIONS FOLLOWING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY

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We reviewed our experience with complications following LRYGB that were managed laparoscopically.

A total of 246 morbidly obese patients (mean BMI: 50.9 kg/m^2) underwent LRYGB by three surgeons in two institutions. Mortality was 1.3%. 26 patients (10.6%) developed 28 complications that required surgical exploration. Two patients underwent a negative laparoscopy to rule out anastomotic leak.

	Total	Open	Lap[1]	Endo[2]	Non-operative
Bowel obstruction	18 (7.3%)	1	14	N/A	3
Gastrojejunostomy stricture	8 (3.2%)	1	1	6	N/A
Bleeding (staple line/ulcer)	10 (4%)	1	2	4	3
Acute cholecystitis	5 (2%)	0	5	N/A	N/A
Gastric remnant perforation	2 (0.8%)	1	1	N/A	N/A
Iatrogenic perforation	1 (0.4%)	0	1	N/A	N/A

[1]Laparoscopic management; [2]Endoscopic management

The bowel obstruction was secondary to adhesions (n=6), internal hernia at the level of the transverse mesocolon (n=3) jejuno-jejunostomy stricture (n=3) and cicatrix around the Roux limb at the level of the transverse mesocolon (n=3). Two patients developed perforation of the gastric remnant; one due to ulcer disease and one due to distal obstruction. The iatrogenic perforation occurred during pneumatic dilation of the proximal anastomosis. The mean operating room time for the laparoscopic re-operations was 134 minutes, the mean estimated blood loss was 46 cc and the mean length of hospital stay was 3.2 days. Two of the 24 patients who were managed laparoscopically required further endoscopic treatment: pneumatic dilation of stricture (1) and sclerotherapy of bleeding ulcer (1). The rest of the patients had complete resolution of their symptoms.

Laparoscopy is an excellent technique to treat complications following LRYGB. It accomplishes resolution of the problem with minimal morbidity.

Bariatric Surgery-S071*

CLINICAL PREDICTORS OF LEAK AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS

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Introduction: Anastomotic leak is a complication after laparoscopic Roux-en-Y gastric bypass (LRYGB) for morbid obesity. Contrast studies may underdiagnose leaks, forcing surgeons to rely solely upon clinical data. The aim of this study was to determine the usefulness of clinical signs in determining the presence of leak after LRYGB.

Methods: We prospectively analyzed 56 patients undergoing LRYGB between June and August of 2001. Clinical data from this cohort were compared to data collected from a review of nine patients with documented anastomotic leaks among 234 LRYGB performed at this institution. Clinical indicators were analyzed to determine the sensitivity, specificity, accuracy, and positive and negative predictive values of each in identifying leaks.

Results: Mean patient age was 41 (26-65) years old and mean body mass index was 48 kg/m^2 (38-62).

Clinical Indicator	Sens.	Spec.	Accuracy	PPV	NPV
Respiratory distress	67%	84%	83%	14%	98%
SBP $\leq$ 100 mm Hg	22%	80%	78%	4%	97%
HR $\geq$ 120 BPM	89%	89%	89%	25%	99%
Pos. Contrast Study	22%	100%	97%	100%	97%
Temp $\geq$ 38.5 °C	0%	82%	79%	0%	95%

Of the 56 prospectively evaluated patients without leaks, 11% were tachycardic (HR $\geq$ 120) and 18% were febrile (temperature $\geq$ 38.5°C). None of the patients with leaks were febrile, and hypotension was infrequent.

Conclusion: Leak after LRYGB remains difficult to detect. Patients who are afebrile, normotensive, and have negative post-operative contrast studies may still harbor leaks. Persistent tachycardia over 120 beats per minute and evidence of respiratory distress may be the most useful indicators of leak after LRYGB.

Bariatric Surgery-S072

THE INFLUENCE OF SEQUENTIAL COMPRESSION DEVICES ON FEMORAL VENOUS FLOW DURING LAPAROSCOPIC AND OPEN GASTRIC BYPASS.

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Pneumoperitoneum (PP) and reverse Trendelenburg position (RT) can decrease femoral venous flow and result in venous stasis. The effects of PP and RT on femoral venous flow have not been evaluated in morbidly obese patients undergoing laparoscopic gastric bypass (GBP). We analyzed 1) the effects of PP and RT on peak systolic velocity (PSV) and cross-sectional area (CSA) of the femoral vein during laparoscopic GBP, 2) the effects of RT on PSV and CSA of the femoral vein during open GBP, and 3) the efficacy of sequential compression devices (SCD) in reversing these changes.

Thirty patients with a body mass index (BMI) of 40–60 were randomly allocated to laparoscopic (n=14) or open (n=16) GBP. A duplex ultrasound of the femoral vein was performed at baseline, during PP, and during PP/RT in the laparoscopic group and at baseline and during RT in the open group. The ultrasound was performed without SCD and with SCD inflated to 45 mmHg.

The two groups were similar in age, sex, BMI, and calf/thigh circumference. During laparoscopic GBP, PP resulted in a PSV reduction of 43% and a CSA increase of 53%. The combination of PP/RT decreased PSV by 57% from baseline and increased CSA by 121%. The use of SCD increased PSV by 30% during PP and by 40% during PP/RT. During open GBP, RT resulted in a PSV reduction of 39% and a CSA increase of 67%. The use of SCD increased PSV by 26% during RT. The use of SCD, however, did not increase PSV to baseline levels. PSV during PP/RT with SCD was 40% lower than baseline (21 $\pm$ 8 vs 35 $\pm$ 21 cm/s) and PSV during RT with SCD was 23% lower than baseline (24 $\pm$ 7 vs 31 $\pm$ 15 cm/s).

PP and RT are independent factors for reduction of femoral venous flow. The combination of PP/RT further reduces femoral venous flow. In morbidly obese patients, SCD increased femoral venous flow during PP by 30% and during PP/RT by 40% in the laparoscopic group and during RT by 26% in the open group, but did not return flow to baseline levels.

Bariatric Surgery-S073*

INTRAOPERATIVE ULTRASOUND AND PROPHYLACTIC URSODIOL THERAPY FOR GALLSTONE PREVENTION FOLLOWING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS

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Gallstone formation occurs in 32%-38% of patients following bariatric surgery, and ursodiol decreases the incidence to 2% in previous studies. We hypothesized that intraoperative ultrasound (IOUS) screening followed by prophylactic ursodiol therapy would effectively prevent gallstone formation following laparoscopic Roux-en-Y gastric bypass (LRYGB).

Under an IRB-approved protocol, 52 patients who underwent LRYGB and had no gallstones on IOUS were prescribed ursodiol (300mg BID x 6 mo.) and underwent a follow-up trans-abdominal ultrasound examination. Patients who developed gallstones were compared to patients who did not have stones. No significance was detected for all comparisons between the two groups by Mann-Whitney U; data are mean $\pm$ s.d., $p < 0.05$.

	Stones (n=14)	No Stones (n=38)
Preop BMI (kg/m^2)	48.2 $\pm$ 3.7	51.1 $\pm$ 6.7
Follow-up Interval (months)	9.6 $\pm$ 4.9	10.1 $\pm$ 4.8
Excess Weight Loss (%)	70.1 $\pm$ 23.1	68.0 $\pm$ 19.3
Ursodiol Compliance (%)	63.2 $\pm$ 41.4	57.9 $\pm$ 41.2

Of 52 patients found to be gallstone-free at the time of LRYGB, 14 (27%) patients developed gallstones; 4 of these 14 patients (29%) were symptomatic and required cholecystectomy. Ursodiol compliance in patients with symptomatic stones was 31% compared to 76% with asymptomatic stones ($p = 0.03$). Ursodiol side-effects were reported in 25% of patients. We conclude that ursodiol compliance is poor after LRYGB, and consequently may not prevent gallstone formation. However, ursodiol may decrease the incidence of symptoms in patients who develop gallstones.

Bariatric Surgery-S074*

CAN THE EFFECT OF GASTRIC BANDING BE PREDICTED BY AN INTRAGASTRIC BALLOON? Suzan van der Meij MD 1, Robert GJM Pierik MDPhD 1, Marco Oudkerk Pool MDPhD 2, Lisbeth M Mathus-Vliegen MDPhD 3, 1 Department of Surgery, Isala klinieken, locatie Weezenlanden , Zwolle, 2 Department of Gastro-enterology, Isala klinieken, locatie Weezenlanden , Zwolle, 3 Department of Gastro-enterology, Academic Medical Centre, Amsterdam

Objective: The most effective treatment for morbid adipositas with long term result is bariatric surgery.

The clinical dilemma is the selection of patients, due to the fact that individual results cannot be predicted. To see whether the result of an intragastric balloon can predict the result of gastric banding a prospective study was started in 1999.

Methods: After informed consent patients with a Body Mass Index (BMI) > 40 were evaluated by a multidisciplinary group of specialists, and, if accepted for gastric banding (LapBand r.) received an intragastric balloon(BIB tm system) 6 months preoperatively. Successful weight loss was defined as a loss of 10% of the starting weight after 6 months and 25% of the starting weight after 18 months.

Results: In 38 patients (33 female, 5 male; age 37 (26-45)) an intragastric balloon was placed endoscopically. In 4 patients the balloon had to be removed prematurely due to complications.

The average BMI of the 34 remaining patients decreased in 6 months from 46,7 to 40,5 (77% successful).

Until now 26 patients have been operated for laparoscopic banding. Average hospital stay was 5 (3-8) days. During the average follow up of 8 (3-19) months 2 patients developed a pouch dilatation for which 1 patient was reoperated. The average BMI in the lapband group decreased from 40,5 to 35,7 (42 % successful). None of the patients who did not loose sufficient weight with an intragastric balloon were successful in loosing weight after bariatric surgery.

Conclusion: Unsuccessful weight loss after an intragastric balloon has a negative predictive value for successful weight loss after laparoscopic banding.

Bariatric Surgery-S075

RADIOGRAPHIC COMPARISON OF GASTRIC POUCH VOLUME AND ANASTOMOTIC SIZE IN OPEN VERSUS LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS PROCEDURES Paul T. Cirangle, M.D., Simon Telian, M.D., University of Hawaii, Honolulu HI;, Tripler Army Medical Center, Honolulu HI

The Roux-en-Y Gastric Bypass procedure has clearly been demonstrated to be an effective treatment for patients suffering from morbid obesity and the associated medical co-morbidities. Controversy exists in the surgical community whether laparoscopic bypasses are equivalent to open procedures. The two critical technical components of the gastric bypass procedure are the volume of the gastric pouch and the size of the gastro-jejunal anastomosis. For this study, a mathematical model was developed to objectively quantify these parameters and compare them postoperatively in patients undergoing laparoscopic procedures versus open surgery.

METHODS: Retrospectively, 30 consecutive patients were compared in each group (Laparoscopic Roux-en-Y vs. Open Roux-en-Y). Patients were well matched demographically. All patients underwent postoperative digitized contrast studies and mathematical volumetric determination of gastric pouch volume and anastomotic area was determined in a blinded fashion. Results were analyzed statistically using ANOVA and the t-test.

RESULTS: Mean pouch volume for laparoscopic procedures was 14.8cc vs. 27.3cc for open bypass patients. This was statistically significant. The mean gastro-jejunal anastomotic area of the laparoscopic Roux-en-Y bypass patients was 28.27cm3 compared to 40.84cm3 for the open group. This was also statistically significant.

CONCLUSIONS: We have described a simple and accurate objective technique of quantifying the anatomical results of a gastric bypass procedure. Laparoscopic Roux-en-Y Bypass is at least equivalent to Open Bypass anatomically, and may in-fact allow creation of a smaller gastric pouch than in open surgery. Additional long-term prospective studies are needed to help correlate this information with weight loss and complication data.

Bariatric Surgery-S076

ENDOSCOPIC DILATATION OF GASTROESOPHAGEAL ANASTOMOSIS STRICTURE AFTER GASTRIC BYPASS Carlos A. Barba, MD, Michael Butensky, MD, Manuel Lorenzo, MD, Richard Newman, MD, Department of Surgery and Gastroenterology, Division Of Minimillay Invasive Surgery, Saint Francis Hospital and Medical Center, University of Connecticut, Hartford, CT

OBJECTIVE: To review the technique and results of endoscopic dilatation for patients that developed gastroesophageal stricture after gastric bypass. **METHODS AND PROCEDURES:** A retrospective review of all dilatations performed for patients developing anastomotic stricture after gastric bypass was done. All dilatations were performed by the same physician. The dilatations were standardized after the first few procedures. We found the scope balloon dilators (CRE, Boston Scientific/Miroinvasive) to be the best. If the stricture impedes a standard 9 mm gastroscope, a CRE 8,9,10 mm is initially used. Fluoroscopic Guidance is requiered if the balloon does not traverse the stricture freely. Occasionally, tight ectatic strictures require the use of a wire guided through the scope balloon system.The demographics of patients, the type of surgery, time when stricture appear and number of dilatations were recorded. **RESULTS:** We reviewed 24 patients that required dilatation (10% of total procedures) over 24 months period. Fourteen patients had an open surgery, 9 laparoscopic and 1 was a reoperation. Females were 83%; mean age was 38.6 and mean BMI was 51. Twenty-one strictures (86%) occurred within 3 months of the surgery. Attempts to dilate strictures to 10 mm was done initially. All dilatations were successful, with 65% patients requiring one dilatation and the rest between 2 to 3 procedures. No stricture was seen after 8 months of surgery. A dilatation up to 12 mm was done in patients requiring multiple procedures. **CONCLUSIONS:** Anastomotic strictures after gastric bypass is not unusual. Proper technique to dilate these strictures has not been reported. We had a 100% success using the scope balloon dilators technique. Most strictures appear during the first three months of surgery. The need for multiple procedures is minimized using our approach. Weight loss is mantained in patients presenting this problem.

GERD/Achalasia/Gastric-S081

LAPAROSCOPIC STAGING IN GASTRIC CANCER Juan Eduardo contreras M.D Carlos Carvajal M.D.Marcos Bustamante M.D.Juan Carlos Justiniano M.D.Juan Lombardi M.D. , DEPARTMENT OF SURGERY SALVADOR HOSPITAL FACULTY OF MEDICINE UNIVERSITY OF CHILE.GASTRIC CANCER GROUP. SANTIAGO DE CHILE

In Chile gastric cancer (G.C.)is the first cause of death in male sex.The present incidence of mortality in Chile is 18.7 per 100.000 people. The only chance to improve the management of G.C. is improving the methods of preoperative Staging.Overall CT scans and US have an accuracy of only 60%.The objective is to evaluate the utility of the diagnóstic laparoscopy for the staging of G.C.**METHOD** Since 1993 through 2000 a prospective protocol for laparoscopic staging in G.C. it was introduced. A complete visual and surgical exploration and taking samples for biopsy it was done. T.N.M. classification was used.The results were analyzed with statistical analysis of sensitivity. It was used as Gold Standard the results the open surgery finding and the tissue diagnosis. Patients dischargeg from the study were, patients with T1 and T2 or carcinomatosis or multiple hepatic metástasis. Submitted by laparoscopic staging, patientes with T3,T4 and patients with less than 4 hepátic metástasis.**RESULTS:** From year 1993 through 2000 we have incorporated to this protocol a total of 91 patients of a total of 579 treated patients with G.C.The laparoscopic staging for the primary tumor (T) show for T3 a sensitivity of 79.49 % whereas with TAC / U.S. it was of a 28,21%. For T4 the sensitivity of the laparoscopy was of 68.75 % and with TAC/US of a 21,88%. The hepátics metástasis detected by laparoscopy gave sensitivity of a 89.47% whereas with TAC/US was 31.58 %.Finaly the sensitivity of the laparoscopy for peritoneal carcinomatosis was of 81.82% and 22.73 % with TAC/US. All this I determine a 48% of less exploratory laparotomy, helped on changing the surgery strategy on 30% of the cases and changed TNM on 52 % of the cases. **DISCUSSION** Laparoscopy is an excellent diagnóstic tool for the preoperative evaluation in patients with G.C.sensitivity is superior to the TAC/US and help to reduce hospital costs and outcome for patients.

GERD/Achalasia/Gastric-S082

VAGUS NERVE SPARING LAPROSCOPIC ASSISTED DISTAL GASTRECTOMY WITH REGIONAL LYMPH NODE DISSECTION FOR EARLY GASTRIC CANCER, Kazuyuki Kojima, MD; Toshiki Yamashita MD; Mikito Inokuchi, MD; Kenichi Sugihara MD, Division of Digestive Surgery, Tokyo Medical and Dental University, Tokyo, Japan

Introduction: Vagus nerve sparing distal gastrectomy (Vs-DG) has been introduced to improve quality of life in patients with early gastric cancer (EGC). Vs-DG constitutes preserving hepatic and celiac branches of the vagus nerve, expected to be beneficial in functional advantages of post-gastorectomy syndromes compared with standard distal gastrectomy. We have investigated the feasibility of Vs-DG using laparoscopic techniques (Vagus nerve sparing laparoscopic assisted distal gastrectomy: Vs-LADG).

Patients and Methods: The records of consecutive 40 patients who received Vs-LADG with regional lymph node dissection for EGC located in the middle or lower third of the stomach between January 1999 and April 2001 were reviewed and compared with consecutive 40 patients with open gastrectomy (OG) for EGC before introducing Vs-LADG, in terms of operating time, frequency of analgesic requirements and recovery from surgical stress. We performed Vs-LADG with D1+ƒ¿ in 19 patients, Vs-LADG with D2 in 21 patients.

Results: No significant difference was found in age, sex, size and histological differentiation of the lesion between the two groups. Vs-LADG required significantly longer operating time with same extensive lymph node dissection (P<0.05). However, time to start walking, time to return normal bowel function, and postoperative hospital stay were significantly shorter in the Vs-LADG group and this group required fewer analgesics than the OG group (P<0.05). There were no intraoperative and postoperative complications in both groups. During the median follow up of 12 months ranged 4 months to 30 months, no recurrent diseases were observed in the Vs-LADG group. Incidence of postoperative diarrhea and bowel obstruction and degree of postoperative body weight loss were significantly low in the Vs-LADG group (P<0.05).

Conclusion: These observations may support that Vs-LADG for EGC is a feasible and safety procedure, and improve early functional results after gastrectomy.

Lap. Surgery in Adults & Children-S084*

POSTNATAL OUTCOME FOLLOWING MATERNAL SURGERY DURING PREGNANCY. Sebastian G. de la Fuente MD; Michael K. Gupta BMs; Jose Pinheiro MD; Rebecca Green; W. Steve Eubanks MD and James D. Reynolds PhD Departments of Anesthesiology and Surgery, Duke University Medical Center, Durham, NC.

Objective: The purpose of this study was to contrast postnatal behavioral development in offspring who were exposed to maternal CO2 pneumoperitoneum to those exposed to a laparotomy.

Methods: Time-dated pregnant guinea pigs (bred in-house) were randomly assigned to one of three treatment groups: CO2 pneumoperitoneum (P); laparotomy (L); or control (C). Surgeries were preformed under isoflurane anesthesia on gestational day 45 (term 68 days). In group P, the abdomen was insufflated with CO2 for 45 min at 7 mm Hg pressure. For group L, a 5 cm midline abdominal incision was made and kept open for 45 min. Entry points were then closed in layers and animals recovered from anesthesia. Each guinea pig was allowed to deliver without further intervention. On postnatal day 10, behavior was assessed by monitoring locomotor and exploratory activity of each offspring in a 1 x 1 m chamber demarcated into 100 squares. Animals were videotaped in the chamber for 60 min and then each recording was scored for number of squares transited. In addition, vocalization and exploratory activity level were scored on a three-point scale (low, moderate, high). All scoring was completed by observers unaware of the treatment groups. Locomotor data was log-transformed and then expressed as mean +- standard deviation.

Results: To date, a total of 28 animals have been studied. Neither of the two surgical manipulations affected gestational length or birthweight. However, offspring in both group P and group L exhibited significantly higher levels of locomotor activity compared to C offspring: P = 1.81 +- 0.51; L = 1.89 +- 1.01; and C = 0.78 +- 0.77. Exploratory activity and vocalization were also increased in the surgical treatment groups.

Conclusion: Maternal surgery during the late second-trimester equivalent produced hyperactivity in neo natal guinea pig offspring. In this regard, laparoscopy offered no benefit over an open procedure. It remains to be determined if these behavioral anomalies persist during subsequent postnatal development.

Lap. Surgery in Adults & Children-S085

MINIMALLY INVASIVE SURGERY IN NEONATES:THE FIRST DECADE'S EXPERIENCE Steven S Rothenberg M.D.The Hospital For Infants and Children at P/SL Denver, Colorado

Pediatric and specifically neonatal surgeons have been reluctant to adapt minimally invasive techniques (MIS) siteing patient size, physiologic differences, inadequate instrumentation, and questionable benefits as reasons for not applying MIS in this population. Over the last 10 years we have developed an extensive experience in neonatal MIS surgery and this report documents our findings.

From November 1992 to Sept 2001 487 neonates underwent laparoscopic or thoracoscopic procedures. Weights ranged from 1.1 Kg to 5.0 Kg. Operative procedures included Nissen Fundoplication, G-tube placement, pyloromyotomy, colon pull-through,congenital diaphragmatic hernia repair,imperforate anus repair, duodenal atresia repair, bowel resection for stricture or duplication, Ladd's procedure, PDA ligation, lung biopsy, lobectomy, resection forgut duplication, TEF repair, Aortopexy, diaphragmatic plication, and neprectomy.Procedures were initially performed with 5mm instruments and telescopes but as specific pediatric instruments were developed changed to 3mm. Physiologic parameters monitored included temperature, blood pressure, pulse, end-tidal CO2, and arterial oxygenation.

Operative times ranged from 8 minutes (pyloromotomy)to 210 minutes (colon pull-through). Conversion to an open procedure was .8%. The Operative complication rate was 2.1%.

Time to full feeds, hospital stay, and long term complications all compare favorably to standard open operative techniques.Only one patient (0.2%) has presented with an adhessive bowel obstruction.

Advances in MIS techniques and instrumentation now allow almost all neonatal surgical diseases, both congenital and aquired, to be approached endoscopically.The same benefits seen in older patients, decreased pain, earlier return of bowel function, and earlier hospital discharge, are seen in this population. Long-term benefits may include a much lower risk of adhession formation and bowel obstruction over the lifetime of these infants.

Lap. Surgery in Adults & Children-S087*

INTRA-ABDOMINAL ABSCESS FOLLOWING LAPAROSCOPIC AND OPEN APPENDECTOMY IN THE PEDIATRIC POPULATION R. McKinlay, M.D., S. Neeleman, M.D., K. Stevens, M.D., D. Coulter, B.S., M. Ghory, M.D., J. Greenfeld, M.D., C. Cosentino, M.D., Department of Surgery, University of Arizona Affiliated Hospitals, Tucson, Arizona.

Objective: Studies comparing laparoscopic appendectomy (LA) and open appendectomy (OA) with regard to postoperative intra-abdominal abscess (IAA) formation have shown conflicting results. The aim of this study was to determine retrospectively the rate of IAA formation for both LA and OA in a large enough pediatric population to determine if a statistically significant difference could be demonstrated.

Methods: Three hundred fifty charts of patients between the ages of one and eighteen undergoing appendectomy between July 1998 and April 2001 in a university and private hospital were reviewed to examine the incidence of any complication including IAA. Chi-square analysis was performed to determine statistical significance.

Results: Of the 350 patients undergoing appendectomy, 204 were completed laparoscopically (58.6%) and 146 were performed open (41.4%). Only one laparoscopic appendectomy was converted to an open procedure (0.2%). Thirty-five patients were lost to follow-up and were excluded from review regarding abscess formation. There were 16 intra-abdominal abscesses, 10 in the open group and 6 in the laparoscopic group. The incidence of IAA formation for LA overall was 3.2% (6/187), and the incidence for OA overall was 7.9% (10/127) (p<0.07). The incidence of IAA following LA for perforated appendicitis was 6.5% (3/46), and the incidence of IAA following OA for perforated appendicitis was 7.7% (4/52) (p<0.82). For acute appendicitis, the incidence of IAA in the laparoscopic group was 2.9% (3/103) and in the open group was 7.1% (4/56) (p<0.21).

Conclusions: This study demonstrates in a large pediatric population no statistically significant difference in the rate of intra-abdominal abscess formation following laparoscopic and open appendectomy. Laparoscopic appendectomy can be performed for perforated appendicitis without increasing the risk of intra-abdominal abscess.

Lap. Surgery in Adults & Children-S088*

PEDIATRIC LAPAROSCOPIC APPENDECTOMY FOR ACUTE APPENDICITIS: A COST ANALYSIS Ashley H. Vernon, MD, Keith E. Georgeson, MD, Carroll M. Harmon, MD, PhD Division of Pediatric Surgery, Department of Surgery, University of Alabama at Birmingham, Birmingham, Alabama

Background: The benefit of laparoscopy in the treatment of pediatric acute appendicitis continues to be controversial, particularly as it relates to operative time and costs. We performed a cost analysis comparing laparoscopic and open appendectomy in treatment of acute appendicitis in a pediatric population.

Methods: We reviewed the charts of 202 patients that underwent appendectomy for acute appendicitis from January 1998 through November 2000 at a large children's hospital. Potential benefits of laparoscopic appendectomy were examined in three major categories: operative time, postoperative length of stay and hospital costs. We included only patients treated for acute appendicitis as defined by operative findings and pathologic examination. Student's T-test and Chi Square were utilized to determine statistically significant differences ($p<0.05$). The p-value was adjusted for multiple comparisons (Bonferroni adjustment) in the itemized cost data.

Results: Laparoscopic and open appendectomy was performed in 106 and 96 children, respectively. The groups were similar in terms of sex, age and weight. The operative times were the same for the laparoscopic group (45 mins) compared to the open group (47 mins). In addition, the postoperative length of stay was similar in each group, 41 hours for the laparoscopic group compared to 45 hours for the open group. The total hospital cost for the laparoscopic group was $5,572+/-1495 which was significantly higher than for the open group $4,472+/-1254 ($p<0.05$).

Conclusions: These results are notable in that we have shown similar operative times for laparoscopic and open appendectomy in a large series of patients cared for in a pediatric teaching hospital. The cost of laparoscopic appendectomy for acute appendicitis is higher than for the open procedure despite similar operating times and length of hospital stay. These results challenge us to reduce our laparoscopic operative costs.

Lap. Surgery in Adults & Children-S089

MANAGEMENT OF PERIAPPENDICEAL ABSCESS: THE ROLE OF LAPAROSCOPIC INTERVAL APPENDECTOMY Michael Clar, MD, Tom Paluch, MD, Department of Surgery, Kaiser Foundation Medication Center, San Diego, California

Appendicitis presenting with abscess occurs in 1 - 10% of patients presenting with symptoms of appendicitis. The management of these patients remains controversial. We evaluated the role of ambulatory laparoscopic interval appendectomy (ALIA) in a multi-specialty, managed care environment. From 1995 to 2001, 28 patients were identified. These patients were initially managed non-operatively with IV antibiotics and CT-guided percutaneous drainage. Hospital stay averaged 5.2 days. All underwent subsequent ALIA within 6-24 wks (mean 9 wks). ALIA was succesfully completed in 26 pts (93%). One pt (3.5%) developed a post-op intra-abdominal abscess requiring trans-rectal drainage. Pathology revealed an abnormal appendix in all but 2 patients. Ambulatory (same-day) discharge was successful in 86% of patients. We conclude that laparoscopic interval appendectomy can be successfully performed in a majority of patients on an ambulatory basis with minimum morbidity. Non-operative management followed by ALIA is now the treament of choice in our institution for patients presenting with peri-appendiceal abscess.

Lap. Surgery in Adults & Children-S090

LAPAROSCOPIC VERSUS OPEN APPENDECTOMY: PROSPECTIVE RANDOMIZED STUDY OF 227 PATIENTS

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Background. Although laparoscopic appendectomy is widely practiced, still there are many questions regarding the advantages and disadvantages of this approach in the treatment of acute appendicitis. Several controlled trials have been conducted, some in favor, others not. The aim of this study is to evaluate laparoscopic appendectomy in comparison with open appendectomy with special emphasis on post-operative septic complications.

Patients and Methods. A total of 227 patients with a diagnosis of suspected appendicitis were randomized, 108 in the laparoscopic group and 119 in open group. There were 159 males and 68 females. They underwent appendectomy between 1995 and 1999.

Results. Wound infection was significantly higher in open group with an incidence of 7.6% ($P<0.003$). Intra-abdominal infections were equal in both groups. The hospital stay is significantly shorter in laparoscopic group ($P < 0.046$) but the operative time was longer than in open group ($P<0.002$). Conversion to open surgery was necessary in one case.

Conclusions. Laparoscopic appendectomy is as safe and effective as the open procedure. It significantly reduces the rate of post-operative wound infection than open surgery. However, it is still acceptable to perform the open procedure, especially in hospitals without large laparoscopic experience.

Lap. Surgery in Adults & Children-S091

THERAPEUTIC LAPAROSCOPY IN ABDOMINAL TRAUMA. Youn-Baik Choi, M.D., Department of Surgery, University of Ulsan College of Medicine and Asan Medical Center, Seoul, Korea

Recently laparoscopy for abdominal trauma has been used to be an effective diagnostic modality, but the therapeutic potential is still under evaluation, The purpose of this study was to assess the therapeutic potential, feasibility and the effectiveness of the laparoscopy in the abdominal trauma, and a retrospective review was performed.

Laparoscopy was applied for 48 hemodynamically stable patients with suspicious abdominal injuries between February 1998 and January 2001. The age ranged from 15 to 79(mean 40) years. 30 were male and 18 were female. Preoperative evaluation with enhanced abdominal CT revealed some significant injuries in all cases. The laparoscopic procedures were done in the operating room under general anesthesia. Mechanism of injury was blunt trauma(36) and stab wound(12). On the basis of laparoscopic finding, therapeutic laparoscopy(totally laparoscopic, laparoscopic-assisted or hand-assisted) was done in all cases(100%) for gastric wall repair(6), small bowel repair and resection(17), colon repair and resection(11), Hartman's procedure and colostomy(6), distal pancreatectomy(3), splenectomy(2) and etc(3). For bowel resection and distal pancreactomy, laparoscopic-assisted(9) and hand-assisted(3) procedures were applied.

No significant abdominal injuries were missed as a result of laparoscopy in all cases. No conversion to exploratory laparotomy was noted. As in small bowel and colon resection, the mean operation time was 103 minutes(123 minutes in totally laparosopic surgery and 89 minutes in laparoscopic-assisted surgery, respectively), and the hospital stay was 5.7 days. There was no major complications, but five cases of minor complications (two wound infection, two paralytic ileus and one atelectasis) were occurred. There was no mortality.

Short-term results suggest that laparoscopy is a safe, feasible and effective procedure for the evaluation and treatment of abdominal trauma and can reduce the non-therapeutic laparotomies. Limited therapeutic laparoscopy is possible in a hemodynamically stable abdominal trauma patients.

Lap. Surgery in Adults & Children-S092

OCCULT BOWEL PERFORATION DURING LAPAROSCOPIC SURGERY

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Bowel perforation may escape recognition during laparoscopic surgery and its' subsequent diagnosis may be delayed - sometimes with fatal consequences.

Thirteen cases of occult bowel perforations during laparoscopic surgery were reviewed. Three operations were gynaecological and 10 surgical. Four patients died as a result of the perforation (31%). The median delay between primary operation and diagnosis of peritonitis and re-operation was 76h and 90h repeatedly.

Symptoms and signs present during the 1st postoperative day included abdominal pain (54%), reluctance to mobilise (62%), anorexia (45%), nausea (56%), vomiting (35%), tachycardia >90 (46%), pyrexia >38oC (8%), abdominal distension (54%), tenderness (72%). Tenderness was present in 80% of patients on the second postoperative day but other symptoms and signs often improved.

After laparoscopic surgery, bowel perforation is a serious but infrequent complication with a subtle presentation. A protocol to facilitate earlier investigation and diagnosis has been developed from the data.

Donor Nephrectomy-S093*

HEALTH-RELATED QUALITY OF LIFE (HRQL) FOLLOWING LAPAROSCOPIC AND OPEN NEPHRECTOMY Kenneth Pace, MD, MSc, Sarah Dyer, MSc, Robert Stewart, MD, R. John Honey, MD, Eric Poulin, MD, MSc, Christopher Schlachta, MD, and Joseph Mamazza, MD, Divisions of Urology and Minimally Invasive Surgery, St. Michael's Hospital, University of Toronto, Toronto, Canada

Background: Laparoscopic (lap) and open procedures are often compared to demonstrate differences in post-operative recovery but equivalent surgical outcomes. However, post-operative recovery is often assessed with parameters prone to bias, such as pain and time to return to work. The post-operative recovery scale (PRS) is a validated self-administered questionnaire based on the SF-36 and designed to assess pain, ADL, and HRQL in post-operative patients.

Methods: The PRS was administered prospectively to patients undergoing contemporaneous lap and open radical nephrectomy (with organ-confined, asymptomatic renal cell carcinomas) and donor nephrectomy. All open cases were performed via an extra-peritoneal, extra-pleural, non-rib resecting, supra-12 flank incision, while all lap cases were performed transperitoneally. Pre- and post-operatively results were analysed with repeated measures analysis of covariance and survival analysis to compare how quickly patients returned to 75% of pre-operative HRQL.

Results: 17 open (12 donor nephrectomy, 5 radical nephrectomy) and 25 lap (22 donor nephrectomy, 3 radical nephrectomy) patients had 3-month follow-up data. Patients were comparable in age (36.9 vs. 40.1), gender (8 vs. 14 females), BMI (27.9 vs. 26.5), and extraction incision size (7.3 vs. 7.4 cm). Operative time was longer in the lap (231 vs. 160 minutes, $p<0.001$), but hospital stay was shorter (median 3 days vs. 5 days, $p=0.010$). HRQL scores were consistently higher for lap patients from post-op day 3 to 90 (ANCOVA $F(7,26)=2.734$, $p=0.010$). Lap patients recovered faster than open patients: median time to return to 75% of pre-op score was 90 vs. 42 days for open and lap patients (log rank, $p=0.0245$).

Discussion: Application of an objective HRQL instrument confirms that patients undergoing lap nephrectomy recover faster, with a greater HRQL than open nephrectomy patients. The PRS can be applied to patients undergoing other abdominal procedures, and may prove useful for comparisons of other minimally-invasive surgical techniques.

Source of funding: Departmental and Biomedical Research Grant from the Kidney Foundation of Canada.

Donor Nephrectomy-S094*

LAPAROSCOPIC VERSUS OPEN DONOR NEPHRECTOMY: A COST-UTILITY ANALYSIS Kenneth T. Pace, MD, MSc, Sarah J. Dyer, MSc, Veronique Phan, MD, MSc, Robert Stewart, MD, R. John Honey, MD, Eric C. Poulin, MD, MSc, Christopher M. Schlachta, MD, and Joseph Mamazza, MD, Divisions of Minimally Invasive Surgery and Urology, St. Michael's Hospital, University of Toronto, Toronto, Canada

Introduction & Objectives: Laparoscopic donor nephrectomy (LapDN) offers donors more rapid post-operative recovery and recipients equivalent graft function at 5 years when compared with open donor nephrectomy (OpenDN). Nonetheless, operative times and costs are less favourable for LapDN than for OpenDN. We compared LapDN and OpenDN with cost-utility analysis.

Methods: A decision-analysis modeling approach was performed: utilities were measured for donor health states using time trade-off and quality-adjusted life year (QALY) techniques; probabilities were derived from a systematic review of the literature. All in-patient, out-patient, direct and indirect costs were included from a societal perspective using actual cost data from 29 OpenDN and 27 LapDN patients performed contemporaneously between July 1, 2000 and July 1, 2001. Costs of lost employment were estimated using mean provincial annual earnings. Incremental cost-effectiveness ratio (ICER) was calculated with best-case and worst-case scenarios for confidence intervals; sensitivity analyses were used to assess robustness.

Results: LapDN costs are higher ($10,317.40 vs. $9,853.70), while quality of life (QOL) is superior (0.7683 vs. 0.7062). ICER was $7,471.11/QALY, ranging from LapDN dominant (lower cost and greater QOL in best-case scenario) to $34,177.70/QALY (worse-case). The model was sensitive to in-patient costs, probability of not returning to work post-operatively, and model length. For these variables, the ICER varied from LapDN dominant to $34,765.03/QALY.

Conclusions: LapDN offers improved QOL 3 months post-operatively at marginally higher cost, despite the fact that these patients represented the learning curve of LapDN at our institution. A societal ICER of $7,471.11/QALY compares favourably to many accepted health-care interventions. By potentially increasing organ donor rates, LapDN may becost saving by decreasing the number of patients on dialysis.Source of funding: Departmental and Biomedical Research Grant from the Kidney Foundation of Canada.

Donor Nephrectomy-S095*

A STUDY TO COMPARE STANDARD OPEN NEPHRECTOMY, LAPAROSCOPIC NEPHRECTOMY AND HAND-ASSISTED LAPAROSCOPIC LIVE-DONOR NEPHRECTOMY. Ergun Velidedeoglu MD Noel Williams MD Kenneth L. Brayman MD Niraj M Desai MD Louis Campos MD Maral Palanjian MD Martin Wocjik MD Roy Bloom MD Robert Grossman MD Kevin Mange MD Jo Buyske MD Clyde F. BarkerMD Ali Naji MD and James F. Markmann MD, Department of Surgery,Hospital of the University of Pennsylvania

Introduction: Minimally invasive live-donor nephrectomy is reported to promote organ donation through an accelerated recovery with reduced pain and length of hospital stay (LOS) compared to the open operation. However, the risks are not fully established. The hand-assist technique (HA) may hold advantages over the standard laparoscopic technique (LAP) including a greater margin of safety, reduction of operative time and costs. We compared the outcome of donor and graft in live donor nephrectomies for standard open (ODN), LAP or HA. Methods: Records of 125 live donor nephrectomies were examined: ODN in 50 patients, LAP in 40, HA in 35. Conversion to ODN from LAP or HA was required in 3 LAP and 1 HA cases. Outcome measurements included donor operative time (OT), donor LOS, cost of donor hospitalization, recipient urine output (UO) on day 1 and 2, recipient creatinine (CR) and recipient or donor complications. Results: For all groups, donor and recipient age was similar. Donor weight was less in ODN (155.5 lbs) than in LAP and HA (167.1 and 168.3 lbs). Early graft function with LAP and HA, measured by UO and CR, were equivalent to ODN. By 6 weeks, graft function was excellent in all groups. OT was shorter in ODN compare with either LAP or HA ($p<0.001$). LAP and HA was associated with reduced hospital LOS ($p<0.001$) but both were associated with a trend toward greater hospital costs. Surgical complications for ODN included DVT, wound infection, thrombosis, urine leak (n=2); for LAP graft thrombosis, splenic laceration, hydronephrosis; for HA urine leak, lymphocele. Conclusions: Minimally invasive live donor nephrectomy using LAP or HA results in excellent early renal function with a favorable safety profile. Occurrence of urine leak post transplant was not increased using either LAP or HA. Hospital LOS was significantly reduced in both LAP and HA compared with ODN. We conclude that LAP and HA provide effective and safe minimally invasive alternatives to ODN.

Donor Nephrectomy-S096

IS HAND ASSISTED LAPAROSCOPIC DONOR NEPHRECTOMY A PROHIBATIVE EXPENSE OR A USEFUL TOOL? Joseph F. Buell MD, Michael J. Hanaway MD, Steven R. Potter MD, J. Wesley Alexander MD, Rino Munda MD, E. Steve Woodle MD, Division of Transplantation, Department of Surgery, The University of Cincinnati, Cincinnati, Ohio

Some have considered hand-assisted laparoscopy (HAL) an unnecessary and costly addition to laparoscopic donor nephrectomy. We report here the first large series of HAL compared to open nephrectomy to demonstrate the benefits of HAL. Methods: 100 consecutive HALs (10/98-8/01) donor/recipient pairs were compared to 50 open pairs (8/97-1/00) using student's t-test and Chi-square. Results: Mean donor weights were similar (178.3 ± 40.5 vs 167.4 ± 30.3 lbs;p=NS) while age was higher in HAL (38.5 ± 9.5 vs 31.2 ± 7.8 yrs;P < 0.01). The percentage of right nephrectomies were lower in HAL (15/100 [15%] vs 22/50 [44%];P < 0.05). Two conversions (2%) were required for bleeding during the first 20 cases. Despite increased OR time HAL (3.9 ± 0.7 vs 2.9 ± 0.5 hrs; p < 0.01), warm ischemia time (3:02 ± 1:09 vs 3:16 ± 0:21mins; p =NS), return to diet (6.9 ± 2.8 vs 25.6 ± 6.1 hrs;p < 0.01), narcotics requirement (17.5 ± 6.5 vs 56.3 ± 6.4 hrs;p < 0.01) and length of stay (52.2 ± 22.9 vs 129.6 ± 65.7 hrs;p < 0.01) were less. All grafts had immediate function. Total financial costs of the procedure and hospitalization were almost identical between the HAL and open group ($11,072 vs. 10,840). No ureteral stricture was identified in HAL group. With the addition of a HAL program our percentage of live donation increased by 30%. Conclusions: HAL preserves the donor benefits over traditional open nephrectomy while adding the advantages of tactile sensation and providing excellent renal function while avoiding ureteral strictures.

Donor Nephrectomy-S097

PERIARTERIAL APPLICATION OF PAPAVERINE IMPROVES INTRAOPERATIVE KIDNEY FUNCTION DURING LAPAROSCOPIC DONOR NEPHRECTOMY Johannes Zacherl, MD, Manfred Stangl, MD, Hubert Feussner, MD, Wolfgang Erhardt, MD, Georg Bischof, MD, Rudolf Steiniger, MD, Jörg R. Siewert, MD Chirurgische Klinik und Poliklinik, Institut für Experimentelle Onkologie und Therapieforschung, Klinikum rechts der Isar, TU München, Munich, Germany; Universitätsklinik für Chirurgie, University of Vienna, Vienna, Austria

Background: Laparoscopic donor-nephrectomy decreases disincentives to donation frequently associated with the disadvantages of open surgery. However, concerns have been raised regarding graft quality, since the incidence of delayed graft function is higher when compared with the results of open harvested kidneys. This may be caused by amelioration of kidney perfusion due to the elevated intraabdominal pressure and due to a mechanically induced renal angiospasm during donation. This study was adressed to reveal if the renal periarterial application of papaverine is able to enhance renal blood flow during laparoscopic nephrectomy. **Materials and methods**: Twelve male piglets underwent left laparoscopic donor-nephrectomy after laparoscopic clipping of the right renal vessels and ureter. Urine output and creatinine-clearance were determined as indirect indicators of renal blood flow. In the treatment group (n=6) papaverine-hydrochloride was administered to the tissue surrounding the renal artery prior to the preparation of the vessels and results were compared with controls (n=6). Free sodium-excretion was measured to preclude prerenal failure. **Results:** In the control group mean urine output per minute was 0.35 +-0.2 ml and mean creatinine-clearance was 0.95 +- 0.1 ml/min/kg. In pigs treated with papaverine mean urine output per minute was 1.4 +- 0.9 ml and mean creatinine-clearance was 2.22 +- 0.5 ml/min/kg. The differences were significant (p=0.011, urine output; p=0.038, creatinine clearance). **Conclusions:** Papaverine improves renal function during laparoscopic kidney harvest when applicated at the vicinity of the renal artery prior to vascular preparation. Obviously, this technique increases renal blood flow, which is impaired by capnoperitoneum, and protects against mechanically induced angiospasm. Further studies are needed to show, if melioration of kidney function during donation is followed by improved early postoperative graft function.

Donor Nephrectomy-S098*

HAND-ASSISTED LAPAROSCOPIC DONOR NEPHRECTOMY VERSUS LAPAROSCOPIC DONOR NEPHRECTOMY FOR LIVING DONOR RENAL TRANSPLANTATION – A CASE-CONTROL COMPARISON Paolo Gentileschi, MD, John de Csepel, MD, Subhash Kini, MD, Emma Patterson, MD, Theresa Quinn, MD, Alfons Pomp, MD, Daniel Herron, MD, Lewis Burrows, MD, Jonathan Bromberg, MD, Michael Edye, MD, Michel Gagner, MD, FACS. Division of Laparoscopic Surgery and Transplantation, Mount Sinai School of Medicine, New York, NY.

INTRODUCTION: Recently, the use of a hand-assisted laparoscopic donor nephrectomy (HALDN) in place of a totally laparoscopic donor nephrectomy (LDN) for living donor renal transplantation has been investigated. The aim of this study was to compare HALDN with LDN evaluating donor and recipient outcomes.

METHODS: all LDNs and HALDNs performed from October 1996 to February 2001 were retrospectively reviewed. From October 1996 to June 1999, the technique for donor nephrectomy was LDN; in June 1999, the technique changed from LDN to HALDN.

RESULTS: Data reported as mean +-standard error.

OUTCOME	LAPAROSCOPIC (n=117)	HAND-ASSISTED (n=81)
Operating time (min)	257 +- 5	211 +- 7 *
Blood loss (ml)	286 +- 33	122 +- 17 *
Marked renal vascular bleed	5.1%	1.2%
Conversion to open	3.4%	0%
Warm ischemia time (sec)	257 +- 8	106 +- 6 *
Hospital stay (days)	2.4 +- 0.1	3.0 +- 0.1
30-day graft survival	94%	95%
Median 30-day creatinine (mg/dl)	1.5	1.6
Lymphocele	13.4%	0% *
Thrombosis	6.6%	2.4% *
Acute tubular necrosis	6.6%	7.3%

Note: * denotes statistical significance (p<0.05)

CONCLUSIONS: HALDN was associated with shorter operating times, less blood loss, shorter warm ischemia times, and lower incidence of recipient post-operative complications. The hand-assisted method of laparoscopic nephrectomy may make the operation available to more transplant centers.

Colorectal Techniques & Outcomes-S099

NINE-YEAR AUDIT OF LONG-TERM OUTCOME OF LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER. Masahiko Watanabe, M.D., Hirotoshi Hasegawa, M.D., Hideo Baba, M.D., Seiichiro Yamamoto, M.D., Masaki Kitajima, M.D. Department of Surgery, Keio University School of Medicine, Tokyo, Japan.

[Aim] The role of laparoscopic surgery in colorectal cancer is still controversial. The aim of this study was to analyse long-term outcome of laparoscopic surgery in patients with colorectal cancer.

[Patients and methods] Between June 1992 and June 2001, 417 patients with colorectal cancer (259 men and 158 women; mean age: 62.0 years) underwent laparoscopic surgery. The median follow-up was 39 months (range: 2-109 months). The 5-year survival rate was calculated using a Kaplan-Meier method.

[Results] Sites of tumour was distributed in the caecum: 50 (12%), ascending: 73 (18%), transverse: 67 (16%), descending: 22 (5%), sigmoid: 135 (32%) and the rectum: 70 (17%). As for the local invasion, there were 122 (29%) pTis, 135 (32%) pT2, 87 (21%) pT3 and 3 (1%) pT4 tumours. Dukes' staging identified 299 patients (71%) for Dukes' A, 54 (13%) for B, 57 (14%) for C and 7 (2%) for Dukes' D. Postoperative complications included wound sepsis in 19 patients (4.6%), anastomotic leakage in 15 (3.6%) and bowel obstruction in 10 (2.4%). Twelve patients developed recurrences (liver: 5, peritoneum: 3, local: 4). The 5-year survival rate was 98.5% for Dukes' A, 100% for Dukes' B and 85.3% for Dukes' C.

[Conclusions] Laparoscopic surgery for colorectal cancer is feasible and long-term results are quite favourable for Dukes' A and B.

Colorectal Techniques & Outcomes-S100

ONCOLOGICAL QUALITY AND LONG-TERM RESULTS IN LAPAROSCOPIC COLORECTAL SURGERY., Hubert Scheidbach, M.D.; Claus Schneider, M.D.; Ferdinand Kockerling, M.D.; Hanover Hospital (Siloah), Dept. of Surgery and Center for Minimally Invasive Surgery, Hannover, Germany

BACKGROUND: This presentation makes an attempt to interpret data on the perioperative course, oncological quality and long-term results of laparoscopic colorectal surgery carried out in curative intent.

PATIENTS&METHODS: The data were collected within the framework of a prospective multicentre observational study that has been ongoing since Aug 1, 1995 including 42 hospitals. Out of a total of 2383 patients, 663 (28%) underwent a curative resection for colorectal carcinoma.

RESULTS: The patients` average age was 67.9 years, the sex distribution almost 1:1. UICC staging of tumours (stages I, II and III) revealed the following figures: 243/37.3%;203/30.6%;and 213/32.1%. In the majority of the cases, an oncologically radical resection with high transsection of the supplying vessels was performed. Intraoperative seeding of tumour cells was reported in 1.8% of the patients, in 8/12 patients, however, due to spontaneous perforation of the tumour. An average of almost 13 lymphnodes in the resected specimen were investigated (10 LN in stage I, 14 each in stages II/III). Depending on the individual hospital, a remarkable variation in the number of lymphnodes investigated was observed. With a mean follow-up period of 673 days, Kaplan-Meier survival function showed acceptable results, both for rectal and colonic carcinoma, in comparison with conventional colorectal surgery. This also aplied to a stage-related consideration of the survival data.

CONCLUSION: Overall, the results show that a laparoscopic colorectal procedure can fulfill oncological radicality criteria, even though certain reservations, in particular in the case of procedures done in curative intent, have not been completely eliminated.

Colorectal Techniques & Outcomes-S101*

LAPAROSCOPIC TOTAL MESORECTAL EXCISION FOR RECTAL CANCER Joel Leroy, MD; Michelle K Smith, MD; Faek Jamali, MD;Lael Forbes,MD;Francesco Rubino, MD;Jacques Marescaux, MD, Hopitaux Universitaires de Strasbourg, EITS/IRCAD, Strasbourg, France

Objective: Total mesorectal excision (TME) for the treatment of rectal cancer has been reported by multi-center studies to improve local control and survival rates. Despite some concerns, laparoscopic procedures are increasingly being performed for colorectal cancer. We present our series of laparoscopic TMEs performed for rectal cancer.Methods:Between November,1991,until September,2001, prospective data was accrued on 112 consecutive patients undergoing laparoscopic TME for rectal cancer performed for cure or palliation. The operations were all performed by the same surgeon. The mean age was 67 years (range 28 - 84). All tumor stages were included in the study (T0 – T4) although the majority of the patients were TNM stage II or higher (81%). 48 patients received preoperative radiotherapy. The mean distance of the tumor from the anal verge was 9 cm.Results: TME was successfully performed laparoscopically in 97% of the patients. Mean operative time was 202 minutes. An average of 8 lymph nodes were resected per case. Margin of resection (proximal or distal) was 3.4 cm. Postoperative anastomic leaks occurred in 16.7% of cases; 6% requiring intervention. There were 2 (1.9%) perioperative deaths. Mean follow-up was 3 years (0.1 – 8.5 years). Local recurrence rate was 7%. Cancer-specific survival and overall survival rates at five years were 75% and 65% respectively for patients resected with curative attempt.Conclusion: Laparoscopic total mesorectal excision for rectal cancer performed by an experienced laparoscopic surgeon is a safe and technically feasible operation. Overall complication and survival rates compare favorably to those of conventional open TME procedures. Based on our study, we propose that the laparoscopic approach for TME dissection may actually improve and aid in standardization of the technique by allowing the surgeon to perform a more precise dissection the pelvic planes under the direct visualisation and magnification of the endoscope.

Colorectal Techniques & Outcomes-S102

TRANSANAL ENDOSCOPIC MICROSURGERY IN THE TREATMENT OF SELECT RECTAL CANCERS OR SUSPICOUS RECTAL TUMORS

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PURPOSE: This study describes our experience utilizing Transanal Endoscopic Microsurgery (TEM) in select patients with known or suspected rectal cancer to facilitate surgical access, reduce operative trauma by avoiding major abdominal surgery, and prevent the need for colostomy.

METHODS: 43 patients with rectal cancer or tumors with a high likelihood of malignancy are the subject of this study. Of the 24 men and 19 women there were 2 groups: known cancer: n=16; patients with suspicious lesions: n=27, 6 who proved to have invasive malignancy. Size of lesions ranged from 1cm to 7cm (avg. 3.5cm). The inferior level in rectum ranged from -1cm to 21cm (avg. 6.5cm). Eleven known rectal cancer patients were treated with preoperative radiation or preoperative chemoradiation. Twenty-two patients would have received an abdominal perineal resection (APR) by ordinary standards; 14 patients would have qualified for abdominal sphincter preserving operations; and 7 patients were indeterminate. Full thickness local excisions were: disk: n=23; hemi-circumferential: n=19; and sleeve resection: n=1. Ages ranged from 30 to 91 years (avg. 66.7).

RESULTS: 90% avoided a major abdominal operation (39/43). 90% avoided an APR (20/22). Mortality: n=0; morbidity 9/43: minor wound separation: n=6; major wound separation: n=3, 2 of which were rectovaginal fistulas (91 year old patient presented with fistula and a 77 year old patient presented with a previously irradiated and incompletely excised cancer). A single instance of locally recurrent cancer required an APR. There were no other recurrences. Overall 3 patients required a stoma.

CONCLUSION: TEM promises to offer a safe and effective option in the selective treatment of patients with known or suspected rectal cancer with or without preoperative radiation or chemoradiation by reducing the need for major abdominal surgery and colostomy.

Colorectal Techniques & Outcomes-S103

IS LAPAROSCOPIC SURGERY ACTUALLY LESS INVASIVE THAN CLASSICAL OPEN SURGERY? -QUANTITATING PHYSICAL ACTIVITY USING AN ACCELEROMETER AS THE CONDITION OF CONVALESCENCE Y. Inoue MD, T. Kimura MD, S. Fujita MD, H. Noro MD, F.Uchikoshi MD, T. Itoh MD, E. Taniguchi MD, S. Ohashi MD, H. Matsuda MD Department of surgery, Osaka University Graduate School of Medicine, and department of surgery, Osaka Central Hospital

PURPOSE Laparoscopic surgery has accepted as less invasive than classical open surgical procedures, but this has not been adequately evaluated based on assessments of objective parameters. Currently, clinical parameters such as the day of first mobilization, the day of initial food intake and the length of hospital stay are employed. These parameters are prone to bias and lack of objectivity. We have reported that measurement of physical activity using an accelerometer after operation was useful to evaluate the condition of convalescence. This study was done in order to demonstrate that laparoscopic surgery is actually less invasive, objectively and quantitatively.

MATERIALS AND METHODS We compared physical activity for 7 days postoperatively measured by accelerometer in 3 groups of patients: laparoscopic-assisted colorectal surgery(LAC, n=30), classical open colorectal surgery (OC, n=30) and body surface operation such as partial mastectomy and thyroidectomy(BSO, n=15).

RESULTS Physical activity expressed as cumulative acceleration was significantly higher in the LAC and BSO than in OC on each postoperative day. Recovery time defined as the day that cumulative acceleration recovered to 90% of the preoperative level, was significantly shorter in LAC (2.8+/-2.1 days) and BSO(2.5+/-1.3 days) than in OC(6.5+/-3.2 days).

CONCLUSION Our results showed that the duration of convalescence in LAC was similar to BSO but significantly shorter than OC. We may conclude that laparoscopic surgery is less invasive than classical open surgery but as equivalent as body surface operation in respect of convalescence after operation.

Colorectal Techniques & Outcomes-S104

LOCAL EXCISION OF RECTAL CANCER BY TRANSANAL ENDOSCOPIC MICROSURGERY (TEM): 10 YEARS EXPERIENCE. Mario Guerrieri, M.D., Francesco Feliciotti, M.D., Alessandro M. Paganini, M.D., Pamela Zenobi M.D., Francesca Crosta, M.D., *Emanuele Lezoche, M.D. Istituto di Scienze Chirurgiche, University of Ancona, Ancona, Italy; *II Clinica Chirurgica, Università La Sapienza, Roma, Italy.

Aim of this study was to evaluate the long-term results of the treatment of rectal cancer by radiotherapy and transanal endoscopic microsurgery (TEM).

A group of 114 patients with extraperitoneal rectal carcinoma underwent preoperative radiotherapy (5,040 cGy) and TEM resection. The indications were: > 75 years old, high risk patients and patients who refused abdomino perineal resections. The histological findings were: 26 T1 lesions (22,8%), 56 T2 lesions (49,1%) and 17 T3 lesions (14,9%). In the 13,2% of the patients, the pathologist did not find cancer cells in the resected speciment (15 T0). No operative complications were observed and no perioperative mortality was reported. Postoperative pain was mild and oral intake began after two-three days. The results were as follow: 2 major complications (1,7%),1 recto-vaginal fistula that required reoperation and 1 recto-urethral fistula treated by conservative therapy; 11 minor complications (9,6%) consisting of 7 leaking suture, 3 cases of stool incontinence and 1 rectal haemorrage that resolved by medical therapy. Mean hospital stay was 5 days (range 3-12). Mean follow-up was 48 months (range 6-114 months). Local recurrences were observed in 7(6,5%) patients: 5 patients were successfully reoperated by TEM (one), anterior resection (2) and abdomino perineal resection (2); the other two patients were high risk for major surgery and underwent radiotherapy. The cancer-related survival in T0 and T1 patients was 100%.

The cancer-related survival in T2 and T3 patients was 81% and 62,1% respectively. Transanal endoscopic microsurgery (TEM), combined with full-dose preoperative radiotherapy allows to perform minimally invasive full-thickness local excision of rectal cancer with full-thickness perirectal fat dissection.This approach is feasible and safe and current follow-up appears to be effective. Randomized clinical trials will be necessary to confirm our preliminary results.

Foregut-S105*

LAPAROSCOPIC ANTIREFLUX SURGERY. PREOPERATIVE LES PRESSURE DOES NOT AFFECT OUTCOME. Silvana Perretta, Marco G. Patti, Piero M. Fisichella, Alessandra D'Avanzo, Lawrence W. Way. Department of Surgery, University of California San Francisco.

Background: It has been claimed by some that a fundoplication in patients with GERD and normal LES pressure (LESP), would often fail to control reflux and result in a high rate of postoperative dysphagia.

Hypothesis: We hypothesize that: (a) fundoplication is effective in patients with GERD irrespective of the preoperative LES pressure; and (b) normal preoperative LES pressure does not increase the risk of postoperative dysphagia.

Patients and Methods: We studied 280 unselected patients with GERD (126 women and 154 men, mean age 54 years) who underwent laparoscopic fundoplication. They were divided into 3 groups based on the preoperative LES pressure (normal LESP 14-24 mmHg): (1) group A, LESP 0-6 mmHg, 61 pts (22%); (2) group B, LESP 7-13 mmHg, 178 pts (64%); (3) group C, LESP >14 mmHg, 41 pts (14%). De novo dysphagia was defined as new onset of postoperative dysphagia lasting more than 10 weeks. Average follow up was 17±22 months.

Results:

	Group A	Group B	Group C
*No heartburn (% of pts)	95	92	88
*No regurgitation (% of pts)	98	88	93
De novo dysphagia (% of pts)	8	7	2

*There was no difference in resolution of symptoms among the 3 groups.

There was no difference in incidence of de novo dysphagia among the 3 groups. Among the 19 pts (7%) who developed postoperative dysphagia, it resolved spontaneously after an average of 4 months in 15 pts (79%) and after dilatation in 4 pts (21%).

Conclusions: These data show that: (a) fundoplication controlled GERD symptoms irrespective of preoperative LESP; (b) a normal preoperative LESP is not associated with a higher rate of postoperative dysphagia.

Foregut-S106

DOES LAPAROSCOPIC ANTI-REFLUX SURGERY PREVENT OCCURRENCE OF TRANSIENT LOWER ESOPHAGEAL SPHINCTER RELAXATION? F Bahmeriz MD, M Misra MD, M Anvari MB BS PhD, CJ Allen MB Ch, C Gill Pottruff BSc, Centre for MInimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

Transient Lower Esophageal Sphincter Relaxation (TLESR) is the most common mechanism underlying Gastroesophageal Reflux Disease (GERD), causing 70-100% of reflux episodes in normal subjects and 63-74% of reflux episodes in patients with reflux disease.

Aim: To evaluate the effect of laparoscopic fundoplication on TLESRs in patients with proven GERD.

Methods: We prospectively followed 73 patients (13M: 60 F) with mean age of 43.7 +- 1.72 years, with proven diagnosis of GERD and reported finding of TLESRs during a 40 minute esophageal manometric study. Patients underwent repeat testing 6 months after undergoing laparoscopic Nissen fundoplication.

Results: Laparoscopic Nissen fundoplication increased the basal and nadir Lower Esophageal Sphincter (LES) pressure and significantly reduced the number of TLESRs during the manometric study. No patients after surgery exhibited TLESR with nadir < 2 mm Hg. However, 8 of 73 patients (11%) exhibit transient relaxation of lower esophageal sphincter to nadir >50% of basal pressure (mean nadir 5.0 +- 1.07 mmHg).

	Preoperative n=73	Postoperative n=73
% Acid Reflux pH< 4	7.53 +- 0.816	1.08 +- 0.259 *
Basal LES Pressure (mm Hg)	10.78 +- 0.62	19.18 +- 1.10*
Nadir LES Pressure (mmHg)	0.85 +- 0.14	6.23 +- 0.49 *
# TLESR with nadir< 2 mm/patient	2.38 +- 0.32	0

Data shown as mean ± se *p<0.05

Conclusion: The number of TLESRs is reduced significantly by anti-reflux surgery. Even accounting for increased basal and nadir pressures, the incidence of transient relaxation of the LES is reduced suggesting that there may be additional mechanisms involved in this process.

Foregut-S107*

PREDICTION OF POSTOPERATIVE GAS BLOATING FOLLOWING LAPAROSCOPIC ANTI-REFLUX PROCEDURES BASED UPON 24 HOUR pH ACID REFLUX PATTERN. PK Papasavas, MD, PF Caushaj, MD, RJ Keenan, MD, RS Macherey, RN, TS Santucci, RN, S Bartley, RR, DJ Gagné, MD, RJ Landreneau, MD. Minimally Invasive Surgery Program, West Penn Allegheny Health System, Pittsburgh, Pennsylvania.

Postoperative Gas/Bloating (G/B) is a common sequelae following laparoscopic fundoplication. Patients (pts) with "Upright" reflux are thought to have more aerophagic tendencies contributing to their GERD symptoms compared to pts with significant "Supine" patterns of reflux. The risk for developing postoperative (postop) G/B was analyzed in relation to patient preoperative (preop) patterns of Upright, Mixed, or Supine 24 hour pH scores.

330 pts undergoing fundoplication (271 Nissen and 59 Toupet) were evaluated for preop G/B symptoms using a 0-10 severity visual analogue scale Pts with preop G/B less than a score of 3 (n=118, 36%) were considered to have minimal preop G/B. All 118 pts were found to have abnormal preop 24 hour ph scores. The pattern of 24 hour acid reflux exposure was defined as Upright (<10% supine), Mixed (10%-25% supine) and Supine (>25% supine). Post-operative G/B scores were assessed. Student's T-test was utilized.

Gas Bloat Scores (0-10 visual analogue scale)

Time	Upright	Mixed	Supine
Preoperative (N=118)	0.6±1.0	0.6±1.1	0.7±0.9
1 month (N=118)	4.5±3.4*	4.1±3.3*	**3.1±2.1****
6 months (N=58)	3.5±3.7*	2.8±3.0*	**1.2±1.7****
2 years (N=61)	3.6±3.3*	4.4±3.7*	**1.0±1.4****

***p = NS*, *p < 0.0001; all p values are related to preop G/B scores*

Acid reflux and regurgitation were controlled in 87% of pts. There was no gender predisposition, nor was there any difference in the incidence of G/B between complete and partial fundoplication.

The 24 hour pH pattern of acid reflux can aid in predicting the chronicity of G/B symptoms. Pts with upright and mixed patterns of 24 hour acid reflux exposure are at greater risk postop for chronic G/B than supine refluxers.

Foregut-S108

REDUCING THE IMPACT OF POST-FUNDOPLICATION SYMPTOMS - LAPAROSCOPIC 90 DEGREE ANTERIOR FUNDOPLICATION David I Watson MD FRACS, Glyn G Jamieson MS FACS,FRACS, Richard Krysztopik MD FRCS, Peter G Devitt MD FRCS, FRACS, University of Adelaide Department of Surgery, Royal Adelaide Hospital, Adelaide, South Australia, AUSTRALIA

Introduction: Laparoscopic Nissen fundoplication is now the procedure of choice for the surgical treatment of gastro-esophageal reflux. However, it can be followed by an adverse outcome, including dysphagia and wind-related problems. To reduce the likelihood of this, we have progressively modified this procedure to an anterior 900 partial fundoplication.

Methods: The procedure entails posterior hiatal repair, posterior oesophagopexy, accentuation of the angle of His, and construction of a 90 degree anterior partial fundoplication. Clinical follow-up has been collected prospectively using a standardized questionnaire.

Results: From February 1999 to June 2001, 97 patients underwent 90 degree anterior fundoplication. In 20 the procedure was chosen because of poor oesophageal peristalsis, in 45 within the context of an ongoing randomized trial, and in 32 because of specific patient or surgeon preference. Operating time ranged from 20 to 160 mins (median 57), and all but 2 procedures were completed laparoscopically. One patient experienced a major post-operative complication – small bowel injury from Veress needle. Follow-up has ranged up to 2 years (median 1 yr). Two patients have undergone further surgery, both for recurrent reflux. Control of reflux has been acceptable, with a reduction in heartburn symptom scores, and high overall satisfaction. Post-operative dysphagia measured using a visual analogue scale was less following surgery, compared with pre-operative scores. 84% of patients could belch normally 3 months after surgery. Objective testing with manometry demonstrated significantly better lower oesophageal sphincter relaxation compared to Nissen fundoplication.

Conclusion: 90 degree anterior fundoplication achieves good control of reflux, a low incidence of side effects, and physiological post-operative manometric parameters. To further evaluate its potential we are currently undertaking a prospective randomized trial.

Foregut-S109*

COMPARISON OF PATIENT SATISFACTION WITH REDO VERSUS PRIMARY FUNDOPLICATION. Leena Khaitan, M.D., Parul Bhatt, William Richards, M.D., Hugh Houston, M.D., Kenneth Sharp, M.D., Michael Holzman, M.D., Vanderbilt University Medical Center, Nashville, TN

Introduction: There is little information in the literature comparing patient satisfaction with redo versus primary fundoplication.

Methods: All patients undergoing fundoplication at our institution were sent short form health surveys (SF12), GERD specific QOL questionnaires (QOLRAD, scale 0-7, a higher score reflects improved QOL), and queries regarding long term satisfaction.

Results: 221 patients (198 primary, 23 redo) underwent fundoplication between November 1992 and July 2000. There were 19 open cases (3 primary, 16 redo). In the primary group, 173 underwent Nissen, 23 Toupet, and 2 Collis. In the redo group, 12 underwent Nissen, 9 Toupet, 1 Collis, and 1 Belsey. Follow-up surveys were completed in 130 patients (112 primary, 18 redo) at a mean of 32.6 months (range 0.8-98). 87% of the patients in the primary group were satisfied with their operation versus 75% in the redo group. There was no difference in SF12 mental scores or QOLRAD between the two groups. However, there was a significant difference between SF12 physical scores, which might be explained by a higher percentage of the redo cases being open (70% v. 0.02%).

	SF12 MCS	SF12 PCS	QOLRAD
Primary	46±12	32±13	6.2±1.3
Redo	40+14	18.5±11	5.2±2.0
p value (chi-square)	0.07	.0002	0.07

Conclusion: Redo fundoplication can be an effective procedure with high patient satisfaction when performed in the appropriate patient population.

Foregut-S110

REDEFINING GASTROESOPHAGEAL REFLUX: DETECTION USING MULTICHANNEL INTRALUMINAL IMPEDANCE TECHNOLOGY. Nagammapudur S. Balaji FRCS, Denis Blom MD, Tom R DeMeester MD, Jeffrey H. Peters MD, University of Southern California, Los Angeles, CA

INTRODUCTION: Detection of gastroesophageal reflux (GER) has to date has been limited to acid exposure observed on 24 hr pH monitoring. It is clear that non-acid reflux occurs and can be a significant clinical problem. Ambulatory reflux monitoring via impedance technology has been recently developed and has the capacity to detect all reflux events (acid, non-acid, liquid, mixed and air). The aim of this study was to characterize reflux via impedance in normal ambulant subjects.

METHODS: Five asymptomatic healthy volunteers underwent combined 24-hour pH and impedance testing. pH was measured 5cm above the lower esophageal sphincter (LES) and simultaneous impedance changes recorded at 3, 5, 7, 9, 15, and 17cm above the LES. Reflux events were classified into acid (drop in pH <4, > 5 sec) or non-acid based on chemical properties and liquid, mixed or gas based on impedance changes. The height of the reflux into the esophagus was also recorded and classified as distal (< 5 cm), mid (5-9cm) or proximal (9-17cm) esophageal reflux.

RESULTS: A total of 185 reflux events were characterized. Forty five percent (82) of these were non-acid detected by impedance changes only. Of the remaining 55% (103) all but 3 were detected by both pH and impedance; 3 swallow associated acid events were detected by pH changes only. Pure liquid reflux was seen in 49% and a mixed liquid and gas in 51%. Reflux was confined to the distal esophagus in 28%, reached the mid esophagus in 55% and the proximal esophagus in 16%. An additional 42 gas reflux events were detected by impedance changes only and were predominantly non-acid.

CONCLUSION: Nearly one half (45%) of reflux events are undetected by pH studies. Furthermore, the majority (71%), are observed to reach the mid and proximal esophagus by impedance changes. The additional information provided by detection of reflux via ambulatory impedance studies is likely to have a major impact on the clinical management of patients with gastroesophageal reflux disease.

Foregut-S111

LAPAROSCOPIC ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFLUX DISEASE: EXPERIENCE WITH 668 CONSECUTIVE LAPAROSCOPIC ANTIREFLUX PROCEDURES Frank Alexander Granderath MD, Ursula Maria Schweiger MD, Thomas Kamolz PhD,Heinz Wykypiel jr.MD, Rudolph Pointner MD, Department of General Surgery, Hospital Zell am See, 5700 Zell am See, Austria;Department of General Surgery, University of Innsbruck,A-6020 Innsbruck, Austria

Background: In the last decade, laparoscopic antireflux surgery has become the standard operating procedure in the treatment of severe gastroesophageal reflux disease. Several studies have been published showing that LARS can achieve good to excellent results at short- and mid-term follow-up. Aim of this study was to review our experience with 668 laparoscopic antireflux procedures.

Patients and methods: Between September 1993 and July 2001, 668 laparoscopic antireflux procedures have been performed at the Department of General Surgery of the Hospital Zell am See. In 505 (75.6%) patients a laparoscopic 360° floppy Nissen fundoplication and in 163 (24.4%) patients with poor esophageal motility (< 30 mmHg in the lower esophageal segments in response to wet swallows) or severely disordered peristalsis (> 40% simultaneous contractions in wet swallows), a laparoscopic 270° Toupet hemifundoplication has been performed with standard mobilization of the upper part of the gastric fundus and with division of the short gastric vessels. Patients with achalasia were excluded from analysis. Preoperative and postoperative data including 24-hour pH monitoring, esophageal manometry, quality of life (GIQLI) and analysis of failure were prospectively reviewed.

Results: Overall morbidity was 7.5 %. Conversion to open surgery was necessary in 3 patients (0.45%). In 32 of our own patients, a laparoscopic redo-procedure was necessary due to failed primary intervention. There was no mortality. For a mean follow-up period of 4.8 years (range 3 months to 94 months) 24-hour pH monitoring and esophageal manometry showed normal values in 93% of the patients. Gastrointestinal Quality of Life Index (GIQLI) increased significantly ($p<0.05$) in comparison to preoperative values and remained stable in most of the patients at follow-up.

Conclusion: Laparoscopic antireflux surgery is feasible, effective and can be performed safely without mortality and low morbidity with good to excellent results and a significant improvement of patient´s quality of life.

Foregut-S112

RESULTS OF 310 CONSECUTIVE LAPAROSCOPIC NISSEN FUNDOPLICATIONS PERFORMED IN A TRUE OUTPATIENT SETTING.

Subir Ray, M.D.

The author has performed 310 consecutive laparoscopic Nissen Fundoplications in a true outpatient setting over the last four years regardless of the patient's age, weight or underlying medical problems.

Patients who underwent a Colles gastroplasty were excluded from this paper as these patients were admitted to the hospital postoperatively.

Preoperatively the patients underwent an Upper Endoscopy with biopsy, esophageal manometry and patients with atypical symptoms underwent a twenty four hour PH study.

On the first one hundred patients a bougie was used intraoperatively, however, subsequently no bougie was used and every patient underwent a 360 degree loose wrap. Ninety nine percent of the procedures were performed utilizing five 5 millimeter trocars and one percent utilizing six 5 millimeter trocars. The patients were discharged two to four hours postoperatively on a full liquid diet and no carbonated beverages. There were no procedures converted to open and no patient required a transfusion. On the patient's first postoperative visit, in approximately one week, their diet was increased to mechanical soft foods. Six patients were admitted within a seven day period for dehydration.

All patients were followed at intervals of one week, six weeks, six months and one year postoperatively. Recurrence of symptoms was evaluated by an Upper GI series, Upper endoscopy and or a 24 Hour PH study. There were four failed Nissen procedures three of which were reoperated laparoscpically with good results.

The author is concluding that laparoscopic Nissen fundoplication can be done safely in a true outpatient setting without any increase in morbidity or mortality regardless of the patient's age, weight or underlying medical problems.

Foregut-S113

LAPAROSCOPIC MESH CRUROPLASTY FOR LARGE PARAESOPHAGEAL HERNIAS, J.K. Champion MD, David Rock M.D.
Department of Surgery, Emory Dunwoody Medical Center, Atlanta, Georgia

Previous studies have shown that surgical repair of paraesophageal hernias is associated with a high recurrence rate. The recurrence rate has also been reported higher with a laparoscopic approach. We determined and reported our own recurrence rate of 10.6% in primary repairs with suture cruroplasty in 144 patients with a crual opening of >5cm, which prompted us in 1996 to begin prosthetic reinforcement of large hiatal defects. We retrospectively report our outcomes in 52 patients over a 5 year period.

All patients had symptomatic reflux and endoscopic or radiologic evidence of a large paraesophageal hernia pre-op. Fifteen patients(28.8%) had previous failed antireflux procedures. Using a laparoscopic approach, the contents of the hernia were reduced and the crura were approximated with interrupted permanent sutures and a prosthetic material was then secured over the repair as an onlay reinforcement. A Nissen(42) or Tilley(9) fundoplication was then performed in all but one patient. Eighteen patients (34%) required a wedge collis gastroplasty to achieve adequate esophageal length.

There were no perioperative complications related to placement of the mesh. All but 4 patients were discharged in 23 hours on a liquid diet. Postop gastroscopy or barium swallow have been performed in 25 patients to date, with 10 experiencing foregut symptoms. There has been one recurrence (1.9%) which required a collis gastroplasty to correct. There has been no prosthetic erosion in any patient with a mean followup of 25 months (range7-60).

Early results suggest prosthetic material cruroplasty is effective in reducing the rate of recurrence after laparoscopic repair of large paraesophageal hernias, when utilized in conjunction with a collis gastroplasty to restore esophageal length. Futher followup and evaluation for anatomic recurrence or prosthetc erosion in all patients will be required.

The World of GI Surgery-S114

LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: INITIAL TWO-YEAR EXPERIENCE. Michel Suter, MD, Vittorio Giusti, MD, Eric Héraief, MD, Elisabeth Zysset, MD, Jean-Marie Calmes, MD, Department of Surgery and Internal Medicine, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland

Roux-en-Y gastric bypass (RYGBP) is essentially a restrictive bariatric procedure, and is considered as the gold standard in the surgical treatment of morbid obesity. Open surgery in the obese patients is associated with a high risk of wound infection and incisional hernia. Since a few years, this operation can be performed by laparoscopy. The aim of this paper is two present our results with this procedure after the first two years.

Some 107 patients were operated since 1999, 82 women and 25 men, with a mean age of 39,7 years (19 - 58). RYGBP was a primary procedure in 80 cases (50 morbidly obese and 32 superobese patients), and a reoperation after failure of another bariatric operation in 27 cases. Mean duration of surgery was 169 minutes for morbidly obese, 195 minutes for surperobese, and 203 minutes for reoperated patients. Two patients had to be converted to open surgery. A total of 22 patients (20,5 %) developed complications, of whom 9 (8,4 %) required reoperation for anastomotic leak (5), bowel occlusion (3) or subphrenic abscess (1). Wound infection developed in 5 patients. Mortality was 0,9 %. Major morbidity decreased over time (first two thirds: 12,5 %, last third: 3 %). Comorbidities improved or disappeared over time in the vast majority of the patients. The results in terms of weight loss are expressed in the following table with the body mass index (BMI):

Time (months)	0	3	6	9	12	18
All patients	45,1	37,6	34,4	32,2	32,2	32,7
Morbidly obese	44.6	36.5	32.6	30.5	31.6	
Superobese	55,3	44,6	40,5	37,1	35,9	
Reoperations	34,8	30,3	29,2	28,8	28,6	30,9

Laparoscopic Roux-en-Y gastric bypass is feasible. The learning curve is steep and long, as reflected by the high number of major complications among the first 70 patients. Therefore, only a limited number of surgeons should perform this technically demanding and challenging operation. After the learning curve, the morbidity is low and acceptable. The results in terms of weight loss and correction of comorbidities are comparable to those obtained after open surgery, at least in the short term.

The World of GI Surgery-S115*

HAND-ASSISTED LAPAROSCOPIC SPLENECTOMY FOR MASSIVE SPLENOMEGALY. Edward C. Borrazzo, MD, John M. Daly, MD, Kevin P. Morrissey, MD, Eva Fischer, MD, Mary Belmont, EdD, NP, Nancy J. Hogle, BSN, Dennis L. Fowler, MD, Depts. of Surgery, Weill Medical College of Cornell University, New York, NY, and Allegheny General Hospital, Pittsburgh, PA.

When the spleen is massively enlarged, laparoscopic splenectomy is technically much more difficult, and the pieces of spleen that can be removed through a port site may be inadequate for histologic diagnosis. The purpose of this study is to determine the safety and feasibility of using a hand-assisted technique for laparoscopic splenectomy for massive splenomegaly.

All patients who underwent hand-assisted laparoscopic splenectomy for symptomatic massive splenomegaly or hypersplenism during an 18-month period were retrospectively reviewed. Demographic information, operative data, and outcomes data were tabulated.

Sixteen patients met these criteria. Mean age of the patients was 56 years (range 35-78). Operating time averaged 240 minutes (range 165-360), while mean blood loss was 576cc (range 100-1800). There were no conversions to an open procedure. Mean weight of extracted spleens was 2008g (range 543-4090). Histologic diagnoses included lymphoma(9), leukemia(3), primary hypersplenism(2), Gaucher's disease(1) and Felty's syndrome(1). Postoperatively, length of stay averaged 3.3 days (range 2-7). One patient (6.25%) had a complication; there was no mortality. That one patient initially required removal of a small segment of the tail of the pancreas with the spleen, and then developed a small pancreatic leak and a subphrenic abscess.

Hand-assisted laparoscopic splenectomy for massive splenomegaly is feasible and safe while preserving the recovery benefits of minimal access surgery. It also facilitates retrieval of large pieces of spleen for histologic study.

The World of GI Surgery-S116

THREE YEARS EXPERIENCE IN LAPAROSCOPIC LIVER RESECTION
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The purpose of this study was to establish the benefit of laparoscopic hepatectomy in cirrhotic and non-cirrhotic patients, to determine feasibility and safety. The inclusion criteria were: 1) patient with unilobar hepatic mass, 2) patients with Child B or Child C were excluded form the laparoscopic study. Surgery consisted of laparoscopic approach with abdominal wall lifting.

Between February 1993 and August 2000, 54 patients with liver tumor underwent laparoscopic liver resection. The indications for the operation were: hepatic carcinoma (HCC) 22, cholangio carcinoma 1, colon metastasis 22, angioma 2, hamartoma 1, cholangio adenoma 1, FNH 1, Caroli Disease 2, hydatid cyst, 2. Among the patients with HCC there were 8 Child A patients, with mild cirrhosis. The type of resection performed was segmentectomy 18, bisegmentectomy 6, left hepatectomy 16, extended left hepatectomy 1, right hepatectomy 5, extended right hepatectomy 2. In two cases (4%), one segmentectomy and one bisegmentectomy, the procedure was converted to open surgery. Pringle maneuver was performed in 21 patients with an average time of 44 min (range 20-80 min). There was no intra-operative mortality, but one patient died on the first postoperative day because of liver failure and coagulopathy. Postoperative morbidity rate in the malignancy group was 43 % including 9 pleural effusions and/or chest infections, 4 bile collection, and 4 hematomas of the trocar sites. Mean hospital stay was 10 days (range 2 to 25 days). The follow-up ranged 12-29 months (median follow-up 32 months): of the 45 patients with malignancy, 22 patients are alive and disease-free, 9 are alive with recurrent disease, 8 died from recurrences of the primary, 5 died of other causes.

Laparoscopic hepatectomy is feasible with minimal perioperative bleeding and a relatively low rate of bile leakage, using currently available dissection and hemostatic techniques.

The World of GI Surgery-S117

PROPHYLACTIC BUPIVACAINE ADMINISTRATION DURING LAPAROSCOPIC APPENDECTOMY REDUCES POST-OPERATIVE PARENTERAL NARCOTIC USE, Patrick N. Cervini B.Sc., Lloyd C. Smith M.D., David R. Urbach M.D., Minimally Invasive Surgery Program, Division of General Surgery, Toronto Western Hospital, University Health Network, Toronto, Ontario, Canada

Introduction: The literature on the effects of prophylactic local analgesia on pain after laparoscopic appendectomy is scant. The purpose of this study is to investigate how pre-emptive infiltration of a local anesthetic affects the need for parenteral narcotics following laparoscopic appendectomy.

Methods: We conducted a retrospective chart review of 60 patients who underwent a laparoscopic appendectomy from January 2000 to April 2001 at our institution. The association between prophylactic bupivacaine analgesia and post-operative parenteral narcotic use was analyzed using chi-square analysis, the Wilcoxon rank sum test, and multivariate logistic regression.

Results: Of 46 patients who received intra-operative bupivacaine, 24 (52.2%) required post-operative parenteral narcotics as compared to 12 (85.7%) of 14 patients who did not receive bupivacaine. After adjustment for other factors, patients who did not receive prophylactic bupivacaine were 5.5 times as likely to receive parenteral narcotics during their post-operative hospital stay as patients who received prophylactic bupivacaine (95 percent confidence interval, 1.1 to 27.4; P=0.03). Further, the patients who received prophylactic bupivacaine required fewer doses (median number of doses=0.5, mode=0, inter-quartile range [IQR]=0-2.0) of parenteral narcotics postoperatively than those who did not receive bupivacaine (median=2.0, mode=1.0, IQR=1.0-4.0; P value for comparison=0.03).

Conclusions: Intra-operative bupivacaine, infiltrated locally into surgical wounds, is associated with both a decreased need for, and number of doses of, post-operative parenteral narcotics in patients who have a laparoscopic appendectomy. Use of prophylactic bupivacaine may reduce the post-operative parenteral narcotic requirements of laparoscopic and other surgical patients.

The World of GI Surgery-S118

ESOPHAGEAL FUNCTION AND REFLUX SYMPTOMS AFTER LAPAROSCOPIC GASTRIC BANDING AND CONVENTIONAL GASTRIC BYPASS. Michael Korenkov, MD; Lothar Köhler, MD; Nedim Yüsel, MD; Guido Grass, MD; Stefan Sauerlan, MD; Peter Goh, MD; Hans Troidl, MD

Surgical Clinic, 2nd Department of Surgery, University of Cologne, Germany and Surgical Clinic, Hospital Grevenbroich, Germany

Surgical treatment of morbid obesity is nowadays the most effective method for weight control. The most common operations are gastric banding and gastric bypass. The effect of this operations on the esophageal function and gastric esophageal reflux symptoms is not adequate investigated.

The patient population consisted of 53 patients. Before operation each patient underwent a complete history, physical examination, lung function test, esophageal manometry and gastroscopy. Gender, age, list of medications and esophageal symptom score were recorded. "Non-sweet eaters" patients with good compliance underwent laparoscopic gastric banding (LGB) operation. In "Sweet-eaters" or patients with lack of compliance the gastric bypass (GBP) was carried out.

From July 1997 till April 2000 53 consecutive patients (9 males and 44 females) were operated. 32 patients with median BMI 46,4 kg/m2 ± 5,4 received LGB and 21 patients with median BMI 54,0 kg/m2 ± 10,7 GBP. Except three patient all other underwent complete follow-up examination 6 weeks and then yearly after operation. Median follow-up time was 22 months. In 3 patients out of 6 after LGB the reflux symptoms disappeared and in 3 patients the intensity of complains did not change. Three patients who had no reflux symptoms preoperatively developed them after gastric banding. In the group of GBP nobody had esophageal dismotility and incompetent LES neither prenor postoperative. Postoperative esophageal symptoms were independent of operative technique (Wilcoxon U-Test: p= 0,755).

The present results did not reveal any correlation between gastric reduction and postoperative esophageal function or gastroesophageal reflux.

The World of GI Surgery-S121

CHANGES IN MESENTERIC BLOOD FLOW DURING INTRACRANIAL HYPERTENSION DUE TO ACUTE ELEVATIONS IN INTRAABDOMINAL PRESSURE. LARGE ANIMAL OBSERVATIONS Oscar Brasesco, MD, Danny Rosin,MD, P Paolucci, MD, Turab Pishori, MD, Klaus Thaler, MD, Raul Rosenthal, MD, Steven Wexner, MD Cleveland Clinic Florida, Weston, FL.

Acute elevations in intraabdominal pressure (IAP) have been associated with increased intracranial pressure (ICP). Changes in mesenteric blood flow (MBF) were monitored during periods of elevated intraabdominal pressure with intracranial hypertension.

Five large animals (swine) were studied. An electromagnetic flowmeter probe was placed through a midline laparotomy on the superior mesenteric artery (SMA) to monitor splanchnic hemodynamic changes. An intraparenchymal bolt was placed through a burr hole in the parietooccipital region to monitor ICP. The femoral artery and jugular veins were cannulated to monitor mean arterial pressure (MBP) and central venous pressure (CVP). A 10mm trocar was introduced into the abdominal cavity to create a pneumoperitoneum and elevate the IAP with nitrogen gas. Abdominal pressure was elevated to 10 and 20mmHg by a laparoscopic insufflator. Changes in ICP, CVP, MBP, and SMA flow were recorded at each level of IAP. A 10-minute stabilization period was utilized between each measurement. Statistical analysis was done using one way repeated ANOVA and paired t test, with $p<0.05$ considered significant.

There was a statistically significant increase in ICP ($p=0.02$) at each level of increased IAP. There were no statistically significant changes in MBP and CVP when IAP and ICP were increased. SMA flow decreased significantly ($p=0.006$) with each level of increased IAP. All parameters returned to baseline values when the abdominal cavity was desufflated.

The simultaneous increase in ICP and decrease in mesenteric blood flow with constant MBP during acute elevations of IAP may represent a neurohormonal response (Cushing's reflex) to the acutely elevated ICP.

The World of GI Surgery-S122*

LAPAROSCOPIC RADIOFREQUENCY ABLATION AND HEPATIC ARTERY INFUSION PUMP PLACEMENT IN THE EVOLVING TREATMENT OF COLORECTAL LIVER METASTASES Jun Cheng MD, Robert Glasgow MD, Robert O'Rourke MD, Lee Swanstrom MD, Paul Hansen MD. Dept. of Minimally Invasive Surgery, Legacy Health System, Portland, Oregon.

Laparoscopic radiofrequency ablation (LRFA) and laparoscopic hepatic artery infusion pump (LHAIP) placement are new treatment options for patients with colorectal liver metastases. We investigate the selection criteria, safety, and preliminary outcomes of patients treated with LRFA, LHAIP placement, or both.

32 patients with colorectal metastases confined to the liver and who had failed systemic chemotherapy were treated with LRFA and/or LHAIP from 1996 to 2001. Treatment selection was based on tumor number, location, and distribution.

There were no perioperative deaths and 4(13%) complications. One patient was converted to an open pump placement due to a prior hepatectomy. Median follow-up was 8 months (range, 0.5-38 months). Survival over the follow-up period was 82%, 75%, and 44% for LRFA+LHAIP, LRFA, and LHAIP respectively. LHAIP had the shortest survival time of the 3 groups by Kaplan-Meier survival curves ($p=0.017$).

LRFA, LHAIP placement, or combination therapy are safe options for the treatment of colorectal hepatic metastases. Tumor distribution and vascular involvement are important selection criteria for treatment. Long term studies are required to elucidate the proper role for these evolving treatment options.

	LRFA+ LHAIP (n=11)	LRFA (n=12)	LHAIP (n=9)	*P* value
Tumor Pattern-Diffuse	0	0	6(67%)	< 0.01
-Focal	11(100%)	12(100%)	3(33%)	
# Tumors	2.5±1.5	2.1±1.4	N/A	NS
Vascular Involvement	7(64%)	2(17%)	9(100%)	< 0.01
OR Time (minutes)	410±76	250±50	314±79	< 0.05
Perioperative Complic.	2(19%)	0	2(22%)	NS

Hernia-S125

RESULTS OF 5000 LAPAROSCOPIC EXTRAPERITONEAL HERNIA REPAIRS (TEP) : C.Tamme M.D., H.Scheidbach M.D.,C.Hampe M.D., C.Schneider M.D.; F.Köckerling M.D. Department of Surgery and Minimal Invasive Therapy, Hanover Hospital, Germany

In our department we perform the total extraperitoneal approach for hernia repair (TEP) as a tension-free method since may 1994. Up to now we operated on 5000 hernias in 3740 patients. More than 90% were men.

The average age of the patients was 53 years. In 32% of the patients bilateral hernias and in 13 % of the hernias a single or multiple recurrence following conventional herniotomy were treated. The median operating time was 51 minutes per patient, including also scrotal and incarcerated hernias.

After blunt dissection of the preperitoneal space using a PDB trocar, we perform a preparation of the hernia sac with an extended parietalisation of the spermatic cord or round ligament. Than a 10x15 cm non-slitted polypropylene mesh is placed without staple fixation. Intraoperative complications were injuries of the urinary bladder in 8 patients (0.2%) and of the spermatic duct in 2 patients (0,05%). We haven't seen any bowel injury or damage of the iliac vessels.

Postoperatively we noticed only one case of mesh infection. In 12 cases (0,3%) postoperative bleeding necessitated either an inguinal or endoscopic reoperation. As major complication a small-bowel obstruction caused by insufficient closure of a peritoneal lesion occurred in two patients (0,05%). Both underwent laparoscopic revision without having postoperative complications.

Overall we have had 24 recurrences (recurrence-rate: 0.5%) after TEP and we reoperated 19 of these, using the Lichtenstein procedure.

In summary, we assess TEP to be a low-complication procedure, combining the advantages of the minor-access-surgery and the mesh augmentation of the groin region with early postoperative mobilisation of the patient and a very low recurrence rate.

Solid Organ-S127*

WARM ISCHEMIA TIME DOES NOT CORRELATE WITH RECIPIENT GRAFT FUNCTION IN LAPAROSCOPIC DONOR NEPHRECTOMY Molly M. Buzdon, MD, Eugene Cho, MD, Stephen C. Jacobs, MD, John L. Flowers, MD, University of Maryland School of Medicine, Baltimore, Maryland, USA

Laparoscopic donor nephrectomy (LDN) has been shown to be a safe and effective option for renal procurement. Studies comparing open nephrectomy and hand-assisted LDN have emphasized decreased warm ischemia time (WIT) when compared with "pure" laparoscopic retrieval, however no data exist that define what constitutes a prolonged WIT in terms of recipient graft function. The aim of this paper was to use a large, single institution experience with LDN to determine if WIT correlates with recipient serum creatinine levels. 640 LDN's were performed from 3/96 to 8/01. WIT's were prospectively collected and were defined as the time from renal artery occlusion to immersion in iced saline. Serial recipient creatinine levels were measured at one week, one, three, six and twelve months from the transplant. Data were analyzed using Pearson correlation at a confidence interval of 95%. Mean WIT(seconds) was 151 with a standard error of 3.4 and ranged from 35 to 720. Recipient creatinine (mg/dl) mean at 1 week was 1.94 and ranged from 0.5 to 10.5. Recipient creatinine mean at 1 month was 1.68 and ranged from 0.6 to 8.5. Recipient creatinine mean at 3 months was 1.60 and ranged from 0.6 to 8.8. Recipient creatinine mean at 6 months was 1.63 and ranged from 0.7 to 13.5. Recipient creatinine mean at 12 months was 1.70 and ranged from 0.5 to 14.5. No correlation was found between WIT and recipient creatinine levels at one week($p=0.4737$),one month($p=0.9180$), three months ($p=0.6227$), six months ($p=0.8349$) or twelve months ($p=0.2835$). WIT does not correlate with recipient graft function in LDN within the range of times studied. Shorter warm ischemia time associated with open donor nephrectomy and hand-assisted LDN does not necessarily offer a measurable advantage in recipient graft function. During extraction of the kidney, expediency to minimize WIT should not supersede controlled and safe maneuvers in renal vessel division and extraction of the kidney.

Solid Organ-S128*

IMPACT OF RENAL ANATOMIC VARIATION ON LAPAROSCOPIC DONOR NEPHRECTOMY, John Mecenas, M.D., Michael Edye, M.B.B.S., Devon John, M.D., Christine Ren, M.D., Mary Ann Hopkins, M.D., Thomas Diflo, M.D., Department of Surgery. Mount Sinai-NYU Health. New York University Medical Center. New York, NY.

Aim: To demonstrate how anatomic variation affects selection of donor side and surgical technique in laparoscopic live donor nephrectomy (LDN).

Methods: A prospectively maintained database tabulated operative findings of vascular and ureteral anatomy in 160 consecutive patients that were correlated with findings on preoperative imaging. Imaging methods included conventional angiography, CT, and MR. Reason for kidney selection as well as operative findings were reviewed.

Results: Thirty-one right and 129 left LDNs were performed. Five were converted (3.1%). 72% had normal anatomy at operation. Other operative findings included renal arterial variants in 19% of patients. 11% had polar arteries, 6.9% had double renal arteries, and 0.6% had three right renal arteries (RRA). A left renal artery aneurysm was also found (0.6%). Renal venous anomalies were seen in 8.1%. These included duplicated right renal veins (RRV) in 3.1%. 1.9% had retroaortic left renal veins (LRV) and 1.3% had circumaortic LRVs. Other findings were a small accessory vein on the right, a short RRV, and triple RRVs. Left lumbar veins were present in 88 of 129 patients (68%), 19% of these were multiple or abnormal. 1.9% had duplicate ureters, all noted preoperatively. Preoperative studies did not identify 66% of polar arteries, triple RRAs,or 77% of renal vein anomalies. Right donor selection criteria included favorable renal vein length(13%), multiple left arteries (58%), anomalous LRV (6.5%), RRA stenosis (6.5%), size discrepancy (19%), duplicate ureter (6.5%), other (3.2%). 9.7% of these patients met multiple criteria.

Conclusions: Preoperative imaging gives useful information for donor side selection but is no substitute for careful dissection. In this series, significant vessels were missed in 14% of patients.

Technical considerations include keeping a wide margin during mobilization of the kidney, judicious use of sharp dissection, and anticipation of anatomic variants.

Solid Organ-S129*

LAPAROSCOPIC SPLENECTOMY FOR IDIOPATHIC THROMBOCYTOPENIC PURPURA IN ADULTS Martin Lajous M.D., Lopez-Karpovitch Xavier M.D., Paulina Bezaury M.D., Miguel F. Herrera M.D.

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Introduction. Laparoscopic splenectomy (LS) is becoming the preferred technique for the management of some benign hematologic disorders. Patients with idiopathic thrombocytopenic purpura (ITP) are particularly suitable to be managed by LS. Safety and efficacy of the procedure still need to be proven. This study analyses our long-term results of LS in a consecutive cohort of patients with ITP.

Patients and Methods. From a total of 87 LS performed at our Institution in a 7 year period, 60 patients underwent surgery for ITP. Clinical and surgical characteristics, complications and long term results are analysed.

Results. Mean age of the patients was 38+-16 years; 43 were females and 17 males. The lower edge of the spleen was palpable in 8% of the patients and ultrasound revealed splenomegaly (>12 cm) in 1/40 patients. The mean preoperative platelet nadir was 15+-34 X 1000/mm3. Eighty-two percent of patients received preoperative antipnemococcal vaccination. There were 3 conversions to open surgery (5%). The mean operative time was 169+-63 minutes. Twenty-one percent of the patients presented minor complications and 10% developed major complications (2 incisional hernias, 1 intraabdominal bleeding, 1 bleeding from the trocar site)including a 30-day mortality of 2 patients (1 stroke and 1 abdominal sepsis). Mean postoperative hospital stay was 4.2+-1.8 days. In a mean follow-up of 23+-22 months, complete response (platelet count >150,000/mm3 for at least 2 months) was observed in 59% of the total group. Partial response (platelet count >150,000/mm3 with treatment, or >50,000/mm3 without treatment or relapse after complete response) was documented in 21%. There was no response in 19%. Two of these patients underwent reoperation for an accesory spleen.

Conclusions. The long-term results of LS support its use in the management of patients with ITP.

Solid Organ-S130

LAPAROSCOPIC SPLENECTOMY FOR ITP: LONG-TERM FOLLOW-UP DATA, David E. Pace, M.D., Patrick M. Chiasson, M.D., Christopher M. Schlachta, M.D., Joseph Mamazza, M.D., Eric C. Poulin, M.D.,The Centre for Minimally Invasive Surgery, St. Michael's Hospital, University of Toronto, Toronto, Ontario

The purpose of this study was to determine the remission rate of patients who underwent a laparoscopic splenectomy (LS) for medically refractory idiopathic thrombocytopenic purpura (ITP).

Data was collected from a prospectively collected computer database of 52 patients who underwent a laparoscopic splenectomy for ITP from October 1992 to December 2000. Patients and their referring hematologist were contacted and follow-up information obtained .

Fifty-two patients (27 women and 25 men) underwent a LS for ITP. Median operative time was 160 minutes (70-335) and median blood loss was 100 cc (20-1500). There were 7 cases of intraoperative hemorrhage (13.7%) resulting one conversion. Accessory spleens were found in 17 patients (32.7%). Postoperative complications occurred in 3 patients (5.9%). There were no mortalities. Median length of stay was 2 days (1-12). Follow-up data was obtained in 45 patients (86.5%) with a median follow-up of 51 months. Six patients did not respond to surgery initially and another two patients developed recurrent disease for a remission rate of 82.2%. Nine patients underwent a damaged red blood cell scan. This group included the two patients that recurred. A positive scan was noted in 3 patients (33%), one of which was a patient with recurrent disease. This patient underwent an uneventful laparoscopic accessory splenectomy but continues to require intermittent steroids to maintain platelet counts. The two other patients with a positive scan remain in remission.

Laparoscopic splenectomy for ITP is safe and associated with low morbidity and a short hospital stay. Long-term follow-up reveals that remission rates of ITP following laparoscopic splenectomy are comparable to those published in the open literature.

Solid Organ-S131*

QUANTITATIVE TIME ANALYSIS IN LAPAROSCOPIC SPLENECTOMY, Alicia Fanning MD, Fred Brody MD, Michael Rosen MD, Frank Duperier, MD, Jeffrey Ponsky MD.Department of General Surgery, Minimally Invasive Surgery Center, The Cleveland Clinic Foundation, Cleveland OH

Quantitative time analysis has been proposed as a method to evaluate the efficiency and functionality of advanced laparoscopic techniques. This study analyzes laparoscopic splenectomy (LS) and time spent during each phase of the operation.

Time analysis of 19 patients undergoing LS at the Cleveland Clinic Foundation was evaluated prospectively between May 2000 and August 2001. The operation was divided into 11 steps. Time was recorded and analyzed using a student's t-test for each step.

The mean operative time was 146.8 minutes (range 94-221). Of this, the longest phase of the operation was patient preparation, mean 40 min. The mean time to complete the remaining 10 phases is as follows: port placement 11min, splenic ligament dissection divided into four phases; phrenocolic, posterior, splenocolic, and short gastric, 4.3, 10.6, 6.8, and 12.3 min respectively, hilar control 14.4 min, bagging 11.7 min, extraction 10.5 min, reinsufflation 12.2 min, and closure 12.8 min. When comparing all phases of the operation the patient preparation was the most time consuming ($p < .001$). There was no statistical differences between any of the other phases (p= NS).

To our knowledge, this is the first time quantitative time analysis has been used to study LS. Interestingly, the time consuming aspect of this operation is patient preparation and positioning which is critical to the overall surgical approach. Clearly a learning curve to achieve proficiency in advanced laparoscopy exists. This study shows that once that curve has been achieved, phases of the operation become efficient and routine with very little time variance.

Solid Organ-S132*

FEASIBILITY OF LAPAROSCOPIC ADRENALECTOMY FOR LARGE ADRENAL MASSES Yuri W. Novitsky, M.D., Kent W. Kercher, M.D., Donald R. Czerniach, M.D., Richard A. Perugini, M.D., John J. Kelly, M.D.,Demetrius E.M. Litwin, M.D, Department of Surgery, University of Massachusetts Medical School, Worcester, MA

Background: Laparoscopic adrenalectomy (LA) is a preferred method for the removal of small adrenal masses. However, the role of LA for surgical treatment of large adrenal masses is less established. We evaluated the outcomes of LA for large (>=5cm) adrenal masses.

Patients and Methods: Retrospective review of 27 consecutive patients who underwent LA for large adrenal masses at a University hospital. All LA (14 right and 13 left) were performed via lateral decubitus transperitoneal approach. Average size of the mass was 6.83+-1.5 (range 5-11) cm. Preoperative indications included: pheochromocytoma (8), Conn's adenoma (7), nonfunctioning adenoma (4), cyst/pseudocyst (3), myolipoma (2), cortical hyperplasia (2), and Cushing's syndrome(1). Statistical analysis was performed using a two-sample t-test.

Results: Average operating time was 183+-65 (range 120-375) min, average blood loss was 105.5+-102.7 (range 20-500) ml. The average operative time and blood loss were non-significantly greater in right than in left LA groups (166.3 vs 203.5 min, p=0.89 and 76.7 vs 123.8 ml, p=0.14, respectively). Average NPO time was 0.7 (range 0-4) days and average time of return to a regular diet was 1.74+-0.9 (range 1-5) days. Average length of stay was 2.6+-1.8 (range 1-10) days. One patient had transient episode of pseudomembranous colitis. There were no conversions to open adrenalectomy and no major morbidities.

Conclusion: LA is safe and effective for surgical treatment of large adrenal masses. Both right and left large adrenal masses can be approached laparoscopically with equal success.

Adv. Foregut Surgery-S133*

Symptomatic Outcomes of Laparoscopic Antireflux Surgery (LARS) in Patients Eligible for Endoluminal Therapies (ET). Ketan M. Desai, M.D., Mary E. Klingensmith, M.D., Emily Winslow, M.D., Peggy Frisella, R.N., Nathaniel J. Soper, M.D., Department of Surgery, Washington University School of Medicine, St. Louis, MO.

Objective: Patients with less severe manifestations of gastroesophageal reflux disease (GERD) are being considered as candidates for ET, in part due to a concern that their outcomes following LARS may not be as favorable as those with more severe disease. This study compared clinical outcomes following LARS in GERD patients eligible for ET to those who would be excluded from ET.

Methods: From 1995 to present, 459 patients who underwent LARS were analyzed prospectively with clinical follow-up of > 6 months. Of these, 117 (25%) without preoperative dysphagia, strictures, esophagitis > grade 2, or a hiatal hernia > 2 cm were considered potential candidates for ET **(Group 1)**. By these criteria, 342 patients (75%) were not eligible for ET **(Group 2)**. Mean follow up for Group 1 and 2 were 29(± 21) and 26(±17) months, respectively. The presence or absence of gastrointestinal symptoms and acid -reduction medication use were assessed.

Results: Except for dysphagia, there were no differences in perioperative variables. While LARS significantly reduced medication use and GERD symptoms in both groups, there were no differences between Group 1 and 2 postoperatively, and satisfaction was ≥90% in both groups.

	Group 1		Group 2	
	Preop	Postop	Preop	Postop
Med Use	96%*	16%	97%*	14%
Heartburn	91%*	15%	96%*	9%
Dysphagia	0%*	13%	66%*†	17%

*P<0.001 vs. postop; †P<0.001 vs. Group 1

Conclusion: LARS is an effective treatment option in patients with GERD whether or not they are candidates for ET. Patients who are candidates for ET demonstrate an equally favorable response following LARS compared to those excluded from ET. ET is a novel approach in the management of GERD, but LARS remains a successful, durable option for those with significant GERD.

Adv. Foregut Surgery-S134

A PREVIOUS ENDOSCOPIC TREATMENT (WITH PNEUMATIC DILATIONS OR BOTULINUM TOXIN INJECTIONS) DOES NOT AFFECT THE OUTCOME OF LAPAROSCOPIC HELLER-DOR OPERATION FOR ESOPHAGEAL ACHALASIA. Mario Costantini,MD, Giovanni Zaninotto, MD, Giuseppe Portale, MD, Daniela Molena, MD, Michela Costantino, PhD, Loredana Nicoletti, BS, Christian Rizzetto, BS, Ermanno Ancona, MD. University of Padua, Department of Medical and Surgical Sciences (Clinica Chirurgica IV), Padua, Italy.

Laparoscopic Heller myotomy is the treatment of choice in esophageal achalasia (EA). However, some patients are referred for surgery only after an unsuccessful endoscopic treatment with dilations (D) or Botox injections (Bo), when the operation may be more difficult and the risk of mucosal perforation higher. In this study we evaluated the effects of a previous endoscopic treatment on the outcome of laparoscopic myotomy. From 1992 to June 2001, 150 patients underwent Heller-Dor operation for EA: they were 85 male, 65 female; their median age was 42 years (range 11-80). The majority of our patients (124) underwent surgery without any previous treatment (Group A), 15 had had one to 8 D (Group B) and 11 had Bo treatment (alone in 7, associated to D in 4)(Group C). No differences in the intraoperative mucosal lesions were detected among the 3 groups (6/124 mucosal lesions in group A, 0/15 in group B and 1/11 in group C, p=n.s.) nor in the median duration of the operation (152 +-37 min, 150 +- 32 min, 130 +- 13 min for group A, B & C, respectively, p= n.s.), even if a subjective impression of a more difficult operation was experienced by all the surgeons in patients of group B and C. None of the patients was lost to follow up. At a 26 month median follow up, a similar percentage of good results (absent or mild dysphagia) was detected in the 3 groups: 89.7%, 92.8%, 81% for group A, B & C, respectively, p=n.s. Twelve patients of group A, 1 of group B and 2 of group C eventually required 2 to 4 complimentary pneumatic dilations to solve residual dysphagia. One group A and 1 group B patient needed reoperation. One group A patient refused further treatment. In conclusion, a previous endoscopic treatment with D or Bo does not increase the intraoperative complications nor affect the clinical outcome of laparoscopic Heller-Dor operation, which represents the treatment of choice in EA, also after ineffective endoscopic treatment.

Adv. Foregut Surgery-S135

ESOPHAGEAL CANCER : LAPAROSCOPIC STAGING TO IMPROVE OPTIMAL TREATMENT GIANDOMENICO MISCUSI M.D.; ENRICO RUGGERI M.D.; MAURIZIO ONORATO M.D.; JESSICA MONTORI M.D.; LUIGI MASONI M.D. 3rd Dept. of Surgery - La Sapienza University of Rome - ITALY

BACKGROUND: In the last years it has been witnessed a change in the prevalence and in the istologic pattern of esophageal cancer. The aim of this study was to evaluate the stage distribution, the clinic presentation and the management algorithms for this disease by using surgical laparoscopy.

STUDY DESIGN: Forty-four patients with esophageal cancer consecutively accessed from '95 to 2000 where evaluated for diagnostic tests, laparoscopic study and treatment modalities.

RESULTS: The diagnostic yield of Laparoscopy was 23.3 %, compared to preliminary US-CT studies; in fact 10 pts had been understaged by imaging diagnostic techniques: 4 stage I pts were stage III, 2 stage I pts were stage IV and 4 stage II pts were stage IV. The impact upon the treatment modalities for these 10 patiens is evident. The diagnostic sensitivity and specificity of the Laparoscopy was respectively 45% and 97% in the pts undergoing surgery, while it reached 97% and 100%,respectively, on autopsy studies of the non-operated group (40%). No complications were observed following Laparoscopy.

CONCLUSION: Laparoscopy should be performed in patients with esophageal cancer who are candidates for resective surgery. Intra-abdominal metastases and advanced stage of disease can be missed in some cases by current imaging tools, in order to avoid unnecessary surgery.

Adv. Foregut Surgery-S137

LAPAROSCOPIC REPAIR OF PERFORATED PEPTIC ULCER W.T. SIU, C.H. CHAU, C.N.TANG, M.K.W. LI, Department of Surgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong, China

Aim: This study prospectively evaluates the results of laparoscopic repair for perforated peptic ulcers (PPU) in our institution.

Patients & method: From Jan 1994 to April 2001, 180 patients diagnosed clinically with PPU were treated by laparoscopic suture repair. The initial 63 patients were recruited for a randomised controlled trial comparing open versus laparoscopic omental patch repair. After the trial, all patients with PPU were treated laparoscopically. We excluded patients with history of upper abdominal surgery, concomitant evidence of ulcer bleeding or gastric outlet obstruction. Patients with clinically sealed off perforation were treated conservatively. Laparoscopic procedure would be converted for non-juxtapyloric gastric ulcers or for perforations larger than 10mm.

Results: There were 148 male and 32 female patients treated, aged 16 to 85 year (mean=54.6). 142 patients had perforated duodenal ulcers, 27 prepyloric and 11 gastric ulcers. There were 28 conversions (15.6%) for perforated non-juxtapyloric gastric ulcers (9), large perforations (12), bleeding (1) and un-identifiable perforations (3), poor exposure (3). Average operating time was 46.3 minutes (10-150). Post-operatively, the average analgesic requirement (by intramuscular pethidine) was 1 dose.

Morbidity & mortality: There were 3 leakages from repaired site required re-operation. One patient developed duodenal ulcer bleeding after operation. One patient with conversion complicated by port site herniation. Four ASA IV patients died in the post-operative period.

Conclusion: Laparoscopic repair of perforated peptic ulcer is safe, not painful and associated with acceptable morbidity and mortality.

Adv. Foregut Surgery-S138

SHORT-TERM RESULT OF LAPAROSCOPIC DISATL GASTRECTOMY (LDG) FOR EARLY GASTRIC CANCER Kawai J.M.D., Fujiwara M.M.D., Kasai Y.M.D., Nakao A.M.D., SurgeryII, School of Medicine, Nagoya University, Nagoya, Japan

Background: Endoscopic mucosal resection (EMR) and laparoscopic wedge resection offers fine comfortableness after treatment of early gastric cancer (EGC), but, has no certainty about curability for the cases with fear of lymph nodes involvement. Recently laparoscopic distal gastrectomy(LDG) with lymphadenectomy has been done for the EGCs in L,M region with potential lymph nodes involvement . We expect LDG has both certain curability and minimal invasiveness.

Aim: To assess the safety, curability, and minimal invasiveness ,surgical outcome and histological findings of LDG cases are analyzed compared with those of open conventional operation(ODG).

Cases and method: We have performed 90 LDG with lymphadenectomy (D1- D2, according to the size and depth) for clinical mucosal or submucosal (cT1) cancer between 1997 and Sep.2001. We analyzed histological curability and clinical outcome of 90 patients who have undergone LDG in comparison with those of 58 cases of EGCs who received conventional open distal gastrectomy(ODG) at Nagoya University Hospital between 1994 and 1998.

Result: There were no significant differences in mean blood loss , mobidity rate, post-operative febrile days, and max of CRP. Less analgesic , however , were required in LDG cases and passing flatus and ambulation in LDG were faster than in ODG cases. Histologic reports revealed all cases were curative operations (fCurA) and there is no recurrence in LDG cases (mean follow-up time: 20months, range 0-50months) as well as ODG cases.

Conclusion :LDG is less invasive than ODG from the viewpoints of faster recovery ,nevertheless it is equivalent to ODG in terms of safety and curability,. LDG has both certain curability and minimal invasiveness for the treatment of EGC in L,M region.

Thoracoscopy-S139

IS VIDEO-ASSISTED THORACIC SURGERY JUSTIFIED AT CLINICAL STAGE I LUNG CANCER? Yoshifumi Sano, M.D., Akio Ando, M.D., Itaru Nagahiro, M.D., Motoi Aoe, M.D., Kazunori Okabe, M.D., Hiroshi Date, M.D., Nobuyoshi Shimizu, M.D., Department of Surgery II, Okayama University Medical School, Okayama, JAPAN

OBJECTIVE: The role of video-assisted thoracic surgery (VATS) in the treatment of benign pulmonary diseases is generally accepted today, however, the indication for malignant pulmonary diseases is still contravertial. This study intends to evaluate whether VATS is justified at clinical Stage I lung cancer or not.

PATIENTS AND METHODS: This study includes 124 patients of clinical Stage I lung cancer operated with VATS lobectomy from January 1995 to August 2001 in our institution. We performed VATS lobectomy with ND2a lymph nodal dissection in 121 patients (97.6%), and with ND1 in 3 patients (2.4%). Postoperative pathological examination revealed that 112 patients (90.3%) were pathological Stage IA, three (2.4%) in Stage IB, one (0.9%) in Stage IIA, and eight (6.4%) in Stage IIIA. Parameters analyzed were as follows: (1) time required for operation; (2) amount of intraoperative bleeding; (3) time required for pleural drainage; (4) complications; (5) survival rates; (6) recurrences.

RESULTS: Average time for operation was 213.7 minutes. Average volume of intraoperative bleeding was 210.1 ml. Average time for pleural drainage was 4.8 days after operation. We experienced 10 cases (8.1%) of intraoperative and 12 cases (9.7%) of postoperative complications. We lost one patient with hemorrhagic cerebral infarction after pulmonary embolism. We achieved a 5-year survival rate of 97.3%. Recurrences occurred in 6 patients (4.8%).

CONCLUSIONS: We believe that VATS lobectomy for clinical Stage I patients is a safe and effective approach with exellent long-term results.

Thoracoscopy-S140*

VIDEO ASSISTED THORACIC SURGERY (VATS) IN OCTOGENARIANS

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Thoracic surgery is associated with a high morbidity and mortality rate in the elderly patient population. Appropriate management of thoracic diseases is often avoided because of the inherent risks associated with the access thoracotomy. The purpose of this study is to evaluate the perioperative outcomes of octogenarians who underwent VATS for a variety of thoracic conditions.

A retrospective chart review was done on all patients who were between 80 and 90 years of age and underwent elective VATS between Jan. 1995 and Aug. 2001.

One hundred and sixty two (162) consecutive VATS procedures were performed in one hundred and fifty seven (157) patients. Co-morbid conditions consistent with their advanced age included chronic obstructive pulmonary disease, hypertension, coronary artery disease, and diabetes. The VATS procedures included 96 lung resections (53 lobectomies, and 42 wedge/segment resections), 46 pleurectomies, 8 decortications, 8 mediastinal biopsies, 3 pericardial windows, and 1drainage of hemothorax. The pathology included 76 primary lung cancers, 35 metastatic diseases, 37 benign conditions, 9 mesotheliomas, and 3 carcinoid tumors. The average operative time and length of hospital stay after surgery was 51 minutes and 2.6 days respectively. There were 3(1.9%) mortalities, two from cardiac complications, and one from pneumonia. 2(1.2%) patients required re-exploration for bleeding. 4(2.5%) cases were converted to open thoracotomy. 13(8.0%) cases had an air leak of which 11 were managed as an outpatient with a Heimlich valve. They were discharged from the hospital on average of 3.3 days post-operatively.

With VATS, surgical therapy can be offered to octogenarians with a low morbidity and mortality rate, as well as a short hospital stay.

Thoracoscopy-S142*

EFFICACY AND SAFETY OF THORACOSCOPIC SYMPATHICOTOMY FOR HYPERHIDROSIS OF THE UPPER LIMB: EXPERIENCE AFTER 734 PROCEDURES Christoph Neumayer, M.D., Georg Bischof, M.D., Reinhold Függer, M.D., Martin Imhof, M.D., Raimund Jakesz, M.D., Eugen Plas, M.D., Friedrich Herbst, M.D., Johannes Zacherl, M.D.Department of General Surgery, University Clinic of Surgery, Vienna General Hospital, Vienna, Austria

Severe hyperhidrosis is the main indication for thoracoscopic sympathicotomy (TS). This study was undertaken to assess the role of video-assistance in TS (VATS) versus conventional TS (CTS) for primary hyperhidrosis of the upper limb. The safety, side-effects and the long-term outcome after Kux`s procedure was investigated retrospectively.

In 406 patients 734 procedures were performed from below T1 to T4. In the CTS and the VATS group 558 and 176 procedures were performed, respectively. After a median observation period of 16 years long-term follow-up was completed in 82% of all patients by a questionnaire and/or clinical examination. Statistical significance of differences between the groups was tested by C2-test.

Immediately after operation dry limbs were achieved in 92% of the CTS and 97% of the VATS group (p=0.98). One patient underwent conversion due to bleeding in the CTS group. Horner`s syndrome occurred in 2.2% and rhinitis in 9.9% of procedures. In contrast, in the VATS group no patient experienced Horner`s syndrome (p=0.025). 3 patients developed rhinitis (p=0.11). Compensatory sweating was observed in 67.6% in the CTS group versus 55.6% in the VATS group (p=0.051), and gustatory sweating was observed in 50.4% and 33.3%, respectively (p=0.01). There was no significant difference concerning failures or recurrences between the two groups. Finally, 6.5% (CTS) and 5.5% (VATS) of patients regret the operation (p=0.7).

A significant decrease of the incidence of Horner`s syndrome and gustatory sweating was observed when TS was guided by video-imaging. Furthermore, compensatory sweating was markedly reduced in video-assisted thoracoscopic sympathicotomy.

Thoracoscopy-S143

SONOGRAPHIC EVALUATION FOR PERIPHERAL PULMONARY NODULES DURING VIDEO-ASSISTED THORACOSCOPIC SURGERY

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Objective: The value of sonographic guidance during video-assisted thoracoscopic surgery (VATS) was studied in 26 patients with peripheral pulmonary nodules. Intratumoral blood flow was also evaluated by using Color Doppler method following classification of tumor's location in each case.

Subjects and methods: Between June 2000 and March 2001, 26 patients underwent VATS at our institution. Our study group included 15 women and 11 men who were 47-79 years old. There were primary lung cancer (n=15), pulmonary metastasis (n=6), and various benign tumor(n=5). The tumors ranged from 8 to 40 mm in size with a mean of 19.5 +- 8.5 mm. The Diagnostic Ultrasound System SSD-1700 (ALOKA instruments, Japan) with a dedicated 7.5 Mhz flexible endosonographic probe were used in this study.

Results: Sonographic guidance visualized peripheral intrapulmonary tumors easily in 21 (81%) out of the 26 patients. In the remaining 5 patients it was failed to visualize because of retained air in the collapsed lung that have severe emphysema in 1 case and lesion in too deep portion from the lung surface in 4 cases, respectively. In the 21 cases with successful sonographic guidance, rich intratumoral blood flow signal was identified in 8 out of 15 primary lung cancers by using Color Doppler method. The peak velocity was 26+-12.8 cm/s in primary lung cancer and 9.4+-1.7 cm/s in pulmonary metastasis, respectively. Significant difference was appreciated between them. ($p < 0.01$)

Conclusion: Sonographic guidance during VATS helped to locate lesions and determine the extent of the surgical resection. Color Doppler method was also useful to evaluate intratumoral blood flow which differentiated primary lung cancer from metastatic tumor or benign tumor.

Thoracoscopy-S144

Evaluation of the Thoracoscopic Esophagectomy for Advanced Thoracic Esophageal Cancer on the Basis of Survival Masashi TAKEMURA M.D., Harushi OSUGIM.D., Nobuyasu TAKADAM.D., Hiroaki KINOSHITA M.D., Department of Gastroenterological Surgery, Osaka City University Graduate School of Medicine

We compared the survival of the patients with advanced esophageal cancer after thoracoscopic esophagectomy with that of conventional one (through right thoracotomy) to define whether curability of thoracoscopic surgery for the cancer invaded into the muscular layer or deeper.

[Subjects and methods] 192 patients with esophageal cancer invading into the muscular layer or deeper were subjected. 36 patients who had thoracoscopic esophagectomy from July 1995 to May 2000 were classified into T group and the other 132 who had conventional one from 1986 to June 1995 were into C group. The clinicopathological factors, surgical stresses, postoperative complications and the survival after surgery were compared between these two groups.

[Results] No significant difference was observed in age, gender, location of the tumor, and there was also no significant difference in the depth of tumor invasion, degree of lymph node metastasis. There was also no significant difference in the average number of total dissected lymph node between 2 groups (66±22 in T group, 61±26 in C group). On the other hand, duration of thoracic procedure of T group was significantly longer than that of C group, while there was no significant difference in the duration of total procedure between 2 groups. ?The amount of blood loss was significantly less in T group. The rate of postoperative complications was not significantly different. 11 cases in T group and 66 cases in C group had recurrent disease. There was no significant difference in survival rate at 4 years after surgery between 2 groups. The survival rate in the patients with lymph node metastasis was not significantly different between 2 groups.

[Conclusion] The thoracoscopic esophagectomy is as equally curative as conventional open surgery for advanced thoracic esophageal cancer.

Colon Resection-s148

LAPAROSCOPIC VS OPEN COLONIC RESECTION FOR CANCER: LONG TERM RESULTS ON 266 UNSELECTED PATIENTS Feliciotti F., M.D.,[1] Guerrieri M., M.D.,[1] Paganini A.M., M.D., FACS,[1] De Sanctis A., M.D.,[1] Campagnacci R., M.D.,[1] Lezoche E., M.D., FACS [2]. [1] Department of General Surgery, University of Ancona, "Umberto I" Hospital, Ancona, Italy [2] Department of Surgery "Paride Stefanini", II Clinica Chirurgica, University "La Sapienza", Rome, Italy

Aims of this clinical study were to compare perioperative results and long-term outcome in unselected patients (pts) undergoing either laparoscopic or open hemicolectomy for colonic cancer. Between 1992 and 2000, 156 pts with colonic cancer underwent laparoscopic colonic resection (LR) whereas 110 were treated by open surgery (OR), by the same surgical team following the same type of surgical technique for right and left hemicolectomy, excluding segmental resections. The treatment modality was selected by the pts after reading the informed consent form. Statistical significance (p) for morbidity and mortality rates, local recurrence rates and incidence of distant metastases was assessed by Chi Square test between the two groups (laparoscopic and open). The survival probability analysis was performed in both groups by means of the Kaplan-Meier method. Significant differences in survival probability between strata were assessed by the log-rank test. A level of 5% was used as the criterion for statistical significance.

LR was technically feasible in 96.2% of cases. No statistically significant difference (ns) was observed in the major complications' rate (5.3% after LR and 4.5% after OR) (p– 0.692) and in perioperative mortality (2% after LR and 1.8% after OR) (p=0.798). Mean follow-up was 44.6 months (range 1-9 years) during which time we observed 2 cases of abdominal wall metastases in the laparoscopic group (0.9%) in pts with advanced disease. The local recurrence rate was lower after LR as compared to OR: 4.1% vs 8.1% (p=0.560), respectively (ns). Distant site metastases occurred in 8.2% after LR and 9.3% after OR (p=0.936) (ns). At 60 months of follow-up cumulative survival probability in LR completed malignant cases was 0.897 as compared to 0.861 after OR (p=0.763) (ns). Eighty-five pts in the laparoscopic group (87.6%) and 71 in the open group (82.5%) are disease free. Based on our data, a better trend in terms of survival rate is detected in the laparoscopic group. The main limit of the preliminary long term oncological outcomes is the low number of patients enrolled. In order to be able to draw conclusive scientific statements, we should wait the completion of the ongoing international randomized controlled trials.

Hernia Repair-s151

A COST UTILITY ANALYSIS OF TREATMENT OPTIONS FOR INGUINAL HERNIA IN 1,513,008 ADULT PATIENTS Nicholas Stylopoulos MD, David Rattner MD, Department of Surgery, Massachusetts General Hospital, Boston, MA

Objective

Few studies have addressed the long term costs and outcomes of laparoscopic and open herniorraphy. The aim of this study was to assess both the short term and lifetime clinical, economic and quality of life outcomes for different treatments of adult inguinal hernias.

Material and Methods

The study group consisted of 1,513,008 hernia repairs derived from the NSAS, NHDS (National Center of Health Statistics), HCUP NIS (Agency of Health Care Research and Quality) databases. Additionally, 51 randomized controlled trials were analyzed. Projection of the clinical, economic and quality of life outcomes expected from the different treatment options was done by using a Markov Monte Carlo decision model. Two logistic regression models were then used to predict the probabilities of hospital admission after an ambulatory procedure and death after hernia repair. Four treatment strategies were modeled: 1) LR (Laparoscopic Repair), 2) OM (Open Mesh), 3) ONM (Open Non Mesh), 4) EM (Expectant Management). Costs were expressed in US dollars; effectiveness in quality adjusted life years (QALYs). The main outcome measure was the incremental cost effectiveness ratio.

Results

While the cost of the initial laparoscopic procedure was higher than open repairs (mainly due to facility ($2300 vs $1234) and anesthesia ($233 vs $182) costs), the projected lifetime costs of LR were lower (mean $7124 vs $9150). In the base case analysis EM was both the least effective (11.08 QALYs) and the least costly strategy ($4300). Compared to EM the incremental cost per QALY gained was $605 (cost $7124, effectiveness 15.75 QALYs) for LR, $697 ($7480, 15.64 QALYs) for OM, and $1711 ($10820, 14.89 QALYs) for ONM. In sensitivity analysis cost effectiveness was influenced only by the recurrence rate.

Hernia Repair-s152

POLYESTER MESH FOR TOTAL EXTRAPERITONEAL (TEP) LAPAROSCOPIC HERNIA REPAIR: INITIAL EXPERIENCE IN THE UNITED STATES, Bruce Ramshaw MD, Firass Abiad MD, Guy Voeller MD, Russell Wilson MD, Edward Mason MD, Atlanta Medical Center, Department of Surgery, Atlanta, Georgia, University of Tennessee at Memphis, Department of Surgery, Memphis, Tennessee

Polypropylene mesh has been the most commonly used mesh for open and laparoscopic inguinal hernia repair in the United States (US). A variety of polyester mesh products have recently become available. This is the first US multi-institutional study to evaluate the initial experience using polyester mesh for total extraperitoneal (TEP) laparoscopic inguinal hernia repair.

Between January 2000 and June 2001, three hundred and thirty-seven patients underwent 495 TEP laparoscopic inguinal hernia repairs using polyester mesh. There were 309 males and 28 females with an average age of 45 years(range 17- 80). The average operative time for each patient was 54.3 minutes (range 18- 157 minutes). There were no conversions to open repair and no mortality. Complications included 12 seromas/hematomas (six aspirated), three patients with chronic pain, two patients with urinary retention and one incidence of each of the following: epididimitis, prostatitis, hydrocele, port site cellulitis, and a patient who had CO2 in the foley bag at the end of the surgery but a normal cystogram (no identified bladder injury). There has been one recurrence (0.2%). It occured at four months post-op and was repaired with a trans-abdominal laparoscopic approach. The mean time of follow-up is 11 months (range 2- 20 months). There have been no documented infections of the mesh and no mesh has been removed.

This study documents a favorable initial experience with polyester mesh for TEP laparoscopic inguinal hernia repair. There were no complications related to the mesh. There may be technical and long-term advantages to using polyester mesh for laparoscopic inguinal inguinal hernia repair. Longer follow-up and additional studies are warrented to evaluate these potential advantages.

Hernia Repair-s153

TOTALLY EXTRAPERITONEAL ENDOSCOPIC REPAIR OF RECURRENT INGUINAL HERNIA - RESULTS FROM THE CONSECUTIVE PATIENTS OF TWO YEARS H.Scheuerlein M.D., A.Schiller, C.Schneider M.D., F.Koeckerling, M.D., Department of Surgery and Minimal Invasive Therapy, Hanover Hospital, Germany

The recurrence rate in conventional repair of recurrent inguinal henia ranges from 2.9 to 36.8 %. So nowadays the best method of repair is still on debate. Since the beginning of endoscopic hernia repair in 1991 the experience in endoscopic therapy widely increased. Synchronously the using of meshes in hernia repair was accepted more and more.

Starting with endoscopic extraperitoneal hernia repair in 1994, till now we performed endoscopic extraperitoneal hernia repair in more than 4.500 cases. To specify our own results we prospectively investigated the three-year-follow-up of 1329 patients operated on in the years 1997 and 1998. 177 of these patients had hernia recurrences and were operated on in the total extraperitoneal mesh repair technique (163 males, 14 females). 96 patients had recurrent hernias on the right or left side, 32 had bilateral recidives and 49 had recidives on the left or right side and a primarily contralateral hernia. Alltogether 258 hernias were found in this group, 209 of which were recidives (85 lateral, 65 medial, 5 femoral and 103 combined hernias). Long-term follow-up was performed by questionnaire and examination. Median follow-up time was 28 months and documentation was complete in 149 patients (84.2%). Our intraoperative complication rate was 2.3% (bleeding, bladder injury etc.), the postoperative complication rate 3.9% (hematoma etc.). The re-recidive-rate in the patient-group with recidive hernias was 0%; there was 1 hernia recurrence in a patient with a primarily contralateral hernia.

The total extraperitoneal endoscopic recidive hernia repair produces very low re-recurrence-rates. The method is safe and effective with acceptable intraoperative and postoperative complication rates. In our opinion it is the method of choice in the experienced hand.

Hernia Repair-s154*

LONG-TERM RESULTS OF LAPAROSCOPIC RECURRENT INGUINAL HERNIA REPAIR Andrey Keidar, MD, Shridhor Kanitkar MD, and Amir Szold, MD. Endoscopic Surgery Service and the Department of Surgery B, Tel-Aviv Sourasky Medical center, Tel Aviv, Israel.

Background and objective: laparoscopic repair of recurrent inguinal hernia is becoming a popular alternative because it combines the potential low recurrence rate of open preperitoneal repair with fast recovery. The true long-term recurrence of this method is still a matter of debate.

Methods: All patients undergoing a laparoscopic recurrent inguinal hernia were registered in a database with all preoperative and postoperative data. Patients were interviewed by phone at least 6 months following surgery and examined by one surgeon. A special effort was made to examine patients with a recurrent groin lump or persistent pain.

Results: Between April 1995 and November 2000, 150 laparoscopic repairs of recurrent inguinal hernia were performed in 130 patients. In most (115) patients a TAPP repair was used. One third of the hernias presented after two or more previous repairs. The average age of the patients was 55.

Average operative time for unilateral repair was 56 minutes, and for bilateral repair 68 minutes. Conversion to open procedure was required in one patient (0.77% per patient). There were three intraoperative complications, all identified and repaired laparoscopically. Minor postoperative complications occurred in 24 patients (18.5%), seroma being the most common, encountered in 19 (14%). There were no bowel or major vessel injuries. The average postoperative stay was 1.3 (0.5-13) days.

Average follow-up was 37 (7 -75) months. 123 (94.6%) patients were available for interview. Regular daily activity (including physical) was resumed by 10.7 days (1- 90). Strenuous physical activity was resumed at 24.5 days (1-90). 106 patients with 122 (81.3%) hernias were examined. There were seven (5.7%) recurrent hernias.

Conclusion: laparoscopic repair of recurrent inguinal hernia is effective and has superior long-term results compared to historical series. If cost could be reduced it should probably become the method of choice for the repair of recurrent inguinal hernia.

Hernia Repair-s155

LAPAROSCOPIC HERNIORRHAPHY IN CHILDREN, Clark M. Gorsler, Felix Schier; Departments of Pediatric Surgery, University Medical Centers Jena and Lübeck, Germany

Departments of Pediatric Surgery, University Medical Centers Jena and Lübeck, Germany

We report the clinical experience with 224 inguinal hernias in children, treated with a purely laparoscopic approach using 2-mm instruments without the use of a groin incision.

A total of 224 children (aged three weeks to 13 years) underwent surgery. A 5-mm laparoscope was inserted through the umbilicus, and two 2-mm needle holders were inserted through the inferolateral abdominal wall. The open inner inguinal rings were closed by placing Z-sutures of monofilamentous nonabsorbable material.

The mean operating time was 14 minutes for unilateral hernias, and 21 minutes for bilateral hernias. 3.6% were direct hernias. Hydroceles occurred in 0.6% of patients, testicular atrophy was noted in one patient, and no hernia was found in 1.8% of patients. In girls with inguinal hernias, contralateral asymptomatic patent processus vaginalis (PPV) were found in 32%, no matter whether the hernia was on the or on the left side. In boys with inguinal hernias, contralateral PPVs were found on the right side in 15% and on the left side in 12%. There were no complications. A conversion was necessary in one patient because of dilated bowel. The mean follow-up period was 23 months. There were 3.1% hernia recurrences.

The recurrence rate was slightly higher than with the open technique. Laparoscopic herniorrhaphy allows identification of the type of defect and its correction. The incidence of direct inguinal hernias is higher than previously reported. This technique is safe, reproducible, and technically easy for experienced laparoscopists. Bilaterality is of no concern. The cosmesis is superb. In recurrences, this procedure is preferable to the open technique.

Hernia Repair-s156*

RECURRENCE AFTER LAPAROSCOPIC VENTRAL HERNIA REPAIR, A 5 YEAR EXPERIENCE. Michael Rosen MD, Fred Brody MD, Jeffrey Ponsky MD, R. Matthew Walsh MD, Steven Rosenblatt MD, Frank Duperier MD, Alicia Fanning MD, Allan Siperstein MD., Department of General Surgery, Minimally Invasive Surgery Center, Cleveland Clinic Foundation, Cleveland, OH

While early results of laparoscopic ventral hernia repair document a low recurrence rate, little long term data exists. This study reviews a single institution's experience with laparoscopic ventral hernia repair (LVHR).

A retrospective analysis of all LVHR performed at the Cleveland Clinic Foundation from January 1996 to March 2001 was performed. Recurrence rates were determined by physical exam or phone call follow up. Factors predictive of recurrence were determined using ANOVA.

Of 100 ventral hernias completed laparoscopically, 92 were available for long term follow up averaging 30 months (range 4-65). There were no deaths and major morbidity occurred in 7 patients. Recurrences were identified in 17 patients. Nine recurrences occurred in the first postoperative year, however, hernia recurrence continued throughout the period of follow up. On multivariant analysis, a prior failed hernia repair was associated with a more likely chance of another recurrence (65% vs 34%, Odds Ratio 3.6; p=. 05) and a higher mean EBL (106 cc vs 51 cc, OR 1.03; p=0.005) predicted recurrence. Other variables including BMI (32 vs 31 kg/m2, p=0.51), defect size (115 cm2 vs 91 cm2; p=0.22), size of mesh (468 cm2 vs 334 cm2, p=.06), type of mesh, and mesh fixation did not predict recurrence. An additional 14 cases required conversion to an open operation and 7 (50%) of these cases had recurrence on long term follow up.

Although LVHR remains the preferred method of hernia repair with minimal morbidity and faster recovery, this study documents a higher recurrence rate than many other short term series. This underscores the importance of long-term follow up in assessing hernia surgery outcome.

Hernia Repair-s157*

A PROSPECTIVE STUDY OF COMPLICATION RATES AFTER LAPAROSCOPIC AND OPEN VENTRAL HERNIA REPAIR James M. McGreevy M.D., Philip Goodney M.D., William S. Laycock M.D., Samuel R.G. Finlayson M.D., John D. Birkmeyer M.D. Dartmouth Hitchcock Medical Center

Introduction: Although ventral hernia repair is increasingly performed laparoscopically, complication rates with this procedure are not well characterized. For this reason, we performed a prospective study comparing early outcomes after laparoscopic and open ventral hernia repair. Methods and Procedures: We identified all patients undergoing ventral hernia repair at a single tertiary care center between August 1, 1999 and July 1, 2001 (overall n=257). To increase the homogeneity, we excluded umbilical hernia repairs, non-elective procedures, procedures not involving mesh, and repairs performed concurrently with another surgical procedure. Postoperative complications (in-hospital or within 30-days) were assessed prospectively according to standardized definitions by trained nurse clinicians. Results: 136 patients met the study criteria, 68 (50%) underwent open repair and 68 (50%) received laparoscopic repair (including 3 conversions to open). Patients in the laparoscopic group were more likely to have undergone a prior (failed) ventral hernia repair (40% versus 21%, p=0.01), but other patient characteristics were similar. Overall, patients undergoing laparoscopic repair had fewer postoperative complications (4% versus 15% with open, p=0.04). Of the 3 complications in the laparoscopic group, 1 was minor (ileus) and two were major (enterotomy, infected mesh). Of the 10 complications in the open group, 9 were minor (wound infection, ileus) and one major (dehiscence). The laparoscopic group had longer OR times (2.8 hrs versus 2.3 hrs with open, p<0.001), but shorter average hospital stays (1.2 versus 1.8 days with open, p<0.001). Conclusion: Although more likely to have undergone prior ventral hernia repair, patients undergoing laparoscopic repair had fewer postoperative complications than those receiving open repair. Long-term studies assessing hernia recurrence rates will be required to help determine the optimal approach to ventral hernia repair.

Hernia Repair-s158

OUR EXPERIENCE WITH LAPAROSCOPIC VENTRAL HERNIA REPAIR WITHOUT SUTURES: DOUBLE CROWN TECHNIQUE S Morales-Conde MD PhD, M Martín MD, I Cadet MD, J Bellido MD, JD Tutosaus MD PhD, M Bustos MD PhD, J Martín MD, A Cano MD, S Morales-Méndez MD PhD University Hospital Virgen Macarena and University Hospital Virgen del Rocío. Department of Surgery. University of Sevilla. Spain

Introduction: The laparoscopic approach for ventral hernias is performed by placing a mesh intraperitoneally. It is been described the need of using sutures to fix the mesh to avoid recurrences. We have developed our Double Crown technique for laparoscopic ventral hernias repair with similar results, avoiding the need of those sutures.

Patients and Method: Since november of 1998 78 ventral hernias have been repaired using the Double Crown technique. Medium age of the serie was 58.43 years. Medium size of the defect was 126.2 cm2, 63 in the middle line and 15 in a lateral position. All cases were repaired using patches of PTFE-e (Dual-Mesh plus with holes). Pneumoperitoneum was created using Veress needle, and three trocars placed in the left hemiabdomen. Once the real size of the defect is measured, the mesh should be a minimum of 3 cm larger than the defect. The initial fixation is performed with tacks by placing the firsts ones in the cardinal points. The outside crown is performed with tacks placed at 1 cm interval, right at the edge of the patch. A second inside crown is then placed right at the edge of the defect.

Results: Only one case (1.28%) was converted to open surgery due to dense adhesions. We had two bowel perforation (2.56%), one repaired by laparoscopy and the other one by an assisted minilaparotomy. Our serie shows 9 postoperative complications (11.5%): 2 postoperative ileus, 1 hematoma, 3 seromas that needed to be drainaged and 3 reoperation, one due to mesh intolerance, one to a missed bowel perforation and one due to an small bowel isquemia. The hospital stay of the serie was 47.3 hours, (27.7 hours in the last 33 cases). With a medium follow-up of 20 month our series shows only one recurrence (1.28%).

Conclusions: Double Crown technique for laparoscopic ventral hernia repair is a safe and a reasonable alternative to the technique using sutures, with similar recurrences rate and with some advantages over this technique, such us less pain, less wounds and less operative time compared with the results described in the literature."

Hernia Repair-s159

CRYOANALGESIC ABLATION FOR THE TREATMENT OF POST-HERNIORRHAPHY NEUROPATHIC PAIN Robert D. Fanelli, MD; Michael R. DiSienna, DO; Felix Y. Lui, MD; Keith S. Gersin, MD, Surgical Specialists of Western New England, PC, Pittsfield, MA; Department of Surgery, Berkshire Medical Center, Pittsfield, MA; Department of Surgery, University of Cincinnati, Cincinnati, OH.

Introduction: Chronic postoperative pain has been reported in as many as 62.9% of patients after inguinal herniorrhaphy. Neuropathic pain requiring intervention develops in 2.2 to 11.9% of patients secondary to ileoinguinal and genitofemoral nerve entrapment. Cryoanalgesic ablation is successful in treating chronic pain from craniofacial neuralgia, facet joint syndrome, and malignant pain syndromes. We report our experience using cryoanalgesic ablation for chronic ileoinguinal and genitofemoral neuralgia after inguinal herniorrhaphy.

Methods: Ten patients with ileoinguinal, genitofemoral, or combined neuralgia underwent 12 cryoanalgesic ablations between April 1996 and June 2001. Patients were referred from a multidisciplinary pain clinic, and focused low volume nerve blocks used to map nerve involvement preoperatively. After surgical exposure, nerves and surrounding tissues were cooled to -70C for 3 minutes using the Lloyd Neurostat. Patients were seen 2 weeks postoperatively and offered monthly follow-up.

Results: Nine males, 1 female ages 20 to 54 (mean 42.6) were treated during 58 months with 8.2 month mean follow-up for ileoinguinal (4), genitofemoral (1), and combined (5) neuralgia. Patients reported 1 to 5 prior herniorrhaphies (mean 1.8), experienced neuropathic pain 0 to 14 years (mean 6.3), and underwent up to 3 (mean 1.3) ablative pain procedures prior to referral. Patients reported overall pain reduction of 0 to 100% (mean 77.5%, median 100%); 80% reported decreased analgesic use, and 90% reported increased physical capacity following cryotherapy. Two underwent additional cryotherapy, one for incomplete relief and one for recurrent pain, both with 100% efficacy. Wound infection (1) was the only complication.

Conclusions: Cryoanalgesic ablation successfully eliminates ileoinguinal and genitofemoral neuralgia in most patients, and should be considered early in the treatment of patients with post-herniorrhaphy neuropathic pain.

New Technology/Robotics-s160

CHANGES IN POSTURAL MECHANICS ASSOCIATED WITH DIFFERENT TYPES OF MINIMALLY INVASIVE SURGICAL TRAINING EXERCISES
Jason C. Gillette, Ph.D., Nancy E. Quick, P.T., M.A., Gina L. Adrales, M.D., Robert Shapiro, Phd., and Adrian E. Park, M.D.
Center for Minimally Invasive Surgery, Center for Biomedical Engineering, Department of Kinesiology and Health Promotion, University of Kentucky, Lexington, KY

abstract: Doctors who perform minimally invasive surgical (MIS) procedures commonly report upper extremity fatigue and/or joint and muscle pain. Postural mechanics may serve as a practical ergonomic indicator of surgeon discomfort during MIS tasks. Therefore, three surgeons performed a total of 92 MIS training tasks using different surgical graspers to analyze changes in postural parameters. The tasks consisted of a targeted release of a small object (T1), a simulated bowel inspection (T2), and a cable tying exercise (T3) within a training box. The instruments included a non-ratcheted grasper with a single-action blunt end effector (G1) and two models of ratcheted graspers with double-action blunt end effectors (G2, G3). Force platform data were collected to calculate center of pressure (COP) excursions and video marker data were tracked to calculate maximum joint angles. Multivariate ANOVA was used to test the statistical dependency of the postural parameters on grasper type and training at a significance level of $p < 0.05$. Anterior/posterior (A/P) COP with G3 (66 mm) was significantly greater than with G1 (48 mm). Both medial/lateral (M/L) and A/P COP were significantly greater during T3 (82, 87 mm) than during T1 (19, 24 mm) or T2 (66, 57 mm). Elbow radial pronation was significantly greater when using G3 (85 deg) than when using G1 (77 deg). In addition, shoulder internal rotation and shoulder flexion were significantly greater during T3 (62, 62 deg) than during T1 (29, 34 deg) or T2 (34, 42 deg). To summarize, the longer ratcheted grasper (G3) required additional A/P postural sway and radial pronation. In addition, the increased postural sway and joint angles involved in tie exercises (T3) indicate that training should be designed with similar postural challenges to those that would be present in surgery. Finally, COP may prove to be a valuable ergonomic indicator that could be implemented in a surgical environment, where video tracking may not be feasible.

New Technology/Robotics-s161

ERGONOMIC DIFFERENCES BETWEEN MINIMALLY INVASIVE SURGICAL SUITES AND STANDARD OPERATING ROOMS. Trudy A.G. Kenyon, RN, David R. Urbach, MD, Rob Strickland OTR, Lee L. Swanström, MD, Department of Minimally Invasive Surgery, Legacy Health System, Portland, Oregon

Ergonomic issues in minimally invasive surgery (MIS), impact physical work load for surgeons and staff which, in turn, influences operating room (OR) efficiency, outcomes and workplace injuries. Laparoscopic cases demand movement of awkward video equipment in and out of the OR to achieve rapid turnovers. We studied this manual-handling task (video set-up) in the MIS suite compared to the standard OR.

Standard video carts were compared to ceiling mounted columns in the MIS suite. The criteria included task frequency, distance and the amount of force to move the video equipment. The upper and lower arm movements, platform rotation, monitor push-up and pull-down forces and handle heights were measured (n=3). Minimal force (MF), initial force (IF) and sustained force (SF) were calculated in pounds of pressure using a digital push-pull device by an ergonomic expert and compared to normative anthropometric data and OSHA recommendations.

In the OR, the mean SF for the main cart was 10.4 lb/f [0.6 SD] and for the slave cart 7.3 [1.1] for a maximum distance of 300 ft. In the MIS suite, the mean SF for the columns ranged from 2.1 to 5.3 [0.3] for a maximum distance of 6 ft. ($p<0.05$ by anova). The work (w=f x d) in the standard OR was 7,199 Joules Vs. 81 Joules in the MIS suite ($p<0.05$).

Force Lbs	OR main cart	OR slave cart	MIS main A	MIS main B	MIS 2nd column	MIS 3rd column
MF	8.4	7.4	8.7	3.1	5.9	2.1
IF	26.8	32.3	14.7	5.5	10.9	3.5
SF	10.4	7.3	N/A	2.3	5.3	2.1

Conclusion: Both study groups were within federal guidelines for acceptable push forces for manual handling. The MIS suite is ergonomically preferred with a 63% overall reduction in push-pull force. The physical workload was improved by 98.9%. This contributes to an improved OR environment for MIS staff which impacts OR efficiency and safety.

New Technology/Robotics-s162

THE SURGICAL RECOVERY INDEX: A NOVEL TOOL FOR MEASURING THE ADVANTAGE OF LAPAROSCOPIC SURGERY IN POST-OPERATIVE RECOVERY Mark A Talamini MD, Cathy Stanfield CRNP, David Chang MS, Albert Wu MD MPH

Department of Surgery, School of Medicine and School of Public Health, Johns Hopkins Medical Institutions, Baltimore, MD

Objective: We developed a tool, the Surgical Recovery Index TM (SRI), specifically to measure surgical recovery. We used the SRI in patients undergoing laparoscopic (L) and open (O) operations to measure differences in recovery.

Methods: We surveyed 50 patients from a single surgeon to determine activities defining recovery from surgery. Answers were used to construct the SRI in numerical rank-order scale format, which was then given to 300 patients. Total score and two subscale scores (pain, and activity resumption delay) were calculated for each patient. Mean scores were calculated for each patient group. Chi square and t-tests were used to evaluate group differences for individual questions and summary scores, respectively.

Results: 149 patients completed the SRI (60 L, 89 O). Cronbach's alphas were 0.91 for pain questions and 0.97 for activity resumption questions. Pain level with time (L vs O, 1-10 score) at week 1 (4.42 vs 6.06, p=0.03), week 2 (3.08 vs 4.38, p=0.04), week 3 (2.03 vs 3.16, p=0.02), and week 4 (1.18 vs 2.28, p=0.00) all favored laparoscopy. Pain level with activity (L vs O, 1-3 scale) for getting out of bed (1.62 vs 1.85, p=0.04), hygiene activities (1.38 vs 1.65, p=0.04), and computer work (1.15 vs 1.56, p=0.00) were all significant, although pain with exertion (1.87 vs 2.10, p=0.13) was not. Days until return to activity (L vs O, 1-4 scale) were significant favoring L for 13 activities (all p<0.02), and favored L but were not significant for 3 activities. Subscales (L vs O, standardized on 1-100 scale) for pain (20.7 vs 34.4) and activity resumption delay (44.3 vs 62.0), as well as total scores (33.0 vs 49.0) were also significant (all p=0.00).

Conclusions: Improved time to full recovery (pain resolution and activity resumption) is a fundamental advantage of L surgery, yet no tool exists to specifically measure recovery. These data derived using the new SRI show that patients reach full recovery sooner following laparoscopic operations.

New Technology/Robotics-s163*

COMPARISON OF LAPAROSCOPIC SKILLS PERFORMANCE BETWEEN STANDARD INSTRUMENTS AND TWO SURGICAL ROBOTIC SYSTEMS Gregory F. Dakin, M.D., Michel Gagner, M.D., Peter S. Midulla, M.D., Edward Shlasko, M.D., John N. Cunningham, M.D., Division of Laparoscopic Surgery, Department of Surgery, The Mount Sinai School of Medicine, New York, NY , Division of Pediatric Surgery, Department of Surgery, Maimonides Medical Center, Brooklyn, NY

Our aim was to compare the performance of laparoscopic tasks by surgeons using standard laparoscopic instruments and two surgical robotic systems.

18 surgeons performed tasks in a training box using three different instrument systems: standard laparoscopic instruments, the Zeus(tm) Robotic Surgical System (Zeus), and the da Vinci(tm) Surgical System (da Vinci). Basic tasks included running a 60-cm rope, placing beads onto pins, and dropping cotton peanuts into cylinders; fine tasks included intracorporeal knot tying and running stitches with 4-0, 6-0, and 7-0 sutures. Time (in seconds) required and precision in performing each task were recorded. The paired t-test and Wilcoxon signed rank tests were used for statistical analysis.

Time to complete the rope, bead, and peanut tasks was 38, 83, and 54 for the standard instruments; 54, 146, and 61 for da Vinci; and 106, 196, and 128 for Zeus. In all basic tasks, standard instruments performed significantly faster than either robotic system (p<0.04) while da Vinci performed significantly faster than Zeus (p<0.04). No significant difference in precision was found between standard instruments and Zeus. Da Vinci was more precise than standard instruments (p<0.04) and Zeus (p<0.03) in the peanut task. 6-0 and 7-0 knot tying time was similar between standard instruments and da Vinci (113 and 110) and were significantly faster than Zeus (237, p<0.001). Running suture times showed a similar pattern (192 and 149 vs. 361, p<0.005). The robotic systems were similar in precision for fine suturing tasks and were significantly more precise in knot tying (Zeus and da Vinci) and running sutures (da Vinci) than standard instruments (p<0.03).

Basic laparoscopic task performance is generally faster and as precise using standard instruments versus either robotic system. In performing fine tasks, neither robotic system is faster than standard instruments though they may offer some advantage in precision.

New Technology/Robotics-s164

AN ATTEMPT TO EXPAND THE VIEW UNDER SCOPE WITH FINGER-ATTACHABLE CAMERA (FINGER CAMERA) Yukio Fujino,M.D., Kazuyuki Shimomura,M.D.,Kazuhiko shinohara,M.D,Naoki Ishizuka,M.D,Hirobumi Yamada,M.D.,Akio Odaka,M.D.,Takanobu Hoshino,M.D.,Daijo Hashimoto,M.D.,Yasuo Idezuki,M.D.Department of Surgery,Saitama Medical Center,Saitama Medical School,Saitama,Japan

There are increasing numbers of cases conducted by Hand-Assisted Laparoscopic Surgery (HALS) worldwide due to its wide variety of advantages; surgeons can handle the organs gently by directly inserting their hands into abdominal cavity, and make localizing diagnosis of tumors, etc. by tactile sensation. Although two types of laparoscope, rigid and flexible, are generally used, the observable area is confined due to the limitation for the number of ports to be inserted and its inserted position. Therefore, surgeries must be conducted by concerning the possibility of missing lesions or causing secondary damages on all occasions. This time, we developed a compact scope (Finger Camera, FUJINON, SAITAMA, JAPAN) that is attached to the surgeon∞fs fingertip aiming to reduce the lapaloscopic blind spots, improve the ability of observation and diagnosis, and conduct HALS safely. Its weight is several tens of grams with CCD camera attached approximately 40∞‹in a slanting direction below the device∞fs extremity. This device is used by attaching to forefinger or middle finger by latex-made cylindrical fixing equipment. Surgeons can observe the proximate organs at an angle of bending the finger while excluding other organs by the dorsum of hand. Furthermore, attaching a compact finger-attachable ultrasonic probe to the tip of other finger makes it easier to observe the parenchymal organs such as liver, pancreas and spleen, and also makes it possible to make diagnosis for the lesional conditions, the number of lesions, and infiltration in other organs by directly feeling with the finger. By providing the examples in the actual clinical use of this device for hepatic metastasis from pancreas cancer, or splenomegaly, etc., its advantages, weak points, points to be improved, and its application area in future, etc. will be discussed and reported.

New Technology/Robotics-s165

A NON-ENDOSCOPIC TECHNIQUE FOR DIFFICULT CASES TO CREATE A PERCUTANEOUS ENDOSCOPIC GASTROSTOMY Hideto Oishi, M.D., Hironari Shindou, M.D., Noriyasu Shirotani, M.D.,* Shingo Kameoka, M.D.*

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PURPOSE: We established a less invasive method of esophagostomy with a rupture-free balloon (RFB), which we invented to be used in conjunction with Percutaneous Trans-Esophageal Gastro-tubing (PTEG). PTEG with RFB allows the surgeon to create an esophagostomy safely and simply even in cases with complications that would make it difficult to create a Percutaneous Endoscopic Gastrostomy (PEG).

METHOD/MATERIALS: The control group consisted of eleven patients who underwent an esophagostomy by PTEG with a normal balloon from October 1994 to May 1997. Thirteen cases were done with existing balloon catheter to dilate the gastrointestinal tract in place of an RFB for PTEG from June 1997 to December 1997 as the preliminary study. This prospective study is based on 107patients, 49 for drainage and 58 for feeding, with informed consent for PTEG, who were performed PTEG with RFB invented in January 1998 and who needed an indwelling catheter for a long term, from January 1998 to July 2001.

1. Insert an RFB through the nose into the esophagus and inflate it.
2. Puncture the RFB percutaneously aided by ultrasonography.
3. Insert a guide wire.
4. Insert a dilator with a sheath.
5. Insert an indwelling catheter into the digestive tract through the sheath.

RESULTS: We treated fifty patients by creating an esophagostomy by PTEG with an RFB without any major trouble, which could occur when creating a PEG. This method only took about fifteen minutes. The average periods for the indwelling catheter are 78.1+-90.0 days for drainage and 147.1+-107.1 days for feeding. The Indwelling catheter may be used for the long term affording easy maintenance at the bedside and home care. The patientsÕ complaints subsided, and the quality of life was improved for them all.

CONCLUSIONS: When it is difficult to create a PEG, PTEG with RFB is safe, simple, less invasive and just as effective.

New Technology/Robotics-s166

USE OF NAVIGATOR FOR INTRAOPERATIVE DETECTION OF LYMPH NODE METASTASES FOR COLORECTAL CARCINOMA DURING LAPAROSCOPIC SURGERY Nobuyoshi Miyajima, M.D., Tatsuo Yamakawa, M.D., Department of Surgery, Teikyo University Hospital, Mizonokuchi, Kawasaki, Japan

We aimed to detect the lymph nodes metastases during laparoscopic surgery for advanced colorectal carcinoma using 67Ga-citrate and Navigator.

Methods: [Preliminary study] 67Ga citrate was injected intravenously in 10 patients with colorectal carcinoma 96 hours before surgery. Immediately after the surgical specimen was resected, the lymph nodes were divided and gamma ray intensity of them was counted with a hand-held detector probe of Navigator. The intensity of the gamma energy of each lymph node / background ratio (L/B ratio) was calculated and the cut-off value was determined. [Clinical study] Intraoperative evaluation of lymph node metastasis was carried out in 40 cases of colorectal carcinoma. During the laparoscopic surgery, the gamma-detecting probe was applied along the tumor and the regional lymph nodes.

Results: [Preliminary Study] A total of 157 lymph nodes were resected. Histopathological examination revealed that 137 of them were metastasis-negative and the remaining 20 were positive. The L/B ratio of metastasis-positive lymph nodes was 3.818∞}1.814. On the other hand, the L/B ratio of metastasis-negative lymph nodes was 1.419∞}0.469. L/B ratio of metastasis-positive lymph nodes was significantly larger than that of metastasis-negative lymph nodes ($P<0.01$). The cut-off value of the L/B ratio was determined as 2.0 to include all metastasis-positive nodes. [Clinical study] Dukes' classification of 40 cases was A in 8, B in 21 and C in 11. Metastasis to the lymph nodes could be predicted in every case. However, 5 cases out of 29 cases without lymph nodes metastases were judged to be metastasis-positive with Navigator. Sensitivity of this clinical study was 100%, specificity was 82.8% and accuracy was 87.5%

Conclusions: This cut-off value is adequate to detect the lymph nodes metastases. Detection of lymph nodes metastases with 67Ga citrate and Navigator is very useful in choosing the operative method and the range of lymphadenectomy, especially in laparoscopic colorectal surgery in which palpation is impossible.

New Technology/Robotics-s167*

COMPARISON OF ULTRASONIC ENERGY, BIPOLAR THERMAL ENERGY, AND VASCULAR CLIPS FOR THE HEMOSTASIS OF SMALL, MEDIUM, AND LARGE-SIZED ARTERIES Kristi L. Harold MD, Harrison Pollinger DO, Brent D.Matthews MD, Kent W. Kercher MD, Ronald F. Sing DO, B. Todd Heniford MD, Department of Surgery, Carolinas Medical Center, Charlotte, North Carolina

Advanced laparoscopic procedures necessitate the development of new technology for hemostasis. This study compared the burst pressure of arteries sealed with laparoscopic ultrasonic coagulating shears (UCS), electrothermal bipolar vessel sealer EBVS), standard laparoscopic clips (LC), and newer plastic clips (PC).

Arteries in three size groups (2-3mm, 4-5mm, 6-7mm) were harvested from euthanized pigs. Each device was used to seal 16 specimens from each group for burst testing, measured in mm Hg. The UCS and EBVS were used to seal an additional eight vessels in each group for histologic examination. The microscopic extent of thermal injury, defined by coagulation necrosis, was measured in millimeters. Analysis of variance was performed, and where appropriate, a Tukey's test.

The EBVS's mean burst pressure was statistically higher than the UCS at 4-5mm (600 vs. 206) and 6-7mm (442 vs. 174). EBVS had higher burst pressures for the 4-5mm group (442.2) and 6-7mm group (600.9) compared to its pressure at 2-3mm (128.0) ($p=0.0001$). The UCS was slightly stronger than EBVS at 2-3mm (226 vs. 128), but this was not significant. Both clips were statistically stronger than the thermal devices except at 4-5mm where the EBVS was as strong as the LC (601 vs. 593). The PC and LC were similar except at 4-5mm where the PC was superior (854 vs. 593). The PC burst pressure for 4-5mm (854) was statistically higher than its burst for vessels 2-3mm (737), but not different than its 6-7mm pressure (767). Thermal spread was not statistically different between EBVS and UCS at any size (EBVS mean = 2.57mm vs. UCS mean = 2.18mm).

The EBVS can be used confidently in vessels up to 7mm. In vessels ranging from 4-7mm it has mean pressures well above physiologic systolic blood pressure.

New Technology/Robotics-s168*

DIGITAL STEREOTACTIC BREAST MICROBIOPSIES FOR NON PALPABLE BREAST LESIONS: STUDY OF 276 CASES. Carlo Mariotti M.D., Francesco Feliciotti M.D., Maddalena Baldarelli M.D., Andrea Tamburini M.D., Jlenia Sarnari M.D and Emanuele Lezoche M.D., FACS.*Clinica di Chirurgia Generale, University of Ancona; * II Clinica Chirurgica, University of "La Sapienza", Rome, Italy.

New diagnostic approaches are necessary for non palpable breast lesions (NPBL) that required histological investigation. Percutaneous Biopsy (BP) is a valid alternative to "open" surgical biopsy. Aim of the study is to evaluate the results and the diagnostic value of Vacuum Assisted Core Biopsy (VACB) and Advanced Breast Biopsy Instrumentation (ABBI).

From June 1999 to July 2001 276 BP were perfomed using VACB in 198 (72.7%) cases and ABBI in 78 (28.3%). All patients (pts) had dubious mammography lesions not confirmed by US. Mean age of the pts was 53 years, (range 39-79). Indications were: 194 (70.3%) microcalcifications, 50 (18.1%) nodular opacities and 32 (11.6%) parenchymal distortions.

All the BP were performed with a digital stereotactic table with a vacuum suction aspiration system for VACB and with a cutting cannula for ABBI. The digital imaging system calculates the exact three dimensional position of the lesion and transmits it to the operator work-station. Mean operative time was 10 min for VACB and 20 min for ABBI. One (1.3%) intraoperative complication was observed with ABBI for the technical defect of the cannula and 5 (1.8%) pts developed postoperative hemathomas. Cosmetic outcome was good for ABBI and excellent for VACB. Thirteen (16.7%) lesions removed by ABBI and 37 (18.7%) by VACB resulted malignant whereas 65 (83.3%) lesion treated by ABBI and 161(81.3%) by VACB resulted benign.

BP is a valid method for the diagnosis of NPBL. BP, in positive cases, offers the possibility to perform biological tests on the tumor before surgery. ABBI system allows to remove the lesion in toto and evaluate the margin status but the procedure is longer and more difficult than VACB. In our exeperience VACB is a easy method to perform BP without discomfort to the pts and with a smaller amount of tissue.

The World of Laparoscopy-s169

30 YEARS OF DIAGNOSTIC LAPAROSCOPY – AN OVERVIEW

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We commenced Diagnostic Laparoscopy (D.L.) in a developing country in 1972, with the objective of hastening diagnosis, reducing patient distress, improving management and bed utilization in an over crowded Teaching Hospital, where simple investigations like x-rays took weeks to materialize. Over 18 years upto 1990 we had performed 3157 diagnostic laparoscopies, with all adults being done under L.A. We had no mortality and an acceptable complication rate of 0.09%. We achieved an 84% diagnosis rate, 74% being on histological target biopsy, covering a wide spectrum of pathology. The equipment cost when spread out over 3000 patients works out to Rs. 30 ($0.75). With availability of non-invasive diagnostic aids like US, CT, MRI and under control target biopsy with these modalities the role of diagnostic laparoscopy has altered in many parts of the world. Over the last ten years we use D.L. for the evaluation of peritoneal pathology, abdominal tuberculosis, malignancy and in the acute abdomen and abdominal trauma, where the 3 mm instruments offer safety. We use it in the management of lower abdominal pain in females in the childbearing age and children with indeterminate lower abdominal pain. D.L. is often a prelude to laparoscopic treatment of the underlying pathology.

We have found that D.L. has its optimal application in developing countries, as it is exceedingly cost-effective in an environment where there is a heavy patient load and sophisticated, non-invasive diagnostic aids are not available. D.L. is the ideal teaching aid for laparoscopic surgery in developing countries.

New Technology/Robotics-s170

LAPAROSCOPIC SURGERY FOR PERITONITIS Hiroaki OMORI, M.D., Hiroshi ASAHI, M.D., Yoshihiro INOUE, M.D., Takashi IRINODA, M.D., Shigeatsu ENDO, M.D., Kazuyoshi SAITO, M.D. Critical Care Medicine, Iwate Medical University, School of Medicine, Moroka, JAPAN

Purpose: There are tendencies that many surgeons are employing laparoscopic interventions for acute abdominal conditions. In this study, we assessed the outcome of laparoscopic surgery for peritonitis retrospectively and evaluated indications for laparoscopic interventions. Patients and results: We experienced 472 laparotomies from 1998 to 2000 in our emergency center. 72 (15%) of these 472 procedures were laparoscopic interventions for peritonits. The age ranged from 9-99 with a mean age of 55.6. Gender ratio was 41:31. The diagnoses of these cases were perforated duodenal ulcer (PDU) in 16, traumatic perforated viscus in 13, acute cholecystitis in 12, appendicitis in 11, pelvic inflammatory disease (PID) in 6, non-occlusive mesenteric ischemia (NOMI) in 4, bowel obstruction in 3, iatrogenic perforated viscus in 2 and others in 4, respectively. In NOMI, the laparoscopy was mainly performed for confirming a diagnosis and in appendicitis and PID the laparoscope was used as diagnostic and therapeutic tools. In traumatic perforated viscus, no major complications were found, but there existed a missed injury in one patient who had a minor perforation of the 4th part of duodenum. The rate of conversion was 4%. In PDU, the rate of complications and death were relatively higher than the other diseases, because the mean age of PDU patients was significantly higher. Overall morbidity and mortality rate were 7% and 6%, respectively.

Conclusion: For peritonitis due to uncertain etiology in the lower abdomen in women, diagnostic laparoscopy was an excellent diagnostic and therapeutic tool. In traumatic perforated viscus, especially the lesions near ligament of Treiz, it was necessary to take special care for missing injury. In PDU, laparoscopic surgery should be avoided in the patients with underlying cardio-pulmonary disorders.

New Technology/Robotics-s171

THE ABSENT ROLE OF PROPHYLACTIC ANTIBIOTICS IN ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY Baris Zulfikaroglu M.D., Can Kece, Ahmet Kessaf Aslar M.D., Necdet Ozalp M.D., Mahmut Koc M.D.

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Introduction: Laparoscopic cholecystectomy (LC) has become the standard procedure for the treatment of symptomatic cholelithiasis. The use of prophylactic antibiotics (PA) for laparoscopic cholecystectomies was contradictory and varied among surgeons. The aim of this study is to show that PA treatment in elective LC does not lower the already low infection rate associated with this procedure.

Patients and Methods: A prospective double-blind randomized study. Before anesthesia was administered, group A(n=38) received intravenously 2 g of cefotaxime sodium;Group B(n=34), intravenous placebo. A gallbladder bile sample for culture was withdrawn intraoperatively from all patients. In both groups, age, sex, weight, duration of surgery(DOS), presence of diabetes, American Society of Anesthesiologists(ASA) patient classification score, intraoperative gallbladder rupture, findings from bile culture positive for bacteria, episodes of colic within 30 days before surgery, length of stay(LOS), and number of septic complications were recorded.

Results: There were no differences between groups in age, sex, weight, DOS, ASA score, intraoperative gallbladder rupture, LOS. In group A, 1 case of wound infection were observed; group B, 1 case of wound infection. Comprasion of data showed no statistically significant difference between the groups. Data were evaluated using the x2 test and analysis of varience with unpaired t test.

Conclusion: This study suggest that surgeons should not use prophylactic antibiotics for routine, low-risk patients undergoing LC. Antibiotic prophylaxis seems justified only in patients having episodes of colic within 30 days of surgery and in patients with diabetes.

New Technology/Robotics-s172

COMPARISON OF THE ACUSTIMULATION RELIEFBAND® DEVICE TO ONDANSETRON FOR TREATMENT OF POSTOPERATIVE NAUSEA AND VOMITING (PONV) AFTER AMBULATORY LAPAROSCOPY

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PONV is a potential obstacle to outpatient laparoscopy. This study compares transcutaneous acupoint electrical stimulation using the ReliefBand® device to ondansetron for the treatment of PONV after laparoscopy.

285 patients undergoing ambulatory laparoscopic procedures with a standardized general anesthetic were enrolled in this randomized, double-blind, placebo- and sham-controlled study. All patients received antiemetic prophylaxis. 90 patients developed PONV in the PACU and were randomized to one of three treatment groups: (1) Control (CTL): inactive (sham) ReliefBand® and ondansetron, 4 mg IV, (2) ReliefBand® (RB): active ReliefBand® and saline, 2 ml IV, and (3) Combination (COM): active ReliefBand® and ondansetron 4 mg IV. A blinded observer recorded the response to nausea treatment and time to achieve discharge criteria. Postdischarge side effects, patient satisfaction and quality of recovery (QoR) scores were assessed at 24 and 72 h via a follow-up phone call. Data were analyzed using ANOVA and Chi-square tests, with a p-value < 0.05 considered statistically significant.

The complete response rate was significantly higher in the COM group (73%) compared to the RB group (40%) and comparable to the CTL group (57%). Patients in the RB and COM groups reported higher QoR scores than the CTL group (8±2, 8±2 vs 7±2, $p<0.05$).

Combination antiemetic therapy with the Reliefband® device and ondansatron resulted in higher complete response rates and QoR scores when used to treat established PONV after laparoscopy and general anesthesia.

New Technology/Robotics-s173

BALLOON ASSITED ENDOSCOPIC RETRO-PERITONEAL GASLESS (BERG) FOR ANTERIOR LUMBAR INTERBODY FUSION (ALIF) NORTHWESTERN EXPERIENCE Giri T. Gireesan, M.D. (orthopedics) Richard Vazquez, M.D. (general surgery) Northwestern University Northwestern University Medical School

The objective of the study was to determine the utility of BERG for ALIF for use with a variety of inter-body fusion devices and instruments. From January 1998- August 31, 2001, forty-four individuals underwent (ALIF) with devices ranging from cylindrical cages, femoral ring allograft, and synmesh cages. There were 32 males, and 12 females in this group. The average age of the group was 39 years. The average hospital stay was 3 days. The operations were performed for severe back and leg pains, in individuals who did not get relief of pain with non-surgical treatments for a period of at least one year. The surgical conditions for fusion ranged from Grade I spondylolisthesis to discogenic back pain with and without neurological deficit. Lumbar discs L5, L4, L3 were approached 30, 20 and 4 times respectively. The procedures were performed with the patients positioned supine on a radiolucent table. Access to the retroperitoneal space was gained similar to a TEP hernia repair. The rest of the procedure was performed in a gasless fashion using standard orthopedic and laproscopic instruments. To access the L4 disc and mobilize the left common iliac vein, the ascending lumbar vein was transected using harmonic scalpel, as were the segmental arteries to mobilize the aorta. Complications included a left common iliac vein injury not requiring operative repair and a far lateral placement of BAK cage at L5 level that required removal two days later. Two patients reported retrograde ejaculation one transient the other a recent occurrence.

Conclusion: BERG/ALIF is a viable alternative to the conventional open procedure and permits the use of most open orthopedic instruments and any implant. From a spinal surgeon's viewpoint, the anterior approach is a less destructive operation. The posterior bony elements are spared. Post-surgical scarring in and around the spinal canal and nerve roots is avoided and average blood loss is less than 100 cc per level.

New Technology/Robotics-S174

ONE HUNDRED CASES EXPERIENCE OF VIDEO-ASSISTED THYROIDECTOMY Li-Heng Yang M.D., Shou-Jen Kuo M.D.Department Of Surgery, Division Of General Surgery, Changhua Christian Hospital

Introduction: Mini-invasion operation had been use in many entities however video-assisted thyroidectomy was introduced into clinical practice during recent years . We present our first 100 cases experience in this new technique

Method: In this study 100 patients with thyroid mass less then 4cm including 4 papillary carcinoma 12 Graves disease, 26 follicular adenoma and 58 nodular goiter were operated on video-assisted thyroidectomy by one surgeon. A lower neck 2 to 3 cm incision and retracted method was used and ultrasonic scalpel for dissection and hemostasis. Operative time,blood loss, postoperative pain, complications, hospital stay and outcome were analyzed.

Result: All procedures were successful without conversion, no complications occurred

Mean operation time was 72 minutes. The mean hospital stay was 1.3 days

Conclusion: Video-assited thyroidectomy seems to be a safe and effective treatment for thyroid tumor less then 4cm with good cosmetic result and should be considered the operation of choice.

Colorectal Surgery for Benign Disease-S179

LAPAROSCOPICALLY-ASSISTED PROCTOCOLECTOMY WITH ILEAL J POUCH ANAL ANASTOMOSIS. Kazuhiko Shibuya M.D., Akihiko Hashimoto M.D., Yuji Funayama M.D., Hiroo Naito M.D., Kohei Fukushima M.D., Chikashi Shibata M.D., Taku Kitayama M.D., Seiki Matsuno M.D., Iwao Sasaki M.D First Department of Surgery, Tohoku University, Sendai, Japan.

Background & Aims: Recently, laparoscopic surgery has become widely accepted in the field of gastrointestinal surgery. Especially, benign diseases of the digestive tract are often accessible to treat by laparoscopic approaches. To assess the advantages of a laparoscopically-assisted proctocolectomy with ileal J pouch anal anastomosis compared to conventional procedures, we retrospectively analyzed the results of the two procedures.

Methods: The principal indications for laparoscopically-assisted surgery were as follows. 1) The patient did not have any severe side effects from steroid therapy. 2) No advanced cancers in the peritoneal cavity were found by precise preoperative examinations. 3) The patients with UC were not in serious condition. 4) The patients were generally considered suitable to undergo elective surgery. From June 1997 to present, 19 patients including 9 patients with familial adenomatous polyposis (FAP) and 10 with ulcerative colitis (UC) underwent a laparoscopically-assisted proctocolectomy and hand-sewn ileal J pouch anal anastomosis. This laparoscopically-assisted colectomy (LAC) group was then compared with a group of 13 patients who had undergone conventional ileal pouch anal anastomosis using a standard laparotomy.

Results: Median operative time of the LAC group was 8 hours and 15 minutes, which was 73 minutes longer than that of the standard colectomy (SC) group. The number of days during which eating was prohibited were similar in the two groups but the median postoperative hospital stay was significantly shorter in the LAC group (22.5 days). In the LAC group, the small incisions showed better cosmetic results, and the remarkable reduction in the degree of postoperative pain was observed.

Conclusion: Laparoscopically-assisted proctocolectomy with ileal J pouch anal anastomosis can be employed widely in patients with FAP and also in selected patients with UC.

Colorectal Surgery for Benign Disease-S180

COMPLICATED CROHN'S DISEASE IS NOT A CONTRAINDICATION TO LAPAROSCOPIC SURGERY Barry Salky MD, Division of Laproscopic Surgery, Department of Surgery, Mount Sinai Hospital, New York, New York

Complicated Crohn's disease requiring surgery(previous resection, fistula, abscess, and multiple sites of disease) is usually thought to be a contraindication to the laparoscopic approach. The author has reviewed his prospectively maintained database of 149 patients(161 procedures) undergoing laparoscopic resection for Crohn's disease. Diagnostic, diversion, non-complicated and bypass patients have been excluded. There were 73 patients considered to have complicated disease, and they form the basis fo this report. The mean age was 37 years, and there were 58% females. Immunosuppressive medications were seen in 40%. Previous open Crohn's surgery(n=50), fistulas(n=115) (multiple n=28), and abscess(n=13) were commonly present, and they were not reasons for conversion to open surgery. Twenty-three patients had two resections, and one patient had three resections. Operative time was highly variable based on number of previous surgeries, number of fistulas, and present of concurrent abscess. The mean OR time was 155 minutes(range 90-240). Length of stay was 4.2 days. All patients had laparoscopic assisted surgery. In summary, complicate Crohn's disease requiring surgery is feasible and safe utilizing laparoscopic technology. While more time consuming than non-complicated disease, the benefits of laparoscopic surgery were seen in this difficult group of patients.

Colorectal Surgery for Benign Disease-S181

LAPAROSCOPIC MESH RECTOPEXY FOR RECTAL PROLAPSE: EXPERIENCE WITH 174 CASES JL. DULUCQ MD, P. WINTRINGER MD ILS - Institute of laparoscopic surgery Bagatelle hospital - 203, Route de Toulouse 33401 TALENCE (France)

The aim of this study was to review 174 patients having a laparoscopic rectopexy between january 1992 and march 1999.

There were 158 females and 16 men, of mean age 56 years (range 18 to 89 years). Operative indications were complete rectal prolapse, or rectocele associated with severe dyschesia. 24% of the patients had undergone proctological surgery, and 48% female patients gynaecological surgery. 46% patients had had previous laparotomy.

Laparoscopic technique needed 4 cannula. A modified French-type Orr-Loygue mesh rectopexy was performed. The rectum is being entirely freed, then stapled to the sacral promontory using two mersilene meshes. Fourteen patients had a combined procedure. There was no mortality, and morbidity was low (7 minor complications).

Five of 174 procedures were converted to open (3%) because of too tense adhesions. Functional results were excellent in 94% of the cases. Anatomical results were excellent in 85% of the cases. Two patients kept mild rectocele, and 2 patients a mucosal prolapse.

Rectal prolapse is a complex disorder, and surgical treatment is difficult. Our laparoscopic technique is standardized, with excellent functional results after a follow-up of up to 9 years.

Colorectal Surgery for Benign Disease-S182

RECURRENCE RATES AFTER SURGERY FOR UNCOMPLICATED DIVERTICULITIS: LAPAROSCOPIC VERSUS CONVENTIONAL SIGMOID RESECTION Klaus Thaler, MD, Eric Weiss, MD, Steven Wexner, MD, *JP Arnaud, MD, Juan Nogueras, MD, *Roberto Bergamaschi, MD, Cleveland Clinic Florida, Weston, FL and *Angers University, France.

Superiority of laparoscopic sigmoid resection (LSR) for uncomplicated diverticulitis should be proven addressing areas of failure after open sigmoid resection (OSR). The aim of this study was to compare LSR to OSR regarding recurrence rates after surgery.

Between 1/92 and 2/96, 79 patients had LSR for uncomplicated diverticulitis at two tertiary referral centers compared to 79 matched controls who had OSR. Resection length and inflammation at proximal resection margins were determined at the formalin-fixed specimen as was level of anastomosis. Recurrence was defined as left lower quadrant pain, fever and leukocytosis with consistent CT on admission and enema findings at 6 weeks.

The groups were matched for age, gender, body mass index, length of symptoms and ASA classification. Mean resected specimen length was 16.1 cm in LSR and 18.3cm in the OSR group (p=0.048). 19 (24%) LSR vs 41(52%) LSO patients had splenic flexure mobilization (p<0.001). 21 (27%) LSR vs 4 (5%) OSR patients had inflamed proximal margins in the resected specimen (p<0.001). Colosigmoid, not colorectal, anastomosis was made in 4 LSR (5%) and 53 OSR patients (70%)(p<0.001). Follow up was longer in the OSR vs LSR group (86.9+-14 vs 81.9+-16 months, respectively; p=0.046). 3 LSR (4%) vs 7 OSR patients (10%) had recurrence (p=0.19). There were no differences between recurring and nonrecurring patients in splenic flexure mobilization (40 vs 38%, p=0.93) and resected specimens with inflamed proximal margins (0 vs 18%, p=0.95). 70% of recurrences vs 33% with no recurrence had colosigmoid anastomosis (p=0.03).

LSR for uncomplicated diverticulitis has similar recurrence rates as OSR if the anastomosis is performed to the proximal rectum and not the distal sigmoid colon.

Colorectal Surgery for Benign Disease-S183*

WOUND COMPLICATIONS OF LAPAROSCOPIC VS. OPEN COLECTOMY Emily R. Winslow MD, James W. Fleshman MD, Elisa H. Birnbaum MD, L. Michael Brunt MD. Department of Surgery and Institute for Minimally Invasive Surgery, Washington University School of Medicine, St. Louis, MO.

Aims: The purpose of this study was to determine if laparoscopic surgery has impacted on the incidence of wound complications after colon resection.

Methods: Eighty-three patients with colon cancer were prospectively randomized to undergo either laparoscopic colon resection (LCR) or open colon resection (OCR) at our institution as a part of a multi-center clinical trial. All incision related data were tabulated from review of the prospective database and physician records at a mean follow-up of 27.4 ± 17.9 months postoperatively (range 4-68 months). Results are expressed as mean ± SD. Statistical analysis was performed using Fisher's exact and student's t-test.

Results: Thirty-seven patients were randomized to LCR and 46 to OCR. Seven patients in the LCR group (15.9%) were converted to open colectomy and were included in the OCR group for analysis. LCR was carried out using an open incision for anastomosis and specimen extraction. No differences in patient age, incidence of prior abdominal surgery, steroid use, or medical comorbidities were seen between groups. Incision length was significantly greater (p<0.001) in the OCR group (19.4 ± 5.6cm) compared to the LCR extraction site (6.3 ± 1.4cm). Wound infections were seen in 13.5% of patients after LCR (2.7% trocar sites, 10.8% extraction sites) and in 10.8% after OCR (p=NS). The rate of incisional hernia was 18.9% after LCR and 17.4% after OCR (p=NS). Only 1 incisional hernia (2.7%) in the LCR group occurred at a trocar site. In the LCR group, extraction sites accounted for 10 of 12 (83.3%) total complications while there were only 2 (16.7%) trocar site complications.

Conclusions: The extraction site for LCR is associated with a high incidence of incisional complications, comparable to that for open colectomy. Strategies to alter incision size, location, and closure technique should be considered in LCR cases to reduce the incidence of these complications.

Colorectal Surgery for Benign Disease-S184*

ENDOSCOPIC TREATMENT OF SURGICAL COLO-RECTAL ANASTOMOSIS STENOSIS Schuster K.L., M.D., Manegold B.C., M.D.
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INTRODUCTION: Stenosis of the surgical anastomosis remains a frequent and unsolved problem. Numerous patients present postoperatively with defecation problems or an ileus.

PATIENTS AND METHODS: From 1996-2001, we analyzed 98 patients with symptomatic anastomosis stenosis to elucidate factors regarding i.e. initial diagnosis, type of operation, anastomosis technique and postoperative course (anastomotic insufficiency, etc.).

RESULTS: The majority of patients were diagnosed preoperatively with colo-rectal carcinoma (n=64), the remaining patients with diverticulitis, Crohn's disease or adenoma (n=34). Most frequently, surgical intervention with subsequent anastomotic stenosis occurred after low anterior resection, resection of the sigma and the left colon; in patients with Crohn's disease after ileocecal resection. Postoperative insufficiency was documented in 18 patients, mechanical stapler anastomosis in 50 patients. Usually, endoscopic treatment was performed by hydrostatic or pneumatic balloon dilatation, sometimes preceded by laser incision. Depending on the stenosis type, laser incision was used solely. In patients with distal stenosis, dilatation was achieved with Hegar or Savary-Gilliard dilators. Up to 11 sessions were necessary to achieve a satisfactory result. Successful dilatation was documented in 65 patients. The remaining patients were not treated primarily at our hospital and are currently being investigated. In 5 patients recurrent carcinoma was detected following more than one dilatation. Complications included perforation (n=5) which required surgery in 3 patients, abscess formation (n=2) and restenosis.

CONCLUSION: In conclusion, endoscopic treatment is an effective technique to avoid surgical intervention in patients with postoperative anastomotic stenosis with promising outcome and low complication rate.

Bariatric-S185

THE LEARNING CURVE FOR LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS IS 100 CASES. Philip Schauer MD, Sayeed Ikramuddin MD, Giselle Hamad MD, William Gourash CNP, The Minimally Invasive Surgery Center, University of Pittsburgh, Pittsburgh, PA

The purpose of this study was to determine the effect of operative experience on perioperative outcomes for laparoscopic Roux-en-Y gastric bypass (LRYGBP).

Methods: From 7/97 to 9/2001, 750 patients underwent LRYGBP for the treatment of morbid obesity. The same 2 surgeons performed all operations. The operation consisted of creation of an isolated gastric pouch (15mls) with a Roux-en-y gastro-jejunostomy and entero-enterostomy. We evaluated perioperative outcomes of the first 150 consecutive patients to determine if a learning curve effect could be demonstrated. Groups were divided into 3 groups (I, II, III) of 50 consecutive patients, and outcomes for each group were compared.

Results:

Group	%BMI >55	Mean ASA	MeanOR Time (min)	Convert rate	Intraop comps	Tech Comps % (major+minor)
I (1-50)	18%	2.56	311	1 (2%)	2	21
II (51-100)	24%	2.67	227	0	0	15
III (101-150)	24%	2.70	237*	1(2%)	2	11*

ASA, American Society of Anesthesia risk classification (1-4); *P<0.05 for Group III vs. Group I

Conclusion. Our data suggests that operative time and technically related complications decreased with operative experience even though heavier patients and higher risk patients were more predominant in the latter part of our experience. LRYGBP is a technically challenging operation with a long learning curve. Strategies for developing training programs must address these training challenges in order to minimize morbidity related to the learning curve.

Bariatric-s186*

LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS DEMANDS A LONG LEARNING CURVE D. Oliak, MD, H. Schmidt, MD, P. Weber, MD, A. Wasielewski, RN, P. Fan, MD, G. Ballantyne, MD. Hackensack University Medical Center, Hackensack, NJ

Introduction: Few bariatric surgeons perform laparoscopy. Yet, laparoscopic Roux-en-Y gastric bypass (LGB) offers obvious advantages to morbidly obese patients. As a result, increasing numbers of laparoscopic surgeons are performing LGB. What is the learning curve for these surgeons? **Aim:** Our aim was to determine the length of the learning curve for LGB for a skilled laparoscopic surgeon. **Methods:** The study population consists of the first 200 consecutive LGB procedures attempted by one surgeon between 7/99 and 7/01. Medical records were reviewed retrospectively. The study population was analyzed as four groups of 50 patients. **Results:** * $p<0.05$

Group (n)	1 (0-50)	2 (51-100)	3 (101-150)	4 (151-200)
Mortality	2	0	0	0
Morbidity (%)	19 (38)	13 (26)*	7 (14)*	4 (8)
OR Time (min±SD)	202±50	164±38*	133±33*	128±37
Conversion	2	1	0	1

The patient groups were similar with regard to age, sex, and BMI. The perioperative morbidity rate (not including stricture) decreased from 38% (group 1) to 8% (group 4). A statistically significant decrease in morbidity occurred between groups 2-3, but not between groups 3-4. Average OR time decreased from 202 minutes (group 1) to 128 minutes (group 4). A statistically significant decrease in OR time occurred between groups 2-3, but not between groups 3-4. There was no statistically significant difference in mortality and conversion rates between the groups. **Summary:** For a surgeon skilled in advanced laparoscopy, low mortality and conversion rates can be achieved early in the learning curve. Nevertheless, morbidity and OR time do not plateau until 101-150 LGB procedures have been performed. **Conclusion:** For a surgeon skilled in advanced laparoscopy, the learning curve for LGB is 101-150 procedures. This suggests that the learning curve for bariatric surgeons not skilled in advanced laparoscopy may be much longer.

Bariatric-s188

ROLE OF ROUTINE INTRA-OPERATIVE ENDOSCOPY IN LAPAROSCOPIC BARIATRIC SURGERY. J.K. Champion M.D. Department of Surgery, Emory Dunwoody Medical Center, Atlanta, Georgia

Laparoscopic bariatric surgery represents a challenging procedure with a high risk of technical misadventures which may increase post-operative morbidity. Routine intra-operative endoscopy may reduce post-op morbidity. This paper reviews our six year experience.

From April 1995-September 2001, we performed 825 laproscopic bariatric procedures. There were 743 roux gastric bypass, 55 vertical banded gastroplasties, 18 lap-bands and 9 gastric pacemakers. All patients underwent flexible endoscopy by the primary surgeon at completion of the case to assess for technical errors.

There were 34 technical errors (4.1%)identified. There were 29 suture/staple line leaks, 2 bougie perforations, 2 inadvertant stoma closures secondary to the suture line, and 1 mucosal perforation in a gastric pacemaker. All errors were successfully repaired laparoscopically at the time of the procedure. Post-op there were 3 anastamotic leaks. One in the 34 repaired errors (2.9%) and two in the remaining 791 patients (0.25%)

Routine intra-operative endoscopy identifed 34 technical errors in a series of 825 laparoscopic bariatric procedures, with successful repair of 33 (97%).

Bariatric-s187*

EFFECT OF STANDARD VERSUS EXTENDED ROUX LIMB LENGTH ON WEIGHT LOSS AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS. John J Feng MD, Michel Gagner MD, Brian P Jacob MD, Christine A Chu MD, David C Voellinger MD, Theresa Quinn MD, William B Inabnet MD, Daniel M Herron MD, Alfons Pomp MD
institutions: Mount Sinai Minimally Invasive Surgery Center, Mount Sinai School of Medicine, New York, New York

Introduction. Increasing the length of the Roux limb in open Roux-en-Y gastric bypass (RYGB) effectively increases excess weight loss in superobese patients (BMI > 50). Extending RYGB limb length for obese patients with a BMI < 50 could produce similar results. The purpose of this study was to compare such patients who underwent RYGB with standard (< or = 100cm) vs extended (150cm) Roux limb length to 1 year.

Methods. Retrospective data over 2.5 years was reviewed to include patients with BMI < 50 who underwent RYBG with one-year followup (n=31). 26 pts (sRYGB) had limb lengths < or = 100cm: 1pt-45cm, 1-50, 7-60, 1-70, 2-75, 14-100. 5 pts (eRYGB) had 150cm lengths. Postoperative weight loss was compared at 1-year. Significant differences were determined using Student's t-test at $p<0.05$.

Results. Comparing sRYGB vs eRYGB: average age (years) +/- std dev was 39.8 +/- 14 vs 40.2 +/- 12, preop weight (kg) 115.6 +/- 11.7 vs 127.1 +/- 11.1 and preop BMI (kg/m2) 42.7 +/- 4.4 vs 46.2 +/- 3.7 with no significant differences. Average operating time (min) for sRYGB pts was 168 +/- 85 vs 126 +/- 22 for eRYGB pts with estimated blood loss (cc) at 150 +/- 125 vs 112 +/- 58, respectively. At 1 year, avg BMI was 27.7 +/- 5 vs 29 +/- 6.5 with an excess weight loss (%) of 69.0 +/- 21 vs 67.2 +/- 20. In 23/26 sRYGB pts and 4/5 eRYGB pts, >50% excess weight loss was achieved. There were no significant differences in these results between the 2 groups.

Conclusion. In this series, both groups experienced similar >50% excess weight loss at 1 year after RYGB. However, extending Roux limb length from > or = 100 cm to 150 cm did not significantly improve weight loss outcome in patients with BMI < 50.

Bariatric-s189*

COMPARISON OF OBJECTIVE OUTCOMES FOLLOWING LAPAROSCOPIC NISSEN FUNDOPLICATION VERSUS LAPAROSCOPIC GASTRIC BYPASS IN THE MORBIDLY OBESE WITH GERD

Daniel G. Davis, DO, Yashodhan Khajanchee, MBBS, Lee L. Swanstrom, MD, Emma J. Patterson, MD. *Legacy Health System, Portland, Oregon.*

Gastroesophageal reflux disease affects approximately 25-50% of the morbidly obese. The purpose of this study was to objectively compare the effects of gastric bypass surgery on esophageal pH and motility versus the effects of laparoscopic Nissen fundoplication, in the morbidly obese patient with GERD.

Between 1995 and 2000, all patients undergoing laparoscopic Nissen fundoplication(LN) and laparoscopic gastric bypass(LGP) in our practice underwent pre-operative esophageal physiologic studies, which were repeated 6-12 months post-operatively. Both groups met NIH criteria for bariatric surgery. The results of the studies were than compared.

Six patients in each group have completed the studies to date. The LGP group had a mean follow-up of 14.6 months (range 13-18) the LN had a mean of 19.6 months follow-up (range 7-77). The mean BMI was 55 kg/m2 in the LGP group and 39.8 in the LN group. Data means presented in table below, with results of paired t-tests.

	Preop DeMeester	Postop DeMeester	Preop Reflux Score	Postop Reflux Score	Preop LES (mmHg)	Postop LES (mmHg)
LGP	34.76	5.7	2.2	0.16	23.6	29.7
LN	64.38	2.8	3.5	0.5	12.9	35.5
p-value	0.2	0.3	0.01	0.07	0.07	0.34

Results of this study show that laparoscopic gastric bypass and laparoscopic Nissen fundoplication are both effective in treating GERD. The type of surgery did not have an impact on overall results, since both groups improved. The well established health benefits of weight loss after laparoscopic gastric bypass should make this operation the procedure of choice in the morbidly obese patient with GERD.

Bariatric-s190

LAPBANDR.: ITALIAN EXPERIENCE ON 2602 PATIENTS OPERATED IN 6 YEARS. Angrisani Furbetta, Doldi,Basso, Lucchese, Giacomelli, Zappa,Lattuada, DiCosmo, Veneziani, Turicchia, Favretti, Alkilani, Forestieri, Lesti, Puglisi, Toppino, Campanile, Capizzi, D'Atri ,Scipioni ,Giardiello ,DiLorenzo , Lacitignola,Belvederesi,Marzano,Bernante,Iuppa,Lorenzo, Italian Group for Lap Band – GILB, Naples - Italy

LapBand System procedure is the most common bariatric surgical procedure worldwide. This is an interim report of the experience of the 28 Italian Centres participating to the national Collaborative study group for LapBand (GILB).Methods. An electronic database was specifically created. It was e-mailed to all the surgeons performing Laparoscopic Gastric Banding System operation in Italy. Statistical analysis was perfomed by mean of Fisher exact test. Results. From October 1994, 2602 patients (1883F/719M;mean BMI:44.3±4.2, range 30.4-83.6 Kg/m2, mean age:38.03±11, range:15-74 yr.) have been recruited. Mortality rate has been 0.38% (10/2602), mainly due to cardiovascular complications (myocardial infarction, pulmonary embolism). Laparotomic conversion rate has been 2.3% (59/2602) and was more frequent in super-obese (BMI>50) patients in respect to morbid (BMI>50) obese patients ($p<0.05$). Postoperative complications in 289/2602 (11.1%) patients were: tube-port failure (n=116;40.1%),gastric pouch dilation (n=138;47.7%), gastric erosion (n=35;12.1%).Most of Gastric pouch dilation (67.3%) presented during the first 50 operated patients/centre. The incidence of gastric pouch dilation decrease with growing surgeon's experience. Surgery for complications was often performed by laparoscopy, rarely via laparotomy. No death was recorded as consequence of surgery to treat complications. Weight loss has been evaluated at the following intervals: 6,12,24,36,48 and 60 months, with BMI 39.9,36.4,32.2,33.1,32.7 and 31,1 Kg/m2, and was significantly different between super-obese and morbid-obese group. Preoperative comorbidities (hypertension, diabetes, respiratory symptoms, degenerative arthritis) in superobese patients were improved and/or completely disappeared 12 months following Lap Band. Conclusions:LapBand system is a surgical procedure with very low mortality, low morbidity rate and satisfactory weight loss.Surgery for complications can be safely performed by laparoscopy.

Poster Program

Chair: Peter Crookes, MD, **Co-Chair:** Manabu Yamamoto, MD **Location:** Sutton Complex, 2nd Floor of the New York Hilton

Hours: Thursday, March 14 **10:00AM - 4:00PM**
(Poster Award Winners only)

Friday, March 15 **10:00AM - 4:00PM**
(Topics on display: Bariatric, Colorectal/Intestinal Surgery, Complication Of Surgery, Education/Outcomes, Ergonomics/Instrumentation, Esophageal/Gastric Surgery, Flexible Diagnostic & Therapeutic Endoscopy, Thoracoscopy & Poster Award Winners)

Saturday, March 16 **10:00AM - 4:00PM**
(Topics on display: Hepatobiliary/Pancreatic Surgery, Hernia Surgery, Minimally Invasive Other, New Techniques/ Technology, Solid Organ Removal & Poster Award Winners)

The poster session is where you are likely to glimpse ideas of the future, experience and techniques from countries around the globe. Most posters will only be displayed for one day, either Friday or Saturday, depending on the topic. The Award Winning Posters will be on display at the entrance of the Sutton Complex on Thursday, Friday *and* Saturday. Poster presenters will be available for discussion at their posters on the day of their presentation, Friday or Saturday, from 11:30AM - 12:30PM.

Poster Award Winners, Thursday - Saturday

BARIATRIC SURGERY

PA001 Fielding, George "RESULTS IN CHANGE IN TECHNIQUE WITH LAPAROSCOPIC GASTRIC BANDING"

PA002 Papasavas, Pavlos "OUTCOME ANALYSIS OF LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY: THE FIRST 116 CASES"

PA003 Ren, Christine "IMPACT OF DEDICATED TRAINING IN LAPAROSCOPIC BARIATRIC SURGERY ON OUTCOME"

PA004 Rutledge, Robert "WEIGHT LOSS AFTER OPEN, LAPAROSCOPIC ROUX-EN-Y AND MINI GASTRIC BYPASS FOR MORBID OBESITY"

PA005 Suter, Michel "LAPAROSCOPIC GASTRIC BANDINGL BEYOND THE LEARNING CURVE"

PA006 Tarnoff, Michael "ENDOSCOPIC INJECTION OF FIBRIN GLUE: AN ADJUNCT TO NONOPERATIVE MANAGEMENT OF POST-GASTRIC BYPASS ANASTAMOTIC LEAK AND GASTROGASTRIC FISTULA"

BASIC SCIENCE

PA007 Are, Chandrakanth "REDUCED GUT BLOOD FLOW DURING LAPAROSCOPIC NISSEN FUNDOPLICATION-SIMILAR TO PERICARDIAL TAMPONADE?"

PA008 Kim, Zun-gon "IMPACT OF DOPAMINE AND ENDOTHELIN-1-ANTAGONISM ON LIVER FUNCTION DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY."

PA009 Kirman, Irena "EPCAM VACCINE INHIBITS TUMOR GROWTH IN ANESTHESIA CONTROL BUT NOT LAPAROTOMIZED OR Co2 INSUFFLATED MICE BEARING EPCAM EXPRESSING ADENOCARCINOMA"

PA010 Kirman, Irena "NATURALLY OCCURRING IGG ANTIBODIES TO EPCAM IN COLON CANCER AND CONTROL PATIENTS"

PA011 Ziprin, Paul "LAPAROSCOPY REDUCES ADHESION FORMATION BY ENHANCING MESOTHELIAL CELL FIBRINOLYTIC ACTIVITY VIA A DOWN REGULATION OF PLASMINOGEN ACTIVATOR INHIBITOR-1 (PAI-1) LEVELS"

COLORECTAL/INTESTINAL SURGERY

PA012 Konstantinidis, Konstantinos "LAPAROSCOPIC APPROACH IN SMALL BOWEL SURGERY"

PA013 Madbouly, Khaled "SYMPTOM DIRECTED LAPAROSCOPIC REPAIR OF RECTAL PROLAPSE: A COMPARISON OF THE WELLS PROCEDURE AND RESECTION RECTOPEXY"

PA014 Mascio, Christopher "OUTCOME ANALYSIS OF ROUTINE LAPAROSCOPIC APPENDECTOMY, SELECTIVE LAPAROSCOPIC APPENDECTOMY AND OPEN APPENDECTOMY"

PA015 Targarona, Eduardo "LEFT COLECTOMY: A COMPARISON BETWEEN LAPAROSCOPIC AND HAND ASSISTED TECHNIQUE."

EDUCATION/OUTCOMES

PA016 Grantcharov, Teodor "TEACHING AND TESTING SURGICAL SKILLS ON A VIRTUAL REALITY LAPAROSCOPY SIMULATOR - DEFINITION OF FACTORS AFFECTING PERFORMANCE."

PA017 Mcbride, Corrigan "SLEEP DEPRIVATION DOES NOT IMPAIR LEARNING OF LAPAROSCOPIC SKILLS"

PA018 Nutt, Mike "EFFECTS OF VARIOUS ENVIRONMENTAL STIMULI ON THE LEARNING OF BASIC VIRTUAL REALITY LAPAROSCOPIC SKILLS"

ESOPHAGEAL/GASTRIC SURGERY

PA019 Lucktong, Tananchai "CIRCUMFERENTIAL ESOPHAGEAL MUCOSECTOMY WITH PROSTHETIC REPLACEMENT"

PA020 Winslow, Emily "INFLUENCE OF SPASTIC ESOPHAGEAL MANOMETRIC FEATURES ON OUTCOMES OF LAPAROSCOPIC ANTIREFLUX SURGERY"

PA021 Zornig, Carsten "LAPAROSCOPIC FUNDOPLICATION NISSEN VS. TOUPET. A PROSPECTIVE RANDOMIZED STUDY OF 200 PATIENTS REGARDING PREOPERATIVE ESOPHAGEAL MOTILITY."

FLEXIBLE DIAGNOSTIC & THERAPEUDIC ENDOSCOPY

PA022 Hunerbein, Michael "ON DEMAND ENDOSONOGRAPHY OF UPPER GI TRACT CANCER USING MINIPROBES OR ENDOSCOPIC ULTRASONOGRAPHY"

HEPATOBILIARY/PANCREATIC SURGERY

PA023 Schmandra, Thomas "RISK OF GAS EMBOLISM IN CONVENTIONAL VERSUS MODIFIED HAND-ASSISTED LAPAROSCOPIC HEPATIC RESECTION"

PA024 Tranter, Sheena "LAPAROSCOPIC BILE DUCT EXPLORATION CAUSES MORE MORBIDITY THAN CHOLECYSTECTOMY ALONE: A MATCHED CONTROLLED STUDY"

MINIMALLY INVASIVE OTHER

PA025 Ainslie, William "MICROPUNCTURE CHOLECYSTECTOMY: A RANDOMISED CONTROLLED TRIAL."

PA026 Martin, Iain "WARMING AND HUMIDIFICATION OF CARBON DIOXIDE INSUFFLATION GAS SHORTENS THE TIME TAKEN TO RETURN TO NORMAL ACTIVITY AFTER LAPAROSCOPY."

PA027 Rao, Venkat "A NOVEL TECHNIQUE OF LAPAROSCOPIC MANAGEMENT OF SUPERFICIAL HYDATIDOMAS OF THE LIVER."

PA028 Rosin, Danny "EFFECTS OF ACUTE BOWEL OBSTRUCTION ON INTRACRANIAL PRESSURE: OBSERVATIONS IN A LARGE ANIMAL MODEL"

PA029 Wilson, Erik "COMBINED LAPAROSCOPIC NISSEN FUNDOPLICATION AND CHOLECYSTECTOMY: INCREASED ASSOCIATION BETWEEN GASTROESOPHAGEAL REFLUX AND BILIARY DISEASE"

NEW TECHNIQUES/TECHNOLOGY

PA030 Kim, Won Woo "LAPAROSCOPICALLY HARVESTING OF SMALL BOWEL GRAFT FOR SMALL BOWEL TRANSPLANTATION"

BARIATRIC SURGERY

PF001 Adusumilli, Prasad "PATHOLOGICAL FINDINGS AND HELICOBACTER PYLORI INFECTION IN ASYMPTOMATIC PATIENTS UNDERGOING BARIATRIC SURGERY"

PF002 Ben-meir, Aviv "FEASIBILITY OF CHOLECYSTECTOMY AT TIME OF ROUX-EN-Y GASTRIC BYPASS."

PF003 Bokobza, Bernard "COMPLICATIONS RELATED TO THE USE OF THE PERI-GASTRIC BAND : STUDY OF 120 PATIENTS."

PF004 De Caestecker, James "USE OF AN EEA STAPLER SIMPLIFIES THE JEJUNO-JEJUNOSTOMY OF LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS"

PF005 Elariny, Hazem "EARLY RESULTS OF LAPAROSCOPIC NON-BANDED VERTICAL GASTROPLASTY WITH SLEEVE GASTRECTOMY (WITHOUT DUODENAL SWITCH) IN THE TREATMENT OF MORBID OBESITY"

PF006 Gould, Jon "TRANSGASTRIC INSERTION OF THE CIRCULAR STAPLER ANVIL IN LAPAROSCOPIC GASTRIC BYPASS"

PF007 Hamad, Giselle "ELECTIVE CHOLECYSTECTOMY DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: IS IT WORTH THE WAIT?"

PF008 Johson, Beverly "THE OR TEAM CONCEPT IN LAPAROSCOPIC GASTRIC BYPASS SURGERY"

PF009 Madan, Atul "LAPAROSCOPIC OBESITY SURGERY ON THE INTERNET"

PF010 Maresca, Michele "SINGLE CENTRE EXPERIENCE WITH LAP BAND SYSTEMR., OPEN AND LAPAROSCOPIC GASTRIC BYPASS FOR THE TREATMENT OF MORBID OBESITY."

PF011 Masoni, Luigi "LAPAROSCOPIC BILIO INTESTINAL BY-PASS FOR MORBID OBESITY: PRELIMINARY REPORT ON FIVE CASES."

PF012 Mattar, Samer "SHOULD CHOLECYSTECTOMY BE A ROUTINE PART OF LAPAROSCOPIC GASTRIC BYPASS FOR OBESITY: A COST ANALYSIS"

PF013 McCormick, James "LAPAROSCOPIC REVISION OF FAILED OPEN BARIATRIC PROCEDURES"

PF014 Mehta, Vishal "LAPAROSCOPIC BARIATRIC SURGERY FOR THE TREATMENT OF SUPER-OBESITY: BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH AND ROUX EN Y GASTRIC BYPASS WITH LONG LIMB: 24 MONTH FOLLOW-UP"

PF015 Ritchie, James "THE IMPORTANCE OF THE PARS FLACCIDA POSITION IN LAPAROSCOPIC GASTRIC BANDING- A COMPARISON OF COMPLICATION RATES IN 151 CASES OF LAP BANDING AND 174 CASES OF THE SWEDISH ADJUSTABLE GASTIC BAND"

PF016 Schmoeller, Friedrich "LAPAROSCOPIC REOPERATIONS FOR COMPLICATIONS OF LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING."

PF017 Sims, Thomas "ROUTINE UPPER GASTROINTESTINAL GASTROGRAFIN SWALLOW AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS"

PF018 Spivak, Hadar "PROSPECTIVE STUDY OF 298 PATIENTS UNDERGOING LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING USING THE TWO-STEP TECHNIQUE. A TECHNIQUE TO PREVENT POSTOPERATIVE SLIPPAGE"

PF019 Szomstein, Samuel "ANALYSIS OF DIFFERENT LAPAROSCOPIC TECHNIQUES FOR ROUX-EN-Y GASTRIC BYPASS"

PF020 Voellinger, David "LAPAROSCOPIC SLEEVE GASTRECTOMY IS A SAFE AND EFFECTIVE PRIMARY PROCEDURE FOR BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH"

PF021 Yeaney, Woodrow "CASE REPORT: GASTRIC PERFORATION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY"

PF022 Are, Chandrakanth "THE PROPERTIES OF PNEUMOPERITONEUM MODIFIES ACUTE PHASE RESPONSE INDUCED BY BACTERIAL LIPOPOLYSACCHARIDE

PF023 Gutt, Carsten "BODY POSITION AND DESUFFLATION INFLUENCES PORTAL VENOUS FLOW DURING PNEUMOPERITONEUM"

PF024 Jobe, Blair "THE EFFECT OF TOPICAL ANESTHETIC ON ESOPHAGEAL MOTILITY TEST RESULTS"

PF025 Kim, Zun-gon "IMPACT OF IMPROVED HEPATIC BLOOD FLOW ON LIVER METASTASES DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY."

PF026 Veldkamp, Ruben "CHANGES IN THE MORPHOLOGY OF THE PERITONEUM AFTER LAPAROSCOPIC SURGERY: GAS OR STRETCHING? "

COLORECTAL/INTESTINAL SURGERY

PF027 Ardhanari, Ramesh "LAPAROSCOPIC SINGLE LAYER HAND SUTURED GASTRO JEJUNOSTOMY"

PF028 Ardhanari, Ramesh "LAPAROSCOPIC HAND SUTURED RECONSTRUCTION AFTER HARTMAN'S PROCEDURE"

PF029 Billy, Helmuth "TOTAL LAPAROSCOPIC PROCTECTOMY WITH SPHINCTER PRESERVATION FOR DISTAL VILLOUS ADENOMA OF THE RECTUM"

PF030 Chen, William "INTRACORPOREAL ANASTOMOSIS VS. DIRECT VISUALIZED ANASTOMOSIS IN LAPAROSCOPIC-ASSISTED ANTERIOR RESECTION"

PF031 Chinnusami, Palanivelu "LAPAROSCOPIC REPAIR OF COLO-VESICAL FISTULA"

PF032 Chock, Alana "NEEDLESCOPIC APPENDECTOMY: ANOTHER OPTION"

PF033 Chock, Alana "LAPAROSCOPIC SMALL BOWEL RESECTION: LAPAROSCOPIC ASSISTED AND TOTALLY LAPAROSCOPIC APPROACH"

PF034 Chowdhury, Humayun "UNCOMMON GALL BLADDER ANATOMY ENCOUNTERED DURING LAPAROSCOPIC CHOLECYSTECTOMY ."

PF035 Chowdhury, Humayun "LAPAROSCOPIC APPENDICECTOMY-DESERVES MORE ATTENTION IN THE DEVELOPING COUNTRIES"

PF036 Costi, Renato "LAPAROASSISTED SUBTOTAL COLECTOMY WITH ANTIPERISTATLTIC CAECOPROCTOSTOMY FOR COSTIPATION"

PF037 Diamond, Ivan "LAPAROSCOPY IN THE MANAGEMENT OF COLONIC DUPLICATION"

PF038 Dubsky, Peter "LAPAROSCOPICALLY ASSISTED SURGERY IN CROHN`S DISEASE"

PF039 Fujii, Shoichi "LAPAROSCOPIC ASSISTED COLECTOMY WITH COLON-LIFTING METHOD BY THREAD FOR COLON AND RECTAL CANCER"

PF040 Fujiwara, Senko "ILEUS FOLLOWING COLONOSCOPY REPORT OF A CASE.."

PF041 Gibeily, George "LATE PRESENTING COMPLICATED APPENDICITIS;A NOVEL APPROACH TO A COMPLICATED PROBLEM"

PF042 Grubnik, Volodymyr "LAPAROSCOPIC TREATMENT OF COMPLICATED DUODENAL ULCERS"

PF043 Hamad, Mostafa "LAPAROSCOPIC SUTURED ANASTOMOSIS OF THE BOWEL. TECHNIQUE AND LEARNING CURVE."

PF044 Hasegawa, Hirotoshi "LAPAROSCOPIC RESTORATIVE PROCTOCOLECTOMY FOR PATIENTS WITH ULCERTATIVE COLITIS"

PF045 Hsiao, Koung-hung "LAPAROSCOPIC TOTAL ABDOMINAL COLECTOMY FOR SLOW TRANSIT COLON"

PF046 Inge, Thomas "COST ANALYSIS OF STAPLED AND LIGATED TECHNIQUES OF LAPAROSCOPIC APPENDECTOMY IN CHILDREN"

PF047 Inokuchi, Mikito "LAPAROSCOPIC COLECTOMY WITH INTRACORPOREAL FUNCTIONAL END-TO-END ANASTOMOSIS"

PF048 Inufusa, Haruhiko "LAPAROSCOPIC LYMPHADENECTOMY OF COLORECTAL CANCER BY 3 PORTS METHOD."

PF049 Kamei, Shusaku "EVALUATION OF CONVERTED CASES IN LAPAROSCOPIC TREATMENTS FOR SMALL BOWEL OBSTRUCTION"

PF050 Kasai, Yasushi "LAPAROSCOPIC TOTAL COLECTOMY FOR ULCERATIVE COLITIS"

PF051 Kim, Seon Han "ONE HUNDRED AND FIFTEEN CONSECUTIVE LAPAROSCOPIC COLECTOMIES WITHOUT OPERATIVE MORTALITY"

PF052 Kobayashi, Michiya "LAPAROSCOPIC ASSISTED COLECTOMY FOR COLON CANCER - EVALUATION OF OUR 5 CONVERTED CASES"

PF053 Korolija, Dragan "BLOOD LOSS IN LAPAROSCOPIC VS OPEN COLORECTAL SURGERY.META-ANALYSIS"

PF054 Lau, Stanley "COMBINED LAPAROSCOPIC ASSISTED RIGHT HEMICOLECTOMY AND LOW ANTERIOR RESECTION FOR SYNCHRONOUS COLORECTAL CARCINOMAS"

PF055 Lirici, Marco "COMBINING ULTRASONIC DISSECTION AND THE STORZ OPERATION RECTOSCOPE: AN EFFECTIVE NEW APPROACH TO TRANSANAL ENDOSCOPIC MICROSURGERY"

PF056 Marcello, Peter "LAPAROSCOPIC PROCTECTOMY WITH ILEOANAL POUCH AFTER LAPAROSCOPIC TOTAL COLECTOMY: A COMPARATIVE STUDY"

PF057 Michelet, Ivan "LAPAROSCOPIC MANAGEMENT OF PERFORATED PEPTIC ULCER"

PF058 Okuda, Junji "LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER - MILLENNIUM STRATEGY"

PF059 Paluch, Tom "THE LEARNING CURVE IN LAPAROSCOPIC COLECTOMY: MAKING A MOLEHILL OUT OF THE MOUNTAIN"

PF060 Ravo, Biagio "COMBINED LAPAROSCOPIC-COLONOSCOPIC COLON RESECTION AND ANASTOMOSIS BY INTUSSUSCEPTION"

PF061 Ray, Subir "SINGLE SURGEONS EXPERIENCE OF 121 CONSECUTIVE LAPAROSCOPIC APPENDECTOMIES AT A COMMUNITY HOSPITAL."

PF062 Recio, Patrick "LAPAROSCOPIC TREATMENT OF SMALL INTESTINAL DISORDERS: A TEN YEAR EXPERIENCE"

PF063 Rivas, Homero "LAPAROSCOPIC MANAGEMENT OF MECKEL'S DIVERTICULUM IN ADULTS."

PF064 Shirota, Yoshinori "LAPAROSCOPIC ASSISTED ANTERIOR RESECTION WITH AUTONOMIC NERVE PRESERVATION FOR RECTAL CANCER."

PF065 Suga, Hiroyasu "ENDOSCOPIC HEMOSTASIS WITH FIBRIN GLUE TO HEMORRHAGE OF UPPER DIGESTIVE CANAL."

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PF067 Takenaka, Satoru "IDENTIFICATION AND SPARING TECHNIQUE OF VAGUS NERVE IN LAPAROSCOPIC GASTRECTOMY"

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PF083 Faife, Barbara "MORBILIDITY AND MORTALITY AFTER LAPAROSCOPIC SURGERY. OUR EXPERIENCE IN 3869 CASES."

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PF087 Kimura, Taizo "BILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY.."

PF088 Kurumiya, Takashi "ASSESSMENT OF LAPAROSCOPIC CHOLECYSTECTOMY FOR SEVERE ACUTE CHOLECYSTITIS REQUIRING TREATMENT BY PTGBD"

PF089 Kusano, Toshiomi "DUCT-TO-DUCT ANASTOMOSIS AFTER TRANSECTION OF THE RIGHT HEPATIC DUCT DURING LAPAROSCOPIC CHOLECYSTECTOMY – SIX YEARS FOLLOW-UP –."

PF090 Milic, Dragan "COAGULATION DISORDERS IN THE PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY"

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PF172 Kimura, Masayuki "MINIMALLY INVASIVE SURGERY FOR GASTRIC CANCER (LADG:LAPAROSCOPY-ASSISTED DISTAL GASTRECTOMY)"

PF173 Lagoo, Sandhya "HISTOLOGICAL CHANGES IN CANINE ESOPHAGEAL MUCOSA FOLLOWING ACID REFLUX AND MIXED ACID AND ALKALINE REFLUX"

PF174 Lee, Sang-woong "PREOPERATIVE SIMULATION OF LAPAROSCOPIC ASSISTED GASTRECTOMY FOR EARLY GASTRIC CANCER WITH THREE-DIMENSIONAL IMAGING BY MULTIDETECTOR HELICAL CT"

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PF176 Madan, Atul "THE MYTH OF THE SHORT ESOPHAGUS"

PF177 Mochizuki, Yoshinari "A CLINICAL PATHWAY FOR LAPAROSCOPIC DIATAL GASTRECTOMY"

PF178 Morales-Conde, Salvador "INDICATIONS AND MANAGEMENT OF PROTHESES TO CLOSE THE CRURA DURING LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL HERNIAS"

PF179 Nelms, Cynthia "MINIMALLY INVASIVE MANAGEMENT OF ESOPHAGEAL DIVERTICULI"

PF180 O'Rourke, Robert "SHORT ESOPHAGUS AND ITS IMPACT ON FAILURE AFTER NISSEN FUNDOLICATION"

PF181 Ozawa, Soji "VIDEO-ASSISTED THORACIC SURGERY AND LAPAROSCOPIC SURGERY FOR CANCER OF THE THORACIC ESOPHAGUS."

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PF191 Urushihara, Takashi "GASTRIC MOTILITY AFTER LAPAROSCOPIC ASSISTED DISTAL GASTRECTOMY, WITH/WITHOUT PRESERVATION OF THE PYLORUS FOR EARLY GASTRIC CANCER AS ASSESSED BY DYNAMIC X-RAY IMAGING"

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PF194 Villegas, Leonardo "LAPAROSCOPIC HELLER MYOTOMY WITH BOLSTERING PARTIAL FUNDOPLICATION FOR ACHALASIA."

PF195 Weber, Kaare "COMPARISON OF LAPAROSCOPIC AND OPEN GASTRECTOMY FOR MALIGNANT DISEASE"

PF196 Wilson, Erik "ESOPHAGOGASTRIC FISTULA AS A RARE CAUSE OF FAILURE OF LAPAROSCOPIC NISSEN FUNDOPLICATION"

PF197 Yamashita, Toshiki "LAPAROSCOPY ASSISTED PROXIMAL GASTRECTOMY FOR EARLY GASTRIC CANCER"

PF198 Y_Sel, Nedim "RESULTS OF LAPAROSCOPIC GASTRIC BANDING FOR OBESITY CONSIDERING THE PORT FUNCTION"

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PF200 Hagiike, Masanobu "USEFULLNESS OF TOTAL COLONOSCOPY AND ENDOSCOPIC POLYPECTOMY IN HEMODIALYSIS PATIENTS."

PF201 Hazzan, David "ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY AND PAPILLOTOMY FOR BILE DUCT STONES IN PATIENTS 80 YEARS OLD AND OLDER-A SAFE PROCEDURE"

PF202 Kelessis, Nickos "IS GASTROSCOPY A VALID DIAGNOSTIC TOOL IN DETECTING GASTRIC MALT LYMPHOMAS? A DILEMMA BEYOND THE EYE"

PF203 Lagares-Garcia, Jorge "COLONOSCOPY IN OCTOGENARIANS"

PF204 Low, Donald "REMOVAL OF ESOPHAGEAL EXPANDABLE METAL STENT: DESCRIPTION OF TECHNIQUE AND REVIEW OF POTENTIAL APPLICATIONS"

PF205 McGuire, Tim "CAUSTIC INJURY OF THE UPPER GASTROINTESTINAL TRACT- A TWENTY YEAR EXPERIENCE IN AN URBAN HOSPITAL"

PF206 Murcia, Mario "COMPARISON OF SURGICAL VERSUS ENDOSCOPIC PALLIATION OF PANCREATIC CANCER"

PF207 Newlin, Matthew "INTRAOPERATIVE ENTEROSCOPY IN THE EVALUATION OF SMALL BOWEL DISEASE: INDICATIONS AND TREATMENT ALGORITHM FOR THE SURGEON"

PF208 Sekac, Jaroslav "THE TREATMENT OF UNRESECTABLE ESOPHAGEAL CANCER WITH SELF-EXPANDING STENTS."

PF209 Yamagiwa, Kentaro "THE ROLE OF FLEXIBLE THERAPEUTIC ENDOSCOPY (FTE) AND INTERVENTIONAL RADIOLOGY (IVR) FOR THE HEPATO-BILIARY-PANCREATIC (HBP) SURGICAL DISEASE"

PF210 Ziegler, Daniel "COMPARISON OF ENDOSCOPIC SCLEROTHERAPY VERSUS ENDOSCOPIC LIGATION OF ESOPHAGEAL VARICES"

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PF211 Takagi, Sumito "STRATEGY OF LAPAROSCOPIC HEPATECTOMY FOR EXTRAHEPATIC GROWING TUMOR"

THORACOSCOPY

PF212 Abdulkarim, Amal "HIGHLY SELECTIVE SYMPATHOTOMY"

PF213 Akashi, Akinori "THE USE OF NON-CONTACTED AND WIDE SPREAD ND-YAG LASER TIP WITH Y-SHAPED STOPPER IN THORACOSCOPIC LUNG VOLUME REDUCTION SURGERY FOR DIFFUSE CHRONIC EMPHYSEMA"

PF214 Al Dohayan, Abdullah "THORACOSCOPIC MANAGEMENT OF HYPERHYDROSIS (SYMPATHECTOMY, SYMPATHOCTOMY, SYMPATHETIC CLIPPING)"

PF215 Al Otiaby, Ahmed "LAPAROSCOPIC PERCAUTANEOUS REPAIR OF INCISIONAL HERNIA"

PF216 Al-otiaby, Ahmed "COMPARISON BETWEEN THORACOSCOPIC SYMPATHECTOMY AND SYMPATHETIC CLIPPING."

PF217 Aoe, Motoi "THORACOSCOPIC THYMECTOMY FOR PATIENTS WITH MYASTHENIA GRAVIS. (EXTENDED THYMECTOMY THROUGH COLLAR INCISION WITH VIDEO-ASSISTED THORACIC SURGERY)"

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PF219 Hamada, Yoshiro "VIDEO-ASSISTED SURGERY FOR PERSISITENT THORACIC FLUID COLLECTION"

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PF221 Kurihara, Masatoshi "THE APPLICATION OF ULTRASONICALLY ACTIVATED TROCAR SYSTEM TO THE INSERTION OF THORACOSCOPIC TROCARS"

PF222 Mori, Takahiro "THORACOSCOPIC ESOPHAGECTOMY FOR A CASE OF LOCAL RECURRENCE AFTER RADIATION THERAPY"

PF223 Morikawa, Toshiaki "TECHNICAL FEASIBILITY OF THORACOSCOPIC SEGMENTECTOMY OF LUNG"

PF224 Nishimura, Mitsuyo "HAND-ASSISTED THORACOSCOPIC ESOPHAGECTOMY"

PF225 Ramakrishnan, Parthasarathi "THORACOSCOPIC EXTRACTION OF IMPACTED FOREIGN BODY ESOPHAGUS"

PF226 Saxena, Deepak "ROLE OF LAPROSCOPIC SURGERY IN ACUTE ABDOMEN (247 CASES)- A RETROSPECTIVE STUDY"

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PS002 Alexakis, Nikolaos "LATENT COLON ADENOCARCINOMA DISCOVERED DURING OR AFTER LAPAROSCOPIC CHOLECYSTECTOMY"

PS003 Alexander, Kelly "FLEXIBLE STAGING LAPAROSCOPY FOR UPPER GASTROINTESTINAL MALIGNANCIES - IMPROVING YIELD THROUGH FAILURE ANALYSIS"

PS004 Alexander, Kelly "LAPAROSCOPIC CHOLECYSTECTOMY IN ELDERLY PATIENTS"

PS005 Andoh, Hideaki "LAPAROSCOPIC CHOLECYSTECTOMY FOR SUSPECTED EARLY GALLBLADDER CANCER"

PS006 Barczynski, Marcin "ROUTINE LOW-VERSUS STANDARD-PRESSURE PNEUMOPERITONEUM DURING LAPAROSCOPIC CHOLECYSTECTOMY - INITIAL RESULTS OF PROSPECTIVE RANDOMIZED CLINICAL TRIAL"

PS007 Berber, Eren "LAPAROSCOPIC RADIOFREQUENCY ABLATION OF LIVER TUMORS COMBINED WITH OTHER SURGICAL PROCEDURES"

PS008 Brasesco, Oscar "ACUTE CHOLECYSTITIS DUE TO GALLBLADDER CROHN'S DISEASE"

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Bariatric Surgery-PF001

PATHOLOGICAL FINDINGS AND HELICOBACTER PYLORI INFECTION IN ASYMPTOMATIC PATIENTS UNDERGOING BARIATRIC SURGERY

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Introduction: Studies suggest that the incidence of Helicobacter pylori (H.pylori) infection and gastritis in obese patients, including those undergoing gastric reduction surgery, may be increased.

Methods: Histological findings at the time of surgery in a series of patients who were undergoing Roux-en-Y gastric bypass (RYGBP) for morbid obesity were analyzed. Pathological material obtained from the bypass anastomosis was reviewed for the presence of gastritis and H. pylori. The presence of H. pylori was demonstrated using a hematoxylin- and eosin- stained biopsies.

Results: 341 morbidly obese patients underwent bariatric surgery between January 1999 and August 2001 by two surgeons at a single institution. Of 290 patients undergoing RYGBP, material for histological examination was available in 212 patients (73%). Gastritis was present in 85 patients (40%), active chronic gastritis in 28 (13%) and chronic gastritis in 57 (27%). H. pylori were present in 20 patients (9.4%). One in four patients with gastritis was positive for H. pylori. H. pylori were present in 15 patients with active chronic gastritis (56%) and in 5 patients with chronic gastritis (9%). The absence of H. pylori in gastritis positive patients was confirmed by further testing the biopsies with giemsa stain and modified Diff-quick method.

Conclusions: Our case series contradicts the recently published reports that the incidence of Helicobacter pylori in asymptomatic patients undergoing bariatric surgery is higher. In fact the incidence is lower than that found in age-matched controls.

Bariatric Surgery-PF002

FEASIBILITY OF CHOLECYSTECTOMY AT TIME OF ROUX-EN-Y GASTRIC BYPASS. Aviv Ben-Meir, M.D., Anna Miller, R.N., Courtney Holbrook, Ph.D., and Bruce D. Schirmer, M.D. Department of Surgery, University of Virginia, Charlottesville, Virginia.

INTRODUCTION We performed a retrospective review of our database to determine if there was any added morbidity from performing cholecystectomy at the time of roux-en-y gastric bypass and to assess the increase in our operative time.

METHODS AND PROCEDURES We performed a chart review of our gastric bypasses over the last 3 years.

RESULTS Since July 1998, we have perfomed 226 gastric bypasses, of which 51 were completed laparoscopically. Of the total number of gastric bypasses, 96 included other procedures such as herniorraphies or extensive adhesiolysis. An additional 36 patients either required conversion from laparoscopic to open bypass or were patients with vertical banded gastroplasties converted to roux-en-y gastric bypasses. Operative times for the remaining 94 patients were reviewed and compared. We performed 29 open gastric bypasses with a mean operative time of 198 minutes. During this time period, we also performed 28 open gastric bypasses with cholecystectomy with a mean operative time of 211 minutes. We performed 16 laparoscopic gastric bypasses with a mean operative time of 256 minutes. We added cholecystectomy to laparoscopic gastric bypass in 21 patients with a mean operative time of 300 minutes. One patient that underwent cholecystectomy at the time of laparoscopic gastric bypass presented to the emergency room on postoperative day 5 with gallstone pancreatitis secondary to retained common duct stone. This was treated via a percutaneous transhepatic route.

CONCLUSION Cholecystectomy can be performed safely in the setting of gastric bypass regardless of open or laparoscopic approach adding 13 minutes to our mean open operative times and 44 minutes to our mean laparoscopic operative times.

Bariatric Surgery-PF003

COMPLICATIONS RELATED TO THE USE OF THE PERI-GASTRIC BAND : STUDY OF 120 PATIENTS. B. Bokobza, A. Le Roux, E. Bisson, F. Kasawat Département de Chirurgie Générale – Groupe Hospitalier du Havre – BP 24 76083 Le Havre Cedex

From 06/07/98 to 06/02/01 (30 months) 120 patients were operated for morbid obesity by one single surgeon. This study included 108 women (90%) and 12 men (10%). Average BMI was 46.6 (36-77), average weight 126 kg (93-225).118 Lap-Bands (Bioenterics®) and 2 Swedish bands (Obtech®) were implanted. At 12 months, 65 patients could be evaluated, with an average weight decrease from 126 to 96 kg.

Port complications : 4 reversals due to suture failure (prolène 00), and 2 catheter disconnections (retrieved by laparoscopy).

Band complications : one porous band that was impossible to inflate at month 4 was recorded. It was changed under laparoscopy using the « small train » technique. Two gastric penetrations were also recorded : weight loss stopped at month 9, and the barium x-ray showed the band inside the stomach. Yellow discharge was also observed in the port. Removed laparoscopically at month 24. Abscess at the port site at month 5 after the removal of a bezouard by fibroscopy two months before. Ablation by a conversion laparotomy (a paralytic ileus made laparoscopy impossible). Four peroperative complications led to 2 conversions due to the position of the trocarts and to a gastric perforation. Two port site haematomas necessitated re-intervention at H2 and D3. 10 dilatations of the stomach with aphagia (8.3%) resulting from the anterior large tuberosity sliding over the band, after an average period of 9.1 month (3-20), required 2 laparoscopic ablations (end of the weight loss), 2 laparoscopic repositionnings (one secondary failure) and 7 laparoscopic implantations of new bands. Patient related problems were linked to difficult follow-up, as 8 patients did not re-consult, 1 stopped follow-up at M4, and 50% consulted every one or two months. However, compliance is not a factor of success, and it is probable that women, aged >40, unemployed and depressive, represent a bad indication.

Bariatric Surgery-PF004

USE OF AN EEA STAPLER SIMPLIFIES THE JEJUNO-JEJUNOSTOMY OF LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS James E de Caestecker,M.D., Andreas Castellanos,M.D., Barry D. Mann,M.D., William N. Wang, M.D., Medical College of Pennsylvania Department of Surgery, Philadelphia, Pennsylvania, Hahnemann University Hospital, Department of Surgery, Philadelphia, Pennsylvania

OBJECTIVE: Laparoscopic Roux Y gastric Bypass has revolutionized the field of bariatric surgery. One of the most difficult steps is the jejuno-jejunostomy, which by most popular techniques, requires 2 applications of the endo-GIA stapler.Closure of the common channel formed by the first application of the device is often difficult to perform particularly when it has become enlarged by manipulation and threatens to narrow the caliber of the Roux limb.We describe a method of introducing the anvil of a EEA to the desired point in the Roux limb.**PROCEDURE:**After transecting the jejunum 40cm distal from the ligament of treitz the Roux limb is measured 75-150cm distally and marked with an endoclip.The anvil of a 21mm EEA is placed through the open end of a 16Fr red rubber catheter and the other end is cut. A 4Fr EET exchanger catheter is then placed as a stiffener through the catheter into the open end of the anvil.The anvil and attached catheters are then pushed into the peritoneal cavity.The tip of the device is exteriorized through the right side 12mm cannula. The anvil is placed inside the Roux limb and telescoped onto the catheter system until the anvil reaches the endoclip.The anvil is grasped and the catheter system detached by gentle traction.The post of the anvil is torqued against the antimesenteric border and a small enterotomy is made to allow the stem of the anvil to penetrate through the bowel wall. The EEA is passed into the biliary-pancreatic limb about 3cm and its stem brought out through the anti-mesenteric border. The anvil is married with the stem of the EEA and fired. The biliary-pancreatic limb is closed using the Endo GIA stapler, completing the jejunojejunostomy.**RESULTS:**Operative time for performance of the jejuno-jejunostomy has been lessened by an estimated 25%.**CONCLUSIONS:**Performance of the jejunojejunostomy can be simplified by using an EEA stapler. Benefits include decreased operative time and decreased concern for narrowing of the Roux limb.

Bariatric Surgery-PF005

EARLY RESULTS OF LAPAROSCOPIC NON-BANDED VERTICAL GASTROPLASTY WITH SLEEVE GASTRECTOMY (WITHOUT DUODENAL SWITCH)IN THE TREATMENT OF MORBID OBESITY Hazem A. Elariny, M.D., Ph.D., Advanced Laparoscopic and General Surgery Associates, P.L.L.C.

Background: In performing laparoscopic BPD with duodenal switch procedure in super morbidly obese, the dificulty and risk, encouraged the performance of the procedure in two stages. We began performing the laparoscopic vertical gastroplasty/sleve gastrecomy alone, with intent to return for the duodenal switch after a significant weight loss. Many lower BMI (35-40) patients requested this procedure to reduce short and long term risks. Highly motivated non-sweet addicted, compliant patients were selected. Methods: During one year, 30 laparoscopic vertical gastroplasty / sleve gastrectomy procedures were performed. Two 5 mm working ports and two 10/12 mm ports are placed. The Greater curvature of the stomach is devascularized using the harmonic scalpel. Application of the endo-GIA stapler is used to create a lesser curve gastric tube over a 60 french bougie. The antral staples are 4.8mm thick; body and fundic staples are 3.5 mm thick. No nasogastric suction is used. The patients are fed a liquid diet in the recovery room.

Results: Operative time ranged from 55 minutes to 210 minutes and averaged 90 minutes. 28/30 patients were discharged within a 23-hour observation period. Weight loss averaged 20 lbs during the first month post-operatively, then tapers to 1/4 to 1/2 pound per day for the next two months. Longer term weight loss results will require further follow-up. We experienced no staple line leaks, no hernias, no wound infections, no DVT's, no other major complications. Patients report a high level of satisfaction. Conclusions: Laparoscopic non-banded vertical gastroplasty with sleeve gastrectomy, can be safely and rapidly performed on an out-patient basis, for morbidly obese patients. Candidates for the procedure must be highly motivated, and/or are super morbidly obese, and will need a second stage duodenal switch after significant weight loss. Further follow-up is necessary to assess the long-term outcome of these patients.

Bariatric Surgery-PF006

TRANSGASTRIC INSERTION OF THE CIRCULAR STAPLER ANVIL IN LAPAROSCOPIC GASTRIC BYPASS

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Objective: Creation of the gastrojejunostomy remains one of the most difficult steps in laparoscopic gastric bypass. Hand-sewn, side-to-side stapled, and circular stapled anastomoses have been described. We have adopted and refined a technique using a 25-mm circular stapler. The results of our last 100 patients using this approach are reviewed.

Methods /Technique: We insert the anvil transgastrically rather than the alternative transoral route. A gastrotomy is made along the greater curve of the stomach with an ultrasonic shears. This gastrotomy is in a direct line with our most inferior lateral left sided port and the proposed gastrojejunostomy anastomotic site on the proximal lesser curve. The anvil has a looped suture tied to its end. It is dropped into the abdomen via a right-sided port site after removing the port. A disposable curved dissector with a tip capable of 90-degree roticulation and full rotation is then used to grasp the suture. This instrument is then passed through the gastrotomy and the tip placed intragastrically in the location selected for the gastrojejunostomy. By roticulating the tip of the dissector, the gastric wall is tented and thinned in this location. The ultrasonic shears are used to open the stomach on the tip of the anvil. The suture is grasped and pulled along with the spiked end of the anvil through the gastric wall. The greater curve gastrotomy site is closed with a linear endostapler. The pouch is then constructed with multiple firings of a roticulating linear stapler.

Results:	Patients	Body Mass Index	OR time(min)	Stenosis	Leak
	n=100	49(range 37-74)	146(range84-263)	6%	1%

Conclusions: Laparoscopic roux-en-Y gastric bypass is a procedure that has undergone parallel evolution at many centers and different techniques have been developed. Our technique is relatively simple and is associated with a low leak and stricture rate.

Bariatric Surgery-PF007

ELECTIVE CHOLECYSTECTOMY DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: IS IT WORTH THE WAIT? Giselle G. Hamad MD, Sayeed Ikramuddin MD, William F. Gourash CRNP, Philip R. Schauer MD, University of Pittsburgh Medical Center Department of Surgery, Pittsburgh, Pennsylvania

We wish to demonstrate the safety of concomitant laparoscopic Roux-en-Y gastric bypass (lap GBP) and cholecystectomy (LC) in patients with gallstones diagnosed preoperatively.

Methods: Eighty-four out of 549 (15%) consecutive morbidly obese patients who underwent lap GBP had simultaneous elective LC. Six ports were used for the lap GBP; the same port placement was used for the LC. The gallbladder was retracted using the right subcostal ports and dissection was carried out using the left upper quadrant port. Intraoperative cholangiography was approached selectively.

Results: Out of 549 patients, 105 had prior cholecystectomy. Forty-two percent of all patients had a concomitant secondary procedure; the most common was cholecystectomy (16.7%). Preoperative BMI was 48.4 ± 7.09 kg/m2 for patients having the combined procedure and 48.8 ± 7.3 kg/m2 (p=0.64) for patients having only lap GBP. Five patients had preoperative symptoms of biliary colic. Postoperatively, at a mean follow-up of 7.8 ± 6.73 months, the percent excess weight loss was 46.5 ± 0.25% for the group having combined lap GBP and LC versus 50.15 ± 62.72% (p=0.59) for lap GBP alone. There were no conversions to an open procedure in order to perform the LC. None of the patients required intraoperative cholangiography. Operative time for the combined procedure was 293.2 ± 79.8 minutes versus 245.0 ± 77.0 minutes for lap GBP alone ($p < 0.0001$). Length of stay for the combined procedure was 4.41 ± 11.2 days versus 2.69 ± 0.77 days for the lap GBP alone (p=0.001). There were no postoperative bile leaks or bile duct injuries. None of the patients had retained stones nor required endoscopic retrograde cholangiopancreaticography.

Conclusions: Concomitant laparoscopic cholecystectomy and Roux-en-Y gastric bypass is safe and feasible using the same port placement for lap GBP. Combining LC with lap GBP does significantly increase operative time and nearly doubles the hospital stay.

Bariatric Surgery-PF008

THE OR TEAM CONCEPT IN LAPAROSCOPIC GASTRIC BYPASS SURGERY Valeriu E. Andrei, MD; Beverly A. Johnson, RNFA, CNOR; Corazon Ramos, RNFA, CNOR; Wendy Hancox, RNFA, CNOR; Jacqueline W. Carey, RN, CCRN Department of Surgery and Operating Room Nursing Staff, Saint Peter's University Hospital, New Brunswick, NJ

PURPOSE: This study evaluated the efficiency and cost-effectiveness of using a designated team for laparoscopic gastric bypass surgery.

METHODS: An early postoperative outcome based on a retrospective review of increasing the number of cases performed in the same day was analyzed in three groups. Group 1 is constituted by the first two patients done on the rate of one laparoscopic gastric bypass (LGB) case per day. Group 2 included the first two patients done on a rate of two LGB cases per day, and Group 3 included the first three patients done on the rate of three LGB cases per day. Total operating room time(TORT) which includes procedure time(PT), anesthesia time(AT) and nursing time(NT), American Society of Anesthesia physical status classification(ASA), body mass index(BMI), patient weight and length of hospital stay(LHS) were reviewed for these cases. The operating room time cost(ORTC) was calculated based on TORT. The procedures were performed by one surgeon(VEA) and the OR team which was consistently the same for all our cases(RNFA,OR tech,and RN circulator).

RESULTS: The results for Group 1(cases 1,2),Group 2(cases 8,9) and Group 3(cases 236,237,238)are as follow:

#1:Weight 219lbs,BMI 40,TORT 370min, PT 300min,AT&NT 70min, ORTC $5141.
#2:Weight 246lbs,BMI 44,TORT 335min,PT 290min,AT&NT 45 min, ORTC $4760.
#8:Weight 240lbs,BMI 43,TORT 365min,PT 300min,AT&NT 65 min, ORTC $4760.
#9:Weight 262lbs,BMI 43,TORT 295min,PT 200min,AT&NT 95 min, ORTC $4380.
#236:Weight 327lbs,BMI 50,TORT 145min,PT 100min,AT&NT 45 min,ORTC $2248,
#237:Weight 299lbs,BMI 47,TORT 155min,PT 100min,AT&NT 55 min,ORTC $2640.
#238:Weight 222lbs, BMI 39,TORT 155min,PT 100min,AT&NT 55 min,ORTC $2640.

ASA and LHS were the same for all these patients. TORT, AT&NT decreased significantly from the first cases and were not related to lower weight or BMI.

CONCLUSIONS: Experience and the development of a team concept significantly decreased the cost for OR time without affecting the early postoperative discharge from the hospital.

Bariatric Surgery-PF009

LAPAROSCOPIC OBESITY SURGERY ON THE INTERNET Atul K. Madan MD, Constantine T. Frantzides MD PhD Department of Surgery, Rush University, Chicago, IL

While the easy access to the Internet can provide much information for many patients, the quality and accuracy of information are uncertain. Patients interested in laparoscopic obesity surgery have often attempted to educate themselves via the Internet. This investigation explores the information available over the Internet.

Four terms (laparoscopic obesity surgery, laparoscopic gastric bypass, laparoscopic bariatric surgery, and laparoscopic Roux-en-y bypass) were arbitrarily chosen to search on the six most popular search engines and two metasearch engines. The first twenty hits were included for each separate search. Each site and page were explored and reviewed.

A total of 602 hits were found with 54 hits of them being invalid links. While 250 unique pages were found from the original 602 hits, only 119 unique web sites were found. Only 67/119 (56%) unique web sites had some type of education information concerning laparoscopic obesity surgery. While 63/119 (53%) sites discussed a procedure related to obesity surgery, 18/63 (29%) had biased or misleading information, 30/63 (48%) did not discuss the details of the procedure, 37/63 (59%) did not discuss other procedures, 30/63 (48%) did not discuss complications of the procedure, 37/63 (59%) did not discuss death as a risk to any procedure, and 7/63 (11%) did not discuss laparoscopic as a option for obesity surgery. Only 89 (15%) of the original 602 hits led to web sites that discussed laparoscopic obesity surgery, details of the procedure, and complications in an unbiased manner.

A large amount of information (biased and unbiased) is available over the Internet. However, it is difficult for the patient to ascertain the unbiased information while wading through a vast amount of unrelated, biased, and incomplete information. Bariatric surgeons may often have to spend time not only to educate but also re-educate their patients. The Internet is not a dependable source of accurate information for patients.

Bariatric Surgery-PF010

SINGLE CENTRE EXPERIENCE WITH LAP BAND SYSTEMR., OPEN AND LAPAROSCOPIC GASTRIC BYPASS FOR THE TREATMENT OF MORBID OBESITY. L. Angrisani M.D., V. Borrelli M.D., M. Lorenzo M.D. Ph.D., M. Maresca M.D., M. Ciannella M.D., M. Giuffrè M.D., G. Silvestri R.N., Unit of Endoscopic Surgery, "S.Giovanni Bosco" Hospital, Naples, Italy

BACKGROUND: Aim of this study is the retrospective comparative analysis of the early results obtained with Lap Bandr. (LAGB) and initial experience with Roux-En-Y Gastric Bypass performed via laparotomy (RYGBP) and laparoscopy (LRYGBP) in a single centre.

METHODS: From January 2000 to July 2001, 74 patients were referred for surgery and selected according to the following criteria: LAGB in highly motivated patients with BMI < 50, LRYGBP in those without compliance for LAGB and BMI £ 50, RYGBP in pts with BMI >50. Open and Laparoscopic Gastric Bypass were performed with mechanical stapling using Gagner tecnique (anvil positioning in the proximal pouch via NG tube passed transorally).

RESULTS: LAGB: 27 pts (27/74=36.4%) 23F/4M; mean age 32.8, range:21-52 yrs; pre-operative mean BMI 43.8,range 35-51; 1 pts (3.7%) was converted to laparotomy. Post-operative complications were:1 recurrent port infection and 1 non fatal pulmonary embolism. Mean post operative BMI at 6 and 12 months were 35.3 and 32.7. LRYGBP: 24 pts 22F/2M; mean age 35.2,range 19-50 yrs; pre-operative mean BMI 45.7, range 39-50; 1 pts (4.2%) was converted to laparotomy, 3 concomitant cholecystectomy were performed. Two pts (8.4%) suffered wound infection. Mean post operative BMI at 6 and 12 months were 33.6 and 27.3. RYGBP: 23 pts 14F/9M mean age 38.4,21–56 yrs; pre-operative mean BMI 52.7, range 39-64; concomitant cholecystectomy was performed in 4 patients. One (4.3%) leakage required a reoperation. Eleven pts (47.8%) had wound infections. Mean post operative BMI at 6 and 12 months were 41.8 and 32.3. Mean post operative hospital stay for LAGB, LRYGBP and RYGBP were 3+-1,5+-3 and 8+-5 days, respectively in pts without post operative complication. No mortality was observed.

CONCLUSION: Gastric Banding and Gastric Bypass are presently available in obesity surgery mainly laparoscopically (51/74; 68.9%). Experience with laparotomic gastric bypass is required before starting the laparoscopic approach.

Bariatric Surgery-PF011

LAPAROSCOPIC BILIO INTESTINAL BY-PASS FOR MORBID OBESITY : PRELIMINARY REPORT ON FIVE CASES. LUIGI MASONI M.D.; MAURIZIO ONORATO M.D.; ENRICO RUGGERI M.D.; JESSICA MONTORI M.D.; MARCO BADIALI M.D.; GIANDOMENICO MISCUSI M.D. 3rd Dept. of Surgery - La Sapienza University of Rome - Italy

BACKGROUND: Malabsorbitive surgery still plays an important role in the treatment of morbid obesity (MO). In our experience we have been giving our preference to the bilio-intestinal by-pass (BIBY) according to the technique described by Eriksson in the early '80s. Besides the jejuno-ileal by-pass, a cholecysto-jejunal anastomosis represents the distinguishing feature of this operation, which restores the entero-hepatic bile circulation so reducing risks of hepatic failure and of cholerethic diarrhea; moreover the continuous lavage of the diverted stump prevents the occurrence of the sump syndrome, with no compromise of the results on weight loss.

STUDY DESIGN: Since May of 1996 we have been operating a total of over 120 patients affected by MO. Of these, 51 underwent BIBY based on strict clinical and psychological pre-operative criteria. They were 33 females and 18 males, median age 33 yrs (range 19-48), median BMI 46..9 (range 40.1-64.7), mean BMI 48. Two cases (the first one in December of 2000) have been treated by laparoscopic approach by an original 6-port technique and they represent the basis of this report.

RESULTS : Operative time was 215', compared to a mean 90' of the open technique. No intraoperative complications were observed. Both patients were able to leave the bed and pass flatus on the first and second post-op day, but restoration of oral intake and discharge were on the fourth and seventh post-op day, respectively, as with open BIBY.

CONCLUSION: Our preliminary results show that lap BIBY is feasible and safe. It allows an earlier patient mobilisation with reduced risks of DVT. Moreover no incisional hernias are expected, compared to over 30% risk with open surgery. With experience we believe that it will be possible to reduce operative time.

Bariatric Surgery-PF012

SHOULD CHOLECYSTECTOMY BE A ROUTINE PART OF LAPAROSCOPIC GASTRIC BYPASS FOR OBESITY: A COST ANALYSIS

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Background: Many surgeons will routinely perform cholecystectomy during open bariatric procedures, to prevent another laparotomy should gallstones develop. Because laparoscopic cholecystectomy (LC) can be easily performed after laparoscopic Roux-en-Y gastric bypass (LGB), deferring management of the gall bladder is considered by many to be accepted practice.

Objective: To determine, based on a cost analysis, the optimal management of the gall bladder in patients undergoing LGB.

Methods: A literature survey was performed from which the following assumptions were derived: a prevalence of gallstones of 30% in obese patients, a 35% incidence of postoperative gallstone formation, a 30% incidence of postoperative symptomatic cholelithiasis (17.5% of whom will have complicated disease). The incidence of bile duct injury in elective and acute cholecystectomy was assumed to be 0.5% and 2.7%, respectively. A decision analysis was performed using three broad management strategies: LGB and deferred gallbladder management (LGB + deferred LC), concomitant LC only for those patients with known stones, as determined by preoperative ultrasound (LGB + selective LC), and concomitant LC in all patients (LGB + LC). Mean hospital charges from patients managed at Emory University Hospitals under each strategy were calculated and applied as a relative indicator of cost of care.

Results: Concomitant LGB with LC resulted in decreased cost when compared to both selective and deferred management of the gall bladder. The additional cost incurred in selective management was $217 and in deferred management was $580 per patient.

Conclusion: The common practice of deferring management of the gall bladder during LGB cannot be recommended from a health care cost standpoint.

Bariatric Surgery-PF013

LAPAROSCOPIC REVISION OF FAILED OPEN BARIATRIC PROCEDURES. JT. McCormick, DO, PK Papasavas, MD, PF Caushaj, MD, F Hayetian, MD, DJ Gagné, MD, Minimally Invasive Surgery Program, West Penn Allegheny Health System

Roux-en-Y Gastric Bypass (RYGB) is considered the surgical procedure of choice for morbid obesity. Procedures such as vertical banded gastroplasty (VBG) have also been performed to facilitate weight loss, however, results following VBG have been less dramatic and less durable. Patients who fail to meet weight loss goals after restrictive or malabsorptive surgery can be offered revision. Technically challenging, an open approach has been adopted by many bariatric surgeons for reoperative surgery, particularly when the initial operation had been performed open. We present five cases in which prior open bariatric procedures were revised laparoscopically.

Five patients presented having regained weight after initial success with prior bariatric surgery.

Three patients had prior open VBGs, which were converted laparoscopically to RYGB. Two patients had prior RYGB; one was revised to a banded RYGB and the other, converted to a long limb RYGB. Preoperative BMI averaged 46 kg/m^2. Average operative time was 344 minutes (range 240-450). This was significantly longer than our experience with 56 primary RYGB during the same 4 month time period (average 206 minutes (range 90-390)). Average length of stay was 3.2 days (range 2-5). One patient developed a stricture at the gastro-jejunostomy requiring endoscopic dilatation. There were no other complications and no deaths. The follow-up period is too short to determine effect on weight loss or quality of life.

Laparoscopic revision of failed open bariatric procedures can be performed safely in the hands of an experienced minimally invasive surgeon. Laparoscopic revision of prior open bariatric procedures requires longer operative times than primary RYGB.

Bariatric Surgery-PF014

LAPAROSCOPIC BARIATRIC SURGERY FOR THE TREATMENT OF SUPER-OBESITY: BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH AND ROUX EN Y GASTRIC BYPASS WITH LONG LIMB: 24 MONTH FOLLOW-UP Andrei VE, MD; Kortbawi P, RN,NPC; Mehta V, MD; Johnson BA, RNFA; Villapaz A, RNFA; Ramos C, RNFA; Hancox W, RNFA; Carey JC, RN,CCRN; Brolin RE,MD.

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abstract: With its incidence on rise, obesity is the second most preventable cause of death after tobacco. Conservative treatment often cannot achieve a sustained weight loss greater than 10 kg especially if the treatment is not continued indefinitely. Surgical treatment for morbid obesity achieves significant long-term weight loss and is becoming more accepted in the medical and lay communities. In the United States, the most common procedure performed has been the Roux-en-Y gastric bypass. Recently, however, other procedures, such as biliopancreatic diversion with duodenal switch, are gaining greater popularity for excellent weight loss. This is a retrospective analysis at 24 months of 15 superobese patients who underwent laparoscopic biliopancreatic diversion with duodenal switch -LBPD-DS (3 patients) and laparoscopic Roux en Y gastric bypass with long limb -LRYGB-LL (12 patients). The body mass index ranged between 50 and 62 kg/m2. In the LRYGB-LL group was no conversion to open procedure. In the LBPD-DS one case was completed using hand-assisted technique and one case was converted to open. The early and late postoperative data include operating room and inpatient data, complications, weight loss, vitamin profile. Excellent weight loss was achieved with both procedures with minimum early and late postoperative complications. The laparoscopic approach is feasible for surgical treatment of super-obesity; however, longer follow ups in a larger group of patients are necessary and in progress to assess the efficacy of one procedure over the other, if any.

Bariatric Surgery-PF015

THE IMPORTANCE OF THE PARS FLACCIDA POSITION IN LAPAROSCOPIC GASTRIC BANDING

A COMPARISON OF COMPLICATION RATES IN 151 CASES OF LAP BANDING AND 174 CASES OF THE SWEDISH ADJUSTABLE GASTRIC BAND.
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Background Experience with 151 cases of the Lap band inserted between 1993 and 1998 and 174 cases of the Swedish adjustable band inserted between 1998 and 2001 is presented and the results and complications compared and discussed.The importance of positioning the bands via the pars flaccida approach is stressed.
Patients and methods. Initally the Lap Band (Inamed) was used and inserted by the approach developed by Belachew et al.A high incidence of posterior wall slippage ensued.A change of device to the SAGB was decided upon because of the low incidence of slippage reported with this device.The main reason why the device does not slip is that it is placed in a tunnel through the pars flaccida.Other factors that may reduce the tendency to slip include the soft low pressure balloon,the band surface and the wide diameter of the stoma when the band is placed empty.The low rate of complications has been confirmed in my experience.
Results My experience to date with the SAGB indicates weight losses comparable to the Lap Band.Complication rates are 29% for the Lap Band vs. 4% for the SAGB .Complications are discussed in detail.
Conclusions The most important factor in avoiding the problem of slippage is the insertion of the band via the pars flaccida route.I strongly advise all surgeons contemplating adopting laparoscopic banding as a bariatric technique to adopt this method of insertion.

Bariatric Surgery-PF016

LAPAROSCOPIC REOPERATIONS FOR COMPLICATIONS OF LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING.
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Laparoscopic Adjustable Silicone Gastric Banding (LASGB) operations have become an increasingly important surgical option for morbidly obese patients. However, in case of complications reoperations may be necessary. To offer the advantages of laparoscopy also to patients with complications we decided to operate laparoscopically in most of these cases.

Between December 1996 and March 2001 we implanted 237 LAP-Bands laparoscopically. In 27 of these patients (11,4%) and in 5 patients, who had been operated in other hospitals primarily, 42 reoperations became necessary. Indications were: band slipping, pouch dilatation, band erosion, band infection, leakage, gastric wall incarceration, wrong position of the band, pain and reimplantation of a LAP-Band.

36 reoperations (85,7%) were planned and performed laparoscopically. In 7 patients we removed a band, in 9 patients refixation (6 posteriorly and 3 anteriorly) of the band seemed to be sufficient, in 16 cases we removed the band and implanted a new one in a higher position and in 4 cases we reimplanted a LAP-Band.

There were no intraoperative complications, in one patient we converted to open surgery because of severe adhesions. Postoperatively one upper gastrointestinal bleeding caused by necrosis of gastric mucosa could be treated medically and endoscopically. Posterior refixation for posterior band slipping led to pouch dilatation, which was the indication for further reoperations in all 6 cases.

Laparoscopic surgery for complications of LASGBs is as feasible and safe as for the primary operation. Because of poor long-term results with posterior refixation of LASGBs we now prefer to replace a dislocated band by a new one in a higher position.

Bariatric Surgery-PF017

ROUTINE UPPER GASTROINTESTINAL GASTROGRAFIN SWALLOW AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS

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Upper gastrointestinal (UGI) swallow radiograph following laparoscopic Roux-en-Y gastric bypass (LRYGB) may detect an obstruction or an anastamotic leak. The aim of our study was to determine the efficacy of routine imaging following LRYGB.

Radiograph reports were reviewed for 201 consecutive LRYGB operations between April 1999 and June 2001. UGI swallow used gastrografin and fluoroscopic video, with a delayed image at 10 minutes. Mean values $\pm$ one standard deviation were tested for signifigance ($p< 0.05$) using Student's T-test.

Of 198 available reports, UGI detected jejunal efferent limb narrowing (17), partial obstruction (12), anastamotic leak (4), complete bowel obstruction (3), diverticulum (1), hiatal hernia (1), and proximal Roux limb narrowing (1). A normal study was reported in 159 cases (80%). Partial obstruction resolved without intervention. Complete obstruction required re-operation. Compared to six patients who developed delayed leaks, early identification of a leak by routine UGI swallow resulted in a shorter hospital stay (mean 7 $\pm$ 1.5 days vs. 41 $\pm$ 6.4 days, $p< 0.001$).

Early intervention after UGI swallow may lessen morbidity. Routine UGI swallow following LRYGB does not obviate the importance of close clinical follow-up.

Bariatric Surgery-PF018

PROSPECTIVE STUDY OF 298 PATIENTS UNDERGOING LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING USING THE TWO-STEP TECHNIQUE. A TECHNIQUE TO PREVENT POSTOPERATIVE SLIPPAGE.

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Objective: Laparoscopic adjustable silicone gastric banding (LASGB) has gained tremendous popularity, but creation of the retrogastric tunnel (RGT) is a considerable challenge, especially in the surgeon's early experience, and is associated with up to 10% band slippage and occasional gastric perforation. The two-step (TS) technique involves a crural dissection towards the angle of His through a pars flaccida approach. The technique facilitates passage of the band with no extensive posterior gastric wall dissection.

Patients and Methods: A prospective study of 298 patients who underwent LASGB from 01/1999 to 05/2001 using a two-step (TS) dissection technique. There were 238 females and 60 males; mean age 37 years (18-59 years); mean preoperative weight 121 kg (range: 90-173 kg); mean body mass index (BMI) of 43.9 kg/m^2 (range: 36-69 kg/m^2). Two hundred and fifty eight procedures were performed in Israel, and 40 in Houston, Texas, as part of the FDA clinical trial.

Results: All procedures except three were completed laparoscopically. The mean operative time was 59 minutes (31-150 min) and the mean hospital stay 1.2 days (1-5 days). In a mean follow-up of 12 months (1-26 months), mean BMI decreased from 44.1 kg/m2 preoperatively to 39.6, 37.2, 35 and 33.3 kg/m2 at three, six, nine, and 18 months respectively. There were only two band slippages (0.67%), and they were corrected laparoscopically.

Conclusion: LASGB using the TS is technically simple, avoids intimate posterior gastric wall dissection, and facilitates tight posterior band support. It is therefore associated with only minimal perioperative complications and a low slippage rate.

Bariatric Surgery-PF019

ANALYSIS OF DIFFERENT LAPAROSCOPIC TECHNIQUES FOR ROUX-EN-Y GASTRIC BYPASS:

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Objective: To compare the benefits between three different laparoscopic bariatric surgical techniques; laparoscopic Hand assisted gastric bypass with EEA gastro-jejunal anastomosis(HA-GBP),Laparoscopic gastric bypass with EEA gastro-jejunal anastomosis(LAP-EEA-GBP) and Laparoscopic bypass with GIA gastro-jejunal anastomosis(LAP-GIA-GBP).

Methods: We retrospectively reviewed 15 patients with similar characteristics that underwent laparoscopic gastric bypass under three different techniques:HA-GBP(n=5), LAP-EEA-GBP(n=5) AND LAP-GIA-GBP(n=5). 93.3 % were female, mean age was 40.73 years, mean weight of 318.66 lbs.The mean BMI was 52.56. Cost analysis by acquiring direct variably hospital cost and measuring length of hospital stay was performed. Other variables like wound complications and OR time was measured. All jejuno-jejunal anastomosis were done using GIA . One surgeon performed all procedures. T test using a Bonferroni correction was used for statistical analysis.

Results: Mean cost for LAP-GIA-GBP($35790) was not significantly less than for HA-GBP($39056) p=0.42 and LAP-EEA-GBP ($41496) p=0.16. Mean length of stay for LAP-GIA-GBP(3.6 days) was also not significantly shorter than for HA-GBP(6 days) or LAP-EEA-GBP(5.8 days) p=0.018 and p=0.03 respectively. OR time was shorter for LAP-GIA-GBP(2.3 hours) vs. HA-GBP(5.6hours) or LAP-EEA-GBP(5.3 hours) p=<0.001 for both. There were two wound complications in the LAP-EEA-GBP group p=0.44 (Fisher's Exact Test)

Conclusion: Laparoscopic Roux-en-Y gastric bypass using a GIA gastrojejunal anastomosis has a shorter OR time although it's not a Cost-effective alternative compared to other laparoscopic techniques(Hand Assisted with EEA gastrojejunal anastomosis and Laparoscopic with EEA gastrojejunal anastomosis) with similar Cost, Wound complications and Length of stay.

Bariatric Surgery-PF020

LAPAROSCOPIC SLEEVE GASTRECTOMY IS A SAFE AND EFFECTIVE PRIMARY PROCEDURE FOR BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH

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Introduction: Biliopancreatic diversion with duodenal switch has been successful in achieving long-term weight loss in the super-obese, although with significant morbidity and mortality. The purpose of this study is to show the advantages of sleeve gastrectomy in laparoscopic biliopancreatic diversion with duodenal switch (LBPD-DS).

Methods: A retrospective analysis was performed on all laparoscopic sleeve gastrectomies (LSG) performed at this institution as part of a two-stage procedure (9/00 to 7/01). Variables analyzed included: age, sex, length of hospital stay (LOS), initial weight and body mass index (BMI), follow-up weight and BMI, and post-operative morbidity.

Results: Twenty-four patients underwent LSG as part of a two-stage LBPD-DS for morbid obesity. Mean age was 42, 8 were men and 16 were women. Initial mean weight was 414 lbs., with mean BMI of 65 (range 58 to 76). Mean operative time was 114 minutes. Average LOS was 3 days (range 2 to 7) with a median of 3 days. Follow-up at 3 weeks, 3 months, and 6 months after LSG resulted in an excess weight loss of 11 +-3%, 23 +-5% and 32 +-5% and mean BMI of 60, 56 and 49. No major morbidity and no mortality occurred in this population.

Conclusion: Laparoscopic sleeve gastrectomy is feasible and can be performed with minimal morbidity as the primary stage of LBPD-DS in the superobese. It also results in substantial short-term weight loss and should allow for a safer operation during second stage LBPD-DS.

Bariatric Surgery-PF021

CASE REPORT: GASTRIC PERFORATION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY. WW Yeaney, MD, PK Papasavas, MD, PF Caushaj MD, RJ Keenan, MD, RJ Landreneau, MD, DJ Gagné, MD. Minimally Invasive Surgery Program, West Penn Allegheny Health System, Pittsburgh, Pennsylvania

A 35 year old female with a history of morbid obesity, BMI= 45, underwent a laparoscopic Roux-en-Y gastric bypass. The patient lost 110 pounds over a 14-month period following surgery. The patient had a history of anemia and had been receiving oral iron and proton pump inhibitors before and after surgery. Upper and lower endoscopy, small bowel follow through and a Meckel's scan were done prior to the operation with no positive findings. One year after the operation the patient developed acute onset of left upper quadrant pain, substernal chest pain and shortness of breath. An upright chest film demonstrated free air under the left hemi-diaphragm. The patient was taken to the operating room for prompt surgical exploration.

Exploratory laparotomy revealed that the fundus of the gastric remnant, along the greater curvature, had perforated with gross spillage of gastric contents. The retained stomach, lateral to the creation of the pouch, perforated at its superior aspect away from the staple line. The stomach was divided at its midpoint using a TA-55 stapler. The fundus and perforated segment were removed in this fashion. The abdomen was copiously irrigated and closed.

The patient had a stable post-operative course and was discharged to home on the fifth post-operative day. Her final pathology revealed a benign perforated gastric ulcer with signs of chronic gastritis. A Giemsa stain done for H. pylori was negative. The patient has returned to work without any sequelae from her surgery. She has had no further evidence of GI bleeding at 3-month follow up. She remains on proton pump inhibitor medication.

We present an unusual case of perforation of the gastric remnant following laparoscopic morbid obesity surgery. No prior publication of a free remnant perforation secondary to ulcer disease has ever been reported. This complication represents a unique management problem for the laparoscopic surgeon since the gastric remnant is not reachable by endoscopy.

Basic Science-PF022

THE PROPERTIES OF PNEUMOPERITONEUM MODIFIES ACUTE PHASE RESPONSE INDUCED BY BACTERIAL LIPOPOLYSACCHARIDE Chandrakanth Are MD, Yorge Karolat PhD, Mark A Talamini MD, Antonio DeMaio PhD., Department of Surgery and Department of Paediatric Surgery. The Johns Hopkins Medical Institutions.Baltimore, Maryland.

OBJECTIVE: Previous studies have shown that pneumoperitoneum with carbon dioxide attenuates the acute phase response. To elucidate the possible mechanisms behind this alteration, we compared the effect of different gases on the acute phase response induced by bacterial lipopolysaccharide.

METHODS: Male rats were injected via the penile vein with lipopolysaccharide (1mg/kg). Five hours later, animals (n=4) were randomized into three groups. Group I and II were subjected to carbon dioxide and helium pneumoperitoneum respectively. Animals in Group III served as controls.All animals were sacrificed and livers harvested. Total mRNA was isolated, analyzed by Northern blot hybridization with probes for alpha-2-macroglobulin (A2M, an acute phase gene) and detected by auto-radiography. The film in the linear range of exposure was quantified using an imaging system. The signal intensity corresponding to A2M mRNA was normalized by signal corresponding to 28SrRNA detected by staining with methylene blue. Results are presented as Relative Intensity (arbitary units)+/- standard error of mean. p values were determined by student t test.

RESULTS: The mRNA levels in Group I was 454604.5 +/- 70001 compared to 703777 +/- 20986 (Group II, $p< 0.05$) and 690879 +/- 10865 in Group III ($p< 0.05$). Reduced A2M m RNA levels of - 34% ($p<0.05$) was noted by addition of carbon dioxide pneumoperitoneum. There was no difference in A2M mRNA levels beteween controls and Group II(helium pneuoperitoneum)

CONCLUSIONS: Pneumoperitoneum is associated with alterations in acute phase response. Carbon dioxide leads to an attenuation in acute phase response in comparison to helium. This further reiterates the beneficial effect of carbon dioxie for pneumoperitoneum based surgery.

Basic Science-PF023

BODY POSITION AND DESUFFLATION INFLUENCES PORTAL VENOUS FLOW DURING PNEUMOPERITONEUM Carsten N Gutt MD, Oliver Heupel MD, Vivian Riemer MD, Tobias Weberschock MD, Lars Brinkmann MD, Claus-Georg Schmedt MD, Department of General Surgery, Ruprecht-Karls-University, Heidelberg, Germany

Background: Reduction of macro- and microperfusion in splanchnic and portal venous blood flow (PBF) has been described following CO2-insufflation with elevated intraabdominal pressure (IAP). The current study investigates changes in portal venous blood flow during CO2-laparoscopy with different body positions and insufflation profiles.

Methods: An established animal model of laparoscopic surgery was extended by implanting a portal vein flow probe. The hemodynamics in the portal vein were measured by transit time ultrasonic flowmetry. 48 male SD rats were randomized into four experimental and two control groups. Total CO2-insufflation time was 60 min (8mmHg). Group1 (n=8): desufflation for 5 min after 30 min of insufflation. Group 2 (n=8): desufflation for 1 min every 15 min. Group 3 (n=8): 35 degree head-up position. Group 4 (n=8): 35 degree head-down position. Pos. control group (n=8): constant insufflation. Neg. control group (n=8) : no insufflation. Data were analyzed by Kruskal-Wallis, Dunn and Holm test.

Results: The establishment of a pneumoperitoneum causes in all groups a significant decrease of portal venous blood flow (60%). After desufflation, group 1 and group 2 showed immediatly increasing portal flow (85%). After re-insufflation the flow decreased again (60%), but was followed by compensatory increase (76%). The period of compensation was realated to the duration of desufflation.

Group 3 (head-up position) showed a significant improve of portal venous flow, group 4 (head-down position) no improve compared to the pos. control group.

Conclusions: Intraoperative desufflation of pneumoperitoneum is recommended, because it improves portal venous flow and hepatic perfusion. Extreme head-down position should be avoided, because compromised hepatic perfusion may influence the hepatic metabolism and cell-conveyed immunity in a negative way.

Basic Science-PF024

THE EFFECT OF TOPICAL ANESTHETIC ON ESOPHAGEAL MOTILITY TEST RESULTS: Blair A. Jobe MD, John S. Domreis MD, Karen D. Horvath MD, Lee L. Swanstrom MD, Oregon Health Sciences University and Legacy Health Systems, Portland, Oregon

Although topical oropharyngeal anesthetic sprays provide patient comfort during manometry, their effect on esophageal body physiology are unknown.

Ten patients with normal esophageal motility underwent manometry before and after a two second duration spray (200mg/second) of 14% benzocaine, 2% butyl amino benzoate and 2% tetracaine HCL solution into the hypopharynx. Each patient served as their own control and underwent a series of 10 pre- and post-anesthetic water bolus swallows. Measurement of amplitude, duration, propagation time and slope of contraction were obtained at 4 levels (5cm between each level) beginning 3cm proximal to the upper border of the distal high pressure zone. Tertiary and simultaneous contractions and interrupted peristalses were recorded.

Analysis of variance using mean values demonstrated that the duration of contraction, propagation time and slope of contraction did not exhibit a post-anesthetic change. There was no increase in the number of tertiary or simultaneous contractions or interrupted peristalses. Contraction amplitudes were different from pre-anesthetic values, however there was no discernable pattern of amplitude change; While some patients had a significant increase in contraction amplitude, others decreased. This difference may have been secondary to the wide variation in contraction amplitudes between swallows in the normal patient.

Topical oropharyngeal anesthetic spray does not appear to significantly effect the results of esophageal manometry.

Basic Science-PF025

IMPACT OF IMPROVED HEPATIC BLOOD FLOW ON LIVER METASTASES DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY. Zun-Gon Kim1, M.D., Thomas Mosch1, Matthias Lorenz1, M.D., Claus-Georg Schmedt2, M.D., Carsten N. Gutt2, M.D.
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Background: Recent experimental studies demonstrated laparoscopic insufflation to stimulate the growth of colorectal liver metastases. Alterations in hepatic macro- and microcirculation are believed to enhance these findings. Whether improved hepatic blood flow might have beneficial oncological effects has not been investigated yet.

Material and Methods: 40 male WAG/Rij rats were randomized into 5 experimental groups. In the 3 laparoscopic groups rats were implanted a PE-50 cannula into the V. jugularis interna to apply dopamine (n=10), ET-1-antagonist (n=10) or NaCl (n=10) via a microperfusion pump. In the 2 open groups a midline laparotomy only (n=10) or with ligation of the portal vein (n=10) was performed. Liver metastases were inducted by laparoscopic-assisted or open intraportal injection of 50,000 CC531 cells. Tumor growth was evaluated 28 days following surgery regarding the number, diameter and cancer index of the nodes. Data were analyzed by Kruskal-Wallis, Dunn and Holm test.

Results: All animals survived the surgical procedures. Analysis of hepatic tumor growth and total tumor take showed significant differences between the 5 experimental groups. Increased tumor growth was found comparing the 2 open groups to the 3 laparoscopic groups. In the open groups portal venous ligation showed significantly increased tumor take when compared to laparotomy only. In the laparoscopic groups the administration of dopamine and ET-1-antagonist significantly reduced liver metastases when compared to sodium chlorid infusion.

Conclusion: Improved liver blood flow during laparoscopic surgery seems to have beneficial oncological effects on the growth of colorectal liver metastases.

Basic Science-PF026

CHANGES IN THE MORPHOLOGY OF THE PERITONEUM AFTER LAPAROSCOPIC SURGERY: GAS OR STRETCHING? Ruben Veldkamp M.D., Maarten Vermaas M.S., Eric J. Hazebroek M.D., Michiel A. Schreve M.S., Ron W. de Bruin PhD., H. Jaap Bonjer M.D. PhD.
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Morphological Scanning Electron Microscopy (SEM) studies have suggested that intraperitoneal CO2 insufflation causes bulging of peritoneal mesothelial cells. Adhesion formation and growth of tumorcells after laparoscopic surgery may be related to these changes. However, peritoneum after gasless laparoscopic surgery or laparotomy has been rarely studied. The objective of this study is to assess if these peritoneal changes can be attributed to CO2 insufflation.

Forty-eight rats were randomly assigned to 4 groups of 12 rats. Groups were subjected to 2 hours of CO2 insufflation, helium insufflation, gasless suspension of the abdominal wall and laparotomy. Each group was subsequently divided into 3 subgroups and biopsies were taken at 0, 2 and 24 hours after the procedure from the anterolateral side of the abdominal wall. SEM photos were taken of the biopsies.

At 0 and 2 hours after pneumoperitoneum the cells showed some bulging and widened intercellular clefts were seen in all groups after 2 hours. In the laparotomy group this appeared more pronounced. At 24 hours after insufflation of CO2, bulging of cells and the formation of intercellular clefts was most pronounced. A similar aspect of the peritoneum was seen in the gasless suspension group and the laparotomy group. In the helium group the peritoneal changes at 24 hours after pneumoperitoneum seemed to be more pronounced with elongation of the endothelial cell and formation of thin finger-like cytoplasmic processes.

Parietal peritoneal changes occur after intraperitoneal gas insufflation, gasless elevation of the abdominal wall and laparotomy, so they appear to be not due to CO2 insufflation itself. Stretching of the abdominal wall could be the underlying cause.

Colorectal/Intestinal Surgery-PF027

LAPAROSCOPIC SINGLE LAYER HAND SUTURED GASTRO JEJUNOSTOMY , Ramesh Ardhanari, R.P.Wadhwa, N.Mohan.
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The effectiveness and safety of single layer hand sutured gastrojejunostomy was retrospectively analyzed.

31 patients underwent the procedure over last 4 years. 25 patients had duodenal ulcer with obstruction and 6 patients had obstructed carcinoma stomach.Five ports were used (2 of 10mm and 3 of 5mm).In all patients the Harmonic Scalpel (Ethicon) was used to perform vagotomy and to open bowel loops.The patients with duodenal ulcer underwent truncal vagotomy.Then a posterior, antecolic, horizontal gastrojejunostomy was performed in single layer with 2-0 Ethibond (Ethicon) continuous suture.The suturing was done through 2 ports to the right of the camera that was placed 2 inches subumbilically.The surgeon stood to the right of the patient.First the posterior seromuscular coat was done. Then the stomach and jejunum were opened 2mm from the suture line and anterior layers were approximated with the suture passing all layers. Patency and integrity of anastomosis was tested by filling stomach with CO2. Patients with carcinoma stomach underwent anterior, antecolic GJ in the same manner.

The mean duration of operation in the first 5 patients was 185 minutes while in the last 5 patients was 90 minutes.The suturing technique was very comfortable to the surgeon. All patients had an uneventful recovery and resumed full solid diet at 7 days.

A singe layer gastrojejunostomy is safe and saves considerable time compared to standard 2-layer gastrojejunostomy.

Colorectal/Intestinal Surgery-PF028

LAPAROSCOPIC HAND SUTURED RECONSTRUCTION AFTER HARTMAN'S PROCEDURE, Ramesh Ardhanari, R.P.Wadhwa, N.Mohan
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The feasibility of hand sutured reconstruction following Laparoscopic Hartman's procedure is reviewed.

Six diabetic patients underwent Laparoscopic Hartman's procedure over the last 1 year for severe perineal sepsis. One patient died of septicaemic shock. 3 of the 5 patients had restoration of continuity by laparoscopic colo-colic anastomosis. The same port sites used for original operation were used. The rectal stump was identified and freed. In one patient a loop of small bowel was densely adherent to the stump and was released. The small bowel had a small perforation that was closed with interrupted stitches. The colostomy was undone and end to end colocolic anastomosis using 3-0 silk in interrupted, single layer all coat technique was done. Integrity of anastomosis was checked by rectal insufflation with dilute Povidone Iodine solution. The operating time was 3 hours for the first and 2 hours for the last two cases. The patients had an uneventful recovery. Two patients are awaiting closure.

Hand sutured intra-corporeal colocolic reconstruction after Hartman's operation is feasible. It is safe and can be recommended.

Colorectal/Intestinal Surgery-PF029

TOTAL LAPAROSCOPIC PROCTECTOMY WITH SPHINCTER PRESERVATION FOR DISTAL VILLOUS ADENOMA OF THE RECTUM

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Laparoscopic resection and anastomosis of very low rectal lesions is technically difficult. We describe a technique for total laparoscopic resection and colo-anal anastomosis of very low benign rectal lesions.

A 71-year-old man was referred for surgical resection of a large villous adenoma which circumferentially encompassed 40-50% of the luminal wall of the rectum. The lesion was located 5 cm from the anal verge. Modified lithotomy position was used. A four-trocar technique was employed. Mobilization of the sigmoid colon was performed laparoscopically using the harmonic scalpel. The rectum was circumferentially mobilized laparoscopically. Lateral ligaments were divided using the LCS and the anterior dissection was carried to the level of the levator. Resectability was confirmed using sigmoidoscopic guidance during the laparoscopic dissection. After mobilization the rectum was transected laparoscopically just proximal to the lesion. The distal rectosigmoid segment was grasped using a Babcock passed through the anus and externally everted. The everted rectum allowed easy identification of the lesion and its distal margin. The rectum was transected just distal to the lesion using a TA stapler. A margin 2 cm proximal to the dentate line was preserved. The anastomosis was performed using an ILS stapler Hospital stay was six days. The patient had complete resection of the villous lesion and suffered no anal incontinence. At one year follow up he has no evidence of recurrence. Bowel function is normal

Total laparoscopic resection of benign lesions of the distal rectum can be safely accomplished laparoscopically. Laparoscopy allows for excellent visualization of distal anatomy and preservation of sacral nerves. Total laparoscopic resection of distal rectal lesions allow for a sphincter preserving anastomosis utilizing either a stapled intraluminal approach or per-anal techniques.

Colorectal/Intestinal Surgery-PF030

INTRACORPOREAL ANASTOMOSIS VS. DIRECT VISUALIZED ANASTOMOSIS IN LAPAROSCOPIC-ASSISTED ANTERIOR RESECTION

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Purpose: The outcomes of laparoscopic-assisted anterior resection (L-AR) using different methods of anastomosis were compared.

Method: A prospective trail was performed on patients with sigmoid and upper rectal cancer during a 12 months period. Exclusion criteria were emergency surgeries, bulky tumors, middle and lower rectal cancers, and previous extensive abdominal surgery. Data were collected in regard of age, gender, body mass index (BMI), the American Society of Anesthesiologists' physical status scale (ASA), diagnosis, method of anastomosis, and outcomes. All patients received L-AR was divided into two groups. Group I were the patients who received L-AR with anastomosis performed in an open fashion through a transverse suprpubic incision. Group II patients were those who received L-AR and the anastomosis was done laparoscopically after re-establishing pneumoperitoneum.

Result: Between January 2000 and December 2000, 30 consecutive patients with sigmoid or upper rectal cancer were operated laparoscopically. Group I consisted of 15 patients (8 males; mean age, 65.3¡Ó12.2 years), and group II consisted of 15 patients (10 males, mean age, 66.1¡Ó11.7 years). There was no mortality in this study. There were no statistically differences in Body mass index (22.8¡Ó2.8 vs. 23.0¡Ó3.5), estimated blood loss (144.7 vs. 157.7), operation roomtime (203.0 vs. 217.3), resumption of oral diet intake (3.5 vs. 3.6), length of incision (8.8 vs. 6.0), length of hospital stay (6.9 vs. 6.4), splenic flexure take down (2:15 vs. 7:15), conversion to open surgery (zero vs. one), and postoperative complication (2 vs.2).

Conclusion: Both anastomosis method after L-AR was acceptable, and it depends on surgeon's preference. Finally and most importantly, intracorporeal anastomosis does not increase the operation room time.

Colorectal/Intestinal Surgery-PF031

LAPAROSCOPIC REPAIR OF COLO-VESICAL FISTULA

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Repair of colovesical fistula is considered good indication for laparoscopic approach. We had two such cases treated successfully by laparoscopic method.

Since 1996 June, we had two cases of colovesical fistula, one due to Crohn's disease and another due to tuberculosis. Colonoscopy, Cystoscopy and imaging investigations revealed non tumorous inflammatory lesions. Both the cases were successfully treated by laparoscopic method.

Procedure : 4 ports were made of which one 10mm was used for sigmoid colon retraction. Laparoscopy revealed fistulous communication from the anterior wall of sigmoid colon to the bladder. Rectosigmoid was mobilised all around except for the fistulous site of 2cm diameter which was disconnected using harmonic scalpel. Fistulous opening on both bladder and sigmoid colon was closed with vicryl stitches and again with omental patch. Greater omentum was mobilised and kept between the bladder and sigmoid colon and anchored to the pelvic wall. Post operative period was uneventful.

Laparoscopy has a definite role in the management of colo-vesical fistula.

Colorectal/Intestinal Surgery-PF032

NEEDLESCOPIC APPENDECTOMY : ANOTHER OPTION.

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Laparoscopic appendectomy (LA) has demonstrated its advantages by reducing the pain and length of hospitalization. Needlescopic surgery , using 2 mm instruments, is not commonly performed. This paper describes the result of our experience in using needlescopic techniques for the treatment of acute appendicitis, showing complications and results to determine its advantages and efficacy.

From August 1996 to February 2001, 34 selected patients with preoperative diagnosis of acute appendicitis underwent needlescopic appendectomy (23 male, 11 female) with an average age of 20 years (range 3-64 years). Operative data and postoperative course were recorded in a prospective fashion.

All procedures were successfully completed by means of needlescopic techniques. The appendiceal artery was double clipped and divided in 20.8% and cauterized in 79.16%. Endoloops were used to ligate the appendiceal base in 79% of the patients and a specimen bag was used in 58.8% of the cases. The estimated blood loss was 14.6 cc (range 5-50 cc). No intraoperative complications occurred. The operative time was 55 minutes (range 35-70 minutes). There were no conversions to either standard laparoscopy or open technique. The mean hospital stay was on an average 2.07 days (range 1-7). The overall complication rate was 5.8%. One patient developed a pelvic abscess which required percutaneous drainage. None of our patients developed wound infections, nor hernias at the trocar sites.

We believe that needlescopic appendectomy is feasible and can be performed safely. It is another option to treat acute appendicitis in selected patients. The surgical wounds are smaller and it has a similar operative time and hospital stay as LA. Less analgesics are required and the cosmetic results are significantly better. Improvement in instrumentation, however, is necessary.

Colorectal/Intestinal Surgery-PF033

LAPAROSCOPIC SMALL BOWEL RESECTION: LAPAROSCOPIC ASSISTED AND TOTALLY LAPAROSCOPIC APPROACH. Morris E. Franklin Jr., MD, Arturo Almeida, MD, Miguel C. Mendoza, MD, Robert Michaelson, MD, Jeffrey Glass, MD, David Paulson, BS, Alana Chock, MD. Texas Endosurgery Institute, San Antonio, TX.

This is a retrospective review of our experience using the laparoscopic assisted and the totally laparoscopic approach in the management of patients necessitating small bowel resection.

The data of 14 patients who underwent laparoscopic small bowel resection in our institution from 1995 to 2001 were reviewed. Parameters that were included were age, gender, indications for resection, concomitant procedures, technique of resection, type of anastomosis, operative time, blood loss, return of normal bowel function, and post-operative hospital stay.

A total of 14 patients were included. Overall, 7 were males and 7 females. 11 underwent a laparoscopic assisted approach and 3 underwent a totally laparoscopic approach. Their ages ranged from 33 to 84 years with a mean of 60 years. The indications for the small bowel resection were necrotic bowel secondary to incarcerated hernias (5), adhesions (3), lymphoma (2), carcinoid tumor (2), intussusception (1), and Crohn's disease (1). For the laparoscopic assisted group, eight patients had stapled anastomosis and three had hand-sewn anastomosis. The mean operative time was 89.2 minutes, mean estimated blood loss was 50 ml, return of bowel function was 3.6 days, and post-operative hopital stay was 7 days. For the totally laparoscopic group, all had stapled anastomosis. The mean operative time was 91 minutes, estimated blood loss was 40 ml, return of bowel function was 2.3 days, and postoperative hospital stay was 5.3 days.

Laparoscopic small bowel resection using either the laparoscopic assisted or the totally laparoscopic technique is a safe and feasible procedure.

Colorectal/Intestinal Surgery-PF034

UNCOMMON GALL BLADDER ANATOMY ENCOUNTERED DURING LAPAROSCOPIC CHOLECYSTECTOMY. Prof. H. Kabir Chowdhury,

BIRDEM Hospital, Dhaka, Bangladesh.

Anatomical variations of the gall bladder are well known, and among these cystic artery anomalies are probably most commonly encountered. Laparoscopic surgery has definitely helped us to understand these variations more clearly and at the same time record them and reproduce them. This paper is presented to show the anatomical variations encountered by the author during laparoscopic Cholecystectomy(Lch) during last seven year while more then 5000cases Lch were done. Following were the variations encountered: (a). Situs inversus totalis, (b). Sinistroposition of the gall bladder, (c). Cystic duct from the right hepatic duct, (d). Absent cystic duct, (e). Cystic artery anomalies, (f). Partially intrahepatic gall bladder, (g). Gall bladder with long mesentery, (h). Hour glass shaped gall bladder. These anomalies did not cause conversion in any of the cases neither they caused any complication during or after surgery. Careful dissection in a blood less clean field is all that is required for successful completion of these cases. Author's experience confirms that the cystic artery anomaly is most commonly encountered and a laparoscopic surgeon must be vigilant to avoid any unnecessary conversion or disaster.

Colorectal/Intestinal Surgery-PF035

LAPAROSCOPIC APPENDICECTOMY- DESERVES MORE ATTENTION IN THE DEVELOPING COUNTRIES H. Kabir ChowdhuryMD, M.H.Khan MD ,Mohd.Akram Hossain MD, Minimally Invasive Surgery Centre, Department of Surgery BIRDEM Hospital , Dhaka, Bangladesh.

Laparoscopic Appendicectomy provides the best opportunity to deal with the intra-abdominal emergencies which is commonly encountered with the diagnosis of acute appendicitis. Author has performed more then 6000 cases of Laparoscopic Cholecystectomies but only 380 cases of Laparoscopic Appendicectomies. With the experience of this small number, few questions can be raised. Why it is not done more frequently? Is there any technical difficulty? Who does most of the appendicectomies in the developing countries? Laparoscopic appendicectomy is comparatively easier procedure, conversion rate is minimum, it helps to do a good survey of the abdomen and on many occasion helps to diagnose conditions which could be other wise missed. Considering all these factors in addition to the advantages of keyhole surgery there cannot be any doubt about the benefit of Laparoscopic Appendicectomy. Then why not this procedure is done more frequently in the developing countries. Probably the causes are as follows: this relatively simple procedure is mostly performed by the junior surgical stuff, access to the instrument is not easy to them due to the service delivery system, they are not usually experienced in Laparoscopic surgery and as a result seniors don't allow them to do the procedure independently. Where as in open surgery seniors don't even bother to stay nearby. It's a great disadvantage for the young surgeons as well as for the patients who are deprived of the benefit of this procedure. So it is high time to think and act quickly to train our young surgeons, and allow them more often to do the procedure. Also it is important to develop service delivery system so that the instruments are easily accessible to them. Author in this paper also discusses an easier technique to perform the procedure with a video clipping

Colorectal/Intestinal Surgery-PF036

LAPAROASSISTED SUBTOTAL COLECTOMY WITH ANTIPERISTATLTIC CAECOPROCTOSTOMY FOR COSTIPATION, Leopoldo SARLI,M.D., Renato COSTI,M.D., Domenico IUSCO,M.D., Luigi RONCORONI, M.D., Istituto di Clinica Chirurgica Generale e Terapia Chirurgica dell'Università, Parma, Italy

Several trials demonstrated the efficacy, low morbidity, and clinical benefit of laparoscopy compared with laparotomy for the treatment of benign colorectal disease. Slow transit constipation, also defined as colonic inertia (CI),improves after colectomy, and a technique for laparoscopic colectomy with ileorectal anastomosis has been proposed even for this benign disease. We recently proposed a technique for subtotal colectomy with a novel antiperistaltic cecorectal anastomosis (CRA). In this paper we propose a technique for subtotal colectomy with CRA with a laparoscopic approach, utilized to treat two young women affected by CI.

After insertion of 5 trocars with a 13 mm/Hg pneumoperitoneum, the mobilization of all colic segments, and the dissection of the mesorectum of the high rectum were performed. Ligature of vascular pedicles was laparoscopically performed carefully preserving the ileocolonic artery and its branches to the cecum. Through a small Pfannestiel incision (10 cm) the colon was delivered, appendectomy was performed, the ascending colon was divided 10-15 cm above the ileocaecal junction and subtotal colectomy was completed by transecting the rectum just below the level of the sacral promontory. The caecum was brought into the pelvis with no rotation, and an antiperistaltic CRA was carried out anastomising the caecal bed to the rectal stamp using a circular stapler utilising the colonic section line as an entrance door for the stapler. The apex of the cecum was closed using a linear stapler.

The operating time was 320 min and 360 min respectively. The interval between surgery and resumption of an oral diet was 3 days in both cases. There was no postoperative morbidity. The length of postoperative hospital stay was 10 days. One month after CRA, bowel frequency was regular in both cases.

Laparoscopically assisted subtotal colectomy with CRA is safe and effective for patients with CI.

Colorectal/Intestinal Surgery-PF037

LAPAROSCOPY IN THE MANAGEMENT OF COLONIC DUPLICATION, Ivan R. Diamond, B.Sc., Jacob C. Langer, M.D., Department of Surgery, University of Toronto and Hospital for Sick Children, Toronto, Canada

Introduction: Colonic duplication is a rare form of intestinal duplication usually diagnosed during childhood. Although frequently asymptomatic, duplications are usually resected to prevent the risk of obstruction, bleeding, perforation and malignancy. We describe four consecutive cases of colonic duplication that were managed using laparoscopy.

Method: Charts of all patients undergoing resection for colonic duplication between 1995 and 2000 were retrospectively reviewed.

Results: Four children were identified. Age at operation ranged from four months to six years (median 3.5 years). Location was cecum (2), transverse colon (1), and splenic flexure (1). The duplication was successfully identified laparoscopically in all cases. Two of the duplications were resected using an entirely laparoscopic approach, and the procedure was laparoscopic-assisted using a very small incision in the other two cases. Median operative time was 100 minutes and there were no intra-operative complications. Post-operatively 2 children received intravenous morphine overnight, one received acetaminophen and codeine and the fourth patient received acetaminophen alone. Median post-operative stay was 1.5 days. No patient experienced any postoperative complication.

Conclusions: Laparoscopy is an excellent approach to the management of colonic duplication, and is associated with a short hospital stay, minimal analgesic requirements, and a superior cosmetic result.

Colorectal/Intestinal Surgery-PF038

LAPAROSCOPICALLY ASSISTED SURGERY IN CROHN`S DISEASE, P.Dubsky,M.D., J.Zacherl,M.D., G.Bischof,M.D., F.M.Riegler,M.D., H.Puhalla,M.D., R.Jakesz,M.D.; F.Herbst,M.D. University Clinic of Surgery, Department of General Surgery; Vienna, Austria

Background: Laparoscopic (assisted) surgery is evolving as a treatment option for patients with complicated abdominal Crohn´s disease. The aim of this study was to compare operative and perioperative outcome of pat. undergoing laparoscopic surgery for either uncomplicated ileocoecal obstruction or for more advanced disease.

Methods: From 1/1997 until 7/2001, 61 pat. underwent laparoscopic assisted procedures. For this analysis pat. were grouped according to the intraop. assessed and pathologically confirmed stage of disease. Group I (GI) was determined to include pat. with stenosis and/or ileo-ileal fistula (49,2%, 30pat.), Group II (GII) included pat. with right lower quadrant mass with or without abscess and/or ileocolonic or ileocutaneous fistula. Pat. requiring colonic surgery were assigned to GII (50,8%, 31 pat.). Other predictive factors of outcome and surgical procedure (Ileocoecal resection: 54; right Hemicolectomy: 3; sigmoidal res. with ICR: 1; terminal sigmoidostomy: 2; subtotal colonic res.: 1) were evenly distributed between the two groups. All procedures were carried out or taught by a single surgeon.

Results: Mean operating time was 114 min. in GI and 127 min. in GII, 3.2 ports were used in GI vs. 3.3 in GII. Mean size of minilaparotomy was 69mm in GI vs. 72mm in GII. Pat. in GI tolerated liquid diet 2.3 days postop. vs. 1.9 days in GII, complete diet 4.8 days postop. vs. 5.5 days in GII. Mean hospital stay in GI was 7.6 days vs. 8.0 days in GII. There were three conversions in GII. Postop. complications included one case of secondary wound healing of the mini-lapar otomy (GII), and a total of 5 cases of transient intestinal paralysis (GI:3, GII:2). We did not find any statistically significant differences between the two groups.

Conclusion: Although we did find a higher rate of conversion in pat. with more advanced disease, our overall results do not suggest a disadvantage for pat. undergoing laparoscopic surgery with an advanced stage of disease.

Colorectal/Intestinal Surgery-PF039

LAPAROSCOPIC ASSISTED COLECTOMY WITH COLON-LIFTING METHOD BY THREAD FOR COLON AND RECTAL CANCER Fujii Shoichi.M.D.*,Shimada Hiroshi.M.D.+, Ike Hideyuki.M.D.*, Imada Toshio.M.D.*, Ohki Shigeo.M.D.*, Yamaguchi Shigeki.M.D.+, Ichikawa Yasushi.M.D.+, Kimura Hideaki.M.D.+, Yamagishi Shigeru.M.D.+, Yokohama City University Medical Center Gastroenterological Center*∞AThe Second Department of Surgery+

Laparoscopic assisted colectomy for colon and rectal cancer is spread in Japan recently. This procedure has the advantages in minimizing surgical stress, however it consumes more money and staffs. Then, we designed colon-lifting method by thread, which requires only two staffs and three trocars. It is able to perform without deterioration of the curability by recognition of the main feeding artery easily. (Surgical technique) The patient was placed in the lithotomic position with Trendelenburg setting. The trocar that was 12mm in the diameter was inserted at just cranial site of the navel and pneumoperitoneum was performed. Another two 12mm trocars were placed at the upper quadrant in the same site of the lesion and the lower in the opposite site respectively. The nylon thread of 2-0 was inserted in the abdominal cavity and the mesocolon was pierced with the dissecting forceps. The colon was retracted to the frontal side by pulling the thread passed through the mesocolon, and the thread was fixed at the abdominal wall by Pean∞fs forceps. Then, the main feeding artery was tensed in the mesocolon; lymph node (LN) dissection was easily performed near the SMA in the case of right colonic lesion, the IMA in left colonic and rectal lesion. The first assistant was not required and the scopist only, except the surgeon, because of fixing the thread to abdominal wall. The thread was added at the other position of the mesocolon in case of the elongated colon patient in order to maintain the fine view.

(Results) From `99 to `00, this method was performed for 23 patients with early colon and rectal cancers∞iright side:6, left side and rectum:17∞j. The mean length of the operation time was 248 min (179-360). The mean number of the dissected LNs was 18.7(2-56). (Conclusion) The colon-lifting method by thread was advantageous in respect of medical cost by reason of saving the number of men and the implement without deterioration of the LN dissection.

Colorectal/Intestinal Surgery-PF040

ILEUS FOLLOWING COLONOSCOPY REPORT OF A CASE. Senko Fujiwara M.D., Michiya Kobayashi M.D., Ph.D. Toru Ando M.D., Ph.D., Ken Okamoto M.D., Takeki Sugimoto M.D., Ph.D., Toyokazu Akimori M.D., Takashi Saito M.D., Kimio Matsuura M.D., Ph.D., Keijiro Araki M.D., Ph.D.

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Endoscopic polypectomy is the first modality for benign colon polyps. We experienced a case of ileus following endoscopic polypectomy, who underwent laparoscopic operation.

A 70-year-old female, who had no history of abdominal operation, complained abdominal pain and nausea on the following day of endoscopic polypectomy for benign small colon polyps. Physical examination and laboratory data showed no sign of peritonitis. Abdominal X-ray and CT scan demonstrated the dilatation of small intestine. She was diagnosed as ileus. The long tube was inserted into the ileum on 3 days after the onset of ileus. The ileus tube improved her symptoms, however, the fluoroscopic study revealed the stenosis of the ileum. She underwent laparoscopy. Laparoscopic examination demonstrated that omentum adhered to lower abdominal peritoneum forming a band. The band strangled two parts of the ileum, which caused the ileus. The cutting this band and detachment of adhesion were performed laparoscopically. On the 2nd postoperative day, the ileus tube was removed, and she could start to eat. On the 6th postoperative day, she was out of hospital without any symptoms.

This case had no history of abdominal operation. The cause of adhesion was obscured. We, however, speculated that massive inflation of air during the colonoscopy made the ileum dilated. And the dilated ileum entered the space under the strangle, which caused ileus.

Colorectal/Intestinal Surgery-PF041

LATE PRESENTING COMPLICATED APPENDICITIS;A NOVEL APPROACH TO A COMPLICATED PROBLEM George J. Gibeily M.D., Mitchell N. Ross M.D.,Darrell Manning M.D., Kaiser Permanente, Washington, D.C.

Acute appendicitis is the most common etiology of an acute abdomen that necessitates urgent surgical intervention. An appendiceal mass (AM), often nonpalpable, is recognized in up to 13% when presenting after 72 hours of symptoms (Late). Prompt appendectomy is universally agreed upon in the acute setting but treatment remains controversial with late presentation. The objective of this prospective study is to determine if interval laparoscopic appendectomy(ILA) after initial non-operative treatment for late appendicitis is a safe alternative to immediate appendectomy.

Sixteen consecutive patients seen by three surgeons over a period of five years presented with late appendicitis.There were five males and eleven females whose ages ranged from 16 to 60 years old with a mean age of 40y/o . All patients were made NPO and treated with parenteral antibiotics and i.v. fluids. Three patients did not improve clinically in the first 24 hours and required CT guided drainage of a periappendiceal abcess. All patients underwent ILA from two to sixteen months after initial presentation.

Preoperative workup did not demonstrate neoplasms or other pathology in these patients. None of the patients developed recurrent peritonitis or became septic awaiting surgery. The averge operative time of laparoscopic appendectomy was 77 minutes.The average duration of hospitalization before surgery was five days,the average postop stay was two days and the average total hospitalization was seven days.The laparoscopic approach was successful in 94% with only one requiring elective conversion to open due to dense retrocecal fibrosis. The complication rate was 12% consisting of two patients with prolonged ileus .

ILA allows a judicious diagnostic evaluation to exclude etiologies that require more than an appendectomy, if any surgery at all. Should surgery be necessary, the most appropriate procedure can be planned under controlled conditions in a more stable patient.This yields both overall shorter inpatient stays and postsurgical disabilities.

Colorectal/Intestinal Surgery-PF042

LAPAROSCOPIC TREATMENT OF COMPLICATED DUODENAL ULCERS

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INTRODUCTION: Laparoscopic treatment of duodenal ulcer disease is still economically preferable in Ukraine.

PATIENTS AND METHODS: Laparoscopic operation were performed in 142 patients for management of compli-cated peptic duodenal ulcers. Indications for operation were: bleeding in 97 patients, perforation in 34, stenosis in 10. In patients with bleeding, vagotomy was performed after successful endoscopic hemostasis. Posterior trunk vagotomy and anterior seromyotomy (Taylor's procedure) was performed in 82 patients. In 15 patients posterior trunk vagotomy and resection of the lesser curve by stapler was performed. In 34 cases with perforation, 19 patients were operated by intracorporal suturing of the perforation, 7 patients by omental patch to the perforation. Taylor's vagotomy and sutur-ing of the ulcer defect was performed in 8 cases. In cases of stenosis, 6 patients were operated by bilateral posterior truncal vagotomy with gastroenterostomy. In 39 cases of large ulcer with stenosis and bleeding, the following com-bined operation was performed: Taylor's vagotomy + mobilisation of the duodenum by Kocher's method and mini-laparotomy (length 4-5 cm) exactly at the projection of the ulcer to perform resection of the ulcer and pyloroduode-noplasty under laparoscopic control.

RESULTS: Postoperative mortality was zero. Complications were observed in 14 cases. Conversion was performed in 6 cases. 4 years analyses of post-operative results shows: Visick I or II - in 90 % of patients, Visick III - in 5.8% and Visick IV - in 4.2%.

CONCLUSIONS: Our experience shows that laparoscopic procedures can be performed successfully in patients with complicated duodenal peptic ulcers.

Colorectal/Intestinal Surgery-PF043

LAPAROSCOPIC SUTURED ANASTOMOSIS OF THE BOWEL. TECHNIQUE AND LEARNING CURVE

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Introduction: In spite that the safety and efficacy of sutured anastomosis has been proved in open surgery, laparoscopic sutured anastomosis is rarely performed because it is difficult and time-consuming. We aimed at description of a standardised technique for laparoscopic sutured anastomosis of the bowel and definition of its learning curve.

Methods: In a laparoscopic abdominal simulator, 56 laparoscopic sutured anastomoses of cow small intestine were performed. Additionally, in a survival animal trial, two gastrojejunostomy, two cholecystojejunostomy, two colocolic , ten end-to-end and one side-to-side anastomoses were performed, using the same technique. We used two stay sutures, and a single layer full thickness continuous inverting suturing. A novel type of suture loop was used to replace the intracorporeal knot at the beginning of suture line, so that, the whole anastomosis can be performed by a single intracorporeal knot.

Results: In the survival cases, we had no leaks nor obstruction, minimal adhesions, and only one stenotic gastrojejunostomy. The mean end-to-end anastomotic time was 50 min. The technique was suitable for most sites in the GIT. The learning phase required 40 anastomoses in the simulator.

Conclusions: The described technique of sutured bowel anastomosis seems relatively fast, safe, universal, and needs about 40 anastomoses to be mastered. We feel that this technique could be given a chance by well-trained laparoscopic surgeons, whenever bowel anastomosis is required.

Colorectal/Intestinal Surgery-PF044

LAPAROSCOPIC RESTORATIVE PROCTOCOLECTOMY FOR PATIENTS WITH ULCERTATIVE COLITIS Hirotoshi Hasegawa, M.D., Masahiko Watanabe, M.D., Hideo Baba, M.D., Seiichiro Yamamoto, M.D., Masaki Kitajima, M.D., Department of Surgery, Keio University, Tokyo, Japan

[Aim] To describe a short-term outcome of laparoscopic restorative proctocolectomy in patients with ulcerative colitis (UC).

[Patients and methods] Between 1994 and 2001, 15 patients (8 male and 7 female; mean age: 30.3 years) with UC underwent elective laparoscopic restorative proctocolectomy. Data were prospectively collected and all patients were reviewed with a median follow up of 14 months (range: 3 months-7 years).

[Surgical technique] Pneumoperitoneum was developed and 5 trocars (two 5 mm trocars in the right and left upper quadrant regions and three 12 mm ones in the both lower quadrants and suprapubic regions) were placed. After the entire colon and rectum were completely mobilised, all the vessels and the rectum were divided by autostapling devices. The colon and rectum were extracted through the suprapubic port that was extended to the length of 4 cm. The ileal J pouch and the rectum were joined together using a circular stapler and a diverting ileostomy was fashioned.

[Results] The median operative time, blood loss and hospital stay were 6 hours, 105 ml and 9 days, respectively. No procedures were converted to open surgery. One patient developed wound sepsis and another developed bowel obstruction that was managed conservatively.

[Conclusion] Laparoscopic restorative proctocolectomy was feasible in selected patients with UC.

Colorectal/Intestinal Surgery-PF045

LAPAROSCOPIC TOTAL ABDOMINAL COLECTOMY FOR SLOW TRANSIT COLON, Koung-Hung Hsiao, M.D., William T.Chen, M.D., Hung-Chang Chen, M.D., Chien-Ming Chiu, M.D., Department of Surgery, Division of Colorectal Surgery. chang-Hua Christian Medical Center Chang-Hua,Taiwan

Purpose: The aim of this study was to analyze the results of perioperative course, postoperative quality, and two years results of laparoscopic total abdominal colectomy (L-TAC) for slow transit colon (STC).

Method: From January 1, 1999 to December 31, 2000, L-TAC was attempted in eight patients with STC. Data were prospectively collected regarding the patients' age, sex, previous history, anorectal physiology testes, psychological state, diagnosis, procedure performed, type of anastomosis, postoperative course, and quality of life.

Results: All eight patients were females with a mean age of 31.1 (range, 25-41) years. Mean operative time was 276.36 (range, 200-360) minutes. Mean postoperative hospitalization was 6.6 (range, 4-8) days. Time to first bowel movement and commencement of solid diet were 1.8 (range, 1-3) and 4.38 (range, 2-6) days, respectively. One patient had prolonged postoperative ileus. Average stool frequencies per day were 6.6 at one week, 5.3 at one month, 4.9 at six months, 3.2 at one year, and 2.4 at two years postoperatively. Eight patients (100 percent) required antidiarrheal treatment for the first six months after initial treatment, but none required long-term therapy. Overall functional outcome as good to excellent in 7 patients (87.5%), and one patient was not satisfied with the outcome of the surgery. There was no mortality. One patient had recurrent admissions for adhesion colic, which resolved with surgical therapy.

Conclusion: The outcome of laparoscopic total abdominal colectomy is generally rated as good to excellent. No major intra or postoperative complication was observed. Acceptable bowel function and control is regained within six months of the operation and levels off at one year after surgery, and no patient requires long-term antidiarrheal medication.

Colorectal/Intestinal Surgery-PF046

COST ANALYSIS OF STAPLED AND LIGATED TECHNIQUES OF LAPAROSCOPIC APPENDECTOMY IN CHILDREN William E. Wehrman, B.S., and Thomas H. Inge, M.D., Ph.D. Department of Pediatric Surgery, Children's Hospital and Medical Center, University of Cincinnati College of Medicine, Cincinnati, OH

BACKGROUND: Laparoscopic appendectomy (LA) offers several advantages over open appendectomy. However, the laparoscopic technique is associated with higher surgical costs than the open method. We hypothesized that for children undergoing LA, a cost-savings may be realized if a simple electrocautery and ligature technique was utilized as compared to the commonly employed method of stapled LA.

METHODS: A retrospective study of 55 pediatric patients was performed comparing the two different techniques of LA. The operating time, surgical expense, postoperative stay, and complications requiring readmission were examined. Findings were stratified for perforated and non-perforated cases.

RESULTS: The ligature method was used for 37 patients overall with an average surgical time of 70 minutes, average operating room cost of $655, and average postoperative stay of 2.6 days. The stapled technique was used for 18 patients with a surgical time of 71 minutes, charges of $1,047, and a postoperative stay of 3.4 days. There were no statistical differences between these two treatment groups for any of these variables except cost. Overall, a 37% lower cost for ligated vs. stapled appendectomy ($p<0.001$) was seen. When patients with perforated appendicitis (n=13) were examined separately, a 45% reduction in cost was seen using the ligature technique ($p<0.001$). The observed complication rate (intra-abdominal abscess) was similar for ligated (8%; 3 cases) vs. stapled (22%; 4 cases) techniques ($p>0.05$).

CONCLUSION: The ligature technique of LA was associated with a significant cost savings over the stapled method, especially for children with perforated appendicitis. Neither the operative time nor the rate of complication was adversely affected by the ligature technique.

Colorectal/Intestinal Surgery-PF047

LAPAROSCOPIC COLECTOMY WITH INTRACORPOREAL FUNCTIONAL END-TO-END ANASTOMOSIS Mikito Inokuchi M.D., Kazuyuki Kojima.M.D.,Masayuki Enomoto M.D.,Toshiki Yamashita M.D.,Kenichi Sugihara M.D., Tokyo medical and dental university, Digestive surgery

In the reconstruction phase of the laparoscopic colectomy, extracorporeal anastomosis is usually performed through the incision except the patients with rectal cancer. A functional end-to-end (FETE) anastomosis using linear stapler is known as a safe and expeditious method. We have investigated the feasibility intracorporeal anastomosis using this technique.

In the case of extracorporeal anastomosis, we often have to enlarge the incision in order to bring out both oral and anal sides of the colonic lesion through it. We also have to decide the incisional position above the lesion. These are limiting factors in laparoscopic assisted colectomy.

On the other hand, the intracorporeal anastomosis can make the incision shorter because it is utilized only for bring out the resected specimen. It also can be possible to place the incision in the lower abdominal region, so the patient will have much less pain.

Recently, we succeeded two cases of the intracorporeal FETE anastomosis after right-side colectomies. The method is in same way as open technique, but we used ENDO GIAtm(60mm, blue cartridge) at four times. We minimized the hole into where we inserted the forks of ENDO GIAtm, because of preventing laeskage of the contents from the colon into the peritoneal cavity. It takes 57 and 44 minutes each other to perform anastomoses. There were no intraoperative and postoperative complications.

Our experience shows this procedure is complicated, but less invasive.

Colorectal/Intestinal Surgery-PF048

LAPAROSCOPIC LYMPHADENECTOMY OF COLORECTAL CANCER BY 3 PORTS METHOD. Haruhiko Inufusa, M.D., Kazuki Ueda, M. D., Takehito Yshifuji, M. D., Tadao Tokoro, M. D., Kiyotaka Okuno, M. D., Hitoshi Shiozaki, M. D., and Masayuki Yasutomi, M. D., Department of the First Surgery, Kinki University School of Medicine, Osakasayama, Japan

Laparoscopic colectomy (LC) is reported that have various advantageous in reduction of the postoperative pain, early rising, early release from hospital, etc. compared to open colectomy (OC). However, LC is usually required higher technique, and need longer operation time compare to OC. From1997, we are employing the 3 ports method that the assistant holds scope only and operator uses both hands to do operation at the starting time LC. Then, the additional port was added when the case required more assistance. In this study, we examined the sufficient lymphadenectomy of colorectal cancer by 3 ports LC is possible or not. The colorectal cancer patients who received LC with lymphadenectomy in the root area of ileocolic artery and inferior mesenteric artery, in the period from 1997 to 2001 were studied. The patients who converted to the open surgery, complication ablation, or case of total colectomy were excluded, and the post celiotomy patients were included. Eleven cases required additional port (4 ports) and 56 cases were completed LC with lymphadenectomy by 3 ports method. Dissection level of lymphadenectomy, operations times, and blood loss are in 3 ports D1: 113 min, 104 ml, D2: 130 min, 57 ml, D3: 138 min, 56 ml, and in 4 ports D1: 165 min, 78 ml, D2: 163 min, 75 ml, D3: 220 min, 156 ml. Histopathological examination revealed that the all cases were received sufficient lymphadenectomy compare to the progression or metastasis of the cancer. No metastasis of the level 3 lymph node was found in the patients who received D3 level lymphadenectomy, therefore, these D3 lymphadenectomy was over surgery. The patients required additional port (4 ports) showed longer operation time, more blood loss compare to the 3 ports LC with lymphadenectomy. Three ports LC is possible to do sufficient lymphadenectomy of colorectal cancer.

Colorectal/Intestinal Surgery-PF049

EVALUATION OF CONVERTED CASES IN LAPAROSCOPIC TREATMENTS FOR SMALL BOWEL OBSTRUCTION, S.Kamei M.D., M.Fujisaki M.D., T.Takahashi M.D., S.Hirahata M.D.,,D.Maeda M.D., N.Wada M.D., M.Matsumoto M.D., Department of Surgery, Ashikaga Red Cross Hospital,Tochigi, Japan

AIM: To evaluate the efficacy of laparoscopic treatment for small bowel obstruction, and to analyze the importance of laparoscopic observation in abdominal cavity.

METHODS: From July 2000 to August 2001, 6 patients with small bowel obstruction, whose cause of obstruction were unclear and we could get effective decompression, underwent laparoscopic treatment.

RESULTS: 4 patients underwent laparoscopic adhesiotomy successfully. 2 patients were converted to open surgery. One case was post myomectomy, and ileum was adhesive to back of uterus. Other was found severe-curved-ileum adhesive to pelvic cavity. In both cases we could get the cause of obstruction by laparoscopic observation, and could get appropriate position of abdominal incision easily.

CONCLUSIONS: (1) Laparoscopic adhesiotomy is useful because of its minimal invasiveness, if we could get effective decompression. (2) Laparoscopic findings of intraabdominal adhesion and detection the cause of obstruction are effective for converting appropriate operation.

Colorectal/Intestinal Surgery-PF050

LAPAROSCOPIC TOTAL COLECTOMY FOR ULCERATIVE COLITIS

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Ulcerative colitis (UC) is usually found in young patients, and they are suffering from severe diarrhea with bloody stool and long-term usage of steroids. We reported here the feasibility and technique of laparoscopic total colectomy for severe UC patients.

From 1999, 10 cases of UC patients were received laparoscopic total colectomy in our university hospital. Seven out of 10 cases were reconstructed with ileal-pouch and anal anastomosis (IAA) and 3 cases were reconstructed with ileal-pouch and anal-canal anastomosis (IACA). Briefly, 5 ports were inserted under pneumo-peritoneum and total colon was removed through a small incision in right lower abdomen.

Although 2 cases were converted to open colectomy due to bleeding, we could perform the removal of total colon safely, using the technique of laparoscopic operation in the remaining 8 cases. An average time of this operation is 7 to 8 hours and operation time is getting shorter depending on a learning curve. Laparoscopic total colectomy needs only small incisions and could be less invasive for young patients. Therefore, this laparoscopic operation has a benefit for cosmetic reasons.

Colorectal/Intestinal Surgery-PF051

ONE HUNDRED AND FIFTEEN CONSECUTIVE LAPAROSCOPIC COLECTOMIES WITHOUT OPERATIVE MORTALITY Seon Han Kim, M.D., Jin Seok Yoon, M.D., and Dong Keun Lee, M.D, Laparoscopic Colon Surgery Unit, Department of Surgery, Hansol Hospital, Seoul, Korea

Background: For laparoscopic colectomy to be accepted, this procedure must have an equal or better safety profile than open colectomy. Hospital mortality, however, is similar between the two procedures in the literature, ranging from 1.5% to 3%. This study aimed to investigate the operative mortality and morbidity in consecutive patients undergoing laparoscopic colectomy by one surgical team specially trained in these methods.

Methods: Prospectively collected data was achieved in 115 consecutive patients (M:F=68:47, median age 58 years) undergoing laparoscopic colectomy between October 1997 and August 2001. Thirty patients (26.1%) were 65 years of age or older. The American Society of Anesthesiologists scores were I in 63.3%, II in 24.5%, and III in 12.2%. One hundred eight patients had cancers (55 colon and 53 rectal), vs 7 had benign diseases.

Results: Operative procedures included 20 right and 3 left colectomies, 35 anterior and 40 low anterior resections, 15 abdomino-perineal resections, 1 subtotal colectomy, and 1 total proctocolectomy. Median operative time was 210 (range, 105-420) minutes. Median blood loss was 250 (range, 50-850) ml. Conversion to an open procedure was required in 7 cases (6.1%). TNM stages were as follows: 0:I:II:III:IV=8:19:36:37:8. Overall morbidity rate was 20.9%. Major complications occurred in 9 patients (7.8%): 2 intraabdominal bleedings, 1 anastomotic bleeding, 4 anastomotic leaks, 1 fungal peritonitis, and 1 respiratory distress syndrome. None of these were fatal. Tumor margins were clear in all cancer patients. During median follow-up of 13 (range, 1-47) months after 100 curative cancer resections, distant metastases occurred in 4 patients. There were no port site recurrences.

Conclusions: With a specially trained team approach, laparoscopic colectomy can be performed with minimal risk of morbidity and mortality, even without mortality. This data further supports laparoscopic resections for malignant and benign indications.

Colorectal/Intestinal Surgery-PF052

LAPAROSCOPIC ASSISTED COLECTOMY FOR COLON CANCER. – EVALUATION OF OUR 5 CONVERTED CASES-- Michiya Kobayashi, M.D., Ph.D., Ken Okamoto, M.D., Tohru Ando M.D., Ph.D., Naoshige Tohchika M.D., Toyokazu Akimori M.D., Shinichi Hamada M.D., Tkeki Sugimoto M.D., PhD., Kimio Matsuura, M.D., Ph.D., Keijiro Araki, M.D., PhD. First Department of Surgery , Kochi Medical School, Nankoku, Kochi.

Laparoscopic assisted colectomy (LAC) is now one of the surgical modalities for colon neoplasm. From January 1997 to December 1999, our indication of the LAC was adenoma and cancer with mucosal or submucosal invasion. After the investigation of these cases, we have changed it to the Dukes A cases. In this study, we reviewed the converted cases in our LAC cases.

We experienced 48 LAC cases from January 1997 to July 2001. Among them, there were 5 converted cases. Case 1was a caecal cancer patient with massive adhesion of omentum to mesenterium due to previous history of laparotomy. We converted to laparotomy because of the adhesion. Case 2 was a sigmoid colon cancer patient. When applying an endostapler, the wall of rectum was injured following conversion. Case 3 is a sigmoid colon cancer patient. When dissecting mesorecutum by laparoscopic coagulating shears, we mis-recognized the degenerated adipose tissue as stool flowing out from the injured rectum. Case 4 is a patient of ulcerative colitis with a history of high-dose steroid administration. Skin and subcutaneous tissue were very weak caused by long-term steroid administration. During the laparoscopic procedure of subtotal colectomy, we could not control the level of PaCO2 due to massive subcutaneous emphysema. Case 5 is a sigmoid colon patient. We accomplished sigmoidectomy with D2 dissection laparoscopically. However, the frozen section revealed cancer metastasis to N1 lymph node. Our policy is to convert for D3 dissection for the patient with positive N1 and/or N2 by frozen section. We dissected N3 lymph nodes under mini-laparotomy.

The reasons of the conversion are 1) patient's characteristics for Case 1and 4; 2) poor technique for Case 2 and 3; 3) massive extension of the primary disease for Case5. We experienced the Case 2 and 3 in the early period of the series. This can be avoided by an experienced operator. Although the reason of the conversion for Case 1 and 4 is the patient's characteristics, the progress in technique may avoid the conversion. Even if we accomplish the D2 dissection laparoscopically, we convert to the laparotomy for further LN dissection for the cases, which the frozen section of N1 and/or N2 LN shows cancer metastasis so far. However, we should practice the procedure of D3 dissection to avoid the conversion.

Colorectal/Intestinal Surgery-PF053

BLOOD LOSS IN LAPAROSCOPIC VS OPEN COLORECTAL SURGERY. META-ANALYSIS S.Tadic M.D., V.Augustin M.D. B.Romic M.D. University teaching hospital Zagreb-Rebro , Surgical Clinic, Ki?patiæeva 12 Zagreb,CROATIA

INTRODUCTION: Laparoscopic colorectal surgery is complex procedure with high technical demands.There were some dilemas about this approach in last years.We wanted to evaluate difference in blood loss between laparoscopic and open approach with evidence based procedure: meta-anaylsis.

MATERIAL AND METHODS: We have selected papers published from 1990 to 1999.,which have had data on blood loss during laparoscopic or open procedures.Inclusion criteria was at least 20 patients reported for comparative studies and 30 patients for laparoscopic or open series of patients.

At the end we have selected 18 published papers.There were 9 comparative studies, 4 laparoscopic series and 5 open series of patients. Meta analysis was done with logistic regression method.

RESULTS: Average blood loss was 200,1 ml for laparoscopic procedures, and 467,9 ml for open procedures (descriptive statistics).Meta-analysis with fixed-effect model showed difference of 395,6 ml (233,1 ml-558,2 ml).When random-effect model was used, estimated difference was 251,2 ml (54,6 ml-447,8 ml).Both differences were highly statistically significant.Correlation between blood loss in open vs open procedures was 0,459.This relatively big correlation shows that there is great impact of randomeffect.

CONCLUSION: By using a meta-analysis, we have shown that there is significantly higher blood loss in open procedures. Together with lesser impact on immune system, this maybe the reason of smaller operative morbidity and mortality reported in laparoscopic procedures.

Colorectal/Intestinal Surgery-PF054

COMBINED LAPAROSCOPIC ASSISTED RIGHT HEMICOLECTOMY AND LOW ANTERIOR RESECTION FOR SYNCHRONOUS COLORECTAL CARCINOMAS David M Lauter MD, Stanley T Lau MD Departments of General Surgery Group Health Cooperative of Puget Sound and Virginia Mason Medical Center Seattle WA

Introduction: Two cases of combined laparoscopic assisted right hemicolectomy and low anterior resection for malignancy are presented to illustrate the technical aspects of performing two concurrent laparoscopic assisted bowel resections with sequential anastomosis. Although there are similarities with laparoscopic assisted total proctocolectomy, the need for complete mesenteric dissection in two areas, removal of two separate specimens containing malignancy, and the need for two anastomoses raises unique technical considerations which include port placement, sequence of dissection, sites of specimen extraction sites, specimen handling, and sites for extracorporeal anastomosis

Methods: Operative notes, operative videotapes, hospital and outpatient records were reviewed for both patients.

Results: Laparoscopic assisted combined resection was completed in both patients. In both cases, laparoscopic total mesorectal excision was performed. Maximum incision length was 5 cm. Both patients were ready for discharge on post-operative day 3.

Conclusion: Combined laparoscopic assisted right colectomy and low anterior resection can be performed for synchronous colorectal malignancies with curative intent.

Colorectal/Intestinal Surgery-PF055

COMBINING ULTRASONIC DISSECTION AND THE STORZ OPERATION RECTOSCOPE: AN EFFECTIVE NEW APPROACH TO TRANSANAL ENDOSCOPIC MICROSURGERY Marco M. Lirici, M.D., Giovanna Sgarzini, M.D., Cristiano G.S.Hüscher, M.D., Department of Surgery, San Giovanni Hospital, Rome, Italy

Transanal endoscopic microsurgery is indicated for treatment of large sessile adenomas and early rectal cancer allowing precise full thickness resection of any lesion up to 15 cm from the dentate line. TEM, as described by Buess, needs dedicated and rather expensive equipment, is high skill demanding and requires a running suture secured by silver clips for closure of the parietal defect and continuous control of bleeding and oozing during dissection. The Storz operation rectoscope does not need dedicated instruments. Its features required the development of a slightly different procedure. Combination with US dissection offers further advantages. Definition of indications and evaluation of the cost-effectiveness of this new approach are the objective of the study. US activated 5 mm, curved blade scissors are employed for dissection and coagulation. Only 2 instrument are used with no need for instrument exchange. Full-thickness resection of adequate margin of clearance is performed. Closure of the parietal defect is accomplished by interrupted 3-0 PDS sutures secured with extracorporeal slip-knots. Fourteen TEM have been performed with such a new approach. Adenomas (5), ca in situ/T1 tumors (6), T2 cancers (2)and anastomotic stricture (1) were the indications. Follow-up ranged 1-36 months. No recurrence was observed. One postoperative complication occurred in a patient with adenoma: a bleeding that required a new rectal suturing.Compared to the original technique, TEM with the Storz rectoscope is indicated only for tumors located up to 15 cm from the anal verge. Close-up view is not possible but the use of US dissection avoids smoke generation. Despite the mentioned complication, coagulation is optimal and US scissors allow working in a pretty bloodless field. Overall costs are remarkably lower.

Colorectal/Intestinal Surgery-PF056

LAPAROSCOPIC PROCTECTOMY WITH ILEOANAL POUCH AFTER LAPAROSCOPIC TOTAL COLECTOMY: A COMPARATIVE STUDY Peter W. Marcello, M.D., Department of Colon & Rectal Surgery, Lahey Clinic, Burlington, Massachusetts

Introduction: There are no previous reports of laparoscopic (LAP) proctectomy with ileoanal pouch after laparoscopic total colectomy in ulcerative colitis patients (pts). This study aims to determine the safety and efficacy of LAP in these pts compared to those undergoing conventional (CON) surgery.

Methods: 10 pts from 1998-2000 underwent LAP proctectomy with ileoanal pouch and loop ileostomy. All pts had undergone an urgent LAP total colectomy and ileostomy for acute colitis. CON pts were matched for patient characteristics, diagnosis, procedures, and operative period. Adhesion formation following total colectomy was also assessed. Median (range) values are reported.

Results: There were 10 LAP pts and 13 matched CON pts. At the time of proctectomy, small bowel adhesions were noted in 10% of LAP cases and 92% of CON cases ($p<0.05$).

There were no differences in operative times (LAP 250 (180-350) min vs. CON 240 (150-350) min, $p=0.72$). Estimated blood loss was less in the LAP group (250 (200-400) cc vs. CON 600 (200-1800) cc, $p<0.01$). Return of flatus was sooner in the LAP group (1 (1-3) days vs. CON 3 (2-4) days, $p<0.01$) and length of stay was shorter in the LAP group (5 (4-11) days vs. CON 7 (5-21) days, $p=0.04$).

Perioperative morbidity was also less in the LAP group (20% vs. CON 53%).

Conclusions: Laparoscopic proctectomy and ileoanal pouch is feasible and safe in colitis patients and leads to a faster recovery than a conventional procedure. Adhesion formation following laparoscopic total colectomy is less than conventional colectomy, offering a previously unrecognized advantage at the time of reoperation.

Colorectal/Intestinal Surgery-PF057

LAPAROSCOPIC MANAGEMENT OF PERFORATED PEPTIC ULCER, IVAN MICHELET, M.D., FERDINANDO AGRESTA, M.D., NATALINO BEDIN, M.D., DEPARTMENT OF GENERAL SURGERY, OSPEDALE CIVILE, VITTORIO VENETO (TV) , ITALY

Perforation of a gastro-duodenal ulcer is a serious complication of peptic ulcer disease that affects almost 10% of the patients and accounts for more than 70% of deaths associated with the disease. Its treatment is essentially surgical.Aim of the present work is to illustrate retrospectively the results of a case-control experience of LAPS vs. open surgery carried out at our institution for perforated gastro-duodenal ulcer.

Between November 1992 and July 2001 a total of 48 patients (mean age 59 years) underwent urgent surgery for peritonic acute abdomen due to a perforated gastroduodenal ulcer. Among them, 22 (45.8%) were operated on Laparoscopically, according to the presence of a well-trained surgical team.The contraindication to a laparoscopic approach were the already known absolute ones plus previous history of more than two major abdominal surgical procedures. We did not consider peritonitis to be a contraindication. The following procedures were carried out: simple closure in 9 patients of the LAPS group and 16 in the laparotomic one; closure plus omentoplasty in 4 of the LAPS and 9 in the laparotomic group; a peritoneal lavage plus drainage in the remaining 7 cases of the LAPS group. One patient in the laparotomy group required resection. The laparoscopic group conversion rate was 9% and was mainly due to the presence of dense intraabdominal adhesions and the impossibility to properly find the perforation. Major complications ranged as high as 18.1% in the LAPS group and 19.2% in the open one with a postoperative mortality of 4.6% in the former and 3.8 in the last. Duration of operation and postoperative nasogastric aspiration, analgesic requirements, hospital stay were similar in the two groups.

Our results show the feasibility of the laparoscopic approach for repair of perforated peptic ulcers with acceptable morbidity and mortality, that are at least comparable with those of the laparotomy, and surely with less surgical trauma.

Colorectal/Intestinal Surgery-PF058

LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER - MILLENNIUM STRATEGY - Junji Okuda, M.D., Masao Toyoda, M.D., Tetsuhisa Yamamoto, M.D., Keitaro Tanaka, M.D., Kanji Nishiguchi, M.D., Hirokazu Okano, M.D., Sang-Woong Lee, M.D., Keisaku Kondoh, M.D., Keiji Suga, M.D., Nobuhiko Tanigawa, M.D., Department of General & Gastroenterological Surgery, Osaka Medical College, Takatsuki-City, Osaka, Japan

Concerning the efficacy of laparoscopic curative surgery for colorectal cancer, there have been two major controversial issues: 1) adequacy of oncologic surgery including systematic lymh node dissection, 2) port-site/wound recurrence. The purpose of this study was to demonstrate our indication and surgical procedure of laparoscopic curative surgery for colorectal cancer and to evaluate its efficacy. The conventional oncologic principles can be maintained in laparoscopic surgery using laparoscopic type of No-touch isolation technique, which could lead to prevent the port site recurrence . Through August 2001, we did laparoscopic resection for curative intent on 201 partients with colorectal cancers (stage‡T:103, ‡U:43, ‡V:55). To accurately identify the vascular anatomy of each patient, we have applied Integrated 3D-CT as preoperative simulation and intraopetative navigation since July, 2000. With respect to adequate resection with lymphadenectomy, laparoscopic surgery was comparable with open surgery. In a laparoscopic group, blood loss was less and first flatus was passed earlier. The overall morbidity rate and mortality rate after lapasroscopic surgery were 15.5%(major:5.5%, minor:10%) and 0%. The mean follow-up time is 26 months. Recurrence was identified in four patients with Stage‡Vcancer (liver metastasis:3, lymphatic metastasis:1). There have been no local or port site recurrences so far. In conclusion, laparoscopic surgery could play a significant role in the treatment of colorectal cancer. Using no-touch technique appropriately under the precise recognition of laparoscopic surgical anatomy, systematic lymph node dissection by laparoscopy for each portion appears to be feasible and equivalent to one by conventional open surgery.

Colorectal/Intestinal Surgery-PF059

THE LEARNING CURVE IN LAPAROSCOPIC COLECTOMY: MAKING A MOLEHILL OUT OF THE MOUNTAIN Tom Paluch, MD, Michael Clar, MD

Department of Surgery, Kaiser Foundation Medical Center, San Diego, California

Laparoscopically-assisted colectomy (LAC) has not yet achieved widespread popularity. A major reason is the purportedly extended learning curve, ranging from 15 to 60 cases in various reviews. We present our experience with LAC using a unique, methodical approach to the training of surgeons which virtually eliminated the learning curve. From 1993 to 1998, 255 patients underwent LAC by 16 surgeons at our institution. Operations performed were 113 right, 111 sigmoid, 22 left, and 9 other colectomies. 55 cases (22%) were converted. Mean op time was 142 mins (140 lap, 147 converted). Peri-op mortality was 1.5%. Laparoscopy-related complications occured in 4%. Overall morbidity rate was 23%. LOS was 3.9 days for LAC, 6.8 for converted (P<0.01). Two surgeons were identified as 'vanguards', undergoing specific didactic and laboratory training in LAC, followed by 3 proctored cases. Each then performed LAC with the other as assistant (camera operating position) until their op times varied by no more than 20% (approx 20 cases each). These two then served as assistants to their 14 partners (who, in the interim had undergone didactic and laboratory training in LAC), working in the camera operating position. With this arrangement, there was no demonstrable learning curve; i.e., op times for surgeons trained in this manner varied by <20% from their initial case. This trend was similar for both right and sigmoid LACs. We conclude that LAC is a safe and effective operation. In a group with trained surgeons operating as assistants in the camera position, the training program described herein essentially eliminates individual learning curves after an inital 'vanguard' group is trained.

Colorectal/Intestinal Surgery-PF060

COMBINED LAPAROSCOPIC-COLONOSCOPIC COLON RESECTION AND ANASTOMOSIS BY INTUSSUSCEPTION, Biagio Ravo, M.D., F.A.C.S.Enrico Nicolo, M.D., F.A.C.S., F.I.C.S., Rome-American Hospital, Rome, Italy, University of Pittsburgh Medical Center, McKeesport, PA

The intestinal lumen is external to the body, therefore easily accessible from the two natural openings, anus and mouth. For this reason the intestinal tract can be resected intraluminally, and with the help of laparoscopy, can be controlled on the peritoneal site.

A new technique, and a new instrument are described that allows you to perform an intraluminal colon resection and anastomosis, with a combined laparoscopic and colonoscopic approach using the method of intussusception, anastomosis and resection via colonoscopy intraluminally.

Material and Method: The procedure has been performed under general anesthesia in three dogs and six pigs. All animals survived with no mortality. One pig developed a large bowel obstruction secondary to a submucosal abscess that required re-operation.

This new technique allows you to perform colon resection entirely intracorporeally, and in total asepsis; being the anastomosis is performed prior to the resection.

The results are encouraging, and the new instrument has been developed, and will be presented.

Colorectal/Intestinal Surgery-PF061

SINGLE SURGEONS EXPERIENCE OF 121 CONSECUTIVE LAPAROSCOPIC APPENDECTOMIES AT A COMMUNITY HOSPITAL. Subir Ray, M.D.

The author has performed 121 consecutive laparoscopic appendectomies all for acute appendicitis over the past six years. There were four patients who were converted to an open procedure due to the inability to identify the appendix or a phlegmon which required a partial colectomy. One hundred ten patients were discharged to their home within two to four hours following their surgery. There were a total of eleven patients admitted to the hospital because the procedure was performed in the evening or due to a frank perforation with peritonitis and these patients were discharged within twenty-four hours on intravenous antibiotics and a clear liquid diet. One of the patients admitted was a pregnant female who was observed for twenty four hours prior to her discharge.

If the acute appendicitis did not involve any periappendiceal inflammation or surrounding inflammation the patients were discharged without any postoperative antibiotics. However, if inflammation was seen in the omentum or mesentery the patients were discharged on Cipro 500 milligrams bid for five days. The patients were asked to resume clear liquids postoperatively and subsequently a regular diet as tolerated and a return to normal activities within forty-eight hours. Among the eight patients who have received intravenous antibiotics because of perforations eighty percent were discharged within forty eight hours to home intravenous antibiotics.

The author experienced one postoperative abscess very early in the series, no wound infections, no postoperative complications, no bowel obstructions and no deaths in this series. In all cases except one the author used Vicryl ties to tie up the appendiceal base. All cases except one were performed with two 5 millimeter trocars and one 11 millimeter trocar.

The author concludes that a laparoscopic appendectomy can be done safely in an outpatient setting without any increased morbidity or mortality and in the author's experience it is more cost effective than an open appendectomy.

Colorectal/Intestinal Surgery-PF062

LAPAROSCOPIC TREATMENT OF SMALL INTESTINAL DISORDERS: A TEN YEAR EXPERIENCE. PJ Recio, DO, PK Papasavas MD, DJ Gagné, MD, F Hayetian, MD, RJ Landreneau, MD, RJ Keenan, MD, PF Caushaj MD. Minimally Invasive Surgery Program, West Penn Allegheny Health System, Pittsburgh, Pennsylvania.

Laparoscopy has become an adjunct in the treatment of disorders of the small intestine. An outcome analysis of all patients that underwent laparoscopic resection, excluding lysis of adhesions and inflammatory bowel disease, during a 10-year period is reviewed.

17 patients underwent laparoscopic treatment for: 7 Meckel's diverticulitis (41.2%), 4 small intestinal malignancies (23.5 %), 3 small intestinal lymphomas (17.6%), 2 stromal tumors (11.7%), 1 carcinoid (6%). The mean age was 51 years (16 to 92). Preoperative evaluation by CAT scan, endoscopy and barium radiographs had established the diagnosis in 13 patients (76.5%). Meckel's diverticulitis was not preoperatively identified in 66.6% of the Meckel's patients.

The mean OR time was 134 minutes (42 to 179). Estimated blood loss (EBL) was a mean of 18 ml (0 to 40). There was a conversion in 2 patients (12%). Postoperative complications occurred in 5 patients (29.4%). Postoperative complications included: urinary retention 2 (40%), wound infection 1 (20%), pneumonia 1 (20%) and ileus 1 (20%). Mean length of stay was 4.2 days (1 to 9). Adjuvant chemoradiation was administered to 6 patients. There were no perioperative mortalities in this group.

Laparoscopic approaches for disorders of the small bowel offer an excellent alternative to resection performed by open surgery. Minimal blood loss and short hospital stays are additional benefits.

Colorectal/Intestinal Surgery-PF063

LAPAROSCOPIC MANAGEMENT OF MECKEL'S DIVERTICULUM IN ADULTS. Homero Rivas,M.D., Robert N. Cacchione, M.D., Jeff W. Allen, M.D.University of Louisville, Department of Surgery, Center for Advanced Surgical Technologies, Louisville, Kentucky

Introduction. Meckel's diverticulum is an uncommon entity. A high index of suspicion is necessary for opportune diagnosis and prompt treatment. Technetium 99m pertechnetate scintigraphy is a sensitive and specific test for a Meckel's diverticulum. In adults the contribution of the scan to clinical decision-making is low, and often will not change the need for surgical intervention. Here we describe our experience with four patients.

Patients and Methods. Between August 2000 and August 2001, four patients were seen with Meckel's diverticula. Three were male and one female. The mean age was 39 with the range being 18 to 64. Three patients presented with anemia and one with an acute abdomen. A 99m Tc pertechnetate scan was performed, at a cost of US$900.00 in the three anemic patients after other endoscopic and radiographic tests had been non-diagnostic. Only one patient had a positive scan. All four patients underwent exploratory laparoscopy and small bowel resection. In one patient, a mini laparotomy had to be performed.

Results. All patients had a satisfactory outcome without complications. Three patients were discharged within three days of surgery. The remaining one had a prolonged hospital stay because of ongoing chemotherapy for small cell lung cancer. In the three anemic patients who underwent enterectomy, ulcerated small bowel outside the diverticulum was found by the pathologist.

Conclusions. Laparoscopy is safe, cost-effective, and efficient for the diagnosis and definitive management of Meckel's diverticulum. Technetium 99m pertechnetate scintigraphy scanning adds considerable time and expense to the care of the patient without significant known benefit in adults. The practice of exploratory laparoscopy in place of scintigraphy is recommended.

Colorectal/Intestinal Surgery-PF064

LAPAROSCOPIC ASSISTED ANTERIOR RESECTION WITH AUTONOMIC NERVE PRESERVATION FOR RECTAL CANCER. Yoshinori SHIROTA M.D., Kazuyuki KOJIMA M.D., kenji SHITARA M.D., Mikito INOKUCHI M.D., Toshiki YAMAHITA M.D. and Kenichi SUGIHARA M.D., Second Department of Surgery, Tokyo Medical and Dental University, Tokyo, JAPAN

We have performed 20 cases laparoscopic assisted anterior resection with autonomic nerve preservation for the patients with rectal cancer. All cases were successfully performed laparoscopically without intraoperative complication. We report that laparoscopy affords improved visualization of the autonomic nerves in the confined space of the pelvis.

We usually used five ports, initial port for a laparoscope was inserted below the umbilicus, then CO2 pneumoperitoneum was created. The left colon is mobilized dividing the lateral peritoneal attachments along the white line of Toldt. The plexus of hypogastric nerves is identified, then retroperitoneum is incised. The inferior mesenteric artery(IMA) and vein(IMV) are swept ventrally and the preaortic hypogastric sympathetic nerves are preserved and swept dorsally. After the origin of the IMA is identified, the IMA is ligated separately after division of the IMV. Care is taken to visualize the ureter prior to ligation and division of the IMA/IMV. We usually used the endoscopic clips for ligation to IMA/IMV.

The peritoneum is incised along the both sides of the rectum down to the peritoneal reflection. The aim of this procedure is to completely remove the rectum without injuring the pelvic autonomic nerves. Dissection continues until the junction of the mesorectum and pelvic autonomic nerve plexus is encountered. The autonomic nerves must be carefully preserved from mesorectum.

This procedure was found to be safe and reliable for identifying autonomic nerve as much as conventional open anterior resection.

Colorectal/Intestinal Surgery-PF065

ENDOSCOPIC HEMOSTASIS WITH FIBRIN GLUE TO HEMORRHAGE OF UPPER DIGESTIVE CANAL. H. Suga M.D., T.Nakagawa M.D.,Y.Soga M.D.,M.Abe M.D.,T.Kawasaki M.D.,K.Imai∞@M.D.,T.Tsunoyama M.D.*,K.IrakoM.D.*,T.Suzuki M.D.*,N.Nakamura M.D.*,Department of Emergency Medicine, Tokyo Women's Medical University Daini Hospital, Tokyo, Japan. *Department of Emergency Medicine, Tokyo Women's Medical University, Tokyo, Japan

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Introduction: As an endoscopic hemostasis to the hemorrhage of the upper digestive canal,local injection of ethanol,clipping and so on have been used widely,but they have some problems,such as making tissue injuries ,hemorrhage from plural sites of widely extended ulcer and basic disorders of the patient(hepatocirrhosis,coagulopathy and so on).This time,in the endoscopic hemostasis with fibrin glue,we got a good results and report it here.Cases and Method:During about 6 months from October 2000 to April 2001,patients of hemorrhage in the upper digestive canal who were carried out hemostasis with fibrin glue were 8 cases. As complication,patients who were noticed exposed vascular vessels in active stage were 5 cases and patients who were not noticed them were 3 cases.As method we injected locally fibrin glue with 21G needle in sandwiches method (in order of saline 1cc,fibrin 2cc,saline1cc,thrombin 2cc and saline 1cc,injected).

Theraputic effects: Findings on the 1st day were active stage but there was no enlargement of ulcer, and exposed vascular vessels disappeared.A patient, who after cerebral infarct,continued anticoagulation therapy for a long time, needed about 8 days for recovery, but other 7cases recovered to healing stage on the 2nd day after hemostasis,and no rehemorrhage was observed.

Conclusion: Comparing with local injection of ethanol hitherto used,the endoscopic hemostasis with fibrin glue is free from enlargement of ulcer because of lacking tissue injury,and is possible to inject locally a sufficient quantity of fibrin glue even to the patients who have functional disorder of liver and are under treatment of anticoagulation therapy.Thus,it was considered to be an effective technique of hemostasis.

Colorectal/Intestinal Surgery-PF066

RESULT OF ELECTIVE LAPAROSCOPY FOR PATIENTS WITH SMALL BOWEL OBSTRUCTION Kenji Suzuki M.D., Yasuhiko Umehara M.D., and Taizo Kimura M.D. Department of Surgery, Fujinomiya City General Hospital

Laparoscopic surgery for patients with small bowel obstruction may have advantages over classical laparotomy, but when this approach is applied in emergency cases, the working space is limited by the distended bowel and precise information about the obstruction cannot be obtained. Therefore, we performed laparoscopic surgery electively in 15 patients with small bowel obstruction. They include nine patients with gastrectomy, two patients with hysterectomy, one patient with retroperitoneal tumor resection, one patient with laparotomy for malrotation of the bowel, one patient with small bowel resection, and one patient without a history of laparotomy. In nine patients, laparoscopic surgery was performed following after decompression, while six patients were treated following spontaneous resolution of the obstruction. The procedure, including removal of adhesions and inspection of the small bowel, was completed laparoscopically in 11 patients, but four patients required laparotomy for suspected perforation, iatrogenic small bowel perforation, or dense adhesions of the small bowel. The mean length of operating time, mean time until the return of bowel function, and mean postoperative stay for patients with a completely laparoscopic procedure was 76 minutes, 2.3 days, and 9.7 days, respectively. During follow-up for one to 26 months, two patients developed recurrent obstruction, one patient suffered from catheter-induced thrombosis, and one patient died of lung cancer. Elective laparoscopic surgery can be performed safely and effectively in patients with small bowel obstruction.

Colorectal/Intestinal Surgery-PF067

IDENTIFICATION AND SPARING TECHNIQUE OF VAGUS NERVE IN LAPAROSCOPIC GASTRECTOMY, SATORU TAKENAKA, KAZUYUKI KOJIMA M.D., KENJI SHITARA M.D., INOKUTI MIKITO M.D., YOSHINORI SHIROTA M.D., TAKAYUKI OSANAI M.D., KENICHI SUGIHARA M.D., DEPARTMENT OF DIGESTIVE SURGERY, TOKYO MEDICAL AND DENTAL UNIVERSITY, TOKYO, JAPAN

In comparison with open surgery, nerves can be seen more precisely and operation in details is easier by laparoscope. And to resect lymph nodes without injuring nerves it is necessary but not easy to identify these details precisely. We devised the method and technique to resect lymph nodes without injuring nerves. [Method] The first trocar is inserted just below the umbilicus and four additional trocars are placed. Under tension of lesser omentum by traction on the greater curvature, anterior vagal trunk, hepatic branches, and anterior gastric branches are observed more easily than in open surgery. After resection of anterior gastric branches and exposing esophageal-gastric junction continuously, posterior vagal trunk is easily identified. Posterior trunk must be grasped with a tape. Under tension of this tape, celiac branches are identified. After opening bursa by insision of greater omentum, with rotation of the greater curvature upwards, gastropancreatic folds is extended and left gastric vein can be identified to be resected. And left gastric artery is easily exposed. In exposing this artery toward its root, celiac branches are found. Under tension of posterior trunk with that tape, posterior gastric branch are resected while celiac branches are preserved. [Conclusions] By this technique, lymphadenectomy of early gastric cancer is possible while sparing vagus nerve.

Colorectal/Intestinal Surgery-PF068

LAPAROSCOPIC TOTAL COLECTOMY IN A PATIENT WITH FAMILIAL ADENOMATOUS POLYPOSIS: CASE REPORT Tanaka K., Okuda J., Toyoda M., Yamamoto T., Kawasaki H., Nishiguchi K., Okano H., Lee S., Kondo K., Suga K. and Tanigawa N., Department of General and Gastroenterological Surgery, Osaka Medical College, Japan

Total colectomy for familial adenomatous polyposis (FAP) is widely accepted treatment. But the role of laparoscopic surgery in the treatment of FAP is still under investigation. We report a case of FAP treated by laparoscopic total colectomy with ileoanalcanal anastomosis(IACA) using J-shaped ileal pouch.

A 23-year-old female with history of FAP was referred to our department for surgical treatment. Colonoscopy demonstrated multiple colon polyps throughout the total colon.<Operative technique > Pneumoperitoneum was initiated and six cannulas were placed. Our procedure started from right colon and continued clockwise to the left colon. At first the right mesocolon was dissected from medial to lateral, followed by mobilizing the mesocolon from the retroperitoneum. Dissection was proceeded to the transverse mesocolon, and the right and left branches of middle colic artery were clipped and divided. Right side of the greater omentum, hepatic flexure and lateral attachment to ascending colon was divided. Right colon was fully mobilized. The left mesocolon was dissected from medial to lateral. Thereafter left mesocolon including left colic artery, sigmoidal artery, superior rectal artery and inferior mesenteric vein were divided. Left side of the greater omentum, splenic flexure and lateral attachment to descending colon were divided. Finally the rectum was dissected all the way down to the levator ani and completely mobilized. After the transection of the rectum just at the anal canal, the whole colorectum was extracted through the suprapubic Pfannenstiel incision. The proximal colon was divided close to the ileocecal junction. After creating the J-shaped ileal pouch and the anastomosis was completed by double stapling technique.

The patient recovered quickly and was dischased without any complication.

In conclusion, laparoscopic total colectomy could be an optimal procedure especially for a young patient with FAP.

Colorectal/Intestinal Surgery-PF069

LAPAROSCOPIC SURGERY FOR ADVANCED COLORECTAL CANCER, J.Tanaka, S.Endo, A.Umezawa, M.Iwashita, K.Nagata, H.Ishizaki, E.Hidaka, S.Usui, T.Yoshida, H.Inoue, S.Kudo, Digestive Disease Center, Showa University Northern Yokohama Hospital, Yokohama, Japan

Recent developments in minimal invasive surgery have altered the surgical approach to colorectal surgery so that the laparoscopic or assisted colorectal resection (LAC) appears to be a feasible alternative to open surgery. Between 1995 and 1999 we performed 132 LAC only for early stage colon cancer without major complication or early recurrence, then we have applied LAC with lymph node dissection for advanced colorectal cancer since 2000. The purpose of this study is to report the preliminary results from 60 patients who underwent LAC between April 2000 and August 2001. Lymph node dissection including regional blood vessels was performed for advanced colorectal cancer through laparoscopy. Procedures are ileocecal resection4, RHC16, transverse colectomy6, sigmoidectomy9, HAR13, LAR9, APR2, Hartomann1. Conversion to open surgery was 5(3 for a huge tumor with peritoneal dissemination, 2 for direct invasion to other organs). No operative mortality, morbidity was 6.7% (anastomotic leak2, ileus2). In all other cases, the immediate postoperative course was uneventful with a hospital stay of 8 to 14 days and quick resumption of physical activity. LAC for advanced colorectal cancer is a feasible and safe operation with a acceptable complication rate. With indication, conversion rate should be low. Recurrence rate or long term functional outcome needs longer follow up.

Colorectal/Intestinal Surgery-PF070

RIGHT COLECTOMY: A COMPARISON BETWEEN LAPAROSCOPIC AND HAND ASSISTED TECHNIQUE. Ester Gracia, MD, Eduardo Mª Targarona, MD, Jordi Garriga, MD, Gemma Cerdán, MD, Manuel Rodríguez, MD, Ana García, MD, Manuel Trías, MD., Service of Surgery. Hospital de Sant Pau. UAB. Barcelona, Spain

Hand assisted laparoscopic surgery (HALS) has been proposed as an useful alternative to conventional laparoscopic surgery, but comparative analysis are lacking. Colectomy is one of the procedures that can obtain benefits of HALS because a bulky specimen is resected and an incision for specimen extraction and anastomosis is needed. Right and left colectomy have different technical requirements, and is not know if HALS have advantages for any specific procedure. Aim: to asses the utility of HALS during right colectomy. **Material and methods**: In the context of a prospective and randomized trial designed to compare HAL and conventional lap colectomy, the specific postoperative features for 25 right colectomies were analyzed. They included, Age, sex, BMI, diagnosis, op. time, conversion to open or HALS, morbidity, stay, length of specimen and nº of lymph nodes.

Results (median & range):

	LAP	HALS	p
N	11	14	
Age	74(54-81)	78 (60-88)	ns
BMI	28 (23-34)	27 (21-33)	ns
Diagnosis(benign/mal)	4b / 7m	2b / 12 m	ns
Operative time	120 (80-180)	105 (70-210)	ns
Conversion	18%(1open/1HP)	7 %	ns
Morbidity (severe)	18 %	7 %	ns
Morbidity (mild)	27 %	21 %	ns
Reoperation	-	7 %	ns
Mortality	-	-	ns
Stay	6 (5-34)	6 (5-8)	ns
Length specimen (cm)	20 (13-40)	23 (17-40)	ns
Nº lymph nodes	13 (7-24)	11 (5-29)	ns

Conclusion: HALS slightly reduces operative time and maintain the oncological features and immediate outcome of conventional laparoscopic right colectomy.

Colorectal/Intestinal Surgery-PF071

PNEUMOBILIA AND PNEUMATOSIS ASSOCIATED WITH SMALL BOWEL OBSTRUCTION Michelle D. Taylor MD, Lena M. Napolitano MD University of Maryland School of Medicine, Department of Surgery, Baltimore, MD

Small bowel obstruction (SBO) is a common occurrence, and treatment requires that the site, level and cause of obstruction be determined accurately. Here we present an unusual clinical finding of pneumobilia and pneumatosis associated with SBO.

A 78-year-old male with past medical history significant for COPD, hypertension, and steroid dependent rheumatoid arthritis, presented after 1 week of abdominal pain, obstipation, and anorexia. Prior surgery included Billroth II for a perforated duodenal ulcer, a right inguinal herniorrhaphy and a sigmoid resection for a T2 colon cancer. In the 4 years since his sigmoid resection, he had 3 admissions for recurrent SBO. After a few days of nasogastric decompression, he was started on a trial of enteral intake. He developed abdominal distension without pain, fever, or leukocytosis. X-rays showed dilated small bowel loops, no air in the rectum, and no pneumoperitoneum. Contrast abdominal CT showed portal venous gas, pneumatosis, patent SMA, and distended small bowel loops with a transition point in the distal small bowel consistent with complete SBO. At exploration he had multiple adhesions of the small bowel to the anterior abdominal wall with small bowel volvulus and transmural necrosis without perforation.The proximal small bowel was extremely dilated with severe venous congestion and required operative decompression of 2.5 L of enteric contents. Small bowel resection and anastamosis were performed and pathology was negative for malignancy with moderate ischemia.The patient did well postoperatively and tolerated enteral feeding prior to discharge.

Pneumobilia is rare in patients without a biliary-enteric fistula. The CT radiographic findings of pneumatosis intestinalis, mesenteric venous gas, and portal venous gas in this case confirmed intestinal necrosis despite minimal clinical findings in this steroid dependent patient, and prompted emergent surgical intervention.

Colorectal/Intestinal Surgery-PF072

ANEMIA AND BLOOD TRANSFUSION IN GENERAL SURGERY: RISK FACTORS FOR ADVERSE OUTCOME Michelle D. Taylor MD, Jim Dunne MD, Debra Malone MD, J. Kathleen Tracy MA, Lena M. Napolitano MD, University of Maryland School of Medicine and VA Maryland Medical System, Department of Surgery, Baltimore, MD

Previous studies have shown that perioperative blood transfusion is associated with a significant increase in post-operative complications. We sought to investigate the incidence of perioperative anemia in general surgery patients and determine if transfusion is an independent risk factor for adverse outcome postoperatively.

Methods: Prospective data from the National Veterans Administration Surgical Quality Improvement Program (NSQIP) were collected on 1788 general surgery patients admitted to the VA Maryland Healthcare System from 1995-2000.

Results: The mean age of the study cohort was 60+-14 years. Colorectal surgery comprised 36% of the study cohort, and 26% of cases were emergent. Preoperative anemia (hematocrit (Hct) <36), was found in 35%, postoperative anemia in 82%. In the postoperative period, 24% had Hct 26-30, 19% had Hct 21-25. Multiple logistic regression analysis documented that low preoperative Hct, low postoperative Hct, and increased blood transfusion rates were significantly associated with increased mortality and increased hospital length of stay. Patients who required blood transfusions perioperatively had significantly longer hospital length of stay (19.0 vs, 10.5 days, $p<0.001$; coef. 2.92, $p=0.031$) and increased mortality (OR 3.98, CI 2.55-6.22, $p<0.001$)

Conclusion: There is a high incidence of preoperative (35%) and postoperative anemia (82%) in general surgical patients. Perioperative anemia and blood transfusions are associated with increased hospital length of stay and mortality in these surgical patients. Consideration should be given to preoperative diagnosis of the etiology of anemia and possible correction with iron, vitamin B12, folate, or recombinant erythropoetin in attempts to reduce the utilization of blood transfusions in general surgery.

Colorectal/Intestinal Surgery-PF073

LAPAROSCOPIC SIGMOID RESECTION FOR LOCALIZED AMYLOIDOSIS OF THE COLON. Stefanie Cravioto Vaimakis M.D., Alan P. White, M.D., Julio Teixeira, M.D., Lawrence Brandt, M.D., Jonathan Wong M.D., Institute for Minimally Invasive Surgery, Montefiore Medical Center, Bronx, New York

Systemic amyloidosis can occur in virtually any organ system. The accumulation of amyloid in the GI tract is a well recognized occurrence however, solitary colorectal involvement without the presence of systemic amyloidosis is rare.

We present the case of a 71 year old male who presented with lower GI bleeding. Colonoscopy revealed a strictured segment of the sigmoid colon consistent with ischemic colitis. The lesion was removed via laparoscopic sigmoid resection. Final pathology revealed the presence of amyloid.

Systemic amyloidosis is not a single disease but rather a group of disorders characterized by the extracellular deposition of insoluble fibrillar proteins in various organs. All types of amyloidosis have important effects on the GI tract and as such the clinical manifestations are numerous. When colonic amyloid presents as ischemic colitis it may be referred to as "amyloid colitis". In this case amyloid deposits completely obstruct the vessels of the lamina propria and muscularis mucosa leading to chronic ischemia with sloughing of the mucosal lining and hemorrhage. Acute infarction of the sigmoid colon can be attributed to obstruction of the mesenteric blood vessels by amyloid.

Amyloidosis can present in various forms and may follow several different paths. In our case, local laparoscopic resection was indicated for a symptomatic and well defined lesion. The most effective treatment against localized amyloidosis however, remains unclear.

Colorectal/Intestinal Surgery-PF074

LAPAROSCOPIC MANAGEMENT OF COLORECTAL CANCER. - RETROPERITONEAL APPROACH TECHNIQUE AND RESULTS, H.YAMADA,M.D., Y.Okazaki M.D., M.Kawada M.D., K.Sakamoto M.D., S.Arita M.D., T.Iwashita M.D., H.Kashiwabara M.D., Department of Surgery, sakura national hospital, Chiba, Japan

The aim of the present study was to perform a retrospective study of our experience in performing laparoscopic colon surgery after 7 years experience.

PATIENTS : From june 1994 to July 2001, 232 patients underwent colorectal laparoscopic surgery using the retroperitoneal approach method. The patient∞fs average age was 65.1 (range: 18-96). Tumor depth were from m to se.

RESULTS: 177 laparoscopic procedures were Cur A. The conversions were 9 out of 232 (3.9%). The average operative time was 120 min (range: 52-192).There were 2 complications (0.9%) during operation (right urinary injurys). There were 16 complications (6.9%) after operation (11 (4.7%) ileus, and 5 anastomotic leak). We have no portsite metastasis. 5 years survival rate was 94.0% (Cur A cases). Stage 0, 1 were 100%,Stage II was 96.7%, stage IIIa was 90.4%, and stageIIIb was 62.5%. We concluded that laparoscopic assisted colorectal surgery is a safe and feasible technique, which may be associated with a faster return of bowel activity ,and short-term and long-term results. We will report the indication of laparoscopic colectomy for colorectal cancer, our technique,and our results.

Colorectal/Intestinal Surgery-PF075

LAPAROSCOPIC LYMPH NODE DISSECTION FOR RIGHT COLON CANCER. Shigeki Yamaguchi, M.D., Shoichi Fujii, M.D., Hideaki Kimura, M.D., Shigeru Yamagishi, M.D., Yasushi Ichikawa, M.D., Hideyuki Ike, M.D., Hiroshi Shimada, M.D. Department of Surgery II, Yokohama City University School of Medicine, Yokohama, Japan.

Laparoscopic colectomy for cancer is still controversial. One of the reasons is fear for insufficient lymph node dissection. Major vessels of the right colon and the superior mesenteric vein (SMV), so-called surgical trunk, are very important for dissection. The purpose of this study was to clarify anatomy of the right colon vessels and to investigate actual lymph node dissection in laparoscopic colectomy.

From study of 58 cadavers, the ileocolic vessel was constant and single structure. The right colic vein was lacked in 57 % and direct drainage of the SMV was seen in 24 %. The other 19 % was drained by the gastro-colic trunk (GCT) which was common trunk of colic vein and right gastro-epiploic vein. All cadavers had the middle colic vein(s). Eighty-five per cent of the main middle colic vein was drained by the SMV directly. The GCT was present in 69 %. Concerning colon branch of the GCT, one fourth was from the ascending colon and three fourths were from the transverse colon.

Thirteen right colon cancers were resected laparoscopically since May 2000. T and N stages of them were T1: 4, T2: 4, T3: 5, and N0: 8, N1: 4, N2: 1. Grade of the lymph node dissection was classified into three categories, D1∞Fonly paracolic nodes along the marginal vessels, D2: up to intermediate nodes along the major vessels and D3: up to main nodes around the SMV. D2 and D3 underwent in 5 and 8 respectively. The ileo-colic vein was presented in all patients. The right colic vein was presented in 31 %. The gastro-colic trunk was checked in 9 patients. The GCT was confirmed in 33 %. The SMV was exposed in 69 % patients for D3 lymph node dissection. There was no intraoperative complication and no converted case.

It is possible and feasible to perform laparoscopic lymph node dissection for right colon cancer.

Colorectal/Intestinal Surgery-PF076

LAPAROSOPIC-ASSISTED SIGMOIDECTOMY WITH LYMPH NODE DISSECTION VIA MINILAPAROTOMY Takuya Yamamura, M.D., Hidetaka Ikai, M.D., Shin-ichiro Noda, M.D., Masaru Nemoto, M.D., Osamu Ohgoshi, M.D., Kyoji Yamada, M.D., Susumu Yamaguchi, M.D. Department of Gastrointestinal Surgery, St. Marianna University School of Medicine, Kawasaki, Japan

Laparoscopic-assisted colectomy (LAC) has become a standard surgical treatment for colon cancer. Indication for LAC has been extended, and LAC is used for main lymph node dissection in case of advanced colorectal cancer. We have performed sigmoidectomy with main lymph node dissection via minilaparotomy in combination with LAC. The procedure is minimally invasive, and we found lymph node dissection by this approach to be similar to that in open surgery. Three or four trocars are placed and assessing the possibility of laparoscopic resection is performed by determining the extent of tumor invasion, and whether liver metastasis or peritoneal dissemination is present. The fusion fascia of the sigmoid colon is dissected and mobilizes the sigmoid colon for sufficient exteriorization under laparoscopy. The supraumbilical port-site incision is extended around the umbilicus to 6 to 7 cm in length. Dissection of the mesenterium of the sigmoid colon starts via this incision at the bifurcation of the abdominal aorta, and the peritoneal incision is carried upwards to the origin of the inferior mesenteric artery. The inferior mesenteric artery and vein are ligated and divided at the level of the origin of the artery. Incision of the mesocolon is carried and the sigmoid colon is clamped and divided. Anastomosis is performed. A drainage tube is placed at the port-site, left lateral to the umbilicus. The incision around the umbilicus is closed. This operation entails three procedures: (1) mobilization of the mesocolon via laparoscopy, (2) ligation and division of the inferior mesenteric artery and vein through a small incision around the umbilicus, (3) extracorporeal division of the sigmoid colon and anastomosis. The small incision around the umbilicus is preferably set just above the origin of the inferior mesenteric artery. Frequency of analgesic is fewer in this procedure than open surgery. The number of dissected lymph nodes in this procedure is similar to that in open surgery.

Colorectal/Intestinal Surgery-PF077

VIDEO-ASSISTED TOTAL COLECTOMY FOR THE FAMILIAL ADENOMATOUS POLYPOSIS Ouki Yasui MD, Hideaki Andoh MD, Norihito Ise MD, Hitoshi Kotanagi MD, Kenji Koyama MD, Department of Surgery,
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The efficacy of video-assisted total colectomy was retrospectively studied in comparison with open total colectomy. Subjects were 4 patients undergoing open total colectomy for the colon polyposis from 1985 to 1998 (OTC group) and 3 patients undergoing video-assisted total colectomy for the same disease from 1999 to 2001 (VAC group). The mean operative time was 331.5 (range, 220 to 425) minutes in the OTC group and 445 (range, 431 to 469) minutes in the VAC group. The mean volume blood loss was 584 (range, 188 to 1005) ml and 450 (range, 85 to 701) ml for the OTC group and VAC group, respectively. The patients walked at POD 5.3 (range, 4 to 6) days and 2.3 (range, 2 to 3) days in the OTC group and VAC group, respectively ($P<0.01$). Analgesics were needed until POD 5.5 (range, 4 to 7) days and 2.3 (range, 2 to 3) days in the OTC group and VAC group, respectively ($P<0.01$). These results indicate that lparoscopic total colectomy has many advantages and is excellent operative procedure.

Colorectal/Intestinal Surgery-PF078

IS ROUTINE PLACEMENT OF A NASOGASTRIC TUBE NECESSARY FOR LAPAROSCOPIC COLON SURGERY AS A PREOPERATIVE PREPARATION?, Jin Seok Yoon, M.D., Seon Han Kim, M.D., Jae Yeong Jung, M.D., Gyu Hwan Choi, M.D., Choon Sik Jung, M.D., and Dong Keun Lee, M.D., Laparoscopic Colon Surgery Unit, Department of Surgery, Hansol Hospital, Seoul, Korea

Background: Nasogastric (NG) decompression is recommended as a routine preoperative preparation for laparoscopic colon surgery (LCS). However, the procedure is painful, and moreover, sometimes traumatic.

Purposes: This prospective study was to investigate if omission of preoperative NG decompression for LCS induces operative difficulties or postoperative complications related to gastric dilation or ileus. We hypothesized that NG decompression is not needed for a routine preoperative preparation, and is selectively indicated following surgery.

Methods: Twenty nine consecutive patients undergoing LCS were included between May 2001 and August 2001 (M:F=17:12, median age 60 years, 25 malignant vs 4 benign). Preoperative NG intubation was not performed. Operative procedures included 2 right colectomies, 5 anterior and 15 low anterior resections, 2 abdomino-perineal resections, 1 total proctocolectomy with ileal J-pouch, 2 resection rectopexies, 1 suture rectopexy, and 1 Hartmann's reversal. Median operative time was 205 minutes. To minimize gastric dilation, epigastric area was compressed during induction of anesthesia.

Results: In no patients, NG decompression was needed during operation. Nineteen patients had nausea following surgery. Vomiting was developed in 6 patients (20.7%); once in 5 patients and multiple times in 1 patient. NG decompression was needed only in this patient who had multiple vomitings following low anterior resection, and continued for 4 days due to small bowel ileus. There were no complications caused by aspiration. Median time to passage of flatus was 1 day and of stool 2 days. Median time to water intake, liquid diet, and solid food was 2, 3, and 4 days, respectively.

Conclusions: Based on this prospective study with a limited number of patients, NG decompression is not needed for LCS as a routine preoperative preparation, and is selectively recommendable to the patients who have multiple vomitings or prolonged ileus after surgery.

Colorectal/Intestinal Surgery-PF079

ACUTE APPENDICIS WITH MASS OR ABSCESS - LAPAROSCOPY IS GOLD STANDARD.

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Aim:- To place on record categorically that laparoscopic surgery is the gold standard for acute appendicitis with complications.

Materials & Methods:- Author has experience & expertise in general surgery for 20 years and in laparoscopic surgery for the past 10 years. Retrospective study of over 5000 open cases of acute appendicitis and 1375 laparoscopic surgery cases of acute appendicitis have shown that morbidity is as low as 2.5% and mortality nil in both the study.

Dissection of mass and deliveation of abscess and drainage even in cases of retrocoreal and retrocolic appendicitis have been shown to be very fruitful. Drainage tube kept in situ with Redivac drainage. Intracorpereal suturing has effectively made dissection and desiccation successful. Pt. in head down 30° and left lat. 30° so that Rt. Iliac fossa is elevated.

Conclusion:- What differentiates the decision of laparoscopic appendicectomy is the panoramic visualization, excellent dissection in experienced hands, intracorpereal suturing and case of extraction in retrocaecal appendicitis. All these are depicted In both sides & in video form (PAL format).

Complication of Surgery-PF080

LAPAROSCOPIC FUNDOPLICATION WITH WIDE MOBILIZATION OF THE GASTRIC FUNDUS IS ASSOCIATED WITH AN HIGH INCIDENCE OF POST-OPERATIVE GASTRIC MIGRATION INTO THE CHEST **M. Anselmino, M. Rossi, MG Bellomini, S. Santi, A. Gennai, B. Solito, G. Castello, Chirurgia Generale IV - Azienda Ospedaliera Pisana, Pisa, Italy**

Post-operative persistent dysphagia represents the most important complication after laparoscopic treatment of gastroesophageal reflux disease (GERD). How long and floppy has to be the gastric wrap is still debated, and sectioning of the short gastric vessels (SGV) is not considered a routinery step of the operation. Two-hundred and twenty-one GERD patients (143 males and 78 females, median age 54 years, range 19-79) underwent laparoscopic Nissen procedure in 137 cases and Toupet in 84. Hiatoplasty calibrated on a Maloney bougie (42-48 F) was routinely added. All patients had a wide mobilization of the gastric fundus through the section of the SGV of the spleno-gastric ligament. In order to obtain a completely free gastric fundus, Nissen patients had a further mobilization with section of the posterior gastro-pancreatic attachments. Pre- and post-operative patient's evaluation showed an overall significant decrease in the symptoms score, with an increase in the lower esophageal sphincter pressure and decrease in esophageal acid exposure ($p<0.001$). At a median follow-up of 23 months, range 6-41, recurrent GERD was detected in 13 patients (5.8%). Post-operative persistent dysphagia was recorded in 3 patients (1.3%), all with Nissen procedure: re-operation and conversion to partial Toupet fundoplication was successfully performed in two, whereas pneumatic dilatation in 1. Partial or complete chest migration of the wrap alone (WM) or associated with a para-esophageal hernia (PH) was observed in 14 patients (6.3%): there was 10 Nissen and 4 Toupet. In the Nissen group stomach migration was WM in 6, and PH in 4; in the Toupet group a mixed migration was evidenced in 2 patients whereas 2 had PH. Re-positioning in the abdomen of the herniated stomach was required in the 8 symptomatic patients who had PH. Complete mobilization of the gastric fundus seems to represent the best option to fashion a real floppy anti-reflux procedure in patients with GERD, with a very low incidence of post-operative dysphagia. Nevertheless an high incidence of stomach migration into the chest occurs post-operatively. This data suggest that wide mobilization of the gastric fundus has not to be routinely performed and that diaphragmatic wrap fixation or anterior pexis of the gastric body has to be added when the gastric fundus is widely freed.

Complication of Surgery-PF081

PERICHOLECYSTIC ADHESIONS IN SINGLE VERSUS MULTIPLE GALLSTONES:DO THEY MAKE A DIFFERENCE IN LAPAROSCOPIC CHOLECYSTECTOMY? G.R. VERMA, M.S., S.M.BOSE, M.S., J.D. WIG, M.S., RAJINDER SINGH, M.S., GURPREET SINGH, M.S. Postgraduate Institute of Medical Education and Research, Chandigarh, INDIA

Adhesions are the common cause for open conversion in laparoscopic cholecystectomy. It is not clear whether the problem is more common with single or multiple gallstones.

The clinical records of 110 patients of chronic cholecystitis harboring multiple gallstones in the gallblader (Multiple stone group, MSG) and 45 patients with single stones in the gallbladder (Single stone group,SSG)undergoing laparoscopic cholecystectomy were analyzed for difference in the clinical presentation and the outcome with special reference to the incidence of pericholecystic adhesions, size of the gallstones and their implications for conversion and complications.

The overall incidence of pericholecystic adhesions was 55.6% and 52.7% respectively in patients with SSG and MSG, however the incidence of dense pericholecystic adhesions was 20% in SSG compared to 3.6% in MSG (P=0.003).

Eleven of 45 SSG patients (24.4%) and 13 of 110 patients of MSG(11.8%) were converted to open cholecystectomy. The dense pericholecystic adhesions alone contributed 9 of 11 conversion (81.8%) in SSG compared to 4 of 13 patients (30.7%) of MSG. The size of the gallstones was significantly greater (p<0.001) in those patients of SSG who required conversion to open cholecystectomy whereas it did not differ significantly in patients of MSG with or without conversion. There was no difference in the clinical presentation and complications in two groups of patients.

It may be concluded that dense pericholecystic adhesions were significantly more common in patients with single gallstones and they are the most common reason for conversion to open cholecystectomy.

Complication of Surgery-PF082

LAPAROSCOPY IN THE LAST DECADE OF THE MILLENNIUM: INNOVATIONS AND COMPLICATIONS. Renato Costi*, Christine Denet†, Leopoldo Sarli*, Thierry Pernicenit, Luigi Roncoroni*, Brice Gayet† * Clinica Chirurgica Generale, Università di Parma, Parma, Italia; † Département de Pathologie Digestive, Institut Mutualiste Montsouris, Université de Paris VI, Paris, France.

Introduction: The aims of the study were to evaluate the evolution of laparoscopic surgery during the last decade in terms of variations in the quality (complexity) of the procedures performed and of modifications in patient outcome, and to evaluate the influence of the learning curve of the surgeon on patient outcome.

Methods and Procedures: A retrospective analysis was performed of 3022 consecutive patients undergoing 99 different laparoscopic procedures at a centre specialised in laparoscopic abdominal surgery. All the procedures were classified according to three classes of complexity. Results relating to the first 1511 patients were compared to those of the last 1511 patients.

Results: In the second group, medium- to high-class complexity procedures significantly increased, conversion rate was higher only for straightforward procedures, duration of low- to medium- class complexity procedures decreased, only the rate of slight complications increased, and mean postoperative hospital stay was longer. Frequency of conversion and severe complications was not different in the two periods for any of the surgeons. The most experienced surgeon performed the new procedures at the outset and had the highest rate of major complications.

Conclusions: The quality of laparoscopic surgery has improved during the last decade, with no increase in the frequency of conversion to laparotomy or of major complications. Every surgical department should have a single surgeon responsible for setting up the new methods, thus enabling the other surgeons to learn to perform already codified procedures and to avoid the «classical», but not ethical, learning curve.

Complication of Surgery-PF083

MORBILIDITY AND MORTALITY AFTER LAPAROSCOPIC SURGERY. OUR EXPERIENCE IN 3869 CASES. Barbara Faife,MD, Juilan Ruiz MD, Miguel A Martinez MD, Tania Gonzalez MD, Rafael Torres MD, Arnulfo Fernandez MD, Julio R Torres MD, Carlos Escoto MD. Endoscopic Surgery Center, Calixto Garcia University Hospital, Havana, Cuba.

This study has the purpose to examine our results dealing with morbidity and mortality after different laparoscopic procedures performed from January first, 1998 to June 30th 2001. A population based, retrospective study was conducted in which data were analyzed. In this period we operated 3869 patients. Complications were presented in 102 cases. They included superficial wound infections (3:0,85%),deep wound infections (3:0,77%), intrabdominal collections (5: 0,12%), biliary leaks (8:0,2%),phlebitis(12:0,31%)and cholangitis(3:0,77%). Other complications were gastric obstruction, staple line dehiscence, postvagotomy diarrheas and bowel obstruction among some others with an overall per operative morbidity rate of 2,6%.

The serious complication rates which required reintervention was 1.1%

Mortality rate was 0,28% from anastomotic leaks, sepsis, multiorgan failure or pulmonary embolism.

We concluded that laparoscopic procedures are safe and effectiveness in experienced surgeons.

Complication of Surgery-PF084

COMMONER INJURY DURING LAP- CHOLECYSTECTOMY, DUCTAL OR DUODENAL. S. P. Gupta, M.S., Neena Gupta, M.D., Nitin Nursing Home, Patiala, India.

Other than ductal injuries during lap-cholecystectomy, there are very few reported injuries to structures adjoining gall bladder. Duodenum and transverse colon are frequently found to be adherent to gall bladder, but strangely there is no stress on preventing their injuries with grave consequences.

It is a retrospective study of 1700 cases of lap-cholecystectomy analysing injuries to CBD, duodenum and colon. The incidence of cholecysto-duodenal adhesions was found to be 8% and included 9 cases of fistula. The injuries are compared in table as under : -

Injury	CBD	Duodenum	Colon
Tran section, ligation, cautry burn	1	0	0
Perforations, tears, avulsion	9	5	1
Conversions	3	4	1
Fistula	0	1	1
Mortality	0	1	0

In conclusion gut injuries are commoner than ductal injuries. Reasons and mechanism & prevention of gut injuries will be discussed.

Complication of Surgery-PF085

FUNCTIONAL LIVER INJURY CAUSED BY MONOPOLAR CAUTERISATION DURING LAPAROSCOPIC CHOLECYSTECTOMY AS THE PREDICTOR OF POSSIBLE LATE STRICTURE OF THE COMMON BILE DUCT.,
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THE OPEN DEBATE ABOUT THE CAUSATIVE AGENT OF LATE POSTOPERATIVE STRICTURE OF THE COMMON BILE DUCT, AFTER THE LAPAROSCOPIC CHOLECYSTECTOMY (SIEWERT II INJURY) STILL EXIST. THERMAL INJURY CAUSED BY MONOPOLAR CAUTOR, OR EXCESSIVE MANIPULATION WITH COMMON BILE DUCT DURING LAPAROSCOPIC PROCEDURE WHERE ACCUSED.THE PURPOSE OF AUTHORS IS TO PRESENT THE RESULT OF RESURCH WHICH INCLUDED TWO GROUP OF 20 PATIENTS TREATED BY LAPAROSCOPIC CHOLECYSTECTOMY. WITH FIRST GROUP WE USED MONOPOLAR CAUTER AS TERMIC MEDICAL MEANS, AND OTHER GROUP WE TREATED BY USING HARMONIC ULTRASONIC KNIFE AS NON-TERMIC MEDICAL MEANS. POST SURGICAL LABORATORIES RESULTS WHICH CONCERN TO FUNCTIONAL LIVER DAMAGE SUCH ARE: AST,ALT,BILIRUBIN,AP,RBC,HEMOGLOBIN AND WBC WERE COMPAIRED.PATHOHISTOLOGICAL ANALYSES OF EXTRACTED GALLBLADDER WALLS WAS DONE BY USING LIGHT MICROSCOPE. AUTHOR CONCLUSION WAS THAT USING OF MONOPOLAR CAUTOR, WHICH PRODUCES HIGH LEVEL OF TERMIC ENERGY IS RELATED TO FUNCTIONAL LIVER INJURY,WHICH CAN BE PROVED BY HIGHER SERUM LEVELS OF AST AND ALT, AND MASSIVE COAGULATIVE NECROSSIS OF ALL PATOHISTOLOGIC LAYERS OF THE GALLBLADDER WALLS.ON THE OTHER HAND, POSTOPERATIVE LEVELS OF AST AND ALT IN GROUP OF PATIENTS TREATED BY ULTRASONIC KNIFE (SMALLER TERMIC-ENERGY PRODUCER) WERE SIGNIFICANTLY LOWER. BESIDES THAT, COAGULATION NECROSIS AFFECTED ONLY MUCOSIS AND SUBMUCOSIS, BUT NOT THE EXTERNAL FIBROMUSCULAR LAYER. ACCORDING TO THIS RESULTS OUR CONCLUSION IS: USING OF MONOPOLAR CAUTER MAY COUSE ELECTROCAUTERY BURNS OF COMMON BILE DUCT - MAIN STRUCTURE NEAR GALLBLADDER, WHICH IS POSSIBLE PROGRESS TO STRICTURE.

Complication of Surgery-PF086

BILE DUCT INJURIES DURING LAPAROSCOPIC CHOLECYSTECTOMY - SINGLE SURGEON'S EXPERIENCE IN 4800 CASES.
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Laparoscopic cholecystectomy (LC) is associated with higher incidence of bile duct injury (BDI) than conventional cholecystectomy (1% vs. 0.2%). In spite of knowing before hand all the possible mechanisms, surgeons commit BDI inadvertently. Our aim was to know how the BDI occurs and to demonstrate a new surgical technique in order to reduce BDI during LC.

From January 1992 to July 2001, 4800 patients underwent LC. The operating surgeon and the assisting team remainedthe same. 340 cases of acute/chronic empyema, 576 cases of acute cholecystitis, 6 cases of Mirizzi's Syndrome type I and II and another 36 cases of difficult dissection were encountered. Empyema GB was diagnosed as having frank pus on aspiration. Our policy has been to video record all difficult dissections.

11 cases (0.2%) of BDI and biliary leak occurred as follows: Right hepatic duct (1) (Type B), Right anterior sectoral hepatic duct (1) (Type C). Latent injury to CBD with patent biliary system (Type D) (1), Bile leakage with no demonstrable cause (3), Type A injuries (5). Only 1 BDI occurred in 1st year and the remaining were in the 4th and 6th year. All ductal injuries were recognised during surgery and were managed by Roux-en Y, repair with T-tube and endoscopic stenting. Dissection in the callot's triangle was carried out with peanut gauze which facilitates delineation of the anatomy and avoids injury to the vital structures. Overall conversion rate was < 1% (42 cases) and 2.1% in difficult LC. In conclusion, adequate knowledge of variants of the biliary anatomy, meticulous surgical dissection and team work are the key factors to reduce the incidence of BDI rather than only a learning curve in laparoscopy.

Complication of Surgery-PF087

BILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY.
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It has been suggested that bile leakage is more common after laparoscopic cholecystectomy than after open surgery. The aim of this study was to review our experience of this complication with regard to its incidence and management. From July 1990 to March 2001, 1,284 laparoscopic cholecystectomies were performed at our institutions. Drainage of the gallbladder bed was done routinely and bile leakage was seen in 22 patients [1.7%]. Twenty-one of these patients showed bile in the drain within 24 hours after operation, but bile leakage stopped spontaneously within 3 days in 17 patients. We suspected that cutting of Luschka`s duct or incomplete closure of the cystic duct was the cause of this leakage. In the remaining 4 patients, bile leakage continued, so ERC and/or fistulography were performed. These examinations revealed that two patients had cystic duct leakage, while the other two patients, who had severe cholecystitis preoperatively, showed posterior bile duct dissection. The two patients with cystic duct leakage were successfully treated by using an ENBD tube. One of the two patients with posterior bile duct dissection needed open surgical repair [posterior bile duct - jejunostomy], but the other patient showed spontaneous resolution. One of the 22 patients was discharged from our hospital uneventfully, but presented 7 days after operation with fever and a subphrenic biloma. ERC showed a wide perforation of the hepatic duct, probably caused by an electrical burn during the operation. Hepatic duct - jejunostomy was performed by laparotomy. Our experience indicates that bile leakage is fairly frequent after laparoscopic cholecystectomy, so the routine placement of a gallbladder bed drain is recommended. Spontaneous resolution of bile leakage often occurs, but when leakage continues more than 3 days, ERC and/or fistulography should be done to identify the source and to allow proper management.

Complication of Surgery-PF088

ASSESSMENT OF LAPAROSCOPIC CHOLECYSTECTOMY FOR SEVERE ACUTE CHOLECYSTITIS REQUIRING TREATMENT BY PTGBD
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In recent years laparoscopic cholecystectomy(LC) has been actively applied to the treatment of acute cholecystitis(AC), but in reality the procedure has often been converted to laparotomy because of severe inflammation. In our department we analysed the blood flow in cystic wall arteries by Doppler ultrasonography(D-US) in AC in 1998-99(early period) and showed that Vmax is useful for the evaluation of inflammation. In addition, we initiated a prospective study of LC on all gallbladder stones in 2000(late period), and we report our findings here. [Subjects and Methods] PTGBD has been carried out in 26 of the 45 cases of AC among the 206 cases of LC encountered in our department since 1998. We assessed: 1.inflammation findings before PTGBD , 2. interval between PTGBD and surgery, 3.change in blood flow (Vmax) after PTGBD, 4.operation time, 5.blood loss, 6.complications, and 7.conversion to laparotomy. <Protocol of the prospective study in the late period> PTGBD was performed when D-US yielded a Vmax value of 30 or more and we waited until it decreased to below 20, and when the inflammation was extremely severe and the Vmax hardly decreased despite PTGBD, an ENBD was inserted before surgery. [Result]1.No significant differences were detected in the both period. 2.The interval was 17.9 days in the early period, and 8.4 days in the late period. 3.Vmax before PTGBD was not significantly different. but after PTGBD it was higher in the late period than in the early period. 4.Operation time was slightly longer in the late period. 5.There were no significant difference in the blood loss. 6.Bile leakage from the site of insertion of the PTGBD was observed in 1 case in the late period. 7.The operation was converted to laparotomy in 4 of the 14 cases in the early period, but there were no conversion in the late period. [Conclusion](1)Deciding on treatment policy based on Vmax was useful even as a prospective study. (2)Preoperative ENBD insertion made it possible to easily perform intraoperative cholangiography at any time without cannulation, which leads the reduction of the risk of accidentally cutting the bile duct.

Complication of Surgery-PF089

DUCT-TO-DUCT ANASTOMOSIS AFTER TRANSECTION OF THE RIGHT HEPATIC DUCT DURING LAPAROSCOPIC CHOLECYSTECTOMY — SIX YEARS FOLLOW-UP —. Toshiomi Kusano, M.D., Ph.D., Naoji Hanashiro, M.D., Tsutomu Isa, M.D., Ph.D., Yoshihiro Muto, M.D., Ph.D., First Department of Surgery, University of the Ryukyus, Okinawa, Japan.

We experienced a case presenting a curious change on serial CT findings after the surgical repair for bile duct injury.

A 28-year-old woman who underwent laparoscopic cholecystectomy for gallbladder polyp developed continuous bile leak on the second postoperative day. Endoscopic retrograde cholangiography revealed an obstruction at the right hepatic duct axis. We performed surgical repair on the eighth postoperative day. The right hepatic duct was transected sharply and clipped. Because bilateral tip of the transected duct wall showed no heat injury by an electrocautery, a stented duct-to-duct hepaticohepaticostomy with retrograde transhepatic tube was done. The stent tube was left there for 10 months. Follow-up cholangiography demonstrated slightly stenosis of the anastomosed site but abdominal CT scan showed no dilatation of intrahepatic bile ducts just before removal of the tube. However, dynamic CT scan with intravenous contrast medium obtained two years after surgery revealed that the whole right lobe of the liver was not enhanced in the arterial phase. Meanwhile no other clinical complications like cholangitis or jaundice occurred without a few elevations of the liver enzyme level during the six years follow-up period. Curiously, the recent CT showed the improvement of the non-enhanced area of the right lobe and a slight dilatation of biliary trees.

In conclusions, a duct-duct anastomosis might be considered as a first choice for the reconstructive procedure of the injured small hepatic bile duct.

Complication of Surgery-PF090

COAGULATION DISORDERS IN THE PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY, D. Milic, V. Pejcic, Surgical clinic,Clinical center Nis,Yugoslavia

Patients who undergo laparoscopic cholecystectomy (LC) are operated under general anesthesia, in a reverse Trendelenburg position, with 12-15 mm Hg pneumoperitoneum. All of these factors induce venous stasis of the legs, which may lead to postoperative deep vein thrombosis (DVT) and pulmonary embolism (PE). The aim of this study was to assess the degree of hypercoagulability and the presence of coagulation disorders in 40 patients in whom LC was performed at surgical clinic Clinical Center Nis during the period from January 1999 to December 1999.

Levels of prothrombin fragments 1+2(F1+2), tissue plasminogen activator(t-PA),plasminogen activator inhibitor 1 activity (PAI-1),D-Dimer ,interleukin 6(IL-6),PT,aPTT and antithrombin III

(AT III) were measured before, during and after LC.

In our work we present the results that show the increase in hypercoagulability in patients undergoing LC. We suggest that the prophylactic measures should be taken especially in patients with higher risk of developing DVT.

Complication of Surgery-PF091

RECURRENCE OF GALLBLADDER CARCINOMA DEVELOPED AT THE PORT-SITE BUT NOT IN THE LAPAROTOMY WOUND AFTER LAPAROSCOPY WAS CONVERTED TO OPEN SURGERY:A CASE REPORT Kazuyuki Okada,M.D. Hiroshi Yano,M.D. Takashi Iwazawa,M.D. Shigeru Okamoto,M.D. Takushi Monden,M.D. , Department of Surgery and Pathology, NTT West Osaka Hospital,Osaka,Japan.

Laparoscopic procedure was decided for a 79-year-old Japanese woman with cholelithiasis. The videolaparoscope was introduced through a 10-mm laparoscopic trocar placed in a periumbilical incision while pneumoperitoneum was maintained. Laparoscopy was converted to the open surgery because of the significant adherence with gallbladder, duodenum and peritoneum. Open cholecystectomy and partial duodenectomy were performed through the mid-upper abdominal wound. Histopathology of gallbladder showed a moderately differentiated tubular adenocarcinoma. Ten months later, she re-presented with a nodule at the periumbilical port site. Surgical treatment was decided for this patient by the diagnosis of port-site recurrence of gallbladder carcinoma. The tumor was localized in the subcutaneous tissue and muscle layer, adjacent to the scar of the periumbilical port site wound. Pathological diagnosis of the tumor was metastatic adenocarcinoma from gallbladder carcinoma. The recurrence could not be detected in the open laparotomy wound. Numerous theories and research studies have been proposed and performed in an effort to define the rate, mechanism and the impact of this phenomenon. A mechanism is pulling the trocar out and allowing a contaminated instrument laden with tumor cells to pass unprotected through the abdominal wall. Authors did not use the instruments in the laparoscopic procedure, but performed only a laparoscopic inspection before conversion to open surgery. Our report indicates that the recurrences of carcinoma will possibly occur at the port site rather than the laparotomy wound, even if the surgical procedure would be carefully performed such as conversion to open surgery or no-touch isolation technique. Irrigation of the peritoneal cavity with saline may be lessen the likelihood of implantation. We tried irrigation of the peritoneal cavity using a lot of saline. Why and when did the recurrence occur only at the port-site but not in the laparotomy wound despite of conversion to open surgery? Its pathogenesis and natural history are still unclear.

Complication of Surgery-PF092

PORTAL VEIN THROMBOSIS: A CATASTROPHIC COMPLICATION OF LAPAROSCOPIC SPLENECTOMY Michelle M Olson, MD, Patrick B Ilada, MD, Keith N Apelgren, MD Department of Surgery, Michigan State University, East Lansing, MI

Portal vein thrombosis (PVT) is a recognized complication of hepatic disease and is also a potentially lethal complication of splenectomy. Most authors report a low incidence of this complication, approximately 1%. However, the true incidence may be greater because of difficulty making the diagnosis.

A 19 year-old female presented with a two-year history of idiopathic thrombocytopenic purpura. Because she had become refractory to medical therapy she underwent laparoscopic splenectomy. She was discharged on post-operative day 2 after an uncomplicated procedure. She did well complaining only of mild backache until post-operative day 21 when she presented with nausea, vomiting, and leukocytosis. Computed tomography (CT) showed PVT and superior mesenteric vein thrombosis. Despite heparin and fluid administration, her exam worsened and her WBC rose. At laparotomy she had diffuse small bowel edema and congestion. At a second-look 24 hours later nearly all her jejunum and ileum were necrotic. After three procedures, she was left with 45 cm of proximal and 10 cm of distal small bowel. Bowel continuity was restored eight weeks later; she continues to receive supplemental parenteral nutrition.

Post-splenectomy PVT is most often seen following splenectomy for myeloproliferative disorders and almost never after trauma. The large splenic vein stump and the hypercoagulable state in patients with splenomegaly are thought to be contributory. The presentation of PVT is vague without defining signs or symptoms. Color-flow Doppler and contrast-enhanced CT scans are the best methods for non-operative diagnosis of PVT. Aggressive thrombolysis via a transhepatic catheter offers the best hope for clot lysis and maintenance of bowel viability. Even vague symptoms must be considered seriously following splenectomy for splenomegaly.

Complication of Surgery-PF093

IMPACT OF GASLESS AND CO2 PNEUMOPERITONEUM ON HEMODYNAMICS DURING LAPAROSCOPIC SURGERY: EXPERIMENTAL STUDY E. Ortiz-Oshiro MD, PhD, L. Rabadán Ruiz MD, C. Hernández Pérez MD, JA De Diego C MD,PhD, JA Fernández-Represa MD,PhD. Department of Surgery. Hospital Clínico San Carlos. Madrid. Spain.

Laparoscopic surgery is increasingly used to carry on advanced procedures, even in patients with compromised cardiopulmonary function. It is known that CO2 pneumoperitoneum (CO2PP) and increasing intraabdominal pressure (IAP) may have deleterious effects. Our aim was to investigate these effects by comparing CO2PP approach to isopneumic approach.

Fifty pigs were anesthetized, intubated and placed on total mechanical ventilation. Jugular venous catheters, pulmonary artery catheters, arterial catheters and bladder catheters were inserted. Animals were divided into five groups: C (control group, only general anesthesia), PP8 (CO2PP at IAP 8 mmHg), PP12 (CO2PP at 12 mmHg), PP16 (CO2PP at 16 mmHg) and AWR (abdominal wall retraction with a mechanical device). Except for C group, all of them underwent advanced laparoscopic procedures (cholecystectomy, hiatal hernia repair and colon resection). Baseline, sequential and final data were obtained. Significance of any changes were tested using ANOVA-Bonferroni test.

Groups were found to be homogeneous in terms of weight and height. No significant differences were shown among groups in the following parameters: body temperature, heart rate, pulmonary artery pressure, urine output and cardiac output. Mean arterial pressure tended to increase along time ($p<0,001$) except for AWR group, which showed the lowest values and did not change along time ($p<0,05$). On the other hand, central venous pressure showed the highest values for PP16 group ($p<0,05$).

Using abdominal wall retraction through mechanical devices may contribute to extent the benefits of laparoscopic surgery to patients with compromised cardiovascular function.

Complication of Surgery-PF094

DOES CO2 PNEUMOPERITONEUM AFFECT MESENTERIC VASCULARIZATION DURING LAPAROSCOPIC SURGERY? E. Ortiz-Oshiro MD, PhD, L. Rabadán Ruiz MD, C. Hernández Pérez MD, JA De Diego MD,PhD, JA Fernández-Represa MD,PhD.

Department of Surgery. Hospital Clínico San Carlos. Madrid. Spain.

Laparoscopic surgery is increasingly used to carry on advanced procedures, even in patients with compromised cardiovascular function. CO2 pneumoperitoneum (CO2PP) and increased intraabdominal pressure (IAP) have been related to postoperative mesenteric ischemia appearance in some reports. Our aim was to investigate this complication through evaluation of tonometric changes in CO2PP approach versus isopneumic approach.

Fifty pigs were anesthetized, intubated and placed on total mechanical ventilation. Tonometric orogastric catheters were inserted. Animals were divided into five groups: C (control group, only general anesthesia), PP8 (CO2PP at IAP 8 mmHg), PP12 (CO2PP at 12 mmHg), PP16 (CO2PP at 16 mmHg) and AWR (abdominal wall retraction with a mechanical device). Except for C group, all of them underwent advanced laparoscopic procedures (cholecystectomy, hiatal hernia repair and colon resection). Baseline, sequential and final data were obtained. Significance of any changes were tested using ANOVA-Bonferroni test.

Groups were found to be homogeneous in terms of weight and height. No significant differences were shown among groups either in intramucosal CO2 or in intramucosal pH.

Using gastric intramucosal pH as splanchnic vascularization marker, we have found no differences between CO2 pneumoperitoneum and abdominal wall retraction approaches during laparoscopic surgery.

Complication of Surgery-PF095

INJURY TO THE POSTERIOR SECTORAL DUCT, A RAREST BILIARY DUCTAL ANOMALY, DURING LAPAROSCOPIC CHOLECYSTECTOMY, G.R.VERMA, M.S., S.M.BOSE, M.S., POSTGRADUATE INSTITUTE OF MEDICAL EDUCATION AND RESEARCH,CHANDIGARH (INDIA)

Extrahepatic biliary tract is one of the most common sites of operative interventions and it also happens to be one of the most frequent area of anatomic variations. Normal extrahepatic biliary tract anatomy as described in the textbooks is seen only in 35-50% of the cases. Lack of their appreciation and recognition can lead to intraoperative injuries and postoperative biliary fistula.

Accessory or abberent bile ducts are the most frequent congenital anomalies responsible for biliary mishaps. Most of these bile ducts open within 3 cms.of cystohepatic angle (junction of cystic duct with common hepatic duct).

During laparoscopic cholecystectomy, we came across an abberent posterior sectoral duct opening at cystohepatic angle.The anatomy came to light while dissecting and identifying the cystic duct, an inadvertent hole was made in a tubular structure lying in vicinity of the cystic duct. It lead to bile leak from the hole. Anticipating injury to the common bile duct, the procedure was converted to open cholecystectomy. Intra-operative cholangiogram revealed that it was an abberent bile duct and later confirmed by post-operative cholangiogram to be a posterior sectoral duct draining segments VI and VII into common hepatic duct at cystohepatic angle.The opening into the posterior sectoral duct was repaired over a thin T tube. It was removed after 3 weeks. Patient made an uneventful recovery.

To the best of our knowledge isolated posterior sectoral duct draining segments VI and VII has not been described in english literature. We thought it prudent to bring it to the attention of medical fraternity.

Complication of Surgery-PF096

CAN BLEEDING FROM AN UMBILICAL PORT BE PREVENTED ? Jiri Vokurka, M.D., Jitka Vokurkova, M.D., Ist.Department of Surgery, Masaryk Univerzity, Brno.

In the post-laparoscopy period, intra-abdominal bleeding from the wound left after an umbilical port can call for an emergency operative revision.

Our study of vascular supply of abdominal wall has made it possible for us to analyze the causes of intra-abdominal bleeding from umbilical ports and develop a technique which reduces the possible risk of this complication.

The measures taken as described prevented the further development of such complication.

If the port in the umbilical region of the abdominal fascia has to be enlarged we recommend that incision should be made in the inferior direction. We recommend that the sheath of rectus abdominis muscle should not be incised laterally because of possible bleeding. The port in the fascia should be closed carefully with haemostatic stitches and the patient should be monitored for at least 24 hours after surgery.

Complication of Surgery-PF097

PERCUTANEOUS TRANSHEPATIC BALLOON DILATATION IS AN EFFECTIVE TREATMENT OF COMMON BILE DUCT STRICTURE FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY: REPORT OF A CASE Hiroshi Yano, M.D. Atsushi Yasue,M.D. Masaki Matsushita,M.D. Takushi Monden,M.D., Department of Surgery and Radiology, NTT West Osaka Hospital, Osaka, Japan

Laparoscopic cholecystectomy has become the treatment of first choice for many patients with symptomatic cholelithiasis, because of its advantages which include limited postoperative pain, shorter hospitalization, earlier resumption of activity, and improved cosmetic aspects. The most serious complication of this procedure is bile duct injury including leakage, transection, and stricture, which usually requires a laparotomy. We report a case of common bile duct stricture following laparoscopic cholecystectomy, for which percutaneous transhepatic balloon dilatation was effective. A 50-year-old man was admitted to our department with right hypochondralgia. Computed tomography and ultrasonography showed multiple stones in the gallbladder. Drip infusion cholangiography revealed neither stone in the common bile duct nor biliary anomaly. Preoperative blood examinations were unremarkable. He underwent a laparoscopic cholecystectomy with a diagnosis of cholecystolithiasis. An intraoperative cystic duct cholangiography was not performed. Intraoperative course was not eventful. Total bilirubin level of 6.7 mg/dl in the serum gradually increased from the first postoperative day. The stricture, caused by clipping of common bile duct, was revealed by magnetic resonance cholangiography and percutaneous transhepatic cholangiography on the 11th postoperative day. Total bilirubin level in the serum gradually decreased after percutaneous transhepatic biliary drainage was carried out. Percutaneous transhepatic balloon dilatation for the stricture site was performed three times at the pressure of 5.5atom. Percutaneous transhepatic cholangiography showed no stricture of common bile duct after percutaneous transhepatic balloon dilatation. The patient was discharged on the 56th postoperative day and 3 years following surgery, he remains well with no signs of recurrence of common bile duct stricture. Percutaneous transhepatic balloon dilatation was a less invasive and effective treatment of common bile duct stricture following laparoscopic cholecystectomy.

Education/Outcomes-PF098

COMPARISON BETWEEN LAPAROSCOPIC SPLENECTOMY AND HAND ASSISTED SPLENECTOMY. Abdul Aziz Al saigh MD; Ahmed Al Otiaby MD; Osman Noraldin MD; Mohd Al Ageely MD; Ihab Anwar MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Splenectomy for haematological disease is common procedure in King Khalid University Hospital. Riyadh, Saudi Arabia. The procedures are done for 22 patients, in 2 equal groups. In the laparoscopic group 5 trocars were used to performed laparoscopic splenectomy, on the other group 2 trocars were used. The time of the procedure is shartter in the hand assisted group. Hospital stay, pain management, and postoperations complication has simillary results in both groups. Hand assisted laparoscopic splenectomy is more useful in big spleen. While laparoscopic splenectomy more suitable for small spleen.

Education/Outcomes-PF099

X-RAY SCREENING TO IDENTIFY THE RIB & SYMPATHETIC CHAIN Abdullah Al Dohayan, MD; Ahmed Alotiaby MD Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Identification of the number of the rib is sometimes difficult especially in obese patient. The first rib to see in the thoracoscope is the second and first rib to feel is the first rib. However these procedures always easy to perform. A surgeon who is performing these procedures for the first time may use this technique before performing sympathectomy. The technique before performing sympathectomy. The technique was performed to 10 patients & illustrated to junior surgeons. X-Ray screening to identify the number of the rib is essential for junior surgeon.

Education/Outcomes-PF100

A 6-YEAR MULTI-INSTITUTIONAL REVIEW OF SURGERY IN PREGNANCY: LAPAROSCOPY HAS NOT BECOME THE STANDARD OF CARE FOR APPENDICITIS. Aviv Ben-Meir, M.D., Bruce D. Schirmer, M.D., and Raymond P. Onders, M.D., Department of Surgery, University of Virginia, Charlottesville, Virginia and Department of Surgery, Case Western Reserve University, Cleveland, Ohio.

INTRODUCTION This retrospective chart review of 51,000 deliveries in the era of laparoscopy was aimed at discerning whether laparoscopy had become the treatment of choice for abdominal pain thought to be secondary to appendicitis during pregnancy.

METHODS AND PROCEDURES In a retrospective chart review of the 6 years from 11/1994 to 12/2000, there were 51,000 deliveries at two major teaching hospitals. The charts of all those patients having surgery at these two hospitals were reviewed.

RESULTS During that time period there were 37 appendectomies performed in this patient population. 6 of the 37 appendectomies were started laparoscopically. In the remaining 3, one patient required ileocolectomy for an initial presentation of Crohn's and two patients were converted due to technical reasons. One patient had a spontaneous abortion one week postoperatively.

CONCLUSION Laparoscopy has not become the modality of choice to evaluate pregnant patients with presumptive appendicitis at two major teaching centers.

Education/Outcomes-PF101

Bipolar or Quadripolar Electrosurgery? Comparison of thermal side effects.
M. BERBEROGLU, F.ERCAN, F. BALABAN, O.SURGIT, B. AYDIN, I. SECKINER
ITEM, Adcanced Medical Technologies Education and Training Center, Ankara TURKEY

Introduction: Heat or fire has been used as a crude method of hemostasis for over 5,000 years. Following the improvements in modern technology, surgeons began to use the electricity more efficiently and widely. In according to achieve more safe techniques, bipolar electrosurgical instrumentation emerged in the field of laparoscopy. Thermal demage of the adjecent tissues is one of the very important unwanted complications of the electrosurgery. To reduce the thermal effects, a new device which called qudripolar cutting forceps was introduced by industry.

Aim: In this in-vitro study, we compared the heat and the color changes of the tissue near the electrodes for both bipolar and quadripolar cutting forcepses.

Material and Method: Bipolar and Quadripolar cutting forcepses were used for electrosurgical instrumentation. As tissue sample, 5 mm thick slices of the hearth of lambs were used. In two groups, 10 watts of coagulation energy were applied for 3 seconds with bipolar (Group I) and quadripolar (Group II) forcepses. Heat values were measured by and thermocouple at 1, 2 and 3 mm distances from the electrodes. These measurements were repeated as 20 indepenedent samples. Values were recorded in to a computer which connected to an analog to igital converter that thermocouple was attached.

Results: Main measured temperature differences were 5.2, 2.6 and 1.4 ^{0}C at the points in 1, 2 and 3 mm distance from the electrode in group I. Respectively, main heat differences were 2.2, 1.1 and 0.6 ^{0}C at the same points on the 3th second after the deactivation of the generator in group II. Side effects on the tissue were observed and photographed for both groups. Distance difference of the thermal side effects were clearly visible on the tissue.

Conclusion: It has been our practice to avoid monopolar electrical energy whenever possible. We're concerned about the associated risk of collateral thermal damage to adjacent tissues. While offering safer electrosurgical energy application with bipolar coagulation, quadripolarity is widely out of risks to harm the adjecent tissues.

Education/Outcomes-PF102

THE SURGEON ON CALL IS A STRONG DETERMINANT OF USING A LAPAROSCOPIC APPROACH FOR APPENDECTOMY: Patrick N. Cervini B.Sc., Lloyd C. Smith M.D., David R. Urbach M.D., Minimally Invasive Surgery Program, Division of General Surgery, Toronto Western Hospital, University Health Network, Toronto, Ontario, Canada

Introduction: Although many studies have compared laparoscopic with open appendectomy, none have specifically examined which factors determine whether a laparoscopic or open approach is used for appendectomy. This study attempts to shed some light on this topic.

Methods: We conducted a retrospective chart review of 140 patients who underwent a laparoscopic (N=60) or open (N=80) appendectomy between January 2000 and April 2001 at our hospital. Medical records were reviewed, and the data were analyzed using chi-square analysis, the Wilcoxon rank sum test, and multivariate logistic regression. We studied age, time from emergency assessment to surgery, sex, type of surgeon on call, leukocyte count, pathology, previous emergency visits, previous pain, and diagnostic imaging results, to determine if there was any association between any of these factors and the use of a laparoscopic approach.

Results: Of the factors studied, only the type of surgeon on call was strongly correlated with a laparoscopic approach. Of the appendectomies performed by laparoscopic surgeons (surgeons who use laparoscopy for operations other than appendectomies and cholecystectomies) 91.7% (N=55) were laparoscopic and 6.3% (N=5) were open (multivariate odds ratio 136; 95 percent confidence interval, 39 to 475; P<0.001). None of the other variables considered had any correlation with a laparoscopic approach.

Conclusions: The preference of the surgeon on call when a patient is admitted is the most important factor in determining whether a patient will receive a laparoscopic or open appendectomy. Possible explanations include differences in surgeon training and ability, strong preferences among surgeons for a particular approach, or the perception that there is a paucity of convincing evidence that a laparoscopic appendectomy is superior to an open procedure.

Education/Outcomes-PF103

LAPAROSCOPIC INGUINAL AND BILIARY ANATOMY TRAINING INSTRUMENT, *Edward Chekan, MD; ^Fred Brody, MD, *Department of Surgery; The University of Virginia. ^Department of Surgery; The Cleveland Clinic Foundation

Intro: The annual SAGES Learning Center provides a variety of educational needs for attending surgeons and residents through hands-on technical and didactic stations. A web based learning tool was created to assess basic inguinal and biliary anatomy and general attitudes regarding inguinal hernia repairs. This study details the results of the SAGES 2000 Learning Center computer questionnaire.

Methods: Participants completed three multiple-choice questionnaires. Section 1 consisted of 9 laparoscopic images linked to questions illustrating important inguinal and biliary anatomy. Section 2 entailed 14 questions regarding general concepts of inguinal hernias and Section 3 consisted of 5 questions regarding laparoscopic cholecystectomy. Results: Fifty participants completed the web based training instrument. Twenty-seven percent of the respondents were 4th-7th year residents; 21% Fellows; 25% Private Surgeons & 27% Others. Responders had difficulty correctly identifying the Vas Deferns (52%) and a Spigelian Hernia (35%). Section 2 revealed that most participants perform open and laparoscopic with equal frequency 41% and 36%, respectively. For primary hernias, surgeons prefer an open repair and for recurrent hernias laparoscopic repairs are preferentially utilized. Section 3 revealed that the majority of responders use 5-10mm instruments (79%), SCDs (81%), Foley catheter (81%), disposable trocars (63%) and discharge the patient within 23 hours of operation.

Conclusion: The SAGES Learning Center addresses a variety of learning needs. Questionnaires can identify broad deficits and help with the design of future learning stations.

Education/Outcomes-PF104

THE INVOLVEMENT OF PERCEPTUAL MOTOR FACTORS IN THE PERFORMANCE OF MINIMALLY INVASIVE SURGICAL (MIS) SKILLS.
Michael Donnelly ,Ph.D., Donald Witzke, Ph.D., Michael Mastrangelo, M.D., Adrian Park, M.D., Department of Surgery, Department of Pathology, University of Kentucky, Lexington, Kentucky

The purpose of this study was to determine the level of involvement of basic perceptual motor (PM) factors in the performance of important MIS skills. Expert laparascopic surgeons judged the degree to which basic PM factors were involved in the performance of 18 MIS skills. The ultimate purpose was to initiate the development of a structural model of factors that underlie the learning of MIS skills.

Eighteen laparascopic skills were identified by a group of expert MIS surgeons. Examples of these skills include: intra-corporeal suturing, adhesiolysis, and deep vein cannulation. Five important perceptual motor factors were also identified: 1) Dexterity, 2) Non-Intuitive Movement, 3) Serial/Simultaneous Complexity, 4) Spatial Orientation, and 5) Hand-Eye Coordination. Clinical Judgment was also included as a factor. A questionnaire was sent to 48 expert MIS surgeons who were asked to rate the involvement of each of the 5 PM factors and Clinical Judgment on the performance of each of the 18 laparascopic skills. 26 of the surgeons (54%) returned the form.

The reliabilities (coefficient alpha) of the expert judges' ratings of the involvement of the 5 perceptual motor and clinical judgment factors were high, ranging from .93 to .95. Repeated measures analyses of variance and PLSD post hoc tests indicated that 5 of PM factors and clinical judgment could be divided into 4 levels of involvement in the MIS skills – ranging from little involvement to major involvement. In the case of the Serial/Simultaneous Complexity, there were 5 levels of involvement.

We conclude that expert judges can reliably estimate the involvement of perceptual motor factors and clinical judgment in the performance of MIS skills, and that there are measurable differences in the degree to which the perceptual motor factors and clinical judgment are involved in the performance of the various MIS skills. Each MIS skill can be represented by a profile of basic perceptual motor factors.

Education/Outcomes-PF105

THE IMPACT OF MINIMALLY INVASIVE SURGERY COURSES ON SURGEONS' PRACTICE Mohey R. El-Banna, M.D., Jon C. Gould, M.D., Brad J Needleman, M.D.,Scott W. Melvin, M.D.Center for Minimally Invasive Surgery, Ohio State University Medical Center, Columbus, Ohio

Introduction: Short courses have been arranged by several centers to teach new technically demanding laparoscopic procedures.

The effect of these courses on the practice of participating surgeons has not been well described. The aim of this study was to evaluate the effect of advanced minimally invasive surgery (MIS) courses on the participating surgeons' practice.

Methods and Procedures: All surgeons who participated in courses on MIS bariatric surgery at our institution since August 1999 were surveyed. A questionnaire was sent to each of them to assess their skills, age and practice prior to and after attending the course.

Results: Twenty-five responded. Thirteen considered their laparoscopic expertise intermediate (52%) while 10 (40%) considered it extensive, and two (8%) defined it as limited. Nine of them were 30-40 years old (36%), 10 were 40-50 (40%), 6 were above 50 (24%). Before attending the course none had performed MIS bariatric surgery, while 16 (64%) had performed open bariatric surgery.

Since participating in the course only ten surgeons (40%) have applied the new techniques. Five of them (50%) had extensive and 5 (50%) had intermediate previous laparoscopic experience. Five (50%) were proctored in the first few cases and five (50%) attended other courses. Nine of them had performed open bariatric surgery before the course (90%) and nine are less than 50 years old (90%).

Conclusion: After attending a MIS course the practice of 60 % of surgeons did not change. Multiple courses, age younger than 50, and extensive prior MIS and relevant open experience are indicators of the effects of short MIS courses on surgeons' practice.

Education/Outcomes-PF106

GASTROINTESTINAL SYMPTOMS ARE MORE INTENSE IN MORBIDLY OBESE PATIENTS Ronald H. Clements MD, Allen Foster MD*, William O. Richards MD^, James McDowell MD^, Henry L. Laws MD.Carraway Methodist Medical Center*, The Norwood Clinic, Inc. and Vanderbilt University Medical Center

Introduction: Laparoscopic Roux-en-Y gastric bypass is an effective treatment for morbid obesity. However, little information is available on gastrointestinal (GI) symptomatology in this population, This study was done to compare GI symptoms in morbidly obese patients versus normal subjects.

Methods: A nineteen-question GI symptom questionnaire was administered prospectively to each patient who was scheduled to undergo laparascopic Roux-en-Y gastric bypass for morbid obesity. The questions were then grouped into six clusters of symptoms. This questionnaire had been previously validated in a control population. The result of each cluster of symptoms (expressed as mean ? standard deviation) was compared to the control using students t-test with significance p=0.05.

Results: 43 patients (40 Female, 3 Male) age 37.3 +- 8.6 with BMI 47.8 +- 4.9 completed the questionnaire.

Abd pain	25.3+-18.0 vs 12.1+-11.4	p = .0002
Irritable bowel	23.0+-14.8 vs 15.6+-13.3	p = .0225
GERD	40.3+-18.9 vs 22.3+-16.1	p = .0001
Reflux	29.9+-19.0 vs 11.8+-13.4	p = .0001
Sleep	50.6+-28.9 vs 32.9+-26.8	p = .0062
Dysphagia	10.9+-15.6 vs 7.2+-10.6	p = .2159

Conclusions: Morbidly obese patients have more intense GI symptoms than normal subjects. Dysphagia is equivalent to normal subjects. This data may be important in counseling patients regarding postoperative expectations.

Education/Outcomes-PF107

LIVE STREAMING VIDEO FOR SURGICAL EDUCATION: A LABORATORY MODEL, Alex Gandsas, MD; Katherine McIntire, MD; Guillermo Palli and Adrian Park, MD, University of Kentucky Chandler Medical Center

At the University of Kentucky, we have created an interactive, virtual classroom with the potential to attract a global audience. Using streaming video technology and the Internet, we developed and tested a web-cast model that will allow institutions to broadcast live and pre-recorded surgeries, conferences and courses in real-time. The model incorporates a web-based user interface that makes access to educational material as simple as a mouse click and allows surgeons to participate in broadcast events via an embedded e-mail/chat module. A University of Kentucky server equipped with off-the-shelf streaming-enabled software, standard hardware and a standard operating system successfully tested a live broadcasting session of a pre-recorded laparoscopic paraesophageal hernia repair to domestic and international clients. Three client computers (two connected to the Internet and a third connected to the University of Kentucky intranet) requested and displayed the surgical film using seven common network connection configurations. Significantly, no difference in image resolution was detected using a bandwidth larger than a 128 kilobyte per second (kbps). Clients easily identified all anatomical structures in full color motion and clearly followed all steps and stages of the surgical procedure. Although a 15 second lag time was encountered (time from data request to data display), once initiated, the film streamed continuously from beginning to end at a mean 14.4 frames per second using an average bandwidth bitrate of 32.7 kbps. While viewing the surgery, clients asked questions/made comments using the e-mail/chat module. Our web-cast model offers a simple, convenient and economical way for institutions to supplement under graduate and graduate surgical education and to offer CME credits. We foresee that physicians will soon be able to wirelessly access web-cast material built on streaming technology using handheld personal computers.

Education/Outcomes-PF108

IMPACT OF A MINIMALLY INVASIVE SURGERY CENTER OF EXCELLENCE ON RESIDENT LAPAROSCOPIC EXPERIENCE

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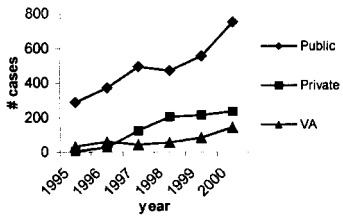
Introduction: Education and training may facilitate the incorporation of minimally invasive procedures into surgical practice. We established a center of excellence (COE) at our institution in 1997. The aim of this study was to determine the impact of a COE on advanced laparoscopy across hospitals affiliated with our resident training program.

Methods: We retrospectively reviewed a central database (SNIPS) detailing cases performed by general surgery residents in our program over a six-year period. We compared the number of basic and advanced laparoscopic cases performed at a 990 bed public hospital (COE), a 600 bed private hospital, and a 250 bed Veteran's hospital (COE).

Results: Total resident-performed laparoscopic cases per year are shown in the figure. Advanced laparoscopic procedures, including totally extraperitoneal inguinal herniorrhaphy, adrenalectomy, common bile duct exploration, colectomy, gastric bypass, and splenectomy were performed almost exclusively at the COE institutions.



Conclusion: The total number of laparoscopic cases performed is increasing. The development of a university-based center of excellence in minimally invasive surgery may positively influence the number and type of advanced procedures performed compared to a private community hospital.

Education/Outcomes-PF109

LAPAROSCOPIC CHOLECYSTECTOMY - A COMPARISON OF RESULTS IN DEVELOPING AND DEVELOPED COUNTRIES. Kuldip Singh, M.S. and Navneet Narula M.D., Ludhiana Laparoscopic and Surgical Centre, Ludhiana, Punjab (INDIA)

Laparoscopic Cholecystectomy (LC) was introduced during 1989 in developed countries and 1991-92 in India. This technology and the advancements thereafter were adopted quite late in the developing countries. Moreover, better facilities in every respect existed in developed countries. During these years, the authors have observed that the laparoscopic surgical centres from developing countries with minimum resources could produce almost similar and even better results as compared to the best in the degveloped countries. The aim was to identify the possible factors responsible for this.

From February 1992 to July 2001, 4800 patients underwent LC in one centre and by one surgeon. There were 460 male and 4340 female patients. The age varied from 7 to 85 years. Being a rural centre we encountered more difficult cases as: 576 cases of acute cholecystitis (> 72 hrs) (12%), 340 cases (7%)of empyema gall bladder. The overall conversion rate to open surgery was <1% and in difficult LC it was 2.1% compared to conversion rate varying from 1% to 35% in world literature. Four patients (o.1%) had major(3) and minor(1) bile duct injuries and 7 patients with biliary leak whereas reports from large series indicate a higher incidence of 0.1 to 1.0% or even more. Patients with BDI were managed with Roux-en-Y, T-tube and endoscopic stenting. 21 patients had wound infections and 1 patient died because of cardiac problem. In conclusion, we feel that surgeon's adequate experience in open as well as laparoscopic technique working with the same team throughout these years, a cautious approach could be the reasons to produce such results.

Education/Outcomes-PF110

ANALYSIS OF PATIENT SATISFACTION WITH LAPAROSCOPIC FUNDOPLICATION. Leena Khaitan, M.D., Parul Bhatt, William Richards, M.D., Hugh Houston, M.D., Kenneth Sharp, M.D., Michael Holzman, M.D., Vanderbilt University Medical Center, Nashville, TN

Introduction: Quality of life (SF12), GERD specific quality of life (QOLRAD) and retrospective pre-operative data was assessed on all patients who underwent fundoplication at our institution.

Methods: Validated questionnaires (SF12, QOLRAD) and queries regarding current medication use and long term satisfaction were mailed to all patients. Chi squared and ANOVA analyses were performed where appropriate.

Results: 221 patients (23 redo) underwent fundoplication between November 1992 and July 2000. Completed follow-up surveys were returned from 130 patients (age 50.7+-15.2; 56% female, 43% male) Mean follow up 32.6+-26 months (range 0.8-98). 112 of 130 were primary fundoplications (76% classic GERD symptoms, 21% extraesophageal symptoms). 99 underwent Nissen, 13 Toupet fundoplication. Long term satisfaction was 87% (100/112).

	Satisfied	Dissatisfied	
LESP	13±12	9±5	p=0.07
% Peristalsis	95±13	95±15	p=0.8
DeMeester Score	53±37	158±105	p=0.3
SF12 Physical	33±13	29±12	p=0.3
SF12 Mental	46±12	39±16	p<0.1
QOLRAD	6±1	5±1	p=0.2
Hospital Stay	1.7±1.2	2.5±3.2	p=0.4
Recurrent meds	24%	61%	p=0.07

Conclusion: With this data, we were unable to identify preoperative indicators of patient satisfaction. SF12 & QOLRAD showed no statistical difference. Further evaluation of dissatisfied patients is necessary to determine the etiology. The vast majority of patients undergoing anti-reflux surgery are satisfied with their results.

Education/Outcomes-PF111

TRANSITION TO LAPAROSCOPIC ADRENALECTOMY – THE NEED FOR ADVANCED TRAINING D.L. MACCABEE MD, C.W. DEVENEY MD, A. JONES MD, B.C. SHEPPARD MD, OREGON HEALTH & SCIENCES UNIVERSITY, Portland, Oregon

Introduction: We sought to determine the learning curve for Laparoscopic adrenalectomy (L.A.), community surgeon's utilization of L.A., and if the indications had changed with laparoscopy.

Methods: A chart review was performed for all L.A.s from 1/1/1994 through 6/30/2001. The operating time (OR time), estimated blood loss (EBL), frequency of conversion and complications were recorded. Bilateral gland removal by flank approach was counted as two cases with OR time & EBL halved. Surgeons in Portland, Oregon were questioned regarding L.A. Indications were reviewed for all cases since 1/1/1990.

Results: 79 L.A.s were performed on 61 patients; 18 of these had bilateral gland removal. 2 cases were converted, and 2 were via posterior approach; these 4 were excluded leaving 57 for analysis. Average OR time was 161 min., average EBL was 84ml. There were 6 complications & 2 conversions. Comparing the first 20 patients (27 glands) to the last 20 patients (26 glands), OR times were 154 min. vs. 159 min. (p<.05). EBL was 102 ml. vs. 47 ml. (p<.05). There were 4 vs. 2 complications (p<.05) and 1 conversion each. 46 surgeons responded (56%). Residents completed about 2 L.A.s during their training (avg. 1.6). Community surgeons performed 0 procedures during their training (avg. 0.14). Of 46 respondents, 16 currently perform L.A; 13 had post residency training. The major barrier to learning was 'too few cases during residency'. Open technique was used more often for hormonal ablation and malignancy; benign disease was more often resected laparoscopically.

Conclusion: Operative time does not significantly fall with experience, however EBL and complications do. Few if any residents acquire enough experience during their training to perform L.A. Additional training is necessary. The procedure is performed laparoscopically more often for benign diseases, and infrequently for malignancy and hormonal ablation.

Education/Outcomes-PF112

THE VIRTUAL CHAPERONE: ACCEPTABILITY TO PATIENTS Ara Darzi MD, Lee Edwards, Sean Mackay MBBS, Joanna Chrzanowska* BSc , and Roger Kneebone MBChB. , Faculty of Medicine, Imperial College of Science Technology and Medicine, London, UK. *Genesis Consulting, Billingshurst, West Sussex, UK.

INTRODUCTION. The use of chaperones to reassure both patient and physician is increasingly common. However, the practice is inefficient and offers little effective protection. The Virtual Chaperone is a data recording and storage device designed for use in one-to-one consultations, comprising a portable audio/video system that saves an encrypted datastream to DVD in real-time. It is envisaged that the device will provide an accurate and permanent record of all consultations, including the discussion of treatment options and consent, as well as physical examinations and office procedures. This study explores the attitudes of patients to this new approach in quality assurance.

METHODS AND PROCEDURES. Understanding patients', concerns and expectations is key at this stage of development. We therefore chose a qualitative approach, using in-depth interviews with a purposively selected patient sample from both primary and secondary care. A 4-patient pilot was followed by 28 face-to-face interviews (16 primary care, 12 hospital outpatients). An experienced qualitative researcher (JC) explored responses to the Virtual Chaperone concept, using semi-structured interviews. The pilot phase comprised telephone interviews, and was used to generate the semi-structured interview. All interviews were recorded and subsequently analysed.

RESULTS. 24 of 28 patients felt that the use of such a device would be acceptable to them, especially in certain circumstances. 9 of the 28 experienced at least moderate anxiety about the upcoming consultation (independent of the research interview), and some of these felt that the implementation of a virtual chaperone system could go some way to relieving this anxiety. Key issues were identified relating to the explanation of the system to patients.

CONCLUSIONS. This study suggests that the virtual chaperone data recorder is acceptable to a range of patients in the primary care and outpatient settings, and that it may improve the patients' experience in these settings. Work is underway to explore its acceptability to physicians

Education/Outcomes-PF113

EMERGENCY DEPARTMENT VISITS BY DEMENTED PATIENTS WITH MALFUNCTIONING FEEDING TUBES Steve Odom MD, James E. Barone MD, Sal Docimo, Sherman M. Bull MD The Stamford Hospital, !90 W. Broad Street, Stamford, CT 06902

Objective: To evaluate the incidence and resource utilization related to feeding tube malfunction in demented patients visiting the emergency department (ED).

Background: Objective data indicate that the use of feeding tubes in demented patients may not be efficacious and can result in serious complications. To date, no study has investigated ED resource utilization in patients with dementia and malfunctioning feeding tubes.

Methods: A retrospective chart review of all demented patients with malfunctioning feeding tubes visiting the ED of our 300-bed community teaching hospital was conducted for the 21 month period from September, 1999 through May, 2001.

Results: Patients were transported by ambulance to and from the ED on 108 occasions (216 total trips). The most frequent complication was unintentional dislodgment (n=125). The average ED length of stay was 2.6 +/- 1.6 hours. All 138 patients were seen by an emergency physician with 99 surgical consults and 26 gastroenterology consults. X-rays were done on 43 occasions (31 tube contrast studies, 6 chest x-rays, 5 abdominal x-rays, 1 patient who had both chest and abdominal films). Total hospital charges not including physician fees were $86,234.48. Total ambulance charges were $57,664.00 (fees paid by Medicare for the ambulance service). The cost of physician time spent in evaluating and managing these patients cannot be quantified.

Conclusion: We have identified a previously unreported issue involving the tube feeding of demented patients. The expense of ED visits by 33 demented patients for tube dislodgment or clogging was in excess of $135,000.00 for a 21 month period in our medium-sized hospital. The mean charge was just over $1000.00/visit. In 1993 throughout the United States, 106000 gastrostomies were performed in patients over the age of 65. If only 30% of these procedures were done on demented patients and the rate of tube malfunction is similar to ours, some 32,400 gastrostomies would have resulted in $32,400,000 worth of charges for ED visits.

Education/Outcomes-PF114

A RURAL, COMMUNITY-BASED PROGRAM CAN TRAIN SURGICAL RESIDENTS IN ADVANCED LAPAROSCOPY, Frederick D. Reynolds, M.D., Leonidas Goudas, M.D., Randall S. Zuckerman, M.D., Michael Gold, M.D., Steven Heneghan, M.D., Department of Surgery. The Mary Imogene Bassett Hospital. Cooperstown, New York.

Introduction: Advanced laparoscopy requires mastery of complex surgical skills. A steep learning curve, lack of an adequate number of cases, and a shortage of experienced staff are reasons cited as barriers to the acquisition of these skills by surgical residents. We believe that advanced laparoscopy can be taught during residency without additional fellowship training.

Methods: Past surgical residents who completed training at our rural, community-based, 140 bed hospital from 1992 to 2000 were contacted by mailed surveys and a follow-up telephone interview. Advanced laparoscopy was defined as cases other than cholecystectomy, appendectomy and diagnostic laparoscopy. Four surgical attendings routinely perform advanced laparoscopy.

Results: Response rate to the survey was 93.3%. 15 of 18 graduates currently practice general surgery. 100% of these surgeons currently perform advanced laparoscopy. Laparoscopic herniorrhaphy, spleenectomy, colectomy, Nissen fundoplication, and adrenalectomy were performed by 12 (85.7%), 10 (71.4%), 11 (78.6%), 13 (92.9%), and 9 (64.3%) surgeons respectively, though the number of cases/year varied widely. Eight (57.1%) surgeons reported confidence to perform advanced laparoscopy immediately following residency. All graduating chiefs from the last three years expressed this confidence. Three surgeons (21.4%) stated the need for additional training should laparoscopic colectomy become the standard of care. On average, for the past three academic years each of two chief residents graduated with 50 advanced laparoscopic cases.

Conclusions: We conclude that a small rural residency program can train residents to perform a broad range of advanced laparoscopic procedures. Practice patterns such as increased volumes of laparoscopic colectomy may improve a residency programs ability to teach advanced laparoscopic skills.

Education/Outcomes-PF115

LAPAROSCOPY IN THE EARLY POST-LAPAROTOMY PERIOD. Danny Rosin, M.D., Joseph Kuriansky, M.D., Barak Bar-Zakai, M.D., Menahem Ben-Haim, M.D., Moshe Shabtai, M.D., Amram Ayalon, M.D., Department of General Surgery and Transplantation, Sheba Medical Center, Tel Hashomer, Israel.

The use of laparoscopy in the scarred abdomen is now well established. However, recent laparotomy and the presence of a fresh abdominal wound usually preclude laparoscopic intervention. Thus, early post-laparotomy complications, which mandate surgical interventions, are usually treated by a second laparotomy.

We report our early experience with the use of laparoscopy for the treatment of post-operative complications, after open abdominal procedures.

Five patients are presented. The primary operations, the conditions mandating a second exploration, the laparoscopic procedure performed and the results are presented in the table.

Primary operation	Acute post-operative condition	Laparoscopic procedure	Outcome
Subtotal colectomy	Perforated duodenal ulcer	Omentopexy	Recovery
Retroperitoneal lymph node dissection	Small bowel obstruction	Enterolysis	Recovery
Small bowel resection	Intra-abdominal abscess	Drainage of abscess	Mortality (sepsis)
Exploratory laparotomy for trauma	Small bowel obstruction by adhesions	Enterolysis	Recovery
Appendectomy	Small bowel obstruction by a misplaced stitch	Enterolysis	Recovery

We conclude that a recent laparotomy is not a contraindication for laparoscopic management of acute abdominal conditions. Post-laparotomy complications can be successfully treated by laparoscopy. Avoiding the re-opening of the abdominal wound and a second laparotomy may reduce the additional surgical trauma, and thus result in easier recovery.

Education/Outcomes-PF116

IMPAIRED TRAINING IN OPEN BILIARY SURGERY IN THE LAPAROSCOPIC ERA. Quynhanh Pham, MD Lynn Wojtasik MD;; Naveed Ahmed, MD; Vedantum Chari, MD; Raphael Chung, MD. Department of Surgery, Huron Hospital, Cleveland Clinic Health System, Cleveland, Ohio.

After more than a decade of widespread use of laparoscopic cholecystectomy, the impact on resident's training in open biliary operations can be analyzed quantitatively. **Method**: In this study we tracked the national residents operative statistics for all biliary operations from 1994-2000, and performed regression analysis to establish trends and to calculate the rate of change. The statistics of 1988, before the birth of laparoscopic cholecystectomy, were used for control.

Results: (mean operations/graduate, performed over entire training)

	88	94	00	r^2	d(#op/yr)
Open Cholecystectomy	54	35	15.5	.95	-3.3
Lap Cholecystectomy	0	42	84	.97	6.8
Open CBDE	9.7	6	2.7	.96	-.6
Lap CBDE	0	0.4	0.9	.84	.09
Choledochoenteric bypass	4.1	3.8	3.0	.95	-.14
Open Cholecystostomy	1.6	1.9	1.2	.67	-.01
Open Sphincteroplasty	1.0	0.5	0.2	.93	-.06
Total open biliary operations	70.4	47.2	22.6	.95	-4.2
Total laparoscopic biliary op	0	42.4	84.9	.97	6.9

r^2 =regression correlation coefficient; d=slope; p<0.0001 for all d values

Conclusion: Since 1994, the resident's experience in open biliary surgery, including CBDE and sphincteroplasty, shrinks in a steady and continuing decline. Today, graduates perform open biliary surgery only 32% as often as in 1988. Development of laparoscopic CBDE does not account for the decline of open bile duct surgery, but loss of patients to therapeutic ERCP has to be assumed. As a result of diminished exposure, young surgeons are less likely to be skilled in open biliary surgery, especially bile duct surgery. Remedial action, such as supplemental teaching using videos, models or virtual reality simulation, should be implemented.

Ergonomics/Instrumentation-PF117

THE EFFECT OF USING LAPAROSCOPIC INSTRUMENTS ON MUSCLE ACTIVATION PATTERNS DURING MINIMALLY INVASIVE SURGICAL TRAINING PROCEDURES Nancy E. Quick, PT, MA, Jason C. Gillette, PhD, Robert Shapiro, PhD., Gina L. Adrales, M.D. and Adrian E. Park, M.D.

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Many surgeons experience pain and muscle fatigue during minimally invasive surgery (MIS). Possible correlations between movement associated with MIS and muscle fatigue were assessed using six electromyography (EMG) electrodes placed over the deltoid, trapezius, bicep, pronator teres (PT), flexor carpi ulnaris (FCU), and extensor digitorum superficialis (EDS) muscles on the dominant arm of five surgeons during three tasks. These tasks included a grasp/targeted release of a small object (T1), a simulated bowel inspection (T2), and a cable tying exercise (T3) using a MIS training box. The in-line finger looped instruments included a non-ratcheted handle with a single action blunt end effector (G1) and two models with ratcheted handles with dual action end effectors (G2, G3). Resting and max voluntary contraction EMG values for each muscle were used to determine the percent of muscle activation during each trial. The muscle was deemed 'on' if it exceeded the resting EMG value by at least 10%. A multivariate ANOVA ($p<.05$) compared EMG relative time of activation (RAT) patterns to grasper configuration, task, and grasper/task interaction. The results demonstrated reduced RAT of the deltoid while using G3 as compared to G1 or G2. Use of G3 also resulted in a lower RAT of the deltoid and bicep during T3 and the deltoid and FCU during T2. RAT during T3 was greater in all muscle groups, except the deltoid, as compared to T2. Greater RAT of the biceps and EDS was noted during T3 compared to T1 while the EDS demonstrated higher RAT during T2 compared to T1. The most notable finding was that across instruments, the shoulder muscles were activated for a greater percentage of time as compared to the forearm muscles, which may account for the neck and shoulder pain reported by laparoscopists. These results indicate that grasper type, task, and especially grasper/task interaction can strongly influence muscle activation patterns, and thereby, play an important role in fatigue.

Ergonomics/Instrumentation-PF118

COMPLICATIONS FROM THE USE OF THE HARMONIC SCALPEL: A REVIEW Prasad S Adusumilli* M.D., Jae-Hyung Chang+., Michael Leitman* M.D. * Department of Surgery, Lenox Hill Hospital, New York.,+ Universitaetsklinikum Frankfurt, Frankfurt, Germany.

Objective: Despite the expanding surgical application of harmonic scalpel (HS) and hook, there are no reports in surgical literature of its associated complications.

Methods: The web based database from United States food and drug administration (FDA) - Center for devices and radiological health were reviewed from 1992 to 1997. All the published events in English literature to the present were also analyzed.

Results: There are twelve reports of complications associated with HS (9 from FDA web site). There were two deaths and ten untoward events, of which there is direct evidence of injury in six events. Two deaths reported to FDA happened after tonsillectomy and laparoscopic Nissen fundoplication (necrosis of stomach). Among untoward events; one patient underwent a reoperation for anastomotic leakage from right hemicolectomy, in three patients laparoscopic procedure was converted to open when HS failed to achieve adequate coagulation. Among the six events where HS is directly involved, one patient had iliac artery injury, two had trocar site burns, one patient had bowel injury from direct contact of heated HS tip and in one patient there was tracheal tube damage from direct contact by HS. A white coagulum inside the harvested vessel was reported in arterial conduits for coronary artery bypass surgery.

Conclusions: Avoidance of physical strains on the laparoscopic blade extender sheath, prompt response to malfunction signals, avoidance of contact with tissue, metal or plastic by the overheated blades from prolonged activation are important ways to prevent complications. Releasing the tissues while the blade is still activated avoids pulling on coagulated tissue. Prompt removal of tissue adherent to the HS blades prevents overheating. The internal mammary artery should be allowed to bleed freely and the radial artery should be flushed until free of coagulum to prevent embolization.

Ergonomics/Instrumentation-PF119

THE USE OF AN ERGONOMICALLY DESIGNED HANDLE DOES NOT ENHANCE PERFORMANCE IN A CLOSED BOX LAPAROSOPIC TASK Simon Bann MB BS, Mansoor Khan MB BS, Vivek Datta MB BS, Ara Darzi MD, Department of Surgical Oncology and Technology,Imperial College School of Medicine at St. Mary's Hospital, London, U.K.

Aims: Does the use of an ergonomically designed laparoscopic handle enhance performance as detected by motion tracking.

Methods: Two different laparoscopic handle types, one a standard Autosuture, Endodisect the other the ergonomically designed Surgical Innovations F4, were both tested in a closed box environment. They were tested with and without ratchets; performance was tracked using the Imperial College Surgical Assessment Device (ICSAD). 9 surgeons of intermediate laparoscopic experience performed the task in a randomised fashion, under standardised conditions, using both hands individually. The task consisted of picking up and object and transferring it across obstacles to a destination 10 cm diagonally away. Subjective analysis of the handles was by questionnaire after each task.

Results: Objective data: time taken, path length and number of movements, showed no statistically significant differences between the handles. Subjective data: No statistically significant difference in the scores for precision, comfort, rotation, ease of opening and closing and overall score. No significance in the feeling of pain/pressure for all handles. Three different sites mentioned for pressure/pain; base of thumb, index finger and ring finger, F4 handle mentioned in 5 cases and standard in 3.

Conclusion: The F4 handle has been designed to avoid the ergonomic problems associated with standard handles e.g. neuropraxia, ulnar deviation of wrist and poor force transmission. However in a small study performance indicators showed no advantage for the ergonomic handle as measured both objectively and subjectively.

Ergonomics/Instrumentation-PF120

THE RELATIONSHIP BETWEEN SURGICAL GLOVE SIZE AND DIFFICULTY USING LAPAROSCOPIC INSTRUMENTS: A SURVEY OF 726 LAPAROSCOPIC SURGEONS. Ramon Berguer MD, Alan Hreljac PhD

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BACKGROUND: Hand size is an important variable to consider when designing hand tools. Laparoscopic instruments have been reported to cause hand and upper extremity discomfort. This study investigates the correlation between surgical glove size and musculoskeletal problems using laparoscopic instruments.

METHODS: Approximately 11,000 questionnaires were sent to SAGES, AAGL, and AWS members. Questions included basic demographic and practice data, surgical glove size, the presence of musculoskeletal problems, and the perceived difficulty using several types laparoscopic instruments. There were 726 responses (159 female and 567 male). Subjects were grouped by hand size (Male: Small <= 6.5, Medium 6.5-7.0, Large >7.5; Female: Small <= 6.0, Medium =6.5, Large > 6.5). An ANOVA method was used to test for differences between groups.

RESULTS: The reported difficulty of using all laparoscopic instruments was greater for the Small glove size group compared to both the Medium and Large groups ($p<0.001$). In females, the scissors and staplers were more difficult to use for the Small and Medium glove size group compared to the Large group ($p<0.001$). Subjects who reported musculoskeletal problems (n=145) performed a significantly greater percent of laparoscopic cases and found the stapler and graspers more difficult to use than those not reporting problems (n=559).

CONCLUSION: Hand size is a significant determinant of difficulty using laparoscopic surgical instruments. Individuals using glove sizes 6.5 or smaller experience significantly more difficulty using laparoscopic instruments, particularly staplers. Manufacturers of surgical hand tools should consider hand size when designing future surgical instruments.

Ergonomics/Instrumentation-PF121

BARE BONES LAPAROSCOPY: A RANDOMIZED PROSPECTIVE TRIAL ON COST REDUCTION IN LAPAROSCOPIC CHOLECYSTECTOMY, MATTHEW BRACKMAN, MD, EVA FOLEY, MD, JESUS ESQUIVEL, MD, MARC BOISVERT, MD, SALLIE DAVIS, MD, ENRIQUE DAZA, MD, JOHN R. KIRKPATRICK, MD AND FREDERICK C. FINELLI, MD, PROGRAM FOR ADVANCED LAPAROSCOPIC SURGERY, WASHINGTON HOSPITAL CENTER, WASHINGTON, D.C.

The high cost of disposable instruments, coupled with inadequate reimbursement, makes laparoscopic surgery increasingly unattractive to institutions. We hypothesize that the disposable equipment cost of laparoscopic surgery can be driven down significantly while maintaining quality. This study tests a cost-saving (Bare bones) protocol for laparoscopic cholecystectomy.

We randomized 50 consecutive patients to control (typical disposable equipment) or study (bare bones) laparoscopic cholecystectomy. The bare bones technique eliminates 2 trocars, the suction/irrigator and disposable clip appliers. The two groups were compared for: prior abdominal surgeries, Mean Adhesion Grade, Mean Health Index, equipment costs, operative time, use of cholangiography, CO2 usage, conversions, complication rates, pain, and length of postoperative disability. Follow-up data was obtained at thirty days via phone questionnaire. The student t-test was used for comparisons.

Mean disposable equipment costs were $173.00 +/- $43. 45 and $434.42 +/- $50.54 for study and control groups respectively ($p<.0001$). Mean operative time was 67 +/- 15 and 70 +/- 19 minutes for the study and control groups respectively. There was 1 conversion in the study group and 3 in the control group. The study group used an average of 8 liters more CO2 per case. There was 1 admission in the study group and 6 in the control group. There were no statistically significant differences between the groups with regard to age, prior surgery, Mean Adhesion Grade, Mean Health Index, cholangiography, complication rates, pain, length of disability, or overall satisfaction.

These findings suggest that in a cost conscious environment, safety and efficiency can be maintained with this approach.

Ergonomics/Instrumentation-PF122

EFFECTS OF IMAGE VARIABLES ON VIDEOSCOPIC TASK PERFORMANCE Donald R. Czerniach, M.D., Yuri W. Novitsky, M.D., Richard A. Perugini, M.D., John J. Kelly, M.D., Richard C Schmidt, Ph.D., Demetrius E.M. Litwin, M.D. Department of Surgery, University of Massachusetts Medical School and Department of Psychology, College of the Holy Cross,Worcester, MA, USA

Objective: To investigate the influence of monitor location and camera position on videoscopic task performance in experienced and naive subjects.

Methods: 12 experienced and 12 naive right-handed subjects performed a basic endoscopic task using their dominant hand using a modified endosurgical simulator. Monitor was positioned at 120, 180 and 240-degree relative to the subject's midline with the camera at 0 degree (Experiment 1). The camera was positioned at 0, 60 and 300 degrees to the subject's midline with the monitor stationed at 180 degrees (Experiment 2). Each task was repeated 5 times under a given condition. The mean task times for monitor and camera positions were analyzed within and between groups using a three-way Latin square analysis of variance.

Results: Experience, monitor location, and condition order had a significant ($p<0.0005$) impact on mean task times in Experiment 1. Both experienced and naive subjects performed more slowly and with less stability when the monitor was at 240 degrees (right side) compared to the 120 or 180-degree positions ($p<0.05$). Experience and camera position had a significant ($p=0.001$ and $p=0.005$, respectively) impact on mean task times in Experiment 2. Experienced subjects demonstrated optimal performance at the 180-degree camera position. Both groups showed significant detrimental effects with the camera on either side of the midline; however, the naive subjects had greater difficulty with the right (300 degrees) than the left (60 degrees) side.

Conclusions: Videoscopic task performance is optimized when an image is located directly in front of the operator and with camera at midline. Right hand dominant surgeons, regardless of experience, perform best with the monitor at or to the left of midline. Right-sided camera positioning affects performance most adversely. However, experienced operators are less affected by suboptimal monitor and camera positions than unskilled operators.

Ergonomics/Instrumentation-PF123

EVALUATION OF A METHOD FOR CONTROL OF CLEANING PERFORMANCE IN REUSABLE HOLLOW INSTRUMENTS FOR MINIMALLY INVASIVE SURGERY Winfried Ebner M.D., Bastian Grande, Nick Acker, Joachim Mutter M.D., Ulrich Matern M.D., Franz Daschner M.D.

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The validation of cleaning reusable laparoscopic (MIS) instruments is an unresolved issue. Contamination of hollow instruments can be detected using labor-intensive endoscopic methods. Other methods (radionuclide, chemical) are more sensitive, but they render the MIS instrument examined unsuitable for further use. The objective of the study was to evaluate cleaning performance in reusable MIS instruments, for which purpose residual contamination after cleaning was assessed by precision weighing.

In a first course the empty weight of six new instruments was determined as well as the weight before each new experiment. In a worst-case scenario, the instruments were contaminated with 1.5 ml sheep's-blood, were weighted again and, after a drying period of 21 hours, processed in a washer/disinfector. Afterwards the instruments were weighted a third time. This cycle was repeated 10 times. The results of the weight control were confirmed by optical-endoscopic method. In a second course (12 cycles, 7 instruments) the drying period was shortened to 1 hour in order to facilitate the processing conditions.

In the first course the MIS instruments were contaminated with an average of 0.33 g of sheep's blood. After processing in the wash/disinfector, a median of 0.02 g blood remained in the instrument (range: 0.01-0.07 g). Compared with the optical method a sensitivity of 100% and a positive predictive value of 92.6% were demonstrated. In the second course a median of 0,023 g contamination remained in the lumen.

The results of the first course show that residual contamination of hollow instruments can be detected quantitatively by weighting the instruments. The results of the second course demonstrated that - even under facilitated conditions - the cleaning of hollow instruments for the MIS is an unresolved issue. Further studies are necessary to demonstrate whether this relatively simple method can be employed for routine control, especially for instruments with hidden surfaces.

Ergonomics/Instrumentation-PF124

THE EFFECT OF DIFFERENT ELBOW ANGLES ON MUSCLE ACTIVITY OF THE FOREARM DURING LAPAROSCOPIC SURGERY Michael Faist* M.D., Carsten Giebmeyer Dipl.-Ing., Rico Bergmann Dipl.-Ing, Peter Waller Dipl.-Des., Ulrich Matern M.D., Study Group Surgical Technologies, Dept. of General Surgery & *Dept. of Neurology, Univ.-Hospital Freiburg

Background: Although no experimental data are available for a laparoscopic setting a working posture of the surgeon with a horizontal forearm or an elbow angle between 90° and 120° has been recommended. The comparison of electromyogram (EMG) activities in different muscles provides information about the force developed by each muscle and allows to assess its contribution to a functional movement. The aim of the present study was to evaluate different elbow angles, for a grasping maneuver performed with different types of instrument handles measuring EMG activity of the main forearm muscles.

Methods: Twelve volunteers were postured in two different standardized arm position, defined by an elbow angle of 90° and 120°. They were manipulating a 0.1 N and a 2.5 N micro switch with four different types of instrument handles (axial handle, ring handle, shank handle, Hirschberg handle). During the test the EMG activity of 5 forearm muscles was recorded and normalized with respect to the maximum voluntary activity of the respective muscle.

Results: A similar pattern of EMG activity was observed manipulating the 0.1 N and 2.5 N micro switch but EMG activity increased in all muscles tested with the switch force applied. With respect to the two elbow angles virtually no significant differences in EMG activities were found. Thus, the muscle activity required to manipulate different types of MIS handles is similar between elbow angles of 120° and 90°.

Conclusion: The present data support that the recommendation of elbow angles between 90° and 120° for a basic ergonomic working posture for laparoscopic surgeons is reasonable.

Ergonomics/Instrumentation-PF125

OBJECTIVE ASSESSMENT OF HAND ASSIST VERSUS CONVENTIONAL LAPAROSCOPIC SURGERY Vivek Datta MB.BS, Simon Bann MB.BS, Juan Hernandez MD, Ara Darzi MD, Department Surgical Oncology and Technology, Imperial College, London UK

Objective: Though several reports have subjectively highlighted the benefits of hand assisted versus conventional laparoscopic surgery, there has been no objective comparative analysis between these two techniques.

Methods: 11 trained laparoscopic surgeons completed standardised knot tying and dissection tasks in a laparoscopic trainer, using both hand-assisted (HandPorttm, Smith+Nephew) and traditional laparoscopic (L) techniques. Motion analysis, utilising the Imperial College Surgical Assessment Device, was used to assess performance, measuring the number of movements made, pathlength of hand travel and time taken. Mann-Whitney-U tests were used to compare hand assisted (HA) versus conventional laparoscopic (L) performance. A p value <0.05 was deemed significant. Means and standard deviations are shown in the results.

Results: With respect to knot tying, there was a significant reduction in the number of movements made (dominant HA 114 +/- 50, L 321 +/- 118, p<0.001; non dominant HA 89 +/- 36, L 296 +/- 96, p<0.001), pathlength (HA 1083mm +/- 680, L 3637mm +/- 1852, p<0.001; non dominant HA 549mm +/- 339, L 2556mm +/- 1042, p<0.001), and time taken (HA 162secs +/- 50, L 460secs +/- 179, p<0.001) for both dominant and non dominant hand between hand assisted and conventional laparoscopic techniques. However, there was no statistical difference for any measured variable with respect to the dissection task.

Conclusion: Hand assisted surgery significantly improves knot tying ability in trained laparoscopic surgeons. However, there appears to be no improvement in performance for this specific dissection task.

Ergonomics/Instrumentation-PF126

MUSCLE-STRAIN AND TASK-PERFORMANCE IN RELATION TO MONITOR-POSITION IN LAPAROSCOPIC SURGERY Katharina Kehl, Carsten Giebmeyer Dipl.-Ing., Michael Faist* M.D., Ulrich Matern M.D. Study Group Surgical Technologies, Dept. of general Surgery & *Dept. of Neurology; Univ.-Hospital Freiburg

Background: The ergonomic aspects of computer work places are very well evaluated and their design has been improved. The study of the ergonomics of the operating room is a relatively new field of research. One of the key problems in laparoscopy is the correct positioning of the monitor. In this study we tested task performance and muscle-strain of subjects in relation to monitor-position during laparoscopic surgery.

Material and Method: 18 subjects simulated laparoscopic suturing by continuously threading tiny pearls. This was repeated in three measurements (15 minutes each) without changing their angle of view. The sequences of the three monitor positions were randomized:

- A: Frontal - at eye level
- B: Frontal - in heigt of the operating field
- C: 45° to the right side at eye level

During a fourth measurement the subjects were allowed to move the head and to observe every monitor. Afterwards they were asked for their preferred monitor position. During all tests the EMG activity of six main neck muscles was recorded and the pearls were counted.

Results: The EMG activity of the six neck muscles was significantly (p<0.05) lowest for position A. No significant digfference was found between the positions B and C.

The number of threaded pearls as an indicator for task performance was highest for position B, but not significant higher than for position A. Although there was no significant difference in task performance between positions A and C, no subject preferred the monitor at the side (C).

Conclusion: Regarding EMG data the monitor positioned frontal at eye level is preferable. Reflecting personal preferences of subjects and task performance it should be of advantage to place two monitors for the surgeon: one in position A for lowest neck strain, and the other one in position B for difficult tasks with optimal task performance. The monitor position at the side is not advisable.

Ergonomics/Instrumentation-PF127

LAPAROSCOPIC VIDEO MONITORS: MINIMALLY INVASIVE SURGICAL SUITES OFFER IMPROVED ERGONOMICS., Trudy A.G. Kenyon, RN, David Urbach, MD, Rob Strickland, OTR, Lee L. Swanstrom, MD,Department of Minimally Invasive Surgery, Legacy Health ions System, Portland, Oregon

The Occupational Safety and Health Administration (OSHA) has an ergonomics program standard to minimize the exposure to risk factors in the workplace. Ergonomics, particularly, repetition and awkward posture, are recognized as important considerations in minimally invasive surgery (MIS), and has led to the creation of specialized operating rooms (OR) that permit dynamic height adjustments of the video display terminals (VDT). Improper viewing can lead to hyperextension in the neck, muscle fatigue and contribute to work-related musculosketetal disorders (MSD). We studied the ergonomic disparity between the VDT correlation to eye height in a modern MIS suite and on video carts in the standard OR.

Ergonomic outcomes were analyzed from both OR environments. VDTs were positioned at the lowest and highest range. The VDT height was calculated by direct measurements and compared to industrial standards for viewing distance, angles and heights and related to anthropometric data for height and eye position for adult men and women in the 5 to 95 percentile.

The average adult eye height is 62.0 +- 5.6 inches. Normal sight is 10 degrees below the horizontal line of sight. In the standard OR, the mean VDT height was 72.4 inches and fixed. The mean line of sight's vertical rise was 10.4 inches. At a distance of 48 inches, the viewer must look up 22 degrees, a significant amount. In the MIS suite, the mean VDT height at the lowest position was 55.5 inches. The mean line of sight's vertical rise was 0 inches. At a distance of 48 inches, the viewer must look up 2 degrees. The flexible VDT height from 55.5 to 91.8 in. eliminated improper neck angulation at a distance of 24 to 48 inches for the 5 to 95 percentile adult eye height.

Conclusion: Only 4% of the adult population can attain OSHA's VDT standards using fixed video carts compared with 96% adult population in the MIS suite. The MIS suite achieves the Gold Standard of a neutral balanced head position for the most varied population of users.

Ergonomics/Instrumentation-PF128

FRICTION BETWEEN LAPAROSCOPIC INSTRUMENT'S SHAFT AND TROCAR Ulrich Matern M.D., Mirco Mandel Study Group Surgical Technologies, Dept. of General Surgery, Univ.-Hospital Freiburg

Background: Many laparoscopic surgeons are concerned about friction between trocar and instrument which disturbs the sense of touch, hinders precise dissection and therefore may lead to complications. To minimize this the instrument and/or the sealing of the trocar are often moistened by NaCl or paraffin oil. The aim of the study was to measure which kind of moistening is best suited to minimize friction.

Material and Method: Two disposable trocars (Versaport, AutoSuture and Endopath, Ethicon) and a reusable trocar (30120T, Karl Storz) (5mm in diameter) were tested under dry and moistened (NaCl and paraffin) conditions using an laparoscopic instrument (Karl Storz). The instrument was pushed and pulled 20 times with a speed of 40 mm/s through the trocar using a special machine for material testing (Z005, Zwick). Friction (F) was measured in mN and recorded continuously. Mean friction and standard deviation (s) where calculated.

Results: Large differences of friction were found for the disposable trocars; the values of the reusable trocar were in between. The Ethicon trocar showed the lowest values under dry (4241.84 mN) and NaCl (4285.54 mN) moistened conditions. The values (dry= 9451.16 mN; NaCl=9590.26 mN) of the AutoSuture trocar were much higher. No reduction of friction was found when moistening the different trocars with NaCl. With paraffin oil friction could be reduced about 56-78%.

Conclusions: Regarding these data two points can be stated:

1. The ergonomic quality of trocars differs between reusable and disposable as well as between different disposable products.
2. During surgery disturbing friction between instrument and trocar can be reduced by moistening the shaft with paraffin oil, but not with NaCl.

Ergonomics/Instrumentation-PF129

A COMPARISON OF THE ERGONOMICS OF DIFFERENT HANDLES FOR MINIMALLY INVASIVE SURGERY - AN EMG BASED STUDY Ulrich Matern M.D., Rico Bergmann Dipl.-Ing., Carsten Giebmeyer Dipl.-Ing., Peter Waller Dipl.- Des., Michael Faist* M.D. Study Group Surgical Technologies, Dept. of General Surgery & *Dept. of Neurology, Univ.-Hospital Freiburg

Background: Only few studies have been performed to test different instrument handles in Minimally Invasive Surgery (MIS) and it remains unresolved which handle design is best. The aim of the present study was to evaluate the difference in muscle activity when manipulating various types of MIS instrument's handles.

Methods: Four different handles (Ring 333121, Karl Storz, Shank 25.00, Wilo, Axial PM 953 R, Aesculap, VG-Hirschberg (own build functional model) were tested by 12 volunteers manipulating two micro switch with a standardized pinch point of resistance (0.1N, 2.5N). During the test the electromyogram (EMG) activity of 4 forearm muscles (M. extensor digitorum communis (EDC), M. flexor carpi ulnaris (FCU), M. flexor digitorum superficialis (FCS), Thenar muscle (TH) was recorded and normalized with respect to the maximum voluntary activity of the respective muscle ($p<0.05$).

Results: Generally the axial- handle requires the highest muscle activity followed by the shank handle. The ring- and the vario- handle show lower EMG values, while the ring handle requires more thenar activity, the vario handle more activity in the EDC.

There is no significant difference between the muscle activities using the two different switch forces for any muscle when manipulating with the ring-, shank-, or axial handle. Using the vario-handle there is a difference between the switch forces for the EDC. With this muscle the functional element of the handle is manipulated for closing the instrument.

Conclusion: Less EMG activity and thus muscle strength is needed, when using the vario- or ring- handle compared to shank- or axial- handles. Regarding the literature about pressure areas and neurapraxia when working with ring handles the concept of the vario- handle seems to be preferable for grasping functions. The difference in the EMG activity of EDC using the vario- handle might reflect a better force feedback in this mechanical minimal invasive instrument.

Ergonomics/Instrumentation-PF130

DEVELOPMENT OF A NEW MEMBRANE-TYPE HEATED FUMIDIFIER FOR LAPAROSCOPIC SURGERY. Minoru Matsuda, MD, PhD*., T. Sekikawa*, M. Inoue**, K. Onodera*, T. Asama*, T. Chikama*, S. Kasai* . Second Department of Surgery, Asahikawa Medical College, Asahikawa, Japan*. Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan**.

Introduction: Recently, several animal studies showed that the core body temperature falls during pneumoperitoneum and this hypothermia could be prevented by using heated humidified gas insufflation. However, there are no satisfactory heated humidifier to meet this purpose. Therefore, we developed a new membrane-type heated humidifier. **Material and methods:** Newly developed heated humidifier equips the ion-exchange membrane (Nafion: Du Pont Co. Ltd) tube that passes water selectively and a gas compartment is completely separated from distilled water to prevent the infection. This humidifier consists of Nafion tube assembly and a case that includes the heater. Guide tube is located outside Nafion tube to prevent the direct touch of the Nafion tube. The Nafion tube assembly is inserted to the case and dry gas flows inside of the Nafion tube. The space between casing and the Nafion tube assembly is filled with distilled water. Heater raises the temperature of distilled water and heat and water vapor are transferred to dry gas through Nafion membrane. This device has 5 special features. 1. Nafion tube assembly is able to be sterilized by either autoclaving or gamma radiation. 2. Since bacteria can not be passed through Nafion tube, there are no risks of infection. 3. A flow resistance is very small due to the large inner diameter of the Nafion tube. 4. Any conventional humidifying chamber is not required and compression volume is minimal. 5. A gas compartment is separated from distilled water by membrane and there is no gas leakage when replenish distilled water. The animal study was done using a temperature-humidity probe and was connected to the exsufflated CO_2 gas (20deg., 3.0% relative humidity) line to measure temperature and humidity. The temperature and humidity of exsufflated gases were recorded at 5-min intervals over the 2-h period (n=3). **Results:** The temperature and humidity were stabilized after 15 minutes by continuous flow at 10l//min (35.7deg., 97.7%) and were well maintained even after 2 hours. In maximal heated condition, the temperature and humidity were 40.4deg. and 97.3% by 10l/min, 34.3deg. and 84.9% by 20l/min and 30.7deg. and 74.7% by 30l/min. **Conclusion:** This newly developed heated humidifier could heat and humidify a CO_2 gas to prevent the hypothermia during the laparoscopic surgery.

Ergonomics/Instrumentation-PF131

HAND ASSISTED LAPAROSCOPIC SURGERY: HAS IT ANY ROLE IN COLORECTAL SURGERY? GIANDOMENICO MISCUSI M.D. LUIGI MASONI, M.D., ENRICO RUGGERI, M.D., JESSICA MONTORI, M.D. DEPT. OF 3RD SURGICAL CLINIC - LA SAPIENZA UNIVERSITY OF ROME (HEAD PROF. ALBERTO MONTORI)

INTRODUCTION: Hand assisted (HA) laparoscopic surgery provides the surgeon with tactile feeling and effective visceral retraction without giving up the advantages of minimally invasive surgery.

It may be indicated in all the so-called complex laparoscopic procedures such as colorectal cases, splenectomies, operations on the retroperitoneum, especially when a short (6-8 cm) incision is required for specimen extraction and/or extracorporeal anastomosis.

METHODS AND PROCEDURES: Between May 2000 and June 2001 11 patients underwent HA procedures for colorectal diseases. They were 6 males and 5 female, age ranging between 48 and 74 yrs.

Operation consisted of 4 anterior resections, 4 sigmoid resections and 3 right hemicolectomies. Incisions were placed in the left lower quadrant in all but the three procedures on the right colon (incision in the RLQ).

The HA device was, in our experience, necessary to obtain anatomical exposure on the pelvis in elderly or overweight patients who could not bear exaggerated Trendelemburg; to verify the degree of infiltration of the retroperitoneal structures (sigmoid cancers); to control a severe bleeding from retracted left colic artery (one case).

RESULTS: Mean length of operation on the left and on the right colon was 168 min and 145 min, respectively. These results were comparable with those obtained with laparoscopic procedures only, even in terms of reestablishment of oral feeding and patient discharge.

CONCLUSIONS: In our experience HA tools represent an useful device to improve the safety of colorectal laparoscopic procedures without impairing the expected advantages of minimally invasive surgery. This is particularly true when a short incision is already planned. Therefore we believe that the HA technique teaching should be included in routine laparoscopic training programs.

Ergonomics/Instrumentation-PF132

A NOVEL SUTURE WELDING DEVICE: PRE-CLINICAL RESULTS Steven D. Schwaitzberg M.D, Raymond Connolly Ph.D., Thomas D. Egan, Dept of Surgery, New England Medical Center, Boston, MA, Axya Medical, Inc. Beverly, MA

Laparoscopic knot tying is a task common to advanced laparoscopists yet remains difficult for many surgeons. The objective of this study was to demonstrate the safety and efficacy of a new device that implants welded suture loops (WL), and compare them to interrupted hand-tied suture loops (HL). A midline incision of 10 – 15cm was made in a canine model. Half of the incision was closed first with either all HLs or all WLs, the choice selected at random. The remaining half of the incision was closed with the alternate technique. The suture used for both the HL and the WL was #0 polypropylene. Welded air loops and hand-tied air loops were made at the time of the implants in order to assess comparable loop strengths. The animals were survived for four weeks. At harvest the complete fascial closure was observed for healing, and any differences between the segments were noted. Portions of both WL and HL were sent with surrounding tissue for histology. Remaining suture loops were harvested for loop strength testing.

On average it took 52.4 sec to complete an HL (range 117 to 36 sec). This compared to an average of 22.0 sec per loop for the WL (range 36 to 15 sec). Tissue bite sizes and tissue edge approximations appeared normal. The hand tied air loops and the welded air loops were pulled to failure on a Lloyd Instruments Tensile Test Machine, with a preload of .05 lbf at a rate of 3.0 in/min. The avg. strength of both WL and HL exceeded USP requirements for size #0 polypropylene suture of 9.5 lbf, although there was a 16% degradation of loop strength in the HL group found over four weeks' time. More scar tissue formation was noted around the HL than around the WL. Sections of both welded and hand tied suture lines examined independently were grossly normal, but revealed that the WL were 25% larger in diameter than the HL. This study showed that ultrasonically welded suture loops are clinically comparable to hand tied suture loops.

Ergonomics/Instrumentation-PF133

COMPARISON OF MULTIMODAL INTERFACE FOR LAPAROSCOPE MANIPULATOR. Kazuhiko ShinoharaMD,YukioFujino MD, Kazuyuki Shimomura MD,Takanobu Hoshino MD,Daijyo Hashimoto MD,Etsuko Kobayashi PhD*,Takeyoshi Dohi PhD*,Department of Surgery, Saitama Medical Center, Saitama Medical School, Saitama Graduate school of frontier science ,University of Tokyo*,Tokyo,JAPAN

The user-friendliness of man-machine interface is important factor in the automation for various kinds of human activities. This paper reports the results of comparison test for three kinds of interface for laparoscope manipulator originally developed by authors' team. The command for the laparoscope manipulator was inputted via Voice-recognition system(VR), Head-mouse system that is controlled by the gyro-sensor attached to operator's head(HM) and control module directly attached to main working forceps(CM). Aiming task of the laparoscope to the indicated points in the training box was imposed on 5 students of medical engineering. The average time and numbers of movement required for aiming one point were 15.5 seconds , 2.1times in VR , 9.2 seconds,2 times in HM and 6.6 seconds, 1.8 times in CM. But CM type interface have the disadvantage of complication in exchange and maneuvering the forceps itself. This study revealed the predominance of HM and CM type interface over VR type interface, but further improvement for CM is required for the smooth maneuvering of working forceps itself.

Ergonomics/Instrumentation-PF134

ENDOSCOPIC TASK PERFORMANCE UNDER SPATIAL MISALIGNMENT CONDITIONS Bin Zheng, M.D., Shermeen Chan, Christine L. MacKenzie, Ph.D., Human Motor Systems Laboratory, Simon Fraser University, Burnaby, British Columbia, Canada

A major problem in minimally invasive surgery is that the displayed surgical field is not always aligned with the actual field. This study evaluated task performance in endoscopic surgery under various misaligned conditions. We hypothesized that task performance is degraded when misalignment exists; the performance will improve when the displayed surgical field is superimposed over the work plane.

The experiment was done in a mock endoscopic surgical set-up that including an endoscopic camera and a training box. The image of the work plane inside the training box was projected either on a vertical monitor placed at the eye level of the subject or superimposed over the training box by means of a half silvered mirror. The work plane consisted of a start plate, a screw plate and a target plate. Subjects reached from the start plate, picked up a metal screw at the screw plate and transported it to the target plate using an endoscopic grasper. Rotating the camera along its longitudinal axis misaligned the displayed and the actual work plane.

When misalignment was present, subjects took longer in both the reach and the transport phases. When the image was superimposed over the work plane, the movement time of reach was shorter than that in the vertical display condition. There was an interaction between display arrangement and the work plane alignment. Under misaligned conditions, the transport time was shorter with superimposed display. In contrast, in aligned conditions, vertical display had some benefit, perhaps because this is how surgeons usually work.

Task performance was worse with misalignment. The interaction of display arrangement and the work plane alignment supported the hypothesis that superimposed display facilitates endoscopic performance when misalignment exists.

Esophageal/Gastric Surgery-PF135

ABDOMINAL ESOFAGO-GASTRIC RESECTION BY LAPAROSCOPY CAN BE FACILITATED BY A DOUBLESTAPLED ANASTOMOSIS. Ahlberg G., Nilsson M, Rosseland A, Arvidsson D, Department of Surgery, Karolinska hospital, Stockholm

Introduction: Esofago-gastric resections are performed for malignant disease in the distal esofagus and/or proximal stomach. A traditional approach often includes both laparotomy and thoracotomy. We describe a technique in which thoracotomy can be omitted and laparotomy changed to a hand-assisted laparoscopy.

Methods and procedures: A handassisted laparoscopic gastric resection or gastrectomy in combination with resection of the distal 5-10 cm of the esofagus is performed. The esofagus is divided with a linear cutting stapler. When the specimen has been removed, the part to be anastomosed (Gastric tube or Roux limb of jejunum), together with a circular stapler without the anvil, is brought up to the esofageal end.With a gastroscope, the inside of the stapled esofageal end is viewed and a needle with a guidewire is directed through the staple line. The guide wire is grabbed from below and an introducer with the attached anvil is brought down transorally. The stapler is connected and fired through the previously performed linear staple line of the esofagus, thus creating a double-stapled anastomosis.

Results: In three patients this technique has been tested, one total gastrectomy including distal 5 cm of the esofagus for proximal gastric cancer, and in two for a esofago-gastric resection with a gastric tube brought up through the hiatus (one esofageal cancer, one GIST tumor in the cardia region). No postoperative NG tube was used, and the patients were allowed free fluids on the day after surgery. No complications occured and all three patients had a rapid recovery. After one year follow-up one patient has died 6 months after surgery from his advanced gastric cancer (cancer growing in 21of 24 excised lymph nodes of the specimen), the other patients are doing well. Two patients needed initial balloon dilatation of the anastomosis (25 mm stapler).

Conclusions: In laparoscopic esofago-gastric resections a double-stapled anastomosis could facilitate the procedure.

Esophageal/Gastric Surgery-PF136

LAPAROSCOPIC NISSEN'S FUNDOPLICATION APPLIED TO PARENTERAL NUTRITION Takashi Akaishi, M.D., Osamu Akaishi, M.D., and So Sato, M.D, Department of Surgery, Akaishi Hospital, Shiogama, JAPAN

Gastrostomy is a well-known surgical technique to establish nutritional access for patients in whom oral food intake is not available. However, we experienced difficulties in managing a patient who underwent simple gastrostomy and was suffered from relapsing pneumonia after surgery. Then we started to check gastro-esophageal reflux before gastrostomy.

METHODS AND PROCEDURES: From 1999 to 2001, enteral tube feeding became necessary for seven patients in our hospital. Five of the seven patients had preceding cerebrovascular attacks and the remaining two had swallowing insufficiency without any apparent neurological disorder. Those seven patients were examined by fluoroscopy using a fine tube introduced into the esophagus. Five of 7 had gastroesophageal reflux and all of them were suffered from frequent debilitating pneumonia.

The patients who did not have gastro-esophageal reflux underwent simple percutaneous endoscopic gastrostomy. And the patients having reflux underwent NissenÕs fundoplication, followed by Witzel∞fs gastrostomy, under general anesthesia.

RESULTS: The two patients without gastro-esophageal reflux were doing well with simple percutaneous endoscopic gastrostomy.

The remaining five patients, despite their poor performance status, tolerated laparoscopic Nissen∞fs fundoplication followed by WitzelÕs gastrostomy under general anesthesia. In four out of five, previous relapsing pneumonia was gone and nutrition was improved. Frequent pneumonia occurred in one patient in whom anti-reflux procedure was insufficient.

CONCLUSIONS: Gastro-esophageal reflux seemed to play a definitely offensive role against the patients who need tube enteral feeding. Therefore, esophago-gastric fluoroscopy is recommended to find out gastro-esophageal reflux. And anti-reflux surgical procedure prevented relapsing pneumonia. The laparoscopic procedures may be preferred to the open procedures because those patients are usually at very poor conditions.

Esophageal/Gastric Surgery-PF137

TRANSGASTRIC MUCOMUSCULAR GASTROPLASTY IN DOGS

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Available operations for obesity are invasive or using band technique. The idea is to reduce the stomach and creating a proximal stomach pouch to reduce the power of eating, is standard methods of obesity surgery. Suturing the anterior wall, of the stomach to the posterior wall, escaping only 1cm tunnel for passing oral intake, by involving the mucomuscular layer through anterior gastrotomy of the body of the stomach, creating proximal pouch of 40ml size

The procedure was done for 6 dogs. Over a 12 month's follow-up, the dogs had lost on average, 18% of body weight. These techniques are minimally invasive and long-term follow-up will show the benefit of the surgery.

Esophageal/Gastric Surgery-PF138

EFFECTIVENESS OF LAPAROSCOPIC ANTI-REFLUX SURGERY IN PATIENTS WITH ACID INDUCED CHEST PAIN. M Anvari MB BS PhD, CJ Allen MB Ch, M Lewis BSc, J Safa-Sefat BSc, C Gill Pottruff BSc, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

Non-cardiac chest pain can be a disabling symptom in patients with Gastroesophageal Reflux Disease (GERD).

Aim: to evaluate the effectiveness of laparoscopic fundoplication in control of non-cardiac chest pain in patients with proven GERD.

Method: We prospectively followed 21 patients (mean age: 50 years, range 18-75, 17 F: 4 M) with proven GERD who presented with primary complaint of chest pain and underwent laparoscopic fundoplication. Preoperatively, the chest pain was reproduced during esophageal infusion of acid (Bernstein test: blinded randomized acid and saline infusion). The patients underwent comprehensive re-evaluation at 6 months after surgery.

Results: All patients had a significant improvement in 24 hour esophageal acid exposure and reported a significant improvement in GERD symptom score and symptom of chest pain after surgery. 52% (11/21) reported complete resolution of chest pain after surgery.

	Preop	6 Months Postop
% Acid Reflux in 24 hours	8.89 +- 1.35	1 .69 +- 2.65 *
Chest Pain Score off medication	9.57 +- 0.80	4.10 +- 1.08 *
GERD Symptom Score	45.00 +- 3.31	18.29 +- 3.85 *

Values shown are mean ± se * p < 0.001

Conclusions: Laparoscopic fundoplication is effective in control of acid induced chest pain in patients with proven GERD. A randomized blinded Bernstein test is useful in patient selection for surgery.

Esophageal/Gastric Surgery-PF139

OUTCOME OF LAPAROSCOPIC ANTI-REFLUX SURGERY IN PATIENTS WITH FUNCTIONAL HEARTBURN. M Anvari MB BS PhD, CJ Allen MB Ch, M Lewis BSc, J Safa-Sefat BSc, C Gill Pottruff BSc, Centre for Minimal Access Surgery, McMaster University, Hamilton Ontario, Canada

Patients with acid induced heartburn but normal amount of acid reflux in 24 hours present a challenge in decision making for anti-reflux surgery.

Aim: to evaluate the outcome of laparoscopic fundoplication in patients with functional heartburn.

Methods: We prospectively followed 21 patients (mean age 49.4 +- 2.1 years, range 29-67, 5 M:16 F) with primary symptom of heartburn induced by esophageal acid exposure (Bernstein test: blinded randomized acid and saline infusion), but normal 24 hour pH study (% acid reflux <4), who chose to undergo laparoscopic fundoplication in preference to long-term acid suppression therapy. During the same time 39 patients (mean age 48 +- 2.83 years, range 21-75,14 M:25 F) with primary heartburn induced on acid infusion (+ve Bernstein) and abnormal acid reflux exposure (% acid reflux *4) underwent laparoscopic anti-reflux surgery. Both groups underwent comprehensive evaluations prior to and 6 months after surgery.

Results: Both groups had similar symptom scores for heartburn and other GERD symptoms before surgery and reported a similar and significant improvement in these score after anti-reflux surgery:

	CONTROL +ve pH test, +ve Bernstein n=39		FUNCTIONAL HEARTBURN -ve pH test, +ve Bernstein n = 21	
	Preop	6 Months Postop	Preop	6 Months Postop
% Acid Reflux in 24 hours	11.19+-1.48	0.88+-0.36*	2.12+-0.23	0.63+-0.32*
Heartburn Score off meds	10.29+-0.46	1.82+-0.47*	9.09+-0.76	2.19+-0.74*
GERD Symptom Score off meds	36.97+-2.38	15.82+-2.23*	39.95+-3.64	19.38+-3.78*

Values shown are mean ± se * p < 0.01 cf preoperative values

Conclusions: Laparoscopic fundoplication is effective treatment in patients with acid induced heartburn who may have normal esophageal acid exposure on 24 hour pH testing. A blinded randomized Bernstein test is essential in selection of these patients for surgery.

Esophageal/Gastric Surgery-PF140

INCIDENCE OF SYMPTOMATIC GASTROESOPHAGEAL REFLUX DISEASE AFTER LAPAROSCOPIC HELLER'S MYOTOMY WITHOUT ANTI-REFLUX PROCEDURE F Bahmeriz MD, M Misra MD, M Anvari MB BS PhD, CJ Allen MB Ch, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

Laparoscopic Heller's Myotomy (LHM) has been shown to improve dysphagia in over 90% of patients with primary Achalasia. The need to add an anti-reflux procedure to LHM is debated among surgeons.

The aim of this study was to evaluate the incidence and severity of reflux symptoms in patients following LHM without an anti-reflux procedure.15 patients (5 M: 10 F) with mean age of 49.5 years (range 30-75) who were confirmed with the diagnosis of primary achalasia underwent LHM without an anti-reflux procedure. The patients were followed over a five year period and underwent a comprehensive evaluation including gastroscopy, 24 hour pH study and GERD symptom score evaluation.

Results: The mean follow-up evaluation was 32 months after surgery. LHM produced a significant drop in LES basal and nadir pressures and was associated with significant improvement in dysphagia symptom score (p<0.0001) . The Heartburn score also improved after surgery (p<0.05). Only 8/15 patients had an abnormal (>4%) acid reflux time in 24 hours within 5 years. All 8 patients were well controlled symptomatically on acid suppression on proton pump inhibitors.

	Preoperative	Postoperative	p value
LES Basal Pressure(mm Hg)	26.9 +- 3.7	5.4 +- 1.4	0.002
LES Nadir Pressure(mm Hg)	20.6 +- 3.1	3.8 +- 1.1	0.003
Dysphagia Score	10.5 +- 0.5	0.7 +- 0.5	<0.0001
Heartburn Score	5.7 +- 1.3	2.4 +- 0.9	0.04
% Acid Reflux in 24 hrs	4.0 +- 1.4	3.7 +- 1.	0.97

Conclusions: Addition of an anti-reflux procedure to Laparoscopic Heller's Myotomy is not necessary. Half the patients will experience chronic reflux symptoms which can be easily controlled on acid suppressive therapy. A prospective randomized study is recommended.

Esophageal/Gastric Surgery-PF141

VARIATION BETWEEN ENDOSCOPIC AND EXTERNAL LANDMARKS OF THE GASTROESOPHAGEAL JUNCTION DURING LAPAROSCOPIC NISSEN FUNDOPLICATION Reginald C.W. Bell M.D., Swedish Medical Center, Englewood CO

Introduction: Correct assessment of the esophageal length and placement of the fundoplication depend upon an accurate understanding of the location of the gastroesophageal junction (GEJ). A common external landmark is the angle of His (HisGEJ) The endosopic landmark of the GEJ (eGEJ) is the start of the gastric folds.

Methods: During laparoscopic Nissen fundoplication we placed a full-thickness temporary suture through the esophagus at HisGEJ. Flexible esophagoscopy then noted the location from this suture to the squamo-columnar junction, the eGEj, and the end of the tubular esophagus (eETE). Esophageal length and placement of the fundoplication were then determined by the location of the eGEJ vis a vis the suture.

Results: 18 new and 4 redo Nissen patients were studied. In 7 of these 22 the eGEJ was more than 1 cm away from HisGEJ. In 4 pt the eGEJ was 1.5 or 2 cm above the HisGEJ, and in 2 the eETE was 1 cm or more above the HisGEJ. In 3 more the eGEJ was 1 cm above HisGEJ. These findings specifically led to extensive esophageal mobilization in 5 patients, and to a different (higher) placement of the fundoplication in 7. In 4 patients the postoperative endoscopic appearance would have suggested a 'slipped' Nissen had it not been for intraoperative endoscopy altering placement of the wrap. There was no correlation of the above to preoperative Barrett's, esophagitis, hiatal hernia, or endoscopic valve configuration.

Conclusions: A temporary full-thickness suture placed at an external landmark of the GEJ aids intraoperative endoscopy. Flexible endoscopy altered either esophageal length assessment or placement of the fundoplication in 8 (36%) of 22 cases and should be considered for routine use during laparoscopic fundoplication.

Esophageal/Gastric Surgery-PF142

How effective are present staging modalities for oesophageal cancer?

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Abstract

Background. Accurate staging of oesophageal cancer is important for the selection of appropriate mode of treatment. Use of laproscopy allows clear visualization of the peritoneum and serosal surfaces. EUS is described as being the best loco-regional staging tool. This retrospective study aims to evaluate the two staging modalities for their effectiveness.

Patients and methods. We highlighted 104 patients who had EUS, however; only 42 patients had all three (CT scan, staging laproscopy and EUS) investigations as preoperative workup and were considered to have operable disease.

Results. 4 (9.5%) patients were under staged by laproscopy, EUS and CT. Two (4.8%) patients were pre-operatively over-staged by EUS. Overall staging accuracy by EUS was 74% for correct T stage identification and 48% for N stage. 1 patient on CT was shown to have extensive loco-regional spread, although laproscopy, EUS and final histology did not show this.

Conclusion. EUS as a staging modality is satisfactory at correctly identifying the T stage, however, for loco-regional spread, accuracy is low. Laproscopy has its limitations too. Correct patient management requires the use of more than one staging modality.

Esophageal/Gastric Surgery-PF143

MICROLAPAROSCOPIC FUNDOPLICATION USING THE LEFT SIDED FIRST APPROACH Helmuth T. Billy M.D., Donald J. Waldrep, M.D., Steven C. Patching M.D, Sacramento/Sierra Advanced Laparoscopic Surgery Associates, Sacramento, California

Dissection of the crus and developing the retroesophageal window during fundoplication is associated with esophageal injuries. Microlaparoscopy may increase the potential of esophageal injury during this dissection. We present 60 consecutive laparoscopic fundoplications performed with 3 mm endosurgical instrumentation using a left sided first approach.

Between February 1999 and July 2001, 60 patients underwent laparoscopic fundoplication using a five-trocar approach. 3mm instrumentation was employed except when limited by available technology. In 60 patients, 36 had a history of previous abdominal surgery. Nissen fundoplication was done in 57 patients, Toupet fundoplication in 3. In all cases the crural dissection was started from the left side first. The short gastric vessels were divided harmonically. The dissection continued cephalad, the left crus and the fibers of the right crus were completely exposed. The gastrohepatic ligament was then opened and dissection of the right crus completed. In all cases the retroesophageal window exposed itself easily. Closure of the crural defect and completion of the fundoplication was performed in the standard fashion. Operative time averaged 112 minutes (55-160). No patient required conversion to laparotomy. No esophageal injuries or perforations occurred. Eight patients were discharged home from the recovery room, 49 were discharged the following morning. 3 had hospitalizations of 2, 2, and 4 days. Perioperative complication included reintubation in a patient with known pulmonary disease. Preoperative symptoms resolved in all patients. Functional complications of longer than 8 weeks included gas bloat in 2 patients and mild dysphagia in 1.

Left sided first mobilization of the fundus allows for direct visualization of the left and right crus and safe creation of the retroesophageal space. Risks associated with dissection through the retroesophageal space while looking for the left crus are avoided.

Esophageal/Gastric Surgery-PF144

LAPAROSCOPIC NISSEN FUNDOPLICATION IN PATIENTS WITH A REPLACED LEFT HEPATIC ARTERY. USING THE LEFT SIDED APPROACH TO PRESERVE THE REPLACED LEFT HEPATIC ARTERY. Helmuth T. Billy M.D., Donald J. Waldrep, M.D., Steven C. Patching M.D. Sacramento/Sierra Advanced Laparoscopic Surgery Associates Sacramento, California

Replaced left hepatic arteries can pose an anatomic difficulty when performing laparoscopic Nissen fundoplication. The replaced artery arises from the left gastric artery and can significantly obstruct visualization of the right crus making anatomic dissection difficult and tedious. Ligation and transection of the vessel has been done in order to improve exposure but can lead to hepatic necrosis. We report four cases in which the replaced left hepatic artery was easily preserved by using a left sided first approach in patients undergoing Nissen fundoplication.

In all patients a large replaced left hepatic artery was identified which prevented adequate visualization of the right crus through the gastro-hepatic ligament. In order to avoid transecting the artery the crural dissection was started from the left side beginning with the short gastric vessels. These were divided using the harmonic scalpel. The dissection continued cephalad. The left crus and the fibers of the right crus were completely exposed. The retroesophageal window was completed through the left side approach. A penrose drain was used to retract the esophagus atraumatically. Placement of an esophageal bougie and closure of the crural fibers also occurred completely from the left side. A modest opening in the gastro-hepatic ligament was still necessary in order to complete the Nissen wrap however the replaced left hepatic artery did not interfere with visualization. Average operating time was 88 minutes. No patient required conversion to laparotomy. All patients had resolution of their preoperative symptoms and were discharged home the next day.

Left sided first mobilization of the fundus allows for direct visualization of the left and right crus and safe creation of the retroesophageal space and preservation of the replaced left hepatic arteries.

Esophageal/Gastric Surgery-PF145

RESULTS OF TRANSORAL MINIMALLY INVASIVE SURGERY FOR ZENKER DIVERTICULUM Georg Bischof M.D., Catharina Chiari M.D., Maria Scharitzer M.D., Peter Pokieser M.D., Reinhold Fuegger M.D., Etienne Wenzl M.D., Departments of General Surgery and Radiology, University of Vienna, Austria

Recently transoral stapler-diverticulostomy has been used to treat patients with Zenker diverticulum. This method differs from traditional open surgery in that the diverticulum is not resected, but opened up by cutting the rim between esophagus and diverticulum. This study presents our experience with this method including late functional results.

Between 1997 and 2001 22 patients were operated with a mean age of 75 years (14 men, 8 women). 20 cases were primary operations, 2 cases reoperations after open surgery. 2 patients previously had other cervical operations. Preoperative work-up included barium-esophagogram (n=18), videocinematography (n=14), upper GI-endoscopy (n=13), esophageal manometry (n=7). The average size of the diverticula was 4cm (range 2-10cm). Dysphagia for liquids was present in 68.4%, for solids in 94.7%, and regurgitation in 100%. Chronic aspiration and coughing was also common.

Intraoperatively, stapler-diverticulostomy could be effectively performed in 19/22 cases (86.4%). In 2 cases exposure of the diverticulum was insufficient, in one patient with the largest diverticulum (10cm) stapling was incomplete. All 3 patients received open surgery. Mean operative time (including esophagogastroscopy) was 49min (15-150min). A liquid diet was started on day 1 after radiologic control. One patient showed a major leak and was temporarily disconnected for 6 weeks. 2 cases of aspiration pneumonia were observed. No deaths occured.

After a mean follow-up of 18 months (0.2-40) 3 recurrences occured. All 3 patients could be successfully reoperated by the same approach. Postoperatively, dysphagia for liquids was present in 7.7%, for solids in 7.7% and minor regurgitation in 23%.

The minimally invasive, transoral operative approach offers acceptable complication and recurrence rates. It seems especially suited for elderly, fragile patients and patients with previous neck surgery.

Esophageal/Gastric Surgery-PF146

LAPAROSCOPIC ESOPHAGEAL MUCOSAL STRIPPING: EVALUATION OF A MINIMALLY INVASIVE METHOD OF RESECTION OF DYSPLASTIC BARRETT'S ESOPHAGUS IN A PORCINE MODEL Steven P. Bowers MD, Samer G. Mattar MD, John G. Hunter MD, Dirck Dillehay DVM, C. Daniel Smith MD, Emory Endosurgery Unit, Emory University Hospital, Atlanta, GA; Department of Surgery, Oregon Health Science University, Portland, OR

Objective: The standard treatment of Barrett's esophagus with high-grade dysplasia (HGD) is esophagectomy; however, minimally invasive techniques of resection and endoscopic mucosal ablation have been developed in response to the high morbidity of esophagectomy. The authors developed a novel technique of esophageal mucosal resection with mucosal continuity reestablished by esophageal mucosal-submucosal advancement.

Methods: In 12 male swine, intragastric laparoscopy was established using balloon-tipped ports. After a submucosal injection of saline at the squamo-columnar junction, the distal esophageal mucosa was dissected off of the underlying muscularis propria and fixed to an oro-gastric tube. The mucosa was stripped to the level of the cricopharyngeus muscle and readvanced with establishment of mucosal continuity by anastamosis with the gastric cardia. A two to five cm segment of distal esophageal mucosa was resected after readvancement in 6 animals. Animals recovered, were returned to a normal diet and underwent contrast esophagram at a mean time of 30 days (range 7-60) before euthanasia and autopsy. Graft take was defined as the percentage length of esophagus lined by normal squamous epithelium at autopsy.

Results: All animals survived the procedure. Histological analysis of the resected specimens confirmed esophageal mucosal and submucosal resection. Five animals developed postoperative infectious complications, and had a 40% graft take. The remaining animals had a 71% graft take. There was a trend towards greater graft take in animals that did not have a segment of distal esophagus resected (72% vs 46%, p=0.1)

Conclusion: Laparoscopic esophageal mucosal stripping enables an esophageal mucosal resection at a depth that is appropriate for the treatment of HGD in Barrett's esophagus. An esophageal mucosal-submucosal advancement has a high rate of graft non-take, and the investigation of mucosal substitutes is warranted.

Esophageal/Gastric Surgery-PF147

PROGRESS TOWARD LAPAROSCOPIC TOTAL GASTRECTOMY FOR MALIGNANT DISEASE. Brian Cantor, M.D., Andrew Camerota, M.D., W. Peter Geis, M.D Department of Surgery and Minimally Invasive Learning Center, St. Peter's University Hospital, New Brunswick, New Jersey.

In the past ten years, advances in technology and laparoscopic surgical skills have allowed various gastric resections and wedge resections for benign disease and later regional gastrectomies for malignant disease. Sequential development of these skills along with operating room team development has allowed this process to proceed to total gastrectomy for malignant disease. Herein we report our progressive experience with subtotal and total regional gastrectomy for malignant disease using minimally invasive approaches.

Following nineteen (19) laparoscopic gastric resections for benign disease, we undertook four (4) distal gastrectomies and three (3) proximal gastrectomies for malignant disease. An additional patient underwent a total regional gastrectomy with Roux-en-Y reconstruction. Patients were in the fifth, six, or seven decade of life. Laparoscopic approach was used in all patients. There were no conversions to open surgery and no blood transfusions.

In these eight (8) patients, there were no technical complications, no anastamotic leaks, and no conversions to open procedures. One patient with distal gastric resection and Roux-en-Y gastro-jejunostomy exhibited an 8 day delay in functionality of the anastomosis. The patient with total gastrectomy has exhibited a persistent early satiety syndrome and required a feeding jejunostomy during the chemotherapy regiment.

These experiences have delineated that cautious progress toward subtotal and total regional gastrectomy for malignant disease is possible without unduly long operating times or serious technical complications. The improved nutritional and immune status of the patient post-operatively may, in part, prevent the early recurrence of metastatic disease. Cautious progress toward subtotal and total gastrectomy, focusing on the progressive experience of the surgeon and a highly qualified operating room team, seems to provide the best technical and clinical outcomes using the laparoscopic approach.

Esophageal/Gastric Surgery-PF148

HAND-PORT ASSISTED GASTRIC MOBILIZATION AND TRANSHIATAL DISSECTION UNDER DIRECT VISION IN PHARYNGO-LARYNGO-ESOPHAGECTOMY Angus CW Chan MD, Danny WH Lee MD, Simon KH Wong MD, YH Lam MD, Enders KW Ng MD, SC Sydney Chung MD.

Department of Surgery, Prince of Wales Hospital, The Chinese University of Hong Kong, Hong Kong, China.

Aim: We reported the hand-port assisted technique of laparoscopic gastric mobilization and transhiatal dissection in 4 patients who underwent pharyngo-laryngo-esophagectomy for cervical esophageal and hypopharyngeal cancers.

Technique: Patient was in a supine position with legs abducted and abdominal surgeon stood between the legs. Cervical incision was made for tumor resection and proximal esophageal mobilization by the head team surgeons. Simultaneously, gastric mobilization was started with a 30 degree laparoscope inserted through the supraumbilical port. A 10 mm port was inserted at the epigastrium for liver retraction. A 7 cm transverse incision was made at the right lower quadrant below the umbilicus for the hand-port insertion. Another 12mm port was inserted at the left upper abdomen for dissection. Gastric mobilization was facilitated by the usage of ultrasonic scalpel and left gastric pedicle was divided with mechanical stapler. The gastric dissection was continued to the hiatus. A surgical gauze was then slinged around the esophago-gastric junction for hand retraction. Laparoscopic mediastinal dissection and oesophageal mobilization were performed under direct vision until both ends met. The pharyngo-gastric anastomosis was then completed by hand suture in the neck.

Results: The laparoscopic mobilization and mediastinal dissection were successfully completed in less than 4 hours in all cases. Handling of the stomach and esophageal retraction were much facilitated with the hand control compared to totally laparoscopic technique as reported by us previously.

Conclusion: We demonstrated the procedure was safe and better handling was achieved with the use of hand port.

Esophageal/Gastric Surgery-PF149

DEFINING THE NORMAL LARYNGO-PHARYNGEAL ENVIRONMENT: ITS RELATION TO THE DIAGNOSIS OF GASTROESOPHAGEAL-LARYNGEAL ACID REFLUX L Chang, MD, B Oelschlager, MD, M Barreca, MD, N Maronian, MD, A Hillel, MD, M Bronner, MD, V Reyes, MD, J Yang, MD, C Pellegrini, MD, Departments of Surgery, Otolaryngology, and Pathology, University of Washington, Seattle, Washington

Objective: Accurate diagnosis of gastroesophageal-laryngeal reflux remains elusive. This study was designed to define the normal laryngeal and pharyngeal environment in order to better assess their pathologic state.

Methods: We studied 11 subjects who had no gastroesophageal reflux, voice, or respiratory symptoms. They each underwent 24-hr quadruple probe pharyngeal-esophageal pH monitoring, esophageal manometry, direct flexible laryngoscopy with the findings quantified by the reflux finding score (RFS), and laryngeal biopsy.

Results: 24-hr pharyngeal-esophageal pH monitoring revealed a mean total percent time pH <4 in the proximal esophagus (3 cm below the UES) of 0.3% and in the distal esophagus (13cm below the UES) of 1.33%. Only 2 of the eleven patients had a single episode of true pharyngeal reflux while the remaining 9 patients had none. Esophageal manometry revealed a mean LES pressure of 18.6 mmHg with complete relaxation in all patients. Wet swallows elicited peristaltic waves in all patients. Mean amplitude was 58.1 mmHg proximally and 83.9 mmHg distally. A reflux finding score (RFS) was determined by characteristics seen on laryngoscopy. The mean RFS score was 2.1 (SD+/-1.4) out of a possible maximum 26 points. Laryngeal biopsies performed during flexible laryngoscopy showed no PMN's or eosinophils.

Conclusion: Our study shows that normal subjects do not reflux into the pharynx more than once. If two or more episodes of pharyngeal reflux are detected, this should be considered evidence of pathologic reflux. Patients who undergo laryngoscopy may exhibit changes which should be considered normal up to an RFS of 7. PMN's and eosinophils are uniformly absent in laryngeal biopsies of normal subjects.

Esophageal/Gastric Surgery-PF150

ROLE OF LAPAROSCOPIC TENSION FREE CRUROPLASTY IN THE MANAGEMENT OF LARGE HIATUS C.PALANIVELU,M.Ch, K.Sendhil Kumar,P.S.Rajan,R.Parthasarathi,A.Roshan Shetty,R.Ravichandran

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Background : In cases with wide hiatal defect with weakened crura, primary closure with non absorbable stitches do not provide adequate stability to prevent the development of paraoesophageal hernia or transthoracic migration of the wrap. These cases can be effectively managed by synthetic mesh reinforcement of the hiatus.

Method : Between June 1995 to June 2001, 220 patients had undergone fundoplication. Out of these 14 patients presented with large hiatus with type II hiatus hernia.The apparent shortening of the oesophagus was corrected by adequate trans hiatal oesophageal mobilisation. The crural closure was done using prolene sutures in all cases and reinforced with Polypropylene mesh of adequate size with 'C' cut to accommodate oesophagus anteriorly. The mesh was fixed to the crurae and the undersurface of the diaphragm with prolene stitches.

Results: This method was uniformly successful in relieving the symptoms. The mean operative time was 90 minutes. No postoperative dysphagia. Hospital stay was comparable with the non-mesh group. With the mean follow-up of 42 months, there was no complication or recurrence.

Conclusion: The tension-free mesh hiatoplasty in addition to fundoplication is an effective treatment in large hiatus hernias to prevent the development of paraoesophageal hernia or migration of the wrap.

Esophageal/Gastric Surgery-PF151

LAPAROSCOPIC APPROACH TO SUPRA-DIAPHRAGMATIC ESOPHAGEAL BENIGN TUMOR C.PALANIVELU, M.Ch, P.S.Rajan,K.Sendhil Kumar,R.Parthasarathi,T.Laxmikanth

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Surgical excision of supra-diaphragmatic benign tumor is considered difficult to approach. Laparoscopic approach to supradiaphragmatic region by dividing the crura anteriorly provides better exposure.

In June 2000, 43 years aged lady presented with progressive dysphagia of 2 years and pain of one month. Imaging evaluation revealed a benign circumscribed tumor arising from the anterior wall of the esophagus.

Procedure : With five parts, esophago-gastric junction was mobilised, dissected from the crura. By dividing the crura anteriorly, the whole tumor could be mobilised all round and excised. The tumor was arising from esophageal musculature. After excising, exposed mucosa was covered by Dor's anterior plication. Post operative period uneventful.

Laparoscopic approach to supradiaphragmatic benign tumour by dividing the crura enables adequate and safe excision.

Esophageal/Gastric Surgery-PF152

Laparoscopic hand assisted transhiatal esophagus resection with cervical esophagogastrostomy for esophageal cancer. Miguel A. Cuesta, M.D., PhD., Frits J. Berends, M.D., Francis P.K. Wu, M.D., Sybren Meijer, M.D., PhD., Alexander P. Houdijk, M.D., PhD Department of Surgery. 'Vrije Universiteit', Medical Center Amsterdam, The Netherlands

Laparoscopic or thoracoscopic esophageal resection for malignancy is associated with problems encountered during mediastinal dissection, gastric tube formation and retrieval of the specimen, lengthening operative time. These problems may be overcome with a hand assisted procedure.

Fifteen patients with tumors of any resectable stage localized in the infracarinal segment of the esophagus were included in the prospective laparoscopic esophageal resection program. Using a five trocars approach the surgical procedure starts completely laparoscopically. The moment for introducing the hand assisted device was determined by surgical difficulty. The distal esophagus with the tumor is dissected following the margins of aorta, pericardial sac and both pleurae up to the superior limit of the pulmonary veins. Thereafter, the stomach is dissected preserving the gastroepiploic vessels. The left gastric vessels are clipped using endostaplers. Meanwhile, another team has dissected the cervical esophagus and the entire esophagus is stripped towards the abdomen. The specimen is exteriorized through the small incision of 7 cm used for the hand assisted device. The gastric tube is formed passed through the mediastinum and anastomosed to the cervical esophagus. Hand assistance was necessary for mediastinal dissection (n=3), dissection of the stomach (n=5) and for specimen stripping or retrieval (n=7). Three patients were converted. Mean operative time was 260 min (230-300min). Postoperative complications included recurrens nerve palsy (n=4) and one evisceration demanding reintervention. There was no mortality. Hospital stay was 10 days (7 to 14 days). One patient has had abdominal tumor recurrence and one developed brain metastases.

Conclusion: From this preliminary prospective study the laparoscopic hand assisted esophageal transhiatal resection for cancer is not only feasible but is also associated with low morbidity.

Esophageal/Gastric Surgery-PF153

EFFICACY OF SURGISIS ES (NOVEL SOFT-TISSUE GRAFT) FOR CLOSURE OF FULL-THICKNESS GASTRIC PERFORATION IN RATS. Sebastian G. de la Fuente MD; Mary B. Harris RVT; D. Curtis Lawson MS; Chris R. Mantyh MD and Theodore N. Pappas MD. Department of Surgery, Duke University Medical Center and Durham VAMC, Durham, North Carolina.

Objective: Anastomosis failure in the gastrointestinal tract is a common cause of morbidity. Previous attempts using non-absorbable materials to help seal anastomosis have failed, probable due to an intense immunological reaction stimulated by these materials. Surgisis tm ES, an inert soft-tissue graft obtained from porcine intestinal submucosa serves as biological scaffolding allowing regrowth and deposition of collagen necessary for bridging tissue defects. In the present study we tested the efficacy of Surgisis tm ES to seal a full-thickness defect in the stomach of rats.

Methods: Six rats (320g) were instrumented with an iatrogenic gastric perforation. Animals were weighed and withheld from food 24 hours prior to surgery. On the day of the surgery, anesthesia was induced with isoflurane and a 5 cm midline laparotomy was made. A 1 cm defect was then created in the stomach by removing the full thickness of the anterior gastric wall. The defect was then sealed with two layers of Surgisis tm ES (previously soaked in saline for 10 min) and sutured to the stomach in a continuous fashion using 5-0 prolene. Sutures were taken from the seromuscular layer and placed within 1 mm of the edge of the graft. Entry points were then closed and animals recovered from anesthesia.

Results: All animals tolerated the procedures and resumed regular feeding the same day of the surgery. None of the animals showed any evidence of leaks or peritonitis three weeks after surgery. Comparison between pre and postoperative (three weeks) weights showed that all animals gained weight after surgery (320.6 +- 5.5 g vs. 371.5 +- 5.9 g). Necropsy evaluation showed neither perforation of the patch nor signs of chronic inflammation.

Conclusion: The present short-term study shows that Surgisis tm ES is reliable to use for grafting of stomach perforations in rats. It remains to be determined if this novel material can be safely used to prevent anastomosis failure in the gut.

Esophageal/Gastric Surgery-PF154

LAPAROSCOPIC MEDIASTINAL ESOPHAGEAL MOBILIZATION: DO YOU GAIN ANY LENGTH? Steven R. DeMeester, MD*, Lelan F. Sillin III, MD**, Harrison W. Lin, BA**, Jeffrey A. Hagen, MD**, Jeffrey H. Peters, MD**, Tom R. DeMeester, MD** Departments of Cardiothoracic Surgery* and Surgery**, The University of Southern California, Los Angeles, California

Introduction: Esophageal shortening can accompany gastroesophageal reflux disease and lead to tension and fundoplication failure after antireflux surgery. Laparoscopic mediastinal esophageal mobilization is possible, but it is unknown whether this significantly increases esophageal length. We hypothesized that laparoscopic mediastinal mobilization would increase esophageal length, but less than that associated with trans-thoracic esophageal mobilization.

Methods: Farm pigs (n=8) weighing 70-75 pounds underwent laparotomy with baseline measurement of the distance between a stitch placed immediately above the gastroesophageal junction and a K-wire placed into the animal's spine. This and all subsequent measurements were obtained with the esophagus under 1 kg of constant tension. Subsequently the incision was closed and the esophagus was laparoscopically dissected as high in the mediastinum as possible without injuring the vagus nerves or vascular structures. After relaparotomy a second measurement was obtained using the existing stitch and K-wire. The esophagus was then mobilized above the pulmonary hilum transthoracically, and again esophageal length was measured. Lastly, the vagus nerves were divided and esophageal length remeasured.

Results: Laparoscopic mobilization increased esophageal length a mean of 5.8 mm. However, mean length increase after trans-thoracic mobilization was significantly greater at 13.5 mm ($p < 0.004$). Bilateral vagal nerve division increased esophageal length a mean of 5 mm beyond that gained with trans-thoracic mobilization.

Conclusions: Laparoscopic mediastinal mobilization resulted in approximately 0.5 cm length gain, and may help reduce tension in patients with marginal esophageal length. However, significantly more length is gained with trans-thoracic mobilization, and may be enough to avoid the need for a Collis gastroplasty in patients with esophageal shortening secondary to reflux disease.

Esophageal/Gastric Surgery-PF155

POTENTIAL ROLE FOR EXCESSIVELY TIGHT CRURAL CLOSURE IN POST LAPAROSCOPIC FUNDOPLICATION DYSPHAGIA Steven R. DeMeester, MD*, Peter F. Crookes, MD**, Departments of Cardiothoracic Surgery* and Surgery**, The University of Southern California, Los Angeles, California

Introduction: Persistent dysphagia after laparoscopic fundoplication is often attributed to an excessively tight fundoplication. However, crural closure accompanies fundoplication, and with the laparoscopic technique it is difficult to gauge the tightness of the crural closure. We hypothesized that excessively tight crural closure could also be a source of post laparoscopic fundoplication dysphagia.

Methods: Farm pigs (n=4) weighing 70-75 pounds underwent baseline video esophogram and esophageal motility. Subsequently each animal underwent laparoscopic crural dissection and excessively tight closure (n=2), appropriate closure (n=1), or lax closure (n=1). No fundoplication was performed. Post-operatively the motility was repeated on day 0 and day 10-14 along with a video esophogram.

Results: Baseline video esophogram and motility studies in all animals demonstrated normal esophageal barium transport and motility. Immediately after excessive crural closure there was 100% simultaneous waves noted on motility, and these findings persisted on the late study. Video esophogram demonstrated stasis and abnormal barium transport. In addition, both animals lost weight. Immediate post-operative motility was normal in the appropriate and loose crural closure animals; however, the loose crural closure animal died post-operatively from a strangulated intrathoracic stomach. The appropriate crural closure animal ate normally, gained weight, and had a normal late motility study.

Discussion: Excessively tight crural closure can induce severe motility and video esophogram abnormalities, difficulty eating, and weight loss in pigs. Likely some of the post-fundoplication dysphagia in humans is related to the crural closure, but on the other hand too lax a closure probably contributes to an increased incidence of recurrent hernia after laparoscopic fundoplication. A mechanism to gauge the degree of crural closure with laparoscopic fundoplication would be beneficial.

Esophageal/Gastric Surgery-PF156

SIX YEARS OF EXPERIENCE IN LAPAROSCOPIC SURGERY OF THE ESOPHAGEAL ACHALASIA. M.D. Arnulfo F.Fernández;M.D. Miguel A. Martinez; M.D. Rafael Torres;M.D. Julian Ruiz;M.D. Bárbara Faife;M.D.; Julio R. Torres;Ph.D. Sandra Garcet;M.D. Carlos M Escoto, Centro de Cirugía Endoscópica Hospital Universitario Gral. Calixto García, Habana, Cuba.

Background: We show the experience of six years in laparoscopic surgical therapeutic of the esophageal achalasia, making use of the Heller-Dor and Heller -Toupet operation with transoperative control endoscopy.

Methods: One hundred interventions were done between November 1995 and May 2001

We studied operative time separating in esophagocardiomyotomy time, transoperative control endoscopy time and antireflux procedure time. We analyzed the relation between postoperative clinical evolution and clinical stage of the disease. We have done clinic, radiological and manometric follow-up.

Result: The mean surgical time of the intervention is 138 minutes , include tran operative control endoscopy of 15,4 minutes, however we consider it is of great utility. The clinical stage of the disease influenced in the results of postoperative clinical evolution. It was not necessary conversion to open surgery. Clinical results are classify like excellent in 94 patients and good in 5 patients in accordance to Vantrappen classification. Morbimortality ratio is about 0,3%.

Conclusions: We indicate that surgical procedure like an alternative of first line in the treatment of esophageal achalasia. It is necessary to have special care in early diagnostic of later evidences of injury by electrosurgery.

Esophageal/Gastric Surgery-PF157

EFFECT OF LAPAROSCOPIC FUNDOPLICATION ON ESOPHAGEAL MOTOR FUNCTION. Piero M. Fisichella, Marco G. Patti, Silvana Perretta, Alessandra D'Avanzo, Lawrence W. Way. Department of Surgery, University of California San Francisco.

Background: It is unclear whether correction of reflux by laparoscopic fundoplication is associated with improvement of esophageal dysmotility.

Objectives: To determine the effect of laparoscopic fundoplication on esophageal motor function (lower esophageal sphincter, LES, and esophageal peristalsis).

Setting: University-based tertiary care center.

Patients and Methods: Fifty-five pts (30 men and 25 women, mean age 49 years), who underwent laparoscopic fundoplication for treatment of GERD and had reflux corrected as confirmed by pH monitoring. Patients with normal or minimally abnormal esophageal peristalsis underwent a 360° fundoplication (Group A, 34 pts, 62%), and patients with abnormal peristalsis (DEA < 40 mmHg) underwent a 240° fundoplication (Group B, 21 pts, 38%). Esophageal manometry and pH monitoring were performed before and 8 weeks or more after the operation. Follow up was an average of 27±27 months.

Results:	Group A (360°)		Group B (240°)	
	Pre-op	Post-op	Pre-op	Post-op
Pre-op LES pressure (mmHg)	11±5	16±6	8.5±5	13±5
Pre-op LES length (cm)	2.3±0.8	2.9±0.8	2.3±0.7	2.8±0.6
Pre-op DEA (mmHg)	93±43	84±41	35±16	53±24

LES pressure and length increased after 360° and 240° fundoplications. Peristalsis improved only after 240° fundoplication, although it was still abnormal, and the changes were unpredictable and clinically unimportant. Improvement occurred in 67% of pts, remained the same in 14% of pts, and worsened in 19% of pts.

Conclusions: These data show that laparoscopic fundoplication: (a) controls GER by increasing the length and pressure of the LES; (b) slightly improves esophageal dysmotility in most patients.

Esophageal/Gastric Surgery-PF158

LAPAROSCOPIC DIATAL GASTRECTOMY FOR SEVERE CORROSIVE GASTRITIS: A CASE REPORT Fujiwara M., Kanyama Y.,Kawai J.,Mochizuki M.,Kasai Y.,Akiyama S.,Ito K,Nakao A. Department of Surgery II, Nagoya University, Nagoya, Japan

A case of effective laparoscopic gastrectomy for severe corrosive gastritis due to alkali ingestion is reported.

A 38-year-old Japanese female who attempted suicide by ingesting Drano registered (50%NaOH) was admitted Nagoya University Hospital after initial management. 1 month after the ingesting attempt she cannot take food without Ensure liquid registered. Upper gastrointestinal (UGI) series showed the stricture of the antrum and poor passage of barium. Upper gastrointestinal scopy showed mild esophagitis and erosive gastritis without ulcer in the proximal stomach, though the antrum was so distorted that the scope could not pass to the distal antrum.

She was treated conservatively with total parenteral nutrition but anteral stricture was unchanged after 2 months hospital stay. It was thought surgical treatment was indicated for this case. She underwent laparoscopic 1/2 distal gastrectomy with Billroth I gastroduodenostomy, and was discharged after 13 days uneventful post operation course.

Endoscopy 2 months after operation showed gastritis had been healed and no residual food residue in the remnant stomach which suggested gatroduodenal stoma works well. Pt. had no complaints about food intake and no body weight loss after operation. Also, she had satisfaction of minimal wound scar.

Gastrectomy is indicated for the patients of corrosive gastritis with severe stricture after a few months conservative management. Less invasive operation is better for such benign diseases. Although surgical management is useful, anastomotic leakage was reported in literature. Sufficient observation period until inflammation subsided may be necessary.

Esophageal/Gastric Surgery-PF159

A NEW TECHNIQUE FOR LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH LYMPHADENECTOMY Tetsu Fukunaga M.D., Akio Kidokoro M.D., Masaki Fukunaga M.D., Kunihiko Nagakari M.D., Seiichiro Yoshikawa M.D., Kazumitsu Hamasuna M.D. Juntendo University School of Medicine, Juntendo Urayasu Hospital, Department of Surgery CHIBA,JAPAN

Laparoscopically assisted distal gastrectomy with lymphadenectomy (LADG) for gastric cancers has not yet become prevalent compared to laparoscopic colectomy with lymphadenectomy for colorectal cancers. One reasons for that is the technical problems including the treatment of many blood vessels. To solve this problem, we developed a technique in which all of the blood vessels can be cut off without clips using an Ultrasonically activated device (USAD) and Bipolar vessel sealing system (LigaSureTM).

Patients and Methods: The subjects were 8 patients who suffered from early gastric cancer with submucosal invasion in the middle and lower stomach. All of them went through LADG, during which right gastroepiploic vessels, right gastric vessels, left gastroepiploic vessels, and left gastric vessels were cut off at their bases. Veins were coagulated and cut off with USAD, while arteries were cut off after being sealed with LigaSureTM.

Results: The operation lasted 201 minutes on average and the amount of blood lost during the operation was 147 ml on average. The number of lymph nodes dissected was 37 on average. Hemostasis and detachment were successful without any clips in all cases and no postoperative complication was experienced.

Conclusion: Blood vessels were securely yet simply treated in LADG with the aid of USAD and LigaSureTM. These devices helped solve the problems of the treatment procedure, and eventually reduced the number of clips erroneously left inside a patient's body as foreign bodies. The use of those devices is considered to be a useful method for generalizing LADG.

Esophageal/Gastric Surgery-PF160

HELLER MYOTOMY WITH ANGLE OF HIS REPAIR - A FOUR-YEAR COMPARATIVE FOLLOW-UP STUDY Gary Gecelter MD, Lawrence Gellman MD, Alan Geiss MD, Kelly Alexander MD, Keith Meslin MD & H. Hank Simms MD, Department of Surgery, Section of Advanced Laparoscopy, North Shore Long Island Jewish Health System. New Hyde Park, NY

No convincing evidence exists to assist the surgeon in determining the necessity of combining a Heller myotomy with an antireflux procedure in the laparoscopic treatment of achalasia. Protagonists of combined antireflux surgery document a 20-50% incidence of clinically significant reflux symptoms following myotomy. Antagonists feel that avoidance of extension of the myotomy to the stomach is sufficient to reduce the risk of reflux symptoms.

We describe a technique that employs reconstruction of the angle of His as an antireflux mechanism.

Between October 1996 and July 2000, 46 patients underwent one of 3 procedures based on surgeons' preference. A total of 26 angle of His (AoH) repairs were performed following laparoscopic myotomy. These were performed by placing 4 sutures between the medial wall of the gastric fundus and the left muscle bundle created by the myotomy. The exposed myotomy was left uncovered by stomach as in a conventional Dor fundoplication (DF). Of the remaining 20 patients, 10 underwent a myotomy with DF and 10 without any antireflux (HM) procedure. Follow-up was for a mean of 31 months (range 6-50 months). Symptom follow-up was blinded.

There were no operative mortalities. All patients were discharged within 72 hours. One patient required re-operation at 90 days for recurrent dysphagia on the basis of a slipped Dor fundoplication.

	HM N=10	HM/DF N=10	HM/AoH N=26
Dysphagia Improvement	10	9	24
Weight Gain	8	9	17
Weight Loss	0	0	0
Reflux symptoms	3	1	3
Antireflux therapy	2	0	1

All three operations are associated with long-term improvement in achalasia-associated dysphagia, as shown by patients' weight gain. The angle of His repair is simpler to perform than a Dor anterior fundoplication with an acceptably low occurence of reflux symptoms. A myotomy alone is associated with a 30% risk of symptomatic reflux and a 20% need for ongoing antireflux medication.

Esophageal/Gastric Surgery-PF161

COMPARISON OF ANTIREFLUX PROCEDURES AMONG ETHNICITY. Benjamin Haithcock, M.D., Vic Velanovich, M.D., Department of Surgery, Henry Ford Hospital, Detroit, Michigan.

Gastroesophageal reflux disease is one of the more common ailments affecting the upper GI tract. There exist no clear data examining the prevalence and treatment of GERD in the different races, especially related to the African American population. This group has historically been neglected in their referral for improved quality of life through medical and surgical therapy.

The purpose of this study was to examine the variations in outcome that exist between Caucasians and African Americans with antireflux procedures. Our surgical experience was reviewed between 1997 and 2001. We compared symptoms, complications, and follow up.

179 individuals underwent attempted laparoscopic procedures and 21 underwent open procedures. Of the laparoscopic procedure, 18 were African American (10%) and 160 were Caucasians American (90%)

Of the African American patients undergoing laparoscopic procedures, 5 were converted from laparoscopic to open (28%). The postoperative complication rate was 33% (6) in this group. Of the Caucasians undergoing laparoscopic procedures, 27 were converted from laparoscopic to open (17%). Complication rate was 12% (19) and included grade III (8), grade II (8), and grade I complications (4). However, a higher satisfaction rate was seen in African Americans compared to Caucasians.

This study demonstrated a significant difference between the complications in African Americans and Caucasians in laparoscopic antireflux surgery, but similar symptomatic outcome. This requires further investigation to determine factors that have led to this difference.

Esophageal/Gastric Surgery-PF162

LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR USING PROSTHETICS IN A CANINE MODEL Valerie J. Halpin, MD, Bryan F. Meyers, MD, Donna Luttmann, RN, Peggy Frisella, RN, Thomas Meininger, Nathaniel J. Soper, MD, Department of Surgery, Washington University, St. Louis, Missouri

INTRODUCTION The purpose of this study was to evaluate the effects of paraesophageal hernia (PEH) repair using a bio-prosthetic mesh made of small intestinal submucosa (SIS, Cook, Inc.) compared to polytetrafluoroethylene (PTFE, Dualmesh, Gore, Inc.) and primary repair.

METHODS AND PROCEDURES PEH were created in 22 mongrel canines via a thoracoscopic approach. Four animals died due to volvulus or intraoperative events prior to hernia repair. At 4 weeks the animals were randomized to one of 4 laparoscopic repair groups: A) 4-ply SIS (n=5), B) 8-ply SIS (n=4), C) primary (n=5), or D) PTFE (n=4). All repairs were performed using a keyhole and slit technique with overlap of the two mesh arms at the anterior portion of the esophageal hiatus. Eight weeks following hernia repair the animals were euthanized. PEH recurrence, location of the mesh, adhesion formation and histology were assessed. Esophageal manometry was performed at baseline, after hernia creation, and prior to sacrifice.

RESULTS There was one death in the primary repair group due to gastric outlet obstruction. There were two recurrent PEH, a small clinically insignificant hernia in an 8-ply animal and a large hernia secondary to a loose stitch resulting in volvulus and death of a 4-ply animal. There were no other complications in the primary or PTFE groups. Two animals in the 4-ply group and 3 in the 8-ply group developed mesh contraction with external esophageal constriction ($p = 0.10$ and $p < 0.03$ respectively compared to both primary and PTFE repair.) Three of these animals required euthanasia prior to study completion due to esophageal obstruction. On histological exam a severe fibrotic reaction was noted in 8/8 SIS animals and 1/7 non-SIS animals ($p < 0.05$).

CONCLUSIONS Paraesophageal hernia repair with small intestinal submucosal mesh using a keyhole technique may result in mesh contraction with esophageal obstruction in a canine model.

Esophageal/Gastric Surgery-PF163

THE PROCEDURE OF LAPAROSCOPE ASSISTED PROXIMAL GASTRECTOMY FOR EARLY GASTRIC CANCER OR SUBMUCOSAL TUMOR. -COMPAIRED WITH OPEN PROXIMAL GASTRECTOMY-
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We had performed laparoscope assisted proximal gastrectomy (LAPG) with lymphadenectomy in 15 cases, diagnosed as gastric cancer in 13, SMT in 2, located in upper third of the stomach, mean age 68.1y.o., male 10 and female 5. Reconstruction was created by jejunal loop interposition in 12 cases and by esophagojejunostomy in 3. The results were compaired with the open proximal gastrictomy (OPG). 【Method】 The procedure of LAPG was as follows; Under 8mmHg pneumoperitoneum, 5 ports were placed in the upper abdomen, and D1+α or D2 lymphadenectomy was completed without pancreasto-splenectomy. A classification of lymphnode of gastric cancer was followed by Japanese gastric cancer association. After lymphadenectomy was completed, 6 cm longitudinal incision was made in upper median abdomen, and reconstructed by jejunal loop interposition or esophagogastrostomy. 【Results】 Operation time was long in LAPG (LAPG=427±116 min.,OPG=276±73 min.) and blood loss was similer in both group (LAPG=565±289 g, OPG=519±322 g) and the number of resected lymphnode was similer (LAPG; D1=15.5±7.7, D2=11.4±6.0, Total =26.9±9.7), (OPG; D1=12.1±7.2, D2=15.7±8.1, Total =29.0±15.1). Postoperatively, oral intake was started in similar (LAPG 6.8±0.4 days, OPG 7.2±1.0 days) and hospital stay was short in LAPG (LAPG21.9±6.6 days, OPG29.4±16.1 days). Complications of LAPG were miner leakage in 1case, anastomotic stenosis in 2 cases and adhesive ileus in 2 cases. 【Conclusions】 LAPG with lymphadenectomy was feasible for the cases with early gastric cancer or large submucosal tumors. The operation time of LAPG was longer than that of OPG but hospital stay was short. LAPG will bcome minimal invasive surgery with sufficient radicarity in near future.

Esophageal/Gastric Surgery-PF164

CLINICAL OUTCOMES OF LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH EXTRA-PEIRGASTRIC REGIONAL LYMPH NODE DISSECTION FOR GASTRIC CANCER Hideki Hayashi, M.D., Takenori Ochiai, M.D., Naotake Akutsu, M.D., Harufumi Makino, M.D., *Hideo Yamada, M.D., Department of Academic Surgery, Graduate School of Medicine, Chiba University, Chiba, Japan, *Department of Surgery, Sakura National Hospital, Sakura, Japan.

Introduction: Laparoscopically assisted distal gastrectomy (LADG) with extra-perigastric regional lymph node dissection has been performed on 14 patients with early gastric cancer in our facility between September 1999 and January 2001. Clinical outcomes of these patients were compared with those of the 11 patients with conventional open procedures during the same period.

Methods: Operating time, blood loss, plasma level of C-reactive protein (CRP) and interleukin (IL) 6 after operation, and time to first flatus, number of dissected lymph nodes were examined. Surgical procedure: Under pneumoperitoneum, the gastrocolic ligament was divided, the left and right gastroepiploic, and the right gastric vessels were divided at their origin with clips. The nodes along the common hepatic, splenic, left gastric, and coeliac arteries, and the hepatoduodenal nodes were then dissected intra-coporeally. After that, 6 cm transverse mini-laparotomy was made in the epigastrium, and four-third of distal gastrectomy was performed extra-corporeally. The remnant stomach was anastomosed to the duodenum with an auto-stapler.

Result: The mean operating time of LADG (274 min.) was longer than that of ODG (235 min.), however, the difference was not significant (P=0.16). Blood loss in LADG group (206 ml, mean) was significantly smaller (p=0.01) than that in ODG group (510 ml). LADG group showed the tendency of lower plasma levels of CRP and IL6 on POD1, compared to ODG group (P=0.06 and P=0.15, respectively). Numbers of dissected lymph nodes in LADG (34, mean) were significantly larger than those in ODG (26, p=0.048). The mean periods to first flatus after LADG (2.9 days) were significantly shorter than those after ODG (3.8 days, P=0.045). No postoperative complications were observed in LADG group.

Conclusions: This surgical procedure is feasible as a less invasive treatment for the patients with early gastric cancer, and could be applicable to the patients with more advanced stages.

Esophageal/Gastric Surgery-PF165

LAPAROSCOPIC-ASSISTED GASTRECTOMY WITH SYSTEMATIC LYMPHADENECTOMY : CAN SUCH A COMPLICATED PROCEDURE BE PERFORMED LAPAROSCOPICALLY ALONE?
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Laparoscopic curative resection of stomach cancer has not yet been well established because of its anatomical complexity and relatively high incidence of lymph node (LN) metastases. This dilemma could be solved by our new procedure of laparoscopic-assisted distal gastrectomy (LADG) in combination with "Sliding Window Method (SWM)".

Methods: LADG comprises two parts, gasless method for laparo-scopic maneuvering and SWM for direct maneuvering. LN dissection within lesser and greater omentum, a highly complicated part, can be performed by direct maneuvering through "sliding window", a small abdominal incision which can be slided horizontally by our system to cover the most of the area of the omentum. LN in deeper areas (around EG junction, spleen, left gastric a., common hepatic a.) are dissected laparoscopically. Gasless method is required so the "window" can be opened through the whole procedure.

Results: LADG with SWM was performed in 45 cases since June 1994. Mean operating time was 189 min, blood loss 110 ml, conversion to open surgery 0%, oral feeding on 4.5 POD*, hospital stay 12.2 days*, mortality 0%, morbidity 2%, port site recurrence 0% (* $p<0.05$ compared to open surg). The number of LN retrieved was 32.2 per case, which was comparable to that in open distal gastrectomy.

Conclusion: LADG with SWM appears to be as safe, smooth, and curative as open gastrectomy, without jeopardizing the less invasiveness of laparoscopic surgery.

Esophageal/Gastric Surgery-PF166

SAFETY AND EFFICACY OF LAPAROSCOPIC ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFLUX DISEASE IN ELDERLY PATIENTS OVER 80 YEARS OF AGE
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The efficacy and safety of laparoscopic antireflux surgery (LARS) for elderly patients (>/= 80 years) with gastroesophageal reflux disease (GERD) have not been clearly established. The aim of this retrospective study was to evaluate the surgical outcome after LARS in patients with GERD aged over 80 years. Between May 1997 to June 2001, 29 patients underwent LARS. They were divided into two groups based on age: group 1 included 23 patients aged < 80 years (27-79 years) and group 2 of 6 patients aged >/= 80 years (80-88 years). All patients underwent laparoscopic floppy Nissen fundoplication with 54-60 Fr bougie. Results were compared between age groups with Student∞fs t- test. The preoperative American Society of Anesthesiologists (ASA) score of patients of group 2 (2.5) was significantly higher than that of group 1 (1.7, $p<0.01$). The vital capacity was smaller in group 2 than in group 1 (1.70 vs. 2.38 L, $p<0.05$), but no significant differences were noted in %VC (78.3 vs 90.7%) and FEV1% (94.5 vs 87.6 %) between the two groups. Preoperative grades of esophagitis and pH values were not significantly different between the two groups. There was no conversion to open surgery and no mortality in both groups. There were no significant differences in operative time (147 vs. 119 min), blood loss (130 vs. 64 g), start of oral intake (1.8 vs. 1.0 days), and time to ambulation (2.50 vs. 2.0 days) between the two groups. Both groups demonstrated equivalent postoperative improvement in symptoms (84 vs. 91%, in efficacy). Left pneumothorax occurred during surgery in one patient of the younger age group. There were no perioperative complications in the older age group. One patient from each group underwent reoperation. Our results indicate that the surgical outcome of laparoscopic antireflux surgery for the treatment of GERD in elderly patients >/= 80 years of age is comparable to that of patients < 80 years. Thus, such treatment could be employed in properly selected patients.

Esophageal/Gastric Surgery-PF167

CURTAIN RETRACTION TECHNIQUE FOR BIG HIATAL HERNIA
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Introduction: Big hiatal hernia causes atelectasis or respiratory sympton, not only GERD. But the procedure of laparoscopic Nissen fundoplication for big hiatal hernia had difficulty for dissection and retraction of herniated stomach, and some cases resulted in pneumothorax or serosal injury of the stomach. We present our CURTAIN RETRACTION TECHNIQUE for big hiatal hernia as safe and easier technique.

Methods and Procedures: We perform laparoscopic Nissen fundoplication for four patients with esophageal hiatal hernia of mixed type (type 3) over 8cm. They also have reflux esophagitis.

We use four 5mm trocars, one 11mm one and LCS-J5 (Johnson & Johnson Co.), placing TFT LCD monitor (Sharp Co.) above patientÕs head in good hands-eyes coordination. Starting from dissection of hernia sac at the top of hiatus, we make curtain of sac and pull it. This procedure make it possible to retract the herniated stomach easily without serosal injury or pneumothorax. With pulling the dissected peritoneal curtain, we dissect around the S-shaped esophagus in direct view. After retraction, the sac is cut and removed. We perform following suture for hiatus and fundoplication.

Results: No complications were occurred after surgery. The patients started liquid to eat at three post operative date. No leakage or reflux after surgery.

Conclusion: Our curtain retraction technique for big hiatal hernia enables safer and easier dissection in difficult cases.

Esophageal/Gastric Surgery-PF168

BOUGIE OR NO BOUGIE. DOES IT AFFECT THE POST OPERATIVE DYSPHAGIA RATE: A RETROSPECTIVE ANALYSIS.
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Bougie dilators by tradition have been used for Nissen fundoplication. The use of a dilator aids in judging how tight a Nissen wrap should be. It does carry a 1% risk of esophageal perforation. One such incident happened at our institution. Since that time we have abandoned its use. The purpose of this study was to see if the dysphagia rate has increased as a result.

Ninety-two consecutive charts were evaluated for the study. After a learning curve of 36 cases the next 45 consecutive patients underwent a laparoscopic Nissen fundoplication with the use of a bougie dilator ranging in size from 48-56 Fr. In September 1999, we stopped using the dilator because of an esophageal perforation and the following 47 consecutive patients under went a laparoscopic Nissen fundoplication without the bougie dilator. Postoperative dysphagia was assessed with interview and patient's complaint of dysphagia.

There were equal numbers of men and women in the two groups. Here are our results.

	Early Dysphagia	Late Dysphagia	Persistent Dysphagia	Needing Dilation
Bougie(45)	14(31%)	10(22%)	1(2.2%)	5(11%)
No Bougie(47)	22(47%)	10(21%)	3((21%)	11(23%)
P Value	0.123	0.912	0.33	0.119

Although more patients in the non-bougie group had early dysphagia, needed dilation, and remained with unresolved dysphagia, statistical significance was not reached. The late dysphagia rate was identical.

Esophageal/Gastric Surgery-PF169

POST-OPERATIVE TRENDS IN PULMONARY FUNCTION FOLLOWING LAPAROSCOPIC ANTI-REFLUX SURGERY IN ASTHMATICS Alfred B. Johnson, M.D., Karyn L. Butler, M.D., and Linda Meyer, P.A., Department of Surgery, Morehouse School of Medicine, Atlanta, GA

Asthmatic patients experience accelerated deterioration of pulmonary function which may be exacerbated by untreated gastroesophageal reflux disease(GERD). We have previously shown that surgical correction of GERD reduces atypical pulmonary related symptoms; however there has been variable success in literature on objective improvements in pulmonary function. The purpose of this study was to determine if surgical correction of GERD is effective in limiting the deterioration of pulmonary function seen over time in asthmatics.

METHODS: Retrospective analysis was performed on thirty two asthmatic patients referred for surgical evaluation between October 1998 and March 2000. At the time of initial evaluation all patients were receiving proton pump inhibitors(PPI) for control of GERD or reflux induced asthma symptoms. Eighteen patients underwent laparoscopic fundoplication with the remaining fourteen patients serving as the control group. PPI therapy was discontinued in all patients following surgery. Spirometry data was analyzed for a ten month period following the institution of either medical or surgical therapy. Trend lines were then assigned to the plotted FEV1 values to determine slopes. Statistical analysis was performed to compare medical and surgical therapy.

RESULTS: Positive slopes, indicative of improving pulmonary function were seen in 55.5% of the patients undergoing surgery compared to 35.7% of the medically treated group(p=.127)

CONCLUSIONS: 1. Surgical correction of GERD compared to medical therapy did not significantly increase FEV1 in the ten month period after the institution of therapy.

2. Long term improvement in pulmonary function following surgical correction of GERD may be dependent on other variables of pulmonary function or length of follow-up.

3. Despite a lack of objective improvement in pulmonary function, laparoscopic fundoplication may continue to play an important role in the subjective improvement of quality of life.

Esophageal/Gastric Surgery-PF170

PATHOLOGICAL VALIDITY OF ESOPHAGEAL ENDOSCOPY. HOW REAL IS WHAT WE SEE? MYTH OR REALITY? S.C.KANTHAN MD*; J.MARSCHALL MD*; R.KANTHAN MD, DEPARTMENTS OF SURGERY* & PATHOLOGY COLLEGE OF MEDICINE, UNIVERSITY OF SASKATCHEWAN , SASKATOON, CANADA

Objective: The purpose of this study is to characterize the spectrum of endoscopic biopsy based esophageal pathology at a provincial tertiary care hospital and to evaluate these findings to their respective endoscopic diagnosis in an attempt to validate the reality of all that is seen.

Methods: Computer generated list of all the patients who had an esophageal biopsy in the year 2000 was obtained. The pathology slides were reviewed and classified as esophagitis (E); intestinal metaplasia (IM); low or high grade dysplasia (LGD,HGD), adenocarcinoma (AD); squamous cell carcinoma (SC) and no pathological diagnosis (NPD). These were matched and analyzed to their respective endoscopic report which were retrieved from the health record charts.

Results: A total of 210 esophageal biopsies were processed in the Royal University Hospital in the year 2000. Endoscopic reports were not available for 27 cases. Clinicopathological data was available for 183 patients (75 females ;108 males). 115 cases had complete concordant results; 69 % of what we saw was a pathological reality. 68 cases had discordant results. 37% of what we saw was a myth. The latter were inaccurate recognition of Barrett's esophagus in 9% and recognition of esophagitis with a false positive of 16.3% and false negative of 7.3%. Other miscellaneous discrepancies included failure to recognize herpetic esophagitis and normal biopsies.

Conclusion: Esophagoscopic diagnosis remains a primary investigative tool in the management of gastroeophageal reflux disease (GERD) and carcinomas. Endoscopic assessment of the latter is the gold standard. On the other hand, assessment of erythema, inflammation and esophagitis can be deceiving. Pathological confirmation of esophagitis can also result from a normallooking esophagus. Endoscopic evaluation of short segment Barrett's remains a diagnostic challenge.

Esophageal/Gastric Surgery-PF171

HAND-ASSISTED THORACOSCOPIC RADICAL ESOPHAGECTOMY USING AN ANTERIOR PHRENO-MEDIASTINAL APPROACH Tatsuyuki Kawano, M.D., Kagami Nagai, M.D., Tetsuro Nishikage, M.D., Katsunori Ami, M.D., Kenro Kawada, M.D., Yasuaki Nakajima, M.D., Takehisa Iwai, M.D. Department of Surgery, Tokyo Medical and Dental University Hospital, Tokyo

Recently video-assisted thoracoscopic surgery is introduced in thoracic esophagectomy. However, although the thoracoscopic approach is less invasive and feasible for mediastinal lymph nodes dissection, it is less reliable for systematic lymph adenectomy. Moreover, thoracoscopic esophagectomy needs a specially trained surgeon(s), longer operative time, and involves higher costs. We devised a new technique for thoracoscopic radical esophagectomy using a new supportive approach called hand-assisted thracoscopic surgery using an anterior phreno-mediastinal approach (HATS / APMA esophagectomy).

Methods and Procedures: Between January 2000 and August 2001, 12 patients with thoracic esophageal cancer were operated on by the new procedures. In the same period, 31 conventional radical esophagectomies and 3 simple thoracoscopic esophagectomies were performed. We could insert a left hand and / or therapeutic instruments through the anterior phreno-mediastinal route to the right thoracic cavity from the small upper abdominal incision and performed hand-assisted thoracoscopic esophagectomy with lymph adenectomy.

Results: All procedures in each patient were performed safely and post-operative courses were uneventful except one case with post-operative recurrent laryngeal nerve palsy and needed long hospital stay. Obvious differences of post-operative course between HATS/APMA esophagectomy and conventional radical esophagectomy were not seen.

Conclusion: The new procedures reduce stress on the surgeons and the number of thoracic ports compared with simple thoracoscopic esophagectomy, and may also reduce the operating time because the use of the hand yields a tactile sense and direct support.

Esophageal/Gastric Surgery-PF172

MINIMALLY INVASIVE SURGERY FOR GASTRIC CANCER (LADG: LAPAROSCOPY-ASSISTED DISTAL GASTRECTOMY) Masayuki Kimura, Ryoji Makizumi,Yuji Jinnouchi,Katsunosuke Takahashi,Yamaguchi Susumu, Department of Gastroenterological Surgery,St.Marianna Univercity School of Medicine∞@ Kawasaki,JAPAN

AIMS: The aim of this study was to establish a procedure for laparoscopy-assisted distal gastrectomy (LADG) with sufficient D2 lymphadenectomy.

Patients: We performed ten laparoscopy-assisted distal gastrectomy from May 2001 to September 2001. The indication of LADG is limited to the early gastric cancer with submucosal invasion at L and M region of the stomach.

Method : After pneumoperitoneum was established using the open technique, 5 ports (12 mm and 5 mm in diameter) were placed. The mobilization of the stomach, and D2 lymphnode dissection were performed by laparosonic coagulating shears. Dissection and divide of the left gastric and right gastric arteries and veins, the left and right gastroepiploic arteries and veins and D2 lymphadenectomy were performed under the pneumoperitoneum. Resection of stomach with stapled side-to-end anastomosis were performed via a minilaparotomy through an incision,5 cm long in the epigastric area.

Result : The mean operative time were 286 (230-420)minutes. The mean blood loss were 210(150-380)ml. The mean number of dissected lymphonodes was 21 +- 8. All patients had no complications.

Conclusion : LADG with sufficient D2 lymphadenectomy is more useful than open distal gastrectomy in the management of patients with gastric cancer from the viewpoints curability, minimal invasiveness, and quality of life of patients.

Esophageal/Gastric Surgery-PF173

HISTOLOGICAL CHANGES IN CANINE ESOPHAGEAL MUCOSA FOLLOWING ACID REFLUX AND MIXED ACID AND ALKALINE REFLUX Sandhya Lagoo, MD, PhD; Leonardo Villegas,MD ;Bassem Eldaif, Jose Pinheiro, MD; Miranda Voss, MD; Michael Gupta, Ross McMahon, MD; Rebecca Greene; Robert McRae; Erik Clary, DVM; Marcia Gottfried, MD and Steve Eubanks, MD, Departments of Surgery and Pathology, Duke University Medical Center, Durham, North Carolina

Aim: The development of Barrett's epithelium due to gastro-esophageal reflux disease (GERD) is well known. Our aim is to compare the pathophysiology of acid reflux (AR) with mixed acid and alkaline reflux or duodeno-gastric reflux (DGR). Using an established canine model of GERD with AR and DGR, we evaluated the esophageal mucosa at multiple intervals following surgery.

Methods: Group I: AR was initiated in 5 animals with thoracotomy, incision of the left crura, Heller myotomy (HM), and creation of a para-esophageal hernia (PEH). Group II: DGR was initiated in 5 animals with laparotomy, incision of the left crura, HM, PEH creation, duodenal stapling distal to the ampulla and creation of a gastro-jejunostomy.

Results: Post-operatively, 24-hour pH studies with a dual channel probe showed significantly increased acid reflux in Group I animals, while Group II animals showed increased alkaline reflux, with documentation of bile in the refluxate. Esophagoscopy with biopsies was carried out after 6 weeks, 12 weeks and 1 year in Group I and after 6 weeks, 12 weeks and 6 months in Group II. At 6 weeks, Group I showed severe acute esophagitis with basal cell hyperplasia, accentuation of the rete pegs, intra-epithelial lymphocytes and neutrophils. At 12 weeks, 3/5 subjects showed evidence of esophagitis, and 2/5 showed regression of the esophagitis. However, at one year, all 5 subjects showed evidence of moderate to severe esophagitis. In one subject, the columnar epithelium at the squamo-columnar junction showed apoptotic necrosis of cells. Group II showed no evidence of esophagitis at 6 weeks, moderate esophagitis at 12 weeks and regression of the esophagitis at 6 months.

Conclusions: Both AR and DGR cause reflux esophagitis in our animal model. Short-term follow up shows more severe esophagitis with acid reflux than with duodeno-gastric reflux. Long term follow up of these subjects will be needed to study the progression of reflux esophagitis to Barrett's metaplasia

Esophageal/Gastric Surgery-PF174

PREOPERATIVE SIMULATION OF LAPAROSCOPIC ASSISTED GASTRECTOMY FOR EARLY GASTRIC CANCER WITH THREE-DIMENSIONAL IMAGING BY MULTIDETECTOR HELICAL CT Lee Sang-Woong M.D., Hisashi Shinohara M.D., Junji Okuda M.D., Masao Toyoda M.D., Keitaro Tanaka M.D., Kanji Nishiguchi M.D.1), Kiyohiro Masuda M.D., Mitsuru Matsuki M.D., Shushi Yoshikawa B.S., Isamu Narabayashi M.D.2), Nobuhiko Tanigawa M.D.1), 1) Department of General and Gastroenterological Surgery, 2) Department of Radiology , Osaka Medical College, Osaka, Japan

Introduction: Treatment of early gastric cancer may be a therapeutic candidate for laparoscopic surgery (LS), which is considered as less invasive procedure as compared with conventional open surgery. However, LS requires a more detailed understanding of local anatomy. In compensation for these disadvantages, we have recently introduced 3-dimensional CT angiography (3D-CTA) in preoperative simulation and intraoperative navigation of perigastric vascular anatomies. Here we determine the accuracy of 3D-CTA and its value in the preoperative simulation of laparoscopic gastric cancer surgery.

Methods: Between December 2000 and August 2001, 30 patients with early gastric cancer underwent laparoscopic assisted gastrectomy. Helical CT was performed using a multidetector scanner, after intravenous injection of 100ml of contrast material at 5ml/sec. Arterial phase images were acquired at 20sec. 3D images were obtained using a volume-rendering workstation (zioM900; ZIO software, Inc., Tokyo, Japan).

Results: All of 30 examinations were diagnostic and successful. The left gastric artery, the right gastric artery, and the right gastroepiploic artery were identified in 100%, 60%, and 100%, respectively. Replaced left hepatic artery, arising from the left gastric artery, was detected in three (10%) patients. These anatomical findings facilitated the intraoperative procedures.

Conclusions: Preoperative imaging by 3D-CTA provides a vascular arterial road map, which is critical for surgical guidance, and hence prevents the operative risks. We conclude that 3D-CTA can play an important part in the preoperative planning of the cancer operations, especially in laparoscopic surgery.

Esophageal/Gastric Surgery-PF175

CURRENT STATUS OF ANTIREFLUX PROCEDURE IN LAPAROSCOPIC HELLER MYOTOMY. META-ANALYSIS. Sergey Lyass, M.D., David Thoman, M.D., Edward H. Phillips, M.D. Cedars-Sinai Medical Center, Minimally Invasive Surgery Institute. Los Angeles, CA

Introduction: Persistent dysphagia and postoperative gastroesophageal reflux (GER) are the most cited reasons for surgical failure of laparoscopic Heller myotomy. Adding an antireflux procedure to Heller myotomy has been proposed to prevent reflux. We performed a meta-analysis to summarize published data and determine the efficiency of antireflux procedure in prevention postmyotomy GER.

Material and Methods: Meta-analysis of laparoscopic Heller myotomy studies and reported in the English language literature from 1991 to 2001. Studies were eligible for inclusion if they reported the outcome of the surgery in terms of GER symptoms or results of 24 hours pH studies.

Results: Antireflux procedure accompanied laparoscopic myotomy in 15 studies with 532 patients enrolled. In 6 studies with 69 patients no antireflux procedure was added to laparoscopic myotomy. Follow up was available on 489 patients (92%) with partial fundoplication. The rate of GER diagnosed at pH studies was 7.9% (18 of 228 patients studied), while only 5.9% of patients experienced symptoms of GER (29 of 489 patients followed). Of the 69 patients without fundoplication 47 (68%) were available for follow up. Forty patients (85%) were studied with pH-monitoring postoperatively, with 4 (10%) demonstrating reflux. Six patients (13%) of 47 had symptoms of GER. The difference in the rate of GER diagnosed with postmyotomy pH-studies in patients with or without fundoplication was not significant (7.9% vs. 10% respectively, p=0.75), nor was the difference in the incidence of postmyotomy GER symptoms (5.9% vs. 13% respectively, p=0.12).

Conclusions. Reflux is not necessarily eliminated with the addition of a partial fundoplication. Based on the published data, recommendations cannot yet be made regarding the efficacy of adding an antireflux procedure to laparoscopic Heller myotomy. Prospective randomized study is needed to clarify the place of antireflux procedure after laparoscopic Heller myotomy.

Esophageal/Gastric Surgery-PF176

THE MYTH OF THE SHORT ESOPHAGUS Atul K. Madan MD, Constantine T. Frantzides MD, PhD, Department of Surgery, Rush University, Chicago, IL

Backgroud: The advent of laparoscopic surgery has increased the number of fundoplications performed today. With the increase of the laparoscopic fundoplication, the reports of short esophagus continue to increase. The literature continues to discuss the prevalence, diagnosis, and treatment of the short esophagus. This investigation was undertaken to review our data regarding the entity described as the short esophagus.

Methods: All charts of patients who had laparoscopic fundoplications performed from 1991 - 2000 were reviewed. Conversions, recurrences, complications, and incidence of short esophagus were noted. Patients with laparoscopic fundoplications also received esophagrams 3 months postoperatively and then every 6 months thereafter.

Results: A total of 628 fundoplications were performed with 351 requiring hiatal hernia repair. Seventy-two patients had extremely large hiatal defects. After appropriate esophageal mobilization was performed, no further esophageal lengthening procedure was needed. There were 4 (0.6%) conversions, 16 (2.5%) recurrences, and 7 (1.1%) complications, and no deaths. Recurrences were due to hiatal hernia recurrences (n=8; 1.3%), 'slipped fundoplication' (n=3; 0.5%), and ineffective valves (n=5; 0.8%).

Conclusion: In our series of fundoplications and hiatal hernia repairs, no short esophagus was noted. With proper esophageal mobilization, clinically the entity described as 'short esophagus' may not exist.

Esophageal/Gastric Surgery-PF177

A CLINICAL PATHWAY FOR LAPAROSCOPIC DIATAL GASTRECTOMY Mochizuki Y. M.D., Fujiwara M.M.D., Kawai J.M.D., Kanyama Y.M.D.,, Kasai Y.M.D., Akiyama S.M.D., Ito K.M.D., Nakao A.M.D. Department of Surgery II, Nagoya University, Nagoya, Japan

Background: Clinical pathways (CP) have been shown in various diseases to be useful tool for optimal quality management and cost management. Recently laparoscopic operations have been increasing, and since 1999 the most popular method for gastric cancer in our hospital is laparoscopic distal gastrectomy(LDG). Laparoscopic gastrectomy needs more resources than open conventional operation, but can reduce hospital stay because of faster postoperative recovery. We expect CP for laparoscopic gastrectomy reduce resource utilization and total cost. We evaluate the effect of CP for LDG.

Cases and Methods: 54 cases underwent laparoscopic distal gastrectomy for early gastric cancer at Nagoya University Hospital in 1999-2000 including 36 cases treated without CP (before institution of CP)[pre-CP group], and 18 cases treated with CP[CP group]. Invasiveness of operation such as lost blood, operation time , and complications, resumption of oral intake, the length of hospital stay, and total expenses of hospital stay are investigated.

Results: Although there is no significant differences between Pre-CP group and CP group about operative invasiveness and complications, the resumption of oral intake in CP group was earlier than that of pre-CP group and the hospital stay of CP group was shorter than that of pre-CP group. Total expenses in hospital stay of CP group is less than that of pre-CP group.

Conclusions: CP decreased hospital stay and reduces the total expenses. CP is useful for high-resource and quick-recovery operation such as laparoscopic gastrectomy.

Esophageal/Gastric Surgery-PF178

INDICATIONS AND MANAGEMENT OF PROTHESES TO CLOSE THE CRURA DURING LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL HERNIAS S Morales-Conde MD PhD, J Bellido MD, I Cadet MD, JD Tutosaus MD PhD, PC Fernández MD, M Bustos MD PhD, J Galvan MD, J Martín MD, S Morales-Méndez MD PhD, M Martín MD, University Hospital Virgen Macarena and University Hospital Virgen del Rocío. Department of Surgery. University of Sevilla. Spain

Introduction: One of the problems associated to the laparoscopic approach of paraesophageal hernias is the evaluation of how to close the crura, since it has been reported a high incidence of recurrences. The use of prostheses have been suggested as an alternative to close the crura, being still discussed indications, type of mesh and way of fixation.

Patients and Method: We retrospectively evaluated the outcome of 61 consecutive patients with type II (22 patients) or III (39 patients) paraesophageal hernias treated laparoscopically. Sac was reduced in the last cases of our series. Protheses reenforcement was performed in recurrent hernias and primary hernias in which a tension in the suture line was observed, being all cases defect larger than 8 cm. Prosthesis placed in the hiatus was in all cases a mesh of PTFE-e (Dual-Mesh plus with holes). The mesh used was prepared making an U shape, being fixed to the crura with tacks. A funduplication was performed in all cases and the fundus was fixed to the mesh with 3-4 stitches.

Results: Two patients were converted to open surgery (3.27%): one gastric perforation and one massive ephysema. Simple closure was performed in 55 cases, being placed a protheses in 9 cases: 6 primary and 3 recurrent paraesophageal hernias. The recurrence rate of the serie was 6.1% (4/65 cases): three of the patients in which a simple closure was performed, corresponding all of them to the initial cases of our serie in which the sac was not excised, the other recurrence corresponds to one patient in which a cruroplasty was performed, being observed a posterior herniation due to a failure in the posterior fixation of the fundoplication to the mesh.

Conclusions: Sac must be excised to avoid recurrences during laparoscopic repair of paraesophageal hernias, while mesh reenforcement of the crura is a good method to decrease the rate of recurrences in large and recurrent hernias. There are no complications related to the use of protheses and to the method the fixation, being important to fix the fundus properly to the mesh to avoid recurrences

Esophageal/Gastric Surgery-PF179

MINIMALLY INVASIVE MANAGEMENT OF ESOPHAGEAL DIVERTICULI Cynthia D. Nelms, MD, Brent D. Matthews, CHARLES E. LOHR, MS, MD, Kent W. Kercher, MD, Harrison S. Pollinger, DO, B. Todd Heniford, MD Carolinas Medical Center Department of General Surgery, Carolinas Laparoscopic and Advanced Surgery Program, Charlotte, NC

Esophageal diverticuli (ED) are rare lesions which have traditionally been resected via thoracotomy. Minimally invasive techniques have made both thoracoscopic (Thor) and laparoscopic (Lap) approaches attractive alternatives. The purpose of this study was to review our experience managing this difficult problem.

A retrospective review of all symptomatic ED patients surgically treated between August 1997 and June 2001 was performed. Preoperative clinical presentations and perioperative data were collected and examined.

Five patients with symptomatic distal ED were identified (3 females ages 72-77 years; 2 males ages 32 and 64 years). All patients complained of dysphagia and had experienced symptoms for at least 12 months. Other symptoms included regurgitation (80%), weight loss (60%), heartburn/aspiration/cough (40%), chest pain/hoarseness/nausea/vomiting (20%). All patients were initially evaluated by barium esophagograms, esophagogastroduodenoscopy, and manometry. Dysmotility was identified in only 3 of the patients. One patient underwent multiple esophageal dilatations prior to surgical referral. Four patients underwent Lap diverticulectomy and myotomy; 3 of these also had a Toupet fundoplication. One patient underwent Thor diverticulectomy and myotomy. All ED measured 5 cm or less. Operative times ranged from 175 to 334 (mean 245) minutes and blood loss was minimal (30-100cc). Postoperatively all patients underwent contrast swallowing studies prior to resuming a diet (postop days 1-4). The Lap patients had a mean length of stay of 2.75 days (range 2-4 days), while the Thor patient stayed until postop day 6 due to pulmonary issues (severe COPD). During an average follow-up of 11.6 months (range 2-36 months), only one patient reports occasional dysphagia with solid foods. There were no wound or other long term complications.

Minimally invasive management of ED can be safely and effectively performed with minimal morbidity.

Esophageal/Gastric Surgery-PF180

SHORT ESOPHAGUS AND ITS IMPACT ON FAILURE AFTER NISSEN FUNDOLICATION Robert W. O'Rourke, M.D., Yashodhan S.Khajanchee, M.B.B.S, Barbara Lockhart, R.N., Lee L. Swanstrom, M.D. Department of Minimally Invasive Surgery, Legacy Health System, Portland, OR

Patients with short esophagi may have higher failure rates after fundoplication, due to intrinsically worse disease severity or inability to obtain a tension-free wrap. Aggressive application of lengthening procedures such as Type II mediastinal dissection and Collis gastroplasty may reduce failure rates. This study compares outcomes after fundoplication using aggressive lengthening techniques in patients with short esophagi with patients having normal esophageal length.

A retrospective review of prospectively gathered intra-operative data sheets recording the extent of esophageal mobilization needed to achieve 2.5cm of tension-free intra-abdominal esophagus on all Nissen fundoplications performed during a 4-year period was performed. Patients with follow-up of >= 6 months were included. Patients with short esophagi were identified by the need for a Type II mediastinal dissection (>5 cm into mediastinum) or Collis gastroplasty. Outcomes were compared to patients with normal esophageal length (Type I dissection). A Chi-square test was used to compare failure rates.

147 patients were identified during the study period. 97 patients underwent Type I dissection, 46 patients underwent Type II dissection, and 4 patients underwent Collis gastroplasty. Median follow-up was 8 months. Objective follow-up (pH study) was obtained in 86%, 74%, and 75% of patients in each group, respectively. Failure occurred in 8.2% (8/97), 8.7% (4/46), and 25% (1/4) of patients, respectively, and was not significantly different between groups.

We report medium-term outcomes in patients with short esophagi as defined by the need for an esophageal lengthening procedure. No difference was seen in failure rates between patients who required a lengthening procedure and those who did not. This data suggests that aggressive application of Type II dissection and Collis gastroplasty, thus obtaining adequate esophageal length and a tension-free wrap, may reduce failure in patients with short esophagi, and provide a success rate similar to that of patients with normal esophageal length.

Esophageal/Gastric Surgery-PF181

VIDEO-ASSISTED THORACIC SURGERY AND LAPAROSCOPIC SURGERY FOR CANCER OF THE THORACIC ESOPHAGUS. Soji Ozawa, M.D., Yuko Kitagawa, M.D., Eiichi Nakamura, M.D., and Masaki Kitajima, M.D., Department of Surgery, School of Medicine, Keio University, Tokyo, Japan.

Aim: Surgery for thoracic esophageal cancer through thoracotomy and laparotomy is attended with great surgical invasion. To reduce the surgical invasion we have successfully performed video-assisted thoracic surgery and / or laparoscopic surgery on 36 patients with esophageal cancer. The surgical procedure and the results are presented.

Methods: The patient was placed in the left lateral decubitus position and a mini-thoracotomy was put and four trocars were inserted. The thoracic esophagus and regional lymph nodes were resected thoracoscopically. Next the patient was placed in the supine position and the stomach was mobilized and the abdominal esophagus was dissected laparoscopically. After the left gastric artery was divided, the whole stomach was pulled out. The stomach tube was made safely with pyloroplasty and pulled up to the left neck through the posterior mediastinum. The anastomosis between the cervical esophagus and the stomach tube was performed with a circular stapler. We compared 36 patients with endoscopic procedures with 22 patients with open procedures in terms of surgical invasion.

Results: Although mean operative duration for thoracoscopic procedure (TP) was longer than that for thoracic open procedure (TOP) ($p = 0.02$), there was no difference between mean operative duration for laparoscopic procedure (LP) and for abdominal open procedure (AOP). Numbers of dissected lymph nodes in TP and LP were almost the same as numbers in TOP and AOP, respectively. Postoperative respiratory function and intestinal movement recovered earlier in LP patients than in AOP patients ($p<0.05$). The serum IL-6 levels in LP patients were lower than in AOP patients. There was no postoperative complication related to TP and LP.

Conclusions: Both video-assisted thoracic surgery and laparoscopic surgery for thoracic esophageal cancer are feasible, and the laparoscopic procedure is less invasive. Quality of lymph node dissection with endoscopic procedures seems to be the same as quality with open procedures.

Esophageal/Gastric Surgery-PF182

DO FUNDIC GLAND POLYPS SECONDARY TO PPI THERAPY REGRESS AFTER LAPAROSCOPIC FUNDOPLICATION? N Pereira MD, M Anvari MB BS PhD, C Gill Pottruff BSc, J Lau, D Hong MD, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

An increased incidence of fundic gland polyps in patients on long-term Proton pump inhibitor (PPI) therapy has been noted. Although the natural history of these polyps has not been well delineated, the possibility that they might regress after cessation of proton pump inhibitor (PPI) use following laparoscopic anti-reflux surgery has been proposed.

Methods: We prospectively followed 13 patients (mean age: 58.2 +- 3.5 years) with fundic gland polyps. None had a family history of adenomatosis polyposis coli. All patients were on proton pump inhibitors for a mean duration of 41.1 +- 12.5 months. 6 of the 13 patients decided to stop PPI therapy and chose to have laparoscopic anti-reflux surgery. The other 7 patients continued on maintenance PPI therapy. Follow-up gastroscopy was done to assess progression of fundic gland polyps.

Results: 5 out of 6 patients who stopped PPIs after antireflux surgery exhibited regression in the number of fundic gland polyps at a mean follow up of 14.3 +- 7.5 months. In three patients the polyps completely disappeared. There was however regression of polyps observed in 4 out 7 patients who continued on PPI therapy after a follow up of 16.4 +- 2.4 months.

Conclusion: The regression of fundic gland polyps may occurs in patients who remain on long-term PPI therapy. Complete cessation of PPIs after laparoscopic anti-reflux surgery is asscociated with complete or near complete regression of fundic gland polyps in most patients.

Esophageal/Gastric Surgery-PF183

ASSESSMENT OF THE FAILED FUNDOPLICATION BY COMUPTERIZED AXIAL MANOMETRY (CAM) Jose Pinheiro, MD; Miranda Voss, MD; Sandyha Lagoo, MD, PhD; Erik Clary, DVM; Rebecca Greene, Robert McRae, Steve Eubanks, MD, Department of Surgery, Duke University Medical Center, Durham, North Carolina

Introduction: Laparoscopic fundoplication has an unsatisfactory outcome in approximately 10% of patients, many of who require surgical revision. Several well-recognized patterns of failure are currently defined by endoscopic and radiographic means. Computerized axial manometry (CAM) is a relatively new technique, which has been shown to define lower esophageal sphincter (LES) anatomy and to predict gastroesophageal reflux. The aim of this study was to assess the value of CAM in defining the anatomy of the failed fundoplication.

Methods and Procedures: Six patterns of fundoplication failure were reproduced at open surgery in six adult female dogs. The dogs, equipped with an esophagostomy cannula, underwent pre and postoperative manometry, which was performed by two observers blinded to the surgical procedure. The fundoplication was assessed using an 8 channel, radial, water perfused system. A 50cm continuous pull through analysis was followed by an 8cm pressure vector volume analysis with 3D computerized reconstruction of the sphincter. At completion of the study, the dogs were sacrificed and underwent necropsy with confirmation of the type of abnormal fundoplication.

Results: Three failed fundoplications were identified by CAM. The LES vector volume was strikingly elevated on the tight wrap. An intra thoracic wrap was correctly identified by standard manometry and CAM. Identification of a twisted wrap configuration required reconciliation of vector volume data with anatomical findings at post-mortem examination. The other three patterns of failed fundoplication were not identified by CAM.

Conclusions: The LES vector volume provided useful information in analysis of the correctly identified tight wrap. Other patterns of failure were either identified on standard manometry or were not identified. Currently, CAM provides excellent representation of the LES preoperatively but does not accurately predict patterns of failure of fundoplications.

Esophageal/Gastric Surgery-PF184

LAPAROSCOPIC NISSEN VERSUS TOUPET FUNDOPLICATION IN PATIENTS WITH GASTROOESOPHAGEAL REFLUX DISEASE AND IMPAIRED DISTAL OESOPHAGEAL MOTILITY. Harald Puhalla M.D., *Johannes Lenglinger M.D., Peter Dubsky M.D.Johannes Miholic M.D., *Georg Stacher M.D., Georg Bischof M.D, Department of General Surgery, *Psychophysiology Unit, University Hospital, Vienna, Europe

A Nissen fundoplication for gastrooesophageal reflux disease may more often lead to persistent dysphagia than a Toupet fundoplication. The aim of this study was to assess the results of laparoscopic Nissen versus Toupet fundoplication in patients with reflux disease and impaired distal oesophageal motility.

In 15 patients a laparoscopic Nissen and in 17 a laparoscopic Toupet fundoplication was carried out. Criteria for an impaired motility of the distal oesophageal third were a mean amplitude of < 30 mm Hg of swallow-induced contractions, or > 33 % nonpropulsive or non-transmitted contraction waves. Before surgery, heartburn, dysphagia, regurgitation and other symptoms were scored and endoscopic, manometric and 24 hour pH-metric investigations performed. Patients were reinvestigated 3 to 30 (median 13) months after Nissen and 3 to 42 (median 7) months after Toupet fundoplication.

After Nissen as well as after Toupet fundoplication heartburn was significantly less frequent, whereas dysphagia and all other symptom-scores remained unchanged. In the 26 patients reinvestigated manometrically, the resting pressure of the lower oesophageal sphincter was significantly higher following both operations and the residual sphincter pressure upon swallowing higher only after Nissen fundoplication. The amplitude of swallow-induced contractions and the percentages of nonpropulsive and non-transmitted contraction waves were not significantly changed after either operation. In the 23 patients restudied pH-metrically, reflux activity was significantly reduced after both Nissen and Toupet fundoplication.

In patients with reflux disease and impaired distal oesophageal motility laparoscopic Nissen and Toupet fundoplication both yielded satisfactory results and neither operation led to increased dysphagia.

Esophageal/Gastric Surgery-PF185

EVALUATION OF FIBROSIS FORMATION AFTER BOTULINUM TOXIN OR FORCED BALLOON DILATION TO THE LOWER ESOPHAGEAL SPHINCTER. William S. Richardson, M.D., Gladden W. Willis, M.D., James W. Smith, M.D.; Department of Surgery, Alton Ochsner Medical Foundation, New Orleans, Louisiana

It has been postulated that Botulinum toxin injection and forced balloon dilation cause fibrosis to the lower esophageal sphincter making Heller myotomy difficult and increasing risk of esophageal perforation in cases of achalasia. Our aim was to evaluate fibrosis after forced balloon dilation or Botulinum toxin type A injection to the lower esophageal sphincter in swine.

Eighteen 40 to 60 kilogram female swine were divided into three groups of six. Group One was euthanized and their lower esophageal sphincters harvested. Group Two underwent endoscopic injections with 80 mu of Botulinum type A to the lower esophageal sphincter. Group Three underwent forced balloon dilation of the lower esophageal sphincter to 30 millimeters. Group Two and Three were allowed to survive for 30 days, then were euthanized and their lower esophageal sphincters harvested. A single pathologist reviewed the specimens in a blinded fashion and the lower esophageal sphincters were sectioned and H and E and trichrome slides were made. Inflammation was graded from 0 equaling none to 4 equaling ulceration into muscle. Fibrosis was graded 0 equaling none to 3 equaling fibrous tissue replacing muscle. Muscle fracturing was graded none or present. Data is presented as mode (range) and evaluated by Chi square or Fischers exact test as required.

There was no difference in grading by trichrome or H and E prepared slides. In treated animals, there was superficial ulceration with inflammation as well as increased fibrous tissue versus none in the untreated group. There was no muscle fracture detected in any specimens.

Inflammation			Fibrosis		
Group	Mode	P	Group	Mode	P
1	1(0-1)		1	0(0-1)	
2	3(1-3)	0.004	2	1(1-2)	0.004
3	3(1-3)	0.016	3	1(1)	0.008

Botulinum toxin injection and forced balloon dilation cause significant reflux disease in swine. Forced balloon dilation did not cause microscopic evidence of muscle fracture in this model. Forced balloon dilation and Botulinum toxin cause a mild fibrotic reaction.

Esophageal/Gastric Surgery-PF186

LAPROSCOPIC OMENTOPLASTY OF DUODENAL ULCER PERFORATION IN 25 PATIENTS-A RETROSPECTIVE STUDY, DR. DEEPAK SAXENA M.S. DR. SHOBHANA SAXENA M.S., DURGA CHIKITSALAYA, DEPARTMENT OF M.A.S. HOUSING BOARD COLONY KATNI M.P. INDIA 483504

LAPROSCOPIC MANAGEMENT OF DUODENAL ULCER PERFORATION IS PROVED TO BE BETTER ALTERNATIVE TO OPEN SURGERY , AIM IS TO SUPPORT ALREDY ESTABLISHED FACT WITH A SHORT STUDY. WE HAVE DONE LAPROSCOPIC MANAGEMENT OF DVODENAL ULCER PERFORATION IN 25 PATIENTS IN TWO YEARS AND 6 MONTHS. AGE RANGING FROM 21 TO 59 MEAN OF 34 YEARS ALL PATIENTS ARE MALE .

PATIENT PLACED IN LOW LITHOTOMY WITH REVERSE TRENDELENBERG POSTION. SURGEON STANDING IN BETWEEN PATIENT`S LEGS. 10MM UMBLICAL PORT MADE FOR TELESCOPE, THREE 5 MM PORTS MADE IN EPIGASTRIUM (LIVER RETRACTION), LEFT MIDCLAVICULAR (NEEDLE HOLDER) , RIGHAT MIDCLAVICULAR (GRASPER), ONE ADDITIONAL PORT MADE IN LEFT ILEAC FOSSA FOR PALVIC CAVITY LAWAGE AND DRAINAGE, PERFOTATION CLOSED BY 3 FULL THICKNESS INTERRUPTED 2 0 VICRYAL STITCHES TIED OVER A OMENTAL PATCH WITH INTACT BLOOD SUPPLY.

THOROUGH PERITONEAL LAWAGE IS DONE BY WARM SALINE SOLUTION IRRGATION AND ASPIRATION. DRAINS PLACED IN RIGHT SUBHEPATIC, LEFT SUB DIAPHRAGMATIC AND PALVIC CAVITY. POST OPERATIVE MANAGEMENT BY H2 RECEPTOR ANTAGONIST, INTRAVENOUS FLUIDS, NASOGASTRIC SUCTION AND ANTIBIOTICS.

OUT OF 25 PATIENTS ORAL FLUIDS STARTED ON 3RD P.O. DAY IN 22 PATIENTS, 5TH DAY IN 3 PATIENTS. ALL PATIENTS RECOVERED UNEVENTFULLY AND DISCHARGED ON 5TH TO 7TH P.O. DAY. TO CONCLUDE LAPROSCOPIC MANAGEMENT OF DUODENAL ULCER PERFORATION WITH OMENTOPLASTY IS A BETTER ALTERNATIVE TO OPEN SURGERY WITH LOW MORBIDITY. ALMOST ALL PATIENT CAN BE MANAGED LAPROSCOPICALLY AS LONG AS THEY TOLERATE GENERAL ANAESTHESIA.

Esophageal/Gastric Surgery-PF187

COMPLETE FUNDOPLICATION HAS EQUAL LONG-TERM RESULTS IN PATIENTS WITH AND WITHOUT ESOPHAGEAL BODY MOTILITY DYSFUNCTION Yacov Shacham , MS, and Amir Szold, MD. , Endoscopic Surgery Service and the Department of Surgery B, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel.

Background and objective: Partial fundoplication is advocated for the treatment of GERD in patients with poor esophageal body function. The procedure is difficult to standardize and reported to have a high rate of recurrent reflux. We hypothesized that a complete floppy wrap may be as safe in patients with poor esophageal motility.

Methods and procedures: A retrospective, case-control study was performed on patients who underwent a complete fundoplication and had poor esophageal motility (mean esophageal body pressure <50 mm Hg). Study patients were matched with controls who underwent the same procedure with normal esophageal body pressures (>50 mm Hg), according to sex, age, and duration of reflux symptoms. Patients were followed up and interviewed using a modified symptom and life quality questionnaire.

Results: Of 331 patients operated for GERD, 19 were diagnosed with poor esophageal body motility and underwent a complete fundoplication. Matched controls had similar sex distribution, age (55.3 years), and duration of reflux symptoms. The mean esophageal body pressure in the study group was 42.1 mm Hg and 87.5 mmHg in the control group ($p<0.05$). The study and control groups were followed up for 40.3 months (5-66) and 28.4 months (5-68) respectively. Three patients in the study group and 5 controls (NS) had post-operative dysphagia exceeding 4 months. None had persistent dysphagia. Average time to complete resolution of dysphagia was 10.1 weeks in the study and 12 in the control groups. Four study and 5 control patients have mild heartburn requiring no medical care. All patients but one (control) grade their life quality improvement as good to excellent.

Conclusion: Our data suggests that a 360-degree fundoplication has similar long-term results in GERD patients with and without poor esophageal motility. It seems that a standard, floppy 360-degree fundoplication may be performed in all patients for the treatment of GERD, including patients with mild to moderate esophageal body dysfunction.

Esophageal/Gastric Surgery-PF188

LAPAROSCOPIC DISTAL GASTRECTOMY WITH REGIONAL LYMPH NODE DISSECTION FOR GASTRIC CANCER Shinya Tanimura M.D., Masayuki Higashino M.D., Yosuke Fukunaga M.D., Shinichi Taguchi M.D., Satoru Kishida M.D., Miyuki Fujita M.D., Masahiro Nishikawa M.D., Akihito Ogata M.D. Department of Gastroenterological Surgery, Osaka City General Hospital, Osaka Japan

Recently a minimally invasive operation for gastric malignancies has been advocated. Here we performed distal gastrectomy with a regional lymph node dissection on 126 cases (103 with HALS, 23 without HALS: totally laparoscopic) of gastric cancer located in the middle or lower third of the stomach. The dissection of all group 1 and group 2 lymph nodes defined according to the general rules of the Japanese Research Society for Gastric Cancer was completely carried out in these cases. Intracorporeal reconstruction was performed to 99 cases by Billroth 1 method and to 27 cases by Billroth 2 method. The average operation time of the 126 cases was 232 min, which was significantly longer than that of conventional open surgery. The average blood loss was 115 ml, which was significantly less than that compared with an open gastrectomy. Postoperative complications resulted in anastomotic leakage in two patients, anastomotic bleeding in one patient and minor leakage of pancerase juice in four patients; all complications were treated conservatively. Postoperative periods of walking, flatus, oral feeding, and discharge were 1.1 days, 2.6 days, 3.3 days, and 13.0 days, respectively, which were all significantly sooner than that of patients operated on in an open gastrectomy. This technique is not only less invasive, but similarly safe and curative compared with an open gastrectomy.

Esophageal/Gastric Surgery-PF189

TWO CASES OF FIBROMUSCULAR THICKENING TYPE OF CONGENITAL ESOPHAGEAL STENOSIS DIAGNOSED BY ENDOSCOPIC ULTRASOUND SONOGRAPHY. Tetsuya Tomonaga, M.D.1, Kazuo Ishida, M.D.1, Kazunori Furuta, M.D.1, Mitsuhiro Kida, Ph.D.1, Tsuyoshi Takahashi, Ph.D.1, Akira Kakita, Ph.D.1, Goro Kaneda, M.D.2, 1Department of Surgery, Kitasato University Hospital, Kanagawa, Japan. 2Department of Surgery, National Sagamihara Hospital, Kanagawa, Japan.

Congenital esophageal stenosis (CES) includes three types of pathologic condition, namely tracheobronchial remnants, fibromuscular thickening and membranous diaphragm. It is difficult to diagnose the type of CES of a patient. We performed operation or baloon dilation to treat each child with CES after the diagnosis by endoscopic ultrasound sonography (EUS).

Case one: A 10-month-old Japanese girl presenting with post prandial vomiting had a history of congenital esophageal atresia and anal malformation. The esophagogram showed a tapering narrowing portion at the middle esophagus. Upper gastrointestinal endoscopy revealed esophageal circular stenosis located 18cm from an incisor, but gastroesophageal reflux disease (GERD) was not noted. EUS showed the wall of stenotic segment to be circularly thickened without calcification. 24H pH monitoring did not show any evidence of GERD, and pressure of the lower esophageal sphincter was within normal range. Balloon catheter dilation of the stenotic segment was not effective. The patient was diagnosed as having a fibromuscular thickening type of CES, and underwent surgery. Pathological examination confirmed the diagnosis of CES due to fibromuscular thickening. **Case two:** A 15-month-old Japanese boy presenting with post prandial vomiting. The esophagogram showed a tapering narrowing portion at the distal esophagus. Upper gastrointestinal endoscopy revealed esophageal circular stenosis located 21cm from an incisor. EUS showed the wall of stenotic segment to be circularly thickened without calcification. 24H pH monitoring did not show any evidence of GERD. Balloon catheter dilation of the stenotic segment was effective.

EUS was utilized for diagnosing for a type of CES. These cases serve to demonstrate that EUS may be able not only to diagnose a type of CES, but also to decide an operative strategy. It may be possible to perform a thoracoscopic surgery for CES, which is diagnosed of a type by EUS.

Esophageal/Gastric Surgery-PF190

EXPERIENCE WITH SELECTIVE PROXIMAL VAGOTOMY USING LAPAROSONIC COAGULATING SHEARS IN THE TREATMENT OF INTRACTABLE DUODENAL ULCER Kazunori Uchida, M.D., Yoshiteru Ogawa, M.D., Atushi Kodama, M.D., Michimasa Yuba, M.D., Atushi Fujii, M.D. Department of Surgery, Innoshima Medical Associated Hospital, Hiroshima, Japan.

Medical therapy is the treatment of first choice for peptic ulcer. However, in cases of intractable ulcer or poor compliance with drug therapy, long-term treatment is necessary because of recurrence, and patient's QOL suffers. We report a case in which we performed selective laparoscopic vagotomy for intractable duodenal ulcer associated with deformation of the duodenal bulb and obtained favorable results. The patient was a 20-year-old male who was found to have a stage A2 duodenal ulcer during an endoscopic examination of the upper GI tract, and medical therapy was instituted. Despite medical therapy lasting about a year and transient improvement in the patientÕs symptoms in response to PPI administration, laparoscopic selective proximal vagotomy and combined pyloroplasty through a small laparotomy were performed when the symptoms of duodenal ulcer repeatedly worsened after switching to an H2 blocker. No evidence of recurrence was detected during gastroscopy 6 months postoperatively, and gastric fluoroscopy showed good peristaltic movements through the pyloric antrum. The patient's body weight had also increased from 66.5 kg to 70.5 kg. It is now 2 years since the operation, and to date there have been no recurrences, anxiety regarding the ulcer has dissipated, and the patientÕs QOL is good.

Esophageal/Gastric Surgery-PF191

GASTRIC MOTILITY AFTER LAPAROSCOPIC ASSISTED DISTAL GASTRECTOMY, WITH/WITHOUT PRESERVATION OF THE PYLORUS FOR EARLY GASTRIC CANCER AS ASSESSED BY DYNAMIC X-RAY IMAGING, T .Urushihara,Ph.D., Y.Kuroda,Ph.D., F.Kuranishi.Ph.D., M.Nakahara,Ph.D., N.Tokumoto,M.D.,H.Momisako,M.D.,H.Tahara,M.D., Onomichi General Hospital

[Introduction] Laparoscopic assisted distal gastrectomy is indicated for patients with early gastric cancer. Therefore, motor function preserving gastric surgery should be considered for patients with a tumor located the corpus. In this study, we assessed postoperative gastric emptying and motility using dynamic X-ray imaging.

[Patients and Methods] Twenty seven patients with preoperative StageIA gastric cancer underwent laparoscopic assisted distal gastrectomy and D1+ƒ¿ lymphadenectomy between April 1998 and February 2001.∞@All of them were classified according to the criteria of the Japanese Research Society for Gastric Cancer. Seventeen patients (nine men and eight women with a mean age of 69 years) underwent laparoscopic assisted distal gastrectomy without preservation of the pylorus (LADG) for tumors located in the antrum, while 20 patients (ten men and ten women with a mean age of 68 years) underwent laparoscopic assisted pylorus-preserving gastrectomy (LAPPG) for tumors in the corpus. The volume of gastric content was measured by gastrointestinal (GI) X-ray at 0 and 15 minutes to determine gastric emptying ratio, and dynamic X-ray was used every two seconds to obtain the contraction ratio of the pre-anastomotic area and the frequency of peristaltic movement during three minutes to determine the motility index (MI).

[Results] The gastric emptying ratio was 69.6+/-24.2 % for LADG and 44.1+/-19 % for LAPPG, suggesting that gastric emptying was achieved significantly earlier in patients who underwent LADG than in those who underwent LAPPG($P<0.01$). M I was 3.45+/-2.81% for LADG and 8.46+/-2.59% for LAPPG, suggesting that postoperative gastric motility was significantly better in patients who underwent LAPPG than in those who underwent LADG($P<0.001$).

[Conclusion] Our findings indicate that dynamic GI X-ray is useful to evaluate gastric motility after laparoscopic assisted gastric surgery.

Esophageal/Gastric Surgery-PF192

LAPAROSCOPIC NISSEN FUNDOPLICATION AFTER FAILED ENDOSCOPIC GASTROPLICATION. Vic Velanovich, MD. Division of General Surgery, Henry Ford Hospital, Detroit, Michigan

Recently, endoscopic techniques have been developed to treat symptoms of gastroesophageal reflux disease (GERD). One of these techniques is endoscopic gastroplication using the Bard Endocinch^R device. Although an effective technique to alleviate symptoms of GERD, there is a certain failure rate. However, no reports exist as to the feasibility of performing laparoscopic Nissen fundoplication after a failed endoscopic gastroplication.

Seven patients were referred for a laparoscopic Nissen fundoplication with persistent symptoms after endoscopic gastroplication. Five patients had typical symptoms of GERD; two had atypical symptoms. All patients had documented pathologic acid reflux by 24 hour esophageal pH monitoring and a hypotensive lower esophageal sphincter pressure. In six of the seven patients, a laparoscopic Nissen fundoplication was completed without difficulty. One patient required conversion due to poor visualization. There were no major or minor complications. Postoperatively, the five patients with typical symptoms had resolution of their symptoms, while the two patients with atypical symptoms did not feel that their symptoms were relieved.

Laparoscopic Nissen fundoplication is feasibility and presents little technical difficulty. As with *de novo* laparoscopic fundoplications, patients with typical symptoms are more likely to achieve symptomatic improvement compared to patients with atypical symptoms.

Esophageal/Gastric Surgery-PF193

PYLOROPLASTY WITH LAPAROSCOPIC FUNDOPLICATION IN THE TREATMENT OF GASTROESOPHAGEAL REFLUX DISEASE ASSOCIATED WITH PREOPERATIVE BLOATING Vic Velanovich, M.D., Department of Surgery, Henry Ford Hospital, Detroit, Michigan

Bloating is not only a common preoperative symptom associated with gastroesophageal reflux disease (GERD), but also is an untoward symptom of antireflux surgery. It has been shown that patients who undergo either laparoscopic or open Nissen fundoplications have improved gastric emptying as determined by gastric scintigraphy, hence patients do not require a pyloroplasty to improve the antireflux effect of a fundoplication. However, it is unclear whether antireflux surgery alone improves symptoms of patients suffering from bloating in addition to their reflux symptoms. This study reports data on the effect of pyloroplasty on bloating symptoms in conjunction with a laparoscopic fundoplication.

During preoperative evaluation, all patients are queried as to associated symptoms of GERD. Those patients who report bloating as a significant component of their symptom complex were further evaluated with gastric emptying scintigraphy. All patients completed a preoperative symptom severity questionniare for bloating (best possible score 0, worst possible score 5). All patients who had delayed gastric emptying and who were candidates for antireflux surgery, then underwent either a laparoscopic Nissen or Toupet fundoplication with pyloroplasty. At 6 weeks or more follow-up, patients completed the questionnaire and underwent another gastric scintigraphy.

21 patients underwent the combined procedures. 81% reported improved or resolved bloating symptoms, in addition to improved or resolved reflux symptoms. There was a median improvement in bloating score from 4 to 1 ($p<0.05$). The average gastric emptying time improved from 240 (s.d. 141) mins. to 118 (s.d. 52) mins. ($p<0.05$).

Although pyloroplasty is not required to improve the effect of antireflux surgery on reflux symptoms, it does improve bloating symptoms in patients with preoperative bloating and delayed gastric emptying.

Esophageal/Gastric Surgery-PF194

LAPAROSCOPIC HELLER MYOTOMY WITH BOLSTERING PARTIAL FUNDOPLICATION FOR ACHALASIA. Leonardo Villegas, M.D, Robert Rege, M.D, Daniel Jones, M.D, Southwestern Center for Minimally Invasive Surgery, UT Southwestern, Dallas.

Background: The ideal antireflux procedure following laparoscopic Heller myotomy for achalasia is controversial. We present a technique of partial fundoplication bolstering the myotomy laparoscopically.

Methods: Between August 1998 and August 2001, eight patients (5 females and 3 males, median age 40 years) underwent a laparoscopic Heller myotomy with bolstering partial fundoplication. Barium swallow and manometry studies were consistent with achalasia. Failed medical treatment included: balloon dilatation, botulinum injection and calcium channels blockers. The preoperative weight loss was 33 lbs. (range 10-50) with mean of symptoms of 29 months (range 12-72). 71% patients had reflux.

Results: Myotomy was confirmed using endoscopic guidance. Partial fundoplication was performed with the edge of the myotomy on the right and left side sutured to the stomach covering the myotomy. No conversion was required. One patient had a perforation recognized, repaired and bolstered. Mean operative blood loss was 72 cc (r, 30-150). Mean operative time was 4 hours. Patients resumed solids at 2.5 days (range 2-5). Postoperative complications include: subcutaneous emphysema (n=1), pneumotorax (n=1), umbilical port hernia (n=1). No patient had reflux symptoms at 3 months follow up.

Conclusion: Laparoscopic Heller myotomy with posterior partial fundoplication is technically feasible and effectually prevents reflux. Bolstering the myotomy may help heal small esophageal perforations.

Esophageal/Gastric Surgery-PF195

COMPARISON OF LAPAROSCOPIC AND OPEN GASTRECTOMY FOR MALIGNANT DISEASE Kaare Weber, MD*; Christine Reyes, MD*; Michel Gagner, MD*; Celia Divino MD^ , *Div of Lap Surg, Mt Sinai Medical Center, ^Div of Min Inv and Lap Surg, Maimonides Medical Center

Few studies have examined a totally laparascopic approach to partial gastrectomy for malignancy. This study compares the outcome of a series of totally laparoscopic cases with matched open surgeries for the treatment of malignant gastric disease.

A retrospective case-matched study was performed for 25 patients (12 laparoscopic, 13 open). A cohort of open cases performed during the same time period was used for comparison. Parameters measured include intraoperative and postoperative details as well as survival. Statistics were calculated with Two-Sameple t-, Fischer exact, and Chi-square tests where appropriate.

Although operative time was increased with laparoscopy($p=0.004$), laparoscopy resulted in less blood loss($p=0.03$). There was no difference in postoperative use of a NG tube($p=0.82$) but patients in the laparoscopic group had earlier return to bowel function($p=0.002$). Length of stay was also shorter($p=0.001$). In both groups, stage of malignancy ranged from I-IV with no statistical difference. Resected margins in the laparoscopic group were free of tumor, whereas two cases (stage II and III) in the open group had positive margins. Extent of lymphadenectomy was comparable with the average number of nodes resected being 8 (range 4-14) and 11 (range 2-21) for the laparoscopic and open groups respectively($p=0.29$). Early follow up at 18 months shows no difference in survival with 75% and 77% of patients alive in the laparoscopic and open groups respectively($p=0.91$).

A totally laparoscopic approach to partial gastrectomy is a viable alternative to open surgery. Benefits include a more rapid return of bowel function and reduced length of stay. Laparoscopic techniques for gastric malignancy can obtain adequate margins and follow oncologic principles. Short term follow up shows no difference in survival. However, more time is required to determine any survival advantage between the open and laparoscopic approach to partial gastrectomy for malignant disease.

Esophageal/Gastric Surgery-PF196

ESOPHAGOGASTRIC FISTULA AS A RARE CAUSE OF FAILURE OF LAPAROSCOPIC NISSEN FUNDOPLICATION Erik B. Wilson, M.D., Stephen W. Abernathy, M.D., B. Camazine, M.D., R. D. Shaffer, M.D., Philip L. Leggett, M.D., Olin E. Teague Veterans Hospital, Texas A&M University Health Science Center, Temple, Texas, Houston Northwest Medical Center, University of Texas-Houston Health Science Center, Houston, Texas

Introduction: Success rates of laparoscopic Nissen fundoplication are reported to be greater than 90% in most large series. Failures are due to technical errors resulting in displaced repair, paraesophageal herniation, or overly tight fundoplication. Diagnostic errors can also lead to failure due to an unrecognized motility disorder or shortened esophagus. Recurrent reflux, dysphagia, or bloating remain the most common complaints in patients who have undergone a failed antireflux procedure.

Case Report: A 43 year old male presented with chronic recurrent reflux despite a previous laparoscopic Nissen fundoplication. His symptoms improved for six months after surgery but then became unresponsive to medical management. Preoperative endoscopy revealed an apparent esophagogastric fistula with a "double lumen esophagus." Multiple biopsies revealed Barrett's metaplasia. The patient underwent resection of the esophagogastric fistula through a left thoracotomy. A Collis-Nissen fundoplication was performed to alleviate reflux. At six months, esophagogram showed no recurrent fistula. To date the patient reports marked improvement of his symptoms.

Conclusion: Only five cases of esophagogastric fistula associated with previous Nissen fundoplication have been reported in the literature. Mechanisms postulated to cause esophagogastric fistula formation include ischemia, necrosis, and microperforation secondary to surgical dissection or suture disruption leading to esophageal ulceration and erosion into the gastric fundus. This case represents the first report of successful surgical correction of an esophagogastric fistula.

Esophageal/Gastric Surgery-PF197

LAPAROSCOPY ASSISTED PROXIMAL GASTRECTOMY FOR EARLY GASTRIC CANCER Toshiki Yamashita M.D., Kazuyuki Kojima M.D., Mikito Inokuchi M.D., Yoshinori Shirota M.D., Kenji Shitara M.D., Satoru Takenaka M.D., Zenro Nihei M.D., Kenichi Sugihara M.D. Tokyo Medical and Dental University, Digestive Surgery

We employed the laparoscopy assisted proximal gastrectomy with regional lymph node dissection for early stage of gastric cancer in upper third of stomach. A new surgical technique is introduced and its use in seven patients on reported.

Methods: The origin of left gastric artery and left gastroepiploic vessels were clipped and divided, greater and lesser curvature side of the proximal gastric wall were dissected with regional lymph node. The abdominal esophageal wall were mobilized and upper third of the stomach was resected by ENDO GIA tm. The resected stomach in ENDO CATCH II tm was brought up through ENDOPATH tm trocar (33mm in diameter). Reconstruction was made by residual gastric tube in use of PROXIMATE tm ILS inserted through 33mm ENDOPATH tm.

Results: We have conducted such operation for 7 patients. Mean operation time was 263min and blood loss was 217ml in average. We have encountered no severe complications with postoperative hospital stay of 17days. Postoperative pain was slight and patient had early bowel movement.

Conclusions: Laparoscopy assisted proximal gastrectomy with lyphadenectomy is feasible for early gastric cancer located in upper third of the stomach. This procedure may be safe, curative, and minimal invasive procedure.

Esophageal/Gastric Surgery-PF198

RESULTS OF LAPAROSCOPIC GASTRIC BANDING FOR OBESITY CONSIDERING THE PORT FUNCTION Nedim Yüsel, MD; Michael Korenkov, MD; Lothar Köhler, MD; Guido Grass, MD; Stefan Sauerland, MD; Peter Goh, MD; Hans Troidl, MD, Surgical Clinic, 2nd Department of Surgery, University of Cologne, Germany and Surgical Clinic, Hospital Grevenbroich, Germany

Background: Laparoscopic adjustable gastric banding (LGB) has gained wide popularity due to its minimally invasiveness and the ability of band adjustment. However, information on port function is limited.

Methods: In a prospective non-randomized comparative study, we analysed port function and related symptoms in an initial series of 50 patients underwent LGB. In 11 patients, the port was placed subcutaneously in the subxiphoid region. In 39 patients, the port was implanted at the in the left upper abdomen at the 18-mm trocar site. Patients were examined in 6 weeks intervals during the first 6 months, and subsequently every 6 months.

Results: From July 1997 to August 2000, 50 consecutive patients (12 males and 38 females) with a BMI 48,4 kg/m2 ±6,4 (mean; SD) were operated. Follow-up was complete for 48 patients (median duration 22 months). Eight women and three men underwent subxiphoidal port implantation. Male patients had no problems with the port, but one complained that the contours of the port were visible. Seven out of eight women reported pain and inconvenience connected with wearing a brassière. Two women underwent port reimplantation in the left upper abdomen (one due to infection; one due to pain). All 11 patients hade no problems with port punction. Among the 39 patients with port implantation in the left upper abdomen, nine patients required port correction (two of them twice). The causes were port dislocation (four patients), difficult punction (three), tube leakage (two after wrong punction, one perforation through connected pin), and infection (one). In two cases, the port was replaced, in other cases the local correction was performed.

Conclusion: The high number of complications suggests that the port is the Achilles' heel of LGB. Although punction was easier at the subxiphoid site, this implantation technique frequently causes pain in female patients.

Flexible Diagnostic & Therapeutic Endoscopy-PF199

THE STRETTA PROCEDURE: REVIEW OF CATHETER AND TECHNIQUE EVOLUTION, EFFICACY, AND COMPLICATIONS TWO YEARS AFTER INTRODUCTION. Keith S. Gersin, MD, Robert D. Fanelli, MD, Department of Surgery, University of Cincinnati, Cincinnati, Ohio Department of Surgery, Berkshire Medical Center, Pittsfield, Massachusetts

Background: The Stretta procedure is an endoluminal technique for the treatment of GERD, which delivers temperature-controlled radiofrequency energy to the gastroesophageal junction. Stretta has been available for 2 years, with the expected evolution in the device and technique. Technique improvements, procedural efficacy and complications are reviewed.

Methods: Review of our experience with Stretta regarding equipment and technique evolution, clinical data from 7 published studies, and the FDA adverse event reporting database.

Results: The Stretta catheter now incorporates a guide-wire lumen, facilitating insertion and positioning. Balloon inflation pressure is 2.5 psi, limiting balloon migration, patient discomfort, and over-dilation. In published reports, 75% of patients are off all medications for GERD by 6 and 12 months. GERD symptoms and patient satisfaction, as measured by the GERD-health related quality of life survey, are improved significantly at 6 or 12 month follow-up ($p<0.05$). Symptom score improvement is superior to that of baseline drug therapy. Patient quality of life is improved in all studies ($p<0.05$) as measured by the Short Form-36. Esophageal acid exposure is improved at 6 and 12 month follow-up, with 1 study reporting a decrease in median % time pH < 4 from 11.7% to 4.8% ($p < 0.0001$). In 1800 cases, the adverse event rate is 0.6%. There has been a decline in the incidence and severity of events upon device and technique enhancement implementation and reinforcement of physician training. There have been no cases of stricture, persistent dysphagia, or achalasia.

Conclusion: The Stretta procedure is an effective intervention for the treatment of GERD. The adverse event rate has declined sharply, due to device enhancements, appropriate patient selection, and rigorous physician training, and is well within the acceptable range for esophageal procedures. We currently offer this procedure as part of our algorithm for the treatment of GERD.

Flexible Diagnostic & Therapeutic Endoscopy-PF200

USEFULLNESS OF TOTAL COLONOSCOPY AND ENDOSCOPIC POLYPECTOMY IN HEMODIALYSIS PATIENTS. Masanobu Hagiike M.D., Yoshiaki Nakabayashi M.D., Yoshihiro Watanabe M.D., Katsuhiko Aoki M.D., Takashi Maeba M.D., Hajime Maeta M.D.Nakabayashi Hospital and Department of Surgery, Kagawa Medical University, Japan.

Objectives; The proportion of patients with colon cancer is higher in the hemodialysis patients (HD) than in the general population (GP). Endoscopic polypectomy substantially reduces the incidence of colorectal cancer compared with that expected in the GP. The aim of this study is to assess the usefulness of colonoscopy and endoscopic polypectomy in HD.

Methods; From January 1999 through December 2000, 678 patients underwent colonoscopy, and 10 patients (8 men and 2 women) were referred for hemodialysis. The patient demographics (age and gender), chief complaint (constipation, positive occult blood test and history of previous polyps), colonoscopic findings (proportion with polyps and number of polyps) and histological findings (hyperplastic, hamartomatous, inflammatory, neoplastic and cancer) of the HD were compared with that of the GP retrospectively.

Results; Patient demographics and chief complain were not different between HD and GP. Proportion with polyps in HD was significantly higher than that in GP (90% vs. 47%; $p=0.007$). The number of polyps in HD was 1.9 +- 1.1 (vs. 1.68 +- 0.9 in GP; NS). Histological types in HD were 3 hyperplastic polyps, 15 neoplastic polyps and 1 carcinoma. Proportion of polyps, which have malignant potential in HD, was significantly higher than that of the GP (84% vs. 62%; $p=0.003$).

Conclusion; The proportion of patients with colon polyps was higher in the HD than in the GP. Most of the histological type in HD was neoplastic polyp. There is a possibility to reduce the incidence of colorectal cancer in the HD by colonoscopy screening and colonoscopic polypectomy.

Flexible Diagnostic & Therapeutic Endoscopy-PF201

ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY AND PAPILLOTOMY FOR BILE DUCT STONES IN PATIENTS 80 YEARS OLD AND OLDER-A SAFE PROCEDURE Hazzan David^, M.D., Geron Nessim^,M.D.,Finkelberg Dimitri*,M.D., Vaissler Alexander*,M.D., Reissman Petachia,M.D. and Shiloni Eitan^,M.D., ^Department of Surgery B, Carmel Medical Center, Haifa, Israel., *Gastroenterology Unit, Carmel Medical Center, Haifa, Israel., Department of Surgery B, Hadassah University Hospital, Jerusalem, Israel.

Objective: To assess the outcome of Endoscopic Retrograde Cholangiography(ERC) and Papillotomy in the treatment of bile duct stones in patients 80 years old and older.

Patients and Methods: All consecutive patients who were 80 years old and older and underwent ERC and papillotomy due to choledocholithiasis, were evaluated. Data analysis include patients age, gender, indication for the procedure, comorbid condition, ASA score, morbidity and mortality.

Results: 37 patients (21 female and 16 male) of a mean age of 86 years old (range 80-90) were evaluated. 15 patients(40.5%) underwent ERC and papillotomy due to obstructive jaundice, 11 patients(29.7%) due to Acute pancreatitis, 6 patients(16.2%) due to Ascending cholangitis and 4 patients(10.8%) due to Acute cholecystitis and concommitant choledocholithiasis.27 patients(73%) had a preoperative ASA of 3 or 4.

15 patients(40.5%)underwent ERC and papillotomy before Laparococpic cholecystectomy was done, 21 patients(56.7%) were treated by ERC and papillotomy as a definitive treatment and 1 patient(2.7%) underwent the procedure after laparoscopic cholecystectomy. 8 patients(21.6%) had a normal ERC. Complications occurred in 3 patients(8.1%).Two patients developed acute pancreatitis and one patient upper gastrointestinal bleeding. There was no mortality.

Conclusions: ERC and papillotomy is safe and effective for the treatment of choledocholithiasis in patients 80 years of age and older.

Flexible Diagnostic & Therapeutic Endoscopy-PF202

IS GASTROSCOPY A VALID DIAGNOSTIC TOOL IN DETECTING GASTRIC MALT LYMPHOMAS; A DILEMMA BEYOND THE EYE, Nickos G Kelessis MD.,PhD, Pericles P Vassilopoulos MD, FACS, Mary N Bai MD, Klisthenis G Tsamakides MD, Shmuel Avital MD, Raul Rosenthal MD, Department of General Surgery, Minimally Invasive Section, Cleveland Clinic Florida, Weston Florida., Gastroenterology department Saint Savvas Anti Cancer Hospital Institute, Athens Greece., Pathology department, Ioannina Medical School Ioannina, Greece

Objectives: Primary gastric MALT lymphomas are a distinct entity with an indolent clinical course and biologic behavior. They account for 2-8% of all gastric malignancies. We conducted this study to demonstrate the accuracy of gastroscopy in diagnosing gastric MALT lymphomas. We compare our results with those of the world literature.

Methods: Sixty-three consecutive patients with gastric MALT lymphomas were retrospectively reviewed between January 1978 to December 1997. There were 63 patients (36 males and 27 females) with a mean age of 53 years (range 20-80 years). All patients underwent a standard diagnostic evaluation including esophagogastroduodenoscopy and biopsy. Patients were staged according to the revised Musshof modification of the Ann Arbor classification system and histologic evaluation was made according to Isaacson classification system for gastric MALT lymphomas.

Results: According to endoscopic findings, the antrum harbored the neoplasm in 31 patients (49%), the body in 38%(twenty four patients) the fundus in 4%(3 patients) while in five patients (8%) the neoplasm occupied the entire stomach. Macroscopic appearance was not pathognomonic of the disease. At endoscopy three main patterns were recognized, a) ulcerative in 32 patients (51%), b) polypoid in 21 patients (33%), and c) diffuse ifiltrative in 10 patients (16%). The neoplasm was characterized as a benign disease in twenty-four patients (38%) with malignancy being suspected in thirty-nine patients (62%). Endoscopy displayed a sensitivity of 61% in detecting malignancy, however in detecting lymphomas the sensitivity dropped to 27%.

Conclusion: Upper endoscopy has a low sensitivity in defining MALT gastric lymphomas from other gastric benign and malignant pathologies only by its gross morphological appearance. Endoscopic pattern of MALT lymphoma is not disease specific and may mimic other various pathologies of this area. Final diagnosis should be confirmed only by histological examination.

Flexible Diagnostic & Therapeutic Endoscopy-PF203

COLONOSCOPY IN OCTOGENARIANS Jorge Lagares-Garcia, MD; Seth Rosen, MD; Eric Weiss, MD; Juan Nogueras, MD; Anthony Vernava III, MD; Jonathan Efron, MD; Steven Wexner, MD, Cleveland Clinic Florida, Weston, FL

Colonoscopy in octogenarians is a safe diagnostic and therapeutic tool. The 4% rate of endoscopic findings of colon cancer is significantly higher than in other age categories. The objective of this study was to evaluate if previous endoscopy performed in octogenarians decreases the likelihood of a diagnosis of carcinoma in subsequent exams.

A retrospective review of patients >80 years of age that had colonoscopy between June 1999 - June 2001 was performed. Age, gender, medications, indications, procedural demographics and complications, completion rates and endoscopic and pathologic findings were recorded. Single or multiple polyps, <1 or >1cm in size were also recorded. These patients were divided into 2 groups: those with a recorded previous endoscopic exam (Group A) at our institution and those without prior endoscopic examination (Group B).

244 patients had colonoscopy during the study period; 49% were female. There were 89 (36.5%) patients in Group A and 155 (63.5%) in Group B. Complications, mortality and completion rate were 4%, 0% and 94%, respectively. Biopsy-proven cancer was diagnosed in 11 patients (4.5%). Females less often had a previous endoscopy (29%) compared to males (43%) ($p=0.03$). The use of medications that can cause bleeding diathesis was not significant between the groups ($p>0.05$). Bloody stool or change in bowel habits were more common indications in Group B ($p<0.05$), whereas patients in Group A were more likely to have a history of polyps or carcinoma ($p<0.05$). All 11 patients diagnosed with cancer had never had prior endoscopy ($p=0.008$). Single or multiple polyps and polyps >1cm were not statistically significant between the two groups, however polyps <1 cm were more prevalent in Group A (45%) than B (31%).

Colonoscopy is a safe method of invasive examination in octogenarians. A single prior endoscopy performed in this group of patients greatly decreases the likelihood of malignant findings on subsequent examinations.

Flexible Diagnostic & Therapeutic Endoscopy-PF204

REMOVAL OF ESOPHAGEAL EXPANDABLE METAL STENT: DESCRIPTION OF TECHNIQUE AND REVIEW OF POTENTIAL APPLICATIONS Donald E. Low, M.D., Richard A. Kozarek, M.D., Departments of Thoracic Surgery and Gastroenterology, Virginia Mason Medical Center, Seattle, Washington

BACKGROUND: Expandable metallic stents (EMS) have seen wide application in patients with malignant stricture and fistulae. They have not seen wide application in benign disease due to concern over acute complications and long-term sequelae.

METHODS: Between June 1999 and October 2000 six patients with EMS in place for malignant stricture (3), benign stricture (1), anastomotic leak (1) and benign esophagorespiratory fistula (1) had their stents endoscopically removed. Removal was carried out secondary to complications (secondary stricture 1, epidural abscess 1, diskitis 1) or resolution of fistula (2) or anastomotic leak (1).

RESULTS: Four patients had one EMS, Ultraflex (3), Z-stent (1). Two patients had 2 stents (Ultraflex and Z-stent) retrieved simultaneously. No procedurally related complications occurred. Two patients with esophageal cancer required additional stents. All three patients with benign fistula and stricture recovered uneventfully.

CONCLUSIONS: The safe removal of current brands of EMS may fascilitate the wider application of these devices to include selective patients with benign disease.

Flexible Diagnostic & Therapeutic Endoscopy-PF205

CAUSTIC INJURY OF THE UPPER GASTROINTESTINAL TRACT - A TWENTY YEAR EXPERIENCE IN AN URBAN HOSPITAL. Tim McGuire, M.D., Choichi Sugawa, M.D., Charles E. Lucas, M.D., Satoshi Tokioka, M.D., Department of Surgery, Wayne State University, Detroit, Michigan.

Caustic injury to the alimentary canal continues to be a challenging problem requiring emergency medical and/or surgical intervention. Over the last 20years, 55 adult patients were admitted and treated for the ingestion of caustic materials. Injured patients underwent early endoscopic evaluation. Ingested materials and severity of injury varied according to ingested agent.

Extent and Severity of Injury

	Esophagus		Stomach		Duodenum	
	Mild	Severe	Mild	Severe	Mild	Severe
Strong acid (9 pts)	2	3	2	6	3	0
Strong alkali (22 pts)	7	12	6	11	2	3
Bleach, ammonia And detergent (21 pts)	12	1	6	1	4	0
Others (3 pts)	3		1		1	

Grade 1 (erythema) = mild
Grade 2 (superficial ulceration) = severe
Grade 3 (deep ulcer or perforation) = severe

There were no complications due to endoscopic examination. Fortyfive patients were treated non-operatively and ten patients required operations. No patient who had ingested bleach, ammonia, detergent, or other substances required surgery. Conclusion: (1) Panendoscopy after caustic ingestion can be performed safely. (2) The ingestion of strong acid or alkali may produce profound pathologic changes which may require surgery for perforation or stricture. (3) Bleach, detergent, or ammonia usually cause mild injuries which respond well with medical treatment.

Flexible Diagnostic & Therapeutic Endoscopy-PF206

COMPARISON OF SURGICAL VERSUS ENDOSCOPIC PALLIATION OF PANCREATIC CANCER Mario Murcia MD, Gerald Larson MD, Jose Sorrentino MD, Gary Vitale MD, Dept. of Surgery, Univ. of Louisville, KY

For 60-70% of patients (pts) with cancer of the head of the pancreas, palliation is the treatment objective. We have frequently been consulted to perform interventional endoscopy in non-resectable cases to relieve symptoms, especially jaundice. The purpose of this study is to compare surgical versus endoscopic treatment.

Methods -We reviewed our registries for pts treated for pancreatic cancer from 1990 –2000. 129 pts were identified and grouped according to treatment intent; Group I-open surgical with choledochojejunostomy and/or gastrojejunostomy (47 pts), Group II- endoscopic with biliary stenting (33 pts). Twenty-nine pts who had curative resection and 21 pts with terminal disease were excluded from the study. Relief of jaundice, obstruction, weight loss, and pain were analyzed 1, 3, 6, and 12 months.

Results – The mean age of the pts was 65 years. The average survival in months was: Group I (surgical) 5.6± 4.8%, Group II (endoscopic) 5.7± 5.4%. The complication rates for Groups I and II were 21% and 12% respectively. All pts presented with jaundice and most noted weight loss, pain, and anorexia. For Group I, jaundice relief was 75% and 80% at 3 and 6 months versus 82% and 87% for Group II. Pain and weight loss were similar in the surgical and endoscopic groups and persisted until pt death. One pt in the endoscopic group II developed duodenal obstruction and was treated with endoluminal stenting. Group II stent changes at 3 month intervals were frequently necessary to prevent clogging or cholangitis.

Conclusion – Endoscopic stenting is as effective as surgical bypass to relieve jaundice but neither has much impact on pain and weight loss. An advantage for endoscopy is a lower complication rate and less time in hospital. We conclude that endoscopic palliation of pancreatic cancer is as effective as the open surgical procedures.

Flexible Diagnostic & Therapeutic Endoscopy-PF207

INTRAOPERATIVE ENTEROSCOPY IN THE EVALUATION OF SMALL BOWEL DISEASE: INDICATIONS AND TREATMENT ALGORITHM FOR THE SURGEON Matthew E. Newlin M.D., Michael Taxier M.D., Oscar R. Ruiz M.D., Departments of General Surgery and Gastroenterology, Riverside Methodist Hospital, Columbus, Ohio

Introduction: Intraoperative enteroscopy (IOE) represents a final modality for the evaluation of the small bowel when other modalities have failed to provide a diagnosis. This paper addresses the surgeon and his/her role in the use of IOE to evaluate occult gastrointestinal bleeding, radiographic abnormalities, or obstructive lesions in the small bowel.

Methods & Procedures: A literature search and review was performed and recent case studies involving the use of intraoperative enteroscopy were reviewed. The authors review the technique and indications for IOE, describe two pertinent case reports involving the use of IOE, and develop an algorithm for the use of IOE by the surgeon.

Results: Literature reviews and two specific case reports demonstrate the theoretical and practical principles of IOE.

Conclusions: The intraoperative endoscopic evaluation of the small bowel is safe and effective when used in managing highly selected patients with GI bleeding, obstruction, or radiographic abnormalities. When used appropriately and with a team approach that involves both the endoscopist and surgeon, video enteroscopes, and locally agreed-upon algorithms, intraoperative enteroscopy can help assure successful management of several difficult clinical problems.

Flexible Diagnostic & Therapeutic Endoscopy-PF208

THE TREATMENT OF UNRESECTABLE ESOPHAGEAL CANCER WITH SELF-EXPANDING STENTS. Jaroslav Sekac, M.D., Vladimir Kostka, M.D., Peter Labas, M.D., PhD., Bernard Ohradka, M.D., PhD., Richard Reis, M.D.

Department of Surgery, Bratislava, Slovak republic

Relief of dysphagia and restoration of oral alimentation must be the main aim of patients with esophageal cancer, which have locally advanced or metastatic disease. A new class of expandable metallic stents has been developed in an attempt to reduce the complications known to be associated with rigid tubes. The aim of this study is to compare classic rigid tubes with placement of expanding metal stents with regard to improvement of dysphagia, therapy associated complications, effectiveness and costs.

In the period of the last 12 months we treated at our surgical endoscopic unit 6 patients with unresectable esophageal tumors. At 3 patients /group 1/ we introduced rigid stent and at 3 patients /group 2/ we introduced self expandable metallic stent. All cases were performed by surgeons. We evaluated treatment efficacy on the basis of improved dysphagia, hospital day,complications and costs.

Both treatments were able to significantly improve dysphagia. No treatment related death was observed in both groups. One patient required conversion to laparotomy and preoperatively we replaced rigid stent because of perforation of esophagus and stomach.

The treatment of unresectable esophageal cancer with self expanding metallic stents appears to be simple, safe method.

Flexible Diagnostic & Therapeutic Endoscopy-PF209

THE ROLE OF FLEXIBLE THERAPEUTIC ENDOSCOPY (FTE) AND INTERVENTIONAL RADIOLOGY (IVR) FOR THE HEPATO-BILIARY-PANCREATIC (HBP) SURGICAL DISEASE Kentaro Yamagiwa M.D., Junji Iwasaki M.D., Masako Mori M.D., Taku Iida M.D., Shintaro Yagi M.D., Kenji Hamada M.D., Kouji Fujii M.D., Shugo Mizuno M.D., Makoto Iwata M.D., Masami Tabata M.D., Hajime Yokoi M.D., Shuji Isaji M.D. First Department of Surgery, Mie University School of Medicine

FTE and IVR have been recently advanced and applied to an alternative treatment of HBP surgical disease, and managements for perioperative complications of HBP surgery. We report our experience of FTE and IVR for HBP surgical disease in the last 7 years. From July 1994 through June 2001, in our department of Mie university hospital, the medical records of 546 patients (malignancy 289, benign 257) with HBP surgical disease were reviewed. Out of 546 patients, 498 operations including 192 of hepatic resections, 59 of pancreatoduodenectomy, 247 of other surgery, 32 of FTE and 28 of IVR, were performed. Out of 32 cases with FTE, 19 (59.4%) of endoscopic sphincterotomy for common bile duct (CBD) stone, calculous chronic pancreatitis and foreign body in CBD, 7 of lithotomy under percutaneous transhepatic cholangioscopy for biliary tract stones, 3 with insertion of expandable metallic stents (EMS) for stenosis of CBD, 2 with removal of splint tubes in the anastomosis, one case with endoscopic resection of papilla Vater carcinoma complicated with severe bronchial asthma, were performed. We finally made a success of all procedures of FTE, but a case of calculous chronic pancreatitis was complicated by basket impaction. Out of 28 cases with IVR, 16 (57.1%) of insertion of EMS for obstruction of biliary tracts due to malignancy or postoperative complications (15 via transhepatic route and one via transenteric), 8 (28.6%) of insertion of EMS for stenosis of portal vein without collateral circulation due to malignancy including 3 cases with emergent lower intestinal bleeding, or complication after portal venous anastomosis. All procedures with insertion of biliary EMS by IVR were succeeded, but 2 cases of portal venous EMS were complicated by thrombosis. The recent advanced technique of FTE and IVR play an important role in minimally invasive treatment for complicated patients of HBP surgical disease and complications after HBP surgery.

Flexible Diagnostic & Therapeutic Endoscopy-PF210

COMPARISON OF ENDOSCOPIC SCLEROTHERAPY VERSUS ENDOSCOPIC LIGATION OF ESOPHAGEAL VARICES Daniel Ziegler, Charles Webber,Jr.,M.D., Fernando Garcia,M.D. Caren Eisenstein,M.D.,David McReynolds,M.D., Geno Tellez,M.D., Tom Connors,M.D., John Peter Smith Hospital, Department of Surgery

Introduction: Esophageal variceal bleeding is a serious sequela of liver disease. Endoscopic sclerotherapy and endoscopic ligation (banding) are accepted treatments of varices and recommended for the prevention of rebleeding. The purpose of this study is to determine if one is more efficacious.

Method: Retrospective analysis from 1992 to 2000 of patients presenting with acute bleeding from esophageal varices and treated with either endoscopic sclerotherapy or banding at an indigent care hospital. Patients had a minimal follow up of one year.

Results: There were 101 patients treated with sclerotherapy and 80 patients treated with banding. There was no difference in the incidence of variceal rebleeding, 34% for sclerotherapy and 32.5% for banding. Obliteration of the varices and survival was achieved in 17 patients (17%) with sclerotherapy and in 21 (26%) with banding. There was no difference in the rate of non-compliance with scheduled follow-up endoscopy exams between the two groups, 29% and 28%. The mortality was 34% in the sclerotherapy group and 24% in the banding group. Patients in the banding group with Child-Pugh class C had a significant lower mortality rate, 36%, than patients in the sclerotherapy group with class C, 63%, $p < .05$. When combining the two treatment groups, there was significantly less rebleeding in patients with Child-Pugh class A compared to class B and C, 20% versus 36% and 38%, $p < .05$.

Conclusion: Both sclerotherapy and banding can be used to treat varices but will have a 30% recurrent bleeding rate. Child-Pugh class A patients are more likely to be successfully treated than patients in class B and C. Banding in patients with class C may have a reduced mortality rate when compared to sclerotherapy. Compliance is a difficult issue in indigent care. Further studies are needed to determine which method of treatment is best suited for this patient population.

Hepatobiliary/Pancreatic Surgery-PF211

STRATEGY OF LAPAROSCOPIC HEPATECTOMY FOR EXTRAHEPATIC GROWING TUMOR, Sumito Takagi, M.D., Hironori Kaneko, M.D., Akira Tamura, M.D., Kunihiro Yamazaki, M.D., Masaaki Yoshino, M.D., Masaru Tsuchiya, M.D., Naoki Joubara, M.D., Yuichiro Otuka, M.D., Toshio Katagiri, M.D., Tesuya Maeda, M.D.,Tadaaki Shiba, M.D., Second Department of Surgery, Toho University, School of Medicine, Tokyo, Japan.

INTRODUCTION: The purpose of this study was to evaluate the varying difficulties and required instrumentation for performing laparoscopic hepetectomy (LH) on the basis of a lesion∞fs extrahepatic growing (EG) rate calculated by computed tomograpy (CT).

METHODS AND PROCEDURES: Lparoscopic partial hepatectomy cases were divided into two groups: an EG tumor group (n=10) and an intrahepatic tumor group (n = 8). The surgical procedures, operative results, and laparoscopic instrumentation were compared between these groups based on the EG rate (%; maximum diameter of tumor pedicle/maximum vertical diameter of tumor x100).

RESULTS: In the EG tumor group, mean operative time was significantly shorter and the mean blood loss was significantly less than in the intrahepatic tumor group. In addition, mean operative time and mean blood loss demonstrated significant differences between the values associated with the different EG rates in the EG tumor group ($p<0.05$, $p<0.01$). The selections of laparoscopic instruments based on the EG rates were; 1) 50%∞† resection in combination with a microwave tissue coagulator and an ultrasonic surgical aspirator [12 cases (including intrahepatic tumor cases)] 2) 51-200% resection with laparosonic coagulating shears (4 cases) 3) 201%∞… resection with a laparoscopic linear stapler (2 cases).

CONCLUSIONS: Our preliminary experience leads us to believe that the EG rate calculated by CT scan is useful for formulating the technical strategy of a subsequent LH procedure.

Thoracoscopy-PF212

HIGHLY SELECTIVE SYMPATHOTOMY Abdullah Al Dohayan MD; Ahmed Al-Otiaby MD; Amal,Abdulkarim MD; Abdulazim El-Dawlatly MD; Mohammed Al-Ageely, MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

The purpose of this study is to compare the efficacy and safety of thoracoscopic cutting of postganglionic fibers and transthoracic endoscopic sympathectomy.

The work was done after doing thorasthoracic unilateral sympathectomy for eight patients. The patients were anesthetized using single lumen tube, with continuous flow of carbon dioxide at pressure of 10mm Hg. We have managed 20 patients complaining of hyperhydrosis in King Khalid University Hospital, Riyadh, Saudi Arabia.

The procedure started by diathermizing post ganglionic fibers of the second, third and fourth sympathetic chain. Then the sympathetic chain will be excised. The hand temperature raised by 2-3 degree c. in contrast, the second technique rises the temperature 0.0.5 degree c more. All patients had smooth post operative recovery and were discharged within 24 hours. Cutting post ganglionic sympathetic nerve fiber may replace excision of the sympathetic chain. Thoracoscopic sympathectomy is standard treatment for hyperhydrosis.

However, the complication of this procedure may limits its success. Rebound hyperhydrosis may cause more serious problems than the initial symptoms. All available surgical techniques for hyperhydrosis have this problem. The need of new technique is required to avoid side effects and highly selective sympathotomy may be useful new technique.

Thoracoscopy-PF213

THE USE OF NON-CONTACTED AND WIDE SPREAD ND-YAG LASER TIP WITH Y-SHAPED STOPPER IN THORACOSCOPIC LUNG VOLUME REDUCTION SURGERY FOR DIFFUSE CHRONIC EMPHYSEMA. Akinori Akashi, MD, Norihisa Shigemura, MD, Tomoyuki Nakagiri, MD, Hajime Yamazaki, MD*, Yoshihro Kitayama, MD*, Toshihiro Okada, MD*. Shigeto Maeda, MD*, Satoshi Matsuzaka, MD*, and Hisashi Kosaka, MD*. Department of Thoracic Surgery, and General surgery*, Takarazuka Municipal Hospital, Hyogo, Japan

By the use of non-contacted and wide spread Nd-YAG laser tip with original Y-shaped stopper, we performed video-assisted thoracic surgery (VATS) for lung volume reduction surgery [LVRS] of patient with chronic diffuse emphysema. To clarify its usefulness, retrospective study was performed about indication, complication, and pulmonary function.

From 1997 to 2001, 42 cases with chronic emphysema which underwent VATS procedure by both the stapler lung resection and the laser ablation using our original non-contacted and wide spread Nd-YAG laser tip with Y-shaped stopper, which can radiate laser about 25 times as wide as the previous one, were analyzed.

41 men and one woman with a mean age of 69, ranged from 55 to 82 years. 18 cases (43%) underwent bilateral LVRS procedure, and 27 cases (57%) underwent lateral LVRS procedure. There was no operative death. There were four operative complications (9%) including prolonged air leakage (>14 days) in 2, pneumonia in 1, and bleeding from the costal artery in 1. The mean hospital stay was 21 days, varied from 10 to 41 days. As the comparison of respiratory function between pre- and post-operation, bilateral and lateral LVRS presented significant improvement in PO2, PCO2, FEV1.0, H-J, and 6-minute walking distance at 1 year after the operation [$p<0.001$]. The mean follow up duration was ranged from 8 to 47 months. The three-year survival rate is 86.8 % for all cases, 78 % for unilateral cases, and 100 % for bilateral cases.

Thoracoscopic LVRS by using our original devices would be performed effectively and safely in a municipal hospital.

Thoracoscopy-PF214

THORACOSCOPIC MANAGEMENT OF HYPERHYDROSIS (SYMPATHECTOMY, SYMPATHOCTOMY, SYMPATHETIC CLIPPING) Abdullah AlDohayan, MD; Mohammed AlSebyl, MD; Othman Noraldin, MD; Amal Abdulkarim, MD; Ahmed AlOtaiby, MD; Mohammed AlSkaini, MD; Ali AlTuwaijri, PhD; Abdulaziz AlSaigh, MD, Department of Surgery and Physiology, King Khalid University Hospital, Riyadh, Saudi Arabia

Hyperhydrosis is a common disease. More than1200 procedures were performed for patients with hyperhydrosis.

Available techniques are sympathectomy, sympathotomy, needle sympathectomy, highly selective sympathotomy and sympathetic clipping, utilising thoracoscopic techniques.

These procedures have advantage and side effects. The management of single hand will minimize the complications. Thoracoscopic clipping of the sympathetic chain is seemed to be the most suitable operation, with fewer side effects.

Thoracoscopy-PF215

LAPAROSCOPIC PERCAUTANEOUS REPAIR OF INCISIONAL HERNIA Abdullah Al Dohayan,MD; Ahmed Al Otiabi, MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Incisional Hernia is a well-known complication of abdominal surgery. As high as 4% of patients who undergo abdominal surgery develop incisional hernias. Procedures for repair of these hernias include the standard open suturing technique, with as without the use of a mesh. However, several complications have been reported following the open technique such as long skin scars, hernia recurrence (recurrence rate of upto 40%), infection, hematoma, rejection of the mesh, bowel injury and fistula formation. The introduction of laparoscopic surgery has opened a new field in the management of incisional hernias. Advantages of the laparoscopic technique include small incisions, a well know decrease in the rate of wound complications, which may lower hernia recurrence and the ability to release bowel adhesions under magnification. Recently, pure laparoscopic technique using gortex (PTFE) mesh has been reported. In that technique the fascial edges are not approximated and the mesh is sutured to the fascial defect from the inner (Abdominal) rather than the outer (Subcutaneous) surface. We have developed a new laparoscopic technique to repair incisional hernias and labeled it "The percutaneous laparoscopic technique". Through small skin incisions, the laparoscopic is used and release bowel adhesions. Through small incision, the sac is excised and fascial edges are then approximated by sutured. Finally a marlex mesh is sutured on the outer (Subcutaneous) surface to augment the fascial repair. This "Percutaneous" technique has been used successfully in 18 patients at our institution.

Thoracoscopy-PF216

COMPARISON BETWEEN THORACOSCOPIC SYMPATHECTOMY AND SYMPATHETIC CLIPPING. Abdullah Al-Dohayan MD; Mohammed Al-Ageely MD;Ahmed Al-Otiaby MD; Amal Abdulkarim, Osman Noraldin, Abduazim Al-Dawlatly MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Thoracoscopic clipping is a new procedure with limited experience. Prospective study was carried out comparing the efficacy of T2-T4 sympathectomy versus clipping at level of Ts. Twenty patients were enrolled in study. Sympathectomy was done for the right side (Group A) and sympathetic clipping for the lift side (Group B). postoperative recovery, satisfaction of patient, and pain were assessed. Thoracoscopic sympathetic clipping is effective as thoracoscopic sympathectomy. Thoracoscopic sympathetomy is performed using 3mm incisions. On the other hand, thoracoscopic clipping is carried out using 1cm incision. Postoperative analgesias consumption rate is more in the sympathetectomy group. Thoracoscopic clipping is effective as thoracoscopic sympathectomy. Longer follow is needed to assess the real success.

Thoracoscopy-PF217

THORACOSCOPIC THYMECTOMY FOR PATIENTS WITH MYASTHENIA GRAVIS. (EXTENDED THYMECTOMY THROUGH COLLAR INCISION WITH VIDEO-ASSISTED THORACIC SURGERY) Motoi Aoe MD, Akio Andou MD, Nobuyoshi Shimizu MD, Yoshihumi Sano MD, Kazunori Okabe MD, Hiroshi Date MD., Department of Surgery II, Okayama University Medical School, Okayama-city, JAPAN.

The complete removal of thymic tissue from the thoracic cavity is the most important point of the thymectomy for myasthenia gravis (MG). We think only the trans-cervical approach is not enough to accomplish the total removal of thymic tissue, because we could not reach the pericardial fat tissue through the small incision. Up to date, we have performed extended thymectomy (Total removal of the thymus and intra-thoracic fat tissue) through collar incision with thoracoscopic technique for twenty seven MG patients (Age: 16-71 y.o., Osserman Classification I-IIB). The thymus and intra-thoracic fat tissue were completely removed from the patients without any difficulties and their post-operative courses were uneventful. This method is benefit for patients from the point of cosmetics and provides the equivalent result of extended thymectomy with other techniques (Remission rate 40.2%, Improvement rate 88.3%). This time, we will report the summary of these cases and the usefulness of video-assisted thoracoscopic technique for extended thymectomy.

Thoracoscopy-PF218

NEEDLESCOPIC BILATERAL THORACIC SYMPATHECTOMY STEPHEN E. BURPEE M.D., CHRISTOPHER M. SCHLACHTA M.D., JOSEPH MAMAZZA M.D., KENNETH PACE M.D., ERIC C. POULIN M.D.,THE CENTER FOR MINIMALLY INVASIVE SURGERY, ST. MICHAEL'S HOSPITAL, TORONTO, ONTARIO, CANADA

Introduction: The purpose of this study was to evaluate the safety and efficacy of needlescopic bilateral thoracic sympathectomy.

Methods: Thirty-six patients (24 female, 12 male) underwent thoracic sympathectomy between 1997 and 2001. Thirty-four had simultaneous bilateral procedures while two had unilateral procedures. Follow up consisted of a clinical examination at one month and a symptom severity and patient satisfaction questionnaire administered from 6 to 32 months post operatively. The procedure consisted of resecting the sympathetic chain from T2 to T4. The first four cases were performed using two 10 to 15mm incisions and the last 32 were performed using needlescopic instrumentation with two 3mm trocars and one 5mm trocar per side without the need to collapse the lung.

Results: 34 patients were operated on for palmar hyperhydrosis while 2 had severe facial blushing. Mean operating time was 93.5 minutes. Estimated blood loss was a median of 10 ml. Three patients had significant intra operative bleeding (1200, 250 and 200ml) but there were no transfusion requirements and no conversions. Chest tubes were required in 6 patients: three with intra operative bleeding, two patients had minor parenchymal injuries and one patient had a concomitant bullectomy. There were no mortalities. Median length of stay was one day. All 36 had resolution of their symptoms with no recurrences. There were no cases of Horner's Syndrome or intercostal neuralgia. Compensation was noted in 76% at 1 month and 78.9% at six or more months. This was classified as mild by 47%, moderate by 40% and severe by 13%. Only 1 patient reported being dissatisfied by their results, while 95% were very satisfied.

Conclusion: Needlescopic bilateral thoracic sympathectomy is a safe and efficacious procedure with a high degree of patient satisfaction.

Thoracoscopy-PF219

VIDEO-ASSISTED SURGERY FOR PERSISITENT THORACIC FLUID COLLECTION Yoshiro Hamada, M.D., Akio Otaki, M.D., Toshiro Ogata, M.D., Yasuo Morishita, M.D. Department of Surgery, Kitakanto Cardiovascular Hospital, 2nd Department o fSurgery, Gunma University School of Medicine, Maebashi, Japan

With the use of video-assisted thoracoscopic surgery, we successfully treated two cases of thoracic fluid collection failed to respond to the tube drainage. In both cases, pleural cavity was occupied with a fibrin deposit, fluid, and clot, and the fibrous membrane surrounded the surface of the lung. The operation consisted of the removal of fibrin deposit, the dissection between the chest wall and lung, and the removal of the fibrous membrane which interfered with the expansion of the lung. **Case 1.** A 21 year-old woman was transferred to the hospital with complaints of dyspnea, fever, and tachycardia. A chest roentgenogram showed that left lung was collapsed with effusion. On chest CT scan, low-density area was occupied a major part of left thoracic cavity. At operation, fibrin and water was removed and lung was freed from the thorax by sharp and blunt dissection. Fibrous membrane surrounding the lung was removed as much as possible. The operation time was 6 hr and bleeding was 300ml. Chest tube was removed at 7th postoperative day and the patient was discharged at 11th day. **Case 2.** A twenty-eight year old man was consulted for surgical treatment against the repetitive collection of exsanguinous pleural effusion. On chest CT scan, low-density area was occupied a major part of right thoracic cavity. At operation, Clot, exsanguinous fluid, and fibrin, which filled in the cavity, was removed and the adhesion was dissected so that the lung was freed from the thorax. Fibrous membrane surrounding the lung was removed extensively. The operation time was 6.5 hr and bleeding was 1200ml. 3 unit of bank blood was transfused. Chest tube drainage was removed and he was discharged on sixth and seventh postoperative day, respectively. In conclusion, video-assisted thoracoscopic surgery affords less invasive operation and shorter hospital stay.

Thoracoscopy-PF220

INTRALOBAR AND EXTRALOBAR PULMONARY SEQUESTRATION TREATED BY VIDEO-ASSISTED THORACOSCOPIC RESECTION IN CHILDREN H. Ishibashi,M.D., H. Takehara,M.D., M. Oshita,M.D., S. Tashiro,M.D.Department of Surgery, University of Tokushima School of Medicine, Tokushima, JAPAN

Pulmonary sequestration refers to a malformation of the lung, which usually receives blood supply from one or more anomalous systemic arteries. There are two forms of sequestration : intralobar and extralobar. Surgical resection is a choice of treatment for pulmonary sequestration with infection.

Video-assisted thoracoscopic surgery has been recognized as a surgical technique that is evolving rapidly. We reported two cases of an intralobar and an extralobar pulmonary sequestration in children which was treated with video-assisted thoracoscopic resection successfully.

Case 1: 2-year-old boy who received repair for left postero-lateral diaphragmatic hernia was diagnosed to have an extralobar pulmonary sequestration above the left diaphragma. Blood supply was received from thoracic aorta. The patient underwent a video-assisted thoracoscopic surgical removal of extralobar pulmonary sequestration.

Case 2: 1-year-old girl, who had an episode of recurrent pneumonia, was diagnosed to have an intralobar pulmonary sequestration in the right lower lobe. Blood supply was received from thoracic aorta and CT scan showed a large cystic mass in the right lower lung field. The patient underwent a video-assisted thoracoscopic right lower pulmonary lobectomy.

Postoperative courses were uneventful in both patients. Video-assisted thoracoscopic approach should be considered in children both for better cosmetic results and for more rapid recovery of general conditions.

Thoracoscopy-PF221

THE APPLICATION OF ULTRASONICALLY ACTIVATED TROCAR SYSTEM TO THE INSERTION OF THORACOSCOPIC TROCARS. Masatoshi Kurihara M.D., Katsura Ito.M.D., Yoshihito Takeno. M.D. Pneumothorax Center, Nissan Tamagawa Hospital, Tokyo, Japan.

Small bleeding and blood dropping into thoracic cavity are often experienced during thoracoscopic surgery. It is because of vascular injuries related with the insertion of trocars. They always make thoracoscopic operation more difficult. Tough thoracic wall often cause the difficulty of the insertion of trocars into thoracic cavity. The purpose of this study is to evaluate if ultrasonic surgical system can be actually applied to the insertion of thoracoscopic trocars,

Ten pneumothorax patients received the thoracoscopic surgery. Ultrasonically activated trocar system is newly developed by Olympus Corporation. The system is composed of an 11mm ultrasonically activated trocar and a generator (Sonosurg G2 frequency: 23.5 KHz Olympus). 12mm diameter trocars (Endopath; Ethicon) were inserted into thoracic cavity on one part of chest wall in ten patients. 12mm diameter ultrasonically activated trocars were inserted on an another part of chest wall in the ten patients. Each of intercostal muscles were partially resected after operation. Each of them were endoscopically and microscopically evaluated after that.

There was no small bleeding and blood dropping into thoracic cavity from stub wounds in ten cases of ultrasonic activated trocars system as well. However there was small bleeding or blood dropping into the cavity in ten cases of conventional trocars system. There was endoscopically small bleeding into stub wounds and microscopically vascular injuries and tearing of muscle fibers in conventional trocar system. However there was no endoscopical small bleeding and no microscopical vascular injuries and tearing of muscle fibers in ultrasonic activated trocar system.

Ultrasonically activated trocar system is less invasive and can easily insert trocars to chest wall in thoracoscopic surgery. However the system needs more development regarding downsizing and simplicity.

Thoracoscopy-PF222

THORACOSCOPIC ESOPHAGECTOMY FOR A CASE OF LOCAL RECURRENCE AFTER RADIATION THERAPY, Takahiro Mori, M.D., Ph.D., Shukichi Miyazaki, M.D., Go Miyata, M.D., Ko Sugawara, M.D., Hirofumi Ichikawa, M.D., Ph.D., Takashi Kamei, M.D., Shunsuke Shibuya, M.D., Susumu Satomi, M.D., Noriaki Ohuchi, M.D., Ph.D., Division of Surgical Oncology, Tohoku University School of Medicine, Sendai, Japan.

[Introduction] We have been clinically applying thoracoscopic esophagectomy for esophageal cancer patients since 1995, and have reported that we successfully obtain survival curve as the conventional esophagectomy. On the other hand, it has been reported that radiochemotherapy plays a leading role in treating esophageal cancer patients, and combination of surgery and radiochemotherapy is thought to be more important to get higher control rates of esophageal cancer. We report here a case of local recurrence after complete response to radiochemotherapy who undertook thoracoscopic esophagectomy with three-field lymphnode dissection.

[A case] Patient S. C., aged 74 years, was hospitalized for upper-thoracic esophageal cancer, and undertook radiochemotherapy from the reason of advanced tumor as stage IVa in TNM classification, as diagnosed to invade adjacent organ such as trachea. Radiologists evaluated the tumor as complete response (CR) status after 70-Gy irradiation, and he was discharged, followed-up by periodical endoscopy, barium exam and CT scan at clinic for out patients. He was endoscopically diagnosed as local recurrence after four months. Operation of esophagectomy and mediastinal lymphadenectomy was performed completely under thoracoscopy, followed by three-field lymphnode dissection and reconstruction by gastric tube prepared under laparoscopy . Tumor was successfully removed from adjacent organs such as trachea and aorta, and intraoperative blood loss was 495ml. Now he was discharged from hospital and followed up at clinic for out patients. He stays in disease-free status without any significant complications.

[Conclusion] Thoracoscopic procedure is also clinically available for patients of local recurrence after radiochemotherapy.

Thoracoscopy-PF223

TECHNICAL FEASIBILITY OF THORACOSCOPIC SEGMENTECTOMY OF LUNG Toshiaki Morikawa,M.D.,Ph.D., Mitsuhito Kaji, M.D.,Ph.D.,Setsuyuki Ohtake,M.D.,Ph.D., Ryunosuke Hase,M.D., Yasuhiro Takahashi,M.D., Shuniti Okushiba,M.D.,Ph.D.,Satoshi Kondo,M.D.,Ph.D., Hiroyuki Katoh,M.D.,Ph.D., Surgical Oncology, Division of Cancer Medicine, Hokkaido University Graduate School of Medicine

INTRODUCTION: In the terms of lung preserving technique, segmentectomy is a desirable operation. On the other hand, video-assisted technique is preferred to deteriolated patients for its minimal invasiveness. We assessed if lung segmentectomy is routinely achieved by means of thoracoscopy.

METHODS AND PROCEDURES: From April 1997 through March 2001, we prospectively attempted thoracoscopic procedure for any patient who were indicated for lung segmentectomy. Twenty-four patients were entered, among which 16 were male and 8 were female, whose age ranged 28 to 87 (averaged 62.3). Causative diseases were, 13 patients of primary lung cancer, 9 of metastatic lung tumor, and 2 of miscellaneous diseases. Resected segments in the right side were, 4 patients of superior segment of the lower lobe, 3 of medial basal segment, and 1 each of basal segment and anterior basal segment. Resected segments in the left side were, 2 patients of upper division segment, 7 of lingular segment, 3 of apico-posterior segment, 3 of superior segment of lower lobe, and 1 of lateral basal and posterior basal segments. Operative procedures were all performed through monitor view, with several skin incisions sized 2-3cm. Responsible arteries were divided and cut using endo-staplers. Then responsible bronchi were also divided and cut using endo-staplers. If necessary, responsible veins were also divided and cut in the same manner. Finally, cutting line was estimated on lung surface by inflating the collapsed lung, then the lung was divided using endo-staplers. Hilar and/or mediastinal lymph nodes were excised when necessary.

RESULTS: In all the patients, lung segmentectomy was completed by means of thoracoscopy, through videoendoscopic view and small incisions. The operation achieved satisfactory outcome and postoperative courses were uneventful.

CONCLUSION: Thoracoscopic lung segmentectomy was safely performed in all patients of relatively small group. This technique may be applied routinely.

Thoracoscopy-PF224

HAND-ASSISTED THORACOSCOPIC ESOPHAGECTOMY Mitsuyo Nishimura M.D. Junji Yoshida M.D. Kanji Nagai M.D. Department of Thoracic Surgery. National Cancer Center Hospital East. 6-5-1 Kashiwanoha Kashiwa Chiba 277-8577, Japan

Video assisted thoracoscopic esophagectomy has been performed at several institutes, but this technique is complicated and can be performed only by expertised surgeons . We applied hand-assisted laparoscopic technique, which has been recently reported in the literature , to esophagectomy .

[Technique] All the procedures were performed under general anesthesia with a double lumen endotracheal tube. The patient was placed in a left lateral position. Ipsilateral ventilation was discontinued to collapse the lung. An 12mm trocar was inserted through the 7th intercostal space in the mid-axillary line for a 10mm 30-degree rigid thoracoscope. The operators left hand was inserted into the right thoracic cavity via the retro-sternal space through a mid upper abdominal incision without opening the abdominal cavity. An additional trocar was placed in the 4th intercostal space , anterior axillary line for surgical instruments. Another trocar was placed in the auscultaroy triangle, if necessary. The left hand retracted the right lung , to secure the surgical field for esophagectomy. Thoracic esophagectomy and systematic mediastinal lymph node dissection were accomplished. Since August 1998, We accomplished 7cases of esophageal cancer in this method. ∞@These total operation times were 330-395min. The mean operation time was 356min. These blood loss were 250-600ml(mean 450ml). Postopertive death was one MRSA enterocolitis, and morbidity was one damage of left main bronchus and three wound infection and one recurrent nerve palsy. The postoperative hospital stay was 20-165days (median 27days)

[Comment] With this technique, no specific training of thoracoscopic surgery was necessary to perform esophagectomy, as the operators left hand was in the thoracic cavity. Almost all procedures could be done, as if in open thoracotomy. As we could feel the distance by the inserted left hand, 3-dimensional camera system was not necessary. This technique can be applied to any other thoracic operation.

Thoracoscopy-PF225

THORACOSCOPIC EXTRACTION OF IMPACTED FOREIGN BODY ESOPHAGUS R.PARTHASARATHI,M.S, C.Palanivelu, K.Sendhil Kumar,P.S.Rajan,G.S.Makesh Kumar,S.Balasasikumar, Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES) GEM Hospital, Coimbarote INDIA

Most of the foreign bodies (about 90% of cases) in the esophagus passes spontaneously. For the remaining cases, endoscopic removal is often successful. About 1-2% of the cases only need surgical management. In the era of minimal invasive surgery, the same can be managed by either laparoscopy or thoracoscopy. Although few reports are there regarding the removal of foreign body by laparoscopic approach, there is no report of removal by thoracoscopy. In June 2001, a 52 years old, known epileptic patient presented with difficulty in swallowing. Initial endoscopy showed features in favor of growth oesophagus at 25 cms. Biopsy was negative. Check endoscopy was done after 15 days. On palpation with biopsy forceps, a stony feel was felt. After suspecting an impacted foreign body, patient was asked regarding the denture. Patient told that he had lost his denture 4 months back following an attack of fits. CT scan confirmed the presence of foreign body without involving the major vessels and trachea. Since it was firmly impacted foreign body, it was decided to go for thoracoscopic removal.

Patient was put on prone position and right thoracic approach with left lung ventilation was used. The denture with plate (5cm long) lying just behind the azygos arch, forming an inflammatory mass, was removed by an incision over the oesophagus just proximal to the impaction, avoiding the vein. The oesophagotomy was closed by using vicryl endosutures. Chest drain kept and wound closed. Patient was discharged on the 6th Post operative day with solid diet.

Thoracoscopic extraction of impacted foreign body esophagus avoids the morbidity of thoracotomy and gives the benefits of minimal invasive surgery to the patient.

Thoracoscopy-PF226

ROLE OF LAPROSCOPIC SURGERY IN ACUTE ABDOMEN (247 CASES)- A RETROSPECTIVE STUDY DEEPAK SAXENA MS SHOBHANA SAXENA MS, DURGA CHIKITSALAYA , HOUSING BOARD COLONY , KATNI,M.P.INDIA- 483504

DIAGNOSTIC LAPROSCOPY HAS STOOD THE TEST OF TIME IN ACUTE ABDOMEN BUT LAPROSCOPIC SURGERY IS RELATIVELY NEW. AIM IS TO SHARE THE EXPERIENCE OF 247 CASES MANAGED LAPROSCOPICALLY IN LAST 2 YEARS AND 6 MONTHS (THAT IS MARCH 1999 TO AUGUST 2001)

INCLUDES 88 CASES OF ACUTE APPENDICITIS, 12 CASES OF PERFORATED APPENDIX , 25 CASES OF DUODENAL ULCER PERFORATION , 21 CASES OF ECTOPIC PREGNANCY ,11 CASES OF TWISTED OVARIAN CYST, 41 CASES OF ACUTE CHOLECYSTITIS, 7 CASES OF OBSTRUCTED UMBLICAL AND VENTRAL HERNIA AND 42 CASES OF INTESTINAL OBSTRUCTION MANAGED BY CONVERTING INTO A MINI LAPROTOMY AND MANAGING STRICTURES, ILEO- CAECAL KOCHS ,BANDS AND ADHISIONS.

UMBLICAL PORT MADE BY HASSANS TECHNIQUE AND SUBSEQUENT PORTS MADE ACCORDINGLY .ANEATHASIA USED SPINAL OR ENDOTRACHEAL .AFTER MANAGING DIFFERENT CONDITIONS LAPROSCOPICALLY UMBLICAL PORT CLOSED IN TWO LAYERS AND 5 MM PORTS CLOSED IN ONE LAYER . PATIENT AGE RANGING FROM 12 YEARS TO 64 YEARS MEAN AGE IS 34 YEARS. MALE : FEMALE RATIO IS 1:3 .

ALL PATIENT RECOVERED UNEVENTFULLY . TO CONCLUDE IF THE PATIENT IS HAEMODYNAMICALLY STABLE AND TOLERATE ANESTHASIA CAN BE MANAGED (EVEN IN DIFFICULT SITUATIONS) LAPROSCOPICALLY.

Hepatobiliary/Pancreatic Surgery-PS001

FURTHER EXPERIENCE WITH LAPAROSCOPIC DRAINAGE OF PANCREATIC PSEUDOCYSTS. William G Ainslie, MBChB, Basil Ammori MD, Michael Larvin MD, Michael J McMahon MD. Leeds Institute for Minimally Invasive Therapy (LIMIT) and Academic Surgical Unit, Leeds General Infirmary, Leeds. UK

AIM. To assess the outcome of laparoscopic drainage of symptomatic pancreatic pseudocysts.

METHOD. Database review.

RESULTS. Laparoscopic drainage procedures were attempted on twenty-three consecutive patients (age 24-75 years, median 53) with symptomatic pseudocysts. Procedures included cyst-gastrostomy (CG, n=17), cyst-jejunostomy (CJ, n=2) and external drainage (ED, n=4). Debridement of necrosis was successfully carried out in 7 patients and a denuded vessel was successfully clipped in a further 1. There were 5 conversions (22%) – the rate was lowest for cyst-gastrostomy (11.8%) and highest for cyst-jejunostomy (100%). Reasons for conversion included difficult access due to location of the cyst (n=4), bleeding (n=2), friable nature of the cyst wall (n=2) and adhesions (n=1). Minor morbidity, consisting of 1 respiratory tract infection and 1 episode of urinary retention, occurred in those patients successfully treated laparoscopically. In those converted to laparotomy 3 (60%) wound infections occurred. Patients resumed diet by a median of 4 days, regardless of drainage procedure. Median postoperative stay was 6.5 (range 4-16) days after CG, 11 (range 10-12) days after CJ and 25.5 (range 5-55) days after ED. Follow-up of a median 15 months (range 1-65) revealed three recurrences (13%). Two, in the external drainage group, occurred early and were managed successfully by interventional radiology. One patient had a recurrence one year after cyst-gastrostomy that was managed conservatively.

CONCLUSION. Experience to date suggests that laparoscopic pseudocyst drainage is feasible for the majority of patients and has a low conversion, complication and recurrence rate.

Hepatobiliary/Pancreatic Surgery-PS002

LATENT COLON ADENOCARCINOMA DISCOVERED DURING OR AFTER LAPAROSCOPIC CHOLECYSTECTOMY N. Alexakis MD, D. Mylonaki MD, MM.Konstadoulakis MD , E.Leandros PhD , G.Androulakis MD, Laparoendoscopic Unit, First Department of Propaedeutic Surgery, Athens University, Hippocration Hospital, Athens ,Greece

Background The wide acceptance of laparoscopic cholecystectomy (LC) has resulted in increased rates of cholecystectomies performed, hence increasing the number of patients discovered with concomitant malignancy or other pathological states.

Methods A total of 3 751 patients operated for LC between January 1995 and December 2000 were included in this study. Nine cases of coexisting malignant colon neoplasm were discovered. All patients but one underwent therapeutic resection.

Results The survival of these 9 patients was the same with that of 62 consecutive colon cancer patients hospitalized in our department at the same period. The rate of postoperative complications in the study group was higher than the control group (21% vs 9.5%). Hospital stay in these patients was also increased (17 days vs 10 days).

Conclusion The rate of accidentally discovered colorectal carcinomas during LC in our Department was 0.24%. These patients had increased complication rates and hospital stay.

Hepatobiliary/Pancreatic Surgery-PS003

FLEXIBLE STAGING LAPAROSCOPY FOR UPPER GASTROINTESTINAL MALIGNANCIES - IMPROVING YIELD THROUGH FAILURE ANALYSIS Gary R. Gecelter MD, Keith Meslin MD, Kelly Alexander MD, Patricia Mikell NP and H. Hank Simms MD, Department of Surgery, Section of Surgical Oncology, North Shore Long Island Jewish Health System. New Hyde Park, NY

The greatest impact of staging laparoscopy (SL) is seen in patients who have metastatic disease unrecognized by pre-operative imaging, and who can thus avoid unnecessary laparotomy. Following analysis of 2 early failures, we have employed flexible laparoscopy since 1996, increasing our degrees of freedom to more closely emulate formal laparotomy.

Prospective data was collected on 124 consecutive patients with upper GI carcinomas (pancreatic/biliary, 64; GE junction, 38; stomach, 22) who underwent SL. The first 30 cases (Group 1) were performed with 0/30 deg rigid telescopes. The next 94 cases (Group 2) were performed exclusively with flexible laparoscopes. Laparoscopic ultrasound was used to evaluate the liver in both groups. Failed SL was defined as the discovery of metastatic disease at conversion to laparotomy for definitive resection.

In Group 1, 7 of 30 patients (23%) were found to have unrecognized metastatic disease. By conventional laparoscopy we were unable to identify metastatic disease in 2 of these 7 patients (failure rate 29%), 1 pancreas cancer with a solitary metastasis in segment VII and 1 gastric carcinoma with posterior lesser sac metastases. In Group 2, 25 of 94 patients (27%) were found to have occult metastases. By flexible laparoscopy we were unable to identify metastatic disease in 2 of these patients. One patient with pancreas cancer had liver metastases under omental adhesions from a prior cholecystectomy. A second patient with gastric cancer had tumor encasement of the celiac trunk at laparotomy despite laparoscopic exploration of the lesser sac. 32 of 124 patients in this series had occult metastases. SL successfully upstaged 28 of these patients (88%) avoiding unnecessary laparotomy.

SL should properly upstage patients with occult metastases, supplanting formal laparotomy, but still demands the same stringent standards expected from open surgery. Flexible laparoscopy may be superior to non-flexible techniques for precise staging.

Hepatobiliary/Pancreatic Surgery-PS004

LAPAROSCOPIC CHOLECYSTECTOMY IN ELDERLY PATIENTS Kelly Alexander MD, Gary Gecelter MD, Deborah Stein MD, Keith Meslin MD, H. Hank Simms MD, Department of Surgery, North Shore Long Island Jewish Health System. New Hyde Park, NY

Laparoscopic cholecystectomy (LC) has been demonstrated to be both safe and effective in a wide range of patients with gallbladder disease. It is now considered to be the definitive treatment for both acute and chronic cholecystitis. However, the elderly are often thought to have too many co-morbid conditions to safely undergo LC.

Of 2063 patients who underwent attempted LC at Long Island Jewish Medical Center, from December 1994 to May 1999, 76 were identified to be 80 years or older (mean age 84.4, range 80-97). Charts were retrospectively reviewed for age, medical history, previous surgery, conversion rate, length of stay, operating time, anesthesia time, and intraoperative findings.

Statistically significant findings included a higher conversion rate in the study group compared to the control - 18.4% vs 5.2% ($p<0.0001$). Subgroup analysis shows a significantly increased conversion rate of emergency procedures versus elective - 37% vs 4.9% ($p<0.007$). There was a trend towards higher mortality in the study group with 1.3% compared to 0.1% in the control (p=ns). Overall morbidity in the study group was 15.8% (28.6% - emergency, 4.9% - elective).

Advanced age alone is not a contraindication to laparoscopic cholecystectomy. It is a safe procedure in elderly patients. The higher conversion rate in the study group may be attributed to chronicity of the disease process and consequently, more complex biliary anatomy and to the identification of additional pathology upon laparosopy in the study group. From this data can be extrapolated that LC should be performed on elderly patients on an elective basis rather than as an emergency with the associated increased morbidity.

Hepatobiliary/Pancreatic Surgery-PS005

LAPAROSCOPIC CHOLECYSTECTOMY FOR SUSPECTED EARLY GALLBLADDER CANCER., Hideaki Andoh, Norihito Ise, Ouki Yasui and Kenji Koyama, Department of surgery, Akita university school of medicine

Thirty-seven laparoscopic cholecystectomy was performed for the gallbladder tumors, which was suspected early gallbladder cancer. When the tumor existed at the gallbladder bed, partial hepatectomy was added under laparoscopic procedure. We never leak the bile juice within the operation and use the vinyl sac to remove the gallbladder.

Five cases were early gallbladder cancer and one case was advanced gallbladder cancer. Four cases were converted open method for the lymph node dissection and the resection of the gallbladder bed or S5+S4a segmentectomy of the liver. Liver metastasis was detected in one case at 16th month after operation, who had the some lymph node metastasis at the operation. Other recurrence such as peritoneal dissemination or port site recurrences were not observed in our department. From these results, laparoscopic cholecystectomy was the reasonable procedure even for early gallbladder cancer, if operation was performed without bile contamination.

Hepatobiliary/Pancreatic Surgery-PS006

ROUTINE LOW- VERSUS STANDARD-PRESSURE PNEUMOPERITONEUM DURING LAPAROSCOPIC CHOLECYSTECTOMY - INITIAL RESULTS OF PROSPECTIVE RANDOMIZED CLINICAL TRIAL. Marcin Barczyński, M.D., PhD., Roman M. Herman, M.D., PhD., 3rd Department of General Surgery, Jagiellonian University College of Medicine, Kraków, Poland.

Capnoperitoneum with standard pressure (SP) of 12mmHg has become a gold standard in laparoscopic surgery. However, the increased intraabdominal pressure results in cardiopulmonary, renal and autonomic depression. To diminish the deleterious effects of SP the low-pressure (LP) of 7mmHg was introduced to clinical practice. The purpose of this study was to investigate the advantages and limits of LP in comparison to SP pneumoperitoneum in a prospective randomized clinical trial.

A group of 97 consecutive patients qualified for laparoscopic cholecystectomy (LC) due to uncomplicated symptomatic gallstones were randomized to either SPLC or LPLC. All the procedures were performed by the same team of surgeons experienced in laparoscopy. The following data were statistically analyzed: sex, mean age, Body Mass Index, operative time, complication rate, conversion rate, postoperative pain assessed in Visual Analogue Scale of Pain (VAS) including incidence of shoulder-tip pain, postoperative hospital stay, recovery time and quality of life within 72 hours following the operation. $p<0.05$ was considered to indicate significance.

There was no case of neither conversion to open procedure nor major complication in both groups. The operative time was similar in both groups (LP: 57.4±8.8min vs. SP 53.6±9.0min). Postoperative pain was approximately 25% lower after LP vs. SPLC ($p<0.05$). The incidence of shoulder-tip pain was 2.3-times less after LP vs. SPLC($p<0.05$). Quality of life within 72 hours following the operation was remarkably better (mean 34.6±7.5%) after LP than after SPLC ($p<0.01$).

LP is superior to SP pneumoperitoneum in terms of lower postoperative pain, lower incidence of shoulder-tip pain and better quality of life within 72 hours following the operation. Thus, LP should be recommended for LC as a routine if extensive follow-up based on a large series confirms the initial results.

Hepatobiliary/Pancreatic Surgery-PS007

LAPAROSCOPIC RADIOFREQUENCY ABLATION OF LIVER TUMORS COMBINED WITH OTHER SURGICAL PROCEDURES Eren Berber, MD, Anthony Senagore, MD, Stanley Rogers, MD, Nora Herceg, RN, Karen Costa, RN, Allan Siperstein, MD, Departments of General Surgery, and Colorectal Surgery, The Cleveland Clinic Foundation, Cleveland, OH; Department of Surgery, University of California San Francisco, San Francisco, CA

Introduction: Laparoscopic radiofrequency ablation (RFA) of liver tumors is gaining increasing acceptance due to the minimal morbidity and overnight hospital stay. It has never been investigated whether adding a clean-contaminated procedure to RFA increases the risk of hepatic abscess or the morbidity of the additional procedure.

Methods and Procedures: Of the total of 225 patients with 803 primary and metastatic liver tumors in a phase II trial, 37 patients with 140 lesions underwent laparoscopic RFA in combination with other procedures. Data was collected prospectively.

Results: Combined procedures included colorectal operations (n=14), laparoscopic cholecystectomy (n=12), ventral hernia repair (n=5), hepatic artery pump removal (n=3), resection of abdominal wall tumors (n=2) and bone marrow biopsy (n=1). Colorectal procedures comprised laparoscopic-assisted colon resection in 5 patients, open colon resection in 2, ileostomy closure in 5, and colostomy formation and anal stricture dilatation in 1 patient each. Cholecystectomy was performed for enroachment of tumor on the gallbladder fossa in all, but 1 patient with symptomatic cholelithiasis. Mean+-SD hospital stay was 2.8+-1.6 days after combination with colorectal procedures, whereas all patients, but one (2 days) were discharged home within 24 hours after laparoscopic RFA in combination with other procedures. The only complication (3%) was a flank abscess after laparoscopic-assisted hemicolectomy that was treated with percutaneous drainage.

Conclusions: Although patients undergoing laparoscopic RFA in combination with a clean-contaminated procedure could be at high risk for secondary infection of ablated foci, this was not observed. This approach is safe and does not impair recovery from either procedure. This data supports the concept that RFA may be safely used with colon resection in patients who may resectable, but the morbidity of liver resection in a synchronous manner may be too risky.

Hepatobiliary/Pancreatic Surgery-PS008

ACUTE CHOLECYSTITIS DUE TO GALLBLADDER CROHN'S DISEASE Oscar E. Brasesco, M.D, Pablo Paolucci, M.D., Shmuel Avital, M.D., Samuel Szomstein, M.D., Raul Rosenthal, M.D., Department of Surgery, University Hospital of Cordoba, Argentina and the Section of Minimally Invasive Surgery, Cleveland Clinic Florida, Weston, Florida.

Crohn's disease and its extraintestinal manifestations including secondary involvement of the biliary tract in extensive bowel disease are well documented. There are only few case reports of Crohn's disease of the gallbladder associated with extensive bowel disease. We report a case of an isolated Crohn's disease of the gallbladder manifested as an acute cholecystitis.

A 51 year-old male was admitted for a right upper quadrant abdominal pain. He denied any GI or medical disorders. Physical examination revealed tenderness and defense in the right upper quadrant. Laboratory findings showed no abnormalities. Ultrasonography demonstrated a distended gallbladder with thickened wall and stones. Laparoscopy revealed an inflamed gallbladder with extensive adhesions. The cystic duct – common bile duct junction was severely inflamed. A laparoscopic cholecystectomy was performed. The intraoperative cholangiogram was normal.

The postoperative course was uneventful, except for a delay in umbilical port site closure. Histological examination revealed a severe granulomatous inflammatory process of the gallbladder consistent with Crohn's disease. Following the pathological results the patient underwent a through evaluation for intestinal Crohn's disease. No evidence for other sites of Crohn's disease was found. The patient experienced no further symptoms in a six months period follow up.

The extra intestinal location of Crohn's disease is a known but unusual diagnosis. To our knowledge, this is the first case report of primary Crohn's disease of the gallbladder without any intestinal manifestation of Crohn's disease. Primary Crohn's disease of the gallbladder could be found with or without other evidence of disease in other typical locations. Physicians treating Crohn's disease should be aware of the possible primary involvement of the gallbladder. This entity could be symptomatic by it self, without any compromise or activity in the rest of digestive tract. Laparoscopic cholecystectomy appears to be a safe and curative treatment for primary gallbladder Crohn's disease.

Hepatobiliary/Pancreatic Surgery-PS009

LAPAROSCOPIC COMMON BILE DUCT EXPLORATION AND CHOLEDOCHOLITHOTOMY. Dr. Manoj Kumar Choudhury M.S., Dr. K. Rajkhowa M.S., Dr. S. Dawka M.S., Department of Surgery, Gauhati Medical College, Guwahati, Assam, India.

Laparoscopic cholecystectomy has become an established procedure today.

After years of experience in laparoscopic surgery, lap. CBD exploration and choledocholithotomy is also gaining popularity gradually.

Since 1999 we have been working on lap. CBD exploration. In this study during the period from July 1999 to August 2001, we have selected thirty-two cases for CBD exploration (with clinical suspicion of CBD calculi but negative on ultrasound, like previous history of obstructive jaundice, pancreatitis, raised alkaline phosphatase, dilated CBD, wide cystic duct with small calculi etc.)

The procedure is started like lap. cholecystectomy. Cystic duct is clipped towards gallbladder and nicked open at a safe distance from CBD. Cholangiogram is done to see presence of calculus. CBD exploration is done if stone is detected in CBD, either by trans-cystic route (37.5%) or trans-CBD route (62.5%) and with the help of choledochoscope, stones are extracted with dormia under direct vision. Post extraction cholangiogram is done. Cystic duct is clipped / transfixed. CBD is repaired with 3-0 vicryl in case of trans-CBD exploration.

Nine cases out of thirty-two (28%) showed stones in CBD, which were successfully extracted. None had to be converted. One case had temporary biliary leakage which stopped spontaneously by the 8th day. Average hospital stay was 3 days.

Laparoscopic CBD exploration and choledocholithotomy along with laparoscopic cholecystectomy has definite indication in experienced hand, specifically like this study or cases where ERCP has failed and, with experience, this procedure will be an effective alternative to ERCP.

Hepatobiliary/Pancreatic Surgery-PS010

MODIFIED NEEDLESCOPIC SURGERY FOR CHOLECYSTECTOMY H. K. Chowdhury MD Minimally Invasive Surgery Centre (MISC), Department of Surgery, BIRDEM Hospital, Dhaka, Bangladesh

As we need to do more and more Needlescopic cholecystectomy, it was necessary to modify the technique to provide benefit to most of the patients. Since Gallbladder extraction requires a 10 mm port in most of the cases, it was decided to use a 10 mm umbilical port from the beginning.

Three other trocars are 3 mm in diameter and are placed as usual. Retractions and dissections are carried out through 3-mm ports under a 10-mm.-scope vision which provides better vision and a wide angle view. Clipping is done through the umbilical port under the needlescope vision through the midline 3 mm trocar. And lastly the gallbladder is removed through the umbilical port under guidance of needlescope through the midline 3-mm trocar.

Author is performing needlescopic cholecystectomy since 1998. Since then 760 cases were performed in this technique. Conversion to standard procedure was required in 19 cases and one case was converted to open procedure. Eighty three cases of acute cholecystitis were performed in this series. Early cases could be completed, though operating time was almost double (30-60 min).

Average operating time in this series was 25 min, which is 7 min more then the average operating time for standard procedure by the author. There was no morbidity or mortality in the series. Patient acceptance was very good, post operative pain was less and recovery was earlier then the standard procedure.

This modification allowed to do the procedure with more comfort and safety under a 10 mm laparoscopic vision. Removal of resected gallbladder even with bigger stones is always much easier through umbilical trocar than the epigastric port. In conclusion, in this modification, we achieve both desired cosmetic result and adequate vision for safe surgery, which are the prime targets for both the surgeon and the patient.

Hepatobiliary/Pancreatic Surgery-PS011

CHILAIDITI'S SYNDROME MAY BE A CONTRAINDICATION TO LAPAROSCOPIC CHOLECYSTECTOMY IN PATIENTS WITH ACUTE CHOLECYSTITIS Douglas R. Ewing,M.D., Susan Talbert, M.D., Department of Surgery, St. Luke's-Roosevelt Hospital Center, New York, NY

A 61-year-old man with a history of non-insulin dependant diabetes, hypertension and diverticulosis presented with 3 days of nausea, vomiting, and diffuse abdominal pain. On physical examination he was febrile to 102F and moderately tender in the periumbilical region without signs of peritonitis. He had a leukocytosis of 13,400 and normal liver function tests. A CT scan of the abdomen and pelvis revealed a normally sized gallbladder with mild wall thickening, pericholecystic fluid and gallstones. Interposition of the colon between the liver and the diaphragm was also noted, consistent with Chilaiditi's syndrome. He was admitted with a diagnosis of acute cholecystitis and taken to the operating room for a laparoscopic cholecystectomy (LC) after 3 days of intravenous antibiotics. The bowel and omentum anterior to the liver were mobilized with little difficulty, and a moderate amount of adhesiolysis was required to free the gallbladder of inflammatory adhesions. Anterior and cephalad retraction of the gallbladder was rather difficult due to the small, immobile, posteriorly located liver. Once adequate exposure and dissection of Calot's triangle had been achieved, a very short cystic duct was noted. In the setting of considerable acute inflammatory changes it was decided to convert to open cholecystectomy. Postoperatively the patient did well and was discharged after 4 days. Chilaiditi's syndrome is a rare anomaly, occurring in 0.025 to 0.28% of the general population. The only previous case report of LC in a patient with Chilaiditi's syndrome described endoscopic nasobiliary drainage of a bile duct injury. It is our assertion that patients with Chilaiditi's syndrome may be predisposed to having poorly retractable gallbladders and short cystic ducts secondary to the anomalous architecture of the liver, and may have a higher risk of bile duct injury during LC. Chilaiditi's syndrome may therefore be a relative contraindication to LC in patients with acute cholecystitis.

Hepatobiliary/Pancreatic Surgery-PS012

LAPAROSCOPIC HEPATECTOMY - MAJOR RESECTIONS ARE POSSIBLE, George A Fielding, Nicholas O'Rourke, I Martin, Royal Brisbane and Wesley Hospital, Brisbane, Australia

This paper reviews experience with 32 major hepatic resections performed laparoscopically using pneumoperitoneum.

Thirty-two patients aged 31 - 75 years underwent laparoscopic formal hepatectomy Nov 1999 - Aug 2001. There were 21 females and 11 males. The hepatectomies performed were 9 right; 3 left and 20 segment 2/3. Pathology was 18 colorectal metastases; 2 cyst-adenoma; 1 cyst-adenocarcinoma; 1 HCC; 1 hydatid; 5 FNH; 2 adenoma; 1 cholangio-carcinoma and 1 where no pathology was found.

Vascular inflow was obtained with staple division of the vessels, hepatic parenchyma was divided with an harmonic scalpel and Endo GIA staples. The specimen was removed through a small transverse right upper quadrant incision. Operating time was 3.5 hrs (1.8 - 5 hrs).

Three of the 32 patients were converted for bleeding to (L) hepatic vein; bleeding branch on the IVC and 1 due to difficulty determining biliary anatomy in the porta. There were no gas-embolic episodes. No patients died either in hospital or at 30 days. Hospital stay was 5.4 days (2 - 21 days). Seven patients required blood transfusion.

Post-operative complications included 1 bile leak, 1 delayed haemorrhage at day 6 on a patient on Warfarin with a heart valve. There were no embolic complications nor chest complications.

The patient with HCC developed recurrent disease at 9 months; 1 new colo-rectal metastasis at 8 months; 1 developed multiple further liver metastases and peritoneal disease. There were no port site recurrences in this patient nor in any other. One patient died of a metastatic melanoma 8 months after surgery for a colo-rectal metastasis.

We believe that major hepatic resections are feasible. The morbidity is similar to that of open surgery without the added risk of wound and chest complications - absent in our series. Major liver centres should consider the role of laparoscopic hepatic resection in those with suitable lesions due to the reduced morbidity it offers the patient.

Hepatobiliary/Pancreatic Surgery-PS013

LAPAROSCOPIC MANAGEMENT OF GANGRENOUS CHOLECYSTITIS. David Finley, M.D., Sandeep Devata, B.A., Karin Blumofe, M.D., Sherri Yong, M.D., Vafa Shayani, M.D., Departments of Surgery and Pathology, Loyola University Medical Center, Maywood, Illinois.

Laparoscopic cholecystectomy is the standard treatment for biliary colic and is often successful in the management of acute cholecystitis. Gangrenous cholecystitis (defined histologically as acute cholecystitis with transmural necrosis) has been approached laparoscopically, but with a high incidence of conversion to open, with potential for a higher incidence of complications. To consider laparoscopic cholecystectomy for treatment of gangrenous cholecystitis (GC), the advantages of the laparoscopic approach must outweigh the potential risk of complications associated with laparoscopy. Additionally, recognizing the factors predictive of conversion to open cholecystectomy may improve clinical outcome.

A retrospective review of 39 consecutive patients who underwent cholecystectomy for GC from August 1996 to August 1999 was performed. The patients were divided into three groups according to the type of procedure performed: Laparoscopic cholecystectomy (LC), open cholecystectomy (OC), and attempted laparoscopic but converted to open cholecystectomy (CC). Patient demographics, ASA physical status score, length of procedure, estimated blood loss (EBL), time until resumption of general diet, length of hospital stay, post-operative complications as well as surgeon's experience were reviewed.

Thirty-one operations started laparoscopically. 14 (45%) of which were converted to open. Eight additional patients had open cholecystectomy without attempt at laparoscopy. Patient demographics and ASA physical status classification were similar in the three groups. LC took an average of 151 minutes as compared to 126 and 115 for CC and OC respectively ($p=0.078$). Average EBL for LC was 72 milliliters as compared to 175 and 272 for CC and OC respectively ($p=0.05$). Resumption of regular diet took place an average of 1.1 days following LC versus 2.6 days and 3.0 days following CC and OC respectively ($p<0.04$). The average length of hospital stay following LC was 2.4 days as compared to 4.1 and 5.8 days for CC and OC respectively ($p<0.002$). There were no peri-operative deaths and the incidence of postoperative complications was similar for the 3 groups. Surgeon experience was an independent predictor for conversion.

Laparoscopic cholecystectomy for GC may be performed safely and with a low incidence of conversion to open. When laparoscopic cholecystectomy is successfully accomplished, it results in lower blood loss, earlier resumption of diet, and shorter hospital stay. Surgeon's experience is likely to predict conversion to open cholecystectomy. Unless physiologic effects of laparoscopy cannot be tolerated, we recommend laparoscopic cholecystectomy, performed by an experienced laparoscopic surgeon, as standard management for gangrenous cholecystitis.

Hepatobiliary/Pancreatic Surgery-PS014

CASE OF LAPAROSCOPIC PANCREATIC CYSTGASTOROSTOMY. KAZUNORI FURUTA,TETSUYA TOMONAGA,NATSUYA KATADA,HIROKI HOSHINO,KOICHI ITABASHI,KEN SHIMADA,TSUYOSHI TAKAHASHI,MUNEKI YOSHIDA, AKIRA KAKITA. DEPARTMENT OF SURGERY, KITASATO UNIVERSITY,KANAGAWA,JAPAN.

Internal drainage of acute pancreatic pseudocysts is indicated that have no reduced 8 weeks after the first occurrence of pseudocysts.

Pancreatic pseudocysts are best drainage by pseudocystgastrostomy, when they are located in adhere closely with the posterior wall of the stomach. Pseudocystgastrostomy can be completed using of intraorgan surgical technique.

We present the case of laparoscopic pancreatic cystgastrostomy.

Using a technique of percutaneous endoscopic gastrostomy, under gastroendoscopic observation, three intragastric ports are placed through the abdominal walls and the anterior gastric walls.

One port for a telescope and the other two ports for bi-hand instruments are established.

After the location of the pseudocysts is confirmed, the posterior gastric wall and cyst wall can be incised and drainage orifice is made by electrocautery and Harmonic Scalpel (Ethicon Endo-Surgery). After a sufficient orifice is made, the cyst contents are discharged into the stomach completely. After the intragastric ports are removed, the defect of the anterior gastric walls are closed with sutures in laparoscopically.

In the first our case, the cyst was recurred at one month after operation. The reasons was that drainage orifice was not made large enough. In this case, the size of cyst was 12cm in diameter. But the drainage orifice was made only 2.5cm in width.

This approach is less invasive than the conventional procedure and a safe procedure for cyst drainage. However, in the treatment for pancreatic pseudocysts, there are many options that convention surgery, catheter drainage of cysts , using interventional radiology technique and endoscopic interventions. Laparoscopic pancreatic cystgastrostomy is one of the treatment options.

This procedure should be the one of the method of choice when the interventional methods are not effective.

Hepatobiliary/Pancreatic Surgery-PS015

LAPAROSCOPIC PORTOCAVAL SHUNT IN THE PORCINE MODEL: A FEASIBILITY STUDY Paolo Gentileschi, MD, Subhash Kini, MD, Greg Dakin, MD, Shoji Fukuyama, MD, Wong Woo Kim, MD, Michel Gagner, MD. Division of Laparoscopic Surgery, Mount Sinai School of Medicine, New York, NY

Introduction: randomized trials have shown that TIPSS provides less optimal outcomes than small diameter H-graft portocaval shunt for patients with portal hypertension and variceal bleeding. The wide acceptance of TIPSS in the clinical practice may be revised. To date, good-risk patients with portal hypertension and variceal bleeding can still be referred for surgical shunt. The aim of this study was to investigate the feasibility of both laparoscopic side-to-side and H-graft portocaval shunt in a porcine model.

Methods: Laparoscopic side-to-side and H-graft (PTFE, 4 mm) portocaval shunts were performed in 5 and 3 pigs, respectively. Each procedure started with the isolation of the portal vein (PV). The inferior vena cava (IVC) was isolated at a level between the renal veins and the inferior margin of the liver. The PV and the IVC were extensively dissected to be able to approximate the two veins without tension. Heparin was administered intravenously (10,000 U). The PV was cross-clamped with a laparoscopic vascular clamp, while the IVC was side clamped with a conventional Satinsky clamp, introduced into the abdomen through a small incision. Both direct and H-graft portocaval anastomoses were performed using a 6-0 Goretex suture. At the end of the procedure, euthanasia and necropsy were performed and the portocaval shunt was carefully inspected.

Results: In all cases, the side-to-side and H-graft portocaval anastomoses were found to be patent and intact. Mean operative time was 242 +- 48.1 minutes (range, 190 to 300 minutes) for side-to-side shunt and 274 +- 50.4 minutes (range, 220 to 360 minutes) for H-graft shunt. Mean anastomotic time was 41. +- for H-graft shunt.

Conclusion: Both shunts were feasible, although technically challenging. Laparoscopic H-graft portocaval shunt took longer than side-to-side laparoscopic portacaval shunt ($p<0.05$).

Hepatobiliary/Pancreatic Surgery-PS016

LAPAROSCOPIC TREATMENT OF HEPATIC ECHINOCOCCOSIS Volodymyr.V.Grubnik MD, Sergey.G.Chetverikov MD, Pushpendra Sharma MD, Sabri Al Nidary., Department of surgery, Odessa State Medical University, Odessa, Ukraine

INTRODUCTION: The aim of the study is to improve the results of treatment of hepatic echinococcosis by minimal invasive methods in endemic region of Ukraine.

PATIENTS AND METHODS: 56 patients with solitary or multiple hydatid cysts of the liver were treated laparoscopicaly and 117 patients – by percutaneous transhepatic ultrasound guided cyst drainage. In 27 patients co-existing cysts were observed in the lungs. Endocyst and the daughter cysts were aspirated and removed with the use of endoscopic bags. The endoscope was advanced into the cyst cavity to check. In 35 patients (I group) we used thermal coagulation for the cyst cavity. In 21 patients (II group) the cavity was irrigated with scolocidal fluid and saline solution. 9 patients with co-existing lung hydatid cysts were operated thoracoscopicaly, 18 - by thoracotomy.

RESULTS: There were no deaths, major complications and conversion to open surgery in any of the groups. Minor complications were observed in 2 (5,7%) patients from the I group and in 3 (14,3%) from the II group. Temporary bile leakage was observed only in 2 (9,5%) patients from the II group. Follow-up time ranged from 6 months to 6 years. In 2 (9,5%) patients from the II group recurrence was observed. In 7 (6,0%) patients from the percutaneous transhepatic group recurrence was observed. Good results were achieved in 89%.

CONCLUSIONS: Laparoscopic treatment of hepatic hydatid disease is the method of choice. Percutaneous drainage is indicated for small hydatid cysts in difficult for access liver segments.

Hepatobiliary/Pancreatic Surgery-PS017

LAPAROSCOPIC CYSTOJEJUNOSTOMY FOR A GIANT PANCREATIC PSEUDOCYST

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Introduction: Therapeutic options for active management of pancreatic pseudocysts are either surgery, percutaneous drainage or endoscopic drainage. Of these, operative internal drainage, mainly to the jejunum, is the most favourable and commonly used technique. Laparoscopic management of pancreatic pseudocyst has recently been reported, but mainly performing cystogastrostomy. We report a case of giant pancreatic pseudocyst, for which we performed laparoscopic cystojejunostomy and describe its technique.

Methods: An 18 year's old male presented with a giant pancreatic pseudocyst measuring 20x16x11 cm, three months after blunt abdominal trauma. Through a laparoscopic approach using four ports sited in the lower abdomen, the transverse colon was retracted upwards to reveal the cyst, which was opened and evacuated. The cyst was anastomosed to the nearby proximal jejunum using single-layer continuous full thickness inverting suturing technique with polydioxanon, and a peritoneal drain was left.

Results: The operation lasted 110 minutes. The postoperative period was uneventful. The patient stayed in hospital for four days. Follow up CT scan after three months revealed complete disappearance of the cyst.

Conclusions: Cystojejunostomy, which is the preferred internal drainage method for pancreatic pseudocyst, could be performed laparoscopically. We feel that this technique is promising, as it combines the potential advantages of both surgical and endoscopic approaches, namely accuracy and minimal invasiveness respectively.

Hepatobiliary/Pancreatic Surgery-PS018

LAPAROSCOPIC CHOLECYSTECTOMY UNDER SPINAL ANAESTHESIA. IS IT POSSIBLE?

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Introduction: Various laparoscopic procedures have been successfully performed under spinal anaesthesia, whether in general surgery or obstetrics. Laparoscopic cholecystectomy, on the other hand, has not yet been reported under spinal anaesthesia. Being less invasive than general anaesthesia, spinal anaesthesia would, theoretically, be more appropriate to the minimal invasiveness of laparoscopic cholecystectomy. But is it feasible to perform laparoscopic cholecystectomy under spinal anaesthesia?

Methods: To answer this question ten successive non-selected laparoscopic cholecystectomies were performed under spinal anaesthesia. The surgical technique was modified in the form of nitrous oxide for insuflation, intraabdominal pressure not more than 11 mmHg, all four trocars at the level of umbilicus, and gentle manipulation specially near the copula. We used spinal anaesthesia by intrathecal hyperbaric 10-12 mg bupivacaine with 10 µg fentanyl, to give an anaesthetic level at T8-T6.

Results: 6 males and 4 females were included, with a mean age of 39.3 years. Nine patients had adhesions to the gall bladder and one had adhesions to the abdominal wall. Only one patient experienced shoulder pain, severe enough to dictate conversion to general anaesthesia, four others had mild discomfort. One patient vomited intraoperatively. Nine patients, considered the procedure well tolerated under spinal anaesthesia. The mean operative time was 47.4 min. Postoperatively, there were minimal pain and no vomiting. The mean hospital stay was 18.8 hours.

Conclusions: Laparoscopic cholecystectomy can be performed successfully under spinal anaesthesia and is well tolerated. Further comparison with general anaesthesia is still needed.

Hepatobiliary/Pancreatic Surgery-PS019

TELEROBOTIC LAPAROSCOPIC CHOLECYSTECTOMY ACHIEVES THE SAME RESULTS AS STANDARD ROBOTIC LAPAROSCOPIC CHOLECYSTECTOMY.

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INTRODUCTION We have used a voice controlled robot (AESOP) to hold the camera in all laparoscopic cholecystectomies (LC) since 1997. Although the FDA recently approved remote surgeon, telerobotic abdominal surgery with DaVinci, few studies have documented its clinical utility and safety. **HYPOTHESIS** We hypothesized that if telerobotic surgery merits clinical use, it should achieve the same results as standard robot assisted LC. **AIMS** The aim of this study was to compare the use of AESOP and DaVinci in concurrent operations. **METHODS** We prospectively compared all LCs performed by one surgeon (GHB) from 8/10/00 until 9/4/01. **RESULTS:**

Robot	Age*	Sex	BMI°	Complications	Δ Hct	LOS*	OR time*	Op time*
AESOP	49.5	f=18	23.4	1(4.5%) ns	3.17	1 day	134min	97min
DaVinci	44.6	f=22	27.5	2(8.6%) ns	3.67	1 day	159min	110min

values expressed as *mean °median

25 patients underwent AESOP and 25 DaVinci operations. The two groups were similar in age, sex, body mass index (BMI), number of previous abdominal operations and indications for surgery. There were no deaths and no conversions in either group. There were 2 wound infections in the DaVinci group (8.6%) and one incident of trocar site bleeding (4.5%) in the AESOP group. There were no significant differences in postoperative length of stay (LOS), blood loss, or length of operation (Op Time) between the two groups. Operating room (OR) time was significantly greater for DaVinci operations (134.4 vs. 154.8 minutes, $p<0.05$). **SUMMARY** This study found that robotic and telerobotic operations were accomplished with the same mortality, morbidity, blood loss, length of operations and length of stay. The DaVinci operations required longer OR time. **CONCLUSION** Telerobotic laparoscopic cholecystectomy achieved the same clinical outcomes as standard robotic laparoscopic cholecystectomy in this small trial. This study justifies further comparison of these techniques in a randomized prospective trial.

Hepatobiliary/Pancreatic Surgery-PS020

HAND ASSISTED LAPAROSCOPIC LEFT LOBECTOMY OF THE LIVER.

, Hitoshi Inagaki, M.D.*, Tsuyoshi Kurokawa, M.D.**, Junichi Sakamoto M.D.*, Michiya Kobayashi, M.D.+, Toshiaki Nonami, M.D.++, *Department of Surgery Aichi Prefectural Hospital, **Department of Surgery, Masuko Memorial Hospital, +First Department of Surgery Kochi University, ++Department of Surgery Aichi Medical College, Aichi, Japan.

Recent rapid development of instruments and technique in laparoscopic surgery has extended its possible application in the field of liver surgery. We have started laparoscopic liver surgery in our group from December 1997, and have performed 26 laparoscopic liver resections for liver tumors. The purpose of this report is to focus on the experience of two cases who underwent left liver lobectomies among those laparoscopic hepatic resections. The case #1 was a 56-year old female who had inflammatory liver cyst, and the case #2 was a 74-year old male who had cystic tumor of the liver and multiple deverticulosis of the ascending colon. In both cases, mobilization of the left lobe of the liver was performed by the hand-assisted laparoscopic surgery (HALS) using pneumoperitoneum method. After sufficient mobilization, further procedures were carried out by the abdominal lifting method was. After en masse taping of left GlissonÕs sheath, liver dissection was started along the demarcation line. GlissonÕs sheath and hepatic vein of the left hemipedicle of the liver was cut by Endo-GIA. Right hemicolectomy was also performed in the case #2. Operation time and blood loss in the two cases were, 322 minutes, 360g, and 331 minutes, 1930g, respectively. Although indication for laparoscopic hepatic resection should precisely determined, operative procedures comparable to an ordinary laparotomy operation would be possible with the introduction of the HALS method. In this regard, we believe that laparoscopic liver surgery could be exploitable in the field of liver surgery , provided that sufficient learning curve will be able to achieve in specialized institutions.

Hepatobiliary/Pancreatic Surgery-PS021

CHOLEDOCHAL CYST:LAPAROSCOPIC EXCISION AND HEPATICOJEJUNOSTOMY-PERSONAL EXPERIENCE K.SENDHIL KUMAR, M.S, C.Palanivelu, P.S.Rajan, B.Kesavan, S.Balasasikumar, Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES) GEM Hospital, Coimbatore INDIA

With increasing experience in laparoscopic surgery particularly endo suturing and knotting, complex procedures may be performed safely and effectively. Laparoscopic excision of choledochal cyst and biliary enteric reconstruction by hepaticojejunostomy has been performed successfully.

Since 1995, 14 patients with Choledochal cyst of the common bile duct type I has been treated by laparoscopic approach . In the first two patients, laparoscopic excision was successful, laparotomy was performed for biliary enteric reconstruction.In one patient, excision was not possible and converted into open surgery, proved to be associated with carcinoma cyst. In 11 patients, excision and hepaticojejunostomy was performed successfully. 9 of them were female and 5 were male, age group ranging between 6 years and 54 years. Three of them were below 10 years.

Procedure: 5 ports were placed. Peroperative cholangiogram was performed in all the cases to identify the lower limit and Pancreatic Duct insertion. Gall bladder was retracted cranially for adequate exposure. Proximal division of the cyst was at level of common hepatic duct close to the confluence.

Reconstruction: Roux en Y jejunal loop was formed by extracorporeal method by extending the camera port in 7 patients and intracorporeal using Endo GIA stapler in 4 patients. End to side hepaticojejunostomy was performed in single layer interrupted stitches using 4 0 vicryl. Right flank decompression tube jejunostomy was performed in 8 patients.

Post operative: Post operative ileus almost nil. Oral fluid given. From 2nd or 3rd post operative day, semisolid diet from 3rd and 5th day. Almost normal diet from 5th day. No anastomotic leak. Average operation time was 180-270 minutes.

Conclusion: Excision of choledochal cyst and biliary enteric anastomotis by laparoscopic approach is highly effective and safe. Experience in Laparoscopic knotting and suturing is essential in performing such procedure.

Hepatobiliary/Pancreatic Surgery-PS022

LAPAROSCOPIC AND THORACOSCOPIC TREATMENT OF HEPATOCELLULAR CARCINOMA Katsunori Kawano, M.D., Atsushi Sasaki, M.D., Masanori Aramaki, M.D., Yukio Iwashita, M.D., Yoshihisa Himeno, M.D., Seiichiro Kai, M.D., Kazuhiro Yada, M.D., Toshifumi Matsumoto, M.D., Toshio Bandoh, M.D., Seigo Kitano, M.D. Department of Surgery I, Oita Medical University

Recent advances in endoscopic technique and development of surgical equipment enabled us to make laparoscopic and thoracoscopic approaches to the surgical management of hepatic malignancies. The aim of the present study was to clinically evaluate the efficacy and safety of endoscopic treatment of hepatocellular carcinoma (HCC).

From 1994 to 2001, we have endoscopically treated a total of 21 patients with either primary or secondary liver cancer with hepatectomy (n=10), microwave coagulation therapy (MCT, n=6), and radio-frequency ablation (RFA, n=5). There were 13 males and 8 females, and the mean age was 66 (range 30-83) years. All the patients had cirrhosis as an accompanying liver disease. The size of the tumors ranged from 7 to 44 mm in diameter.

The procedures were accomplished uneventfully in all cases with no conversion to open surgery. There were 4 cases of partial hepatectomy and 6 cases of lateral segmentectomy. The mean weight of resected liver specimen was 28 g for partial hepatectomy and 245 g for lateral segmentectomy. The mean operative time and the amount of intraoperative bleeding during laparoscopic or laparoscopy-assisted hepatectomy were 214 minutes and 435g, respectively. MCT was carried out laparoscopically in 4 cases and thoracoscopically in 2. Laparoscopic RFA was performed to 2 patients who had S4 or S5 tumors with combined laparoscopic cholecystectomy prior to the RFA procedure. Thoracoscopic approach of RFA was attempted in 2 patients with S7/S8 HCC and successfully done. All the patients well recovered without major postoperative complication and the mean hospital stay following the surgery was 16 days.

In conclusion, these results suggested that the endoscopic surgical treatment of HCC in cirrhotic patients is feasible without any serious complication and is a preferable surgical procedure in selected cases. Satisfactory local control of liver cancer can be achieved by endoscopic MCT and RFA with minimally invasiveness.

Hepatobiliary/Pancreatic Surgery-PS023

LAPAROSCOPIC SURGERY IN THE MANAGEMENT OF BENIGN LIVER CYSTS Constantine Karaliotas, Sophocles K. Lanitis, 2nd Surgical Dept. and Unit of Surgical Oncology . "Red Cross" General Hospital.Athens, Greece

OBJECTIVE: Our aim is to discuss the indications, the technique and the effectiveness of the laparoscopic surgical management of the benign cyst of the liver through the presentation of our experience.

INTRODUCTION: The development of the laparoscopic instruments and techniques opened new horizons in the hepatic surgery. On the other hand the rapid development of the imaging methods made the diagnosis of benign liver cysts more common and therefore have increased the need for intervention. We discuss the feasibility and the effectiveness of the laparoscopic surgery in this field as much as the indications and the conditions under which can be used.

METHOD: 8 patients with benign non-parasitic symptomatic giant liver cysts and 7 with liver hydatid cysts were treated laparoscopically during the last 7 years in our clinic.2 patients with small superficial hydatid cysts underwent complete pericystectomy. The other 5 patients were treated with decompression of the cyst, evacuation of the live elements and sterilization of the cyst. Moreover in 4 of these patients we did omentoplasty and in one simple external drainage. All patients with non-parasitic cysts underwent wide excision of the cyst roof and fenestration with ultrascission.

RESULTS: There was no morbidity or mortality in the group of the non-parasitic cysts .The mean operation time was 120 min (90-160) and the mean hospital stay was 5 days .In the group of the hydatid cysts we had bile leakage in one patient, which was successfully managed with endoscopic sphincterotomy. The mean operation time was 135 min (80-180) and the mean hospital stay 6 days. We had no recurrences during the follow up from 3 to 7 years.

CONCLUSION: In our opinion the laparoscopic surgery for the management of the benign liver cysts is feasible, safe and with excellent results in the hands of an experience surgeon.It is the method of choice for the management of giant non parasitic symptomatic liver cysts and under the right indications and conditions is safe and effective as much as the open surgery in the management of the liver hydatid cysts.

Hepatobiliary/Pancreatic Surgery-PS024

LAPAROSCOPIC CHOLEDOCHOLITHOTOMY IN PATIENTS WHO PREVIOUSLY UNDERWENT CHOLECYSTECTOMY Sang Kuon Lee, M.D., Won Woo Kim, M.D., Eung Kook Kim, M.D, Department of Surgery, St. Mary¡¯s Hospital, The Catholic University of Korea, Seoul, Korea

Although there are several reports about the feasibility of laparoscopic cholecystectomy in patients with previous upper abdominal surgery, report of laparoscopic approach in patients with common bile duct stones who previously underwent cholecystectomy is lacking.

Between January 1999 and June 2001, 78 patients underwent laparoscopic choledochotomy for bile duct stones. Of them, 6 patients previously underwent cholecystectomy, laparoscopically in 2 patients and by open surgery in 4. In all six patients, endoscopic retrograde cholangiopancreatography (ERCP) was performed, but failed to clear bile duct stones because of stone impactation or the presence of duodenal diverticulum. In four of them, endoscopic nasobiliary drainage (ENBD) catheter was placed for relieving symptoms of cholangitis. Open technique under direct vision was used for a safe insertion of the first trocar. Laparoscopic choledochotomy with stone extraction was carried out.

In all six patients, common bile duct identification was possible. Stones were successfully removed laparoscopically in 4 patients, but in two patients conversion to an open surgery was required. One of them had an impacted distal bile duct stone and in another, after clearing bile duct stone, an additional intrahepatic stone was found. Mean operation time was 201.6 minutes and mean hospital stay, 5.8 days. Complication was found in one patient (wound infection).

Laparoscopic approach to common bile duct was feasible in all six patients and converted cases were not because of previous adhesions but the impossibility of stone extraction laparoscopically. Therefore we conclude that laparoscopic bile duct exploration may be considered as an option in patients who underwent previous cholecystectomy

Hepatobiliary/Pancreatic Surgery-PS025

SUCCESSFUL LAPAROSCOPIC TREATMENT OF MCSHERRY TYPE I MIRIZZI¡¯S SYNDROME Sang Kuon Lee, M.D., Won Woo Kim, M.D., Eung Kook Kim, M.D, Department of Surgery, St. Mary¡¯s Hospital, The Catholic University of Korea, Seoul, Korea

Mirizzi's syndrome in one of the infrequent etiologies of obstructive jaundice owing to the calculus impaction at cystic duct or gallbladder neck, causing compression of bile duct (McSherry type I) or erosion of cystic duct-bile duct septum (McSherry type II). Not only the correct diagnosis of this entity is difficult, but also its management. Laparoscopic approach has been attempted with variable success. The objective was to analize the feasibility of laparoscopic approach in Mirizzi's syndrome.

From July 2000 to March 2001, ten patients with McSherry type I Mirizzi's syndrome were identified and laparoscopically managed. All patients had cholelithiasiasis with acute inflammation and one of them, also choledocholithiasis. Subtotal cholecystectomy was performed and after the extraction of impacted cystic duct stone, the cystic duct stump was closed with laparoscopic suture device.

There were 8 men and 2 women, and the mean age was 55.7 (range, 27-71) years. All patients had mild to moderate degree of jaundice (mean total bilirubin 2.24 mg/dl, ranging from 1.24-7.84 mg/dl). The mean operative time was 143 (range, 70-200) minutes. All patients were successfully treated laparoscopically, but one patient showed signs of bile leak which lasted for 72 hr and spontaneously ceased. Mean hospital stay was 4.9 (range, 3-9) days.

Laparoscopic treatment of McSherry type I Mirizzi's syndrome is feasible and safe when high-skilled laparoscopic surgeon is available. Suture closure is a relative safe method for managing an inflamed and thickened cystic duct stump.

Hepatobiliary/Pancreatic Surgery-PS026

TREATMENT OF BILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY Dai Maeda, Masato Fujisaki, Syusaku Kamei Ashikaga red cross hospital, Tochigi, Japan

Postoperative bile leakage occurred in 15 (1.6%) of the 966 patients who underwent laparoscopic cholecystectomy (LAP-C). The cause of bile leakage were due to cystic duct stump injury (n=7), right hepatic duct injury (n=2), cholecystohepatic duct injury (n=1), and accessory hepatic duct injury (n=1). In the 4 other patients, the site of bile leakage were not confirmed. Nine patients were treated by biliary drainage. Five patients were conducted conservative treatment. One patient with transection of right hepatic duct needed hepatectomy. The average time from the biliary drainage until bile leakage stopped was 7.6 days.

When postoperative bile leakage is discovered, cholangiography is performed to identify the site of bile leakage. When there is no evidence of contrast medium leakage, i.e., when bile leakage from the cholecystohepatic duct or Luschka ducts are suspected, the natural course is observed. When injury of biliary tract is identified and not severe, bile duct drainage such as Endoscopic Nasobiliary Drainage or Percutaneous Transhepatic Biliary Drainage is performed with the conservative intent. When severe injury of biliary tract is detected operati is needed .

Cholangiography should be performed whenever bile leakage is discovered after LAP-C. When bile leakage is identified, biliary drainage should be performed as the treatment of first choice.

Hepatobiliary/Pancreatic Surgery-PS027

TRANSVAGINAL REMOVAL OF THE GALLBLADDER AFTER NEEDLESCOPIC CHOLECYSTECTOMY, MASAMICHI MATSUDA M.D., GORO WATANABE M.D., MASAJI HASHIMOTO M.D., DEPARTMENT OF SURGERY, TORANOMON HOSPITAL, TOKYO, JAPAN

With the improvement of laparoscopes and instruments, laparoscopic cholecystectomy has entered the era of needlescopic cholecystectomy . Though the benefits of needlescopic cholecystectomy are less pain and a better cosmetic result, one of the ports (usually the umbilical port) has to be enlarged to remove the gallbladder. In this report, we describe our technique for transvaginal removal of the gallbladder after needlescopic cholecystectomy.

With the patient in the lithotomy position, four trocars were inserted (3-mm umbilical, 5-mm epigastric, and two 2-mm trocars for the lateral abdominal walls). After the gallbladder was freed from the liver bed, the body of the uterus was lifted toward the abdominal wall to obtain a view of the pouch of Douglas. Then a 12-mm trocar was inserted through the posterior fornix of the vagina, and the resected gallbladder was collected into an Endo-catch that was passed through the vaginal trocar. Next the gallbladder was extracted via the vagina using Endo-catch. The posterior fornix required 2 to 3 stitches of absorbable thread, but the abdominal wounds did not need suturing.

We have used this method in nine patients, and there have been no significant complications except for slight vaginal wall injury in 2 cases. In order to apply this method, distension of the vagina is necessary, so a good indication for this procedure is a pre-menopausal woman with a history of vaginal delivery. To avoid injury to the ureters, a clear view of the pouch of Dougas should be obtained during laparoscopy.

This method is technically easy, and because the posterior fornix of the vagina can be well dilated, even the large gallstones are easily extracted. We conclude that this technique can be used to decrease pain and obtain a better cosmetic outcome when performing needlescopic cholecystectomy.

Hepatobiliary/Pancreatic Surgery-PS028

ROBOTIC ASSISTED RADIOFREQUENCY TUMOR ABLATION: AN EX VIVO BOVINE LIVER MODEL Kenneth L. Meredith, M.D., Andrew Wright, M.D., David Quick, PhD, Richard Cochran, M.D., David Mahvi, M.D. Department of Surgery, University of Wisconsin, Madison, Wisconsin.

Robotic assisted surgery is gaining widespread use in cardio-thoracic surgery, however its role in abdominal surgery is as yet not determined. Radiofrequency ablation (RFA) of liver tumors has become a viable alternative for patients not deemed candidates for curative resection. RFA can be performed percutaneously, but with high local recurrence rates. Laparoscopic RFA has been limited by a lack of precise probe placement. The purpose of this study was to investigate the feasibility of performing Radiofrequency ablation robotically.

Tumor mimics were created in ex vivo bovine livers by injecting a mixture of agarose, cellulose, glycerol, and methylene blue. This created a 1 cm hyperechoic density visible by ultrasound. Open ablation was performed free hand with ultrasound guidance utilizing a cooled tip RFA probe. The probe was then attached to an arm of the Zeus surgical robotic system. Robotic ablation was also performed with ultrasound guidance. Ablations were carried out for 10 minutes per ablation. Measurements (taken immediately following ablation) included: tumor mimic size, zone of ablation, and distance between the center of the tumor mimic and the center of the ablation.

Ablation size and tumor mimic size was similar between groups. The average distance between tumor mimic center and ablation center was 6.25 mm +- 3.9 (N=4), in the open ablation group. The robotic assisted RFA's had an average distance between tumor mimic center and ablation center of 5.5 mm +- 3.7 (N=4). There was no significant difference between open and robotic assisted RFA in mimic lesion size (p=0.27), ablation size (p=0.40), or distance between tumor mimic center and ablation center (p=0.39), by unpaired t-test.

Liver lesions were accurately targeted and ablated using the Zeus surgical robotic system. Robot assisted radiofrequency ablation may offer the advantages of greater precision, integration with tumor imaging data, and minimally invasive technique.

Hepatobiliary/Pancreatic Surgery-PS029

INTRAOPERATIVE FINDINGS AND POSTOPERATIVE COMPLICATIONS IN LAPAROSCOPIC CHOLECYSTECTOMY. TEN YEARS OF EXPERIENCE.
E. Lenadros PhD, D. Mylonaki MD, N. Alexakis MD , M.Konstadoulakis MD, G. Zografos MD, G. Androulakis MD . First Department of Propaedeutic Surgery , University of Athens , Hippokration Hospital Athens , Greece

Background/Aims: We report our experience in treating cholelithiasis in a university teaching hospital. Issues as intraoperative findings , conversion and complication rates are analyzed.

Materials and Methods: Between November 1990 and November 2000 we performed 5539 laparoscopic cholecystectomies Mean age was 57 years (range 15-90) and male to female ratio was 1:2,4. All patients presented with symptomatic cholelithiasis, asymptomatic cholelithiasis , or acute cholecystitis. Acute cholecystitis was diagnosed in 636 patients (11,4%). Laparoscopic cholecystectomy was eventually performed in 5440 patients.

Results: There was no intraoperative or in-hospital mortality in our series. Conversion to open cholecystectomy was decided in 99 cases (1,8%). During laparoscopic exploration coincident colon cancer was revealed in 9 patients (0,16%) , other neoplasms in 12 patients , and perforated gastroduodenal ulcer in 7 patients (0,13%)

Pathologic analysis revealed simple cholecystitis in 2453 patients (44,3%), chronic cholecystitis in 2354 patients (42,5%), acute cholecystitis in 304 patients (5,5%), hydrops in 138 patients from (2,5%), empyema in 116 patients (2,1%), adenomyomatosis in 50 patients (0,9%), acalculous cholecystitis in 44 patients (0,8%), polyps in 36 patients (0,65%), gangrenous cholecystitis in 34 patients (0,6%) and gallbladder carcinoma in 11 patients (0,2%).

The complication rate in our series was 2,92% (162 patients). In 8 cases common bile duct injury occurred intraoperatively (0,14%) while severe postoperative bleeding requiring reoperation occurred in 12 patients (0,22%). The vast majority of our patients (92%) was discharged from hospital on the first postoperative day.

Conclusions: Laparoscopic cholecystectomy is a safe technique with satisfying results.The low morbidity / mortality and conversion rate reported is due to the performance of this operation by specialized laparoscopic surgeons. With the advances in laparoscopic surgery , attention towards creation of specialized Laparoscopic units in major general surgery departments is advocated.

Hepatobiliary/Pancreatic Surgery-PS030

INCIDENTAL FINDING OF GALLBLADDER CARCINOMA DETECTED DURING OR AFTER LC
D. Mylonaki, MD, N. Alexakis N, MD , M. Konstadoulakis M, MD, E. Leandros E, PhD G. Zografos G ,MD , G. Androulakis G, MD, First department of propaedeutic surgery , University of Athens Hippokration Hospital, Athens - Greece

Background. Carcinoma of the gallbladder is a rare neoplasm with a dismal prognosis. With the increase of cholecystectomies due to the wide acceptance of laparoscopic cholecystectomy, the incidental diagnosis of gallbladder carcinoma is more frequent.

We report our experience in diagnosing and treating gallbladder cancer diagnosed during or after the performance of laparoscopic cholecystectomy for cholelithiasis..

Methods. Eleven patients were found (0.2%), among 5539 patients who underwent laparoscopic cholecystectomy in the past 10 years. Patient gender, age ,symptoms, signs, diagnostic tests, pathology reports, operative and adjuvant treatments were reviewed.

Results. In only two of the cases , where the cancer grossly cross the muscular layer ,the diagnosis was made intraoperatively. In these patients the procedure was converted to open with liver bed resection and regional lymph node dissection , and in the other 9 cases cancer was diagnosed at the pathologic examination. Of these, 7 patients refused to undergo a reoperation, and the other 2 were judged inoperable.

Conclusions. The surgeon should always examine the gallbladder and send for frozen sections if he has any suspicion for cancer. Infiltrated , thickened , irregular gallbladder wall in patients without preoperative symptoms of cholecystitis should raise a suspicion of cancer. The surgeon should be prepared to perform a conversion , and an appropriate radical operation if necessary.

Hepatobiliary/Pancreatic Surgery-PS031

MANAGEMENT OF CONGENITAL POLYCYSTIC LIVER DISEASE
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Background: Áutosomal dominant polycystic kidney and liver disease is one of the most commonly inherited monogenic disorders, with a frequency of approximately 1:1000. The main symptom is the formation of multiple fluid-filled cysts in the kidneys and liver. Since the cloning of the gene, many mutations have been identified corresponding to certain phenotypes.

Materials and methods: Seven patients with symptomatic multiple liver and kidney cysts presented to our department for surgical treatment. All patients and their relatives underwent genetic counseling and screening for the detection of mutations in the PKD gene. Subsequently, they were taken to the OR and they were treated with the laparoscopic fenestration technique. In one patient that had been previously operated (laparoscopic fenestration), we had to convert because multiple abscesses were discovered intraoperatively.

Results: There were not treated-related deaths in this series. There were no post-operative complications. The mean post-operative hospital stay was 6±3 days. The patients remain free of symptoms for 10-months follow-up.

Discussion: Selected patients with symptomatic polycystic kidney and liver disease benefit from laparoscopic fenestration of the liver cysts with low morbidity and hospital stay.

Hepatobiliary/Pancreatic Surgery-PS032

RANDOMISED TRIAL OF LAPAROSCOPIC CHOLEDOCHTOMY VS POST-OPERATIVE ERCP FOR COMMON BILE DUCT STONES
L.K. Nathanson MB ChB, N.A. O'Rourke MB BCh, G.A. Fielding MB BCh, I.J. Martin MB BCh, Royal Brisbane Hospital, Princess Alexandra Hospital and Wesley Hospital, Brisbane, Australia

Intra-operative cholangiographic identification of secondary bile duct stones allows intra-operative or post operative ERCP clearance, minimises the number of ERCPs performed where no stones are found and allows 75% of our patients with stones identified to have clearance of their bile duct using trans-cystic extraction. This trial identifies those where transcystic clearance is not possible with randomisation to either laparoscopic choledochtomy or post-operative ERCP. Those randomised to ERCP are subrandomised to having an antegrade transampullary stent placed to aid ERCP access.

Over 42 months 157 patients have had trans-cystic clearance of their CBD stones outside the trial, with 70 patients randomised into the trial. Total operative time was 150min vs 157min and hospital stay 8.51 days vs 7.29 days. Morbidity expressed as events was: Pancreatitis 1 vs 2, Biliary leak or retained stones 4 vs 5, sepsis 3 vs 2, Haemorrhage 2 vs 0, Re-operation 1 vs 3, Mortality nil.

Interim analysis of outcome suggest the trial should continue until target accrual has been completed.

Hepatobiliary/Pancreatic Surgery-PS033

DOME-DOWN LAPAROSCOPIC CHOLECYSTECTOMY: A MULTI-INSTITUTIONAL REVIEW. Marc Neff, MD, Brian Cantor, MD, Jim Koren, MD, Veshal Mehta, MD, Rachel Alonso, MPh, Peter Geis, MD., Department of Surgery, St. Peter's University Hospital, New Brunswick, New Jersey.
institutions: Department of Surgery, St. Peter's University Hospital, New Brunswick, New Jersey.

The technique of laparoscopic cholecystectomy has become the preferred treatment for patients with gallbladder disease, but there remains a higher incidence of common bile duct injury compared with open techniques. The Dome- Down Laparoscopic Cholecystectomy (DDLC) has offered several advantages compared to traditional laparoscopic cholecystectomy specifically the safe identification of the anatomy of the biliary tree. We examined the multi-institutional results of the DDLC technique to evaluate its safety and efficacy.

All participants completed training in the performance of the DDLC technique and its benefits. The DDLC technique consisted of dissection that began at the fundus on the gallbladder and proceeded proximally to identify to cystic duct/CBD junction. Information was collected from each surgeon on his or her first 25 consecutive DDLC cases following training. Variables included operating time, conversions to open procedures, biliary injuries, and technical errors. Cases were graded, upon initial laparoscopic examination, on a scale of I to IV based on complexity of anatomy.

Thirteen surgeons representing eleven institutions in seven states participated in the study over an eight-month time period. Two hundred-seventy five patients underwent the DDLC and were studied in a prospective, non-randomized fashion. The times to completion of the dome-down dissection varied from 14.4 minutes to 95 minutes based on complexity category. There were no minor bile leaks or common bile duct injuries. There were two inadvertent entries into the gallbladder wall during dissection and one conversion to open secondary to bleeding.

This review represents the follow-up data of 13 different surgeons with this method of dissection. The procedure was performed successfully with no bile leaks or common bile duct injuries. This technique should allow for a rate of CBD injury comparable to that seen in open cholecystectomy with all the advantages of laparoscopic surgery.

Hepatobiliary/Pancreatic Surgery-PS034

LAPAROSCPIC CHOLECYSTECTOMY WITHOUT INTRAOPERATIVE CHOLANGIOGRAPHY: IS IT SAFE? DAVAADORJ Nyamkhuu, M.D. NYAMKHUU Gonchigsenghe, M.D., Department of Surgery of the Mongolian National Medical University, Ulaanbaatar, Mongolia

The nessity of laparoscopic intraoperative cholangiography (LIOC)during laparoscopic cholecystectomy (LC) is discussed contrary. The aim of this study is to report our experience in LIOC.

In the Department of Surgery of the Mongolian National Medical University, Ulaanbaatar, Mongolia, 560 consecutive patients(186 male,

374 female, average of 42 years) underwent LC between June 1995 and June 2001 under two surgeons. All patients, in addition to their clinical assessment, had routine ultrasound (US)examination of the biliary tract and liver function tests (LFTs). Following preoperative selection criteria, 63 patients were canditates for preoperative endoscopic retrograde cholangiopancreatography (ERCP)while 34 patients were found to have common bile duct (CBD) stones and the patients underwent open cholecystectomy. ERCP was normal29 cases. Complication rate of ERCP was 3,1%(2 cases of mild to moderate pancreatitis). ERCP was performed in 2 patients, in the postoperative period. They had pain, raised bilirubin and alkaline phosphate suggestive of CBD obstraction. There were 2 cases of CBD injuries (0,3%) (2 transection) and re-operation, hepaticojejunostomy were performed 3 and 4 days after LC. The patients requered several operations for sepsis and eventually died 1 and 6 months later.

The follow up period ranged from 75 months to 3 months, without exlusion of any patients. One patient (0,2%) was diagnosed with residual stones and was submitted to successful endoscopic extraction.

Our experience support that LC can be performed safely without LIOC, provided that the pre- and/or posoperative ERCP is performed when indicated.

Hepatobiliary/Pancreatic Surgery-PS035

ENDOSCOPIC HEAT ABLATION THERAPY FOR HEPATOCELLULAR CARCINOMA Masasharu Odo, M.D., Koji Okuda, M.D., Masao Hara, M.D., Naomitsu Kanazawa, M.D., Shigeaki Aoyagi, M.D., Kazuo Shirouzu, M.D., Department of Surgery, Kurume University School of Medicine, Kurume Fukuoka

Hepatocellular carcinoma (HCC) is one of the most common liver tumor in Japan. There are various modalities for HCC, including hepatectomy, transarterial embolization, percutaneous injection therapy and heat ablation therapy. The favorable treatment for HCC is curative surgical resection, but many patients with HCC confined to the liver are not candidates for resection for their concomitant liver cirrhosis with inadequate functional hepatic reserve. On the other hand, the thermal ablation therapy with microwave coagulation treatment (MCT) and with radiofrequency ablation (RFA) are effective alternative treatment. We employed endoscopic guidance thermal ablation therapy aiming to treat with minimally invasive method from April 1991.

Fifty-five patients with HCC associated with liver cirrhosis were treated with endoscopic guidance ablation therapy between April 1991 and August 2001. Forty-seven patients were treated with MCT (Thoracoscopic guidance: 25 cases , Laparoscopic guidance: 22 cases), and 6 patients were treated with RFA(Thoracoscpic guidance: 2 cases, Laparoscopic guidance: 4cases).

Thoracoscopic guidance was employed for 28 cases tumor located in S4 (1case), S6 (2 case), S7 (7 cases), and S8 (18 cases) and laparoscopic guidance was employed for 25 cases tumor located S1 (4 cases), S2 (3 cases), S3 (2 cases), S4 (5 cases), S5 (4 cases), S6 (7cases).Ten patients experienced complications (Pleural effusion:4 cases, Infection of port site:3 cases, Atelectasis:1 case, Pulmonary edema:1 case, Liver abscess:1 case). There have been no deaths associated with heat ablation therapy. We indicate ablation therapy including endoscopic approach for patient with three or fewer, primary HCC which size is <3cm

The endoscopic approach allowed for visualization of surrounding structures with minimizing invasions, and blood loss and operative time were surpressed

Hepatobiliary/Pancreatic Surgery-PS036

ENDOSCOPIC HEAT ABLATION THERAPY FOR HEPATOCELLULAR CARCINOMA Masasharu Odo, M.D., Koji Okuda, M.D., Masao Hara, M.D., Naomitsu Kanazawa, M.D., Shigeaki Aoyagi, M.D., Kazuo Shirouzu, M.D., Department of Surgery, Kurume University School of Medicine, Kurume Fukuoka

Hepatocellular carcinoma (HCC) is one of the most common liver tumor in Japan. There are various modalities for HCC, including hepatectomy, transarterial embolization, percutaneous injection therapy and heat ablation therapy. The favorable treatment for HCC is curative surgical resection, but many patients with HCC confined to the liver are not candidates for resection for their concomitant liver cirrhosis with inadequate functional hepatic reserve. On the other hand, the thermal ablation therapy with microwave coagulation treatment (MCT) and with radiofrequency ablation (RFA) are effective alternative treatment. We employed endoscopic guidance thermal ablation therapy aiming to treat with minimally invasive method from April 1991.

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The endoscopic approach allowed for visualization of surrounding structures with minimizing invasions, and blood loss and operative time were surpressed

Hepatobiliary/Pancreatic Surgery-PS037

THE ERA OF ULTRASONOGRAPHY DURING LAPAROSCOPIC CHOLECYSTECTOMY: IS CHOLANGIOGRAPHY EVER NEEDED Raymond P. Onders M.D., Peter T. Hallowel M.D. Department of Surgery, University Hospitals of Cleveland and Case Western Reserve University, Cleveland,Ohio

Background: The use of ultrasonography to assess for common bile duct stones has been well described. This study was undertaken to assess the use of the umbilical port exclusively for ultrasonography during laparoscopic cholecystectomy and to assess the need for flouroscopy during during an era of radiology personnel shortages.

Methods: A database of cases done by the primary author was analyzed from 1/00 to 8/01 to review all laparoscopic cholecystectomies done with or without laparoscopic ultrasonography. The standard technique was a Hasson trocar with only two additional 5mm ports. A 7.5-MHz ultrasound probe with a deflectable tip was utilized only through the umbilical port. The longitudinal view of the common hepatic and common bile duct was visualized to the ampulla. Ultrasonography was utilized selectively when patients were at an increased risk for common bile duct stones or for identification of the anatomy. No additional personnel were needed during ultrasonography.

Results: There were 189 laparoscopic cholecystectomies performed during the study period. Ultrasonography was utilized in 54 cases and common bile duct stones were identified in 8 patients, 6 of these patients underwent laparoscopic common bile duct explorations and two underwent ERCPs. There were no false positive or false negative ultrasounds. All were completed laparoscopically with a total of three ports. There was no use of cholangiography in this series except during the common bile duct explorations.

Conclusions: The umbilical port technique allows for excellent viewing of the bile ducts and limits the need for a 10mm epigastric port. The use of surgical ultrasonography decreases the need for flouroscopy and the scarce radiology technicians. With meticulous dissection for anatomy and experience with ultrasonography there is little indications for cholangiography except for any rare questions concerning the anatomy and during therapeutic maneuvers for common bile duct stones.

Hepatobiliary/Pancreatic Surgery-PS038

LAPALOSCOPIC CHOLECYSTECTOMY WITH TWO ORIGINAL LIFTING BARS Hirotsgu O'hara, M.D.,Tosiyuki Hirai ,M.D., Yasuhiko masuda , M.D.,Hiroyuki niwa ,M.D., Masanobu Taniguchi,M.D.,Department of surgery , Fujieda Heisei Memorial Hospital , Fujieda , Sizuoka , Japan .

In 1992, We performed laparoscopic cholecystectomy by an abdominal wall lifting method using only one original lifting bar, (our lifting bar consisted of a bent stainless steel rod 5mm in diameter). In1994, we changed this method to a two lifting bar method to accommodate cases of severe obesity or cases of severe inflammation at the Calot's triangle. So, since 1994, We have performed 250 cases of LC with good results by the two lifting bar method. This method, including surgical field and procedure for insertion of our lifting bars, will be discussed.

In every LC, using two lifting bar method, there was no severe complication and no case of damaged wall and peritonium. There was only 2 cases converted from laparoscopic cholcystectomy to conventional open surgery . The average operation time was 69.9min.

By using this method, ligamentum teres hepatis is jerked toward the upper median direction. As a result, the liver is lifted to the median abdominal position, so we can get a suitable surgical field to manipulate the inferior surface of the liver, as is required to perform cholecystectomy. Our lifting method is reliable techuniqe.

Hepatobiliary/Pancreatic Surgery-PS039

LAPAROSCOPIC CRYOABLATION OF HEPATIC TUMORS: MID-TERM FOLLOW-UP RESULTS. Alessandro M. Paganini MD, Francesco Feliciotti MD, Mario Guerrieri MD, Andrea Tamburini MD, Jlenia Sarnari,MD, Emanuele Lezoche, MD.*
Clinica di Chirurgia Generale e Metodologia Chirurgica, Ospedale Umberto I°, University of Ancona, Italy. *Clinica Chirurgica II°, Policlinico Umberto I° University "La Sapienza" Rome, Italy.

Liver resection offers the best chance of cure for patients with hepatic colo-rectal (CRM) and non colo-rectal (NCRM) metastases with 57% and 22% 3 years survival, respectively. Recent technological advances have expanded the range of options for the treatment of liver tumors. Total Laparoscopic Cryoablation (TLC) has been shown to be feasible and safe Aim of this study is to evaluate the long-term results of TLC in pts with hepatic CRM and NCRM.

From April 1996 to October 2000, 24 pts (17 males, 7 females, mean age 63.5 years, range 30-78 years) underwent TLC in our Dept. In 15 cases (62%) for CRM, in 7 cases (29%) for NCRM and in 2 cases (9%) for HCC.

Mean number of cryoablated lesions was 1.4 for CRM and 1.8 for NCRM. Mean hospital stay was 11 and 10 days respectively for CRM and NCRM. Two pts in the CRM group and 1 pt in the NCRM group were converted to open surgery for bleeding. No major complications or mortality were observed.

Follow-up (pts)	CRM (15)	NCRM (7)
Mean Follow-up, mths (range)	40.6 (10-64)	38.2 (7-57)
Alive, n (%)	10 (66.6)	3 (42.8)
Disease-free, n (%)	8 (80)	2 (66.6)
Distant recurrence, n (%)	2 (20)	1 (33.4)
Median survival (mths)	54.9	45.8

No local recurrences on the site of hepatic cryoablation were observed.

TLC is effective for local tumor control. In selected pts the mid-term follow-up results compare favorably with the reported results after surgical resection.

Hepatobiliary/Pancreatic Surgery-PS040

TEN YEARS' EXPERIENCE WITH LAPAROSCOPIC SINGLE STAGE COMMON BILE DUCT STONES' MANAGEMENT. Alessandro M. Paganini MD, Francesco Feliciotti MD, Mario Guerrieri MD, Andrea Tamburini MD, Jlenia Sarnari MD, Emanuele Lezoche MD.*
Clinica di Chirurgia Generale e Metodologia Chirurgica, Ospedale Umberto I°, University of Ancona, Italy. *Clinica Chirurgica II°, Policlinico Umberto I° University "La Sapienza" Rome, Italy.

Aim is to report our 10 years experience with single stage laparoscopic management of gallbladder and CBD stones and to analyse the short and long-term results of this approach.

Since April 1991, 301 elective unselected pts (183 females, 118 males, mean age 55.2 years, age range 12-94 years) completed laparoscopic cholecystectomy and CBD exploration for ductal stones (170 trans-cystic, 131 transverse choledochotomy). Major procedure-related complications were observed in 11 pts (3.6%). Mortality occurred in 2 cases (0.6%). Retained CBD stones were present in 15 pts (4.9%) treated postoperatively by percutaneous approach (8 pts) or ERCP/ES (6 pts). In one pt a small CBD stone passed spontaneously. The overall success is 95.1 %.

Long-term follow-up was obtained on 285 pts (94.7%). Thirteen pts died from unrelated reasons with no evidence of recurrent biliary symptoms. Sixteen pts (5.3%) were lost to follow-up. At a median follow-up of 73 months, 234 (86%) pts are asymptomatic, 22 (8%) report dyspepsia and 16 (5.9%) aspecific bowel symptoms. Recurrent ductal stones were found in 5 pts (1.8%) at 1, 4, 8, 18, 27 months after T-tube removal following negative cholangiogram. All five pts underwent ERCP/ES. In one case the stone passed spontaneously. One pt with dilated bile ducts (>2 cm) developed re-recurrent CBD stones and underwent hepaticojejunostomy. No biliary strictures at the site of the transverse choledochotomy have been observed.

The reported data confirm the safety and efficacy of the single stage laparoscopic approach, both in the short and in the long-term, which allows to redefine the role of endoscopic sphincterotomy in the elective setting as the treatment of choice for residual ductal stones (when a biliary drainage sinus tract is not available) and for recurrent stones.

Hepatobiliary/Pancreatic Surgery-PS041

LAPAROSCOPIC MANAGEMENT OF COMPLICATED HYDATID CYST WITH INTRABILIARY RUPTURE. P. S. RAJAN, MS, C.Palanivelu, R. Parthasarathi, S. Balasasikumar, B. Kesavan, Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES),GEM Hospital, Coimbatore, INDIA

With increasing experience and new equipment, more and more complex procedures are being successfully treated by laparoscopic approach Complex Hydatid cysts ruptured into the biliary system is technically challenging by laparoscopic treatment. We have treated patients with such complication successfully by laparoscopic approach.

Since Jan 1992, we have treated 36 patients of Hydatid cysts liver at CIGES of which 6 of them were complicated cyst with intrabiliary rupture. Four patients had cholangitis with pain, fever and jaundice. Imaging investigations revealed intra biliary hydatid fragments. All of them were submitted for laparoscopic extraction.

We adopted two different approaches depending on the size of the cysts.

Method One : In 4 patients with large cysts were treated by laparoscopic assisted percutaneous trocar cannula extraction system. Our own designed cannulla with long limb 12mm wide and side suction cannula (12mm) and another channel for saline irrigation and gas insufflation for intracavitary telescopic inspection. Keeping continuous suction, trocar insertion prevents intra-peritoneal spillage. By intracavitory vacuum suction alternate will irrigation removes the intrabiliary cysts.

Method Two: patients with collapsed smaller cysts, transcystic approach adopted for extraction by marsupilizing the cyst wall. Laparoscopic choledochotomy with tube irrigation in a reverse fashion removed the cysts into the main cystic cavity.

In all the patients, removal of the hydatid cysts were complete and during follow of mean 3 years, no recurrence.

Conclusion: Laparoscopic assisted percutaneous trocar cannulla with alternate irrigation and suction system for larger cysts and transcystic approach with biliary irrigation through choledochotomy for smaller cysts are found to be highly effective in treatment of hydatid cysts ruptured into the biliary system.

Hepatobiliary/Pancreatic Surgery-PS042

CAN LAPAROSCOPIC CHOLECYSTECTOMY BE DONE IN A TRUE OUTPATIENT SETTING FOR ACUTE, CHRONIC AND GANGRENOUS CHOLECYSTITIS? THE EXPERIENCE OF 588 CONSECUTIVE LAPAROSCOPIC CHOLECYSTECTOMIES BY A SINGLE SURGEON. SUBIR RAY, M.D.

The author has performed 588 laparoscopic cholecystectomies over a six year period for acute, chronic and gangrenous cholecystitis regardless of age, weight or underlying medical problems.

Out of these patients 524 were discharged within two to four hours following their surgery. Thirty percent of the patients were given postoperative antibiotics due to the nature of their problem. However, most of the patients with a chronic cholecystitis were discharged without any further antibiotics. Patients with gallstone pancreatitis and patients who underwent preoperative ERCP as well as patients who were admitted by medical service were excluded from this series.

Most patients received Cefotan 2 grams IV and those with an allergy to Cefotan were given Cipro IV. There were six laparoscopic cases converted to an open procedure due to severe inflammation and the inability to identify the cystic duct. Two patients had a common bile duct injury and one underwent an open choledochojejunostomy and one a laparoscopic common bile duct exploration and insertion of a T tube and a safe cholecystectomy. These patients did extremely and were discharged to their home.

No patients underwent any intraoperative cholangiography. Patients with abnormal LFT's or any sonographic findings of a common bile duct stone were subjected to a preoperative ERCP. There were twenty two patients admitted preoperatively for an ERCP and underwent laparoscopic cholecystectomy. Four patients underwent an unsuccessful ERCP, however, they underwent laparoscopic exploration of the common bile duct with extraction of stones and T tube placement.

In 99 percent of the cases the author used only three trocars for the procedure, two 5 mm. and one 11 mm.. In less than ten cases the author had to use a fourth 5 mm. trocar.

The author concluded that laparoscopic cholecystectomy can be done safely in a true outpatient setting without any increase in morbidity or mortality.

Hepatobiliary/Pancreatic Surgery-PS043

LAPAROSCOPIC STUMP CHOLECYSTECTOMY. HOW SAFE IS IT? DR. PRASANNA KUMAR REDDY, DR.MURALIDHARAN, DR.VENKATASUBRAMIAM, DEPARTMENT OF SURGERY, APOLLO HOSPITALS,CHENNAI, INDIA

The aim of the study is to find how safely gall bladder stumps which were left during earlier surgery, can be removed laparoscopically.Over a period of 7 years, 30 cases of gall bladder and cystic duct stumps for symptomatic gall stone disease were successfully operated.These patients underwent open or laparoscopic cholecystectomy one to two years before. There were 19 females and 11 males. Average age was 25 to 55 years.Routine pre operative investigations were carried out before subjecting them for surgery.Average time taken for surgery is one hour to one and half hour. Post operative period was uneventful. Patients were discharged in 2 to 3 days time. Revision surgery for gall bladder stump can be performed as safely as routine laparoscopic cholecystectomies. It does not increase the morbidity and mortality.

Hepatobiliary/Pancreatic Surgery-PS044

Laparoscopic Enucleation of Pancreatic Islet Cell Tumors Petachia Reissman, M.D., Sergey Lyass,M.D., Ahmed Eid,M.D., Oded Zamir,M.D., Richard Lederman*,M.D., David Gross**M.D., Department of Surgery, Radiology* and Endocrinology**, Hadassah University Hospital, Jerusalem, Israel.

Background: The difficulty in locating small pancreatic islet cell tumors (PICT) makes their laparoscopic management even more challenging and only several small case studies have been so far reported. We retrospectively analyzed our experience with laparoscipic enucleation of PICT order to determine its feasibility and outcome.

Patients & Methods: Between July 2000 and May 2001 – 5 patients (3 male, 2 female, 24-55 years old) underwent laparoscopy for PICT. Clinical data, preoperative endocrine work up, imaging studies, operative data, final diagnosis and outcome were recorded and analyzed. Intraoperative laparoscopic ultrasound for tumor localization and exclusion of synchronous lesions was performed in all patients.

Results: 4 patients had an insulinoma located in the tail – 1, body – 1, head – 1 and uncinate process – 1. In one patient the tumor was nonfunctioning located in the body. Two patients were converted due to failure of tumor localization by the laparoscopic ultrasound probe. In both patients after conversion the tumor was located in the uncinate process and body using an ordinary probe. In one patient with Von-Hipple-Lindau Syndrome, laparoscopic enucleation of the PICT and laparoscopic adrenalectomy for pheochromocytoma were performed in the same session. All patients underwent complete enucleation of the tumor (10 – 20 mm in diameter). There were no intraoperative complications. Postoperatively, 2 of the 3 patients in the laparoscopic group and one of the two converted patients developed a controlled self limiting pancreatic fistula. Tumor histology confirmed the preoperative diagnosis in all patients. During 4 – 14 m of follow-up all patients are well and without any endocrine abnormalities.

Conclusions: Laparoscopic enucleation of pancreatic islet cell tumors is feasible and safe. The use of intraoperative ultrasound is crucial. However, according to our limited experience the laparoscopic probe is still inferior to the ordinary probe. With growing experience and technical progress this may be resolved.

Hepatobiliary/Pancreatic Surgery-PS045

PREDICTIVE FACTORS FOR CONVERSION OF LAPAROSCOPIC CHOLECYSTECTOMY, Michael Rosen MD, Fred Brody MD, Frank Duperier MD, Alicia Fanning MD, Jeffrey Ponsky MD., Department of General Surgery and Minimally Invasive Surgery Center Cleveland Clinic Foundation, Cleveland OH

Laparoscopic cholecystectomy has replaced open cholecystectomy for the treatment of gallbladder disease. However, certain cases still require conversion to open procedures. Identifying these patients at risk for conversion remains difficult. The aim of this study was to identify risk factors that may predict conversion from the laparoscopic to open procedure.

From January 1996 to January 2000,1347 laparoscopic cholecystectomies were performed at one institution. A retrospective analysis of thirty four parameters including patient demographics, clinical history, laboratory data, ultrasound results, and intraoperative details was performed. Stepwise, multivariate logistic regression was used to determine those variables predicting conversion of laparoscopic cholecystectomy.

Seventy one (5.3%) laparoscopic cholecystectomies required conversion. Multivariate analysis revealed that for all cases, a WBC>9 (2.9 greater odds ratio (OR) of conversion p=0.006) and a gallbladder wall thickness>0.4 cm (7.2 OR, p<0.001) predicted conversion to open cholecystectomy. However, when patients with acute cholecystitis were evaluated only a BMI>30 kg/m2 (5.6 OR, p=0.02) predicted conversion. For patients undergoing elective cholecystectomy, a BMI>40 kg/m2 (33.1 OR, p=0.01) and a wall thickness>0.4 cm (24.7 OR, p<0.004) predicted conversion. Finally, an ASA>2 (5.3 OR, p=0.01) predicted conversion in patients undergoing nonelective cholecystectomies.

Obese patients with acute cholecystitis undergoing laparoscopic cholecystectomy have an increased chance of conversion. Likewise, patients with multiple comorbid diseases undergoing nonelective laparoscopic cholecystectomy are more likely to require conversion. Finally, in an elective laparoscopic cholecystectomy, morbidly obese patients with chronic cholecystitis and a thickened gallbladder wall are more likely to require conversion. These factors can help counsel patients undergoing laparoscopic cholecystectomy with regards to the probability of conversion to an open procedure.

Hepatobiliary/Pancreatic Surgery-PS046

THREE PORT VERSUS STANDARD LAPAROSCOPIC CHOLECYSTECTOMY, A PROSPECTIVE,RANDOMIZED TRIAL. Trijuk Sandu M.D. Department of Surgery, Faculty of Medicine, Chiangmai University, Chiangmai, Thailand.

Since the first laparoscopic cholecystectomy was performed and report in 1987. There was widespread accept this technique around the world and now accept as a standard procedure. The procedure is based on standard technique using four trocars. The fourth (lateral) trocar use to graspe the fundus of gallbladder upward to expose Calot's triangle. After performing a number of cholecystectomy , I felt that most of the cases did not need a fourth trocar. So I decide to study compare three port versus four port technique.

During 1998-2000, 200 consecutive patients who underwent elective laparoscopic cholecystectomy due to gallstone were randomized to receive either three or four port technique.

There was no difference between two groups in age (53.22 vs 53.74 p=0.938), sex (1.75 vs 1.73 p=0.522), weight (59.12 vs 57.78 p=0.369), operative time (59.22 vs 57.66 p=1.64), successful rate (0.98 vs 0.98), visual analog score (3 vs 3), number of oral analgesic (0.3 vs 0.39) and post op hospital stay (1.4 vs 1.9 p=0.24) but there was better in three port group in reduce of number of analgesic injection (0.40 vs 0.77 p=0.024)

The results showed that using the three port technique is as safe as compare to standard four port laparoscopic cholecystectomy. The main advantages of the three–port technique are less expensive, fewer scars and use less personnel.

Hepatobiliary/Pancreatic Surgery-PS047

LAPAROSCOPIC CYSTOJEJUNOSTOMY FOR PANCREATIC PSEUDOCYST. -INFRACOLIC APPROACH-Kazuhiko Shibuya M.D., Hisashi Abe M.D., Shigeru Ottomo M.D., Fuyuhiko Motoi M.D., Junichiro Yamauchi M.D., Makoto Sunamura M.D., Kazunori Takeda M.D., Seiki Matsuno M.D, First Department of Surgery, Tohoku University, Sendai, Japan.

Background: The gradual enlargement of a persistent pancreatic pseudocyst generally requires intervention. When the decision to carry out an operative procedure is made, preference should be given to internal rather than external drainage. Cuschieri reported laparoscopic cystojejunostomy using infracolic approach that does not require Roux-en Y or Braun anastomosis for pancreatic pseudocyst in 1998. Purpose: To evaluate the usefulness of this laparoscopic infracolic cystojejunostomy compared to open procedure.

Method: From January 1999 to August 2001, 3 patients underwent this laparoscopic cystojejunostomy (LAP group) and 5 patients underwent open cystojejunostomy (open group). Operative time, amount of bleeding, starting time of water intake, and postoperative hospital stay were compared between two groups.

Results: Mean age was 55.3 years in LAP group and 54.4 years in open group. Mean diameter of the pseudocyst was 6.0cm in LAP group and 8.8cm in open group. Early uncomplicated resolution was observed in all of the patients. Mean operative time was 191 minutes in LAP group and 144 min in open group. Mean amount of bleeding was less than 10g in LAP group and 202g in open group. Mean starting time of water intake was 3.7 days in LAP group and 5.4 days in open group. Mean hospital stay was 14.3 days in LAP group and 25.2 days in open group.

Conclusion: This laparoscopic cystojejunostomy using infracolic approach is a safe and useful procedure because it can reduce amount of bleeding and postoperative hospital stay, although it takes more operative time.

Hepatobiliary/Pancreatic Surgery-PS048

EXPERIMENTAL AND CLINICAL EVALUATION OF COMMON BILE DUCT REPAIR BY TITANIUM CLIP Kazuyuki Shimomura MD, Yukio Fujino MD, Hirohumi Yamada MD, Nobuo Murata MD, Daijo Hashimoto MD, Department of Surgery, Saitama Medical Center, Saitama Medical School, Saitama, JAPAN

Recently common bile duct∞@(CBD)∞@exploration is often performed laparoscopically. However suture repair of common bile duct is sometimes difficult technically, and T-tube insertion tends to prolong hospital stay up to over 3 weeks. In order to simplify closure technique of CBD and to avoid prolonged hospital stay, we applied VCS titanium clip to repair CBD. VCS is a clip system made for vascular anastomosis, and this time was applied to CBD closure after exploration (XL: 3mm). We evaluated efficacy and safety of this method experimentally and clinically. (Experiment) Six pigs (male: body weight 25~40 kg) were used. Under generalized anesthesia 1 cm incision made in resected CBD system, and was closed by VCS clips in every 4 mm, 2 mm, 1 mm and 0.5 mm. Pressure tolerance test by saline injection (1ml/sec) was performed by monitoring bursting pressure of CBD. Results are 18.1 ∞} 6.9 mmHg (4mm stitch), 84.8 ∞} 15.4 mmHg (2mm stitch), 130.0 ∞} 14.6 mmHg (1mm stitch) and 202.9 ∞} 39.3 mmHg (0.5mm stitch) respectively, and we found 0.5 ~2.0 mm stitches appropriate for clinical cases. (Method) Before closing CBD, we performed intraoperative cholangiogram or choledochoscope to neglect outflow obstruction of papilla Vater. After lithotripsy, we applied VCS clips (3mm) to repair CBD. We applied clips every 0.5 mm ∞` 2mm. No bile drainage was attempted to place. (Results) We have 7 clinical cases (6 male, 1 female) performed by single surgeon. Size of CBD exploration was 5 ~ 20mm, mainly according to the size of largest stone. And the number of applied VCS clip was 10 ~ 20. All the 7 patients were evaluated ready for discharge around 3 or 4 postoperative days according to our standard. There was no case of bile leakage after POD 1, CBD stenosis or stone recurrence. Average period of observation was 14.0 months. (Conclusions) VCS clip was useful to simplify CBD repair technique and to reduce hospital stay as short as basic laparoscopic cholecystectomy.

Hepatobiliary/Pancreatic Surgery-PS049

LAPAROSCOPIC CHOLECYSTECTOMY IN OCTOGENARIANS Ram M Spira MD, Nahum Beglaibter MD, Tzeela Cohen MD, Aviram Nissan MD, Herbert R Freund MD, Department of Surgery Hadassah University Hospital, Mount Scopus, Jerusalem Israel

The proportion of patients aged 80 years and more is constantly increasing. This retrospective study was designed to document the special features of this group,the indications for surgery and the perioperative course and complications in this age group. During the last 5 years we performed 1250 laparoscopic cholecystectomies out of whom 59 patients (5%) were 80 (range 80-91) or more years old. There were 43 females and 16 males. The indications were acute cholecystitis in 28 (47%), biliary colic in 17 (29%), cholangitis in 6 (10%), and gall stone pancreatitis in 8 (13%) patients. Ten patients (17%) underwent percutanous tube cholecystostomy during an attack of severe acute cholecystitis several weeks prior to surgery and 17 patients (30%) underwent ERCP preoperatively. Twenty patients had no major comorbidities while 30 patients had 1-2 major comorbidities and 9 patients had 3 or more major comorbidities. Thirty one patients were ASA class II, 26 were ASA class III and 2 were ASA class IV. Conversion to open cholecystectomy occurred in 7 patients (12%) vs. 1.5% in the remaining 1191 patients. Mean operative time was 80 (range 40-190) minutes vs. 60 minutes in the rest of the group. Sixteen major postoperative complications (mainly cardiac and pulmonary) occurred in 8 patients (13%). We had one anesthetic related mortality. Mean postoperative hospital stay was 2.3 days vs. 1.2 days in the rest of 1191 patients.

Conclusions: Octogenarians are more frequently operated because of complicated gall stone disease (acute cholecystitis, cholangitis, pancreatitis) then the younger population and hence the longer operative time and larger conversion rate. Preoperative systemic comorbidities contribute to the higher postoperative complication rate. Nevertheless, the results are superior to published historical controls concerning open cholecystectomy in the elderly. Laparoscopic cholecystectomy is the gold standard for gall stone disease regardless of age.

Hepatobiliary/Pancreatic Surgery-PS050

EXPERIENCE WITH LAPAROSCOPIC RESECTION OF THE PANCREAS Nobumi Tagaya, M.D., Kazunori Kasama, M.D., Norio Suzuki, M.D., Shoujirou Taketsuka, M.D., Kenji Horie, M.D., Makoto Furihata, M.D., Keiichi Kubota, M.D., Second Department of Surgery, Dokkyo University School of Medicine, Mibu, Tochigi, Japan. Department of Surgery, Horie Hospital, Ota, Gunma, Japan.

Laparoscopic pancreatic surgery is still not a common procedure all over the world. Postoperative complications such as a pancreatic leakage cause a serious condition. We report our consecutive laparoscopic pancreatic resections of islet cell tumors or benign diseases and evaluated their outcomes.

Laparoscopic pancreatic resections were attempted in three patients. Preoperative diagnoses were insulinoma in two patients and cystadenoma in one. They were located in the body in two patients and the tail in one. Their sizes ranged from 1 to 6 cm in diameter, with a mean of 3 cm.

We performed distal pancreatectomy using endoscopic linear stapler with the conservation of spleen in two patients and enucleation in one. Of distal pancreatectomies, the splenic artery and vein were preserved in one patient, while in the other they were divided. There were no perioperative complications in all cases. The mean postoperative hospital stay was 10 days (range: 7-14). There were no episodes of hypoglycemia and recurrence during the 16 months of mean follow-up periods (range: 4-29).

Although laparoscopic pancreatic resection of selected patients is a feasible and safe procedure by experienced laparoscopic surgeons, postoperatively we must carefully observe patients to avoid serious conditions by pancreatic fistula.

Hepatobiliary/Pancreatic Surgery-PS051

CHOLECYSTECTOMY WITH LAPAROSCOPIC MINI-INSTRUMENTS J.TANAKA, *H.ANDOH, A.UMEZAWA, S.ENDO, M.IWASHITA, K.NAGATA, H.ISHIZAKI, E.HIDAKA, S.USUI, T.YOSHIDA, H.INOUE, S.KUDO DIGESTIVE DISEASE CENTER, SHOWA UNIVERSITY NORTHERN YOKOHAMA HOSPITAL, YOKOHAMA JAPAN, *DEPARTMENT OF SURGERY, AKITA
UNIVERSITY SCHOOL OF MEDICINE, AKITA, JAPAN

Feasibility of cholecystectomy with laparoscopic mini-sized instruments (mini-LC) was investigated. Consecutive 140 patients underwent mini-LC by using mini-sized instruments measuring 1.8-3.0mm. A 5 or 10mm port for laparoscope or specimen extraction was inserted as the first port just interior to the umbilicus. Under laparoscopic view, 3mm ports for grasper, dissector and/or retractor were inserted. Mini-LC was successfully performed on 122 patients out of 140 patients including acute cholecystitis, previous upper abdominal surgery and∞@choledochocholecysto-lithiasis, with a comparable operating time of 69 +/- 15 min to that of conventional LC with 5-10 mm instruments. There were no remarkable postoperative complications. On 18 patients, mini-sized port was converted to 5mm port due to wall thickness of gallbladder or adhesions due to marked inflammation. Mini-LC is feasible, however it is not recommended to apply the procedure to patients who have adhesions or wall thickness of gallbladder.

Hepatobiliary/Pancreatic Surgery-PS052

LAPAROSCOPIC EXCISION OF CHOLEDOCHAL CYST IN CHILDREN. CK Yeung M.D., KH Lee, YH Tam, WG Manson, DY Sihoe, Division of Paediatric Surgery, Department of Surgery, The Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong, China.

Objectives: With the rapid advances in minimally invasive surgical techniques, even complicated reconstructive procedures can now be achieved laparoscopically in young paediatric patients. We report our early experience of laparoscopic excision of type I choledochal cysts with hepaticojejunostomy in two children. Patients & Methods: Patient 1: A 1-year-old boy was found to have a large choledochal cyst on antenatal screening. The cyst progressively increased in size to 8cm in diameter postnatally. Patient 2: A 17-year-old girl presented with recurrent cholangitis. Investigations revealed a type I choledochal cyst. Surgical Techniques: Patient was in supine position with legs separated and the surgeon was standing between the legs. A 5mm 30° laparoscope was introduced via a supraumbilical port. Three more 3-5mm ports were inserted at left upper and right lower and upper quadrants. An operative cholangiogram was performed via a needle inserted percutaneously. Cholecystectomy was performed. The choledochal cyst was then mobilised away from the portal vein and hepatic artery from above downwards to the retroduodenal and intrapancreatic portions. A 40cm Roux loop was fashioned extracorporeally via the slightly enlarged umbilical port site, then re-routed back into the abdominal cavity and brought to the hepatic hilum in retrocolic manner. The choledochal cyst was then transected just beneath the common hepatic duct bifurcation. End-to-side hepatico-jejunostomy was fashioned using interrupted 5-zero polyglactin sutures with both intra- and extra-corporeal suturing techniques. Results: Laparoscopic excision of choledochal cysts and hepaticojejunostomy was successfully performed in both patients. The initial recovery of the boy had been smooth but he developed a small subhepatic collection 1 week after surgery. This settled quickly on percutaneous drainage. The girl recovered from surgery uneventfully. Conclusion: Excision of type I choledochal cyst and re-establsihment of bilio-enteric continuity can be safely and effectively performed laparoscopically even in infants and children.

Hernia Surgery-PS053

LAPAROSCOPIC PERCUTANEOUS CLOSURE OF DEEP INGUINAL RING IN INDIRECT INGUINAL HERNIA Abdullah AlDohayan, MD; Mohammed AlSebyl, MD; Othman Noraldin, MD; Amal Abdulkarim, MD; Ahmed AlOtaiby, MD; Mohammed AlSkaini, MD; Ali AlTuwaijri, PhD; Abdulaziz AlSaigh, MD, Department Surgery and Physiology, King Khalid University Hospital, Riyadh, Saudi Arabia

Background: Indirect inguinal hernia is a common disease affecting the young population. In healthy patients with non-dilated ring, herniotomy or neck closure are more suitable techniques.

Methods & Results: Laparoscopy is used to localise the hernia. An incision is made at the level of the deep ring. Alkhwiteer-Aldohayan needle is mounted with sutures passed through the floor of the ring and retrieved through the floor. This step is repeated until the patient's neck is closed. This procedure has been performed on 140 patiens with a mean age of 32 years. Two patients developed direct inguinal hernia. Four patients had wound pain, which subsided in 6 months time.

Conclusion: Laparoscopic closure of the deep inguinal ring is a minimally invasive procedure, economic and suitable in young patients with indirect inguinal hernia.

Hernia Surgery-PS054

ADHESION FORMATION AFTER LAPAROSCOPIC VENTRAL INCISIONAL HERNIA REPAIR WITH POLYPROPYLENE MESH:A STUDY USING ABDOMINAL ULTRASOUND Juliane Bingener, MD, George B Kazantsev, MD, PhD, Shailandra Chopra, MD, Wayne H Schwesinger, MD, Departments of Surgery and Radiology, University of Texas Health Science Center, San Antonio, Texas

Introduction: Laparoscopic repair of ventral incisional hernias using a variety of prosthetic materials is feasible while safe. Polypropylene mesh is often preferred because of ease of handling and lower cost. Long term complications such as adhesions, obstruction and fistula formation can occur. The goal of this study was to determine whether bowel adhesions and their attendant complications could be prevented by interposition of omentum.

Methods: Between 1999 and 2001 30 patients with VIH underwent laparoscopic repair with Polypropylene mesh. The omentum was always positioned over the loops of bowel. The mesh was secured in place with hernia staples and transcutaneous sutures At a mean follow up of 14 months 20 patients underwent ultrasonic examination using the previously described visceral slide technique to detect adhesions.

Results: The mean size of the hernias in the study was 50.3 cm2 and the mean size of the mesh applied was 275 cm2. 15 patients were completely free of adhesions as detected by the normal visceral slide. Five patients demonstrated adhesions between the mesh and underlying omentum, however no visceral adhesions were noted. One small seroma and one hernia recurrence were also seen.

Conclusion: This study shows that omental interposition following polypropylene mesh placement for laparoscopic hernia repair provides adequate protection against visceral adhesions. Polypropylene mesh can be used safely, when adequate omental coverage is available.

Hernia Surgery-PS055

RECURRENCE RATE AFTER LAPAROSCOPIC REPAIR OF RECURRENT INGUINAL HERNIAS: HAVE WE IMPROVED? Juliane Bingener, M.D.; James P. Dorman, M.D.; Ginger Valdes, RN, University of Texas Health Science Center San Antonio, Audie L. Murphy VA Hospital, San Antonio, Texas.

The use of laparoscopic repair of recurrent inguinal hernias is becoming increasingly accepted in surgical practice, using an extraperitoneal or transabdominal approach for the placement of mesh. The previous literature reflects that the efforts to perform open repair of recurrent inguinal hernias often result in further recurrences,testicular damage, or nerve injury. Our study reflects physical reexamination of 36 patients over 4years who had undergone laparoscopic repair of recurrent inguinal hernia. Complications early and late are presented and compared with historical results of open surgery. Recurrence rates at this short follow up remain quite low and acceptable.

The laparoscopic repair of recurrent hernia reflects a very low likelihood of recurrence, low occurence of testicular damage, and less likelihood of other such complications as nerve or spermatic cord injury. Our study and careful follow up is the subject of this report.

Hernia Surgery-PS056

THE SPORTSMAN'S HERNIA: A CAUSE OF CHRONIC GROIN PAIN.

Jolanda van de Boogert, Cees J. van Steensel, Robbart van Linschoten and Pieter T. den Hoed.
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Sportsman's hernia is a debilitating condition which presents as chronic groin pain. The definition, investigation and treatment of this condition remain unclear.

The aim of this prospective study was to determine the incidence of symptomatic not palpable hernia in sportsman with chronic groin pain and to evaluate the efficacy of laparoscopic repair.

Twelve sportsman presented with chronic groin pain between January 1998 and February 2001. All sportsman were male with a median age of 38 years (range:12-56). Eight patients complained of unilateral groin pain while four had bilateral groin pain. In all cases clinical signs were lacking. Preoperatively radiography, bone scintigraphy and ultrasonography were performed to exclude osteitis pubis and musculotendinous disorders.

All patients were operated ambulatory without significant difficulties. The most common pathology found by laparoscopy was hernia inguinalis 9 (Nyhus IIIa 7, II 2), hernia femoralis 3 and three preperitoneal lipomas. Only once there was no pathology. In 4 patients a transabdominal approach was used, in 5 a totally extraperitoneal repair and threetimes there was a conversion from transabdominal to totally extraperitoneal. In all patients with a hernia a Marlex mesh (10 x15 cm) was placed preperitoneally.
Eleven patients returned to full activity within three months of surgery. One patient had persistent symptoms.

The sportsman hernia should be high on the list of differential diagnoses in chronic groin pain.Operative treatment can return the patient to his sport within three months.

Hernia Surgery-PS057

LAPAROSCOPIC VENTRAL HERNIA REPAIR Kerrie Bossard M.D., Bruce Ramshaw, M.D., Russell Wilson, M.D., Edward Mason, M.D. Department of Surgery, Atlanta Medical Center, Atlanta, Georgia

Introduction: Traditional repair of umbilical hernias utilizes the open primary suture technique. However, in patients with a history of multiple hernia repairs or in patients with large primary umbilical hernias, recurrences can occur. Laparoscopic ventral hernia repair techniques can be applied to the repair of umbilical hernias with low recurrence rates and minimal complications.

Methods and Procedures: This study reviews our experience with laparoscopic ventral hernia repairs in patients with umbilical defects.

Results: Thirty three patients (twenty male and thirteen female) had laparoscopic ventral hernia repairs between April 1996 and November 2000. Mean follow up for this cohort was 36 months (range 9-63 months). The mean patient age was 48.7 years (25-76) and ten patients (30.3%) were operated on for recurrences. Seven patients (21.2%) had incarcerated omentum. The mean hernia size was 18.7 cm2 (1-100 cm2) and mesh size was 187.13 cm2 (32-432 cm2). The mean operative time was 50.5 minutes (11-95 minutes) and length of stay was 0.52 days (0-5 days) with twenty two patients (67%) going home the day of surgery. There were two complications: a persistent seroma and an ileus that required prolonged hospital stay (5 days). There have been no recurrences.

Conclusions: The use of laparoscopic approach for umbilical hernias is safe and effective.

Hernia Surgery-PS058

SURGICAL TECHNIQUE IN DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY H. Kabir Chowdhury, Minimally Invasive Surgery Centre, Department of Surgery, BIRDEM Hospital Dhaka, Bangladesh.

What is possible in open surgery, the same can be achieved in laparoscopic surgery. This dream of laparoscopic surgeons has seen endosurgery of pancreas to parathyroid and adrenal to liver resection. Lch. is the most common lap. surgery. " Is it necessary to convert a difficult case of Laparoscopic Cholecystectomy (Lch)?" When converted it still remains difficult, so why not continue in the laparoscopic way and why not safely. Author tried to review his 6000 cases of Lch. done in last 8 years to assess conversion rate at different stages, reasons of conversion and the surgical technique involved in non-conversion. Conversion rate of 8% to start with came down to 1.7% with 2500 cases and in last 1600cases there was only 12 conversions, for carcinoma and extremely difficult dissection. From the preserved videos of the cases the surgical technique was reviewed. Following are some of the important points: (a). Use of fine tip hook to perform fine dissection, (b). Peanut dissection, (c). Subtotal amputation of gall bladder, (d). Changing traction angles to get a new view and new plane of dissection, (e). To maintain a clean field as much as possible, (f). Intracorporeal suturing and tying and lastly (h). Considering the fact that a difficult Lch when converted becomes a difficult open Cholecystectomy. Twenty five percent of the cases were acute in the series. Videos of some of the extremely difficult cases are presented to elaborate the possibilities of a non-conversion policy in Laparoscopic Cholecystectomy.

Hernia Surgery-PS059

2514 TOTALLY EXTRAPERITONEAL LAPAROSCOPIC HERNIA REPAIRS (TEPA) IN A SINGLE INSTITUTION JL. DULUCQ MD, P. WINTRINGER MD ILS Institute of Laparoscopic Surgery MSPB BAGATELLE - 203, Route de Toulouse 33401 BORDEAUX-TALENCE (France)

From june 1990 to april 2001, 2514 inguinal hernias in 1900 patients were operated on by 2 single surgeons at the same institution. There were 614 bilateral hernias. Hernia types were: 1150 Nyhus IIIa, 880 Nyhus II & IIIb, 171 Nyhus IIIc, and 313 Nyhus type IV (recurrent). Laparoscopic technique was 2402 times TEPA, 107 times a transabdominal preperitoneal approach (TAPP), and 5 times a laparoscopic suture. Patients ranged from 6 to 93 years of age.

Operative complications included 8 times epigastric vessel bleeding, 1 injury of vas deferens, and 28 extensive subcutaneous emphysema with hypercapnia. Thirty-four cases were converted to open, none since 1995.

One female patient died of unexpected cardiac arrest within the first day of the operation. No mesh infection occured. Post operative complications included 78 hematomas, 3 port-site hernias, 3 cruralgias (needing staple removal and one laparoscopic neurolysis). Three large preperitoneal hematomas needed emergency reoperation. There were 3 early recurrences, and one mesh removal on day 9. Late recurrences occured 9 times. Recurrence rate was 13/2514, thus being 0.51%.

TEPA laparoscopic hernia repair proves to be very effective with a low morbidity and a very low recurrence rate.

Hernia Surgery-PS060

LAPAROSCOPIC HERNIORRHAPHY USING PORCINE SMALL INTESTINAL SUBMUCOSA (SIS) MESH - 2 YEAR FOLLOW UP. David S. Edelman, MD, The Gallbladder & Laparoscopic Surgery Center of Miami, Baptist Health Systems, Miami, Florida, USA

Purpose: Mesh is commonly used to repair inguinal hernias. The ideal prosthetic material should be inexpensive to produce, easy to use, promote host tissue ingrowth, result in a healed repair with equal strength to normal tissue over extended periods of time, provide resistance to infection, elicit no or little inflammatory response and inhibit adhesion or fistula formation. SIS mesh is a new material used originally as graft material for arteries, veins, ligaments, dura, wound coverage and urinary bladders. The purpose of this research was to evaluate the long term results of SIS mesh in laparoscopic hernia repairs.

Methods: A prospective review was started in August, 1999 on all patients having laparoscopic inguinal hernia repairs with SIS mesh. Patients were seen in follow up at 2 weeks, 6 weeks, 6 months, 1 year and 2 years. All hernias were per-primus. Patients were excluded if their hernias extended into the scrotum or were larger that 4cm. A 7cm by 10cm, 4 ply, SIS mesh was placed over the myopectinate space and held in place with 5 titanium tacks. An 11mm Hasson was used in the umbilicus and two 5mm canulas in the midline above the pubic bone.

Results: There were 16 patients and 20 hernia repaired from August, 1999 to April, 2001. There were 8 men and 8 women. Ages ranged from 21 to 69 years. Operating time ranged from 20 minutes to 40 minutes with an average time of 31.5 minutes. Operative findings were direct hernias in 4, indirect hernias in 13, pantaloon in 2 and femoral in 1. Complications were minimal. Seroma occurred in 25 % and resolved by 6 months. One patient believes her hernia has recurred, but this has not been documented.

Conclusions: Porcine SIS mesh can be used for laparoscopic repair of inguinal hernias but longer follow up is necessary to confirm these preliminary results.

Hernia Surgery-PS061

INCISIONAL HERNIA REPAIR: COMPARISON OF 3 TYPES OF MESH IN A RABBIT MODEL Gabriela A. Ghitulescu, MD, Sarah Hagarty, MD, Vayia Koufogianis, MD, Simon Bergman, MD, Donna Stanbridge, RN, Liane S. Feldman, MD, Carolyn Compton, MD, Gerald M. Fried, MD, Division of General Surgery and Department of Pathology, McGill University, Montreal, Quebec, Canada

The ideal mesh for incisional hernia repair has not yet been identified. The purpose of this study was to compare, in a rabbit model, the adhesion formation, strength of incorporation and cellular response of 3 meshes: the Composix (Bard), Sepramesh (Genzyme), and the DualMesh (Gore).

Twenty seven rabbits were randomized to receive a 1 by 2 inch piece of one of 3 meshes. These were placed by laparotomy onto the peritoneal surface of their abdominal wall. Rabbits were sacrificed at 6 weeks, and the presence and type of adhesions were assessed by a blinded observer. Tensile strength between mesh and abdominal wall was measured using a tensiometer. Sections of the mesh-abdominal wall interface were examined histologically and graded for fibrosis and inflammation (a scale of 1 to 4 for each). The groups were compared using the Fisher exact test and the Kruskal-Wallis test. A p-value of .05 was considered significant.

Adhesions were found in 5 of 9 rabbits with the Composix mesh, 1 of 9 rabbits with the Sepramesh, and 2 of 9 rabbits with the DualMesh (p=.17). All adhesions were to the sides of the mesh, except in 2 rabbits with the Composix mesh, where they were also found on the undersurface of the mesh. There were no differences found in tensile strength (p=.31), fibrosis (p=.17), and inflammation (p=.98).

We conclude that with similar tensile strength and degree of fibrosis and inflammation, the DualMesh and Sepramesh have shown a trend toward less adhesion formation than the Composix mesh.

Hernia Surgery-PS062

LICHTENSTEIN VERSUS ENDOSCOPIC INGUINAL HERNIA REPAIR: DIFFERENCES IN QUALITY OF LIFE. Manouchehr Gholghesaei, M.D., Marie L. Essink-Bot, PhD., Martijne van't Riet, M.D., Ruben Veldkamp, M.D., H. Jaap Bonjer, M.D. PhD. Department of Surgery, Erasmus University Medical Center Rotterdam, the Netherlands

For both Lichtenstein repair and total extraperitoneal (TEP) approach for inguinal hernia repair, the differences in recurrence rates appear to be small. An informed choice for either technique therefore requires differentiation on other grounds. With the importance of health related quality of life involved with surgical procedures increasing, this study investigates differences in quality of life between the Lichtenstein and TEP approach for inguinal hernia repair.

30 patients were randomised. 17 patients underwent Lichtenstein repair. In 13 patients TEP repair was performed. Data were recorded prospectively. All patients kept diaries consisting of quality of life and pain questionnaires. EuroQol, Short Form-36 (SF-36), Activities of Daily Life (ADL) questionnaires and a visual analogue scale (VAS) for recording the sensation of pain were used.

Looking at all 8 health related quality of life items measured by the SF-36, there were some differences between both groups. For the item Physical Function TEP scored 62 out of 100 points vs. 42 for the Lichtenstein 1 week postoperatively (p=0.05). For Bodily Pain the scores were 59 vs. 44 with a higher score indicating a better quality of life. This finding was corroborated by the VAS with the Lichtenstein group rating their pain up to twice as severe 2, 3 (p=0.04) and 7 days after surgery. Mean SF-36 physical summary scores for the TEP group were 32 vs. 35 for the Lichtenstein group 1 week postoperatively (p=0.03). At 4 weeks they were 49 and 41 respectively. The better physical function reflects in the ADL. The TEP group is able to perform simple tasks such as walking and getting dressed sooner than the Lichtenstein group. The difference was more pronounced after 1 week.

These results suggest TEP hernia repair is superior to Lichtenstein repair regarding post operative pain and quality of life. TEP repair also enables patients to continue their normal daily routine sooner than does Lichtenstein repair.

Hernia Surgery-PS063

LAPAROSCOPIC VERSUS OPEN TENSION FREE REPAIR OF INCISIONAL HERNIAS: POSTOPERATIVE QUALITY OF LIFE. Manouchehr Gholghesaei, M.D., Marie L. Essink-Bot, PhD, Martijne van't Riet, M.D., Ruben Veldkamp, M.D., H. Jaap Bonjer, M.D. PhD.,Department of Surgery, Erasmus University Medical Center Rotterdam, the Netherlands

Laparoscopic incisional hernia repair has been reported to have improved results over open repair with respect to wound complications, postoperative pain and return to normal activities. This study investigates if these reported benefits translate into an improved health related quality of life.

23 patients with midline incisional hernias were randomised. In 9 patients open tension free mesh repair was applied. 14 patients underwent laparoscopic repair. Data were prospectively collected using diaries consisting of quality of life and pain measurement questionnaires. Short Form-36 (SF-36) and EuroQol questionnaires were completed 4 weeks postoperatively. The SF-36 yields a multidimensional health profile consisting of 8 items while EuroQol is one-dimensional. In addition a visual analogue scale (VAS) assessed intensity of pain at 1,2,3,7 days and 4 weeks postoperatively.

At 4 weeks postoperatively just one item of the SF-36 health profile differed between the two treatment groups. This item relates to the patients Physical Role which was slightly better at 67 vs. 40 out of 100 points for open repair. The mean SF-36 physical score for open repair was 44 vs. 37 points out of 100 points. The mean EuroQol tariffs for both groups were comparable at 4 weeks. VAS scores at 3 and 7 days after surgery suggest less pain after laparoscopic repair: 4.0 vs. 3.0 and 3.3 vs. 1.3 respectively with 0 meaning no pain at all and 10 meaning the worst pain imaginable.

These results indicate laparoscopic repair does not yield a better health related quality of life 4 weeks after surgery. Laparoscopic repair does seem to be associated with less pain, most notable 1 week after surgery. The data do not exclude the possibility of a better quality of life up to 4 weeks postoperatively e.g. 2 weeks postoperatively.

Hernia Surgery-PS064

LAPAROSCOPIC EXPLORATION FOR ATHLETIC PUBALGIA Philip R. Schauer, M.D., Matthew J. Glascock, M.D., Sayeed Ikramuddin, M.D., George Eid, M.D., Bill Gourash, C.R.N.P., Giselle Hamad, M.D., Department of General Surgery, Section of Minimally Invasive Surgery University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Chronic groin pain in athletes, or athletic pubalgia, may significantly impair athletic performance and has been shown to be associated with anatomic defects comparable to inguinal hernia. Open inguinal hernia repair has been shown to effectively eradicate chronic groin pain in athletes and enable restoration of athletic performance. This study evaluates laparoscopic exploration for the management of patients with athletic pubalgia.

Ten male patients, presenting from 1997 to 2000, ages 18 to 43, were evaluated. All were professional or high-performance athletes. All presented with groin pain (7 right, 2 left, 1 bilateral). Duration of symptoms ranged from 2 weeks to 8 months. No frank inguinal hernias were observed on physical examination except in one patient. Preoperative physical therapy ranged from 3 weeks to 3 months. All were explored laparoscopically, 9 preperitoneal, 1 transabdominal-perperitoneal. Small defects or bulges at Hesselbach’s triangle were found in 8 of 10 patients. An indirect sac along with a small direct defect was noted in one patient. A small indirect sac was repaired in one patient. All underwent mesh repair covering both direct and indirect spaces. Symptoms had resolved and return to full activity was realized in 8 of 10 patients with in 2 weeks of repair. One patient had return of right groin pain 4 weeks following repair of right-sided direct defect that resolved with 2 weeks of light activity. One patient’s course was complicated by a right scrotal hematoma following repair of right-sided direct defect.

Occult inguinal hernia should be included in the differential diagnosis of athletes with groin pain. We conclude that laparoscopic exploration should be included in the management algorithm for athletes with obscure groin pain who fail to improve with physical therapy. The laparoscopic approach allows an early return to full physical activity which is particularly important to this patient population.

Hernia Surgery-PS065

BOCHDALEK HERNIA IN ADULTHOOD: PITFALLS AND MISDIAGNOSIS. Elias Habib, M.D., André Elhadad, M.D., Department of Digestive and Thoracic Surgery, Robert Ballanger Hospital, Aulnay Sous Bois, France

Bochdalek hernia (BH) is the result of the non-development of the posthepatic mesenchymal plate. It is discovered most frequently on prenatal US scan or after birth because of acute respiratory failure. It is infrequent in adulthood.

A 64-years-old man suffered since his infancy from a right-sided diaphragmatic hernia. He developed a small intestinal obstruction because of its strangulation. Laparotomy showed BH containing strangulated small intestine, right colon, right kidney and a hypoplastic right liver. A 28-years-old autistic man suffered from dyspnea and vomiting. Chest X-ray and intestinal opacification showed small intestine in the left thorax. Thoracotomy showed left-sided BH containing small intestine, omentum and spleen. A 38-years-old woman operated 5 years ago from splenectomy because of Hodgkin's disease suffered from epigatric pain and vomiting. CT scan and stomach opacification showed strangulated stomach in a left-sided BH confirmed by laparotomy. An 88-years-old man known to have a paralytic diaphragm was admitted because of acute dyspnea. Chest X-ray and CT scan showed a left-sided Bochdalek hernia containing strangulated stomach and left colon confirmed by laparotomy.

In adulthood, one-sided or double-sided BH is discovered because of combined respiratory and digestive symptoms. Respiratory symptoms are snoring, dyspnea, chest pain, cough. Digestive symptoms are belch, nausea, vomiting, abdominal distension, upper quadrant abdominal pain radiating to the shoulder, slow intestinal transit, haematemesis, maelena. BH can be responsible of acute respiratory failure and heart arrest, stomach or intestinal strangulation volvulus necrosis or perforation, empyema and septic shock. Surgical treatment can be made through, thoracoscopy laparoscopy thoracotomy or through laparotomy in case of digestive complications.

The wide spectrum of symptoms is responsible of pitfalls in the diagnosis of BH. Misdiagnosis of BH is responsible of acute complications.

Hernia Surgery-PS066

LAPAROSCOPIC TENSION-FREE REPAIR OF INCISIONAL UMBILICAL OR EPIGASTRIC HERNIA WITH GORETEX MESH. Elias Habib, M.D., André Elhadad, M.D., Department of Digestive and Thoracic Surgery, Robert Ballanger Hospital, Aulnay Sous Bois, France

This prospective study aims to evaluate the results of the laparoscopic repair of incisional umbilical or epigastric hernia with a Goretex mesh (GM) applied without tension on the posterior side of the abdominal wall.

Since July 1994, 49 patients with incisional hernia and 27 patients with umbilical or epigastric hernia were included. They had an average age of 54 years, and an average BMI of 33. The hernia had up to 18-cm high and 13-cm widths. Under laparoscopy, adhesions are first detached. Folded GM with marking silks is introduced into the abdomen and unfolded. Four tracking silks are passed through the GM that is tracked, placed against the abdominal wall, adjusted to cover widely the hernia and then strongly stapled on the anterior abdominal wall.

Conversion to laparotomy due to tenacious adhesions occurred in one case. One operative complication occurred: a laparoscopically repaired serosal laceration of the ileum. GM of 10x15cm, 15x20cm or 20x30cm was applied. After surgery, there was no mesh infection. Immediate postoperative complications occurred in 9 patients including bronchopneumonia, seroma, urinary infection, prolonged ileus and unexplained fever. Hospital stay was of 4.8 days and loss of work duration of 33 days. During an average follow-up of 36 months, recurrence occurred in 5 patients (6.5%). Late complications were noted in 16 patients including 11 seroma, 4 refractive pain, one haematoma, and one trocar-site hernia.

Laparoscopic tension-free repair with Goretex mesh is advisable for the treatment of incisional umbilical or epigastric hernia.

Hernia Surgery-PS067

RETROPERITONEOSCOPIC TENSION-FREE REPAIR OF THE LUMBAR HERNIA. Elias Habib, M.D., A. Elhadad, M.D., Department of Digestive and Thoracic Surgery, Robert Ballanger Hospital, Aulnay Sous Bois, France

Lumbar hernia (LH) is an infrequent pathology that is difficult to treat.

A 65-years-old man presented a right-sided lumbar mass since at least 10 years, which was responsible of pain, must frequently on the morning. It was a fatty mass of 10x15-cm diameter, located in the lumbar fossa, which was easily reintegrated into the lumbar region. After what the examiner could find a 3-cm diameter hole inferior to the 12th rib and external to the vertebral muscles. CT scan showed the hernia and the hole.

Patient was operated with the diagnosis of LH. He was installed lying on the left side. Through a small incision in the flank, dissection was initiated with a smooth instrument than a 10-mm trocar was inserted into this incision and the retroperitoneal space inflated. Under direct vision, dissection of retroperitoneal fatty tissue was continued posteriorly and laterally with the scope. A 5-mm trocar was introduced in front of the anterior edge of the 11th rib. Dissection was then continued until the hernia was seen. Fatty tissue into the LH was reduced slowly and easily allowing the operator to see the lumbar wall defect, and through it the hernial sac developed partially in the vertebral muscles. A 12-cm diameter polypropylene mesh was introduced through the 10-mm trocar, applied on the lumbar wall to cover widely the LH and the 10-mm trocar-site, and stapled on the lumbar wall. Gas was deflated and the trocar-site was sutured.

Under laparoscopy, especially in case of traumatic LH, colon and ureter should be detached to explore the lumbar wall and reinserted at the end of the operation. Under retroperitoneoscopy, even if the space is small, fatty tissue is easily detached at a distance from colon and ureter. The defect is covered with a polypropylene mesh or an ePTFE mesh if the retroperitoneal space is not closed. Mesh is stapled or sutured at a distance from the vertebra to avoid injuring lumbar radicules. Surgery and follow-up were uneventful with no recurrence in this case and in the four cases published.

Retroperitoneoscopy is an easy approach for a tension-free repair of LH.

Hernia Surgery-PS068

LAPAROSCOPIC INGUINAL HERNIA REPAIR BYEXTRAPERITONEAL APPROACH∞\USEFULNESS OF PERITONEAL EDGE ORIENTED METHOD IKEDA M,M.D.,Ph.D., Department of Surgery, Beppu National Hospital, Beppu, Japan.

The argument about merits and demerits of the laparoscopic inguinal hernia repair (IH) compared with the conventional method is still going on. Why is there so much argument despite IH having various advantages such as rapid revovery in addition to the low recurrence rate? This is probably because IH currently in use is by TAPP (transabdominal prepertioneal approach) not without potential complications such as organ damages and ileus and also because it is not a minor surgery unlike the conventional method.

Now is the time to shift to TEPP (totally extraperitoneal preperitoneal approach) and to establish IH which is less invasive and of a minor surgery. TEPP has been deemed as a very difficult surgical technique because of the difficulty in securing the extraperitoneal space as a surgical space. At present, this problem has been resolved by the balloon dissection method. Nevertheless, TEPP has not become popular. As the reason for it, mention can be made of the difficulty in making differential diagnosis of the hernia during operation and the complicated procedure required in treating the hernia sac. Moreover, a detailed description on how to proceed with these surgical procedures is not available now.

The author has developed a new operative technique for TEPP (peritoneal edge oriented method) capable of making a correct diagnosis and treating the hernia sac during operation by following the peritoneal edge continuously and worked it out into a manual, thereby making it possible to perform a sure and stable TEPP. Based on the experience with 780 cases on which the author performed operation, the actual surgical technique is presented with explanation.

Hernia Surgery-PS069

LAPAROSCOPIC VENTRAL HERNIA REPAIR IN THE OBESE PATIENT: A CASE SERIES. Christopher W. Juergens, M.D., Dasen R. Richey,M.D., Department of Surgery, Jewish Hospital Medical Center, Cincinnati, Ohio

Introduction: The objective of this study is to evaluate laparoscopic ventral hernia repair as an acceptable surgical therapy for the repair of ventral and incisional hernias in the obese patient population.

Methods: Medical record review of 10 consecutive cases of laparoscopic ventral hernia repair by a single attending surgeon at a single institution over an 8 month period; January to August 2001. Obesity is defined as a body mass index (BMI) greater than 30 kg/m(2). Laproscopic ventral hernia repair was performed with a single 10mm port and 2 or 3 additional 5mm ports. Goretex dual mesh (430 cm(2)avg. size), with transabdominal fascial sutures (4-8), and 5mm spiral clips were used for each case. Wound drains and foley catheters were not used. Data reported include patient demographics,(age,sex,BMI),characteristics of the perioperative course, length of stay, complications,and recurrence.

Results: There were 7 women and 3 men. The average age was 49.5 years (range 26-64). The mean BMI was 39.5 (range 31-57), and 5 of the patients were morbidly obese (BMI>40). All procedures were completed laparoscopically. Mean operative time was 149 minutes (range 95-283). Incisional hernia repairs took longer than ventral repairs;155 vs.140 minutes. Two cases involved extensive lysis of adhesions due to recurrent incarcerated incisional hernias after previous bariatric surgery.There were no abdominal wound infections, mesh infections, or episodes of urinary retention. There were no abdominal wall vascular injuries, serosal bowel wall injuries, or enterotomies. Average LOS was 1.2 days (range 0-3),and 1 patient was readmitted for treatment of COPD and CHF.At follow-up, 2 patients had seromas that resolved without treatment. No recurrences have occurred.

Conclusion: This case series supports that laparoscopic ventral hernia repair can be successfully completed in the obese patient with low risk of morbidity, and excellent surgical outcomes.

Hernia Surgery-PS070

ARE LAPAROSCOPIC HERNIA REPAIRS TRULY MORE EXPENSIVE THAN OPEN? A COSTS, CHARGES AND PROFIT-COST RATIO ANALYSIS. Yashodhan S. Khajanchee, M.B.B.S, Trudy A.G. Kenyon, R.N., David R. Urbach, M.D., Paul D. Hansen, M.D., Lee L. Swanstrom, M.D. Minimally Invasive Surgery Department, Legacy Health Systems, Portland, OR.

Totally extraperitoneal (TEP) repair of inguinal hernia, despite having a favorable clinical outcome and being cost-effective by societal perspective, are criticized by payors due to higher charges associated with this procedure. We present a comparison of actual direct costs, and charges for open tension free (OPN) herniorrhaphies and TEP repairs with emphasis on a profit-cost ratio.

41 unilateral TEP repairs were compared with 44 OPN repairs done at our institution between Dec-1996 and Dec-1999. Actual direct costs were determined for each patient. Charges and hospital reimbursements were analyzed using the hospital financial database. Hospital profit was calculated and expressed as a profit-cost ratio. Patient records were reviewed to evaluate demographics and perioperative complications. All the values are expressed as mean [±SD] and differences between the groups are tested using the t-test.

There were no significant differences in demographics between the two groups. The mean short-term direct costs for TEP and OPN repairs were $760[±65] and $639[±52] respectively. However, the mean hospital charges for TEP and OPN repairs were $4738[±638] and $2598[±638] respectively. The mean reimbursements were $3064[±1139.10] and $1384[±848] in the TEP group and the OPN group respectively. The charges for the TEP repair averaged $2140 more than the OPN and the reimbursements were $1680 higher in the TEP group. The profit-cost ratio was 3:1 in the TEP group and 1.16:1 in the OPN group, indicating a significantly higher profit margin earned by the hospital in the TEP group ($p<0.01$). No serious post-operative complication occurred in either group.

The direct cost of TEP repairs with the minimal use of disposable instruments in a high volume laparoscopic surgery unit is comparable to the tension free open repair. However, TEP repairs appeared more expensive to payors because of differential determination of hospital charges between the two procedures.

Hernia Surgery-PS071

LAPAROSCOPIC INGUINAL HERNIA REPAIR KONSTANTINIDIS K. M.D.PHD., VORIAS M. M.D., SAMBALIS G. M.D., GEORGIOU M.M.D., ANASTASSAKOU K. M.D.ATHENS MEDICAL CENTER DEPARTMENT OF GENERAL & LAPAROSCOPIC SURGERY, ATHENS, GREECE

Abstract presented is our 10-year (1992-2001) experience in the treatment of inguinal hernias. A total of 1128 hernias in 910 patients (841 males & 69 females) were treated by laparoscopic techniques.

Specifically: 486 pts presented with a unilateral hernia, 218 pts with bi-lateral hernias, 189 pts with recurrent hernias (two with previous open mesh placement) and 17 pts with femoral hernias. Of these,16 pts presented with incarceration, 10 inguinal & 6 femoral.

Our initial experience was with the TAPP technique, treating 120 pts (158 hernias), while in the remaining 790 pts (970 hernias) the TEP technique was applied and as of 1997 we use the large 10cc X15cc mesh.

In the TAPP group (158 hernias)patients experienced a 6.3% complication rate. One epigastric vessel laceration, 2 intra-op bleeding, 1 spermatic vein laceration, 2 urine retentions, 3 nerve paresthesias and one hydrocele. There were no conversions and the overall recurrence rate was 4 pts (2.5%), being 3 pts (6%) in the initial 50 cases, falling to 1pt (0.9%) in the remaining 108 cases. The average operative time was 85 min (60-150min).

In the TEP group (970 hernias) we obseved 71 (7.3%) complications. Forty seromas, 10 urine retentions, , 9 nerve paresthesias,

6 hematomas, 4 subcutaneous emphysemas, 1 nerve entrapment requiring clip removal and 1 vas deferens laceration. In 6 (0.6%) cases the TEP was converted to a TAPP and 8 (0.8%) cases were converted to an open approach. Recurrent hernias developed in 4 pts (0.4%). The average operative time was 39 min (15-85min).

The variation in intra-operative & post-operative complications, the recurrence rate and operative time is directly correlated to the experience of the surgeon, the understanding of the anatomy of the pelvis which is gained using the TAPP approach. Large mesh placement via the totally extra-peritoneal approach, in our opinion reflects the ideal treatment for primary and recurrent hernias of the inguinal canal.

Hernia Surgery-PS072

LEARNING CURVE FOR UNILATERAL ENDOSCOPIC TOTALLY EXTRAPERITONEAL INGUINAL HERNIOPLASTY. Hung Lau, M.D., Eugene Yeung, M.D., Nivritti G. Patil, M.D., Wai K. Yuen, M.D., Francis Lee, M.D., Department of Surgery, University of Hong Kong Medical Center, Hong Kong SAR, China

Performance of totally extraperitoneal inguinal hernioplasty (TEP) requires specialized anatomical knowledge and surgical skills. The present study was undertaken to determine the number of operations required for a general surgeon to master the technique in the absence of an experienced supervisor.

A retrospective analysis of first 120 consecutive unilateral TEPs was performed. The study population was divided into 6 consecutive groups, 20 each. Clinical parameters were compared among the groups.

Operation time was the only clinical parameter that showed significant differences among the groups and reached a plateau after the 4th group. Conversions to transabdominal and open approaches were required only in one patient of groups 1 and 6 respectively. Comparison of demographic features, hernia types, postoperative morbidity, length of hospital day and days taken to return to normal activities showed no significant differences among the groups. All complications were minor and resolved uneventfully. No recurrence was detected during follow up.

Gps	Operation time (minutes)	Morbidity (%)	Length of stay (days)	Return to normal activities (days)
1	90	15	2.4	4.8
2	76	15	1.9	4.3
3	73	20	1.8	2.8
4	71	20	2.5	3.2
5	59	20	1.6	3.3
6	56	20	2.3	3.7

TEP carries a low morbidity and conversion rates even during the learning process. In the absence of an experienced supervisor, a general surgeon should be able to master the technique after an experience of 80 procedures. Unilateral TEP can be safely accomplished within an hour for most patients.

Hernia Surgery-PS073

ENDOSCOPIC EXTRAPERITONEAL INGUINAL HERNIOPLASTY OF INDIRECT INGUINAL HERNIA: REDUCTION V S LIGATION. Hung Lau, M.D., Nivritti G. Patil, M.D., Wai K. Yuen, M.D., Francis Lee, M.D., Department of Surgery, University of Hong Kong Medical Center, Hong Kong SAR, China

During endoscopic totally extraperitoneal inguinal hernioplasty (TEP), ligation of the hernial sac followed by distal transection appears to be a sound alternative to reduction alone but the safeness of ligation has not been tested. The present study was undertaken to evaluate the safety to and clinical outcome of patients who underwent ligation of the indirect peritoneal sac during TEP.

Between September 1999 and July 2001, patients who underwent TEPs for indirect inguinal hernias were recruited. Patients were divided into two groups. Group I (n=65) had complete reduction of the hernial sac whereas group II (n=34) had ligation of the hernial sac using a vicryl suture followed by distal transection. Clinical variables and outcome data were compared between the two groups of patients.

Demographic features and hernia types between the two groups were comparable. The mean operative time of groups I and II patients was 58 and 62 minutes respectively (P = ns). Intraoperative complications occurred in two patients of group II, including a vas deferens transection and a gonadal vessel division. Comparison of the length of hospital stay, postoperative pain scores at rest and upon coughing, postoperative morbidity and incidence of groin collection showed no significant differences between the two groups.

Ligation of hernial sac does not increase pain and postoperative morbidity after TEPs. This technique is however associated with a higher incidence of intraoperative complications. Reduction of the indirect hernial sac is therefore recommended whenever feasible. When ligation of the indirect hernial sac is performed, vas deferens and gonadal vessels should be identified and safeguarded before transection.

Hernia Surgery-PS074

MANAGEMENT OF PERITONEAL TEAR DURING ENDOSCOPIC EXTRAPERITONEAL INGUINAL HERNIOPLASTY. Hung Lau, M.D., Nivritti G. Patil, M.D., Wai K. Yuen, M.D., Francis Lee, M.D., Department of Surgery, University of Hong Kong Medical Center, Hong Kong SAR, China

Peritoneal tear during endoscopic totally extraperitoneal inguinal hernioplasty (TEP) results in pneumoperitoneum and loss of extraperitoneal space. To avoid bowel adhesions and mesh migration, closure of the peritoneal opening is preferred. The present study was conducted to evaluate the efficacy of various operative techniques for the closure of peritoneal laceration.

Between April 2000 and May 2001, one hundred consecutive patients undergoing 123 TEPs were recruited for the present study. The incidence of peritoneal tear and techniques for the closure of peritoneal opening were documented. Operative time and postoperative morbidity were compared among groups for which different closure methods of peritoneal laceration were used.

The incidence of peritoneal tear was 47%. The mean operative times of unilateral TEPs with and without peritoneal laceration were 66 minutes and 53 minutes respectively ($p < 0.05$). Techniques for the closure of the peritoneal opening included endoscopic stapling (n=12), endoscopic suturing (n=14) and pre-tied suture loop ligation (n=21). The mean operative times for unilateral TEPs with endoscopic stapling, pre-tied suture loop ligation and endoscopic suturing of peritoneal tear were 53, 64 and 82 minutes respectively ($p < 0.05$). Comparison of postoperative morbidity showed no significant difference among the three groups.

Peritoneal tear is a frequent and challenging intraoperative event during TEP. Its occurrence significantly prolongs the length of operation. Endoscopic stapling and pre-tied suture loop ligation are safe and quick techniques for closure of peritoneal tear during TEP.

Hernia Surgery-PS075

USE OF STITCHES FOR MESH FIXATION IN LAPAROSCOPIC INGUINAL HERNIA REPAIR. Silvio L S Lemos M.D., Aguinaldo P de Nadai M.D., Clébio P Vasconcellos M.D., André L A Domingos M.D., Célio Helegda M.D., Erlon Klein M.D., Marielle Corrêa M.D., Daniela Bazili M.D. , Santa Casa Hospital, Campo Grande - MS, Brazil.

Objective: There is no consensus about the fixation of mesh in the laparoscopic inguinal hernia repair. It can be done using many kinds of devices. The purpose of this study was to evaluate the results of the laparoscopic inguinal hernia repair using manual suture of mesh on Cooper's Ligament.

Methods: Over a 5-year period (April, 1995 to April, 2000), we performed 143 transperitoneal inguinal hernia procedures (82 unilateral and 31 bilateral). Overall, there were 26 recurrent hernias. The primary operation in 24 patients was open anterior repair, and in 2 laparoscopic repair (TAPP). We used general anesthesia and carbon dioxide pneumoperitoneum in all patients. The inguinal region was approached transperitoneally through 3 trocars. Some cases we used 4 trocars. The mesh length was calculated after opening the peritoneum and dissection of the entire inguinal floor. The fixation of mesh on Cooper's Ligament was realized with stitch of polyester 2-0 in all cases. The fixation above iliac pubic tract was realized with stitch, stapler or tacker. All patients were followed at least for 12 months.

Results: All 143 procedures were completed laparoscopically. The median (range) age was 46 (18-71) years and the median (range) follow-up was 17 (12-48) months. Mean operative time was 72 min for unilateral hernia and 102 minutes for bilateral hernia. We had few peroperative complications: 1 epigastric vessels lesion and 1 unilateral vas deferens complete section, and some minor bleeding. Postoperative complications included nineteen uninfected seromas, one patient with transient testicular pain, 3 patient with transient inguinal pain, none persistent neuralgia. There was no recurrence.

Conclusions: All data presented showed that laparoscopic inguinal hernia repair using stitch on Cooper's Ligament for mesh fixation is a safe method with low rate of postoperative complications and no recurrence. It can be use in situations that tacker or stapler is not available.

Hernia Surgery-PS076

PHS – A NEW APPROACH IN THE TREATMENT OF GROIN HERNIAS: V.Pejcic,D.Milic, Surgical clinic Clinical centre Nis,Yugoslavia

PHS - Prolene Hernia system is a new three component polypropylene mesh introduced with great success in the last few years in the treatment of groin hernias.

The aim of our work was to show early results in the treatment of primary and recurrent groin hernias using PHS mesh in the patients operated during the period from 1.3.2000. to 30.6.2000 at our clinic for general surgery Clinical Centre Ni{.

Prospectively we have analyzed a group of 33 patients with 35 groin hernias who underwent groin hernia repair using PHS mesh. All patients were males (100%) with median age of 59,3 years (22 to 86 years). 22 hernias were primary hernias (62,86%) while other 13 were recurrent (37,14%) and all 35 hernias were classified as class III or class IV according to Nihus classification. 14 patients (42,42%) were operated in local anesthesia, 9 (27,28%) in spinal and 10 (30,3%) in general anesthesia. We have analyzed: operating time, postoperative complications, recovery time and return to work, the need for postoperative analgesia and the presence of early recurrences.

The average operating time was 50 minutes (40 to 100 minutes). Postoperative complications were present in five patients (15,15%): 2 seromas (6,06%),1 hematoma (3,03%) and 2 wound infections (6,06%). These complications were successfully treated with drainage only . The average hospitalization was 1,5 days (6 hours to 5 days) and most patients went back to work after 10 days (7-14 days). 22 patients (66%) didn't need any postoperative analgesia. There were no early recurrences (postoperative follow-up period 2-5 months).

The advantages of PHS are: simplicity, minimal percentage of postoperative complications, short hospitalization period and early return to work.

We can conclude that PHS is a safe and efficient method in the treatment of groin hernias.

Hernia Surgery-PS077

IS THERE INDICATIONS TO PLACE A MESH INTRAPERITONEALLY WITH CONTAMINATION OF THE ABDOMINAL CAVITY DURING LAPAROSCOPIC VENTRAL HERNIA REPAIR? S Morales-Conde MD PhD, M Martín MD, I Cadet MD, J Bellido MD, JD Tutosaus MD PhD, M Bustos MD PhD, J Martín MD, A Cano MD, S Morales-Méndez MD PhD, University Hospital Virgen Macarena and University Hospital Virgen del Rocío. Department of Surgery. University of Sevilla. Spain

Introduction: Contamination or infection of the abdominal cavity have been considered a contraindication to place a mesh. One of the advantages of laparoscopic approach for ventral hernias is the possibility of performing concomitant operations such as cholecystectomy, existing the possibility of opening the gallbladder with the subsequent contamination of the cavity. On the other hand, one of the complications during laparoscopic hernia repair is bowel perforation during adhesiolisys. It has been discussed the use of mesh intraperitoneally during laparoscopic ventral hernia repair in cases of contamination of the abdominal cavity.

Patients and Method: From november of 1998, 78 ventral hernias have been repaired using patches of PTFE-e (Dual-Mesh plus with holes) fixed without sutures following the Double Crown technique. Concomitant operation were performed in 8 cases: 6 cholecystectomy, one paraesophageal hernia and one mesenteric cyst. On the other hand, during adhesiolisys we had two bowel perforation (2.56%), one of them was repaired by laparoscopy and the other one by an assisted minilaparotomy.

Results: All the concomitant operation during the repair of the ventral hernias were completed by laparoscopy. Four of the gallbladder were opened during their disection from the liver bed with subsequent bile spilling. In all cases the mesh was placed in the abdominal cavity with no postoperative complication. One of the patient developed a biloma in the postoperative course due to a stenosis of the papilla, being drainaged by CT-scan, not being obeserved any complication related to the mesh. In those cases in which there were a bowel perforation, the mesh was placed intraperitoneally once the perforation was repaired with no postoperative complications.

Conclusions: Mesh could be placed intraperitoneally during laparoscopic repair of ventral hernias after bowel perforation and if the gallbladder is opened during concomitant operation, but cases with massive spilling of intestinal content and infected bile spilling should be considered apart.

Hernia Surgery-PS078

LAPAROSCOPIC INTRAPERITONEAL ONLAY MESH (IPOM) REPAIR FOR INGUINAL HERNIA BY COMPOSITE MESH Kazuyuki Shimomura MD, Akio Odaka MD, Yukio Fujino MD, Hirohumi Yamada MD, Daijo Hashimoto MD, Department of Surgery, Saitama Medical Center, Saitama Medical School, Saitama, Japan

Surgical repair of inguinal hernia with prothesis has been tried both laparoscopic and anterior approach. Laparoscopic approach has many advantages because this procedure is highly diagnostic, anantomically understandable and suitable for multiple or bilateral hernia. However this procedure has been less performed recently probably because of its technical difficulty and longer operation time. To reduce such drawbacks while maintaining advantages, we adopted composite mesh (polypropylene mesh ∞{ePTFE layer) as laparoscopic onlay to the peritoneum. <clinical cases> Ten male patients (34 - 73 yo: average 57.6 yo) was performed laparoscopic herniorrhaphy, which includes 8 indirect hernia, 6 direct hernia, 2 femoral hernia, and 1 supravesicular hernia. Number of patients who had single hernia was 6. Three cases had bilateral hernias and there was each 1 case who had two , three and four hernias.

All the cases were repaired by IPOM surgery with composite mesh. Operation time ranged 23min to155min (Sigmoid colon incarceration case) with average 50.4 min. The minimal time for intraabdominal procedure was just 6 min. Large hernia sac was fixed to peritoneal side in 4 cases of direct hernia before mesh application, and high ligation of sac by anterior approach with 2.5 cm skin incision was done in one large indirect case. All 10 cases discharged with minimal hospital stay without complications such as intestinal obstruction, recurrence or neuralgia. Mean observation time was 7.2 months.

<Discussion & Conclusions> Composite mesh can be expected less intestinal adhesion to ePTFE side and prompt repair with peritoneum on mesh side. Laparoscopic IPOM repair for inguinal hernia with composite mesh is safe and useful surgery with reduced operation time and without possible complications of bowel injury.

Hernia Surgery-PS079

EVALUATION OF PREPERITONEAL INGUINAL HERNIAPLASTY BY DIFFERENT APPROACHES-TAPP VS TEP VS OPEN, S.BALASASIKUMAR, C. Palanivelu, P.S. Rajan, K. Sendhil Kumar, R. Parthasarathi,S.Rajapandian ,Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES) GEM Hospital Coimbatore, INDIA

Tension free hernioplasty is the order of the day for correction of inguinal hernia. Tension free repair can be achieved by anterior open, Transabdominal laparoscopic or totally extraperitoneal laparoscopic approach. We analyzed the indications of results of each approach.

Since October 1992, we have treated 3450 inguinal hernias in our Institute. Age group ranging between 14 to 84 years. Since 1996, totally extraperitoneal hernioplasty is the first choice, TAPP in-patients where TEP is not possible such as large inguinal hernias, irreducible hernias, recurrent hernias, previous surgery. Open anterior approach for massive inguinoscrotal hernias, incarcerated and strangulated hernias or patient unwilling for laparoscopic hernia. Results : TAPP was performed in one thousand seven fifty patients with 4 recurrences. TEP in one thousand and fifty patients with no recurrence and anterior open in six hundred and fifty patients with no recurrence. All the three recurrences in the mechanical stapling group, 1 recurrence in the totally extraperitoneal hernia repair.

Laparoscopic approach is advantageous over open anterior as it avoids the necessity of cutting all the layers to the preperitoneum. TEP achieves the results of anterior open approach with out cutting the layers and avoids the necessity of peritoneal incision and closure- an advantage over TAPP. TEP technically difficult to perfrom if both working ports are placed in the midline. We evaluated one port between the umbilicus and symphysis pubis and the another at the lateral border of the rectus enables two hand manipulation. Our results are in favour of TEP as first choice, TAPP the second and Open last choice. Each patient should be considered individually for effective repair. TAPP or Open should be considered in selected indications for individual patients.

Conclusion : Tailored approach is the best approach as far as the management of inguinal hernia is concerned as per our studies.

Hernia Surgery-PS080

AN ADVANCED DEVICE FOR LAPAROSCOPIC REPAIR FOR GROIN HERNIA OF PEDIATRIC PATIENTS. TAKEHARA H. ISHIBASHI H. OHSHITA M. TASHIRO S, Dept.of Surg. Univ.of Tokushima, Sch.of Med. Tokushima, JAPAN

Purpose: Laparoscopic percutaneous extraperitoneal closure (LPEC) had been reported as a new procedure for children with groin hernia at SAGES 2000 Meeting. To make the procedure safe and easier, the peritoneum of the hernia orifice was lifted from the gonadal vessels or the spermatic duct by injecting saline solution into the extraperitoneal space. Subsequently, the hernia sac was closed completely without touching either the vessels or the duct.

Methods: The procedure of LPEC was that, following insertion of laparoscope via an umbilicus, a forceps (16-gauge) was inserted via the left side of the umbilicus. To make the peritoneum of the hernia orifice lift from the gonadal vessels or the spermatic duct, saline solution was injected into the extraperitoneal space using a needle (21-gauge). An Endo-suture (19-gauge), that can be used to make a purse-string suture around the internal inguinal ring, was punctured on the midpoint of the inguinal line. The purse-string suture was begun extraperitoneally from the anterior to the posterior edge on one half of the internal ring using the Endo-suture with suture material. After one half of the purse-string suture was completed, the suture material was removed from the Endo-suture and the opposite half of the rim of the internal ring was closed with the same technique without injury to the vessels or the duct. The Endo-suture was then removed from the abdomen together with the suture material. The purse-string suture was tied extracorporeally, and the internal ring was completely closed. It usually took 20 to 25 minutes to repair for the bilateral groin hernia.

Results: 145 patients with groin hernia have been treated with 179 LPEC for last five years. Four patients treated with absorbable suture materials had recurrence.

Conclusion: The advantages of this procedure are not only cosmetic and minimally invasive closure, but also lower risk of injury to the spermatic duct or vessels than the conventional transcanal herniorrhaphy.

Hernia Surgery-PS081

PLANNED TOTALLY EXTRAPERITONEAL LAPAROSCOPIC SPIGELIAN HERNIA REPAIR , Michael Tarnoff, M.D., Michael Rosen, M.D., Fred Brody, M.D., Minimally Invasive Surgery Center and the Department of General Surgery, The Cleveland Clinic Foundation Cleveland, Ohio

A spigelian hernia is a congenital defect in the tranversus aponeurosis fascia. Traditionally, an open anterior hernioplasty is used to repair these defects. Recently, laparoscopic approaches have been described. This report signifies the first application of the totally extraperitoneal laparoscopic approach to a planned repair of a spigelian hernia. The patient is a 62 year old white female with a reducible, left lower quadrant anterior abdominal wall bulge consistent with a spigelian hernia.

At the time of surgery, we exposed the posterior rectus fascia and modified our extraperitoneal inguinal hernia technique by passing the balloon dissector in a more lateral orientation. This created a unilateral preperitoneal space with adequate room for dissection and mesh fixation. The spigelian defect was easily identified. Its preperitoneal fat contents were reduced and a 5mm laparoscopic tacking device was utilized to secure a piece of prolene mesh. The patient was discharged to home with no complications. Placement of the mesh in the preperitoneal space avoids direct interaction of the mesh prosthesis and the intraperitoneal viscera. In conclusion, we find that a laparoscopic totally extraperitoneal approach is technically feasible and advantageous when a spigelian hernia is diagnosed preoperatively.

Hernia Surgery-PS082

LAPAROSCOPIC INGUINAL HERNIA UTILIZING LOCAL ANESTHESIA AND A LARYNGEAL MASK AIRWAY. Fredrick Brody MD, Michael Tarnoff MD, Michael Rosen MD, Frank Duperier MD, Jennifer Malm RN, Jeffrey Ponsky MD, David Whalley MD, Leonard Lazada MD., Minimally Invasive Surgery Center and the Department of Anesthesia and General Surgery. Cleveland Clinic Foundation, Cleveland OH.

The universal acceptance of laparoscopic inguinal herniorraphy has not occurred for several reasons including the necessity of general endotracheal anesthesia. However, several recent reports document successful laparoscopic inguinal hernia repair using only regional anesthesia without airway control. This study documents a prospective series of patients undergoing laparoscopic preperitoneal (TEP) inguinal herniorraphies utilizing local anesthesia and a laryngeal mask airway (LMA).

Twelve patients at the Cleveland Clinic Foundation underwent TEP hernia surgery utilizing an LMA and local anesthesia from January 2000 to March 2001. Following anesthetic induction without the use of paralytic agents, an LMA was placed. A complete inguinal block was performed with 0.25% marcaine by injecting the ilioinguinal nerve, hypogastric nerve, and the rectus sheath. A standard TEP hernia repair was performed. Patient demographics, operative details, and early postoperative results were obtained.

Twelve men with a mean age of 49 years underwent TEP repair. The mean BMI was 24 kg/m2 (range 21-27) and the mean ASA was 2 (range 1-3). Seven patients underwent bilateral inguinal hernia repairs. The mean EBL was 10 cc (range 5-20) and the mean operative time was 61 minutes (range 40-135). There were no intraoperative complications and no patients required conversion to general endotracheal anesthesia. All patients were discharged the same day. Four patients had mild seromas of the spermatic cord that resolved spontaneously. No recurrences have been documented with early follow up.

This study documents a safe and efficacious method to perform laparoscopic TEP hernia repair without the use of general anesthesia while maintaining airway control. This technique should exist in the surgeon's armamentarium and possibly enhance the widespread acceptance of laparoscopic inguinal hernia repair.

Hernia Surgery-PS083

IDENTIFYING THE OPTIMAL APPROACH IN REMEDIAL SURGERY FOR RECURRENT REFLUX AND SYMPTOMATIC HIATUS HERNIA—ABDOMINAL OR THORACIC? Roger Tatum, M.D., Kenric Murayama, M.D., Sudhir Sundaresan, M.D., Peter Kahrilas*, M.D., Raymond Joehl, M.D., Departments of Medicine* and Surgery, Northwestern University Medical School, Chicago, IL.

We hypothesized that preoperative factors may indicate the optimal approach—abdominal (laparoscopy or laparotomy) or thoracic—to remedial operations for recurrent reflux disease or symptomatic hiatus hernia.

From 1993-2001, 275 patients had operations for reflux disease and hiatus hernia. Patients who had a remedial operation were selected to determine which preoperative factors—time to recurrence, nature of primary operation failure, symptoms of recurrence, type of hiatus hernia, esophageal length, sphincter pressure, esophagitis, division of short gastric vessels—indicated an abdominal or thoracic approach.

Twenty-seven (27) patients who had remedial operation for recurrent reflux disease or symptomatic hiatus hernia were identified. Remedial operations were begun laparoscopically in 18; 14 were completed while 3 were converted to laparotomy and 1 was converted to thoracotomy. Five had laparotomy and 4 had thoracotomy as the initial operation. Factors associated with need to perform laparotomy or thoracotomy were analyzed. Fisher's exact test was used to determine statistical significance ($p<0.05$).

Recurrence of paraesophageal hiatus hernia indicated a thoracotomy was needed to complete the remedial operation, $p=0.008$. Other factors did not reach statistical significance. Of note, patients who had dehiscence of the fundoplication or recurrence of hiatus hernia were more likely to require an open remedial procedure.

Patients having remedial operations for recurrent reflux disease or symptomatic hiatus hernia should be thoroughly evaluated and the optimal operative approach carefully selected. Strong consideration should be given to performing thoracotomy for remedial operations in patients with recurrent paraesophageal hiatus hernia.

Hernia Surgery-PS084

Laparoscopic Pre-peritoneal Inguinal Hernia Repair without the Use of Balloon Insufflator or Tackers: A More Cost-effective Approach Vasudevan Tiruchelvam, M.D.; Michelle Ricks, R.N.; Ignacio Prats, M.D., Leader Surgical Center, York, PA

Laparoscopic pre-peritoneal inguinal hernia repair is an effective and well-proven method in the treatment of inguinal hernias. The main disadvantage is the cost due to the use of balloon insufflator and tackers. In an ambulatory surgical center, the facility fee reimbursement sometimes does not cover the cost of instrumentation.

This paper describes a new approach without the use of balloon insufflator or tackers, in an ambulatory surgical center. A total of 57 inguinal hernias were repaired using this technique between August, 2000 and August, 2001. The operating time for bilateral hernias was 60 minutes and for unilateral hernia was 40 minutes. There were no recurrences.

We feel that this new approach is equally effective and certainly more cost-effective.

Hernia Surgery-PS085

LAPAROSCOPIC VENTRAL HERNIA REPAIR WITH THE GORETEX® DUALMESH® : THE FIRST 100 CASES . Philippe Topart, M.D., Loic Ferrand, M.D., Franck Vandenbroucke, M.D., Patrick Lozac'h, M.D. Chirurgie Generale, Centre Hospitalier Universitaire, Brest, France.

From january 1999 to june 2001 100 consecutive attempts of laparoscopic ventral hernia repair were performed to assess the feasability and initial results of this technique with the Goretex® Dualmesh®. The patients were 45 women and 55 men aged 57.2 ± 29 years. Of the hernias 76% were incisional and 19% had a previous repair. Preoperatively the hernia largest diameter was 6.6 ± 4.3 cm. The procedure routinely used 4 ports (one 10mm and three 5mm) without gastric or bladder decompression. The size of the Dualmesh® was selected peroperatively allowing a 3 to 5 cm overlap of the actual hernia limits. The correct intra abdominal positioning of the mesh was secured with 4 to 8 Goretex® anchoring sutures through the abdominal wall. Completion of the attachment onto the abdominal wall was done circumferentially and centrally with tacks. Successful repair was done in 97% with an operative time of 111.6 ± 39 mn. Peritoneal carcinomatosis in 1 and bowel injury in 2 patients led to conversion to laparotomy. Overall 100 meshs were used covering a surface of 354.5 ± 166.7 cm2. Uneventful postoperative course was observed for 84.5% of the repairs. Two patients died of massive pulmonary embolism and one was reoperated on for an intra peritoneal bleeding. No infection occured and no mesh had to be removed. Patients were discharged 4.5 ± 3.8 days postoperatively. There were 5 seromas and 23% of the patients still complained of pain in the stapling areas 1 month after surgery. With a follow up of 13.5 ± 8.5 months 3 recurrences were diagnosed all reoperated on according to the same technique with the addition of another Dualmesh®. Laparoscopic ventral hernia repair is a feasible technique with a low morbidity and short hospital stay.The Dualmesh® provides a reliable material with a low infection rate. Peritoneal adhesions represent the major risk of injury when repairing incisional hernias and are responsible for longer operative times. Despite the relatively short follow up the recurrence rate is low and long term benefits could be expected even for large hernias.

Hernia Surgery-PS086

REOPERATIONS AFTER LAPAROSCOPIC VENTRAL HERNIA REPAIR WITH THE GORETEX® DUALMESH®. Philippe Topart, M.D., Franck Vandenbroucke, M.D., Loic Ferrand, M.D., Patrick lozac'h, M.D. Chirurgie Generale, Centre Hospitalier Universitaire, Brest, France.

We reviewed all the reoperated patients who already had an intra peritoneal Goretex® mesh for a ventral hernia and examined the consequences of various operative procedures on the outcome. Of a total of 101 ventral hernia repairs with a Goretex® Dualmesh® 12 patients were reoperated on over a period of 31 months. The patients were reoperated on a mean 12.7 ± 9.3 months from their laparoscopic ventral hernia repair for recurrence (4), new ventral hernia (3), aortic bypass (1), postoperative intra abdominal bleeding (1), colectomy (1), gallbladder abcess (1) and pelvic abcess in a Crohn's disease (1). All the recurrences and 2 new hernias were treated using the same initial laparoscopic procedure. All the other procedures were laparotomies. The mesh was removed in 2 patients operated on for a new hernia and an aortic bypass by other surgical teams with completion of an open repair. In 3 laparotomies (bleeding,colectomy and pelvic abcess) the mesh was cut through and repaired using non absorbable sutures. When performed the mesh removal proved to be very easy and there was no mesh infection. New laparoscopic repairs showed evidence of loose adhesions on the previous Dualmesh® enabling an easy redo procedure according to the same laparoscopic technique simply overlaping the already existing mesh. Although the follow up of 10.5 ± 7.3 months for the 10 patients who retained their initial Dualmesh® is still limited no reoperated patient showed evidence of delayed infection or recurrence.
Laparoscopic ventral hernia repair using Goretex® Dualmesh® allows easy reoperation when necessary with little adhesions and a low infection risk. When reoperating on a patient even under septic conditions there should be no need for mesh removal.

Hernia Surgery-PS087

TENSILE STRENGTH EVALUATION OF MESH FIXATION METHODS IN LAPARSOCOPIC INCISIONAL HERNIA REPAIR. M. van 't Riet, M.D., Peggy J. de Vos van Steenwijk, M.D., Gert-Jan.J. Kleinrensink, M.D., Ewout. W. Steyerberg, M.D., H.Jaap Bonjer, PhD. Department of Surgery, Erasmus University Medical Centre, Rotterdam, The Netherlands

Fixation of mesh is crucial for successful laparoscopic incisional hernia repair. In the present experimental study, tensile strength of mesh fixation with helical titanium coils (tackers) and transabdominal wall sutures was assessed in a pig model.

Thirty-six full thickness specimens (5x7 cm) of the anterior abdominal wall of nine pig cadavers were randomized for fixation to a polypropylene mesh (7x7 cm) by either tackers, or transabdominal wall sutures. The number of fixation points varied between 1 and 5. The force required to disrupt mesh fixation (tensile strength) was measured by a dynamometer. Statistical analysis was performed using Wilcoxon test and Spearman rank correlation test.

Mean tensile strength of mesh fixation by transabdominal sutures was significantly greater than that by tackers for each number of fixation points: 67 N versus 28 N for a single fixation point ($p<0.001$), 115 N versus 42 N for two fixation points ($p<0.001$), 150 N versus 63 N for three fixation points ($p<0.05$), 151 N versus 73 N for 4 fixation points ($p<0.05$) and 150 N versus 82 N for 5 fixation points ($p=0.001$). Increasing the number of fixation points over 3 per 7 cm did not improve tensile strength

Tensile strength of transabdominal sutures is superior to tensile strength of tackers. Therefore transabdominal sutures appear preferable in laparoscopic incisional hernia repair.

Hernia Surgery-PS088

COMPARISON OF ADHESION FORMATION ASSOCIATED WITH TACKER(ONUX MEDICAL) VERSUS A NEW MESH FIXATION DEVICE, SALUTE (ONUX MEDICAL). Karl Leblanc, MD, MBA, Baton Rouge, Louisiana

The primary purpose of this study was to evaluate the efficacy and associated adhesion formation of an innovative mesh fixation device when compared with the current standard mesh fixation device. Secondarily, two implantation techniques using the new device were evaluated to learn if onetechnique provided superior results over the (less adhesion formation and/or mesh roll-over).

Six purpose-bred femal hounds were evaluated in this 90 day survival study. each dog underwent a laparotomy. A midline incision was made, and mesh implanted bilaterally on the abdominal wall. for the primary objective, six 4 cm round patches of 1-mm Gore DualMesh were fixed to the abdominal wall (3 on each side) with either 10 Tracker or 10 Salute constructs in each patch. the fixation method of each alternated, and the fixation method of each first patch of each animal was alternated to eliminate bias relevant to patch location and adhesion formation. For the secondary objective, 1-4 (depending on the size of the animal) additional patches wereimplanted with only Salute constructs: 10 constructs per patch, all constructs being placed half in tissue and half in mesh. Two dogs were to be evaluatedby intra-study laparoscopic exams, and all dogs were recovered until sacrifice on Day 90.

Adhesion severity scores were significantly higher for ML sites when compared to both LR and UL sites (overall p_0.0177. Adhesion dissection scores were significantly highter for group T vs group S (overall p_0.0083. Total scores approched signifiance (p_0.0846) with respect to

Minimally Invasive Other-PS089

IMMEDIATE OR DELAYED DIAGNOSIS OF PERFORATED GASTRODUODENAL ULCER DURING LAPAROSCOPIC CHOLECYSTECTOMY. N.Alexakis MD, D.Mylonaki MD, E.Leandros PhD, M.Konstadoulakis MD, G.Androulakis MD, First Department of Propaedeutic Surgery, Athens University, Hippocration Hospital, Athens, Greece

The widespread use of H2 blockers has changed the clinical behaviour of peptic ulcer disease making difficult the evaluation and diagnosis of the frequently reported upper abdominal pain and dyspeptic complaints of patients with peptic ulcers and contemporary cholelithiasis

Methods: We evaluated the incidence of perforated gastroduodenal ulcers in 5,539 patients who underwent laparoscopic cholecystectomy for gallstone disease in our unit from November 1990 to November 2000.

Results: Among 5,539 LCs performed in our unit, 7 patients with perforated gastroduodenal ulcer were discovered (0.13%). Upon diagnosis of the perforation, laparoscopy was converted to open surgery. in all patients. The surgical treatment consisted of primary closure of the gastric or duodenal wall defect and selective vagotomy combined with pyloroplasty. There were no short-term post-operative complications observed in any of the patients.

Conclusions: The wide acceptance of LC has resulted in increased rates of cholecystectomy. However, this bears the possibility of concomitantly missing other intra-abdominal pathology. It is therefore important to take a better history of the patient and in selective cases to proceed in preoperative gastroduodenoscopy.

Minimally Invasive Other-PS090

TOTALLY LAPAROSCOPIC MANAGEMENT OF GALLSTONE ILEUS Terry M. McCurry,M.D., Homero Rivas,M.D., Robert N. Cacchione,M.D., Jeff W. Allen, M.D. Center for Advanced Surgical Technologies, University of Louisville

Introduction. Patients with gallstone ileus are often old, debilitated, and have significant medical illnesses. Minimal access procedures are an ideal approach for this subset of patients. Pure laparoscopic approach for gallstone ileus has been reported only once. We describe our experience in this matter, lending more support to the treatment of this uncommon illness laparoscopically.

Methods and Procedures. Our patient is a 60-year-old diabetic woman, with a four-day history of nausea and bilious emesis. She was known to have gallstones, and her only previous surgery had been an appendectomy. Conservative management with bowel rest failed while under the care of the internal medicine service. Abdominal radiographs were suggestive of pneumobilia. Abdominal computed tomography scan revealed a calcified mass and evidence of small bowel obstruction. A laparoscopic enterotomy and removal of a large gallstone were performed. We evaluated the rest of the small bowel and found no other stones. We closed the enterotomy using intra-corporeal suturing techniques. No cholecystectomy was performed at this stage.

Results. Our patient did well. She did not have any complications. Postoperatively, during her same hospital stay, a cardiac pacemaker was placed for sick sinus syndrome, prolonging her hospitalization. She went home seven days after surgery.

Conclusions. Totally laparoscopic management of gallstone ileus is feasible, and as with other laparoscopic procedures, can provide benefits compared to those of open surgery, especially in high-risk patients.

Minimally Invasive Other-PS091

ULTRASOUND GUIDED THERAPY OF CECAL VOLVULUS: A CASE REPORT. Rodolfo Arcovedo MD, Mason City Clinic, Mason City, IA.

Objective: To point out the feasibility and usefulness of ultrasound in intestinal pathology.

Methods: 60-year-old male presented to the emergency room with 24 hours of diffuse, waxing and waning crampy abdominal pain accompanied by laxative induced diarrhea. He denied vomiting, fever or weight loss. The patient refers having had a similar self-limiting episode 6 months earlier. His medical history was significant for heavy smoking; diffuse atherosclerotic cardiovascular disease and a recent right upper lobectomy for benign disease. On physical examination, his vital signs were normal. His abdomen seemed distended over the left hemiabdomen and diffusely tender. Rectal examination demonstrated liquid stool, no gas. The abdominal films revealed a large air fluid level on the left abdomen. Ultrasonography (performed through the abdominal flanks) detected dilated small bowel and right colon, both with visible peristalsis, an empty left colon, no free fluid or thickened loops of bowel. The working diagnosis was colonic volvulus. He underwent immediate colonoscopic decompression. A colonic tube was left in place. The patient's pain subsided. Next day, a barium enema demonstrated a dilated cecum in the right upper abdomen refluxing into the ileum. This was consistent with a successfully reduced cecal volvulus or bascule. He remained under observation for 24 hours and went home on a regular diet. At 6 months, the patient had not had recurrence of the abdominal pain.

Conclusion: The ultrasonographic evaluation of the abdomen is not necessarily obscured by gas as long as the plane of scanning avoids it; furthermore, it may demonstrate the functional and morphological characteristics of the intestine. In the patient with bowel obstruction, the combination of gas pattern portrayed by plain films and the above mentioned characteristics of the intestine by ultrasonography might help the clinician ascertain the diagnosis and direct the treatment of the surgical patient.

Minimally Invasive Other-PS092

LAPAROSCOPIC RESECTION OF GASTROESOPHAGIAL JUNCTION STROMAL TUMOR - A COMBINED APPROACH OF LAPAROSCOPY AND INTRA-OPERATIVE ENDOSCOPY, Shmuel Avital M.D., Oscar Brasesco M.D., Samuel Szomestein M.D., Raul Rosenthal M.D., Section of Minimally Invasive Surgery , Department of General & Vascular Surgery. Cleveland Clinic Florida, Weston, Florida

Laparoscopic gastric wedge resection offers an ideal method for diagnosis and treatment of sub-mucosal tumors. Tumors at the GE junction are complicated to resect because of their complicated anatomic location and the risk of narrowing the GE junction. We report our technique for resection of a gastric submucosal tumor located adjacent to the GE junction.

Between July 2000 to July 2001, five laparoscopic resections for gastric lesions including stromal tumor (1 patients), carcinoid (2 patients) ectopic pancreas (1 patient) and carcinoma in situ (1 patient) were performed at the Cleveland Clinic Florida.

A 55 old patient, presented with a 4 cm submucosal mass located close to the GE junction, which was diagnosed by gastroscopy following episodes of melena. EUS demonstrated a heterogeneous hypo echoic mass arising from the muscularis layer. At Laparoscopy, the lesser omentum was opened and a fine dissection of the GE junction was carried out paying special attention not to injure the Laterjet nerve bundles.

A gastroscopy was performed with an upward retroflexion of 180 degrees of the endoscope, enabling visualization of the GE junction. The extra-luminal placement of the linear stapler from above the mass was continuously monitored by the endoscope to achieve a resection line, which encompass the tumor but do not damage the distal esophagus. The gastric stapling was continued distally and a wedge resection of the gastric wall with the tumor was completed.

Operative time was 70 min. The patient recovery and follow-up was uneventful. Microscopic evaluation revealed a spindle cell neoplasm with a positive immunohistochemical staining for c-kit (CD117) consistent with the diagnosis of stromal cell tumor, and confirmed a complete excision with clear margins. Mitotic figures were not conspicuous signifying a benign type.

Accurate Laparoscopic resection of gastroesophagial junction tumors may be performed safely using the laparoscopic extra-laminal approach under gastroscopic intra-operative monitoring

Minimally Invasive Other-PS093

LAPAROSCOPIC CHOLECYSTECTOMY FOR TRAUMATIC HEMORRHAGIC CHOLECYSTITIS: A CASE REPORT Thomas L. Bass, MD, Randy S. Haluck, MD, Department of Surgery, Penn State College of Medicine, Hershey, Pennsylvania

Introduction: A rare case of isolated gallbladder trauma that was safely managed with laparoscopic surgery is presented.

Methods/Procedures: A belted front seat passenger was admitted after a high-speed front-end motor vehicle crash. The 35-year-old female was awake and alert with a GCS of 15 and complaints of RUQ abdominal pain. Physical examination of her abdomen revealed a soft, non-distended abdomen with moderate RUQ tenderness but no signs of peritoneal irritation. A series of plain radiographs showed no evidence of acute injury. Laboratory findings were within normal limits, except a decreased hemoglobin of 10.0. CT of the abdomen showed a massively dilated gallbladder with pericholecystic fluid and heterogeneous intraluminal fluid consistent with blood and thrombus. While under observation, the patient developed increasing RUQ pain and localized peritonitis. Laparoscopy revealed a massively dilated gallbladder without evidence of hepatic, duodenal, or pancreatic injury. A laparoscopic cholecystectomy was undertaken with a video and photographic record of the case. An intraoperative cholangiogram revealed no evidence of intra- or extra-hepatic bile duct injury. Visual inspection of the specimen showed a markedly enlarged gallbladder full of thrombus without evidence of cholelithiasis. The patient made an uneventful recovery.

Conclusions: Minimally invasive techniques may be safely applied to the blunt trauma population in certain circumstances.

Minimally Invasive Other-PS094

LAPAROSCOPIC LUMBAR SYMPATHECTOMY Nahum Beglaibter M.D, Ram M Spira M.D, Oded Zamir M.D, Yacov Berlatzky M.D, Herbert R Freund M.d Department of Surgery, Hadassah University Hospital, Mount Scopus, Jerusalem Israel

Lumbar sympathectomy is indicated in cases of non-reconstructable peripheral vascular disease, vasospastic disorders and severe Reflex Sympathetic Dystrophy.We present a series of 27 consecutive unselected patients undergoing 29 laparoscopic lumbar sympathectomies. There were 21 males and 6 females, mean age 45 (21-28)years.Twenty two patients suffered from ischemia of the lower limb and five patients suffered from severe Reflex Sympathetic Dystrophy. The retroperitoneal space was developed using a balloon trocar inserted through a small incision in the falnk. Additional trocars were used for endoscopic instruments. The sympathetic ganglia from L2 to L4 was resected. The procedure was successfully acomplished in all the patients without any operative or postoperative complications. Mean operative time was 136 minutes and mean hospital stay was 1.4 days. All the patients enjoyed significant improvement of pain.

Laparoscopic lumbar sympathectomy successfully combines the advantages of minimally invasive surgery with the effectiveness of the 'open' procedure.

Minimally Invasive Other-PS095

LAPAROSCOPIC CORRECTION VERSUS OPEN SURGERY OF PERFORATED PEPTIC ULCER: FIRST RESULTS OF THE LAMA TRIAL. MJ Bertleff, M.D, WA Bemelman, Ph.D., IH Oei, M.D., JF Smulders, M.D., AC vanderHam, Ph.D., HJ Bonjer, Ph.D., JF Lange, Ph.D., Department of Surgery, MCRZ location Clara, Rotterdam, the Netherlands

Aims: the goal of this study is to evaluate whether laparoscopic correction of a perforated peptic ulcer is as save as open correction. After laparoscopic correction is it hypothesised that patients have less pain, shorter hospital stay and less postoperative complications. It is also presumed that pneumoperitoneum itself will not induce sepsis.

Methods: the LAMA trial is a Dutch multicentre randomised trial that started March 1999. All patients, suspected of a perforated ulcer, are included except pregnant women, patients who have had a previous upper laparotomy or if no informed consent was signed. Of all patients pre-, per- and postoperative data are collected. Also the Quality of Life is measured using the Euroqol, Rand 36 and VAS scoring systems. The follow up will be one year.

Results: Until now 55 patients have been included. An analysis was performed of our first 37 patients (quality of life scoring systems not included). There are 18 pt in the laparoscopic group (11 male 7 female), median age 65 (range 34-87) and 19 in the open group (8 male 11 female), median age 62 (range 24-90). The results in understanding table show that operating time in the laparoscopic group is longer. Differences regarding postoperative dosage of opiates and the VAS (pain) scoring systems suggest less postoperative pain in the laparosocpic group. Also in this group the number of complications is lower and the hospital stay is shorter.

	Laparoscopic (n=18)	Open (n=19)
Operation time (minutes)	73	50
Irrigation fluid (ml)	1550	1271
Blood loss (ml)	18	44
Hospital stay (days)	11	16
Vas day 1	4	6
Vas day 3	2	4
Vas day 7	1	3
Opiate usage (days)	1	2
Complications (pt)	3	7

Conclusion: These preliminary results are favourable for the laparoscopic procedure. Inclusion will have to continue to 100 patients for more reliable conclusions.

Minimally Invasive Other-PS096

LAPAROSCOPIC TREATMENT FOR PEDIATRIC GASTRIC VOLVULUS David A. Borenstein H.BSc., Brian H. Cameron M.D., Zakaria S. S. Habib M.D., J. Mark Walton M.D., and Peter G. Fitzgerald M.D., Department of Pediatric Surgery, McMaster University, Hamilton ON, Canada

Gastric volvulus in children is a rare surgical emergency. The classic symptoms of gastric volvulus include the triad of unproductive retching, epigastric distension and the inability to pass a nasogastric tube. However, children have a more heterogeneous presentation. Laparoscopic gastropexy has been reported to be a safe and highly effective modality of treatment.

Methods: This is a case series of 4 children (2 girls, 2 boys ranging from 8 months to 12 years) with gastric volvulus. Two presented as emergencies while one was asymptomatic and the last presented with a feeding problem.

Results: Gastric volvulus was successfully treated by laparoscopic gastropexy in all cases with two children also having a gastrostomy tube placed for post-operative feeding. Postoperative hospital stay ranged from 3 to 12 days, the latter due to unrelated medical problems in one child. There were no direct surgical complications or noted reoccurrence of volvulus. All children were well at follow-up.

Conclusions: Our small experience supports laparoscopic gastropexy for gastric volvulus as a safe and effective treatment in children. Anecdotally, this surgical approach is as effective as the open procedure, with no serious complications and minimal postoperative morbidity. We propose laparoscopic gastropexy as the preferred treatment for pediatric gastric volvulus.

Minimally Invasive Other-PS097

REDUCTION OF LUNG METASTASES AFTER CECECTOMY WITH LAPAROSCOPY AND PERIOPERATIVE VACCINATION J. Carter, MD; I. Kirman, MD, PhD; P. Wildbrett, BS; D. Feingold, MD; Z. Asi, BA; R. Fowler, BS; E. Huang, MD; R. Whelan, MD, Columbia-Presbyterian Medical Center, NY, NY 10032

It has been shown in a murine model that sham laparotomy and C02 pneumo are associated with the formation of more lung mets than after anesthesia alone. Further, a preop tumor cell vaccine was shown to reduce the formation of lung mets after sham open and closed surgery. The first purpose of this study was to determine the impact of cecectomy on the lung met incidence while the second was to assess a preop tumor vaccine in the setting of cecectomy. **METHODS:** 60 A/J mice were randomized to one of 6 groups: anesthesia control(AC), laparoscopic-assisted cecectomy(LC), open cecectomy (OC), AC + vaccine (ACVac), LC + vaccine (LCVac), or OC + vaccine (OCVac). Alginate beads with 10^5 irradiated TA3Hau tumor cells and 0.1mcg of MPLA(adjuvant) were implanted subcutaneously 14 and 7 days before surgery in vaccine groups. All other mice had empty beads implanted. Tail vein injections of 10^5 Ta3Ha tumor cells were given to all after surgery. All were sacrificed 14 days later and the lungs/trachea excised. Surface mets were counted in blinded fashion and differences determined via ANOVA. **RESULTS:** The LC and the OC groups had significantly(signif) more lung mets than the AC group. The LC group had fewer mets than the OC group but the difference was not signif. Signif fewer tumors were noted after preop vaccination in all vaccinated groups(ACVac 4.8, LCVac 88.33, OCVac 174.44) when compared to their respective control group(AC 40.55, LC 215.88, OC 275). There were signif fewer mets in the LCVac group than in the OCVac group ($p<0.01$), suggesting vaccine is more effective after laparoscopic surgery. **CONCLUSION:** Cecectomy is associated with the formation of more lung mets. Preop whole tumor cell vaccine signif reduced the formation of lung mets after both open and closed cecectomy in this model. There was a greater reduction in lung mets in the vaccinated laparoscopic group when compared to the vaccinated open group's results. Other preop vaccine studies appear to be warranted.

Minimally Invasive Other-PS098

PRE-OPERATIVE LOCALIZATION WITH ANGIOGRAPHIC METHYLENE BLUE FOLLOWED BY LAPAROSCOPIC RESECTION OF A JEJUNAL ARTERIOVENOUS MALFORMATION Bipan Chand M.D., Terive Duperier M.D., Mark Sands M.D., Fred Brody M.D., Department of General Surgery, The Cleveland Clinic Foundation

Introduction: The incidence of small bowel arteriovenous malformations (AVMs) is approximately 4% with less than 300 hundred cases reported in the literature. Patients with intestinal AVMs usually undergo multiple endoscopic and radiographic studies for obscure GI bleeding. Occasionally mesenteric angiography is utilized to identify and localize AVMs. This case report reviews the use of selective mesenteric angiography to localize and tattoo a jejunal AVM with methylene blue. The AVM was resected laparoscopicaly followed by an intracorporeal anastamosis.

Methods: A 67-year-old male presented with obscure GI hemorrhage of two years duration. Work-up included multiple upper and lower endoscopies followed by a small bowel push endoscopy and enteroclysis. All studies were normal. Mesenteric angiography was performed revealing a jejunal AVM. Preoperatively, repeat selective mesenteric angiography re-identified the AVM, which was marked with intra-arterial methylene blue. The patient was brought to the operating room within three hours of tattooing and underwent complete laparoscopic resection followed by an intracorporeal anastamosis.

Results: Post operatively the patient was discharged on post operative day number two. Follow-op visits revealed no further melena and a stable hemoglobin.

Conclusion: This case report confirms the ability of angiography to localize and tattoo small bowel AVMs. It also demonstrates the necessary timing between identification with methylene blue and surgery. Finally, this report illustrates the feasibility of complete laparoscopic small bowel resection followed by an intracorporeal anastamosis.

Minimally Invasive Other-PS099

PORCINE LIVE DONOR PARTIAL HEPATECTOMY: DEVELOPING A MIS TECHNIQUE, Patrick M. Chiasson,MD, Christopher M. Schlachta, MD, David R. Grant,MD, James Phillips,MD, David E Pace,MD, Joseph Mamazza,MD, Loyd Smith,MD, Eric C. Poulin,MD., The Centre for Minimally Invasive Surgery, Toronto, ON, Canada.

The application of advanced laparoscopic techniques to hepatic surgery is evolving suggesting a role for MIS in liver transplantation surgery. The purpose of this animal study was to develop a MIS technique using a porcine model for live donor partial hepatectomy.

Four pigs underwent laparoscopic live donor partial hepatectomy removing the two great left lobes in an effort to mimic left lateral segmentectomy in the human. In each case the porta hepatis was explored and the vascular and biliary structures were isolated and transected only after completion of hepatic parenchymal dissection. The hepatic parenchyma was transected using the HALS technique in combination with ultrasonic shears, hemostatic clips, and endolinear staplers with vascular cartridges. Graft viability was assessed by measuring warm ischemic time, confirming vascular integrity with angiogram, and examining the graft for evidence of injury.

The mean operating time was 275 min. There were two successful procedures where the blood loss was 250 mls and 500 mls and the warm ischemic time was 255 and 510 secs. An angiogram confirmed vascular integrity and histology confirmed parenchymal preservation. Two experiments were considered to be failures secondary to complications. A significant intra-operative complication occurred in experiment #2 with major laceration of the middle hepatic vein which was not amenable to laparoscopic repair. In experiement # 4, the left hepatic vein bifurcated near the vena cava origin and our resection resulted in two separated lobes.

Laparoscopic live donor partial hepatectomy is technically feasible in the porcine model. The technique developed in this study could potentially have clinical application in humans.

Minimally Invasive Other-PS100

THORACOSCOPIC MOBILISATION OF ESOPHAGUS WITH SEGMENTAL RESECTION OF THE LUNG INFILTRATED BY THE TUMOR, Dr Manzoor A Dar F.R.C.S., NORTH WEST ARMED FORCES HOSPITAL TABUK SAUDI ARABIA

I wish to give a video presentation of thoracoscopic mobilisation of esophagus in 3 stage esophagectomy.This procedure has been performed since 1993 but it has not been reported before where segmental resection of the lung was performed thereby removing the esophagus enblock with the affected lung.This procedure is an effective way of providing both palliative as well as curative treatment without a thoracotomy and also I have demonstrated that previously deemed irresectable tumour by laparoscopy can be performed safely without reverting to thoracotomy.

Minimally Invasive Other-PS101

QUALITY OF LIFE OUTCOMES IN MINIMALLY INVASIVE VERSUS OPEN SPLENECTOMY Alicia Fanning MD, Fred Brody MD, Michael Rosen MD, R. Matthew Walsh MD, Frank Duperier MD, Jennifer Malm RN, Jeffrey Ponsky MD., Department of General Surgery, Minimally Invasive Surgery Center, The Cleveland Clinic Foundation, Cleveland OH

Numerous studies have compared the morbidity and technical aspects of laparoscopic splenectomy (LS). However, no study has evaluated the quality of life in patients following LS. This study is designed to characterize the quality of life of patients following LS, open and hand assisted laparoscopic splenectomy (HALS).

Twenty-two patients undergoing splenectomy at the Cleveland Clinic Foundation were evaluated prospectively from May 2000 to May 2001. Patients were divided into three groups. Group A included patients undergoing LS. Group B consisted of patients undergoing HALS. Group C contained patients following open splenectomy or conversions from Group A or B. Patients were queried pre and post operatively with a standard SF-36 form. Data was analyzed independently using a student's t-test and ANOVA.

Group A, B, and C had 12, 5, and 5 patients respectively. Within group C, 3 patients underwent conversion from group A and 2 underwent open splenectomies. There were no mortalities. There were no statistically significant differences between the three groups pre and postoperatively. However, a trend toward improved social and physical functioning was noted following LS (p= 0.06 and p= 0.15 respectively). An improvement in mental health (p= 0.02) was noted in the longitudinal comparison of HALS versus open splenectomy patients.

This study successfully characterizes quality of life following LS, HALS, and open splenectomy. Despite the lack of statistical superiority in quality of life our personal bias continues to favor a minimally invasive approach. With continued patient enrollment the trends noted in this study may prove significant and provide a basis for this prejudice.

Minimally Invasive Other-PS102

RADIOFREQUENCY ABLATION OF RENAL TUMORS LAPAROSCOPICALLY ASSISTED Francesco Feliciotti MD, Roberto Campagnacci MD, , AlessandroM.Paganini MD, Mario Guerrieri MD, AndreaTamburini MD,Angelo De Sanctis MD, Silvana Perretta MD and *Emanuele Lezoche, MD Istituto di Scienze Chirurgiche, University of Ancona, Ancona, Italy; *II Clinica Chirurgica, Università La Sapienza, Roma, Italy.

Aim of this paper is to report our experience about in situ laparoscopic Radio Frequency Ablation (RFA) for renal tumors.

From September 2000 to May 2001, three patients were referred to our department for right small size renal tumors. There were two males, 81 and 71 aged, and one 75 years old female. All cases preoperatively undergo abdominal ultrasound, CT scan and fine needle aspiration (FNA). CT scan showed a 3,2 X 2,2 superior polar tumor, 3 X 2 cm mesorenal and 2 X 2,5 mesorenal tumor, respectively. In all cases FNA revealed a renal clear cell carcinoma. Moreover the second case (71 years old male) was mono-renal patient, while the female patient was simultaneously affected by right colon cancer. In the first patient the location of the tumor did not allow the percutaneous approach. Technically, a laparoscopic five hooks radiofrequency probe (RITA Medical System, CA,USA) was utilized under laparoscopic ultrasound control with a 7.5 MHz probe (B&K Medical, Denmark). A 20 minutes ablation cicle at 100°C mean temperature was performed. In the female patient a laparoscopic right colectomy was performed before the RFA procedure. The operative time was 120,200 and 275 minutes and the postoperative hospital stay 3, 4 and 6 days, respectively.

Abdominal CT scan after one and four weeks confirmed the complete treatment of the lesion.

In our experience laparoscopic RFA of renal tumors in selected cases was feasible and safe. Laparoscopic RFA could be considered as an interesting alternative to open or laparoscopic excision when the percutaneous access is not feasible, or the patient should undergo a simultaneous laparoscopic procedure (i.e. colon cancer).

Minimally Invasive Other-PS103

LAPAROSCOPIC SURGERY IN ABDOMINAL TRAUMA-BOTH PENETRATING AND BLUNT TRAUMA Anil Gandhi M.S.,PMY Goh M.S.,George Lenzi M.D. National University Hospital,Singapore,Hospital university Kebangsaan Malaysia,Kuala-Lumpur

Laparoscopy has taken the general surgical world by storm.The potential for diagnostic and theraputic intervention in abdominal trauma both penetrating and blunt using laparoscope presents an exciting avenue for general surgeon.

Signs of major intra-abdominal haemorrhage or peritonitis are reliable criteria for laparotomy. Peritoneal penetration is a poor indicator for significant organ injury and does not warrant a laparotomy while some groups follow that evisceration after a stab wound to the abdomen requires a laparotomy.Similarly ultrasound /clinical evidence of intra-peritoneal bleed due to splenic injury in a haemodynamically stable patient does not constitute an indication for laparotomy.

We report 3 cases where haemodynamically stable patients presented with evisceration (1) peritoneal penetration(1)after stab wound and one patient with haemoperitoneum from splenic injury(ultra-sound)after blunt trauma abdomen.

Results- Diagnostic laparoscopy revealed perforation in the transverse colon in the First case and one perforation in the stomach and two perforations in the jejunum in the second patient.Both were sutured laparoscopically.In the third patient diagnostic laparoscopy revealed a tear in the splenic capsule with oozing of blood which was controlled using diathermy.There were no post-operative complications.

Conclusion- Emergency laparoscopy in the diagnosis of abdominal trauma both penetrating and blunt represents an excellent technique to exclude not only visceral perforation and major splenic injury,hence lowering the rate of negative and unnecessary laparotomies,but also as a therapeutic procedure,thus offering all the benefits of Minimally Invasive Surgery

Minimally Invasive Other-PS104

LAPAROSCOPIC DISMEMBERED PYELOPLASTY USING 2-MM INSTRUMENTS, Clark M. Gorsler, F. Schier, Departments of Pediatric Surgery, University Medical Centers Lübeck and Jena, Germany

We report our clinical experiences with dismembered pyeloplasty using 2-mm instruments in 12 patients. The patients were placed in a 90 degree lateral position. A 5-mm laparoscope was inserted laterally to the umbilicus (halfway between the umbilicus and the kidney), and two 2-mm instruments were advanced through the ipsilateral abdominal wall for manipulation. The peritoneum above the kidney was incised with scissors and the pyelon of the kidney exposed. Two stay sutures were inserted through the abdominal wall near the kidney and grabbed from inside. One served to stabilize the ureter, the other to stabilize the pyelon. Both sutures were exteriorized through the abdominal wall and secured outside with a clamp. The rest of the procedure is identical to the open technique. A transanastomotic stent was placed in all but the first patient.

The only complication occurred in the very first patient. A urinoma developed which required percutaneous drainage. There was no stenosis on follow-up. Operating times decreased rapidly with experience: the first procedure required six hours, whereas the average duration is now 2.5 hours.

The principal cause of protracted operating times is the small steps taken by 2-mm instruments. There are no disadvantages compared with the open technique, except for the extended operating time. Postoperative recovery is quicker with laparoscopic pyeloplasty, and the are cosmetic result much better. A possible disadvantage of the method is the transperitoneal access route, although we have not seen any postoperative complications so far. Laparoscopic pyeloplasty is a technically demanding alternative to the open technique.

Minimally Invasive Other-PS105

LAPAROSCOPIC REFUNDOPLICATION WITH PROSTHETIC HIATAL CLOSURE FOR RECURRENT HIATAL HERNIA AFTER PRIMARY FAILED ANITREFLUX SURGERY: Frank Alexander Granderath MD, Ursula Maria Schweiger MD, Thomas Kamolz PhD, Rudolph Pointner MD, Department of General Surgery,Hospital Zell am See,Zell am See,Austria

Background: A common complication after laparoscopic antireflux surgery is estimated to be the intrathoracic wrap herniation. Therefore, in some patients, revisional surgery will be necessary. Aim of this prospective study was to evaluate surgical outcome in patients who underwent laparoscopic refundoplication for postoperative intrathoracic wrap herniation using a polypropylene-mesh for hiatal closure for a complete follow-up period of one year.

Patients and methods: Between January 1998 and May 2000, a group of 24 consecutive patients underwent laparoscopic refundoplication for postoperative intrathoracic wrap herniation after primary surgery. Therefore, redo-surgery was performed using a 6x12 cm polypropylene-mesh for hiatal closure. Preoperative and postoperative data including esophagogastroduodenoscopy, esophageal manometry, 24-hour-pH monitoring and barium swallow (kinematographic x-ray) were prospectively reviewed for a complete follow-up period of 1 year.

Results: All redo-procedures were completed laparoscopically. There were no intraoperative complications. Previous antireflux procedures were in 5 patients an open Nissen fundoplication, in 15 patients a laparoscopic Nissen fundoplication and in 4 patients a laparoscopic Toupet fundoplication. Postoperatively, one patient suffered from severe dysphagia and had to undergo pneumatic dilatation. For a mean follow-up period of 26 months (range 3 months to 44 months) no patient developed a recurrent hiatal hernia with or without intrathoracic wrap herniation. The mean lower esophageal sphincter pressure increased significantly at 3 months (12.2 mmHg) and 1 year (11.9 mmHg) after redo-surgery (p>.05). The mean DeMeester score decreased significantly from 50.51 points preoperatively to 16.8 at 3 months and 14.7 at 1 year after redo-surgery(p<.05).

Conclusion: Laparoscopic refundoplication with prosthetic hiatal closure is a safe and effective procedure to prevent recurrent intrathoracic wrap herniation with good to excellent functional outcome for a follow-up period of one year.

Minimally Invasive Other-PS106

TAILORED ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFLUX DISEASE: IMPACT OF LAPAROSCOPIC TOTAL VERSUS PARTIAL FUNDOPLICATION ON PATIENTS QUALIY OF LIFE, Frank Alexander Granderath MD,Thomas Kamolz PhD, Ursula Maria Schweiger MD, Heinz Wykypiel jr. MD,Rudolph Pointner MD , Department of General Surgery, Hospital Zell am See,Zell am See, Austria; Department of General Surgery, University of Innsbruck, Innsbruck, Austria

Background: During the last years,there has been an increasing interest in evaluating quality of life data in patients with gastroesophageal reflux disease (GERD). Aim of this prospective study was to compare the impact of either laparoscopic Nissen or Toupet fundoplication on patients quality of life for a complete follow-up period of 3 years after surgery.

Patients and methods: Between 1993 and 1998, a group of 200 consecutive GERD patients underwent a laparoscopic antireflux procedure in our surgical unit. Patients with preoperative normal esophageal motility underwent a laparoscopic 360° Nissen fundoplication (n=100), patients with impaired esophageal motility underwent a laparoscopic 270° Toupet hemifundoplication (n=100). Quality of life was evaluated using the Gastrointestinal Quality of Life Index (GIQLI).GIQLI was evaluated preoperatively, 3 months, 1 year and three years after surgery.

Results: Before surgery, the mean general score of GIQLI and all subdimensions were significantly (p<0.01) impaired when compared to normative data of healthy individuals. In the Nissen group,GIQLI improved significantly from preoperatively 89.8 points to 118.2 points at 6 weeks after surgery. Three months after surgery, GIQLI showed further improvement up to 123.2 points and remained stable up to 1 year (123.4 points) and 3 years after surgery (123.0 points). In the Toupet group,GIQLI was 90.8 points. Six weeks after surgery, the mean general index improved significantly (p<0.05) to 118.9 points. Three months and one year year postoperatively, the mean GIQLI showed further improvement with comparable scores to healthy individuals: 120.6 points respectively 121.4 points. GIQLI remained almost stable 3 years (120.9 points) after laparoscopic Toupet fundoplication.

Conclusion: Laparoscopic antireflux surgery improves quality of life significantly for a follow-up period of 3 years after surgery. There is no significant difference in quality of life outcome after either Nissen or Toupet fundoplication for this periodBackground: During the last years,there has been an increasing interest in evaluating quality of life data in patients with gastroesophageal reflux disease (GERD). Aim of this prospective study was to compare the impact of either laparoscopic Nissen or Toupet fundoplication on patients quality of life for a complete follow-up period of 3 years after surgery.

Minimally Invasive Other-PS107

CAN LAPAROSCOPIC APPENDECTOMY IN CHILDREN BE DONE AS A SAME-DAY OR OUTPATIENT SURGERY, Harsh Grewal, MD, Jeffrey A. Sweat,MD, W. David Vazquez, MD, Department of Surgery, University of Kansas School of Medicine-Wichita, Kansas

Introduction: Laparoscopic surgery has reduced the length of hospital stay (LOS) for common surgical procedures, such as cholecystectomy, gastric fundoplication and appendectomy. We have recently noticed a reduction in LOS for children undergoing laparoscopic appendectomy (LA). We therefore, looked at our data to assess whether LA in children could be done as a same-day or outpatient surgery (<=24-hour post-operative stay).

Methods: Retrospective review of all children undergoing LA for suspected appendicitis during a 3-year period (7/97 to 7/00).

Results: Seventy-nine children (44 boys and 35 girls), between 2 to 17 years (mean-11 years) underwent LA. In 4 (5%) children with perforated appendicitis, the LA was converted to an open appendectomy. At operation, 51 (64.5%) had acute appendicitis, 22 (27.8%) had perforated appendicitis, 4 (5%) had ruptured ovarian cysts, and in 2 (2.5%) no pathology was identified. The median operative time was 54 minutes. Total LOS for all 79 patients was a median of 58 hours, and median post-operative LOS was 35 hours. Complications included: wound infection-2, abdominal abscess-4, drug rash-2, and epididymo-orchitis-1. In 57 (72%) children without perforated appendicitis the total LOS was a median of 42 hours, while median post-operative LOS was only 28 hours. Thirty-two (56%) children went home in <=24 hours following LA. There was no significant morbidity in the non-perforated group (drug rash-1, fever >24 hrs-3); and there were no re-admissions or re-operations on follow-up.

Conclusion: LA is safe and effective in treating children with appendicitis. The majority of children (56%) with non-perforated appendicitis were dismissed from the hospital in <=24 hours. LA may be safely performed as a same-day or outpatient surgery, in selected children without perforated appendicitis, with a post-operative stay of <=24 hours.

Minimally Invasive Other-PS108

LAPAROSCOPIC HAND-ASSISTED SURGERY IN TECHNICALLY DEMANDED CASES, Volodymyr.V.Grubnik MD, Vladislav.V.Velichko MD, Pushpendra Sharma MD,Alexandr S. Dyuzhev MD. Dept. of surgery, Odessa State Medical University, Odessa, Ukraine

Introduction: The aim is to evaluate the efficiency of hand-assisted operations in comparison with similar laparoscopic operations

Patients and Methods: Laparoscopic hand-assisted operations were performed in 28 patients. In 12 patients - laparoscopic colorectal surgery, in 7 - splenectomy, in 3 - subtotal gastrectomy, in 2 – gastric bypass for morbid obesity, in 2 – pancreaticojejunostomy for chronic pancreatitis, in 1 – distal pancreatic resection for tumor, in 1 - right lobe liver resection for tumor. To perform these operations we used Dexterity and Smith and Nephew pneumosleeves. To perform inctracorporal anastomosis (gastroenteroanastomosis, pancreatojejunoanastomosis), we used our method: the suture was performed by the right hand of the surgeon with mini needle holder under laparoscopic control. The results of 28 hand-assisted operations were compared with the similar laparoscopic procedures (laparoscopic colectomy, splenechtomy, liver resection).

Results: Serious complications and mortality were not observed. 2 cases operated for colorectal cancer were converted to open procedure due to late stage of cancer. Trocar site metastasis was not observed in any of the cases. Mild complications were in 6 cases. Operation time was 1.5-2 times less than in similar laparoscopic procedures. In the laparoscopic procedure group, conversion was in 5 cases due to complications during the operation. In one case anastomosis leak and in 2 – trocar site metastasis were observed.

Conclusions: In technically demanding cases laparoscopic hand-assisted surgery is preferable than laparoscopic procedures.

Minimally Invasive Other-PS109

IMPACT OF TEMPERATURE AND HUMIDITY OF CO2 PNEUMOPERITONEUM ON BODY TEMPERATURE AND PERITONEAL MORPHOLOGY Eric J. Hazebroek MD1, Michiel A. Schreve MD1, Pim Visser PhD2, Ron W.F. de Bruin PhD1, Richard L. Marquet PhD1, H. Jaap Bonjer MD PhD1, 1 Dept. of Surgery, 2 Dept. of Cell Biology and Genetics, Erasmus university Medical Center Rotterdam, the Netherlands

Background: Insufflation of cold gas during laparoscopic surgery exposes the patients to the risk of hypothermia. The objectives of this study were to investigate if heating or humidification of insufflation gas could prevent peroperative hypothermia in a rat model, and, to assess whether the peritoneum was affected by heating or humidification of the insufflation gas.

Methods: Rats were exposed to insufflation with either cold, dry CO2 (group I), cold, humidified CO2 (group II), warm, dry CO2 (group III), warm, humidified CO2 (group IV) or gasless laparoscopy (group V). Core temperature and intraperitoneal temperature were registered in all animals during 120 min. Specimens of the parietal peritoneum were taken directly after desufflation and 2 and 24 hours after the procedure. All specimens were analyzed using scanning electron microscopy (SEM).

Results: During the 120 min study period, core temperature and intraperitoneal temperature were significantly reduced in group I, II and III. Animals which had warm, humidified insufflation (group IV) and gasless controls (group V) did not develop intraoperative hypothermia. At SEM, retraction and bulging of mesothelial cells and exposure of the basal lamina were seen in the four insufflation groups (group I-IV) but also in gasless controls (group V).

Conclusion: Insufflation with cold, dry CO2 may lower body temperature during laparoscopic surgery. Hypothermia can be prevented by both heating and humidifying the insufflation gas. Changes of the peritoneal surface, after CO2 insufflation, occur regardless of heating or humidifying, but also after gasless surgery.

Minimally Invasive Other-PS110

A STUDY OF POSTOPERATIVE ADHESIONS FORMATION COMPARING SURGICAL INSTRUMENTS IN LAPAROSCOPIC SURGERIES Hirota Y., M.D., Oohara S.,M.D., Nishizawa H., Udagawa Y.,M.D. Department of Obstetrics and Gynecology, Fujita Health University, School of Medicine, Toyoake, Japan

Objective: In this study, we evaluate the postoperative adhesion formation comparing surgical instruments by conducting animal lab with juvenile female porcine models.

Materials and Methods: Fourteen juvenile female pigs were used with general anesthesia to conduct laparoscopic bi-lateral uterine horn resection with CO2 insufflations. The following surgical instruments were used; (1) endoscopic stapling device (2) endo loop suture ligature (3) monopolar electric cautery (4) ultrasonically activated scalpel. Twelve days after the laparoscopic surgery, all 14 pigs had laparotomy, and have examined to analyze the degree of adhesion formation of 28 distal ends of uterine horn comparing the above 4 surgical devices. Each degree of adhesion was scored in points as follows; no adhesion at the end of uterine horn=0, filmy avascular adhesions =1, connective tissue band between organs=2, adhesions involving 1 of the following urinary bladder, bowel, uterus=3, more than 2 parenchymatous organs with dense adhesions=6. Kruskal-Wallis test was utilized as a method of statistical work.

Results: The adhesion degree range for the cases in which the endoscopic stapling device was used, was from 0 to 1 point (average 0.14 points). The adhesion degree range for the other devices are as followings; endo loop suture ligature: from 0-2 points (average 0.4 points), ultrasonically activated scalpel: from 0-3 points (average 1.4 points), monopolar electric cautery: from 2-6 points (average 3.14 points). We found a statistically significant deference between all those 4 instruments ($p<0.0005$).

Conclusion: The postoperative adhesion formation was decreased in order of, monopolar electric cautery > monopolar electric cautery > endo loop suture ligature > endoscopic stapling device. The importance of the selection of surgical devices is suggested as a factor to avoid the formation of adhesions following laparoscopic surgery.

Minimally Invasive Other-PS111

A NEW TECHNIQUE OF THE LAPAROSCOPICALLY-ASSISTED INTRAGASTRIC SURGERY.-AN INSERTION METHOD OF TROCARS THROUGH GASTRIC WALL USING THE SMALL OPEN LAPAROTOMY.- Kaneatsu Honma, M.D., Toshiomi Kusano, M.D.First Department of Surgery, University of the Ryukyus, Japan

Laparoscopic gastric surgery is gaining momentum, especially in the treatment of benign and/or malignant tumors. However, it is well known that there are some difficult areas in the stomach for the laparoscopic surgery, i.e., the lesser curvature or posterior wall of the body, angulus. To solve the problem, we devised a new technique which was composed of an incision and suture of the gastric wall using the small open laparotomy.

Under both laparoscopy and transoral gastroscopy, we decide an insertion site of the gastric wall. Through a small open laparotomy with about 3 ‡p incision of mid upper part of the abdomen, a cut about 1 ‡p of the appropriate gastric wall with the electrocautery and a 12 ‡o trocar with double balloon cuff is inserted. After exploration of intragastric lesions, once pull out the trocar and we make additional two incisions for a endocutter and an assisting forceps as a same approach.

This technique was performed for four patients with one early gastric cancer, two leiomyomas and one carcinoid. All patients had a good postoperative courses and no essential complications.

Our method prevent intraoperative complications, such as bleeding and hematoma at sites of incised gastric wall or perforation of intestines. Furthermore, the insertion site of the trocar can be chosen depending on the location of the lesions. This technique might extend the indication of laparoscopic intragastric surgery for the patients with gastric tumor irrespective any locations.

Minimally Invasive Other-PS112

LAPAROSCOPIC SURGERY TO THE PATIENTS WITH LIVER CIRRHOSIS AS FOR THE SAFETY POSITION ON ABDOMEN FOR INSERTION OF TROCAR -NORIHITO ISE, HIDEAKI ANDOH,MD, OUKI YASUI,MD, AND KENJI KOYAMA,MD, Department of Surgery of Akita University School of Medicine, Akita, Japan

BACKGROUND Sometimes, the patients with liver cirrhosis give no indication of laparoscopic surgery because of coagulation deficiency. In addition, there is a danger of massive bleeding when trocar is inserted because many patients with liver cirrhosis have been accompanied by development of collateral vessels on abdominal wall.

METHODS From Jun 1994 to January 2000, thirteen patients with liver cirrhosis underwent laparoscopic surgery in our hospital. We had focus on the safety position on abdomen for insertion of trocar for these patients.

RESULTS In all patients, a short incision, about 1 cm in length, just below the umbilicus was made for insercion of trocar which was mainly used for laparoscope. A large amount of bleeding from the point was not occurred, but in 4 patients, a little bleeding was occurred from the point of the flank where a trocar was inserted by paracentetic method under observation through a laparoscopy.

CONCLUSION As for the laparoscopic surgery to the patients with liver cirrhosis, just below the umbilicus was safety position for insertion of trocar. In addition, we could astrict by a inserted trocar because a skin incision was made as short as possible.

Minimally Invasive Other-PS113

ADVANCED LAPAROSCOPY IN CHILDREN WITH CYANOTIC CONGENITAL HEART DISEASE Tomas H. Jacome, M.D., Manuel A. Caceres, M.D., and Donald C. Liu, M.D., Ph.D., Department of Surgery, Louisiana State University School of Medicine, New Orleans, LA and Section of Pediatric Surgery, The University of Chicago Pritzker School of Medicine, Chicago, IL

Background/Purposes: Children with cyanotic congenital heart disease (CHD) were thought to be poor candidates for laparoscopy secondary to the theoretically untoward effects of CO2 abdominal insufflation on an underlying unbalanced pulmonary and systemic circulation. Our aim was to measure the physiological effects of laparoscopy in children with CHD assessing surgical outcome.

Methods & Materials: Retrospective chart review of 10 consecutive infants with cyanotic CHD who underwent laparoscopic Nissen fundoplication (LNF) was performed. Intra-operative physiological parameters of O2 saturation, blood pressure (BP), and heart rate (HR) were averaged at the lowest end tidal CO2 (et CO2) pre-abdominal insufflation (Group A) and compared to averages obtained at the highest et CO2 post-insufflation Group B. Statistical analysis was performed via student t-test and/or Fischer exact analysis when appropriate ($p<0.05$ was considered significant).

Results: LNF was successfully completed in 7/10 (70%) with 3 open conversions; 2 because of rapid development of tachycardia, desaturation, and hypotension soon after abdominal insufflation and 1 due to technical difficulties. In the 7 successful cases, Group A et CO2 = 32.7 +/- 3.56 and Group B = 46.9 +/- 4.0. Group A O2 sat. = 90.6 +/- 3.3 vs 89.1 +/- 3.2 in Group B. Group A systolic/diastolic BP = (86.6 +/- 1.9/46.3 +/- 1.1) vs (78.8 +/- 1.9/40.9 +/- 2.1) in Group B. Group A HR = 134.2 +/- 2.3 vs 136.5 +/- 1.5 in Group B. p values ranged from 0.3–0.76. All infants were doing well at follow-up without evidence of delayed post-op complications.

Conclusions: Advanced laparoscopy can be safely and successfully performed in children with cyanotic CHD. However, rapid onset of derangement in patient physiology may occur mandating immediate conversion to traditional laparotomy with expected good surgical outcome.

Minimally Invasive Other-PS114

LAPAROSCOPIC CHOLECYSTECTOMY VIA TWO PORTS, USING THE TWIN-PORT. Kagaya T MD, Kishida A MD,Takayama S MD,Kougo M MD,Nagai M MD,Fujita S MD Department of Surgery, Chibanishi General Hospital

Minimally invasive laparoscopic cholecystectomy(LC) procedures with needlescopic forceps are now widely reported. However, surgical procedures with needlescopic forceps are of limited values because of problems in manipulating these instruments. Problems include difficulty in grasping the thickened gallbladder wall, and the forceps being too fragile, causing them to bend and thus making it difficult to hold the gallbladder steadily. Also an incision of at least 10-mm width is required to remove a gallbladder with stones and an incision of at least 5-mm width is required to insert the 5-mm clip applier. Therefore, the functions of needlescopic forceps are only as additional instruments. We developed a Twin-Port system that allows a 5-mm camera and a forceps to be inserted through a single port for the LC procedure. An infraumbilical incision of approximately 10mm is made to insert the Twin-Port. After pneumoperitomeum is performed, a 5-mm cameras and grasper are inserted to expose the gallbladder. A 5-mm trocar is inserted approximately 1cm below the xiphoid process, and LC is performed via two ports. The gallbladder is removed through the opened Twin-Port. The operation was performed in 55 patients without acute inflammatory gallbladder disease. None of the patients are converted to open abdominal surgery. In 3 patients, an additional 5-mm trocar was inserted because of difficulty in removing the gallbladder from the gallbladder fossa. Mean operation time was 47 min. The size of the infraumbilical wound was almost the same as that with the conventional procedure using a 10-mm trocar. The Twin-Port system was devised to make LC possible through two ports in the clinical setting. It may be less invasive than other LC procedures, and also has cosmetic and cost advantages. This procedure appears promising as a practical surgical treatment for cholecystlithiasis and gallbladder polyps.

Minimally Invasive Other-PS115

LAPAROSCOPIC ANTIREFLUX SURGERY IN GERD PATIENTS WITH CONCOMITANT MAJOR DEPRESSION. Kamolz Thomas,Ph.D., Bammer Tanja, M.D., Granderath Frank A, M.D., Pointner Rudolph, M.D. Prof., Department of General Surgery, Public Hospital of Zell am See, Zell am See, Austria

INTRODUCTION: Aim of the present study was to evaluate surgical outcome of laparoscopic antireflux surgery (LARS) in GERD patients (gastroesophageal reflux disease) with concomitant major depression for at least 1 year after surgical intervention.

METHODS AND PROCEDURES: Out of a total of more than 600 operated patients, a group of 41 patients (16 male, 25 female; mean age of 54 years) suffered from concomitant major depression. Clinical data have been evaluated preoperatively and 6 weeks, 3 months and 1 year after LARS including quality of life data (Gastrointestinal Quality of Life Index-GIQLI) and subjective severity of dysphagia. Data have been compared to a consecutive group of 100 patients without any psychiatric comorbidity (58 male, 42 female, mean age of 51 years).

RESULTS: In patients with concomitant major depression we found a significant improvement in traditional outcome data (e.g. DeMeester Score)after surgery. These findings are in comparison to those of patients without any psychiatric comorbidity. GIQLI improved significantly ($p<.05$-.01) from preoperatively 80.7 +10.3 points to 98.5 +11.8 points 6 weeks or 105.3 +12.7 points 1 years after surgery (normative GIQLI: 122.6 +8.5 points). In comparison to this improvement, postoperative GIQLI is not equivalent when compared to healthy individuals or to patients without psychiatric comorbidities (preoperative GIQLI: 91.3 +10.4 points; 1 year postoperatively GIQLI: 121.4 +9.2 points; $p<.05$). In addition, patients with concomitant major depression significantly graded postoperative dysphagia to be more severe for a longer period but without any objective findings in barium swallow.

CONCLUSION: Our findings suggest that patients with concomitant depression should generally not refused from antireflux surgery but should be approached with greater attention.

Minimally Invasive Other-PS116

AN ANALYSIS OF QUALITY OF LIFE DATA BEFORE AND AFTER LAPAROSCOPIC FLOPPY NISSEN FUNDOPLICATION IN PATIENTS WITH AND WITHOUT BARRETT´S ESOPHAGUS, Kamolz Thomas, Ph.D., Granderath Frank A, M.D., Bammer Tanja, M.D., Pointner Rudolph, M.D. Prof., Department of General Surgery, Public Hospital of Zell am See, Zell am See, Austria

INTRODUCTION: Aim of this prospective study was to evaluate and compare quality of life data before and after laparoscopic floppy Nissen fundoplication in patients with or without Barrett´s esophagus (BE)and to compare these data to that of general population.

METHODS AND PROCEDURES: The Gastrointestinal Quality of Life Index (GIQLI) was given to 81 BE-patients and to 250 patients with GERD but without BE (grade 0:n=43; grade 1:n=60; grade 2:n=81; grade 3:n=66). The GIQLI was given to all patients preoperatively, partly 6 weeks postoperatively (BE patients n=36; non-BE patients n=127), and in all patients 3 months, 1 year and 3 years after surgery.

RESULTS: Preoperatively, BE-patients (mean: 97.1 +8.6 points) had a better but not significant ($p<.06$) general score of GIQLI when compared to patients without BE (mean: 86.4 +9.2 points). This difference is solely based on the subdimension "GI-symptoms" which means that GERD symptoms are less intensively and frequently recognized in BE-patients than in patients without BE. There are no other differences in the other 4 subdimensions of the GIQLI between both groups. Six weeks, 3 months, 1 year and 3 years after LARS, GIQLI was significantly ($p<.05$-.01) improved in both groups (BE-patients mean after 3 years: 120.6 +7.9 points; non BE-patients mean after 3 years: 122.0 +8.3 points). This improvement was significantly better ($p<.05$) in patients without BE than in BE-patients. Before surgery, both groups scored significantly below average on all subscores of GIQLI compared to general population (mean: 122.6 +8.5 points). After surgery, there are no differences detectable. A total of 6 patients, each 3 out of both groups, underwent laparoscopic redo-surgery.

CONCLUSION: As these data show, non BE-patients undergoing antireflux surgery achieve a better quality of life improvement than patients with BE. However, antireflux surgery is able to improve quality of life significantly in all GERD patients, with and without BE.

Minimally Invasive Other-PS117

LAPAROSCOPIC TREATMENT FOR SPLENIC HYDATIDOSIS
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Background: Hydatid cysts of the spleen are rare. The are managed either by splenectomy, or by preservation of the spleen and cyst evacuation. Laparoscopic evacuation of hydatid cysts of the liver has been shown to be comparable to the open approach in safety and efficacy, in addition to offering the advantages of the laparoscopic surgery. Here we report the use of laparoscopic evacuation in the management of hydatid cysts of the spleen and discuss its safety and short term results.

Methods: Laparoscopic evacuation of hydatid cyst of the spleen was attempted on ten consecutive patients. There were six females and four males. Age ranged between 13 and 65 years. Hydatid cyst of the spleen was suspected radiologically and the diagnosis was confirmed in all cases with serologic testing.

Results: The operation was completed successfully in all patients. The mean operative time was 59min(range 39-120 min). The average hospital stay was 2 days (range 1-5days). There were no mortalities. One patient had recurrence of her disease in the spleen within the first year, and underwent laparoscopic splenectomy. The average follow up period for all the patients wass 29 months (range 4-42).

Conclusion: Laparoscopic treatment of hydatid cysts of the spleen is feasible and safe. It is associated with less operative pain and shorter hospital stay.

Key words: Hydatid cyst- spleen- laparoscopic evacuation- splenic preservation- splenectomy.

Minimally Invasive Other-PS118

LAPAROSCOPIC SKILLS: DO GOOD HANDS BEGET LAPAROSCOPIC ABILITY? Leonardo Villegas, M.D., George Kondraske, Cheryl Napper, R.N., Jeffrey Cadeddu, M.D., Daniel Jones, M.D, Human Performance Institute, UT Arlington. Southwestern Center for Minimally Invasive Surgery, UT Southwestern, Dallas.

Background: Laparoscopic skills are crucial in the era of minimally invasive surgery. The aim of our study was to determine if "skilled hands" predict laparoscopic ability.

Methods: Ten surgery residents (PGY-2) were tested at a basic element of performance (BEP) level evaluating bilateral motor coordination and visual information processing capacity. All residents also performed five laparoscopic tasks in a video trainer. Comparison with both modalities was done using correlation and a cause-and-effect method (NCRA).

Results: Cause-and-effect consistently showed that a greater amount of each basic performance resource was necessary in order to achieve a higher level of performance in the VT tasks. Correlations were higher (0.4-0.5), between motor coordination and each of the VT task performance scores. There was no correlation between visual information processing speed and each of the VT tasks performance.

Conclusion: Visual processing and motor coordination skills are important factors in open and laparoscopic surgery. Motor performance with open skills does beget better laparoscopic task performance. This is particularly evident from the causal, resource-economic analyses.

Minimally Invasive Other-PS119

LAPAROSCOPIC OPERATIONS FOR ABDOMINAL TRAUMA
AFENDULOV S.A.,MD, KRASNOLUTSKY N.A., MD, HEALTH CENTRE OF LIPETSK IRON AND STEEL CORPORATION, RUSSIA, Health centre of Lipetsk Iron and Steel Corporation

OBJECTIVE OF THE STUDY: The sickness rate of abdominal trauma has been in-creasing in Russia during the last years. Laparoscopic technologies help to solve this problem, but are limited by concerns of potential for missed injuries.

MATERIAL AND METHODS: There were 64 patients with abdominal trauma from 01.01.2000 to 01.05.2001. There were 53 male and 11 female and mean age was 36 (18 – 72) years. Most of the patients were hospitalized after 1-6 hours after a trauma.

There were close trauma in 37 causes: there were a liver and spleen injuries in 14 patients, combined injuries in 12, a bleeding from omentum, mesocolon – in 6, hema-toma – in 5. The character of injuries with knifes trauma were: without trauma abdomi-nal organs- 8 patients, a liver wounds – 7, a mesocolon wounds- 2, a colon wounds –2, combined injuries –3, diaphragmatic –2, bowel – 1, many wounds of small bowel with general peritonitis- 1. There is the iatrogenic trauma of the uterus in 1. We use laparos-copy widely for correct diagnosis and approach for treating. Laparotomy was made without a laparoscopy in 8 (12,5%) causes because of shock and bad haemodynamic examination. There were laparoscopic operations in 18 (28,1%) patients. Parenchymal wounds were coagulated or sealed, and wounds in the diaphragm (2) sutured.

RESULTS: 18 of 64 patients totally treated laparoscopically had an uneventful post-operative course. Their median hospital stay was 6 days, with no late complications. There were 3 conversions.

CONCLUSION: Laparoscopic approach can avoid a number of unnecessary laparot-omy in abdominal wounds and can treat most of the lesions found in haemodynamically stable patients.

Minimally Invasive Other-PS120

INDIVIDUAL TREATMENT OF ULCERATIVE DISEASE AFTER LAPAROSCOPIC REPAIR OF PERFORATED DUODENAL ULCER
AFENDULOV S.A.,MD, KRASNOLUTSKY N.A., MD, Health Centre of Lipetsk Iron and Steel Corporation,Russia

OBJECTIVE OF THE STUDY: The sickness rate of perforated duodenal ulcer has been increasing in Russia during the last years. We used laparoscopic repair with individual study of an intragastric pH within 24 hours and rational therapy for low recurrence rate.

MATERIAL AND METHODS: The laparoscopic treatment of perforated duodenal ulcer was made to 136 patients.There were 131 male and 5 female and mean age was 36 years. Surgical procedure was: extensive lavage of abdominal cavity, extra-or intracorporeal suture repair and drainage. After procedure we conducted 24-hour monitoring of stomach acidity with 63 patients (46,3%). For examination purposes we use a daily computer-based acidogastromonitor AGM 24MP "Gastroscan-24" since 1998. With the help of transnasal introduction of three sensors of pH probe continuous registration of acid producing function changes of stomach is carried out at intervals of 20 seconds within 24 hours with the further data array transfer to a personal computer for study.

RESULTS: The test of medicamental vagotomy (atropine+benzohexoni) was negative in 38 patients (60,3%) . All patients have hyperacidity. 11 patients (17,5%) were found resistant to traditional therapy. Ranitidini was effective not more than 4 hours in 23 cases (36,5%). The intramuscular injection of histodili 2.0 ml was ineffective with 68% of patients. Histodili was effective not more than 1,5-3 hours in 32% cases. Famotidini was more effective than ranitidin by 1,5 times, especially intravenous injection. HP–infection was study in 36 (57,1%) patients. 100% contamination of HP was revealed. The recurrence rate was 4,5% for patients with individual antiulcer therapy & HP eradication in the early postoperative period.

CONCLUSION: We consider that the laparoscopic repair of perforated duodenal ulcers is the method of choice with a further course of individually selected antiulcer treatment & HP eradication for low recurrence rate.

Minimally Invasive Other-PS121

RELAPAROSCOPIC OPERATIONS IN TREATMENT OF COMPLICATIONS AFTER CONVENTIONAL AND LAPAROSCOPIC PROCEDURES, Health Centre of Lipetsk Iron and Steel Corporation, Russia

Despite of rough development laparoscopic surgery in treatment of pathology of abdominal cavity, repeated laparoscopic operations take a small place for correction of complications.

MATERIAL AND METHODS: 1196 patients underwent laparocsopic cholecystectomy. There were abscesses of different localization for 10 (0,84 %), bile peritonitis for 3 (0,25%). The relaparoscopic drainage of abscesses was made in all causes. There are 3 cases with a bile peritonitis after deleting of T-tube from common bile duct. 2 patients underwent relaparocsopic operation. 4 patients underwent relaparoscopic operations after conventional procedure on stomach. The drainage of left sub-phrenic abscess was made after 2/3 resection. 2-th female patient had anastomosis leakage after a gastrectomy for gastric cancer. We made laparoscopic entero-enterostomy, jejunostomy for meal. 3-th male patient had the stenosis of an esophagus. There was a hemoperitoneum after first stage of an esophagoplasty, cured by laparoscopically. Suture leakage marked for 1(1,2%) patient after laparoscopic repair of perforated duodenal ulcer. The relaparoscopic procedure was: omental patch repaire of perforation, extensive lavage of abdominal cavity and drainage. Six patients underwent relaparoscopic procedure with a patology of the pancreas. All patients reported reduction of continuous pain, disappearance of symptoms of peritonitis.

RESULTS: Nobody needed the laparotomy after repeated laparoscopic operations. There were 2 postoperative deaths (5,5%). The first cause of the death was the pancreonecrosis and the second cause was the polyorganic failure after gastrectomy for gastric cancer.

CONCLUSION: Correction of the intraabdominal complications after conventional and laparoscopic operations should begin with repeated laparoscopic procedure. The majority of reparoscopic operations were finished without conversion.

Minimally Invasive Other-PS122

THORACOSCOPIC PULMONARY VEIN ISOLATION TO TREAT ATRIAL FIBRILLATION Hiroshi Kubota M.D., Shinichi Takamoto M.D., Toshiya Ohtsuka M.D., Yutaka Kotsuka M.D., Noboru Motomura M.D., Tetsuro Morota M.D., Katsuhide Maeda M.D., Mikio Ninomiya M.D., Hiroo Takayama M.D., Department of Cardiothoracic Surgery, University of Tokyo

Objective: A rapidly firing focus in the pulmonary veins could be the cause of the atrial fibrillation. Endocardial radio-frequency catheter pulmonary vein ablation to treat atrial fibrillation has been reported. However, it requires contrast media and X-ray to identify pulmonary veins, it requires long time to ablate all pulmonary veins, and rarely it causes cardiac tamponade or pulmonary vein obstruction. We developed a new method that enables pulmonary vein isolation thoracoscopically without using X-ray or contrast media.

Methods: Four Mongrel dogs (26 Pulmonary veins) were used. A hook shaped cryoprobe was developed to ablate the pulmonary vein orifice circumferentially. Using this hook probe, each pulmonary vein was ablated thoracoscopically. During ablation, bipolar electrodes were put on the left atrium and pulmonary vein to record the electrical potential.

Results: All pulmonary veins were electrically isolated within short time.

Conclusion: Pulmonary vein isolation could be done thoracoscopically. This method might be applicable in clinical use to treat atrial fibrillation.

Minimally Invasive Other-PS123

LAPAROSCOPIC-ENDOSCOPIC COMBINED RESECTION OF GASTRIC TUMORS, Kaja Ludwig, MD, Gerlind Amtsberg, Henry Ptok, Lutz Wilhelm, MD, Jörn Bernhardt, MD, Department of Surgery, Klinikum Südstadt Rostock, Südring 81, D-18059 Rostock

Background: Submucosal and mucosal tumors of the stomach are different in histopathological and prognostic characteristics and biopsies by endoscopic techniques often not allow a representative histological probe for the therapeutic decision.

Material and Methods: 14 patients with suspected tumors of the stomach wall underwent between 1999-2001 a combined endoscopic-laparoscopic local resection of the tumors in two different procedures. Tumors of the posterior wall were resected by the intragastral (LIR), in cases of location at the anterior wall in the lesion-lifting (LWR) approach.

Results: Laparoscopic resections were applied to 14 patients including 9 females and 5 males (64%:36%). The mean age of the patients was 67.4 (38-81) years. Preoperative work-up included endoscopy with biopsies and histological examination, ultrasound examination or CT-scan and in 12 patients endoscopic ultrasonography. We performed the LWR in 9 patients and the LIR in 5 patients. After in-toto-resection the definitively immunhistological examination of the specimens showed GIST-tumors in 6 cases (followed by 2 oncological resections and 4 follow up examinations including gastroscopy), and both, in 2 cases neurinoms or neurofibrotic benign tumors. 4 patients with mucosal early gastric cancer and high comorbidity risks underwent also a limited full-thickness wedge resection. In all these patients, the surgical margins, lymphatic or venous invasion in pathological specimens were free. Intraoperative complications were seen in 2 cases (1 x hemorrhage, 1 x perforation of the stomach wall) and treated after conversion. The method-specific morbidity was 9%. No fatal outcome had to be registrated .

Conclusions: Selected properly, the laparoscopic-endoscopic approach are considered to be curative and minimally invasive for tumors of the gastric wall. In cases of histopathological preoperative unknown tumors, the definitively examination of the complete specimen allow the furthering therapeutic decision.

Minimally Invasive Other-PS124

LAPAROSCOPIC TOUPET FUNDOPLICATION OPERATIVE RESULTS AND SHORT-TERM FOLLOW-UP, Mohamed Mostafa Marzouk, MD., Department of Surgery, Saudi German Hospital Group - Jeddah, Saudi Arabia

Background. The development of laparoscopic fundoplication over the past several years has resulted in renewed interest in the surgical treatment of gastro-esophageal reflux disease (GERD). The most commonly used surgical procedure is Nissen fundoplication. But it carries the disadvantage that it can produce an over competent cardia resulting in dysphagia or the gas bloat syndrome. Partial posterior wrap (Toupet) overcomes these side effects but only few studies that showed its efficacy to control reflux symptoms and to achieve healing of the esophagitis. The aim of this study is to present the author's early experience in laparoscopic Toupet fundoplication.

Methods. Between July 1998 and December 1999, twenty patients underwent laparoscopic Toupet fundoplication for gastro-esophageal reflux disease. They were 12 males and 8 females. The mean age was 40.6 years. Pre-operative evaluation included upper gastro-intestinal endoscopy and 24-hour pH study. Follow up period ranged between 6 to 18 months for all patients. Upper gastro-intestinal endoscopy was done for all patients 6 months post-operatively.

Results. The mean operative time was 145 minutes. There were no intra-operative complications and no conversion to open surgery. The mean hospital stay was 50 hours. All the reflux symptoms were relieved in the 1st post-operative day and during the whole follow-up period. The pre-operative esophagitis showed complete healing in the follow-up endoscopy. Post-operative mild temporary dysphagia occurred in 9 patients and disappeared completely in less than 3 months.

Conclusion. Laparoscopic Toupet fundoplication provides an excellent symptomatic outcome in patients with gastro-esophageal reflux. It results in complete healing of the esophagitis. This can be achieved with a hospital stay of 50 hours and a low incidence of intra or post-operative complications. Longer period of follow-up and larger series are needed to reach a solid conclusion.

Minimally Invasive Other-PS125

LAPAROSCOPICALLY ASSISTED ORCHIOPEXY EXTENDED MOBILIZATION OF INTRA-ABDOMINAL TESTIS Samy Abd Elhady Soliman M.D., Mohamed Mostafa Marzouk M.D., Departments of Urology and Surgery, Saudi German Hospital Group - Jeddah Saudi Arabia

Purpose: We reviewed the outcome of first 10 cases with 12 intra-abdominal testes treated laparoscopically by dissection of wider peritoneal cuff inscribed around the testis and the vas deferens in order to gain a sufficient length of the testicular pedicle for scrotal placement.

Material & methods: The medical files of 10 patients with 12 undescended testes who underwent laparoscopic orchiopexy were reviewed. Notably, the peritoneum overlying the internal spermatic vessels was mobilized along with the underlying vessels (un-skeletonized) to guard against undue traction, spasm, or inadvertent damage of such fragile vessels. Likewise, the deferential peritoneum was inscribed in-continuity as a wide peritoneal flap to avoid injury of the vasal collateral, which represent an alternative potential blood supply to the testicle in case the spermatic vessels are to be sectioned. Postoperatively, ultrasonic duplex evaluation was performed to assess the size and the vasculature of the orchiopexized testes.

Results: In 9 cases adequate length of the spermatic vessels was obtained laparoscopically with attached joined peritoneal strip, sufficient to accomplish scrotal positioning of the testes as a one-stage procedure, without need to section the spermatic vessels. Division of the spermatic vessels was resorted to in 3 cases where the testicle was retained high, lateral to the external iliac artery of the ipsilateral side. Two testes were placed successfully into the scrotum, while the third was fixed intracanalicular followed by a second stage 6 months later. Ultrasonic duplex check-up revealed neither testicular atrophy nor compromised blood supply.

Conclusion: Not only one-stage, tension-free orchiopexy can be readily performed by laparoscope, but also careful handling of the of the testicular vessels preclude the possibility of Jeopardizing the blood supply of the newly located testes, and hence testicular atrophy.

Minimally Invasive Other-PS126

EXPERIENCE OF LAPAROSCOPIC RADICAL PROSTATECTOMY Ichiro Matsuzawa1), Shuji Akasaka1), Yoshiaki Fujioka1), Yukihiro Kondo2), Go Kimura2), Taiji Nishimura2), 1) Kawakita General Hospital, Tokyo, Japan 2) Nippon Medical School, Tokyo, Japan

[Introduction and Objectives] Laparoscopic radical prostatectomy was first described in an abstract in 1992. And now the world clinical experience is estimated to exceed 1000 cases. Laparoscopic radical prostatectomy (LRP) is a minimal invasive alternative to standard open retropubic procedure in case of localized prostate cancer. But LRP needs longer operative times and difficult procedure. From June, 2000 we started LRP.

[Methods] LRP was performed the MONTSOURIS TECHNIQUE. From June 2000 to September, 2001 15 LRP have been performed at our institution. All patients were clinically localized prostate cancer (T1 or T2).

[Results] Mean patient age was 69.8 years and mean PSA was 6.7ng/ml (3.7-12). Abdominal surgery and TUR-P had been previously performed in two and three pts. One surgeon performed LRP; mean operative time was 6.4 hours, and blood loss was 530ml. First two pts required open conversion due to major bleeding. Two patients had a rectal injury that was repaired laparpscopically. Positive surgical margin was seen in two cases.

[Conclusions] Despite longer operative time and difficult procedure, with increasing confidence and technical improvement LRP will become a gold standard procedure for localized prostate cancer in the future.

Minimally Invasive Other-PS127

ROBOTIC SURGERY IN MEXICO. OUR EXPERIENCE SINCE 1996. Harry S. Miller, M.D., Jorge R. Garibaldi, M.D., Alberto Reyes, M.D., Jonathan M. Sackier, M.D., Jose T. Hernandez, M.D. Hector Orduna, M.D. Department of Surgery of the General Regional Hospital # 20 of the Instituto Mexicano del Seguro Social, Tijuana, Baja California, Mexico

INTRODUCTION: Since 1993 Robotically assisted Endoscopic Surgery with the Automated Endoscopic System for Optimal Positioning (AESOP 1000), has been used in more than 100,000 Endoscopic Surgical procedures. Mexico the second Country in Latin America to use this technology. In Mexico, in Tijuana, Baja California on June 26, two patients had Endoscopic removal of the gallbladder with the assistance AESOP 1000. In 1998, the largest study of Endoscopic abdominal surgery was done in Mexico City, with the Intuitive System. This same year in the United States with the Zeus system 10 cases of Gynecological Surgery were performed. In 1999, the Zeus system was in Tijuana, Mexico for three weeks. On February 2001, 20 cases of Robotic assistance were performed during a Robotic Course.

PATIENT AND METHODS: 20 case with AESOP 1000, 14 Laparoscopic Cholecistectomies, 03 Preperitoneal Hernia Repair (TEP) 02 Esophagic Fundoplacations and 01 Tubal repair and 66 cases with AESOP 3000, 60 Laparoscopic Cholecistectomies, 01 TEP, 02 Esophagic Fundoplacations, 01 Fertility case, 01 Diagnostics & bullet extraction and 01 liver biopsy, for a total of 86 cases.

RESULTS: With AESOP 1000, we had 04 conversions 01 gallbladder case to open Surgery, 02 cases, one gallbladder case and two Nissen Fundoplacations to traditional Endoscopic Surgery. With the AESOP 3000 01 conversions, 03 complications, 02 infections at the site of extraction and 01 case of bleeding during a gallbladder case witch were controlled. With the AESOP 1000 the surgical time was not affected AESOP 3000 in uncomplicated cases tended to diminish. In cases of difficult tasks, the images were better.

CONCLUSION: Mexico isparticipating in this exciting new era with the help of International companies. Robotic assistance and Interfaces as in Short distance is opening new possibilities in Microendoscopic Surgery, Fertility and probably in Intrauterine Fetal Surgery.

Minimally Invasive Other-PS128

COST ANALYSIS OF LAPAROSCOPIC CHOLECYSTECTOMY VS OPEN CHOLECYSTECTOMY IN A UNIVERSITY TEACHING HOSPITAL IN GREECE D. Mylonaki MD, N. Alexakis MD, P. Antonakis MD, G. Delibaltadakis MD, E. Leandros PhD , G. Androulakis MD, First Department of Propaedeutic Surgery,University of Athens, Hippocartion Hospital, Athens, Greece

Aim/Background: Laparoscopic cholecystectomy today is the treatment of choice for cholelithiasis.The shorter hospital stay and recovery period and the quick return to work offered by laparoscopic surgery are reported to decrease the cost of this procedure. In this retrospective study the cost of laparoscopic cholecystectomy is evaluated and compared to that of open cholecystectomy in a university teaching hospital in Greece.

Materials and Methods: A total of 623 consecutive patients with cholelithiasis were included in our study. Laparoscopic cholecystectomy with single use instruments was performed in 547 patients (87.8%), open cholecystectomy in 64 patients (10.3%), while laparoscopic cholecystectomy was converted to open cholecystectomy in 12 cases (1.9%). The cost of surgical equipment used, hospital stay, doctors and nurses fees were calculated in all cases.

Results: The mean cost of laparoscopic cholecystectomy was 1320 euro, while for open cholecystectomy was 1614 euro. Even though the cost of laparoscopic equipment was 10 times higher that of open cholecystectomy surgical equipment, open procedures were significantly more expensive due to the prolonged hospital stay and longer recovery period.

Conclusion: Laparoscopic cholecytsectomy is a cost-effective alternative to open cholecystectomy, when length of hospital stay is included in the cost-analysis , despite the use of non reusable laparoscopic instruments , which is common practice in Greece.

Minimally Invasive Other-PS129

INTRA-SURGEON VARIABILITY IN MOTOR TASK PERFORMANCE IN LAPAROSCOPIC SURGERY Paul B. McBeth, Antony J. Hodgson, Ph.D., Alex G. Nagy, M.D., Karim A. Qayumi, M.D., Ph.D., University of British Columbia, Dept. of Mechanical Engineering, Dept. of Surgery, Vancouver Hospital, Vancouver, CANADA

Background: Current methods of evaluating the skills of surgical residents are subjective and potentially unreliable, so there is a need for objective methods to monitor their training. The purpose of this study is to test the intra-surgeon reliability of a proposed quantitative skill assessment method based on surgical tool kinematics.

Methods: One expert surgeon performed seven clinical laparoscopic cholecystectomies over a period of four months. Using an optoelectronic motion analysis system we acquired tool tip trajectories at frequencies of ~20 Hz. A hierarchical decomposition matrix was used to segment the procedure into specific surgical actions and extracted characteristic measures of these individual actions (e.g., duration, mean tool-tip velocity, etc.). We selected an example sequence (applying a clip) and compared the characteristic measures associated with its component actions across the seven procedures recorded.

Results: We found no statistical similarity difference between the completion time distributions in any of the four contexts examined: (1) first 4 trials vs. last 3 trials: the probability of these segments arising from the same distribution is p=0.30, and a percent difference in mean completion time, which would have been deemed significant of (d)=5.4%, (2) cystic artery vs. cystic duct: p=0.1, d=22.3%, (3) 1 clip vs. subsequent clips (cystic artery): p=0.94, d=9.3%, and (4) 1 clip vs. subsequent clips (cystic duct): p=0.67, d=20.8%. Results for trajectory length and tip velocity are similar.

Conclusions: We used an automated tool tracking system to identify kinematic features of specific surgical actions during laparoscopic cholecystectomies. The results suggest an expert surgeon performs specific tasks quite consistently from case to case and the performance measures are only modestly sensitive to specific patients.

Minimally Invasive Other-PS130

OPTIMAL CLOSURE METHOD OF FIVE MILLIMETER TROCAR SITES, Cynthia D. Nelms, MD, Brent D. Matthews, MD, Ron F. Sing, DO, Kent W. Kercher, MD, Kristi L. Harold, MD, Harrison Pollinger,AMY LINCOURT, PHD DO, William B. Teel, PhD, Rick Hearn, BSN, PHD, B. Todd Heniford, MD, Carolinas Medical Center Department of General Surgery, Carolinas Laparoscopic and Advanced Surgery Program, Charlotte, NC

Although many surgeons utilize absorbable sutures for skin closure of 5 mm trocar sites, alternative materials exist. We conducted a blinded, prospective, randomized-controlled clinical trial to compare 5 mm trocar site closures using either a vicryl suture (VS), skin tape (ST), or cyanoacrylate tissue adhesive (CTA).

One hundred thirty-seven wounds in 48 patients (mean 2.98+-0.84 wounds/patient) undergoing laparoscopic procedures were randomized between 3 closure method groups (VS=49, ST=48, CTA=40). Many patients had all 3 closures. Closure time of each wound was recorded. Patients rated wound pain and appearance at 1 and 6 weeks post surgery. In addition, 6 blinded surgeons rated photographs of each wound at the same time points using the Hollander Wound Evaluation Scale. Logistic regression analysis was used to evaluate the ratings of each wound closure group.

The groups were similar with respect to patient age, race, gender, BMI, and procedure type. Mean wound closure times were significantly longer for VS [VS=43.1, ST=34.7, CTA=33.4 seconds (p=.001)]. Patients favored VS over ST and CTA at 1 week with respect to pain and wound appearance (.66 and .58 times less, respectively). They rated CTA closures more likely to have pain and poor wound appearance at 6 weeks (4.17 and 2.01 times, respectively). Surgeons rated VS as .35 times less likely and CTA 4.9 times more likely to show moderate to severe scar formation. VS was less likely to have wound separation and edge inversion (.345 and .283 times, respectively). CTA was more likely to yield contour irregularities (4.57 times), excessive distortion (4.18 times), edge inversion (2.48 times), separation (4.9 times), and step-off (2.9 times).

Although VS closure time of 5 mm trocar sites takes longer than ST and CTA, VS scar formation and comfort is superior to ST and CTA. CTA yields poor results with respect to both wound healing and pain.

Minimally Invasive Other-PS131

TREATMENT OF INTRAVENTRICULAR HEMATOMA WITH FLEXIBLE ENDOSCOPY: A CASE REPORT TOMOFUMI NISHIKAWA M.D. PH.D, YOO KANG M.D. PH.D, TEFFY@LEE M.D. PH.D, NAMIKO TAKEHIRA M.D., SHIRO WAGA M.D. PH.D. OSAKA SAISEIKAI IZUO HOSPITAL, Osaka, Japan.

Introduction: So far, intracerebral hemorrhage with ventricular hematoma has been treated with open surgery or stereotactic surgery with or without external ventricular drainage. However, such a ventricular hematoma has been frequently remained, and as a result, hydrocephalus has been sometimes observed. Recently, some authors report neuroendoscopic approach for intraventricular hematoma. This time, we report a case of cerebellar hemorrhage with ventricular hematoma producing an acute hydrocephalus treated with flexible endoscopy via anterior horn, and discuss the advantage of this procedure compared to others.

Methods and procedures: This 72-year-old female presented with a sudden onset vertigo and headache. On admission, her Glasgow Coma Scale score was 15. Left cerebellar hemorrhage with ventricular hematoma, which extended to the lateral ventricles and packed the third ventricle, was confirmed on CT scan. As the level of consciousness was gradually deteriorated (Glasgow Coma Scale score of 8) due to progressive hydrocephalus, flexible endoscopy was introduced via right anterior horn.

Results: Almost all of the hematoma in the third ventricle was evacuated and third ventriculostomy was performed. Hydrocephalus was successfully resolved and resulted in a rapid recovery of her consciousness. In addition, this procedure made her rehabilitation earlier because of no drainage tube. However, ocular abnormality was observed right after surgery, because, we consider, the hematoma in the aquaduct was tried to remove.

Conclusion: A neuroendoscopic procedure is a good option for treating intraventricular hematoma with acute hydrocephalus. Its advantages are as follows; 1) minimally invasive surgery with one burr hole, 2) no need of external drainage, resulting in a decrease of subsequent infection and enabling early rehabilitaion.

Minimally Invasive Other-PS132

A CASE OF ECTOPIC OVARY WITH PARTIAL ABSENCE OF BILATERAL FALLOPIAN TUBES THAT WAS DETECTED DURING LAPAROSCOPIC SURGERY Nishizawa H., Hirota Y., M.D.,Yasue Y., Katoh R., Ohhara S., M.D., Udagawa Y., M.D. Department of Obstetrics and GynecologyFujita Health University, School of Medicine, Toyoake, Japan

Introduction: Ectopic ovary is an extremely rare condition with less than 30 cases reported in literature. We report a case of ectopic ovary with partial absence of bilateral fallopian tubes that was detected during laparoscopic surgery.

Case report: The patient, a 25-year-old married woman (G 0, P 0), visited our hospital with a chief complaint of infertility. Her menstrual cycle had been regular. Pelvic examination and ultrasonography suggested the existence of left dermoid cyst. Under the preoperative diagnosis, a laparoscopy was performed. The left ovary was three times larger than average and was not adherent. The right ovary was noted in normal size and position attached to the utero-ovarian ligaments. To our surprise, an additional ovary (the third ovary) was found in approximately the right infundibulopelvic ligament. It was entirely separated from the uterus, the right normally-placed ovary (the second ovary) or the broad ligament. Furthermore, we found that partial absence of mid portion in bilateral fallopian tubes. Left ovarian cystectomy and biopsies from both right ovaries were performed with laparoscopic procedure. Subsequently, the histopathological report showed ovarian tissue with primordial follicles in both ovaries, and characteristics of mature cystic teratoma in the left tumor.

Conclusion: Ectopic ovary is classified into the two types of supernumerary and accessory ovary. In this case, the third ovary was adjacent to normally-placed ovary and was connected to the infundibulopelvic ligament. Therefore, we determined that the third ovary in this case is an accessory ovary. The cause may be due to a defect of genital ridge and Mullerian duct which occurred in the embryonal periods simultaneously. To the best of our knowledge, this report is the first case of ectopic ovary with partial absence of bilateral fallopian tubes in the modern literature.

Minimally Invasive Other-PS133

PROSPECTIVE RANDOMIZED BLINDED TRIAL OF MINI-PORT VS CONVENTIONAL CHOLECYSTECTOMY Yuri W. Novitsky, MD, Donald R.Czerniach, MD, Demetrius E.M. Litwin, MD, Kent W. Kercher, MD, Karen A Gallagher, RN, Steven M. Yood, MD, Stephen Griffey, MD, Mark P. Callery, MD, John J. Kelly, MD, Department of Surgery, University of Massachusetts Medical School, Worcester, MA

Objective: Benefits of laparoscopic cholecystectomy (LC) are well established. The use of smaller instruments has been proposed to further improve postoperative pain and cosmesis. We compared the safety, postoperative pain and cosmetic results of LC performed conventionally (C-LC) and utilizing the mini-ports (M-LC).

Patients and Methods: 78 Patients agreed to be prospectively randomized to C-LC and M-LC groups. Experienced surgical attendings performed all operations. C-LC was performed utilizing two 10 and two 5-mm trocars. M-LC was performed with one 10, one 5 and two 2-mm lateral trocars. Postoperative follow up was conducted by blinded observers. Patients graded their pain according to the Visual Analog Scale (VAS) on postoperative days 1, 3, 7 and 28. Cosmetic results were scored between 1 and 10 both by patients and observers at 28 days. A two-sample t-test was used for the statistical analysis.

Results: The groups were similar in age, sex and self-assessed pain tolerance. 8 out of 33 patients (24%) randomized to M-LC were converted to C-LC, commonly due instrument failures. There was no significant difference in operative times between M-LC and C-LC groups (54.9 vs 50.5 min, respectively). There were no complications and no conversions to open procedure. Postoperative pain scores on days 1, 3, 7 and 28 were not statistically different between M-LC and C-LC groups (4.1 vs 4.8, 2.8 vs 2.9, 1.7 vs 1.9 and 0.1 vs 0.6, respectively). Cosmetic results were found to be statistically superior in M-LC when evaluated by both patients and blinded observers (32.0 vs 38.9, $p=0.0002$ and 28.7 vs 38.7, $p<0.0001$, respectively).

Conclusion: Laparoscopic cholecystectomy can be safely performed using 2-mm lateral trocars. M-LC does not minimize postoperative pain. It appears to be superior in postoperative cosmetic results. However, high conversion rate to C-LC necessitates further improvement of the instruments before widespread implementation of M-LC.

Minimally Invasive Other-PS134

ANAL ULTRASOUND AND ENDOSONOGRAPHIC MEASUREMENT OF PERINEAL BODY THICKNESS: A NEW EVALUATION FOR FECAL INCONTINENCE IN FEMALES Michael Oberwalder, MD, Klaus Thaler, MD, Khurrum Baig, MD, Adam Dinnewitzer, MD, Jonathan Efron, MD, Eric Weiss, MD, Anthony Vernava III, MD, Juan Nogueras, MD, Steven Wexner, MD, Cleveland Clinic Florida, Weston, FL

Perineal body thickness (PBT) is measured by endoanal ultrasound (EAUS). Literature has shown that women with obstetric trauma to the anal sphincter have decreased PBT and a measurement of <10mm has been proposed as abnormal. The aim of this study was to compare the proposed definitions of normal to pathologic findings in patients with fecal incontinence (FI) and to correlate PBT with anorectal physiologic findings.

Female patients who had AUS and PBT for evaluation of FI were assessed. They were divided into 3 groups based on PBT measurement: Group I: <10mm; Group II: >10mm, <12mm; Group III: >12mm. Degree of FI (0-20), manometry, electromyography (EMG), and pudendal nerve terminal motor latency (PNTML) measurements were correlated with PBT.

83 female patients [mean age 59.7 (30-88) years] had AUS and PBT. There were 59, 11, and 13 patients in Groups I, II and III, respectively. 64 (77%) had anterior sphincter defect confirmed by AUS with 57 (97%) in Group I, 4 (36%) in Group II and 3 (23%) in Group III. Mean external sphincter defect angle was 110 (45-170) degrees and the mean FI score was 13.8. 89% had a history of prior vaginal delivery, 35% had one or more prior perineal surgeries, 27% had both and 4% denied having had either. A significant correlation between sphincter defect and PBT ($p<0.001$) was noted. External sphincter defects angles were negatively correlated with PBT ($p=0.001$). There was no correlation between PBT and degree of FI, manometry, PNTML, or EMG findings.

PBT of <10mm is considered abnormal, >10mm - <12mm is associated with sphincter defect in one third of incontinent patients and >12mm is unlikely to harbor a defect except in previous reconstructive perineal surgery.

Minimally Invasive Other-PS135

EVALUATION OF GYNECOLOGICAL LAPAROSCOPIC SURGERY BASED ON ANALYSIS OF SURGICAL STRESS Ohhara S., M.D., Hirota Y.,M.D., Nisizawa H.,M.D., Yasue A.,M.D., Yoshida M.,M.D., Tada S.,M.D., Udagawa Y.,M.D. Department of Obstetrics and Gynecology, Fujita Health University, School of medicine, Toyoake, Japan.

OBJECTIVE: The purpose of this study is to assess the physiological responses to various injuries by gynecological laparoscopic surgery. It is well recognized that laparoscopic surgery reveals not only less postoperative disability, but also more rapid recovery to normal routine life activity than conventional open surgery. This observation suggests that laparoscopic surgery is a less traumatic procedure. The question we have to clarify, is whether laparoscopic surgery can reduce the surgical injuries comprared to conventional surgery.

METHODS: Thirty-three patients undergoing hysterectomy without systemic complications were studied prospectively. They were operated on either by laparoscopic surgery(LS,n=16), or by conventional open surgery(COS,n=17). All procedure utilized general anesthesia. Plasma level of white blood cells(neutrocyte, monocyte, lymphocyte), granulocyte elastase activity(GE), C-reactive protein(CRP), cathecholamines(adrenaline, noradrenaline, dopamine), Interleukin-1b(IL-1b), Interleukin-6(IL-6), were determined on the day of operation before surgery, and then at 4, 24, 96 hours after surgery.

RESULTS: The postoperative CRP levels at 24 and 96 hours were significantly lower in the LS group compared to those in the COS group. The GE levels at 4 hours were also significantly lower in the LS group. The IL-1b levels at 4 , 24, 96 hours were significantly lower in the LS group. There were no significant differences as for postoperative mean level of white blood cells , cathecholamines and IL-6 between the LS and COS groups.

CONCLUSION: These results suggest that the postoperative inflammatory responses in CRP, GE and IL-1ƒÁ subsequent to laparoscopic surgery are significantly reduced compared with those of COS. On the other hand, there were not enough evidences that the laparoscopic procedures may reduce the neuroendocrine stresses due to surgical injuries.

Minimally Invasive Other-PS136

VIDEOSCOPY-CONTROLLED CORONARY ARTERY BYPASS GRAFTS Toshiya Ohtsuka, M.D., Noboru Motomura, M.D., Hiroshi Kubota, M.D., Yutaka Kotsuka, M.D., Shinichi Takamoto, M.D. Department of, Cardiothoracic Surgery, University of Tokyo, Tokyo, Japan.

In minimally invasive coronary artery bypass (MICAB), graft conduits are controlled via limited incisions. We have been using videoscopy for harvesting and quality-control of these grafts, and in this study the clinical results were reviewed.

Fifty-four patients (44 male, 10 female, 64.5∞}9.5 years old) underwent MICAB using an internal thoracic artery (ITA) graft in situ, which was harvested entirely by thoracoscopy through three ports. Thirteen patients (10 male, 3 female, 69.5∞}11.5 years old) underwent modified MICAB using a vein graft with axillary arterial inflow (n=8) or a gastroepiploic artery (GEA) graft in situ (n=5). The intrapleural pathway of each vein and GEA graft was controlled videoscopically through a limited anterior thoracotomy. In each patient, hemipulmonary collapse was induced using a double-lumen endotracheal tube, and a 30-degree, 5-mm rigid scope was employed. Intrapleural carbon dioxide insufflation at 5-10 mmHg was used during thoracoscopic ITA harvest.

There was no mortality or videoscopy-associated morbidity. The ITA harvest was completed thoracoscopically in all 54 cases within a mean period of 47∞}12.5 min, and blood loss was negligible. One (1.9%) of the harvested ITA grafts was not used because of intimal dissection. Graft angiography was carried out in all cases 2-9 days after surgery, and 100% patency was confirmed without kinking, twisting or redundant parts along each graft. The follow-up study is now 100% complete and each graft has been checked using transcutaneous Doppler. Angiograms of 18 (33%) ITAs and three (37%) vein grafts were obtained 1-3 years after surgery and their patency was reconfirmed.

In MICAB via a limited approach, harvesting and control of graft conduits is cumbersome and their intrapleural pathways are disturbed by lung tissue motion. Therefore, videoscopy is useful for harvesting and quality-control of MICAB grafts.

Minimally Invasive Other-PS137

LAPARAOSCOPY IN PATIENTS WITH APPENDICITIS: A RETROSPECTIVE REVIEW OF 33 CONSECUTIVE CASES J. Alexander Palesty M.D., Xiu-Jie Wang M.D., William F. Quigley, M.D. and *Aziz Benbrahim M.D.,St. Mary's Hospital, Waterbury, CT and *Griffin Hospital, Derby, CT

Introduction: Laparoscopy in patients with suspected acute appendicitis is gaining wide acceptance. Our experience confirms that laparoscopic appendectomy may be associated with less postoperative pain and shorter hospital stays when compared to open appendectomy.

Methods: This is a single institution 1-year retrospective review of 33 consecutive patients admitted by 1 surgeon for suspected appendicitis. All patients underwent laparoscopic exploration. Data was analyzed for demographics, CT scan findings, intra-operative and pathologic diagnosis, complications and incidental findings.

Results: Fifteen males and 18 females had operations for suspected appendicitis. Mean age was 23 years (range: 6-67). CT's were obtained in 26 cases (79%). Its sensitivity was 86% and specificity 100%. Conversion to open was 0%. All but 5 patients had acute appendicitis by pathology. Of these, 1 had a pathologically normal appendix, 2 had PID, 1 had a bleeding ovarian cyst, and 1 had cecal adhesions. One patient had an interval appendectomy 6 weeks post laparoscopic abscess drainage. Six patients had a retro-cecal appendix of which 3 were sub-hepatic. An incarcerated umbilical hernia and a small bowel obstruction were treated with acute appendicitis. Four unilateral and 2 bilateral inguinal hernias were found incidentally. Average length of stay was 2.1 days (median-1). There were 5 post-operative complications: 2 intra-peritoneal abscesses necessitating CT guided drainage, 1 case of urinary retention and 2 cases of postoperative ileus. One patient had an inflammatory mass treated conservatively. There were no post-operative wound infections.

Conclusion: Laparoscopy allowed confirmation of the clinical diagnosis of acute appendicitis. It may be considered a safe and effective technique as it allows complete intra-abdominal exploration, low morbidity, short length of stay, and improved cosmesis. It is our procedure of choice and we advocate it for patients with suspected appendicitis.

Minimally Invasive Other-PS138

LAPAROSCOPIC REPAIR OF MORGAGNI DIAPHRAGMATIC HERNIA IN CHILDREN: TECHNICAL CHALLENGES AND RESULTS , Guiseppe Papia MD, J. Ted Gerstle MD, Jacob C. Langer MD, Department of Surgery, University of Toronto and Hospital for Sick Children, Toronto, Ontario, Canada

Purpose: To identify technical issues and report our preliminary experience with laparoscopic repair of anterior midline (Morgagni) diaphragmatic hernia.

Methods: Four consecutive children undergoing laparoscopic Morgagni hernia repair over 3 years were reviewed.

Results: Age ranged from 13 months to 13 years. Three were found incidentally on chest X-ray, and one presented with sudden onset of left-sided chest pain; none had obstructive symptoms. At operation all had omentum and 3 also had bowel in the anterior mediastinum and chest. All four underwent primary laparoscopic repair with interrupted nonabsorbable sutures. The sac was left intact in all cases. A small residual eventration was left along the edge of the pericardium in one patient. The patient who presented with chest pain was found grossly and histologically to have acute appendicitis within the left chest, requiring dissection of the inflamed viscera from the mediastinum and chest wall; laparoscopic appendectomy was also done. Median time to full diet was 3 days, morphine was given for a median of 36 hours, and median postoperative hospital stay was 4.5 days. There were no intra- or post-operative complications, and no cases were converted to an open approach. Follow up CXR demonstrated complete resolution of the hernia in three patients, and a small amount of residual bowel in the unrepaired pericardial portion of the eventration in the other patient. All children remain clinically well.

Conclusion: Laparoscopic repair of Morgagni diaphragmatic hernia in children is a safe technique that provides rapid recovery and superior cosmetic results. Many unexpected technical challenges can be managed effectively without converting to an open approach.

Minimally Invasive Other-PS139

MINIMALLY INVASIVE SURGERY FOR ESOPHAGEAL DIVERTICULA, Andrew F. Pierre MD, Hiran C. Fernando MD, Percival O. Buenaventura MD,Neil A. Christie MD,Philip R. Schauer MD,James D. Luketich MD , Divisions of General and Thoracic Surgery, Univerisity of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Background: Mid and lower esophageal divertiula (ED) are uncommmonly encountered entities that have been successfully managed by open surgical approaches. The purpose of this study was to evaluate our results of minimally invasive surgery (MIS) for ED.

Methods: We performed a retrospective review of all cases of mid and lower ED that underwent repair by MIS at our institution.

Results: From June 1998 to June 2001, 10 patients (5 male, 5 female) underwent MIS for an ED. There were 8 epiphrenic and 2 mid ED. Median size of ED was 7.5 cm. Median age was 71 years. Achalasia was present in 7 patients, 1 had a nonspecific motor disorder, and 2 had apparent normal esophageal function. Symptoms included dysphagia (10), regurgitation (5), vomiting (2), and aspiration pneumonia (2). Six patients had previous surgery or endoscopic interventions. Laparoscopic diverticulectomy, myotomy, and partial fundoplication was performed in 7 patients. Video-assisted thoracoscopic approach was used in three patients. There were 3 esophageal leaks. Two were managed successfully with good outcomes. One delayed death occurred following transfer to a rehabilitation facility (61 days post-op). Median length of stay was 5.5 days (range 1-59 days). Median follow-up was 22 months. Results were excellent in 7 patients, and fair in 2 patients. No patient had a poor result in follow-up.

Conclusion: MIS for ED is technically difficult but feasible with a complication rate similar to open surgery. Open surgery should remain the standard except in centers with extensive experience in advanced MIS esophageal surgery.

Minimally Invasive Other-PS140

CAUSES OF CONVERSION TO OPEN DURING LAPAROSCOPIC ADRENALECTOMY Jose Pinheiro, MD; Miranda Voss, MD; Steve Eubanks, MD, Department of Surgery, Duke University Medical Center, Durham, North Carolina

Introduction: Laparoscopic adrenalectomy is considered the standard treatment for benign functional adrenal tumors. The conversion rate is low, but the factors determing conversion have not yet been well defined. The purpose of this study was to document the causes of conversion in a series of 48 patients.

Methods: A retrospective chart review of all patients undergoing laparoscopic adrenalectomy at a single institution from 1994 to 2001 was performed. An experienced laparoscopic surgeon performed all procedures. Age, sex, race, indication for surgery, body mass index (BMI), tumor location, operative time, intraoperative blood loss, presence of previous surgery, histopathology, tumor weight, and length of hospital stay were assessed. Data were analysed using standard t-test.

Results: 40 patients underwent successful laparoscopic adrenalectomy (LAP) and conversion (CONV) was necessary in 8 patients. Both groups were similar regarding age, sex, race, indications, and tumor location. Laparoscopic patients had shorter operative time, lower intraoperative blood loss, and shorter length of hospital stay. Adhesions from previous abdominal surgery, adhesions from unknown cause, and intraoperative suspicion of malignancy were the causes for conversion in one patient each. Bleeding was one of the contributing factors for conversion in 3 patients. Mean blood loss was greater in the converted group (LAP 128.4 +- 18,2 ml vs. CONV 1325 +- 759.1 ml). Although obesity was a contributing factor for conversion in 3 patients, the difference in BMI between the 2 groups was not statistical significant (LAP 29.4 +- 1.4 vs. CONV 32.5 +- 2.2). Tumor weight in the conversion group was significantly greater (LAP 26.5 +- 3.7 g vs. CONV 97.8 +- 65 g, $p<0.05$).

Conclusion: Obesity and bleeding were a contributing factor in several patients, but this did not reach statistical significance. Tumor weight was the only statistically significant factor contributing to conversion in this study.

Minimally Invasive Other-PS141

REMOVAL OF DROPPED STONE DURING LAPAROSCOPIC CHOLECYSTECTOMY, Mohammad Motiar Rahman, GM Mokbul Hossain, Zahirul Amin, Mohammad Rafiqul Islam, Dhaka National Medical College & Hospital, Dhaka, Bangladesh

Dropping of stone into the peritoneal cavity during Laparoscopic Cholecystectomy is a common problem. Simple measures sometimes work better than very sophisticated measures. The objective of this study was to develop a new technique for removal of dropped stones during laparoscopic cholecystectomy.

We have performed about 8000 laparoscopic cholecyetectomies during the period April , 1994 to July 2001. We always use a hollow pipe (length 18 inch, diameter-10 mm or less) having both ends open. The hollow pipe is introduced through epigastric port blocking the external opening of the pipe with right thumb so that intraperitoneal carbndioxide can not come out. Then the centre of the internal opening of the hollow pipe is placed over the dropped stones, collected in one place. When right thumb is suddenly removed from external opening of the pipe, carbondioxide gushes out of the abdomen through the lumen of the pipe due to positive intra-abdominal pressure & stones also come out with the carbondioxide.

This instrument can be made of metal or plastic, cheaper, easily available, easy to handle and offers no problem for sterilization.

Minimally Invasive Other-PS142

A NEW METHOD OF FIRST CANNULATION IN LAPAROSCOPIC SURGERY, Mohammad Motiar Rahman, GM Mokbul Hossain, Zahirul Amin, Mohammad Rafiqul Islam., Dhaka National Medical College & Hospital, Dhaka, Bangladesh.

There is no doubt that the most dangerous step of any laparoscopic procedure is the insertion of the first trocar and cannula for the optics. There are different methods of first cannulation in laparoscopic surgery. Most surgeons first produce pneumoperitoneum by Veress needle & then introduce trocar with cannula through an incision in the skin and subcutaneous tissue in the subumbilical region. Other surgeons introduce trocar with cannunla directly through a wound made in subumbilical region. The purpose of this study was to develop a new method of first cannulation in laparoscopic surgery to save time and for better cosmesis.

In our procedure we first hold the lateral edges of umbilicus by two Cocker's forceps & lift up the anterior abdominal wall. Then we incise the skin and subcutaneous tissue in the center of the umbilicus.

In our experience of about 8000 laparoscopic cholecystectomies we found that in patients with flat umbilicus an opening in linea alba & peritoneum becomes clearly visible immediately after incising the skin & subcutaneous tissue. We then push the 11 mm trocar and cannula through this opening into the abdomen. In most others the opening remains closed with pads of fat. Here we push an artery forceps in and stress the opening and then push the 11 mm trocar cannula in the abdomen. After cannulation we insufflate through the lateral opening in the cannula.

The new technique is faster, safer and cosmetically better.

Minimally Invasive Other-PS143

LAPAROSCOPIC CRYOABLATION OF RENAL TUMORS – PRELIMINARY RESULTS Ran Katz MD, Dov Pode MD, Amos Shapiro MD, Pinhas D. Lebensart MD and Pethacia Reisman MD, Departments of Urology, Radiology and General Surgery, Hadassah Medical Center, Jerusalem, Israel

Introduction & Aim: Cryotherapy is a tissue ablating technique that has been carried out successfully in solid organs as the liver and prostate. Its application for renal tumors was reported with promising early results. With the growing experience in laparoscopic nephrectomy in our institution, we decided to test the feasibility, safety and outcome of laparoscopic cryoablation of small renal tumors.

Patients & Methods: 3 male patients 50-73 years old with a 3-3.5 cm peripheral renal tumors were treated. The patients were placed in the flank position as for open nephrectomy. Two 10 mm ports (camera and ultrasound) and one 5 mm (dissection) port were used. Dissection was carried transperitoneally, exposing the renal hilum and controlling the renal vessels. Intraoperative ultrasound with truecut biopsy were performed, followed by cryoablation using a 5 mm probe introduced percutaneously and directed under visual and sonographic guidance into the lesion. Two freezing cycles of 15 minutes each followed by active worming were performed. And sonography confirmed the size and location of the iceball.

Results: Renal biopsy confirmed renal cell carcinoma in two patients and an undetermined tumor in the third. The mean operating time was 170 minutes. No intra or post operative complication were noted and the post operative course was uneventful in all patients, who were discharged on second post operative day. During follow up of 8 months, the patients are well, and repeated CAT scan revealed that the tumor had been entirely replaced by scar tissue in all patients.

Conclusions: Laparoscopic cryoablation of selected renal tumors seems to be feasible and safe. The use of laparoscopic ultrasound is crucial. Our short term follow up suggests that cryotherapy is indeed a sufficient tissue ablating technique.

Minimally Invasive Other-PS144

LAPAROSCOPIC TOTAL GASTRECTOMY- INITIAL RESULTS IN 3 PATIENTS, Danny Rosin, M.D., Joseph Kuriansky, M.D., Barak Bar Zakai, M.D., Menahem Ben Chaim, M.D., Moshe Shabtai, M.D., Amram Ayalon, M.D., Department of General Surgery and Transplantation, Sheba Medical Center, Tel Hashomer, Israel

The use of laparoscopy is continuously extended to more complex procedures, including surgery for malignant diseases. We report our initial experience with laparoscopic total gastrectomy for cancer of the stomach.

3 patients, aged 25, 70 and 75, were operated. The indications for surgery were Linitis Plastica in two patients, and a proximal tumor in the third. In all patients the tumor was localized to the stomach, as shown in pre-operative imaging. The stomach was resected en-bloc with the greater omentum and the perigastric lymph nodes. In one patient, in which the splenic hilar lymph nodes were found intraoperatively to be involved by tumor, a splenctomy was performed, as well. Esophagojejunostomy, Roux-en-Y, was performed by a 25 mm EEA stapler. The anvil was introduced transorally.

All procedures were completed laparoscopically, with no intraoperative complications. Operative time was 400, 375 and 560 minutes. Post operative gastrografin study was performed in all patients, showing a patent, non-leaking, esophago-jejunal anastomosis. Oral intake was resumed on post-operative days 2, 5 and 4. Post-operative complications included two wound infections in the sites where the EEA stapler shaft was introduced. These were treated by local wound care.

Pathological reports showed complete resection of the tumors, with clear margins, in all patients. Lymph node involvement was present in all three patients.

We conclude that laparoscopic total gastrectomy is a feasible procedure, which allows for oncological resection of gastric cancer. Comparison to the open procedure requires larger series and long term follow up.

Minimally Invasive Other-PS145

ENDOSCOPIC APPROACH FOR CAROTID ARTERY SURGERY
Francesco Rubino, MD, Richard Nahouraii, MD, Harel Deutsch, MD, Wesley King, MD, William B. Inabnet, MD, Michel Gagner, MD , Minimally Invasive Surgery Center, Mount Sinai Medical Center, New York, NY

Introduction: Carotid endarterectomy is still the approach of choice for the treatment of carotid diseases, and is one of the most commonly performed operations today. Minimally invasive techniques for surgery of the neck have been limited to the treatment of thyroid and parathyroid diseases. The purpose of this study was to verify the feasibility of an endoscopic transcervical approach for surgery of the carotid artery in a large animal model.

Methods: Eight 25-30kg pigs were utilized. Animals underwent endoscopic carotid dissection with carbon dioxide insufflation at 10 mmHg.A 1.5-2 cm arteriotomy was made in the common carotid artery. Four animals underwent direct arteriotomy closure, and four animals underwent synthetic patch graft placement using intracorporeal suturing techniques. Open examination of the operative site and carotid angiograms were performed at the end of the procedure. Operative time was recorded in the last four cases.

Results: All animals tolerated the procedure well and carotid artery repair was successfully performed in all cases using a four-trocar technique. The entire extent of the cervical common and internal carotid arteries was exposed up to the cranial base. Cranial nerves and cervical structures were clearly visualized and preserved. No bleeding occurred at the end of the procedure. Carotid angiograms confirmed patent, nonstenotic vessels in all cases.

Conclusions: Endoscopic approach for carotid surgery is technically feasible in pigs. The availability of this animal model may reveal useful for acquiring the technical skills necessary to perform this procedure in humans. An endoscopic approach for surgery of the carotid artery has the potential to offer the advantages of minimally invasive techniques while maintaining the benefits of surgical arterial repair.

Minimally Invasive Other-PS146

LEARNIG CURVE - TOTAL LAPROSCOPIC HYSTERECTOMY - AN EXPERIENC OF 412 CASES A RETROSPECTIVE STUDY.
DR. SHOBHANA SAXENA M.S. , DR DEEPAK SAXENA M.S. , DURGA CHIKITSALAYA , DIPARTMENT OF M.A.S. HOUSING BOARD COLONY KATNI MP INDIA 483504

LAVH AND TOTAL LAPROSCOPIC HYSTERECTOMY (T L H) HAS LOW MORBIDITY AND WIDE ACCEPTANCE AMONG PATIENTS. AIM IS TO SHARE AN EXPERIENCE OF LEARNIG WITH BEGINER AND FELLOW LAPROSCOPIC SURGEON.

LAVH AND TLH DONE IN 412 CASES BETWEEN 1998 OCTOBER TO AUG. 2001 INDICATIONS WERE MENORRHAGIA IN MAJORITY, RESISTANT PELVIC INFLAMMATORY DIESEAS AND ENDOMATRIOSIS IN OTHERS. AGE RANGING FROM 34 YEARS TO 55 YEARS MEAN OF 42 YEARS. SIZE OF UTERUS REMOVED WAS MAXIMUM UP TO 16 WEEKS GESTATION.

INITIALLY IN LEARNING PHASE ONLY COAGULATION AND CUTTING OF ROUND LIGAMENT, FALLOPIAN TUBE AND OVARIAN LIGAMENT DONE LAPROSCOPICALLY. WITH EXPERIENCE LESS TIME WAS REQUIRED IN ABOVE STEPS AND GRADUALLY NUMBER OF STEPS DONE THROUGH LAPROSCOPE INCREASED. IN TLH SKELETENIZING OF UTERINE ARTERY AND CLIPPING WITH MEDIUM-LARGE LIGA CLIPS 300 AND VAULT REPARIED AND SUSPENDED VAGINALLY. THIS WAY EVEN DURING LEARNING PHASE ABDOMINAL HYSTERECTOMY WAS AVOIDED. ADDED ADVANTAGE WAS A THOROUGH ABDOMINAL EXPLORATION AND LAPROSCOPIC MANAGEMENT OF MANY PATHOLOGIES LIKE ASSOCIATED TUBO OVARIAN MASSES, APPENDICITIS AND ADHESIONS DONE SIMULTANEOUSLY. NULLYPAROUS PATIENTS WITH BIG FIBROIDS AND PREBIOUS SCAR COULD ALSO BE DONE.

IN INITAL PHASE OF LEARNING 3 CASES OF ACCIDENTAL OPENING OF BLADDER OCCURED WHICH COULD BE MANAGED WITHOUT COMPLICATION, VAGINAL BLEEDING TOOK PLACE IN 4 CASES AND WAS MANAGED WELL BY SUTURING VAULT AND VAGINAL PACKING. TO CONCLUDE THAT LAVH AND TLH IS A WELL ACCEPTED TECHNIQUE OF HYSTERECTOMY WHICH IS APPLICABLE TO LARGE VARIETY OF CASES WHERE AT TIME TOTAL VAGINAL HYSTERECTOMY IS NOT POSSIBLE.

Minimally Invasive Other-PS147

ROBOT-ASSISTED LAPAROSCOPIC RESECTION OF AN ANEURYSM OF THE INFERIOR VENA CAVA MIMICKING A RETROPERITONEAL NEOPLASM
T.C. Schmandra MD., R. Ritter MD., F. Adili MD., T. Schmitz-Rixen MD. Department of General and Vascular Surgery, Johann Wolfgang Goethe University Hospital, Frankfurt am Main/ Germany

Objective: The feasibility and safety of remote laparoscopic surgery using a surgical telemanipulator have been demonstrated in laboratory experience and recently in clinical practice. To our knowledge we report the first robot-assisted laparoscopic operation of the vena cava.

Materials and Methods: A 19-year-old woman was diagnosed with a rightsided retroperitoneal neoplasm (suspected soft tissue tumor originating from the caval wall) causing partial thrombosis of the inferior caval vein and a dislocation of the right ureter. Robot-assisted (DaVinci system) transperitoneal laparoscopic tumor resection was performed.

Results: Complete tumor resection with partial resection of the caval vein was successfully performed with the robot. Partial thrombectomy could be achieved in the distal inferior caval vein but was impossible for the proximal vein. The right ureter could be totally dissected from the tumor tissue. Mere laparoscopic operative time was 480 minutes. Convalescence and portsite healing was uneventful. Histological examination revealed an aneurysm of the inferior vena cava mimicking a retroperitoneal neoplasm.

Conclusion: We report the technical feasibility of robot-assisted laparoscopic surgery of the inferior vena cava in humans. The main advantages seem to be improved visualization by using a stereo camera and ease of precise dissection my micromechanical instruments directed by masterslaves from a distant console. The current technology enables and facilitates a wide range of laparoscopic vascular procedures. Its actual usefulness for patient treatment must be established by prospective clinical trials.

Minimally Invasive Other-PS148

MEDIASTINOSCOPIC THYMECTOMY IN MYASTHENIA GRAVIS,
Shuji Shimizu, M.D., Akihiko Uchiyama, M.D., Syoji Kuroki, M.D., and Masao Tanaka, M.D., Department of Surgery and Oncology, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan.

Thymectomy is a widely accepted therapy for patients with myasthenia gravis. Mediastinoscopic surgery is a new approach for resection of the anterior mediastinal mass. The purpose of this study was to evaluate this technique as a treatment of myasthenia gravis.

Twenty-three patients with myasthenia gravis, four of whom were associated with thymoma, underwent total thymectomy between 1998 and 2000. An arc-shaped incision of 3 cm was made just below the xiphoid process, and a telescope was inserted through a trocar placed below the surgical wound. The sternum was lifted with the use of a Laparolift and the resected thymus was removed through the incision. The patients comprised 18 women and 5 men with an average age of 47 years. The clinical improvement of the disease severity was determined according to quantitative myasthenia gravis (QMG) scores with the mean follow up-period of 13.8 months and the Wilcoxon signed-ranks test was applied to determine statistical significance.

Complete removal of the thymic gland with the pericardial adipose tissue was accomplished in 21 of the 23 (91.3%) patients. The remaining two patients required conversion to sternotomy, one for insufficient sternal lifting and the other for invasion of a thymoma to the innominate vein. There was no related mortality, and there was only one complication (phrenic nerve injury in one patient) (4.3%). The mean operation time was 274 +- 62 minutes, and mean blood loss was 98 +- 64 g. The mean QMG score decreased significantly from 4.8 +- 3.9 before surgery to 1.0 +- 1.6 after surgery (p=0.0003).

Mediastinoscopic thymectomy is safe and feasible for patients with myasthenia gravis, although long-term follow-up is necessary for precise evaluation. This approach not only has cosmetic benefits, but also allows us to perform thymectomy bilaterally without one-lung ventilation, which decreases the risk of pulmonary complications and makes it applicable to patients with a history of thoracotomy or pleuritis.

Minimally Invasive Other-PS149

LAPAROSCOPIC SPLENECTOMY FOR RECURRENT METASTASIS OF OVARIAN CANCER Gengo Tajima,M.D., Go Wakabayashi,M.D., Masaki Kitajima,M.D., Department of Surgery, Keio University School of Medicine, Tokyo, Japan

This report describes two cases of recurrent metastatic epithelial ovarian cancer confined to the splenic parenchyma, which were successfully resected with laparoscopic procedure.

Metastasis to the splenic parenchyma is rare condition of recurrent ovarian cancer and difficulties such as intra-abdominal adhesion may be encountered in secondary cytoreduction surgery.

Case 1: A 65-year-old woman underwent 8 cycles of systemic chemotherapy because her CA19-9 level was elevated 12 months after the initial radical surgery. A solitary metastatic tumor emerged in the spleen and cytoreduction surgery was carried out. In spite of severe adhesion, laparoscopic adhesiolysis and splenectomy succeeded. The postoperative course was uneventful and histopathological examination diagnosed metastatic adenocarcinoma in the parenchyma and the hilar lymphnode of the spleen.

Case 2: A 51-year-old woman developed splenic metastasis with elevation of CA19-9 level 19 months after the primary radical surgery. Although laparoscopic splenectomy was successfully performed, exploration revealed a small disseminated lesion. Her postoperative course was uneventful and systemic chemotherapy was administered.

Cytoreduction surgery and subsequent chemotherapy are recommended for the management of intra-abdominal recurrent ovarian cancer. Laparoscopic splenectomy is a feasible option as debulking surgery in the treatment of metastatic ovarian cancer even after an initial open radical surgery.

Minimally Invasive Other-PS150

NATURAL KILLER ACTIVITY IS BETTER PRESERVED AFTER A GASLESS PROCEDURE THAN AFTER PNEUMOPERITONEUM OR LAPAROMY IN RATS Ikuya Takeuchi, MD, Hideyuki Ishida MD, Daijo Hashimoto MD., Department of Surgery, Saitama Medical Center, Saitama Medical School, 1981 Kamoda, Kawagoe, Saitama,350-8550, Japan

(Purpose) Natural killer (NK) activity plays an important role in the prevention of tumor metastasis. However, there have been few data comparing NK activities among a gasless procedure, CO2-pneumoperitoneum, and conventional laparotomy, despite the wide spread use of laparoscopic procedures for colorectal malignancies. This study compared NK activities among the 3 different surgical procedures in a rat model.

(Materials and Methods) Male Donryu rats (200-220g) were randomized to 3 groups (19-21 rats each per group) under pentobarbital anesthesia: (1) Gasless (GL) group underwent abdominal wall lifting for 60 min; (2) Pneumoperitoneum (PP) group underwent CO2-pneumoperitoneum at 10 mmHg for 60 min; and (3) Laparotomy (LT) group underwent xipho-pubic incision with the abdominal cavity remaining open for 60 min. All the rats underwent cecal resection at the end of the procedures. Splenocytes were harvested 6 hr, 24 hr, or 96 hr following the procedures and the NK activities against YAC-1 cells were determined by the 51-Cr-release assay (effecter/target=50/1).

(Results) There were no significant differences in NK activities among the groups at 6hr. The GL group demonstrated higher NK activities compared with the LP group at 24 hr (22.0∞}2.2%∞imean∞} SE∞j vs. 17.3∞}1.3%, P<0.05), and with the PP group at 96 hr (30.5∞}3.8% vs. 19.9∞}2.7%, P<0.05, FisherÕs PLSD test).

(Conclusions) NK activity was better preserved after the gasless procedure in this animal model. Gasless laparoscopic surgery for colorectal malignancies may be a favorable approach in terms of the oncological benefits

Minimally Invasive Other-PS151

USE OF VIDEOPELVIOSCOPY IN THE DIAGNOSIS AND TREATMENT OF GYNECOLOGICAL DESEASES. Alexander P. Ukhanov. Surgical department First municipal hospital, Veliky Novgorod Russia.

Aims: Improvement of diagnostic and surgical treatment of the patients with gynecological deseases on the basis of new medical technologies.
Methods: From April 1995 to January 2001 81 patients underwent diagnostic and/or operative videolaparoscopy for various gynecological deseases.
Results: From total amount of patients 14 ones were operated on for ectopic pregnancy, 34 for chronic pelvic pain or the presense of adnexal mass, 3 for subserous myomas of the uterus, 12 for infertility, 18 for advanced breast cancer, 3 for second-look after ovarian cancer treatment. A linear salpingostomy was performed in 3 and salpingectomy in 11 cases of ectopic pregnancy. Treatment of ovarian and peritoneal endometriosis was performed in 5 cases, enucleation of ovarian and paraovarian cyst in 21, ovarectomy in 16 cases, conservative subserous myomectomy in 3, adhesiolysis in 10, diagnostic laparoscopy with chromosalpingostomy in 7 cases. In 6 patients together with pelvioscopical procedure laparoscopic cholecystectomy was carried out for concomitant gallstone desease. The average time of operation was 45 minites (range 20-85). There were no major intraoperative complications. Postoperative trocar site bleeding requiring wound revision and ligating of bleeding vessel occured in 1 patient. All the patient were active on the next day after the operation and mean hospital stay was 4,5 days after the operation.
Conclusion: Videolaparoscopy is effective method in diagnostic and treatment of various benign gynecological pathologies and is associated with low postoperative morbidity rate, short hospitalisation, quick recovery and negligible scar. These advantages guarantee and promote broader application of videolaparoscopic procedures.

Minimally Invasive Other-PS152

TECHNIQUE AND LONG TERM RESULTS OF LAPAROSCOPIC CHOLECYSTECTOMY USING LIGATURE OF THE CYSTIC DUCT AND ARTERY Giovanni Ussia MD, Dept of Surgery, University of Bologna Medical School, Bologna, Italy

Laparoscopic cholecystectomy is commonly performed securing the Cystic duct (CD and artery (CA)with titanium clips. This technique has several disadvantages: a)danger of slippage if the duct is large or oedematous for inflammation; b) metal clips could migrate in to the CBD and lead to stone formation; c) increases the cost of the operation. In 212 laparoscopic cholecistectomy, performed consecutively from 1998 to 2001 in the same institution and from the same surgeon. The CA and CD were secured with a ligature with absorbable suture; 162 female and 50 male patients ranging from 18 to 83 years of age were submitted to laparopscopic cholecystectomy for gallbladder stones; In 23 cases diagnosis was acute cholecystitis and in 10 cases stones in the CBD were present and were subsenquetly treated with ERCP. The ligatures of CA and CD were done using 2/0 absorbable braided sutures tied with an extra corporeal knot (one for each side) with the aid of the Clarke knot pusher. Medium operative time was 53 min (28-132 min); knotting time was 5 min (4-8).; In 98 cases intraoperative cholangiogram was obtained and in 10 case a postoperative ERCP was performed. The postoperative course was uneventful in all patients and medium hospital stay was 2.5 days; no complications related to the ligatures were observed; follow-up ranged from 3 to 36 months. OR costs were decreased. Based on our experience it is possible to conclude that securing the CA and CD with absorbable suture is safe and feasible; this technique eliminates the possible complications related to the use of metal clips including slippage, stone formations and reduces OR costs.

Minimally Invasive Other-PS153

INDICATIONS FOR DIAGNOSTIC LAPAROSCOPY IN CASE OF SUSPECTED APPENDICITIS Wim T. van den Broek M.D., Bart B. Bijnen M.D. , PhD. Bram Rijbroek M.D. Dirk J. Gouma M.D. PhD., Department of Surgery, Medical Centre Alkmaar, Alkmaar, The Netherlands. Department of Surgery, Academic Medical Centre, Amsterdam, The Netherlands.

INTRODUCTION Despite introduction of minimal invasive surgery, appendectomy is still mostly performed by open surgery in Europe. Applying diagnostic laparoscopy on all patients with suspected appendicitis would lead to many conversions and so to extra costs and morbidity. Therefore, laparoscopy should be reserved for a subgroup of patients with doubtful diagnosis appendicitis. The aim of this study is to develop a scoring system to identify this subgroup of patients.

PATIENTS AND METHODS In the period 1994/1995 were 577 consecutive patients(group 1)and in the period 1996/1997 were 343 consecutive patients(group 2)with suspected appendicitis prospectively evaluated. Variables predicting appendicitis were obtained from group 1. By means of a regression analysis, a scoring system was created and applied to the patients of group 2. After validation of the scoring system,group 1 and 2 were combined for further analysis.The scoring system was validated by comparing odds ratios from group 1 with odds ratios from group 2.Hereafter it was evaluated by comparing the delayed and negative appendectomy rates obtained by clinical practice with the results that would have been accomplished on the basis of the scoring system.

RESULTS The variables:leukocyte count(10.109/L(3points),rebound tenderness(2),male sex(2),duration of symptoms <48 hrs(1)and temperature >38C(1)formed the scoring system.Odds ratio for score of group 1 (1.798) was comparable with group 2 (1.755). When using a low cut-off point of 3 and a high cut-off point of 6 there were no differences in treatment by our scoring system compared with clinical judgment: negative appendectomy rates (14 vs. 15%) and delayed operation rates (7 vs. 9%) except that the scoring system would have lead to a lower perforation rate in the primary observed patient group (2 vs. 17 %)

CONCLUSION The indication for laparoscopy can be established in both males and females by using a scoring system.

Minimally Invasive Other-PS154

ROLE OF INTRAOPERATIVE ULTRASONOGRAPHY IN SINGLE HOLE CHOLECYSTECTOMY - AN EXPERIENCE OF OVER 1000 CASES. MANMOHAN VARMA, MS, PRIVATE, KANPUR, INDIA

Introduction: Defining extrahepatic bile duct system (EHBDS) is more difficult in minimally invasive surgeries than in conventional cholecystectomy. Intraoperative ultrasonography (IOUS) defines bile duct anatomy & hence can be used as a tool for safety. With an aim to study the role of IOUS in providing safety to EHBDS against injury in a minimally invasive surgery, IOUS was done while performing single hole cholecystectomy.

Methods & Procedures: IOUS was performed consecutively in all 1035 patients undergoing single hole cholecystectomy from May 1996 to October 2000. Single incision 3.0 to 3.5 cms long (4 cms in some bulky patients) was given in the right upper abdomen & a muscle splitting microlap cholecystectomy done. IOUS was performed with a 6.5 MHz end-firing sector probe. All patients were discharged 6 - 24 hours after surgery. 92.17 % had chronic cholecystitis, 7.53% acute cholecystitis and 0.28% carcinoma gall bladder. The youngest patient was 6 years old, oldest 85 years, 95.74% were 21 to 70 years of age & 91.69% weighed 50 to 90 kgs, the heaviest being 110 kgs. 2.02% patients had previous history of pancreatitis while 0.77% had previous right upper abdominal surgeries. Gall bladder & EHBDS were recognized by their standard ultrasound features along with concomitant 2D sector scanning & M-mode study of EHBDS. We developed 'contrast ultrasonography' for cases having dense adhesions. Saline was injected near expected EHBDS & IOUS performed. If saline was found lateral to EHBDS the dissection was carried out lateral to saline otherwise reorientation was done.

Result: None of the 1035 patients suffered bile duct injury during single hole cholecystectomy done under IOUS guidance compared to a 0.7 to 1.4% incidence of bile duct injuries in laparoscopic cholecystectomy, claimed to be lesser when IOUS is used in laparoscopic cholecystectomy.

Conclusion: IOUS helps to prevent EHBDS injury in single hole cholecystectomy. As far as we know, IOUS guided single hole cholecystectomy has not been reported elsewhere in the world till date.

Minimally Invasive Other-PS155

DOES VENTILATION WITH PEEP PRESERVE CARDIOPULMONARY FUNCTION DURING LAPAROSCOPIC SURGERY IN PULMONARY DISEASED? Ruben Veldkamp M.D., Jack J. Haitsma M.D., Eric J. Hazebroek M.D., Burkhard Lachmann M.D. PhD., H. Jaap Bonjer M.D. PhD. Departments of Surgery and Anesthesiology, Erasmus University Medical Center Rotterdam, the Netherlands

Elevated abdominal pressure during pneumoperitoneum causes diaphragmatic displacement, predisposing to pulmonary atelectasis and impairment of gas-exchange. This is of particular concern when a pneumoperitoneum is established in patients with pulmonary disease. Hypoxemia and hypercapnia can be encountered during lengthy laparoscopic surgery in these patients. To asses the impact of PEEP ventilation on oxygenation and blood pressure, an experimental study was performed in rats with induced pulmonary dysfunction.

Eighteen rats had a tracheotomy and an indwelling catheter was placed in the carotid artery. Animals were mechanically ventilated in a pressure-controlled mode with 100% oxygen. Pulmonary dysfunction was induced by repeated whole lung lavage until PaO2 < 100 mmHg. Subsequently, animals were randomly assigned to groups, ventilated with either PEEP pressure of 8 cmH2O (n=6) or 14 cmH2O (n=6). All rats were subjected to a CO2 pneumoperitoneum with a pressure of 12 mmHg during 180 minutes. The control group had gasless laparoscopic surgery and was ventilated with a PEEP of 8 cmH2O (n=6). Arterial blood pressures were recorded and arterial blood samples were taken for m easurement of PaO2 every 30 minutes.

The gasless control group had unchanged PaO2 and mean arterial pressure (MAP) levels throughout the experiment. When 12 mmHg pneumoperitoneum was applied blood pressures decreased and two rats died during the experiment. When 14 cmH2O of PEEP was used, PaO2 improved significantly ($p<0.05$) while MAP remained stable and was significantly ($p<0.001$) higher than in the group with PEEP of 8 cmH2O.

In rats with compromised pulmonary function, high PEEP pressures can be used to improve oxygenation status during pneumoperitoneum whilst no adverse effects on MAP were observed.

Minimally Invasive Other-PS156

LAPAROSCOPIC INTRAPERITONEAL HYPERTHERMIC CHEMOTHERAPY FOR MALIGNANT ASCITES IN PERITONEAL CARCINOMATOSIS. Leonardo Villegas, M.D., Samuel Bieligk, M.D., Jason B. Fleming, M.D., Daniel Jones, M.D., Brian Loggie, M.D, Southwestern Center for Minimally Invasive Surgery. UT Southwestern Medical Center at Dallas.

Background: Intraperitoneal hyperthermic chemotherapy (IPHC) is safe and is increasingly used in the treatment of peritoneal carcinomatosis. We report on the technical aspects in one of the first series using a minimally invasive approach to IPHC in the management of malignant ascites.

Methods: Since March to July 2001, laparoscopic IPHC for refractory malignant ascites was performed for four patients age 36-55 years, males (n=3) and female (n=1). The diagnosis: gastric cancer (n=3), pancreatic cancer (n=1). Data was collected retrospectively.

Results: Under general anesthesia via a 11 mm supraumbilical port and two 12 mm ports in the left and right upper quadrants, peritoneal fluid (mean 4.1 liters) and peritoneal biopsies were taken. Two 22 F inflow cannulae in the upper quadrant ports were placed and 32 F outflow cannulae via a separate stab incision above the pubis and directed to the pelvis. A perfusion circuit was used 3 liters of Ringer's at 42 deg. C, 30-40 mg of Mitomycin was added and perfusion performed for 90-120 minutes. The abdomen was shaken during the procedure to get good drug distribution. The perfusion fluid was then drained and the abdomen was irrigated. A round Blake drain was placed percutaneously and directed to the pelvis. There was no bleeding and no intra operative complications. Hospital stay was 4 days (range, 1-18 days).

Conclusion: Laparoscopic Intraperitoneal Hyperthermic Chemotherapy is a technically feasible procedure for patients with advanced and refractory malignant ascites of primary g astrointestinal cancer.

Minimally Invasive Other-PS157

LAPAROSCOPIC MANAGEMENT OF LOCALIZED INTRA-ABDOMINAL CASTLEMAN'S DISEASE, Michael D. Williams, MD; Francis A. Eissien, MD; Jihad R. Salameh, MD; John F. Sweeney, MD, Department of Surgery, Baylor College of Medicine, Houston, Texas

Introduction: Castleman's disease is a rare lymphoproliferative disorder of unknown etiology, which presents in a localized or multicentric pattern. Surgical resection is definitive therapy for localized Castleman's disease. We report the successful management of localized intra-abdominal Castleman's disease using laparoscopic techniques.

Procedure: An 18-year-old female presented with fatigue, weakness, early satiety and a 10-pound weight gain. On physical examination, a nontender mid-epigastric mass was palpable. Laboratory studies including electrolytes, complete blood count, and liver function tests were normal. An abdominal ultrasound demonstrated a large mass anterior to the pancreas. CT scan revealed a 9cm x 7cm x 7.5cm extensively calcified subhepatic intraperitoneal mass anterior to the pancreas and several mesenteric nodes measuring between 3mm and 30mm.

The abdomen was entered with a 10 mm Hasson trocar. Four additional ports were placed; a 5mm left subcostal port, 2-10mm ports at the level of the umbilicus in the right and left midclavicular lines and a 5mm port in the right mid-axillary line. The colon was mobilized and the mass was dissected using harmonic shears. Several large vessels arising from the head of the pancreas were controlled with 5mm hemoclips. The mass was removed via a 10cm Pfannensteil incision. Surgical pathology revealed angiofollicular giant lymph node hyperplasia of the hyaline vascular type consistent with Castleman's disease. The patient was discharged home on the post-op day 2 tolerating a regular diet, and with minimal pain. CT of the chest, abdomen and pelvis revealed resection of the mass and reduction in size of the lymph nodes at 12 months post-op.

Conclusion: Laparoscopic resection provides definitive long-term therapy for localized intra-abdominal Castleman's disease while providing the traditional advantages of minimally invasive surgery.

Minimally Invasive Other-PS158

LAPAROSCOPIC ASSISTED COLECTOMY (LAC) VERSUS OPEN SURGERY, RETROSPECTIVE CASE-MATCHING STUDY Wooyong Lee, M.D., JongGook Woo, M.D., Dooseok Lee, M.D., S I Choi, M.D., HoKyung Chun, M.D., Department of Surgery, Samsung Medical Center, Sungkyunkwan University, School of Medicine, Seoul, Korea.

Despite many reports on laparoscopic-assisted colectomies (LAC) over the past decade, their feasibility in both benign and malignant disease of the colon is not clear. The purpose of this study is to evaluate whether LAC is feasible and safe in the treatment of colonic diseases. Between April 2000 and July 2001, we attempted laparoscopic assisted colectomy in 51 patients and we excluded 3 patients who had converted to open surgery in this study. The results were compared 48 matched patients who underwent conventional open surgery in the same observation period focusing on results of surgery, postoperative recovery, complications. Between two groups, there were not significantly different in age, Dukes stage, and type of resection. There were 14 benign and 34 malignant cases. The mean operating time for the LAC and open surgery group were 175.0 and 98.2 minutes, respectively ($p<0.05$). However, the time taken for bowel movement return (42.3 min. Vs 60.6 min.) ($p<0.05$) and the length of hospital stay (8.5 days Vs 9.0 days)($p < 0.05$) were significantly less in the LAC group than comparative group. Six patients in the LAC group had complications (12.5%): chyle leakage (2), anastomotic site bleeding (3), urinary retention (1) and all are treated conservatively. Comparative group also had six complications. The number of lymph node removed and resection margins, when compared by each type of resections showed no significant difference for both groups ($p>0.05$). This study shows that LAC has the advantage over open surgery of allowing earlier recovery and that oncological clearance (in terms of the number of lymph node removed and resection margins) does not differ from the results achieved by open technique. LAC is feasible technique in the treatment of colon disease with acceptable morbidity. However, long-term randomized trial is warranted.

Minimally Invasive Other-PS159

THE LAPAROSCOPIC RESECTION OF THE DUODENAL CARCINOID TUMOR Akira Yasuda,M.D., Akira Mizuno,M.D.,Kawai Miho, M.D., Kenji Ogino,M.D. Department of Surgery, Inabekosei Hospital, Hokuseicho, Mie, Japan

Introduction: We report a case of the laparoscopic resection of the duodenal carcinoid tumor.

Methods and procedures: A 72-year-old man was pointed out a torose lesion of duodenal bulb by a regular medical check up 3 years ago. A biopsy was performed in June, 2000. The lesion was diagnosed as a duodenal carcinoid tumor and was smaller than 10mm in diameter at that time. Laparoscopic resection of that tumor was performed under general anesthesia on July 19, 2000. At first, a duodenum was liberated from retroperitoneum. We used a gastroduodenoscopy to confirm the position of the lesion during the operation and the lesion was lifted intra abdominal cavity using a laparoscopic appliance. Next to lifting, the lesion was severed by an endocutter. At the end of the operation, we checked the complete resection of the lesion, no passage disturbance and no bleeding by gastroduodenoscopy.

Conclusion: The laparoscopic method can resect a full wall of a duodenum and is more radical to a duodenal carcinoid tumor than the endoscopic method because the endoscopic method can not resect a full wall. In addition, the laparoscopic resection is less invasive than the laparotomy. A carcinoid tumor larger than 10mm in diameter often has metastatic lesions and we think that the laparoscopic resection should not be applied to a duodenal carcinoid tumor larger than 10mm in diameter. In these points, the laparoscopic resection is very effective therapy for a duodenal caricinoid tumor smaller than 10mm in diameter.

Minimally Invasive Other-PS160

RETROPERITONEOSCOPIC URETEROURETEROSTOMY FOR THE TREATMENT OF OBSTRUCTIVE RETROILIAC URETER IN A 4-YEAR-OLD BOY. CK Yeung, M.D., WG Manson, KWK Liu, KH Lee, YH Tam, JDY Sihoe Division of Paediatric Surgery, Department of Surgery, The Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong SAR, China.

Retrocaval or retroiliac ureter is a very rare urological condition and the diagnosis is usually made during a tentative operation for ureteropelvic junction (UPJ) obstruction. The conventional treatment with open surgery has been well described. Objective: We herein reported a case of retroiliac ureter in a child treated by an endoscopic procedure. Patient and Methods: A 4-year-old boy with history of antenatal diagnosis of right hydronephrosis was confirmed postnatally to have right hydronephrosis. Initial diuretic renogram revealed normal drainage. However he developed increasing hydronephrosis over the subsequent years associated with a significant drop in the differential function of the right kidney. Surgery was planned with a provisional diagnosis of right UPJ obstruction. Intraoperatively a right retroiliac ureter was found causing mechanical obstruction at the proximal ureter. Surgical techniques: A 10mm and two 5mm ports were inserted over right flank and pneumoretroperitoneum was developed by CO_2 insufflation. The right ureter was mobilised on both sides of the right common iliac vein and then divided. Retroperitoneoscopic ureteroureterostomy was performed using 5 zero polydioxanone sutures by intracorporal suturing techniques. Results: Initial recovery was uneventful but a collection around the anastomosis was shown by ultrasound on day 3 postoperatively. This settled promptly with cystoscopic insertion of a double pigtail ureteric stent. The patient was discharged a week after surgery and the double J stent was removed at 8 weeks. Follow-up radiological investigations are still pending. Conclusions: Retroperitoneoscopic ureteroureterostomy is technically feasible as an alternative treatment to open surgery for retrocaval or retroiliac ureter. However, meticulous endoscopic suturing skills are required and the long-term outcome will need further evaluation.

Minimally Invasive Other-PS161

LAPAROSCOPIC VARICOCELECTOMY IN YOUNG PATIENTS: TO LIGATE THE TESTICULAR ARTERY OR NOT Wai T. Ng, M.B.B.S., Kelvin K. Liu, M.B.M.Ch.,

Controversy still exists as to (1) whether it is safe to ligate the testicular artery (2) whether there is any benefit of the mass ligation in laparoscopic varicocelectomy. A prospective study was conduct to give a definitive answer to these two questions.

Since 1992, young patients with grade 3 varicocele were randomly selected for one of the two laparoscopic precedures: (1) mass ligation of the testicular artery and veins; (2) selective ligation and division of all identifiable testicular veins. Intra-and peri-operative Doppler ultrasound scans were done to detect changes (if any) in blood flow within the testicular parenchyma. Long-term follow-up on a regular basis was maintained to evaluate the growth of the testis by serial orchidometer measurement and ultrasonography, as well as to detect recurrences. When the patients were co-operative enough, semen analysis was done and repeated.

52 patients were enrolled in the study, ranging from 8 to 15 years of age with a mean of 12. 24 were subjected to mass ligation and 28 to ligation of testicular vein alone. The mean follow-up was 7 years.

Doppler ultrasound did not show any significant change in testicular blood flow in either group. Except for those with recurrence, catch-up growth was observed and no case of testicular atrophy was found. Semen analysis was within the normal range (60-250) in all the samples from both groups. One pregnancy has occurred in the mass ligation group.

The varicocele recurrence (above grade 1) rate for the artery-sparing group was 21 %, while that for mass ligation was 0 %. During re-operations, spermatic venogram was done showing missed vena comitans. In conclusion, mass ligation is safe in this interim report. It is the method with uniform success.

Minimally Invasive Other-PS162

LAPAROSCOPIC SPLENECTOMY UNDER BALLOON OCCLUSION OF THE SPLENIC ARTERY: FOR REDUCTION OF BLOOD LOSS AND OPERATOR'S STRESS

Tadashi Yokoyama, Kimio Hennmi, Akira Jikko, Keisuke Yoshida, Hidenori Takahara, Hiromi Suetsugu, Koji Yamamoto, Makoto Mizutani

Department of Surgery, Ako City Hospital, Japan

Laparoscopic operations such as laparoscopic cholecystectomies and colon resections have rapidly become a popular method in Japan as in the United States. Laparoscopic splenectomy, however, up to now has not been performed so much at each institution. The characteristics of spleen pose important technical problems for its vascular control. Some of patients require blood transfusion and conversion to open surgery because of uncontrollable bleeding. We used a safe approach to remove spleen. First, in the supine position balloon catheter was inserted through the right femoral artery under local anesthesia. The tip of the catheter was placed in the splenic artery and confirmed by arteriogram. Then the balloon was deflated and the patient was lying in the semilateral position under general anesthesia. After division of the splenocolic adhesions, the short gastric vessels were divided. Before the splenic hilum was dissected , the balloon was inflated with saline and the position of the catheter tip was reconfirmed by radiography. The major splenic vessels are exposed and a space dissected behind the hilum to enable the passage of the 30 mm endoscopic vascular stapler. After stapling the hilum structure, residual bleeding could be controlled with an additional clip without bleeding accidents. After complete dissection of the spleen, the balloon catheter was deflated to ensure hemostasis. It is our opinion that laparoscopic splenectomy could be performed with reduction of operative blood loss and operator's stress under balloon occlusion of the splenic artery.

Minimally Invasive Other-PS163

EFFECTS OF CLOSED LOOP INTESTINAL OBSTRUCTION ON MESENTERIC BLOOD FLOW: LARGE ANIMAL MODEL OBSERVATIONS, Seong Yeop You, MD, Klaus Thaler, MD, Turab Pishori, MD, Danny Rosin, MD, Oscar Brasesco, MD, *Laurence Sands, MD, Steven Wexner, MD, Cleveland Clinic Florida, Weston, FL and University of Miami, Miami, FL

The effects of acute elevations in intraluminal pressure (ILP) due to acute bowel obstruction have not yet been analyzed. We hypothesized that the acutely elevated intraabdominal pressure (IAP) due to the elevated ILP in closed loop small bowel obstruction (CLSBO) or closed loop large bowel obstruction (CLLBO) may exert deleterious effects on mesenteric blood flow.

In a porcine model a midline laparotomy was performed. A CLSBO (n=5) and a CLLBO (n=5) was created. The bowel was insufflated to ILP levels of 15mmHg and 30mmHg. IAP was monitored by measuring intravesical hydrostatic pressure (BLP). The mean blood flow in the superior mesenteric artery (MBFs) and inferior mesenteric artery (MBFi) was monitored using an electromagnetic flow meter. Statistical analysis was done using one-way repeated ANOVA, paired t-test and linear regression.

There was a direct and significant correlation between ILP and BLP ($p<0.0001$;$r=0.84$). Elevated ILP in CLSBO or CLLBO resulted in a significant reduction of mean blood flow in the MBFs ($p=0.029$) and MBFi ($p=0.0096$) at ILP of 30 mmHg. Small Bowel Obstruction: Baseline: BLP=19.2 MBFs=290, 15mmHg: BLP=26.6 MBFs =308, 30mmHg: BLP=*38.4 MBFs=*162; Large Bowel Obstruction: Baseline: BLP=16.4 MBFs=23, 15mmHg: BLP=21.6, MBFs=20; 30mmHg: BLP=*30.2 MBFs=*12 (BLP-cmH2O, MBF-ml/min, $p<0.05$)

Acute elevations of intraabdominal pressure due to acutely increased intraluminal pressure in closed loop small and large bowel obstruction results in decreased blood flow in the mesenteric arteries.

Minimally Invasive Other-PS164

LONG TERM OUTCOME FOLLOWING LAPAROSCOPIC NISSEN FUNDOPLICATION D.Zacharoulis M.D., C J O'Boyle M.D.,H H Kumar M.D.,B Dobbins M.D.,W A Brough M.D.,P C Sedman M.D.,C MS Royston M.D., Division of Upper Gastrointestinal and Minimally Invasive Surgery,Hull Royal Infirmary, Kingston-upon- Hull, United Kingdom

AIM: Laparoscopic Nissen Fundoplication(L.N.F.) is now the procedure of choice for the surgical managment of the gastroesophageal reflux disease(G.E.R.D.).However,while there are many reports in the literature of short term clinical efficacy,there is a paucity of evidence to substantiate long term durability of symptomatic relief. The aim of this study was to report a seven years follow-up and beyond.

METHODS: Between December 1991 and December 1994,241 patients underwent L.N.F.The long term follow-up was obtained by office visits and examination by an independent investigator.Data prospectively recorded in a dedicated database and analysed for the purpose of this study.

RESULTS: Two hundred and five patients (85%) were available for outpatient follow-up or telephone interview. The median follow-up was 8.2 years(range7-10 years) 13 patients died ,ten of them from other causes irrelevant to surgery.Lost to follow-up were 23 patients(9.5%)At a minimum of 6 years after surgery 189 patients (92%) were satisfied with the long term results of surgery.Fifty two patients (25.3%) reported wind related symptomatology(bloat/flatus/fullness).

Seventeen patients(8.2%)were taken proton pump inhibitors,of whom just four (1.9%) required regular medication.Fifteen patients (7.3%) had persistent dysphagia and all of them were treated with endoscopic dilatation.Ten patients (4.8%),had documented reccurent reflux and seven of them underwent reoperation.Nine patients (4.3%) presented with intrathoracic stomach migration and all of them underwent reoperation.

CONCLUSION: This patient series confirms the long term efficacy of the L.N.F.for the treatment G.E.RD. Our results have improved with increasing experience.

Minimally Invasive Other-PS165

ECTOPIC PREGNANCIES WITH HAEMOPERITONEUM – TACKLING OF 42 CASES OF EMERGENCIES IN PELVIS. Dr. A. Zameer Pasha, M.S., Dr. Mrs. Shakila Zameer, MBBS., D.G.O., Dr. Z. Shakir Tabrez, MBBS., Shanawaz Nursing Home, A-20, Main Road, Thillainagar, Tiruchirapalli. Tamil Nadu. India.

Ectopic pregnancy both tubal and corneal is obstetric emergency. Patient presented invariably with pain and peripheral failure. Emergency ultrasound examination proved that pregnancy is extrauterine and tubal configuration is present or not. Pouch of Douglas had pelvic Collections of blood Patient anaesthetized 10mm suctions inserted to suck out huge clots thro' left Iliac fossa portal. Right Iliac fossa port of entry used to identify elevated uterus and hold aloft the ipsilateral artery at the confluence of uterine and ovarian vessels near the corneal end. By now pelvis having been cleared of dark clots, bleeding spot is identified, bipolar coagulations done and products of conceptions removed. In early cases (12) tubal salpingostomy done. In 30 cases, salpingestomy had to be done as the tube was lacerated beyond repair. No complications. Series presented to highlight less morbidity in young adult females following unforeseen obstetric emergencies.

Minimally Invasive Other-PS166

ECTOPIC TESTES IN RT. ILIAC FOSSA – LAPAROSCOPIC EXPLORATION, ECTOMY OR PEXY – A SERIES OF 21 CASES. Dr. A. Zameer Pasha, M.S., Dr. Mrs. Shakila Zameer, MBBS., D.G.O., Dr. Z. Shakir Tabrez, MBBS., Shanawaz Nursing Home, A-20, Main Road, Thillainagar, Tiruchirapalli. Tamil Nadu. India.

In third world countries, ectopic testes owing to ignorance is being ignored or neglected. Presentation is with infertility, pain for inguinal hernia in late teens. After initial preoperative work up with ultrasound scan, laparoscopy is performed. In cases where we are aware that the testis is non-functional, orchiopexy is done to boost the morale of adolescent young men. This technique with low morbidity, precise dissection is presented to highlight the low morbidity and excellent results. Presentation supported with multimedia movie presentations.

New Techniques/Technology-PS167

CLOSURE OF TROCAR SITE WOUND Abdullah AlDohayan, MD; Mohammed AlSebyl, MD; Othman Noraldin, MD; Amal Abdulkarim, MD; Ahmed AlOtiaby, MD; Mohammed AlSkaini, MD, Ali AlTuwaijri, PhD; Abdulaziz AlSaigh, MD Department of Surgery and Physiology, King Khalid University Hospital, Riyadh, Saudi Arabia

Objective: Recent reports of complication of 5mm and 10mm trocar incision is observed. A technique using needles and sutures is presented.

Technique & Method: The trocar is removed. A 14 gauge needle is introduced through muscle fascia layer and the suture is grasped, then followed by removal of the needle. A loop of synthetic non-absorbable suture is fed in the lumen of the needle. The needle is passed 1cm away from the other edge. The loop is then pushed inside the peritoneal cavity to widen the loop, pushing more length of suture inside the abdomen. The grasped suture is passed through the loop and grasper is pulled away. The loop is pulled out gently to involve the suture and pulled out and the suture can be tied. This technique is applied for all patients with ascites, portal hypertension, or malnutrition patient's or young patients.

Results: No Hernia is observed after applying this technique.

New Techniques/Technology-PS168

FLEXIBLE LAPAROSCOPY - EXPERIENCE WITH 1036 CASES Gary R. Gecelter MD, Kelly Alexander MD, Keith Meslin MD, Ghulam Abbas MD, Deborah Stein MD, H. Hank Simms MD, Department of Surgery, North Shore Long Island Jewish Health System. New Hyde Park, NY

Since 1994 we have used flexible laparoscopes in the performance of all types of abdominal procedures. This technology has assisted us in better emulating the degrees of freedom encountered in open surgery.

Between May 1994 and September 2001, 1036 flexible laparoscopic procedures were performed with collection of the following data: procedure type, laparoscope used, intra-operative findings and laparoscope failure (y/n).

To date, flexible laparoscopy has been used in the following categories: esophagus 494, hernia 342, oncology 115, bowel 57 and solid organ 28. Five instrument failures were encountered in the first 145 cases (3.4%) using a prototype device. In the subsequent 891 cases there were 18 failures (2%) due primarily to chip damage caused by leakage at the flexion joint in standard production models.

Assessed advantages:

* Increased degrees of freedom afforded by infinite 0-90 deg deflection. This allows visualization over or around impediments.
* Departure from the limitation caused by fixed fulcrum skin entry and limited scope angle (0, 30, 45deg) makes port site location less critical, especially in obese patients.
* Improved optics resulting from direct 'chip-in-tip' technology.
* Decreased fogging as camera and light cable are sealed in a single closed system with no interfaces for condensation to occur.

New Techniques/Technology-PS169

ROBOTIC SOLUTION FOR RELIABLE BIOPTIC SAMPLES DURING LAPAROSCOPIC SURGERY Licinio Angelini1, Vassilios Papaspyropoulos1, Giuseppe Megali2, Oliver Tonet2, Cesare Stefanini2, Mauro Boccadoro2, Paolo Dario2, 1 Dipartimento di Scienze Chirurgiche e Tecnologie Mediche Applicate, Università La Sapienza, Rome, Italy, 2 MiTech Lab, Scuola Superiore Sant'Anna, Pisa, Italy

Intraoperative ultrasonography is a method used both for diagnosis and therapy in different fields thanks to its sensitivity and specificity, compared to preoperative diagnosis techniques. The routine performance of it turned out to be advantageous for liver, pancreas, and VB diseases. The evolution of minimally-invasive surgery called for the simultaneous evolution of intra-operative ultrasonography. At present, ultrasound-guided procedures in video-assisted surgery are limited by the presence of air inside the abdomen and thorax, by the need of performing a free-hand procedure because of the lack of a biopsy kit, by the limited movements of the probe and of the biopsy needle, and, finally, by the difficulty in moving surgical instruments while looking at the monitor of the videocamera and of the US image.

On the basis of these clinical observations, the aim of the project is to build a robotic device able to perform both the ultrasound-guided biopsy and treatment of a lesion during video-assisted procedures. The Project has been subsidized by the Consiglio Nazionale delle Ricerche within the framework of the Strategic Project Robotics in Surgery.

The robotic device is a sophisticated modular system working in a dynamic environment. Here follows the list of components necessary for the device: 3D localization system, ultrasound equipment and probes, biopsy needles, sensorized needle guide with a sliding mechanism, Dexter arm, and surgical pointer. The procedure involves the following steps: target identification and localization of insertion point by the surgeon, robot positioning, stop of respiratory movements, robot position adjustment and bioptic sampling.

The performances of the system have been evaluated in terms of accuracy and time of execution. The system reaches a sub-millimetric accuracy in the positioning of the needle guide. The overall procedure, excluding the time necessary for the initial ultrasound scanning, requires about one minute.

New Techniques/Technology-PS170

COMPARISON BETWEEN THE GEA EXTRACORPOREAL KNOT AND THE ROEDER EXTRACORPOREAL KNOT: MORE SECURE, EASIER, QUICKER TISSUE APPROXIMATION. Rodolfo Arcovedo MD. Mucio Moreno MD. Pablo Olachea MD, Colima, Mexico., Mason City Clinic, Mason City, IA. Dr. Manuel Gea Gonzalez General Hospital, Mexico City, Mexico.

Objective: To prove objectively that the new Gea knot is quicker and more reliable than its counterpart.

Methods: Ninety knots were divided in three groups A)surgeon's knot, B)Roeder knot and C)Gea knot. We measured the tensile strength and slipping rates of each knot on 1-0 nylon, silk, dexon, catgut and vycril with a tensiometer with weights from 1-12 kg. Rupture was defined as disruption of continuity of the suture, while slippage was defined as the lineal displacement of the knot. The knots were tied according to the literature. The creation of the knot was timed from its formation extracorporeally until it was set down on the tissues in a model. The statistical tools utilized to compare groups were Chi square and ANOVA.

Results: With nylon, the Gea knot had a mean resistance= 9.6kg (7-11kg). It did not slip in any case. The Roeder knot slipped with a mean= 0.83kg(0.1-4kg). Every knot slipped, but none broke. The surgeon's knot broke in all cases at a mean= 10kg(7-12kg). It did not slip once. With vycril, the Gea knot broke in all cases at a mean=8.2kg (6-10kg), but did not slip once. The Roeder knot broke in 3 cases at a mean=5.03kg(3-8kg) and slipped in 27 repetitions. The surgeon's knot broke in 30 cases with a mean=8.63kg(6-11kg) and did not slip once. The only statistical significance was between the Gea and the Roeder knot's rate of slippage and/or tensile strength with nylon and vycril. The time to perform the knots was as follows: Gea had a median of 19 seconds(11-28, SD=4). The Roeder knot took a median of 24 seconds (8-32, SD=3). The surgeon's knot took a median of 97 seconds(62-110, SD=5). We compared them with ANOVA. There was a statistically significant difference between each knot.

Conclusions: the Gea knot on nylon and vycril did not slip, had higher tensile strength and it is quicker than the Roeder knot. We have used the Gea knot for 3 years with good results; hence, we believe that it should be part of any laparoscopic surgeon's armamentarium.

New Techniques/Technology-PS171

LAPAROSCOPIC GASTROPEXY IN CONJUNCTION WITH PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN HIGH RISK PATIENTS. Asad Aziz,D.O., Sohrab Mobarhan, M.D., Margaret Borton, R.N., Vafa Shayani, M.D., Departments of Surgery and Gastroenterology, Loyola University Medical Center, Maywood, Illinois.

Percutaneous endoscopic gastrostomy (PEG) tube placement is the most commonly performed procedure for establishing enteral access. Associated comorbid conditions such as severe malnutrition, use of high dose steroids, and ascites are likely to increase the incidence of PEG disruption and septic complications following PEG placement. Since June of 1999, we have employed laparoscopic gastropexy (LG) in conjunction with PEG placement in the high-risk patients in need of enteral access.

A retrospective review of hospital charts of all patients undergoing PEG-LG was performed.

Between June 1999 and December 2000, eight patients (3 males and 5 females) underwent PEG-LG. Mean age was 61 years (38-83). Underlying pathology included CVA, failure to thrive with severe associated malnutrition, encephalopathy, chronic aspiration pneumonia, and ventilator dependence. Risk factors for PEG disruption included severe malnutrition (6 out of 8), use of high dose steroids (2 out of 8), and ascites (2 out of 8). Three patients had more than one predisposing factors. All of the procedures were performed using combined laparoscopy and endoscopy with no conversions to open. The average length of procedure was 62 minutes (47-78). There were no operative morbidity's including no PEG disruptions, no need for transfusions, and no repeat operations. All gastrostomies were used within 48 hours after surgery. There were 2 deaths postoperatively (9 days and 33 days following surgery) from non-operative causes.

Based on our limited experience, we believe PEG placement in conjunction with LG is a safe and effective alternative to PEG alone in patients at high risk for PEG disruption and septic complications. Prospective randomized studies will be able to better demonstrate the advantages of PEG-LG over PEG alone in the high-risk patients.

New Techniques/Technology-PS172

MINIMALLY INVASIVE REPLACEMENT OF THE ABDOMINAL AORTA: A NEW ROBOTIC TECHNIQUE, B. Marcus Bailey MD, Tara D. Balint MD, Kim G. Mendelson MD, William H. H. Chapman MD, You Su Sun MD, William M. Bogey MD, L. Wiley Nifong MD, W. Randolph Chitwood, Jr. MD, Department of Surgery, Brody School of Medicine at East Carolina, University, Greenville, North Carolina

OBJECTIVE: Computer-assisted telemanipulative surgery is gaining popularity in many surgical specialties. Advantages offered by these robotic systems include improved precision, dexterity and vision. These are enhanced with tremor filtration, seven degrees of motion, and three-dimensional vision. We have developed a technique for replacing the abdominal aorta with a Dacron tube graft using the da Vinci system.

METHODS: Using an intubated, anesthetized swine model, the da Vinci system was used for the transperitoneal replacement of the abdominal aorta. Seven ports were placed including one camera port, two robotic instrument ports, two retractor ports and two accessory ports. The pig was placed in the right lateral decubitus position. The abdominal aorta was exposed through the peritoneum from the renal arteries to the bifurcation. Dacron graft material was used to replace a segment of the infrarenal aorta. Each anastomosis was performed using two Gore-tex sutures in a running fashion.

RESULTS: We have successfully replaced sections of the abdominal aorta with Dacron graft in ten animals. The average time for port placement was 12 minutes. The average time for exposure of the aorta was 47 minutes. Average times for performing the proximal and distal anastomoses were 20 minutes and 18 minutes, respectively.

CONCLUSION: There is significant interest in the field of vascular surgery in performing operations on the abdominal aorta using minimally invasive techniques. Robotic abdominal aorta replacement under direct visualization offers an attractive alternative to open and endovascular aortic approaches. This technique may prove to be a viable option for the treatment of aortic aneurysmal and occlusive disease.

New Techniques/Technology-PS173

LAPAROSCOPIC SUBTOTAL COLECTOMY FOR COLONIC INERTIA. Sean P. Barnett, M.D., Vafa Shayani, M.D., Department of Surgery, Loyola University Medical Center, Maywood, IL.

Colonic inertia is a benign motility disorder of the colon, which results in severe constipation and disabling, chronic abdominal pain. Medical management of colonic inertia may be costly and lead to less than satisfactory results. Subtotal colectomy frequently leads to excellent results; however, patients and referring physicians are often reluctant to pursue aggressive surgical management. Laparoscopic subtotal colectomy may be the ideal surgical alternative to treatment of colonic inertia.

A retrospective review and telephone follow-up of 4 consecutive patients who underwent laparoscopic subtotal colectomy between December of 1998 and August of 2001 was performed. Specifically, patient demographics, pre-operative work-up, ASA physical status, operative time, peri-operative complications, and length of stay were reviewed. Additionally, using a telephone interview, overall satisfaction with surgery, persistence of pain, use of pain medications, use of pro-motility or anti-motility agents and frequency of bowel movements were assessed.

All 4 patients were females with a mean age of 47 years (31–63). Pre-operatively, all patients were on daily cathartics. Pre-operative work-up included gastric emptying study (3), UGI/SBFT (4), colonic transit study (4), pelvic floor studies (2), and CT scan of the abdomen and pelvis (3). One patient underwent concurrent salpingo-oophorectomy. All patients were ASA class II. The average length of procedure was 5.3 hours (4.5- 6.5). There were no peri-operative deaths, blood transfusions, anastomotic failures, or wound complications. Minor post-operative complications included prolonged post-operative ileus (2 patients) and UTI (1 patient). Average post-operative length of stay was 5 days (4 – 7). Mean follow-up period was 16 months (1-33). None of the patients remained on any pro-motility or anti-motility agents. Three of four patients had complete resolution of their abdominal pain and denied taking pain medications. Post-operative bowel movements ranged from 4 to 10 per day. None of the patients reported urinary or fecal incontinence. All patients were very satisfied with the outcome of surgery and would recommend it to others.

Laparoscopic subtotal colectomy is a feasible, effective, and safe treatment option for intractable abdominal pain and constipation due to colonic inertia. Long-term follow-up of a larger number of patients may allow aggressive promotion of surgical treatment for colonic inertia.

New Techniques/Technology-PS174

INITIAL ONE YEAR EXPERIENCE WITH ROBOTIC ADVANCED LAPAROSCOPIC FOREGUT SURGERY R. Berger, MD, E. Elli, MD, WS Helton, MD, S. Horgan, MD, Minimally Invasive Surgery Center, University of Illinois at Chicago, Illinois

Objective: We report our first year of experience using the da Vinci Surgical System (tm) in minimally invasive foregut surgical applications. Our initial results are to be used to guide our future endeavors in analyzing the applications and efficacy of the robotic system.

Methods: Records from September 1, 2000 to September 1, 2001 were reviewed. Average length of stay, return to oral intake, and postoperative complications are reported.

Results: A total of twenty-one robotic assisted advanced laparoscopic foregut operations were performed. These include twelve Heller myotomies with Dor fundoplication, four Nissen fundoplications, four gastrojejunostomies (three as part of a gastric bypass procedure), and one pyloroplasty. There were no intra-operative complications. For all cases, average return to oral intake was 1.05 days and length of hospital stay was 2.02 days. Two patients had extended stay (4.1 and 5.9 days) for resumption of chronic anticoagulation. One postoperative complication of death occurred secondary to sepsis from gangrenous bowel following a Roux-en-Y gastric bypass. The gastrojejunostomy anastamosis was intact with no evidence of leak or perforation at re-exploration.

Conclusions: Our first year of experience with robotic advanced laparoscopic foregut surgery shows it to be comparable to current minimally invasive surgery standards for return to oral intake, length of hospital stay, and postoperative complications. We therefore will continue to explore various applications of the robotic system in advanced laparoscopic foregut surgery. As our institution gains experience and volume, in depth analysis will allow for further comparison with traditional laparoscopic surgery.

New Techniques/Technology-PS175

A NEW DEVICE FOR BLEEDING CONTROL IN ENDOSCOPIC SURGERY L.Boni,M.D., A. Benevento, M.D., G. Dionigi, M.D., R. Dionigi, M.D., Department of Surgery, University of Insubria–Varese-Italy

AIMS. Bleeding from small vessel may be a severe complication in endoscopic surgery, since it can impair surgeon's view even when the degree of bleeding is low. Hydroxylated polyvinyl acetal tampons (Merocel r.) are made by a synthetic, open cell foam structure largely used during ear-nose and neurosurgical operations. Their polymeric design provides great absorbing capacity (up to 25 times the initial weight) and haemostatic property. Merocel r. tampons are biocompatible, extremely resistant, designed in different shapes and with no loose fibres. We tested their efficacy for bleeding control during different endoscopic operations.

METHODS. From September 2000 till September 2001, 8x1x2 cm rectangular Merocel r. tampons have been used 70 different endoscopic procedures (35 cholecistectomies, 6 adrenalectomies, 9 colectomies, 3 splenectomies, 5 retroperitoneal nefrectomies, 4 lumbar sympatectomies and 8 thoracoscopic procedures).

RESULTS. In 56/70 (80%) cases just one tampon was required; the efficacy for bleeding control and fluid absorbing was remarkable. No need for conversion due to bleeding was reported. Their main advantages are: 1-great absorbing and hemostatic properties within a small volume (no view limiting); 2-easy intra-abdominal handling using conventional endoscopic instruments; 3-possible use as dissecting instruments due to their initial hard consistency; 4-easy insertion and retrival from conventional 10 mm ports; 5-lack of adesiveness to tissues; 6-blood suction can be performed directly through the tampon thanks to the polymeric structure, greatly improving and speeding the clearing of the surgical field; 7- bio-compatibility; 8- absence of loose fibres and high resistance to infections; 9-low cost.

CONCLUSIONS. The use of hydroxylated polyvinyl acetal tampons resulted extremely efficent for bleeding control during minimally invasive surgery and their use is safe and can be recomended.

New Techniques/Technology-PS176

VIDEO SURGERY AND FIBEROPTIC HIGH SPEED CONNECTIONS Roberto Campagnacci MD, Francesco Feliciotti MD, Alessandro M.Paganini MD, Mario Guerrieri MD, Andrea Tamburini MD,Angelo De Sanctis MD, Silvana Perretta MD and *Emanuele Lezoche, MD Istituto di Scienze Chirurgiche, University of Ancona, Ancona, Italy; *II Clinica Chirurgica, Università La Sapienza, Roma, Italy.

Aim of this paper is to report the impact in our teaching hospital of a televideo-surgical-conferencing system utilizing the Integrated Services Digital Network (ISDN) lines standard H 320 and the TCP/IP (Tranfer Common Protocol/ Internet Protocol) with new standard H 323 fiber optic LAN (Local Area Network) connections.

Since july 1997 our department is provided with three ISDN lines (384 k bit/s), H 320 protocol, to share in a national and international teleconferencing network. Intra-hospital (Intra-Net-work) connections of this standard allow the transfer of images, data and videos from the operating room to the didactic and conference room. Medical students and residents, or doctors in meeting, benefit from this system. Out of the hospital (Extra-Net-work), surgical procedures (laparoscopic colectomies. adrenalectomies etc...) have been successfully transmitted during surgical congresses with satisfactory video quality in 384 kbit/s. Simultaneously an international satellite low bandwidth (32 kbit/s) telemedicine project was active between our department and african site (Congo). To present 192 cases of intercontinental telemedicine have been evaluated and 24 nationai and European teleconferencing with surgical video transmission have been completed.

From January 2000 an evolution of technology connection in our country begun with the fiber optic network. A 10-100 Mbit/s speed, utilizing the internet TCP/IP protocol with the new H 323 standard, is used with very high quality of video surgery, data, audio and multimedia communications. To present this network provided educational and didactic role. A clinical validation with digital radiology (MRI,CT scan) is ongoing. A wide clinical application (neurotraumatologic patient survey, telementoring etc...), with consequent benefits, from our regional teaching hospital to rural hospitals is on planning to reduce costs and useless patient transfer.

New Techniques/Technology-PS177

TISSUE MANAGEMENT IN MIS BY SEALING: ADHESIVE STRENGTH AND TREATMENT OF SPLENIC TRAUMA Roman Th. Carbon, M.D., Sibylle F. Baar, M.D., Stefanie I. Simon, M.D., Hans P. Huemmer, M.D.,Dept. of Pediatric Surgery, Friedrich-Alexander-University of Erlangen, Germany

Surgical inviolability characterizes surgery on the spleen- also in the age of minimally invasive surgery (MIS). But tissue sealing is an essential tool for MIS organ conservation and can be carried out in evaluation of adhesive strength (AS) of sealing media and their implementation in MIS. Evaluatin was performed in the CCP (Carnot-Carbon-Perfusor: Pressure chamber, porcine pleural membran, standardized defect). For implementing fleece-bound sealing (FBS) an modulating MIS-applicator(AMISA, a 10 mm instrument) was developed. FBS (ready-to use vs. on- spot) demonstrated a higher AS for collagen fleeces that are ready coated with a fibrinogen based sealant(TachoComb) than carrier systems imprgnated by hand with liquid fibrin glue (50.2 vs 23.0hPa, p<.ooo1). Pure liquid sealing in a drop or spray dressing exhibits a low AS(5.3% hPa) and should not be employed on stressed surfaces. In a pediatric collective(1993-2000, 192 pat., mean age 12.2 yrs) with blunt abdominal trauma 80 patients had splenic trauma. Surgery was performed on 26 children (31.3%) and of this group, 29.6% had isolated splenic trauma requiring surgery (88.2% MIS) and 39.1% had multitraumatization (22.2% MIS). MIS management of the spleen was always carred out with the AMISA and FBS. AS of the fleeces at the target area was always superb.

Splenectomy was not necessary, no rebleeding occured. Mean hospital stay was 11 days. Innovative FBS has made it possible to distinctly expand the indications for MIS, and in the scope of emergency laparoscopy, this type of sealing can be employed for the management of splenic ruptures.

New Techniques/Technology-PS178

LAPAROSCOPIC SPLENECTOMY WITHOUT CLIPS, STAPLES OR LIGATURES. James A Catton MB ChB, William G Ainslie MB ChB, Basil J Ammori MD, Nikolaos Georgopoulos, Demetrios Davides, Derek R Norfolk, Mark Stringer, Michael J McMahon PhD. The General Infirmary at Leeds, United Kingdom.

Objective: Laparoscopic splenectomy is accepted as the gold standard approach to the normal sized spleen. Controversy still remains regarding the most appropriate approach to haemostatic control of the splenic hilar vessels. The electrothermal vessel sealer system (LigasureTM) uses electrocutery to denature elastin and collagen and combines it with extreme physical pressure to form a "weld" within vessels up to 7mm in diameter. We describe the safe introduction and effects on operative time of this state of the art technology

Methods: Between 1993 and 2001 52 patients underwent laparoscopic splenectomy. The initial 32 patients had haemostatic clips applied to their short gastric and splenic pedicle vessels. The subsequent 20 patients had the Ligasure system employed to provide heamostatic control. Operative times where expressed as medians with interquartile ranges.

Results: Patient age, sex and underlying haematological condition were similar between both groups. The procedure was converted in five patients with gross splenomegaly and in none of the patients with normal-sized spleens (9.6%) In-hospital morbidity was 13.5% and was spread equally across both groups. Perioperative transfusion requirements were similar between each groups with a rate of 0.7 units per patient using clips and 0.8 units in the clipless group. There was a single death in the clipless group as a consequence of postoperative pulmonary embolism. Operative times were reduced in the clipless group compared with clipped group (107.5mins (78.5-174) Vs 172.5mins (139-251) p<0.02 Mann-Whitney U test)

Conclusions: Laparoscopic splenectomy can be accomplished safely and securely without the use of clips staples or ligatures. The LigasureTM vessel sealer system reduces operative time by allowing rapid and precise control of the splenic hilar vessels.

New Techniques/Technology-PS179

COMPUTER ENHANCED ROBOTICALLY ASSISTED GENERAL SURGERY: INITIAL EXPERIENCE WITH 62 PATIENTS Anne M. Conquest, M.D., James Garofalo, M.D., David Maziarz, M.D., William H.H. Chapman,III, M.D., L. Wiley Nifong, M.D., W. Randolph Chitwood, Jr., M.D., Department of Surgery, East Carolina University, Greenville, NC

Introduction: Computer enhanced technology has recently been applied to conventional minimally invasive surgical techniques to enhance and expand surgical capabilities. The most commonly performed laparoscopic general surgical procedures are being safely and successfully performed with robotic systems. We report our first year of experience with robotics in general surgical procedures.

Methods: 62 general surgical procedures were performed over a one year period with the daVinciTM (Intuitive Surgical, Mountain View, CA) system. Standard laparoscopic techniques were employed for patient positioning, pneumoperitoneum, and port placement. The operating surgeon was seated at a console 10 feet from the patient. Procedure times and complications were recorded for each procedure.

Results: 32 of 34 cholecystectomies were successfully completed, with one conversion to conventional laparoscopic cholecystectomy and one conversion to open cholecystectomy. Mean operative time for dissection and overall operative time were 34 and 66 minutes, respectively. 20 fundoplications were performed, both Nissen and Toupet. Mean operative time for dissection was 73 minutes, with an overall operative time of 117 minutes. 4 adrenalectomies were performed for masses ranging from 3.5 to 8 centimeters in size. Mean dissection time was 84 minutes, and overall operative time was 123 minutes. 4 splenectomies for ITP were successfully completed, with a mean dissection time of 51 minutes and an overall operative time of 72 minutes. There were no intraoperative complications for the fundoplications, adrenalectomies, or splenectomies.

Conclusion: The multiple benefits of minimally invasive procedures to our patients are well known. Computer enhanced robotically assisted surgery offers an extension of these benefits, and can be safely and successfully employed to perform many conventional laparoscopic procedures. This technology is revolutionizing the field of general surgery.

New Techniques/Technology-PS180

COMPARISON OF HEALING PROCESS FOLLOWING LIGATION WITH SUTURES AND BIPOLAR VESSEL SEALING Steve Peterson, M.D., D.V.M.; Patricia L. Stranahan, M.D.; Ned Cosgriff, M.D., Denver Health and Hospitals, Denver, Colorado; Metropolitan State College, Denver, Colorado; Valleylab, Boulder, Colorado

Objective: Compare adhesion formation as well as gross and histological results obtained using Bipolar Vessel Sealing Technology and traditional ligation with clips and vicryl sutures in a canine model.

Methods: Three dogs underwent laparoscopy with subsequent ligation of mesenteric and splenic vasculature. In this three-armed study one dog was assigned to vicryl suture, one to clips and one to a new form of bipolar energy to seal vessels (LigaSure tm System, Valleylab). Approximately 20 ligations were placed on tissue bundles and vessels from 1-mm to 4-mm in diameter in each animal using the assigned ligation method. The dogs were recovered and underwent reoperation and necropsy at 32 days post surgery. Sites of the suture and vessel sealing ligations were identified for gross assessment of inflammation, then harvested for histologic evaluation. Adhesion formation was also assessed for each of the three ligation methods.

Results: Seal durability and vessel wall fusions were easily identified on visual inspection. The suture sites exhibited greater inflammatory response in contrast to the LigaSure tm sites.

Conclusion: LigaSure tm Vessel Sealing is a viable alternative to sutures for ligating vessels commonly encountered in surgery. Decreased post surgical adhesions associated with the LigaSure tm seal may result in shorter recovery times and reduced postoperative pain.

New Techniques/Technology-PS181

ROBOTICS IN PEDIATRIC SURGERY TRAINING Harry W. Donias, MD, Hratch L. Karamanoukian, MD, Marc A. Levitt, MD, Giuseppe D'Ancona, MD, and Philip L. Glick, MD Department of Surgery, Division of Pediatric Surgery, Center for Less Invasive Cardiac Surgery and Robotic Heart Surgery, and the Miniature Access Surgery Teaching, Training, and Research Center, State University of New York at Buffalo, Buffalo, NY

OBJECTIVE: The purpose of this study was to determine the prevalence of robotics in North American pediatric surgery training programs, as well as the experience of pediatric surgical residents with this technology.

METHODS: A postal, mutiple-choice, survey questionnaire was sent to all the program directors of accredited pediatric surgery training programs in North America. The questions were formulated in an attempt to define the exposure of pediatric surgery residents in robotic surgery and to assess the interest of program directors in teaching these procedures. All the responses were tabulated and analyzed.

RESULTS: Of the 37 program directors to whom the questionnaire was sent 22 (59%), responded. The largest group of responders, 36%, identified minimal access surgery as an area of special interest or expertise. Twenty-three percent of responders have used robotics in their practice, and 18% currently use robotic assistance. Fifty-nine percent of program directors felt robotics would play at least an important role in the future of pediatric surgery. Currently, residents from 32% of responding programs have exposure to robotic technology. Of these programs, resident education takes place in the robotic lab only for 14%, in the operating room only for 71%, and in both for 14%. Forty-one percent of responding program directors identified plans to incorporate some form of robotic training into their curriculum for pediatric surgery residents, and 14% of program directors are currently participating in robotic studies.

CONCLUSION: There is a definite interest in the development of robotic pediatric surgery among North American program directors. Additionally, 32% of pediatric surgery residents already have access to this technology during their training. With further advancement of this technology, it is likely that more robotic techniques will be applied to pediatric surgery.

New Techniques/Technology-PS182

THE EVALUATION OF THE FUNCTIONAL PERFORMANCE OF A NEW COMPUTER MEDIATED CIRCULAR CUTTING STAPLER IN A PRECLINICAL SETTING Kristoffel R Dumon MD, Gregory G Ginsberg MD, Michell Lucey, Noel N Williams, MD, Department of Surgery, Hospital of the University of Pennsylvania

Background: SurgASSIST (PowerMed Inc) is a new computer-mediated surgical device that allows a variety of cartridge units to be affixed to and deployed from a flexible, steerable shaft. An electromechanical power source and gear drive replaces manually operated systems.Current circular cutting staplers (CCS) are limited by mechanical constrains of length and rigidity. The SurASSIST is designed so as to overcome these limitations. Aim: Compare the SurgASSIST CCS to a predicate device with respect to efficacy and safety.

Methods: In a porcine model, the 25 mm SurgASSIST was compared with a predicate device. A total of 40 applications were performed with each device. We evaluated both devices in end-to-end colocolostomy, end-to-side ileocolostomy, gastrojejunostomy and gastric window. Functional performance was rated on a scale of 5.

Results: With the SurgASSIST device, we achieved a clinically acceptable anastomosis in 39/40 cases, compared to 36/40 for the predicate device (NSSD). The mean number of malformed staples was: 2.5+/-4.8 for the SurgASSIST device compared to 2.8+/-5.7 for the predicate device. Ratings of the SurgASSIST device for characteristics such as staple line integrity (4.9), hemostasis (5.0), ease of use (4.9) and quality of cutting (5.0) were equal to the predicate device: staple line integrity (4.8), hemostasis (5.0), ease of use (5.0) and cutting (4.8). The strength of the staple lines from the SurgASSIST device (burst pressure of 2.7+/-1.4 psi) was significantly greater than the strength obtained with the predicate device (1.1+/-0.85 psi).

Conclusion: In all areas included in the evaluation substantial equivalence between the SurgASSIST and the Ethicon ILS was successfully demonstrated. The SurgASSIST device compared favorably to an existing CCS while creating anastomoses that sustained higher burst pressures. The SurgASSIST system has the potential to enhance and expand current surgical applications.

New Techniques/Technology-PS183

A STATISTICAL ANALYSIS OF SURGICAL IMAGES: IMPLICATIONS FOR VISUAL DISCRIMINATION OF TISSUE Darisuh Ebrahimi, M.Sc., Stanley J. Hamstra, Ph.D., Lorne Rotstein, M.D. & Christopher M. Schlachta, M.D. Department of Surgery, University of Toronto, Toronto, Ontario.

Objectives: Recent research in visual science has shown that naturally-occurring images taken from different contexts have different statistical properties. One approach to the specification of clinical image properties then, is to process these images in terms of their statistical variation or similarity. This may be especially important for endoscopic/laparoscopic surgery, as the visual field is constrained.

Method: As a first step in investigating the feasibility of using multiresolution (wavelet transform) texture analysis for visual discrimination of surgical tissues, we measured the statistical characteristics of several surgical images and compared them with the known characteristics of natural scenes. Natural images have a simple characteristic spatial structure, with amplitude spectra that decrease with frequency roughly as 1/f, and considerable variability in amplitude spectra between individual images and in image ensembles. Therefore, amplitude is generally thought to be proportional to 1/f(power alpha), where alpha has been found to be within a fairly narrow range (0.7 -1.5) for natural scenes. For the purpose of this study, a digital set of 24 parathyroid images was acquired and its spatial frequency content analysed. We used a set of parathyroid images since these represent a difficult visual problem and provided a good set for the development of image enhancement techniques.

Preliminary Results: The value of alpha for this set of images was found to be about 1.59. The same measure for a set of 60 natural images from the Brodatz book of texture gave a value of 1.12.

Conclusions: The large value of alpha for surgical images is barely in the range of natural images and indicates a steep spectrum. This preliminary finding may have implications for data compression algorithms and image enhancement techniques. It may be necessary to focus on a limited range of spatial frequencies (image scale) in this environment.

New Techniques/Technology-PS184

A NEW, GRADED PRESSURE LAPAROSCOPIC FUNDOPLICATION FOR THE TREATMENT OF 'GERD' IN THE DYSMOTILE ESOPHAGUS. William S. Evans, M.D. Department of Surgery, Sauk Prairie Medical Center, Prairie du Sac, Wisconsin.

Esophagogastric fundoplication has gained wide acceptance for the treatment of gastroesophageal reflux disease (GERD). Laparoscopic technique has all but replaced laparotomy for the performance of these procedures. Varying degrees of post-operative dysphagia have been reported historically with all types of 'open' anti-reflux procedures, but the rates of dysphagia appeared to increase in some early reports on laparoscopic fundoplication.

Full wrap (Nissen type) techniques were frequently accused of increasing the rate of post-operative dysphagia, especially in the face of esophageal dysmotility. Partial wrap (Toupet type) techniques were conceived primarily to address the problem of post-operative dysphagia. More recently, the durability of Toupet fundoplication has been called into question. These wraps may be more prone to primary failure as well as rotation and other deformity over time, resulting in recurrent reflux. Our own experience with Toupet fundoplication reinforced the concerns documented by others.

In response to the need for a more durable and highly effective partial fundoplication, the author designed a wrap that represents a hybrid of forms already in use. The wrap is unique, however. The lower esophageal resting pressure generated by this esophagogastric fundoplication is graded over the length of the wrap rather than static. The wrap is 360 degrees at the top, opening to 180 degrees at the bottom. It is anti-rotational and resists other types of deformity. Dysphagia is virtually non-existent. The procedure will be described in detail along with the results from our first series of patients. Supporting data, including pre and post-operative manometric results, 24-hour pH analyses and DeMeester scores will be presented. Video documentation will be shown where appropriate.

New Techniques/Technology-PS185

FIRST WIRELESS BROADCAST OF LAPAROSCOPIC SURGERY TO A HAND HELD COMPUTER, Alex Gandsas, MD, Katherine McIntire, MD,Ivan M. George, Wayne Witzke, Adrian Park, MD,University of Kentucky Chandler Medical Center

At the University of Kentucky, we have developed an innovative method that integrates a hand held computer, streaming video technology and wireless protocols to deliver live medical information without relying on wired infrastructures.

On May 8, 2001, a laparoscopic ventral hernia repair was broadcast live from a University operating room to a handheld device (iPAQ –Compaq) via a wireless local network. Image quality was maintained so viewers were able to easily follow the entire surgical procedure.

The transmission was accomplished using a combination of wired and wireless networks integrated within the University campus. The wireless network hardware consisted of a hand held computer (iPAQ Pocket PC H3670) connected to a wireless Ethernet access point (RangeLAN2). The device operated on a Windows CE platform, and the Windows Media Player for Pocket PC (Microsoft, Inc) was used to render the video images. The wired network hardware consisted of a 750 MHz Pentium III computer connected to the Internet via the Ethernet University network. A digital capture device received analog audio/video signals from the videoconference hub (STRYKER, Inc) while the encoder software (Windows Media Encoder) optimized the signals for broadcast.

The wireless connection to the access point provided 128 kbps of bandwidth with a maximum bitrate of 81 kbps, which allowed a smooth stream of video to be deployed at 15 frames-per-second with sound encoded at 16 KHz. The wireless link was maintained without interruption for the entire transmission. Delay time between the on-going procedure and the rendering of images to the mobile device was 10 seconds.

Further research may identify this system as a new medical teaching/learning paradigm in which student or residents may be able to "attend" lectures or surgical demonstrations regardless where they are physically present. Mobile portable wireless devices may make possible for surgeons in the future to conduct intra-operative consults where traditional wired infrastructures or extensive machinery are not available.

New Techniques/Technology-PS186

TRANSCERVICAL MINIMALLY INVASIVE APPROACH FOR ZENKER'S DIVERTICULUM, 1 FERNANDO TELLERIA MD, 2 ALEX GANDSAS MD, 1 LENZI JORGE MD, 1 DEPARTMENT OF SURGERY IMEC JUNIN BUENOS AIRES ARGENTINA, 2 DEPARTMENT OF SURGERY UNIVERSITY OF KENTUCKY LEXINGTON KENTUCKY

BACKGROUND: THE CURRENT TREATMENT FOR ZENKER'S DIVERTICULUM IS EITHER THE CONVENTIONAL SURGICAL APPROACH OR ENDOSCOPIC TRANSORAL PROCEDURES.

WE DEVELOPED A NEW MINIMALLY INVASIVE TECHNIQUE TO ADD AS A THERAPEUTIC OPTION FOR THIS PATIENTS.

METHODS: FOUR PATIENTS WITH ZENKER'S DIVERTICULUM WERE OPERATED ON USING A MINIMALLY INVASIVE CERVICAL ACCESS WITH CONVENTIONAL LAPAROSCOPIC INSTRUMENTS.

RESULTS: ALL FOUR CASES WERE COMPLETED WITHOUT COMPLICATIONS OR CONVERSIONS. THE MEAN OPERATIVE TIME WAS 65 MINUTES WITH A SHORT HOSPITAL STAY AND GOOD COSMETIC RESULTS. THE OUTCOMES IN TERMS OF CONTROL OF SINTOMATOLOGY WERE VERY SATISFACTORY.

CONCLUSION: IT IS POSSIBLE TO USE THE TRANSCERVICAL MINIMALLY INVASIVE APPROACH FOR THE TREATMENT OF ZENKER'S DIVERTICULUM. THIS MAY BE SUPERIOR TO CONVENTIONAL OPEN APPROACH IN SELECTED PATIENTS.

New Techniques/Technology-PS187

ARE VISITORS OF A MEDICAL WEB SITE SUFFERING FROM THE ILLNESS THE WEB SITE IS ABOUT? *M Garcia-Oria MD, **E Pascual-Jimenez Pharm D, *JI Rodriguez-Hermosa MD, ***A Gandsas MD *Servicio de Cirugia, Hospital Universitari de Girona Doctor Josep Trueta, GIRONA, SPAIN.**CEIC, Hospital Universitari de Girona Doctor Josep Trueta, GIRONA, SPAIN.**Department of Surgery University of Kentucky. Lexington, KY, USA

Objective: Assess through an online survey, how much visitors of a medical web site, are suffering from the pathology this medical web site is about.

Methods: The web site http://www.acidez.net is a monographic web site about hiatal hernia and heartburn targeted on patients. We have published in this web site a survey with 39 items with different types of questions about heartburn symptoms. Any visitor to the website is invited to participate in the survey, and there is no previous relationship between the visitor and the authors.

The survey is available both in English and Spanish and completed forms are submitted via email to the author. We have included in the study forms submitted between feb-20-2001 and aug-20-2001.

Results: The web site acidez.net have received 60173 visits in 6 months. 897 people have submitted the form, 57.01% women and 42.99% men. Average age is 43.30 +- 13 years; most of them, 43.60%, were from USA, 20.41% Spain and, 13.77% Mexico.

We found that 84.49% of the visitors had heartburn symptoms unless twice a week, and 15.51% rarely or never. 75.12% have already visited the doctor. Most of people, 77.31%, are taking medication to treat their symptoms, and proton pump inhibitors is the most common one(40.36%). On the other hand we found that 38.68% had been diagnosed of hiatal hernia, 14.83% esophagitis and 27.42% of gastritis. Only 2.71% had been operated performing a fundoplication, and 80% were by laparoscopic approach.

Conclusion: Visitors to a monographic medical web site about heartburn, http://www.acidez.net, are mostly people suffering from this symptomatology. We think that monographic medical websites achieve selective audiences.

New Techniques/Technology-PS188

A NOVEL METHOD FOR THE ASSESSMENT OF DEPTH PERCEPTION IN SURGERY FROM TWO-DIMENSIONAL DISPLAYS Stanley J. Hamstra, Ph.D., Jiri Najemnik, B.Sc., Dariush Ebrahimi, M.Sc. & Christopher M. Schlachta, M.D., Department of Surgery, University of Toronto, Toronto, Ontario.

Objectives: In laparoscopic surgery, the recovery of three-dimensional (3D) information and the accurate judgment of depth is constrained by the presentation of medical images on a two-dimensional (2D) display. These judgments can be facilitated by the addition (or exclusion) of certain types of visual information. For example, linear perspective cues in the form of a reference grid can theoretically enhance depth judgments. Also, variations in light source direction or quality can affect depth judgments. However, the application of basic findings in this area of visual science have not been made to the field of medical image depiction.

Method: In recent pilot work, we have developed a measurement tool for assessing an individual's judgments of 3D structure from 2D displays (based on the work of J. Koenderink and colleagues). This system allows for the objective experimental assessment of critical visual characteristics necessary for effective depth judgments in a 2D display. Specifically, the subject is presented with a 2D depiction of a 3D structure and requested to make local depth judgments using a specially-constructed but simple gauge figure consisting of two concentric circles and a post. Once the subject is satisfied with the apparent orientation of the figure in depth, they are presented with another figure in a new location on the display. This is repeated until a map of the entire display is obtained. We can then compare their 3D perceptual map with the actual 3D physical structure of the object.

Expectations: We are developing an approach to this problem consisting of repeated depth measurements under various visual conditions, including variations in lighting conditions and the presence of linear perspective reference gradients. Results of this study will provide recommendations for image depiction and transmission standards

New Techniques/Technology-PS189

DUAL VISION SURGERY FOR LAPAROSCOPIC DISTAL GASTRECTOMY HAYAKAWA Tetsushi M.D., TAKEYAMA Hiromitsu M.D., TANAKA Moritsugu M.D., AKAMO Yoshimi M.D., FUKUI Takuji M.D. and MANABE Tadao M.D. First Department of Surgery, Nagoya City University, Medical School

One of the largest disadvantages of laparoscopic surgery is that it has to be performed under two-dimensional imaging with only one magnified video monitor. To overcome this handicap, we use two sets of laparoscopes and monitors when performing laparoscopic distal gastrectomy for gastric cancer. We generally insert six trocar sleeves. The main operator and the contrary assistant operator control the instruments in the same way. They control through two working trocar sleeve of both sides and each other∞fs laparoscope is located in the center. The advantages are as follows. (1) To align all four directions; the own eyes, the laparoscope, the monitor and the manipulating hands in a straight line, facilitates hand-eye coordination and we can handle the instruments more accurately compared to when these are not parallel. (2) The abdominal cavity is better illuminated by the two separate light systems coming from different directions, making shadows which help depth perception regarding the abdominal organs. (3) The assistant does not have to do an over-90 degree inverted traction of organs and can apply precise counter-traction looking at his own laparoscopic image. (4) The assistant can also train his hand-eye coordination by aligning his own laparoscopic axis, monitor viewing axis and manipulating axis in a straight line. When the assistant eventually becomes an operator, he is then prepared to perform surgery from the main surgeon's side. This results in an excellent training system for manipulating forceps for young laparoscopic surgeons.

New Techniques/Technology-PS190

LAPAPAROSCOPIC COLECTOMY PROCEDURE IN A DIFFICULT COLON CANCER PATIENT -INTRA-ABDONINAL ADHESION Yukihito KOKUBA, M.D., Yoshimasa OTANI, M.D., Akira KAKITA, M.D. Department of Surgery, Kitasato University School of Medicine, Kanagawa, Japan

Laparoscopic colectomy's minimal burden on the patient has made this procedure very popular. Laparoscopic colectomy with a no-touch retro-peritoneal approach was possible in a case of severe intra-abdominal adhesion operable only by conventional open surgery. From the start of laparoscopic colectomy in March 1997 to the present, there have been 232 cases of this procedure performed. There were 171 cancer patients (38 had previous abdominal surgery), and in 16 (42%) of these , the retroperitoneal approach was performed. In advanced cancer cases, there are no effects on intra-abdominal adhesions and it can safely be performed by moving the intestines. Also, lymph node resection is possible. With the retro-peritoneal approach and various techniques, the amount of trocars introduced into the abdominal cavity can be reduced and adhesion areas can be avoided along with less damage to intra-abdominal organs from forceps movements.

Laparoscopic colectomy with the retro-peritoneal approach is a useful and safe procedure which can be performed on intra-abdominal adhesion cases.

New Techniques/Technology-PS191

A NEW TECHNIQUE OF ENDOSCOPY-GUIDED TRANSHEPATIC BILIARY DRAINAGE AFTER LAPAROSCOPYC CHOLEDOCHOLITHOTOMY. Nobuaki Kurauchi, M.D., Ichiro Tsuda, M.D., Yoshio Ito, M.D., Yutaka Saji, M.D., Toshiya Kamiyama, M.D., Michiaki Matsushita, M.D., Satoru Todo, M.D., The First Department of Surgery, Hokkaido University Hospital, Sapporo, Japan.

Primary closure with no biliary drainage is a common practice after laparoscopic bile duct exploration for patients with non-complicated choledocholithiasis. However, when they are complicated by numerous stones or biliary sepsis, addition of biliary drainage is essential for safety of the procedure. Insertion of a drainage catheter via the choledochus, the cystic duct or the naso-biliary route has been applied. Described herein is a new technique of endoscopy-guided transhepatic biliary drainage after choledochotomy and stone removal under gasless laparoscopy.

The surgical procedure follows as below. After clipping the cystic duct, choledochotomy, choledochoscopy, and stone removal are performed in a similar manner as an open surgery. Then, under choledochoscopy, the hard tip (tail side) of a guide wire through a scope channel is introduced into the antero-inferior branch of the intrahepatic bile duct. The wire is forced to penetrate the bile duct wall and the liver tissue, and pulled outside the skin. An eight-Fr catheter is inserted into the bile duct over the wire. After the wire is removed, the opening of the bile duct is closed by continuous suture with 5-0 PDS.

This procedure has been applied for five patients. The drainage catheter was removed between 4th and 8th postoperative days in four patients with uneventful course. One with narrowing of bile duct at suture closure site was easily treated by balloon dilation through transhepatic route. Fortunately, no retained stone has been experienced.

Our limited experience indicates that endoscopy-guided transhepatic biliary drainage is a feasible option in laparoscopic choledocholithotomy. It enables to promote an easy access to the bile duct for postoperative biliary treatment or stone retrieval, and early removal of a catheter if drainage is unnecessary.

New Techniques/Technology-PS192

CAN A NITINOL CLIP REPLACE SUTURE FOR ADVANCED LAPAROSCOPIC SURGERY? Marina Kurian, M.D. and Mitchell Roslin, M.D. Department of Surgery, Lenox Hill Hospital, New York, NY

Nitinol, which is an alloy of nickel and titanium, has several unique properties. These include favorable handling characteristics and an ability to return to its prefabricated shape. These properties have been utilized for medical applications in the central nervous system and coronary stents. A nitinol clip (U-CLIPtm, Coalescent Surgical, Inc.) has been recently introduced for cardiac surgery. The clip has the appearance of a suture with memory and is placed with standard instrumentation. After placement, the clip is deployed with a simple squeeze of the needle holder, thus eliminating knot tying. These attributes make the U-CLIPtm attractive for laparoscopic surgery. After the development of larger diameter (.070-.090in) clips and subsequent animal testing, we have begun an initial clinical trial for closure of the enteroenterostomy in laparoscopic gastric bypass. We have used the U-CLIPtm in five consecutive patients without complication. Both surgeons were able to use the U-CLIPtm without difficulty in their first case. Video will be shown. The advantage of the nitinol clip is that it offers the flexibility of suture, combined with easy handling and rapid deployment with no additional instrumentation. It eliminates suture handling and intracorporeal knot tying. Tissue incorporation is similar to staples since the exterior surface, titanium oxide, is the same.

It is our plan to continue utilizing the clip for enteroenterostomy closure. Future modifications that improve laparoscopic entry with a delivery system may make the U-CLIPtm ideal for a sutured gastrojejunostomy and laparoscopic vascular surgery.

New Techniques/Technology-PS193

Introduction: The purpose of the study was to establish construct validation of a flexible sigmoidoscopy simulation trainer. Simulation training is growing in popularity but few studies have attempted to verify the validity of the simulator scoring system. Through the comparison of three distinct groups, based on training level, construct validation of this instrument could be established. If the simulator scoring system were able to discern between experts and trainees then further research using this training tool would be beneficial.

Methods: The three groups were clerical staff (n=6), senior residents (n = 19) and expert endoscopists (n=4). No participant had simulator training, practice or guidance. The clerical group was instructed on the use of the scope and the task goals. Three cases were done that varied in pathology and difficulty. Several task variables were captured.

Results: The data was analyzed with one-way ANOVA or the Aspin-Welch test if the data had unequal variance. The results are:

Variable	Clerk Vs Resident		Clerk Vs Expert		Resident vs Expert	
Time secs	NS		p<0.001	C>E	p<0.001	R>E
Insertion length	NS		NS		NS	
% of bowel viewed	NS		p=0.01	C<E	NS	
% time no pain	NS		p=0.02	C<E	NS	
% time severe pain	p=0.007	C>R	NS		NS	
Distance tip moved	p=0.001	C<R	p=0.05	C<E	NS	
Speed In	NS		NS		NS	
Speed Out	NS		NS		NS	
Time in red out	p=0.004	C>R	p=0.002	C>E	NS	
Air in	p=0.01	C<R	NS		NS	
Air left in	p=0.01	C<R	NS		NS	
Max force used	NS		NS		NS	
Perforation	NS		NS		NS	
Lesions Seen	p<0.001	C<R	p<0.001	C<E	NS	

Conclusions: These preliminary results support the conclusion that the flexible sigmoidoscopy simulator was able to discern between the trained and untrained. Clearly this technology has limitations. More training groups are needed to help determine the level at which the simulator is unable to distinguish between groups of trainees.

New Techniques/Technology-PS194

USES OF BIPOLAR SEALANT SISTEM (LIGASURE®),IN LAPAROSCOPIC SURGERY ANTONIO MALLEN, M.D. Department of Surgery. Laparoscopic Surgery Unit. Hospital Dr. Americo Babó. CVG Ferrominera Orinoco. Puerto Ordaz. Venezuela

PURPOSE: We present a retrospective clinical study concening our preliminary experience in the use of bipolar sealant sistem, to perform laparoscopic surgery.

METHODS: Thirthy one consecutive patients were operated using laparoscopic technics, and bipolar sealant sistem (Ligasure®)for
disecting and hemostasis purposes.

RESULTS: Every operation attemted was successfully terminated. We performed: 9 Cholecistectomies, 6 Appendectomies, 4 Hysterectomies, 4 Ooforectomies, 3 Nissen Funduplications, 4 Hernioplasties, 3 Ventroplaties. We didn't have complications attributable to use the bipolar sealant sistem (Ligasure®).

CONCLUSION: Laparosopic Surgery can be made safe, using bipolar sealant sistem (Ligasure®), because is highly hemostatic with decreased thermal damage to tissues. In adittion, is very easy to handle in contrast with others sistems like ultrasonically activated scalpel which is very complex.

New Techniques/Technology-PS195

USE OF BIPOLAR VESSEL SEALING SSYSTEM (LIGASURE TM)IN LAPAROSCOPIC SURGERY. Antonio Mallén M.D.,Department of Surgery. Laparoscopic surgery Unit., Hospital Dr.Americo Babó. CVG Ferrominera Orinoco., Puerto Ordaz. Venezuela

PURPOSE: We present a retrospective clinical study concerning our preliminary experience in the use of bipolar vessel sealing system, to perform laparoscopic surgery.

METHODS: Thirthy one consecutive patients were operated using laparoscopic technics, and bipolar vessel sealing system (Ligasure tm.)for disecting and hemostasis purposes.

RESULTS: Every operation attempted was successfully terminated. We performed: 9 Cholecistectomies, 6 Appendectomies, 4 Hysterectomies, 4 Ooforectomies, 3 Nissen Funduplications, 4 Hernioplasties, 3 Ventroplaties. We didn't have complications attributable to the use of bipolar sealing system (Ligasure tm.).

CONCLUSION: Laparosopic Surgery can be made safe, using bipolar sealing system (Ligasure tm.), because is highly hemostatic with decreased thermal damage to tissues. In adittion, is very easy to handle in contrast with other systems like ultrasonically activated scalpel which is very complex.

New Techniques/Technology-PS196

ULTRASONIC TROCAR, SCISSORS AND ASPIRATOR WITH AN ELECTRIC CAUTERY CONNECTOR ACCOMPLISED SAFE LAPAROSCOPIC OPERATION. Sumio Matsumoto, M.D., F.A.C.S., Norihiko Kawabe, M.D., Yoshihisa Mizuno, M.D., Yasuhiro Kano, M.D., Kenichi Kobayashi, M.D., Hiroichiro Suzuki, M.D., Shunji Umemoto, M.D. Department of Surgery, Second Teaching Hospital, Fujita Health University, Nagoya, Japan.

Although the trocar safety shield system decreases abdominal organ injury, the probability of bleeding from the abdominal wall port site had still not been resolved. We therefore developed a novel ultrasonic vibrating trocar that prevents bleeding by an ultrasonic cavitation effect. We also developed an energy source system that can connect ultrasonic trocar, scissors and aspirator with single cable. Ultrasonic scissors and aspirator has a pin that connects HF electric cautery. Thereby, we can use ultrasonic vibrating trocar, scissors and aspirator smoothly according to the progression of the operation procedure.

The ultrasonic vibrating trocar has the advantage of ease of insertion, and the force required for trocar insertion is only 34% of the force required by commercially available trocars. Bleeding from the abdominal wall was prevented by an ultrasonic cavitation effect. The ultrasonic vibrating scissors decrease efforts to prevent bleeding using clips and shorten the operation time. The ultrasonic aspirator can make less effort to identify the vessels during the lymph node dissection for the operation of the patients with malignant tumor.

We developed a reusable ultrasonic vibrating trocar that can be bloodlessly and smoothly inserted through the abdominal wall. This instrument is inexpensive∞@and decreases organ injury and other complications. The system which can connect other ultrasonic device, scissors and aspirator, accomplish easy and bloodless operation. Reusable devices has the advantage with a respect of cost effectiveness.

New Techniques/Technology-PS197

THE ULTIMATE LAPAROSCOPIC CHOLECYSTECTOMY - CLIPLESS NEEDLE PROCEDURE Yoshifumi Matsuura M.D., Go Wakabayashi M.D., Masaki Kitajima M.D., The Department of Surgery, Keio University School of Medicine, Tokyo

Laparoscopic cholecystectomy has become the standard treatment for symptomatic cholelithiasis. However, the standard procedure varies from surgeons to surgeons. The advancement of laparoscopic instruments has made us possible to perform the least invasive cholecystectomy. Here, we report our new standard laparoscopic cholecystectomy.

[Materials & Methods] We started to use 3mm bipolar coagulation forceps and 2mm-needle instruments at our service since February, 1997.∞@We have performed laparoscopic clipless needle cholecystectomy as described below for 143 patients for the past three years, and evaluated the procedure being compared with the conventional laparoscopic cholecystectomy using 5mm instruments. The clipless needle procedure uses an open laparoscopy method to place a 12mm trocar through the umbilicus as a port for a flexible video laparoscope. One 3mm trocar and two 2mm trocars are placed in the abdomen under direct vision. The serosal attachments of the neck of the gallbladder are first dissected laterally, and the CalotÕs triangle is finally exposed. We use 3mm bipolar coagulation forceps to coagulate the cystic artery and use 2mm absorbable tie to ligate the duct. After the isolation of the gall bladder, we retrieve it through the incision of umbilicus, and suture the fascia and the incision subcutaneusly. Other wounds are closed with surgical tapes.

[Results & Conclusion] The operating time of this procedure took less than one hour in most cases although it was roughly 1.5 times longer than that of the conventional 5mm procedure. Four cases had complications: two cases had liver dysfunction needed longer hospital stay, one case had bleeding needed to place 5mm trocars, and one case had common bile duct stone that fell while operation. Two cases needed placement of 5mm trocars because of bleeding mentioned above and difficulty of adhesiolysis. In conclusion, the clipless needle procedure is feasible and safe with merits of less scar and no clips.

New Techniques/Technology-PS198

INITIAL EXPERIENCE WITH LAPAROSCOPIC ADHESIOLYSIS AND INSERTION OF SEPRAFILM II. Karen M Maude MBChB, Simon PL Dexter MD, Michael J McMahon PhD, Leeds Institute for Minimally Invasive Therapy (LIMIT) and Academic Surgical Unit, Leeds General Infirmary, Leeds. United Kingdom

Introduction: Adhesions are a recognised causal factor in chronic abdominal pain and subacute bowel obstruction. Laparoscopic adhesiolysis has been shown to be effective in certain patients but there is a high rate of recurrence. Seprafilm, a bioresorbable membrane, can reduce post-operative adhesion formation. Technical advances have enabled laparoscopic insertion of this material. We report our initial experience of laparoscopic seprafilm usage.

Methods: Since April 2000, 13 patients (9 female, 4 male), mean age 57 yrs, (range 27-83) with a history of chronic abdominal pain or small bowel obstruction, after previous abdominal surgery, have undergone 16 laparoscopic adhesiolysis and insertion of Seprafilm II. Operation approach in all cases involved a 10mm umbilical port for camera usage and two or more 5mm ports for instruments and Seprafilm insertion. Ultrasonic coagulation was used to divide intra-abdominal adhesions. Sheets of Seprafilm II were cut into quarters and inserted using the laparoscopic applicator. 92% of Seprafilm II was inserted successfully.

Preliminary Results: The operation was successfully completed in 11 patients (14 cases; 1 patient with a crohns mass was converted, 1 patient with a jejunostomy, experienced intra-operative perforation of the small bowel, this was sutured laparoscopically, no Seprafilm was inserted). Post-operative small bowel obstruction developed in two patients. After a mean follow-up of 248.4 days (range 43-487), four (30.85) patients remain symptom free. Seven (53.8%) patients have experienced a recurrence or persistence of symptoms. Three (23.1%) patients have required repeat laparoscopic adhesiolysis and insertion of Seprafilm II.

Conclusion: This experience demonstrates the feasibility of laparoscopic adhesiolysis even after multiple laparotomies. It remains unclear which patients are likely to benefit from this procedure.

New Techniques/Technology-PS199

ENDOSCOPIC TOTALLY PREPERITONEAL VENTRAL HERNIA REPAIR: FEASIBILITY STUDY Marc Miserez, Ph.D., Dirk Vervloessem M.D., Freddy Penninckx Ph.D., Department of Abdominal Surgery, University Hospital Gasthuisberg, Leuven, Belgium.

Aims: In an attempt to combine the advantages of a retromuscular mesh implantation with a minimally invasive approach, we propose an endoscopic totally preperitoneal technique for the treatment of ventral hernias.

Methods: From September 2000 until May 2001 fifteen patients with an incisional or primary ventral hernia with a maximal width of 9 cm were operated. One blunt tip trocar and two additional 5 mm trocars were placed at a substantial distance from the hernia orifice. The first trocart is introduced in the retromuscular plane under direct view, mostly at the lateral border of the rectus muscle. After initial blunt dissection in this plane, the two other trocars are inserted. On the midline, the medial border of the posterior rectus sheath is opened on both sides and contralateral retromuscular dissection is continued. After reduction of the hernia sac or opening of the peritoneum at the hernia neck, a mesh is inserted, ensuring minimal circumferential overlapping of 5 cm. A polypropylene mesh was used in six cases. In the other patients, ePTFE or a composite mesh was used (median surface area of the meshes: 285 square cm). All meshes were fixed with helicoidal tackers.

Results: There were no major complications after a median follow-up of 4 months (range 13-276 days). We noticed one postoperative subcutaneous infection with total regression after IV antibiotics and local incision. Another patient developed fever and local cellulitis signs after discharge. A third patient had fever without a clear focus. Both were also successfully treated with antibiotics. One patient developed a postoperative ileus. One recurrence was seen 5.5 months postoperatively (6.7%).

Conclusions: Endoscopic totally preperitoneal ventral hernia repair is feasible. In this way the mesh can be placed in the same plane as in open surgery, avoiding the disavantages of an open approach and the disavantages of transabdominal approach with the need for extensive adhesiolysis. In addition, preperitoneal placement of the mesh might obviate the need for extensive fixation of the mesh due to the intrabdominal pressure and peritoneal covering (as in endoscopic inguinal hernia repair).

New Techniques/Technology-PS200

LAPAROSCOPIC SPLENECTOMY: SURGERY TECHNIQUE AND OUTCOME OF 23 PATIENTS. Naoki Nagata,M.D., Aiichiro Higure,M.D,. Kazunori Shibao,M.D., keiji Hirata M.D., Yoshifumi Nakayama M.D., Koji Okamoto,M.D.,Hedeaki Itoh,M.D.,Takahiro Hayashida,M.D.*, Department of surgery 1 University of Occupational and Environmental Health, *Department of surgery,Kokura central Hospital, kitakyushu, Japan

Laparoscopic splenectomy (LS) has become one of the advanced laparoscopic procedures that benefit most from minimally invasive surgery. From March 1995 through August 2001, the authors performed laparoscopic splenectomy on 23 patients including 15 cases of idiopathic thrombocytopenic purpura, 4 cases of splenic tumor (hamartoma, Hodgkin disease, sarcoidosis and metastatic malignant melanoma),1 cases of hereditary spherocytosis, 2 case of idiopathic autoimmune hemolytic anemia,and 1 case of true splenic cyst. In early experiences of first 10 consecutive cases (group A), the patients were placed in a right lateral decubitus position to get splendid operative field and to facilitate dissection of the dorsal side of the spleen. Splenic vessels were isolated through ventral apporach and each branch was ligated using the metal clip. In late experiences of 13 cases (group B), the resection of the splenic ligament was performed by the use of a ultrasonic coagulation cutting device and we tried using linear staplers to divide splenic hilum without isolating of each vessels from lateral apporach in right recumbent position. All cases were completed laparoscopically and no severe compilications were recognized. As results, mean surgery times were 248 minutes in group A, 165 minutes in group B, mean estimated blood loss was 308 ml in group A, 82 ml in group B, respectively. Both surgery time and blood loss by the change of the strategy was improved. The postoperative hospital stay was 9th. days. Conclusions: The total splenic hilum division by linear staplers and ligation method through lateral apporach is safe and may be the standard operative method in laparoscopic splenectomy.

New Techniques/Technology-PS201

NOVEL GASTROINTESTINAL ANASTOMOTIC DEVICE DEVELOPED FOR LAPAROSCOPIC OR ENDOLUMINAL DEPLOYMENT-A PILOT STUDY Adrian E. Park, MD, Gudjon Birgisson, MD, Charles F Knapp, PhD, Uyen B.Chu, MD, Center for Minimally Invasive Surgery, The University of Kentucky, Lexington, KY

INTRODUCTION: The ability to perform entirely laparoscopic (lap) GI anastamoses (anast) consistently and with ease remains elusive. We developed an anastamotic device(AD) which when deployed creates an immediately patent, secure anast In this study we investigate the function and effectiveness of the AD in a rabbit model.

METHODS: 12 White NZ rabbits (mean wt. 6.2 kf) were divided into 3 groups of 4 animals. In each rabbit a small bowel anast was created using the AD. All animals were fed ad lib immediately postop. Groups 1,2,and 3, were survived 1,4,and 8 weeks respectively prior to necropsy. Global assessments, weight (wt.) gain and fluoroscopic evaluation prior to explanation as well as burst pressures and histologic evaluation of the anast post-explant were recorded for each animal.

RESULTS: There was no clinical or necropsy evidence of an anastomotic leak or peritonitis in any animal. One animal in group 3 was euthanized postop day 17 for wt. loss and inability to feed. Necropsy revealed partial bowel obstruction but no leak. All other animals revealed patent anast on fluoroscopy. In one animal the AD migrated proximally into the stomach. The mean wt gain in group 1 was -212.5 g (range -390 to + 200 g); group 2 was -25 g (-210 to +350 g); and group 3 was 800 g (630 to 910 g). The mean anast burst pressure in group 1 was 207.4 mm Hg; group 2 was 259.3 mm Hg; and group 3 was 224.7 mm Hg. Histologic findings from each group will be presented.

CONCLUSION: Animal wt. gain increased through the course of the study. Mean burst pressures at necropsy were greater than 200 mm Hg (equivalent to burst pressure of a stapled anast) in all groups. In 11 of 12 rabbits the AD created a secure and patent GI anast over a period of up to 2 months. The AD is easily deployed and functions effectively in an animal model. Further evaluation will focus on delivery of the AD through a 5mm trocar.

New Techniques/Technology-PS202

APPLICATIONS OF DIGITAL IMAGING PROCESSING TO LAPAROSCOPIC SURGERY, Michael Shaw, Ph.D., Adrian E. Park, M.D. Center for Minimally Invasive Surgery, The University of Kentucky, Lexington, KY

Laparoscopic surgery is limited in part by the two-dimensional image the surgeon views while performing a procedure. Depth information and perspective are lost in the video process. Most laparoscopic imaging systems employ an analog camera and signal conditioning box that converts the signal to s-video for display on a monitor. With recent advances in digitizing and digital signal processing circuit boards (DSP's) the analog signal can be digitized and algorithms applied to manipulate the image before sending it to the monitor. The newest DSP's are fast enough to accomplish this in real time. We use a technique known as structured light profilometry to analyze a laparoscopic image to obtain a complete geometry. Using this information we will demonstrate two applications: 1) an on screen scale is generated that can be used to make precise intracorporeal measures of anatomic (e.g. hernia defect) or specimen (e.g. spleen size) dimensions; 2) a full three-dimensional image is constructed (real time) and when projected onto a standard monitor can be rotated in any direction to improve perspective, sense of depth and surface texture. Both these techniques involve adaptation of existing image processing algorithms and technology and are capable of performing in real time making them useful for laparoscopic surgical application.

New Techniques/Technology-PS203

WHAT IS THE VALUE OF TELEROBOTIC TECHNOLOGY IN GASTROINTESTINAL SURGERY? Alexander Perez, M.D., David C. Brooks, M.D., Michael J. Zinner, M.D., Stanley W. Ashley, M.D., Edward E. Whang, M.D., Department of Surgery and Division of Minimally Invasive Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Our study objective was to determine the performance characteristics of telerobotic technology in a single gastrointestinal procedure: laparoscopic cholecystectomy. Initially targeted toward cardiac surgery, the impact of this technology in gastrointestinal surgery has been unclear.

METHODS: All telerobotic-assisted laparoscopic cholecystectomies performed at a tertiary academic medical center between 1/00-9/01 were analyzed. All cases used the daVinci Surgical System. Data expressed as mean±S.D.

RESULTS: Twenty patients (47±20yr, 4 male, 16 female) underwent telerobotic-assisted laparoscopic cholecystectomy. Indication for surgery was symptomatic cholelithiasis in all cases. All patients had a successful gallbladder removal without need for conversion to conventional laparoscopic or open cholecystectomy. There were no intraoperative or postoperative complications. Procedure time was 134±36 min. The overwhelming majority of this time was related to telerobotic positioning and adjustments rather than surgeon-directed tissue manipulation. All operations were performed by one of three competent laparoscopic surgeons; no learning curve associated with the telerobotic procedures was observed. Surgeon-perceived advantages of this system included: easier tissue dissection related the multiple degrees of freedom afforded by the Endowrist, increased surgeon comfort, and stimulated interest in biliary surgery among medical personnel at all levels. Surgeon-perceived disadvantages included: increased operating time related to apparatus set-up and adjustments, lack of tactile feedback, and limited instrument choice.

CONCLUSIONS: This series is the largest available U.S single-center experience with telerobotic-assisted laparoscopic cholecystectomy. Our results suggest that this procedure is effective and safe when performed by competent laparoscopic surgeons. Telerobotic technology has the potential to reinvigorate gastrointestinal surgery.

New Techniques/Technology-PS204

VALIDATION AND APPLICATION OF A METHOD TO CONTINUALLY-MEASURE IN UTERO FETAL SHEEP CEREBRAL OXYGENATION DURING MATERNAL GENERAL ANESTHESIA James D. Reynolds, PhD; John V. Booth, MB, ChB; David W. Amory, MD; Paul B. Benni, PhD; Sandhya Lagoo-Deenadayalan, MD; Ross L. McMahon, MD; Miguel Garcia-Oria, MD; W. Steven Eubanks, MD, Endosurgical Research Group, Departments of Anesthesiology and Surgery, Duke University Medical Center, Durham, NC.

Maternal laparoscopy for non-obstetric related surgery during pregnancy is increasing in popularity. While some have investigated the fetal responses to pneumoperitoneum, less attention has gone towards other aspects of the surgical procedure. One area that is incomplete is an understanding of what effects maternal general anesthesia has on the fetus, especially the fetal brain, which can be exquisitely sensitive to decreases in oxygenation. Part of this uncertainty is due to the inability to separate the anesthetic effect from the underlying pathology that necessitated its use. The other factor is the impracticability of measuring fetal oxygen levels. To experimentally investigate both points, we have developed a means (near-infrared spectroscopy; NIRS) of continually quantitating in utero fetal cerebral oxygenation in pregnant sheep.

NIRS is a spectrometric method that measures tissue oxygenation by recording changes in the amount of oxygenated, de-oxygenated, and total hemoglobin (Hb). A NIRS device was designed, built, and optimized by us for in utero fetal brain monitoring. Our device was validated by measuring fetal cerebral oxygenation during episodes of controlled umbilical cord occlusion. In a separate series of animals, cerebral oxygenation was recorded before and during maternal general anesthesia with 1.25% isoflurane in oxygen. Almost immediately after induction, fetal cerebral oxygenation decreased. Anesthesia also appeared to reduce fetal cerebral blood volume as measured by a decrease in fetal cerebral total Hb. In contrast, fetal arterial blood oxygenation levels did not change during the study.

This preliminary result suggests general anesthesia can alter the amount and supply of oxygen to the fetal brain. It is important to note that the study involved healthy sheep fetuses. Data from previous studies suggests that CO2 pneumoperitoneum can produce a substantial amount of fetal acidemia and hypercarbia. How these fetal physiologic effects of insufflation interact with the anesthetic effects reported here may warrant further investigation.

New Techniques/Technology-PS205

NEW APPROACH OF A 3D VIRTUAL COLOSCOPY: AUTOMATIC TREATMENT FROM THE MRI DATA Lamy J., Mutter D., Soler L., Rubino F., Vasilescu C., Roy C., Leroy J., Marescaux J. Clinique Chirurgicale A - IRCAD-EITS, Hôpital Civil, 67091 STRASBOURG, France.

Several methods enable to detect polyps in order to prevent colo-rectal cancer. Coloscopy is linked with a not inconsiderable morbimortality. Blood detection in the stools has an insufficient sensibility. Polyps detection through virtual coloscopy from CTscan data provide insufficient specificity and sensibility. We developed an original method carried out on the analysis of MRI data by a computer-based method enabling to detect and locate polyps automatically and to realize a virtual navigation in the colon.

An abdomen MRI is realized after having filled the colon with water. These digital data (Philips, 1.0 T, sequence TSE T1) are used by a computer software which: 1- reduces noise and increases image contrast by anisotropic diffusion; 2- uses automatic thresholding followed by an automatic form analysis through morphological, topological and geometrical constrains to identify and reconstruct the colon anatomy; 3- enables to navigate in the colon; 4- detects and locates automatically the polyps in the colon.

The images are composed of a piling up of 150 sections in a sagittal plane. Each section contains 512x512 voxels. The resolution in the section plan is of 0.88mm and the inter-section space is of 2mm. The colon wall does not appear because it is too thin. Polyps appear as a deformation at the colon's surface.

The first results obtained with this original method confirm the possibility to reconstruct the anatomy of the colon thanks to a fully automated system, to detect the polyps, and to precisely locate them using virtual navigation. The specificity of the program is still insufficient therefore leading to some false positives due to the position of the patient, to the presence of some air bubbles or to residual materials. An injection or the registration of two different images of the patient could enable to distinguish between polyps and artifacts thus increasing the specificity of the method.

New Techniques/Technology-PS206

TRI-DIMENSIONAL (3D) VIRTUAL CHOLANGIOGRAPHY: EVALUATION OF A NEW COMPUTERIZED TECHNIQUE F Rubino, MD, D Mutter MD, PhD, M Simone MD, L Soler PhD, C Roy MD, M Smith, MD, J. Leroy, MD, J Marescaux, MD. Chirurgie A, IRCAD-EITS, University Hospital, 67091 Strasbourg, France.

We developed a program for automatic reconstruction of the anatomy of the biliary tract as an alternative method for preoperative non-invasive evaluation of lithiasis of the common bile duct (CBD). This software allows virtual navigation into the lumen of the biliary tree, detection of stones, and interactivity.

Digital data acquired through a cholangio-MRI (Philips, 1.0 T, sequence TSE T2) are processed by a software which: 1- reduces noise and increases contrast by anisotropic diffusion; 2- identifies and reconstructs biliary vessels; 3- permits intra-luminal navigation in the biliary vessels and identifies bile stones. 26 patients with suspected lithiasis of the CBD were enrolled. MRI were evaluated by a radiologist and 3D reconstruction by a computer scientist blind to the radiologic evaluation. All patients underwent intraoperative cholangiography (IOC)or ERCP.

The software used for automatic 3D reconstruction of the biliary tract allowed excellent definition of the anatomy of biliary vessels greater than 3 mm. MRI revealed lithiasis of the CBD in 7 cases (4 confirmed by either ERCP or IOC, 3 false positive). With 3D reconstruction, CBD lithiasis was diagnosed in 8 cases (5 confirmed, 3 false positive at IOC or ERCP). Two false negative cases (failure to identify lithiasis of the CBD) occurred with cholangio-MRI, and one with 3D reconstruction. Concordance between the two methods in recognizing biliary stones was found in 4 cases, while both methods accurately predicted the absence of lithiasis in 18 patients (true negatives).

Our results show the feasibility of using a totally automated system for reconstruction of the anatomy of the biliary tract. It allows virtual navigation, automated stone recognition, and identification of anatomical abnormalities before surgery. It may represent a valuable alternative for non-invasive preop diagnosis of CBD lithiasis. Improvements of the program are likely to increase quality and precision of this new method.

New Techniques/Technology-PS207

INITIAL EXPERIENCES WITH ROBOT-ASSISTED LAPAROSCOPIC SURGERY; A REPORT OF 30 LAPAROSCOPIC CHOLECYSTECTOMIES WITH THE USE OF THE DA VINCI SYSTEM. J.P. Ruurda, M.D., I.A.M.J. Broeders, M.D., Ph.D., R.P.M. Simmermacher, M.D., Ph.D., I.H.M. Borel Rinkes, M.D., Ph.D., Th.J.M.V. van Vroonhoven, M.D., Ph.D. Department of Surgery, University Medical Center Utrecht, Utrecht, The Netherlands

Introduction: In order to cope with the limitations in laparoscopic surgery, researchers started developing new tools for laparoscopic surgery, starting with camera guidance systems. Finally this resulted in the development of robotic telemanipulation systems, which provide the surgeon with visualization and manipulation capacities comparable to open surgery. To demonstrate and evaluate technical feasibility of robotic assisted surgery, 30 laparoscopic cholecystectomies were performed.

Methods: 30 robot-assisted laparoscopic cholecystectomies were performed with the Da Vinci system (Intuitive Surgical, Mountain View, California) The system consists of a master-console, and a 3 armed robotic telemanipulator, located at the operating table. From the console, the surgeon directly controls the camera-arm and the two instrument arms with two manipulators. The surgeon's motions are transposed to the tips of tiny instruments, where the Endowrist system provides the surgeon with seven DOF. The double optic system provides a 3D image, integrated in the console. The natural eye-hand-target axis is hereby restored. Set-up time, OR-time, complications and technical problems were recorded and evaluated.

Results: In 29 cases (29/30; 97%) the cholecystectomy was completed laparoscopically. There was one conversion to an open procedure, caused by the surgeons' incapability to manipulate the gallbladder, due to severe cholecystitis. There were no robot-related complications. In three cases the replaceable blade of the electrocautery instrument detached, but could be removed during the same session. The time needed to install the robotic system decreased with experience of the OR-crew. Operating time was comparable in robot-assisted cases to time needed for laparoscopic cholecystectomy.

Conclusion: Technical feasibility of robot assisted laparoscopic cholecystectomy was repeatedly demonstrated. No significant problems were noted during these procedures. The system showed to enhance the surgeon's dexterity and visualization possibilities.

New Techniques/Technology-PS208

EVALUATION OF TIME-LOSS RELATED TO THE USE OF ROBOTICS IN LAPAROSCOPIC SURGERY. J.P. Ruurda, M.D., I.A.M.J. Broeders, M.D., Ph.D. Department of Surgery, University Medical Center Utrecht, Utrecht, The Netherlands

Introduction: Robotic surgery systems were introduced recently to overcome the disadvantages of laparoscopic surgery in the fields of manipulation and visualization. However, working with these systems is associated with time-loss related to robot-specific tasks, such as set-up of equipment and sterile draping of the system. Where time loss might be accepted in complex laparoscopic surgery, it can be undesirable in routine procedures, where the benefits of robot-assisted surgery are not yet established.

To exactly evaluate time-loss, and point out at what point of the procedure time-loss occurs, we compared 10 robot-assisted- to 10 standard laparoscopic cholecystectomies, with the objective to reduce time-loss to a minimum.

Methods: The robot-assisted procedures were performed with the Da Vinci robotic telemanipulation system This system consists of a surgeon console, integrating 3D vision, and a tableside robotic cart. The cart carries two instrument arms and a camera arm, which are all under the surgeon's direct control.

The total time at the operating room (total OR time) was recorded and divided in a pre-, per- and postoperative phase. These phases were further divided in smaller time frames to precisely evaluate time-loss.

Results: Median total OR time was significantly longer in robot-assisted cases compared to standard procedures (144 vs.119 minutes, p=0.041). Pre-, per and postoperative phases all contributed to this time-loss. Although laparoscopic dissection time was shorter in robotic cases, the total per-operative time was slightly longer, due to time-loss caused by attachment of the robot to the trocars and calibration of the 3D optical system..

Conclusion: Robotic surgery leads to time-loss in routine laparoscopic procedures, when performed in a standard OR setting. Analysis of the data indicated that time-loss can be minimized by efficient time management by the surgical team, improvement of the robotic system ergonomics and by working in dedicated OR's with integrated robotic equipment.

New Techniques/Technology-PS209

NEW METHOD OF VIDEOMEDIASTINOSCOPY USING SUBCU-DISSECTOR Yoshifumi Sano, M.D., Akio Ando, M.D., Motoi Aoe, M.D., Kazunori Okabe, M.D., Hiroshi Date, M.D., Nobuyoshi Shimizu, M.D., Department of Surgery II, Okayama University Medical School, Okayama, JAPAN

Introduction. Mediastinoscopy has become an important procedure for evaluating thoracic diseases and for staging of lung cancer. On the other hand, videoendoscopy has widely accepted in many fields of surgery. We developed a new method of videomediastinoscopy with SUBCU-DISSECTORr., and it was very useful for biopsy of mediastinal lymph nodes.

Materials and methods. We have done five cases of videomediastinoscopy with a new method for biopsy of mediastinal lymph nodes. The tool we have used for videomediastinoscopy is SUBCU-DISSECTORr. with a 30-degree oblique view thoracoscope (5mm in diameter). The procedure to reach for the space of mediastinum is as same as that of conventional mediastinoscopy. SUBCU-DISSECTORr. is moved forward just the front of the trachea, and perform the examination.

Results. There was no severe operative or postoperative complication with this method. The average time of procedure with this method was a little bit longer than that with the conventional one, however, the amount of bleeding was smaller.

Conclusions. There are many advantages using this method. As this method provides very clear and wide view, it is possible to detect anatomical structures such as the vessels and the nerves precisely. Therefore, we can perform the examination very safely and reliably. Moreover, it facilitates good movement of the endoscopic instruments for suction, hemostases, or biopsy. In addition, it is very useful for education, because many people can observe the procedures through monitors simultaneously.

New Techniques/Technology-PS210

DUAL HOLDER TELESCOPE/LIVER RETRACTOR IN LAPAROSCOPIC HIATUS HERNIA SURGERY – A NEW INEXPENSIVE AND PRATICAL DEVELOPMENT.

JOSE E.C. SANTOS, MMED(Surg.)Wits, A.J.RIBEIRO MD, Surg.Dept. Univerity of Witwatersrand, Johannesburg.

Laparoscopic hiatus hernia repair & floppy Nissen fundoplication, is a technically demanding procedure that usualy requires 2 experienced assistants(not always available in developing countries).A simple new dual holder of telescope and liver retractor with adjustable,variable lenght rods & clamps that can fix the liver retractor and the telescope in position whilst allowing adjustments of the same during the course of the operation was developed at our institution, with the assistance of Gimmi-Germany).This allows the need for only one assistant whilst maintaining the flexibility of adjustment of the telescope and change of port use.Ten patients were prospectively randomised to 2 groups having the conventional procedure done with two assistants the other one assistant and the use of the new dual holder.Lenght of time of procedure ease of use,problems and complications were analysed.On the conventional method the operating time was 2h37min(2h10min-2h55min)and with the new dual holder 2h10min(1h55-2h34min).With two assistants sliding of the liver retractor occured frequently requiring re-positioning.Laceration of the liver and the need for focusing adjustments.With the dual holder the position of the telescope was in the same fixed position 90% of the time and there was never need for adjustment of the position of the liver retractor.

Conclusion:The newly developed dual scope holder offers significant advantages in simplifying laparoscopic Nissen fundoplication in time saving particularly and in requiring only one assistant.

New Techniques/Technology-PS211

LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR USING A NEW BIOMATERIAL MESH. Philip Schauer MD, Sayeed Ikramuddin MD, Giselle Hamad MD, William Gourash CNP, James Luketich MD., The Minimally Invasive Surgery Center, University of Pittsburgh, Pittsburgh, PA

Early recurrences after suture repair of Paraesophageal Hernia have been reported to be as high as 20%. The use of synthetic mesh such as Marlex or Gortex to reinforce the hiatal repair and reduce recurrence has been associated with rare but devastating mesh erosion into the esophagus or stomach. The purpose of this preliminary study was to determine the safety, feasibility and early efficacy of using a mesh made of biomaterial to reinforce the hiatal repair to minimize or eliminate the risk of synthetic mesh related complications.

Methods: In this study, paraesophageal hernia repair involved a laparoscopic approach using 6 access ports and included gastric reduction, sac excision, crural closure with suture and reinforcement with a new biomaterial mesh followed by Nissen fundoplication with or without Collis gastroplasty. The biomaterial mesh (Surgisis, Cook Surgical, Bloomington, In) is composed of porcine small intestinal submucosa that is non-immunogenic and provides an acellular matrix that promotes native tissue in-growth for added strength and durability. The mesh was affixed to the crura utilizing titanium tacks (Protack, US Surgical, Norwalk, Con).

Results: From 6/2000 to 9/2001, nineteen patients with Giant Paraesophageal Hernia underwent repair utilizing the biomaterial mesh. All cases were performed laparoscopically without conversion. One intraoperative complication occurred involving a gastrotomy that was repaired laparoscopically without subsequent complication. With a mean follow-up of 8 months there have been no mesh related complications such as infection, erosion, or recurrent paraesophageal hernia.

Conclusion: Laparoscopic Paraesophageal Hernia repair utilizing biomaterial mesh is safe and feasible. It appears to be a promising new approach that may reduce recurrence rates while reducing the risk of mesh related complications attributed to synthetic material.

New Techniques/Technology-PS212

POINT OF CARE DATA COLLECTION FOR MINIMALLY INVASIVE SURGERY: THE DOMINIC PROJECT Christopher M. Schlachta MD, Joseph Mamazza MD, Steven Burpee MD, Kenneth Pace MD, Eric C. Poulin MD, The Centre for Minimally Invasive Surgery, St. Michael's Hospital, Toronto, Canada

OBJECTIVE: To develop an accurate and efficient system of electronic data collection for recording clinical outcomes in patients undergoing minimally invasive surgical procedures.

METHODS: The Database of Minimally Invasive Chirurgie (DoMinIC) evolved in three phases. Phase I (1991) begin with our very first attempts at laparoscopic splenectomy, colectomy, and thoracoscopic pulmonary lobectomy. This consisted of simple data sheets on which predetermined clinical endpoints were recorded in free format. Data was later transcribed into a computer spreadsheet. Phase II (1997) focused on broader data collection and a more efficient retrieval method. All patients having advanced laparoscopic procedures were recorded on modified and expanded data sheets specifically tailored to related categories of surgical procedures. Data was transcribed into a Borland Paradox database through a data entry form that closely mimicked the data sheets in hopes of reducing transcription error. Additionally, extensive use of check boxes, push buttons, and look-up lists was incorporated to speed data entry and ensure homogenous coding of data fields. Phase III of DoMinIC began in 2000. The main goal was to move toward a direct point of care data entry system that was simple for the end user as well as being readily accessible and easy to use.

RESULTS: All patients undergoing advanced minimally invasive procedures at our centre are captured at each encounter with data entry through a small fleet of Palm devices. Data is then transferred to our secure central database at regular hot synch intervals. The central database was rewritten in Microsoft Access to accommodate Pendragon Forms in which the Palm data entry front end was designed.

CONCLUSION: DoMinIC has evolved in our centre as an efficient and accurate means of point of care data entry. This system is easy to use, readily available and highly effective in tracking outcomes of patients having minimally invasive surgical procedures.

New Techniques/Technology-PS213

LAPAROSCOPIC RADIOFREQUENCY ABLATION OF THE LIVER IN PROXIMITY TO MAJOR VASCULATURE: EFFECT OF THE PRINGLE MANEUVER, Perry Shen MD, Shawn Fleming BS, Venkat Challa MD, Carl Westcott MD, Department of General Surgery, Wake Forest University School of Medicine, Winston Salem, NC

Pringle Maneuver (PM) is known to increase ablation size in radiofrequency ablation (RFA). A concern about RFA in close proximity to major vessels is the potential for thermal injury. Laparoscopic RFA with laparoscopic ultrasound guidance was performed in proximity to major hepatic vasculature to examine the effects of PM on ablation size, thermal RFA goals and vascular injury. Laparoscopic RFA was performed in 10 pigs. Each underwent ablation of 3 zones: peripheral, portal vein, and hepatic vein. Laparoscopic ultrasound was used to position the RFA 5 to 8 mm from the vascular structures. US flow characteristics were used to verify effective PM. Five were done with laparoscopically applied PM and 5 without. The liver underwent gross and microscopic evaluation Target ablation temperature of 105 centigrade was obtained for 10 minutes.

There were no significant differences in size for non-PM vs. PM RFA lesions. The average volume of the non-PM peripheral, hepatic vein and portal vein lesions was 5.3 cm3, 8.9 cm3 and 5.5 cm3. The average volume for the corresponding areas ablated using PM were 10.6 cm3, 4.9 cm3 and 11.1 cm3. Target temperature was acheived sooner using PM, 168s vs. 159s (p=.0084). Histology revealed early evidence of coagulative necrosis of the ablated lesions but no evidence of any vascular damage to hepatic or portal veins. In the 10 portal vein ablations, tissue damage was abutting the vein in 7 pigs and an average of 2.7 mm from the vein in 3 pigs. In the 10 hepatic vein ablations, tissue damage was abutting the vein in 6 pigs and an average of 2.3 mm from the vein in 4 pigs. Of note, in the peripheral lesions, 6 were noted to contain significant vasculature.

Laparoscopic RFA, with or without PM close to hepatic vessels does not appear to increase ablation size or cause acute vascular injury.

New Techniques/Technology-PS214

HISTOLOGICAL CHARACTERISTICS OF LAPAROSCOPIC COAGULATION WITH THE TISSUELINK (TM) FLOATING BALL(TM)
Carrie Sims MD, Nicholas Stylopolous MD, Julio Clavijo MD, Julie Fuchs MD, Cynthia Barlow MS, Harvard Center for Minimally Invasive Surgery and Massachusetts General Hospital, Boston, MA

OBJECTIVE OF THE STUDY: To determine the histological effects of laparoscopic coagulation of liver and splenic injuries using the TissueLink Floating Ball, a new electrosurgical device. The device provides a continuous saline flow to the electrode which keeps tissue temperature below 100 deg C and prevents sticking, arcing, charring and smoke formation.

METHODS: Nine anesthetized female domestic pigs (30–40 kg). After pneumoperitoneum and port placement, each received 3 liver tip amputations and 3 splenic wedge cut-outs. Each injury was followed by Floating Ball treatment until hemostasis was achieved. Monopolar coag power levels were 25–35 watts (liver) and 35–45 watts (spleen). A flow rate of 4 cc/min was used. Animals were sacrificed immediately post-procedure (acute), 1 wk, and 4 wk later. Depth of necrosis was measured from H & E stained sections. The qualitative characteristics of wound healing were assessed by a pathologist. Other variables included gross evidence of hemoperitoneum and adhesions. Results for depth of necrosis were analyzed (mixed model ANOVA) with terms for interval and organ.

RESULTS: The mean depth of necrosis for liver was 3.2 mm (acute), 6.0 mm (1 wk) and 5.3 mm (4 wk) and were not significant by interval. The results for spleen were 7.0 mm (acute), 7.0 mm (1 wk) and 2.7 mm (4 wk), with the 4-wk data significantly different from acute and 1-wk (P=0.001). No evidence of hemoperitoneum or serious adhesions were found. Acute injuries showed a typical pattern of thermal coagulation necrosis. All injuries healed well with injured tissue surrounded by well-defined bands of collagenous tissue at 1wk and 4 wks.

CONCLUSIONS: The Floating Ball is very effective in controlling bleeding from hepatic and splenic injuries in pigs and results in acceptable depth of necrosis with satisfactory wound healing.

New Techniques/Technology-PS215

ANORECTAL MALFORMATIONS -IS LAPAROSCOPIC PULLTHROUGH JUSTIFIED? Dr.K.R.Srimurthy, F.R.C.S., Dr.S.Ramesh, M.Ch., The Bangalore Hospital & Indira Gandhi Institute of Child Health, Bangalore, India

Minimally Invasive Surgery(MIS) has made a major impact in the approach to many complicated pediatric surgical procedures. Can the principles of MIS be applied to Anorectal Malformations especially when Posterior Sagittal Anorectoplasty(PSARP) of deVries & Pena is currently accepted as the gold standard?

We have done Laparoscopy Assisted Ano-Rectoplasty (LAARP) in 8 children (7 males & 1 female). Age range : 3 months to 1 year.

We mobilize the rectum Laparocopically till it cones in to a fistula, which is then ligated & divided. The muscle complex is identified using electrical stimulation through a small perineal dissection and the centre of this muscle complex is dilated under vision over a guide wire. The mobilized rectum is pulled through this tract and anoplasty is completed.

Of the 8 children only one of the early cases had a rectal recession. All the others have done well. Post operative MR Imaging have demonstated good postion.

LAARP is an innovative procedure and is as effective in results as the PSARP. Further, it offers excellent visualization of the fistula which can be ligated and divided under magnified vision without the risk of urethral injury. It allows accurate placement of the mobilized rectum through the centre of an intact Levator Ani / Sphincter complex. It also allows to deal with concurrent anomalies like undescended testis, hernia, renal anomalies etc.

New Techniques/Technology-PS216

LAPAROSCOPIC SURGERY USING A NEWLY DESIGNED SUCTION-LIFTER

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Since 1996, the authors have performed subcutaneous lifting, which was developed by Nagai et al, on approximately 300 patients undergoing laparoscopic abdominal surgery. Using a newly designed suction-lifter a new abdominal wall lifting has been performed on 60 patients with appendicitis, 22 patients with cholecystolithiasis, and 5 patients with perforated duodenal ulcer .

SURGICAL PROCEDURES : The suction abdominal wall lifter consisted of an 11cm diameter silicone rubber cup with a suction opening and a chain for lifting. We raised the abdominal wall under negative pressure of about 200 mmHg , and simple trocars inserted through the surrounding area, and then laparoscopic surgery was performed.

RESULT : The average operation time was 48.7min (range : 19 to 99min) for laparoscopic appendectomy, 89.2min (49 to 175min) for laparoscopic cholecystectomy, and 89.2min (69 to 115min) for laparoscopic closure of performed duodenal ulcer with the greater omentum.

DISCUSSION : Suction abdominal wall lifting has advantages over conventional lifting: (1) This new lifting technique allows surgeons to elevate the abdominal wall more quickly with fewer technical difficulties; and (2) Unlike conventional multiple area lifting, the suction lifter does not disturb manipulation of laparoscope and other surgical instruments, because it elevates the abdominal wall by single-area lifting.

CONCLUSION : Suction abdominal wall lifting is easy to use and applicable to various laparoscopic surgery.

New Techniques/Technology-PS217

A NEW THERMAL DEVICE FOR TISSUE WELDING, Michael R. Treat M.D. Department of Surgery, Columbia University, New York, New York

Tissue welding has become an accepted clinical tool for laparoscopic surgery. Clinically successful devices based on radiofrequency and ultrasonic energy are in use today. This presentation reviews tissue welding principles and describes the design and experimental results for a new device for welding blood vessels. In tissue welding, energy is used to denature and coagulate tissue proteins, thereby effecting hemostasis and bonding together of tissues including the walls of blood vessels. Regardless of the initial form of the energy, the final common pathway at the tissue level is thermal. The new device uses thermal energy directly and is capable of dividing a vessel while welding shut each divided end. The device uses a bell-shaped temperature profile in order to accomplish two simultaneous welds as well as subsequent division of the vessel. The central peak portion of the bell-shaped temperature profile performs the cutting while the welding is done on the lower temperature shoulders of the curve. Compared to other energy sources, the new device has the advantage of providing a simple, efficient and inexpensive means for the production of thermally based tissue welding effects, as well as also being able to divide the tissue without a mechanical cutter.

Experimentally, tissue welds were produced in 0.45mm to 0.75mm diameter mesenteric (n=110) and 2mm diameter gastroepiploic (n=4) vessels in a porcine model. Measurements of overall thermal damage width were made in all of the welds. Histological evaluation and bursting pressure measurements were done in a representative subset. Gross and histological measurements show a very limited extent (less than 1mm) of collateral thermal damage associated with satisfactory-appearing welds. All welds subjected to bursting pressure testing withstood pressures in excess of 300 mm Hg.

New Techniques/Technology-PS218

USE OF HEAD-MOUNTED DISPLAY IN TRANSANAL ENDOSCOPIC MICROSURGERY. Van Koesveld, J.J.M., M.D, Tetteroo, G.W.M., Ph.D., De Graaf, E.J.R., M.D. Department of Surgery, IJsselland Hospital, Capelle aan den IJssel.

To the operating team, endoscopic surgery is physically more demanding than conventional surgery, because of an increase in forced adjustments of position and eyes. The use of Head-Mounted Display (HMD) might decrease these adjustments. We investigated the feasibility of HMD in Transanal Endoscopic Microsurgery (TEM).

HMD is a voice controlled system with lightweight helmets with a built-in, adjustable monitor. Two separate lens- and camera systems within one endoscope provide overlapping images at the monitors, enabling a throughly three-dimensional view. The view within the helmet remains in direct line of sight of the eyes with stable focus distance, independent of position. During TEM, standard stereoscopic optic and HMD were alternated. Use of HMD was possible with few adaptations. The helmet was comfortable to wear. External view outside the built-in monitor was adequate. It was experienced a great relief to operate in upright and relaxed position with a constant view on the operating field. Position was only restricted by the manipulation of inserted instruments. Range of vision, depth of vision and resolution seemed comparable to the standard stereoscopic optic. Adjusting the HMD for optimum viewing required practice.

HMD is feasible in TEM. It enables a more relaxed position and view on the operative field. These initial findings encourage further investigation.

New Techniques/Technology-PS219

ROBOTIC VERSUS LAPAROSCOPIC HELLER MYOTOMY: REVIEW OF THE INITIAL EXPERIENCE, Santiago Horgan, MD; Daniel Vanuno, MD; Steven J. Schwulst, BA; Marcia Edison PhD; W. Scott Helton, MD., Minimally Invasive Surgery Center, Department of Surgery, University of Illinois at, Chicago, Chicago, IL

BACKGROUND: The DaVinci ® robotic system provides the following advantages: 360-degree range of motion in the articulated arms of the robot, a 3-dimensional magnified view, and elimination of tremor. Hence, we decided to utilize this system to perform robotic Heller myotomy and compare it to laparoscopic Heller myotomy in order to evaluate the efficacy of robotic surgery in Heller myotomies.

STUDY DESIGN: Prospective study of ten consecutive patients who underwent either robotic Heller myotomy or laparoscopic Heller myotomy between June 2000 and February 2001 for treatment of achalasia. Follow up information was obtained during office visits and a telephone survey was used to assess postoperative symptoms and satisfaction.

RESULTS: The indication for surgery was the presence of achalasia documented by esophagogram, manometry, 24 hour pH, and EGD in all cases. Myotomy was combined with a partial anterior Dor fundoplication in all ten cases. The mean operative time for the myotomy portion of the operation was significantly decreased in the robotic group with 17.8 minutes, while in the laparoscopic group the mean operative time was 33.6 minutes. Independent T-tests of our patients' postoperative symptom assessments, such as heartburn, dysphagia to solids, dysphagia to liquids, belching, and bloating, showed no significant difference between the robotic and laparoscopic groups. The mean hospital stay was 1.8 days in the robotic group and 2.4 days in the laparoscopic group. No esophageal perforations or major complications were observed.

CONCLUSIONS: This early experience suggests that robotic Heller myotomy provides similar results to laparoscopic Heller myotomy shortening the overall time of the myotomy portion of the operation. We believe that robotic surgery, with its ability to regain the hand-eye coordination and 3-dimensional view lost in laparoscopic surgery, allows us to perform Heller myotomy with greater precision, confidence and comfort.

New Techniques/Technology-PS220

LESS INVASIVE VIDEO-ASSISTED SURGERY FOR THYMIC DISEASES THROUGH MINI-STERNOTOMY -ESPECIALLY EXTENDED THYMECTOMY FOR MYASTHENIA GRAVIS- Masazumi Watanabe M.D., Ryohei Yozu M.D., Makoto Sawafuji M.D., Masafumi Kawamura M.D., Hirohisa Horinouchi M.D., Koichi Kobayashi M.D.Department of Surgery, School of Medicine, Keio University, Tokyo

Background: Mediansternotomy or standard thoracotomy has been using for surgery of the anterior mediastinum as a conventional approach. Recently thoracoscopic approach which usually needs approach from bilateral chest wall, has been introduced as a less invasive procedure. We present thymectomy through mini-sternotomy as a new approach to thymic diseases including Myasthenia Gravis (MG).

Methods: About 6 cm long skin incision was made and sternum was traversed at the second intercostal space level. Using original sternum lifting device, video-assisted thymectomy was performed via mini-sternotomy.

Results: This procedure was performed in 5 patients with MG (2) and thymic cyst (3). Extended thymectomy was performed in 2 patients with MG. Complication during surgery was not seen. Their post operative course was uneventful in 5 cases.

This procedure does not need approach through thoracic cavity. Treatment of thymic vein which is usually the most sensitive manipulation in thymectomy is easier than thoracoscopic approach.

Conclusion: This procedure may be useful from the standpoint of minimal access and good cosmetic results because of no scar in cervical region. Information about long term relief of the myasthenic symptoms, however, is not available.

New Techniques/Technology-PS221

ISOBARIC LAPAROSCOPY MADE EASY BY THE LAPAROTENSER. Wenger U, Waage A, Jersenius U, Arvidsson D., Department of surgery, Karolinska Hospital, Stockholm

Introduction: Isobaric* laparoscopy is potentially of great interest since pneumoperitoneum is avoided. This is of special interest in malignant disease and for patients with severe cardiopulmonary dysfunction. Abdominal wall-lifting replaces pneumoperitoneum.

Methods and procedures: The Laparotenser is a device were two pluriplan needles, inserted subcutaneously, and then attached to a lifting device, creates a working space within the abdominal cavity. Depending on its placement it can be used for surgery within various parts of the abdomen.

Results: The device has been tested by our group in 12 operations (cholecystectomy, fundoplication, staging of malignant disease and splenectomy). The procedures were done in the same manner as when using pneumoperitoneum, without an increase in operating time or change of instrumentation.

Conclusions: The Laparotenser, an Italian construction, is the best abdominal wall-lifting device that we have encountered. It warrants further testing and could open the road to more laparoscopic surgery for malignant disease such as gastric, pancreatic and hepatic cancer. (A short video-clip can be added to the presentation if of interest).

* used instead of gasless since the abdominal cavity is actually filled with air at room pressure.

New Techniques/Technology-PS222

LIGA-SUTURING DEVICE FOR ENDOSCOPIC SURGERY.
T. Yamakawa, MD, Department of Surgery, Teikyo University Hospital at Mizonokuchi, M. Hirata, Hirata Precisions Co. Ltd., Chiba, Japan

The spread of advanced endoscopic surgery is seemed to be very slow, mainly because of technical infancy. Especially technologies of knotting and suturing are one of the problems for the majority of endoscopic surgeons. To overcome these problems, an instrument for ligature and suturing was developed by Hirata Precisions Co. Ltd in Japan.

The total length of this instrument is 462 mm long. The grip, 162 mm long, is connected to 300 mm long metallic tube, 5 mm in diameter. A removable 28mm long bobbin with 5 ditches, 5 mm in diameter, is installed in the grip at the tip of the metallic tube. Moreover the slider, metallic board, which is also connected to the grip offers 5 steps longitudinal movement through the interior of metallic tube and bobbin, by maneuvering the lever installed in the grip to make a knot. First, the end of suture material with a needle is fixed at the tip of the slider. Then, the needle sews the tissue and is passed through the hole produced by slider and bobbin to wind the suture material around the slider. At the same time, with the inward movement of the slider, the suture material will come off from the bobbin and a knot will be established. Along the same theory, a single knot, a surgical knot, and a continuous and interrupted suturing can all be easily and simply carried out. Depending on the number of times the suture material is wrapped around the slider, different knots can be made. For example, if it is wrapped around one time, a single knot will result, two times produces a surgical knot, etc. Moreover repeated knottings can be also carried out if the Slider was returned to the initial stage by pushing rear handle installed in the Grip.

The authors believe that laparoscopic surgery can be more safely and securely carried out by the use of this new instrument.

New Techniques/Technology-PS223

INTRAVESICAL ENDOSCOPIC URETERIC REIMPLANTATION FOR OBSTRUCTIVE MEGAURETERS UNDER CARBON DIOXIDE PNEUMOVESICUM. CK Yeung, M.D., WG Manson, JDY Sihoe, YH Tam, KH Lee. Division of Paediatric Surgery, Department of Surgery, Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong, China

Currently, primary megaureter associated with ureterovesical obstruction that has not responded to conservative treatment is usually managed by ureteric reimplantation. The approach however necessitates a large vesicotomy and transgression of the peritoneal cavity and can be technically difficult in the small pelvis of a young child. Objective: To evaluate the effectiveness of intravesical ureteric mobilization and transtrigonal ureteric reimplantation under carbon dioxide insufflation of the bladder, or pneumovesicum, for the management of obstructive megaureters in infants and children.

Patients and Methods: A 10-month-old boy and a 1.5 year old girl with a unilateral obstructive megaureter underwent endoscopic Cohen's transtrigonal ureteric reimplantation with carbon dioxide pneumovesicum. The endoscopic procedure was preceded by distension of the bladder and insertion of a 5 mm Step port over the bladder dome under cystoscopic guidance. The bladder was then kept insufflated with carbon dioxide at 10-12 mm Hg pressure, with a balloon catheter inserted per urethra to occlude the internal urethral meatus. A 5 mm 30 degree scope was used to provide intravesical vision. Two more 3-5 mm working ports were then inserted. Intravesical mobilization of the ureters, resection of the hypoplastic or obstructive segments of lower ureter, and dissection of submucosal tunnel were performed under endoscopic vision with CO_2 pneumovesicum. A Cohen's type of ureteric reimplantation using interrupted 5 zero poliglecaprone or polydioxanone sutures was then performed. Bladder drainage by an urethral catheter was maintained for 48 hours post-operatively.

Results: Endoscopic transtrigonal ureteric reimplantation with carbon dioxide pneumovesicum was successfully performed in both patients. Both patients recovered uneventfully and remained well. Follow-up radioisotope scans confirmed satisfactory drainage with no more hold-up at the ureterovesical junction.

Conclusions: This preliminary experience illustrates that endoscopic intravesical ureteric reimplantation with carbon dioxide pneumovesicum can be a safe and effective management option for obstructive megaureter in infants and young children. The long-term outcome and potential physiological effects of carbon dioxide pneumovesicum on the bladder and upper tract function will need to be further evaluated.

New Techniques/Technology-PS224

ENDOSCOPIC INTRATHORACIC SURGERY UNDER NEGATIVE PRESSURE AND SPONTANEOUS RESPIRATION Masayoshi Yokoyama, M.D., Takashi Adachi, M.D., and Takamasa Ohnuki, M.D., Department of Surgery 1, Tokyo Women's Medical University, Tokyo, Japan

Purpose: As epicardial pacing would be helpful in surgical cases requiring multisite pacing, this study was aimed to determine if an epicardial lead could be fixed under negative pressure and spontaneous respiration without general anesthesia for experimental dogs.

Methods: After administering intravenous injection of pentobarbital sodium, experimental dogs were placed in the supine position. Intratracheal tubation was not employed. A thoracic port with an internal diameter of 20mm was inserted through the left, fifth intercostals space at the midclavicular line. The heart surface was clearly visible through this port. Under normal conditions, dogs could not survive for more than several minutes as positive intrathoracic pressure would contact the lungs resulting in respiratory failure. By applying Bernoulli∞fs theorem (pitot tube), negative intrathoracic pressure could be maintained inside the port and the pleural cavity by blowing a constant air flow of 3 l/sec across the mouth of the port.

Results: Sp02 measured on the tongue remained above 93% throughout the procedure. Normal respiratory function of dogs was restored and intrathoracic fiberscope revealed lung movement during the air flow. The port could be capped if necessary. It was very easy to fix a screw-in epicardial electrode on the left ventricular wall with the heart surface positioned just beneath the thoracic wall. It required less than 6 minutes.

Conclusion: By blowing air across the opening of an intrathoracic port, negative pressure can be maintained in the pleural cavity. This procedure made it possible and simple to place a screw-in epicardial lead to the myocardial wall under negative pressure and spontaneous respiration without general anesthesia.

Solid Organ Removal-PS225

LAPAROSCOPIC SPLENECTOMY Abdullah AlDohayan, MD; Mohammed AlSebyl, MD; Othman Noraldin, MD; Amal Abdulkarim, MD; Ahmed AlOtaiby, MD; Mohammed AlSkaini, MD; Ali AlTuwaijri, PhD; Abdulaziz AlSaigh, MD, Department of Surgery and Physiology, King Khalid University Hospital, Riyadh, Saudi Arabia

Objective: Splenectomy is indicated when medical treatment does not help patients. Failure rate of splenectomy is high, up to 20%. Laparoscopy can minimize the impact of surgery. Splenectomy was the first line of treatment in managing patient with splenic disease, indicated surgically.

Methods: Seventy four patient were having idiopathic thrombocytopenia purpura, thalassemia, sickle cell anaemia and amylofibrosis were undergone laparoscopic splenectomy.

Results: One patient was opened due to bleeding from pancreatic injury. The average hospital stay was 2 to 14 day (3.2) days.

Conclusion: Laparoscopic splenectomy is a suitable operation for patients needing splenectomy and avoiding laparotomy, and should be the suitable way in managing surgical spleen.

Solid Organ Removal-PS226

LAPAROSCOPIC DONOR NEPHRECTOMY DOES NOT ADVERSELY AFFECT LONG-TERM QUALITY OF LIFE. Robert L Bell M.D., Eugene Cho M.D., Christopher Lutcavage M.D., Kate E Reinhardt R.N., Stephen Jacobs M.D., and John L Flowers M.D., Department of Surgery, University of Maryland School of Medicine, Baltimore, Maryland

Introduction: Laparoscopic donor nephrectomy (LDN) is being increasingly performed. Though multiple studies have confirmed the feasibility of LDN, to date, no data exist that describe long-term donor quality of life. Clinical measures of outcome may not sufficiently reflect the complete impact of surgery. The short form 36 (SF-36) is a widely used, well-validated tool for measuring outcomes in eight specific health areas. The aim of this study is to determine quality of life in a single institution cohort five years after surgery.

Methods: A total of 69 patients underwent laparoscopic donor nephrectomy between March, 1996 and March, 1997. Five years after surgery, 37 patients completed follow-up questionnaires. Outcome was evaluated with respect to sex, age, length of hospital stay, return to work, and annual income. A two-tailed, paired t test was used to make statistical comparisons.

Results: The study cohort comprised 24 females and 13 males, with a mean age of 46.7 years and a mean annual income of $46,875. The postoperative length of stay and return to work averaged 2.9 days and 18.5 days, respectively. Four of the eight SF-36 health categories (physical functioning, role functional-physical, bodily pain, and role functional-emotional) were significantly higher than the general population and four of the eight health categories (general health, vitality, social functioning, and mental health) were no different than the general population. Sex, age, length of hospital stay, return to work, or annual income had no relationship to outcome.

Conclusions: Patients who have undergone laparosopic donor nephrectomy do not experience a decreased quality of life, five years after surgery, as determined by the SF-36 questionnaire.

Solid Organ Removal-PS227

LAPAROSCOPIC MANAGEMENT OF GRADE III AND IV SPLENIC INJURIES IN THE HEMODYNAMICALLY STABLE TOURIST Helmuth T. Billy M.D., Donald J. Waldrep M.D., Steve C. Patching M.D. Sacramento /Sierra Advanced Laparoscopic Surgery Associates, Sacramento, California

The efficacy of non-operative management of isolated splenic injuries has been well established. The exact timing of discharge, ability to limit activities and extent of follow up poses a problem for the tourist patient who is on vacation and has considerable distance to travel home. Careful laparoscopic examination of the grade III or IV fractured spleen in the hemodynamically patient allows for immediate control of hemorrhage and removal of devitalized tissue.

Four patients on vacation at a ski resort sustained isolated grade III and IV splenic injuries during falls while snow skiing. All patients were hemodynamically stable during their initial evaluation. Preoperative studies included CBC and double contrast helical CT scans. Three patients underwent immediate laparoscopy. One patient was managed non-operatively, but developed a delayed splenic rupture seven days after injury which was subsequently managed laparoscopically. Laparoscopic partial splenectomy and splenic salvage was possible in three patients. One required laparoscopic splenectomy despite efforts at splenic salvage. Intraoperative cell saver was employed in all patients and no postoperative transfusions were required. Operative time ranged from 130 –180 minutes. Postoperative hospital stay ranged from 2 to 5 days. There were no subsequent episodes of delayed splenic rupture or rebleeding. All patients traveled home by car or commercial air without incident.

The out of town trauma patient with an isolated splenic injury who is hemodynamically stable can be effectively managed using diagnostic laparoscopy and control of hemorrhage. Laparoscopic management of splenic injuries may decrease the need for transfusions and lower the incidence of delayed splenic rupture in those patients who want to travel home following non-operative management of a splenic injury.

Solid Organ Removal-PS228

LAPAROSCOPIC DONOR NEPHRECTOMY IN THE SUPER MORBIDLY OBESE Joseph F. Buell MD, Steven R. Potter MD, Kieth Gersin MD, Horatio Rilo MD, Rino Munda MD, Michael J. Hanaway MD, E. Steve Woodle MD., Division of Transplantation, Department of Surgery, The University of Cincinnati, Cincinnati, Ohio

Technical aspects have dissuaded many from approaching the obese donor (BMI >32) let alone the super morbidly obese (BMI >35) patient. Hand-assisted laparoscopic (HAL) donor nephrectomy has minimized our resistant to these donors Methods: Review of 100 HAL examined pt demographics, operative times, complications, donor recovery between BMI's > and < 35 Statistics used were student's t-test. Results: 13 donors with BMI > 35 (Super Morbidly Obese; SMO) were identified and compared to 87 donors with a BMI < 35 (NMO). SMO M:F distribution was equal 1:1 vs. NMO 2.5:1 with similar age. A higher percentage of right HAL were performed in the NMO group 15% vs. 8%. The OR time = 4.2 vs. 3.8 hrs; $p<0.05$, extraction and warm ischemia time 3:47 vs. 2:45; $p<0.05$ were longer. EBL (140.4 vs. 138.8 cc), fluid resuscitation (3.4 vs. 3.4 L), and urine output (1.1 vs. 1.0L) were similar. Complications were significantly higher in the SMO group 5/13:38% vs. 22/88; 25%; $p< 0.05$. Positioning complications, splenic injuries and extraction difficulties were common in this group. PTX, bleeding and ileus were the most commonly encountered in the NMO group. Return to diet (15.8 vs. 17.1 hrs) and length of stay (54.4 vs. 51.6 hrs) were similar. Return to driving a car (13.2 vs. 11.8 d) was longer but return to work (26.3 vs. 30.6 d) was slightly shorter. Immediate graft function was present in all SMO and 99% of the SMO organs. A higher mean Cr is noted at day 1 (4.6 vs. 3.6;p=NS), 7 (1.5 vs. 1.4;p=NS), and 30 (1.6 vs 1.2;$p<0.06$). By 2 months creatinines equalized through the first year of follow-up. Conclusions: This study demonstrates that there is a significant increase in operative times warm ischemia to the graft and donor complications. These factors may result in diminished graft function. Despite the small numbers of patients in the SMO group the donor surgeon should be circumspect about patients with BMIs >35 and avoid those >40.

Solid Organ Removal-PS229

FACTORS PREDICTING RESPONSE OF LAPAROSCOPIC SPLENECTOMY IN PATIENTS WITH IMMUNE THROMBOCYTOPENIC PURPURA (ITP) TERIVE DUPERIER, MD. MIKE ROSEN, MD. FRED BRODY, MD. R MATTHEW WALSH, MD. ALICIA FANNING, MD. JENNIFER MALM, RN. JEFFREY PONSKY, MD., DEPARTMENT OF GENERAL AND MINIMALLY INVASIVE SURGERY, THE CLEVELAND CLINIC FOUNDATION(CCF), CLEVELAND, OH

There are little data examining factors that predict successful response to laparoscopic splenectomy (LS) for ITP. This study examines preoperative factors that may predict a successful response to LS in ITP patients.

A retrospective review of 67 patients undergoing LS for ITP from 8/95–8/01 was conducted. A response to splenectomy was defined as a postoperative platelet (PLT) count>100,000/mcl without medical therapy. Patients considered refractory to splenectomy did not achieve a PLT count >100,000/mcl without medical therapy. Patients with recurrent ITP initially achieved a PLT count >100,000/mcl but subsequently became thrombocytopenic during follow up. Both univariate and multivariate analysis were performed for 13 preoperative variables.

At a mean follow up of 22 months, 43(64%) patients responded to LS, 14(21%) were refractory, and 10(15%) developed recurrent ITP. Univariate analysis revealed that patients responding to LS were younger (mean age 43 vs 59 yr,p=0.005), had a higher mean preoperative PLT count (98,000 vs 48,000/mcl,p=0.005), and initially responded to steroids, but relapsed with tapering (70 vs 38%; p=0.004) as compared to those patients who failed LS. Refractory patients were older (mean age 55 vs 44 yr,p=0.05), had a lower mean postoperative PLT count (113,000 vs 540,000/mcl,p=0.0003), and did not respond to preoperative intravenous gamma-globulin. Patients with recurrent ITP were older (mean age 64 vs 44 yr,p=0.01). On multivariate analysis, a younger mean age (43 vs 59 yr,p=0.005) and a higher mean preoperative PLT count (98,000 vs. 48,000/mcl, p=0.007) predicted a response to LS. Refractory patients had a lower mean preoperative PLT count (36,000 vs 98,000/mcl,p=0.01) and had a higher mean age (55 vs 44 yr,p=0.03). In addition, a higher mean age (64 vs 44 yr,p=0.03) predicted recurrent ITP.

A long-lasting response to LS for ITP was seen in patients younger than 50 years of age with preoperative PLT counts>70,000/mcl.

Solid Organ Removal-PS230

LAPAROSCOPIC SPLENECTOMY FOR PATIENTS WITH EVANS SYNDROME TERIVE DUPERIER, MD. MIKE ROSEN, MD. FRED BRODY, MD. R MATTHEW WALSH, MD. ALICIA FANNING , MD. JENNIFER MALM, RN. JEFFREY PONSKY, MD., DEPARTMENT OF GENERAL AND MINIMALLY INVASIVE SURGERY, THE CLEVELAND CLINIC FOUNDATION (CCF), CLEVELAND, OH

Evans syndrome is a rare, chronic, sometimes fatal, immunologic disorder defined as Coombs' positive hemolytic anemia and immune thrombocytopenia without an underlying etiology. This syndrome has a variable clinical course and the benefit of splenectomy is unknown. This study reviews the clinical outcomes for laparoscopic splenectomy (LS) for Evans syndrome.

A retrospective review was conducted of patients undergoing laparoscopic splenectomies for autoimmune hemolytic anemia (AIHA) and immune thrombocytopenic purpura (ITP) at the Cleveland Clinic Foundation from August 1995 through August 2001. Data collected included patient demographics, surgical indications, operative details, and postoperative follow up.

Five patients underwent laparoscopic splenectomies for Evans syndrome. There were 2 males and 3 females with a mean age of 44 yrs (range 17-66). The mean duration of disease was 38 months (range 2-120). The mean preoperative platelet count was 82,000/mcl (range 2,000-230,000/mcl). Average operative time was 162 minutes (range 61-269), mean EBL was 100 cc (range 50-150), and there was one accessory spleen identified. The mean morcellated splenic weight was 299 grams (range 61-493). There was no morbidity or mortality. At mean follow up of 18 months (range 1-31) after LS, two patients had normal platelet counts (>100,000/mcl) requiring no further medical therapy. Two patients did not respond to LS and remain on medical therapy. One patient initially responded to LS but became thrombocytopenic at 18 months and required further medical therapy. After 2 months of treatment, this patient is currently in remission at 10 months follow up.

Laparoscopic splenectomy for Evans syndrome is safe and technically feasible. The clinical outcome for patients with Evans syndrome following splenectomy is unpredictable. This select cohort of patients requires extensive long-term follow up to determine the merits of splenectomy.

Solid Organ Removal-PS231

LIVING RELATED ROBOTIC DONOR NEPHRECTOMY E. Elli, MD; R. Berger, MD; E. Benedetti, MD, S. Horgan, MD, Minimally Invasive Surgery Center, University of Illinois at Chicago, Illinois

Introduction: We present our early experience of 17 minimally invasive donor nephrectomies using the da Vinci Surgical System (tm) with hand port assistance.

Methods: Between January and August 2001, 17 patients underwent robotic donor nephrectomy. A hand port assisted, transperitoneal technique was used on all patients. A retrospective review evaluated donor demographics, preoperative workup, intraoperative times and complications, and postoperative recovery and complications.

Results: Seventeen patients underwent left robotic donor nephrectomy. No patient required conversion, either to conventional laparoscopy or to an open operation. There were eleven males; mean age of 33.7, only four patients had duplicated renal arteries on preoperative CT scan, Preoperative creatinine level ranged from 0.6 to 1.2 with postoperative creatinine from 1.0 to 1.9. Average operation time was 218.8 minutes. Blood loss was less than 50 ml in all procedures. Warm ischemic time was from 1 to 1 and a half minutes. No intraoperative complications occurred. Length of stay ranged from 0.8 to 6.3 days (average 2.5). Three patients had an ileus that prolonged their hospital stay (4.3 o 6.3 days). Two patients required readmission, one with abdominal pain and one with dehydration secondary to vomiting.

Conclusions: Robotic donor nephrectomy affords a new operation with results comparable to conventional hand assisted laparoscopic donor nephrectomy. The hand-assisted technique in conjunction with the da Vinci Surgical System (tm) allows for a safe and rapid organ harvest with minimal ischemia time. Collection and analysis of data with future cases will continue. We believe that as we gain more experience with this technique and technology, the postoperative complications and the duration of the procedure may decrease.

Solid Organ Removal-PS232

LAPAROSCOPIC VERSUS OPEN SPLENECTOMY FOR ITP: A CASE-MATCHED COMPARISON Liane S Feldman MD, Sarah Hagarty MD, Jacob Garzon MD, Gerald M Fried MD, Department of Surgery, McGill University, Montreal, Quebec

Introduction: Laparoscopic splenectomy (LS) has emerged as the treatment of choice for ITP despite the absence of randomized comparison to open splenectomy (OS). The purpose of this study is to compare the results of LS to OS in two similar groups of patients undergoing splenectomy for ITP in the past decade.

Methods: Since 1997, 21 patients with ITP have undergone LS, and are followed prospectively. These patients were matched by gender and age to 21 patients with ITP treated by OS since 1990, identified through retrospective chart review of all splenectomies performed for hematologic disease. Patients with concomitant rheumatologic disease or HIV were excluded. Data were compared using the Fishers exact and Mann-Whitney U tests. Results are expressed as medians.

Results: The two groups were well matched for age, gender, duration of disease, and Charlson comorbidity score (p>0.5). At operation, 1 accessory spleen was removed in each group. The estimated blood loss was less in the LS group (125 versus 200 cc, p=0.05) while the operating time was longer (95 versus 70 min, p<0.01). Serious complications were noted in 1 patient after OS (bleeding requiring transfusion) and in 2 patients after LS (bleeding requiring transfusion, and bowel obstruction into a trocar site, resulting in laparotomy). The postoperative length of stay was shorter after LS (2 versus 6 days, p<0.01). At last follow-up, 14 patients in the OS group and 18 in the LS group (p=0.23) had a complete hematologic response (platelets > 150000 on no medications), with significantly longer follow-up in the OS group.

Conclusion: In 2 similar groups of patients undergoing LS or OS for ITP in recent years, LS was associated with earlier hospital discharge, with no compromise in safety or hematologic outcome.

Solid Organ Removal-PS233

TREATMENT OF ADRENAL METASTATES BY LAPAROSCOPIC TRANSPERITONEAL ANTERIOR APPROACH. Francesco Feliciotti, M.D., Mario Guerrieri, M.D., Maddalena Baldarelli, M.D., Alessandro M. Paganini, M.D., *Emanuele Lezoche, M.D. Clinica di Chirurgia Generale, University of Ancona, Ancona, Italy. * II Clinica Chirurgica, University of "La Sapienza", Roma, Italy.

Laparoscopic surgery changed the approach to the adrenal gland. The recente literature demostrated the safety and the effectiveness of this procedure for benign adrenal disorders: aldosteronoma, pheochromocytoma, Cushing's disease and incidental adrenal mass. Aim of this study was to evaluate the feasibility and results of 5 laparoscopic adrenalectomies performed for solitary metachronous adrenal metastases.

Between January 1994 to June 2001, 142 consecutive patients (pts) underwent laparoscopic adrenalectomy by anterior transperitoneal approach. In 5 pts indications were solitary adrenal metastases. The metastatic sources were the followings: melanoma of the back, gastric cancer, renal, lung and breast cancer, respectively. Three males and 2 females were operated; average age was 57 years (range, 44-70). Three pts underwent right adrenalectomy and 2 pts left adrenalectomy.

No conversion to open surgery occurred. No mortality nor intraoperative complications were observed. Mean operative time was 103 minutes (range, 70 -150) for right adrenalectomy and 172 minutes (range 90-280) for left adrenalectomy. No postoperative complications occured. Mean diameter of the tumor was 3.5 cm (range 2-5). All surgical margins were free of cancer. Average hospital stay was 2 days (range 2-3). Two pts died after 15 months and 24 months for systemic metastases. The other 3 pts, at mean follow-up of 4 months (range 2-6) are aliving. Nobody of the 5 pts presented with port site or local recurrence.

In our experience adrenal metastases can be treated safety and effectively by laparoscopic anterior transperitoneal approach. This access allows to explore the contralateral gland and the entire abdomen for accurate staging of disease. Moreover the anterior approach permits the early ligature of main adrenal vein and the rapid conversion to open surgery.

Solid Organ Removal-PS234

RIGHT HEPATIC DUCT EMPTYING INTO CYSTIC DUCT-REPORT OF A CASE- Masaji Hashimoto, M.D., Ph.D., Tsuyoshi Ishikawa, M.D., Toshiro Iizuka, M.D., Masamichi Matsuda, M.D., Goro Watanabe, M.D., Department of Digestive Surgery, Toranomon Hospital, Tokyo, Japan

Background: Anomalous insertion of the right hepatic duct into the cystic duct is a rare anatomical variation. Only 9 cases have been reported in the literature so far. In the patients presenting this anomaly, one may accidentally transect the right hepatic duct during cholecystectomy.

Methods and Results: We encountered a case of anomalous insertion of the right hepatic duct into the cystic duct, which was clearly demonstrated the intraoperative cholangiography. As the half-cut point of the cystic duct happened to be on the gallbladder side of the cystic duct, cholecystectomy was accomplished laparoscopically.

Conclusions: In anomalous insertion of the right hepatic duct into the cystic duct, hepatic duct transection could happen. Preoperative precise evaluation of the biliary duct, awareness of potential biliary variations and identifying all anatomic structures before ligation and division were essential to prevent bile duct injury.

Solid Organ Removal-PS235

LAPAROSCOPIC MANAGEMENT OF SPLENIC TRAUMA: CASE REPORT AND REVIEW OF THE LITERATURE Patrick G. Jackson, M.D. Department of Surgery, Massachusetts General Hospital

The role of laparoscopic management of splenic injuries remains an area of debate. While studies show that laparoscopic splenectomy can be performed with fewer complications and less blood loss, the increased operative times associated with laparoscopic splenectomy may preclude its widespread use in the trauma patient. We present a case report of a grade II splenic laceration managed by laparoscopy.

Case report: A 71 year old male presented to the Emergency Ward complaining of multiple episodes of dizziness, near syncope and multiple falls over the previous six months. His past medical history was significant for atrial fibrillation. His medications included Atenolol, Digoxin, and Coumadin. His physical examination was remarkable for an irregularly irregular rhythm, and tenderness to palpation over his left upper quadrant. An abdominal CT scan showed a grade II splenic laceration involving the upper pole, with minimal extravasation. He was admitted to the hospital where he remained hemodynamically normal with a stable hematocrit. With a need for lifelong anticaogulation and the history of multiple falls, the decision was made to perform a splenectomy. He was brought to the operating theater where he underwent a laparoscopic splenectomy. The estimated blood loss was 100 mls, and the operative time was 105 minutes. The patient recovered uneventfully.

Discussion: The use of laparoscopy in the management of splenic injuries from blunt trauma is poorly defined. Large studies comparing laparoscopic with open splenectomy has shown a lower complication rate, and reduced blood loss but longer operative times with laparoscopic splenectomy. As most abdominal procedures in the setting of trauma focus on initial control of damage, the increased operative times may jeopardize patient care. While the definitive role of laparoscopic splenectomy remains unclear, the case presented suggests that laparoscopy can be used safely in the management of splenic trauma.

Solid Organ Removal-PS236

LAPAROSCOPIC SPLENECTOMY: THE EARLY EXPERIENCE. A Jensen, BS, PK Papasavas, MD, PF Caushaj, MD, J Maurer, PA-C, RJ Keenan, MD, RJ Landreneau, MD, DJ Gagné, MD Minimally Invasive Surgery Program, West Penn Allegheny Health System, Pittsburgh, PA.

The laparoscopic technique has rapidly become the standard of care for splenic removal. We reviewed the outcome of laparoscopic splenectomies in patients with a wide range of hematologic or splenic disorders.

Data was gathered prospectively for 21 consecutive laparoscopic splenectomies performed between June 1999 and August 2001. Indications for splenectomy included warm autoimmune hemolytic anemia (WAHA N=7), idiopathic thrombocytopenic purpura (ITP N=7), thrombotic thrombocytopenic purpura (TTP N=2) and 5 other hematologic disorders (hereditary spherocytosis, acute lymphocytic anemia, hypersplenism, lymphoma, and splenic cyst).

Mean Values

	N	OR Time	Spleen Size	EBL	Preop Plt	Postop Plt	Preop Hct	Post-op Hct	F/U	LOS days
ITP	7	167	192 g	201	68	125	N/A	N/A	15	4.4
TTP	2	240	373 g	425	111	110	N/A	N/A	14	19.0
WAHA	7	250	705 g	39	173	381	27.2	25.9	47	7.4
Other	5	224	790 g	275	174	302	31.6	37.1	135	2.8

Six cases (29%) required hand assisted extraction to facilitate removal of the specimen (mean weight 1227g). No cases required conversion. Two accessory spleens (9.5%) were found and removed. Postoperative complications occurred in eight patients (38%) and included subdural hematoma (2), pneumonia (1), sepsis (1), urinary tract infection (1), respiratory failure (1) and herniated trocar site (1). Two patients (9.5%) died due to postoperative complications not related to splenectomy. One patient died secondary to a subdural hematoma after a fall and another patient suffered respiratory failure due to preexisting pulmonary aspergillosis.

Laparoscopic splenectomy can be safely performed to treat hematologic diseases with acceptable morbidity and mortality.

Solid Organ Removal-PS237

LAPAROSCOPIC ADRENECTOMY (RETROPERITONEAL APPROACH) Remi Katori, Kazunori Furuta, Tetsuya Tomonaga,Takumo Enomotoi,Hiroki Hoshino, Koichi Itabashi, Ken Shimada, Tsuyoshi Takahashi, Akira Kakita, Department of Surgery,Kitasato University Hospital, Kanagawa,Japan

Since Clayman et al. reported the technique of laparoscopic nephrectomy in 1991,some reports showed adrenal tumor were resected in laparoscopically.But these all reports were reached to retroperitoneal space using transabdominal approach.After that, we would be able to operate in retroperitoneoscopically,same as transabdominal approach.

We present our case of retroperitonel approach for right adrenal tumor.

Left semi-lateral position under general anesthesia, the first cutaneous incison is performed at right subcostal line on the middle axillary line. After incision, the finger are inserted into retroperitoneal space directry, and dissecting balloon is inserted and insufflated. The between tumor and retroperitonium is dissected. After dissecting balloon is removed, the first trocar with balloon is inserted and insufflated with CO2. Retroperitoneal cavity for operation is made. At this point, the laparoscope is inserted through the trocar. After making retroperitoneal space, other two trocar are inserted as operative trocar on the posterior axillary line. Using these trocar, the tumor is dissected and adrenal vein is clipped and cut off. This technique is indicated for patients whose the tumor is diagnosed benign tumor preoperatively. We think that it is possible to resect the tumor that size of until about 5cm in a diameter in this technique

The advantage of retroperitonal approach are not injury of intraperitoneal organs, be not influenced by intraperitoneal operative adhesion, reduce operation time and near the adrenal gland. And the patients can recover earlier than intraabdominal approach.

Solid Organ Removal-PS238

IMPACT OF THE INTRODUCTION OF LAPAROSCOPIC NEPHRECTOMY WITHIN A COMMUNITY-BASED TEACHING HOSPITAL Kent W. Kercher MD, Trina I. Smith MS, Chris M. Teigland MD, Pierce B. Irby MD, Brent D. Matthews MD, B. Todd Heniford MD, Departments of Surgery and Urology, Carolinas Medical Center, Charlotte, NC

Despite the proven advantages of laparoscopic nephrectomy, the absence of local expertise has delayed the introduction of this technique into many institutions.

Data were collected prospectively on all laparoscopic nephrectomies performed during the first 13 months following introduction of the technique into our institution. Procedures were performed as a collaborative effort between an advanced laparoscopic surgeon and either a transplant surgeon or urologist. All open nephrectomies performed during the same period were analyzed by retrospective chart review.

From August 2000 to September 2001, a total of 61 laparoscopic nephrectomies were performed. None were performed during the prior year. Cases included donor nephrectomy (n=25), radical nephrectomy (n=19), simple nephrectomy (n=10), nephroureterectomy (n=6). There were 38 open nephrectomies during the same interval. Clinical endpoints and changes in the volume of laparoscopic versus open cases are compared in the table.

Variable	Laparoscopic	Open	p-value
Age (years)	53.2 (27-90)	52.5 (29-78)	NS
Length of Stay (days)	3.39 (2-7)	5.39 (3-9)	0.0001
Complications	7 (12%)	17 (44%)	0.002
# cases first 6 months	20	24	
# cases last 7 months	41	14	0.003

When combined with existing urologic and/or transplantation expertise, the introduction of laparoscopic renal surgery can result in substantial improvement in patient outcomes. Multidisciplinary collaboration has the potential to generate new clinical volume for minimally invasive general surgeons, promote sub-specialization within minimally invasive surgery, and dramatically change urologic practice patterns within a short period of time.

Solid Organ Removal-PS239

PROS AND CONS OF VIDEO-ASSISTED-NECK-SURGERY.

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【Intro.&Aim】 We have introduced Video-Assisted-Neck-Surgery (VANS)procedure since 1997 in pursuit of a better cosmetic outcome. However the cosmetic outcome of VANS procedure is clear, but another merit is still unknown. We investigated pros and cons of VANS procedure. 【Method】 We have compared VANS and conventional neck surgery retrospectively in several factors. 【Objective】 We have performed 30 cases of VANS procedure (A group), in the same period we have performed 22 cases of conventional neck surgery(B group). Between these two groups we compared several factors. 【Rezult】 There was not significant difference about oral intake (p=0.22), first walking (p=1.00), pain killer(times:p=0.47, period of usage:p=0.21), drain(p=0. 34), Labo.data (WBC:p=0. 78, CRP:p=0.19)between two groups. But hospital stay of A group (4.1±1.9 day) was shorter than B group (5.4± 2.6 day) (p=0.035). 【Conclusion】 Unfortunately we could not perform randomized trial, because most patient, especially in case of female, have selected VANS procedure. In this study, the VANS procedure contributed to shortening hospital stay only one day statistically. However considering progress and inprovement of our technique, thre is no difference between two groups except cosmetic outcome.

Solid Organ Removal-PS240

DEVELOPING A PROGRAM FOR LAPAROSCOPIC NEPHRECTOMY IN A MEDICAL STAFF MODEL HMO, David M Lauter MD, Marc A Lowe MD, Eric J Froines MD, Department of General Surgery and Department of Urology,Group Health Cooperative of Puget Sound Seattle, WA

Introduction: We present the development of a program for laparoscopic nephrectomy through collaboration between urologists without prior laparoscopic experience and general surgeons with advanced laparoscopic experience. Our program goals were 1) to perform the operation with outcomes comparable to those reported in the literature, 2) continue to maintain the role of the urologist as the primary provider of surgical treatment for urologic disease, and 3) to build a foundation for further advanced laparoscopic urologic procedures.

Methods and Procedures: All procedures were evaluated for patient demographics, operative time, and operative team composition. The urologists role as either camera operator, first assistant, or primary surgeon was recorded, as was a breakdown of operative tasks including establishing pneumoperitoneum/access, colon and adjacent organ mobilization, ureteral mobilization and division, dissection and division of renal artery and vein, adrenal dissection, and final specimen mobilization. Outcomes included estimated blood loss, transfusion requirements, hospital stay, and complications.

Results: 11 laparoscopic nephrectomies have been performed to date, with no conversions and no transfusions. The operative team has transitioned from three MDs to one urologist and one general surgeon. The operative role of the urologist has transitioned from camera operator to primary surgeon.

Conclusions: Laparoscopic nephrectomy can be performed safely by urologists with limited laparoscopic experience in collaboration with general surgeons with advanced laparoscopic experience. Our program is an alternative for the urologist faced with the choice of performing the procedure with limited laparoscopic experience, obtaining fellowship training, recruiting a fellowship trained urologist to their practice, or referring patients for laparoscopic nephrectomy to other centers.

Solid Organ Removal-PS241

A TECHNIQUE FOR SAFE DIVISION OF THE RENAL VESSELS DURING LAPAROSCOPIC KIDNEY HARVEST John Mecenas, M.D., Michael Edye, M.D., Devon John, M.D., Christine Ren, M.D., Mary Ann Hopkins, M.D., Thomas Diflo, M.D., Department of Surgery. New York University School of Medicine. New York, New York.

Devices that simultaneously divide and staple blood vessels carry the inherent risk of serious bleeding should the staple line fail. A clip or staple technique, which ligates without simultaneous division, avoids this risk by allowing the closure to be inspected and reinforced if imperfect. However this requires the extra step of scissor division of the vessel. We thus sought to determine whether (1) extraction and therefore warm ischemia times (WIT) were increased by the added step of scissor division and (2) whether graft function reflected any differences found.

The technique of ligation was recorded for each vessel. Extraction time (in donor) and serial creatinine levels (in recipient) were compared according to the technique of ligature: (A) Scissor division necessary: suture ligature, clips or non-cutting (TA) stapler (B) cutting stapler. Complications were recorded for each technique.

The frequency of ligation techniques used for 316 vessels was: (A) Suture ligature 26 (8.2%), clips 71 (22.5%), TA stapler 57 (18%), (B) cutting stapler 162 (51.3%). Four bleeding complications (one for each technique) occurred although the mechanism was different in each case. Mean extraction time for group A was 4.4 and for group B was 3.4 minutes ($p<0.0001$). Median serial creatinines were not significantly different between groups A and B.

Techniques in which scissors are used to divide the vessels prolong extraction time but produce no measurable delay in graft function. Avoidance of simultaneous stapling and division allows scrutiny of ligature, clip placement or staple line to confirm secure ligation of the vessel prior to its division and lessens the danger of misapplication. Maximal vessel length is preserved for anastomosis in the recipient. Our current technique is application of the endo-TA stapler loaded with vascular staples to both artery and vein during live donor kidney harvest.

Solid Organ Removal-PS242

LAPAROSCOPIC ENDCYSTECTOMY OF HYDATID LYST OF THE LIVER Abdul Aziz Al saigh MD; Ahmed Al Otiaby MD; Osman Noraldin MD; Mohd Al Ageely MD; Ihab Anwar MD;Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Hydatid Cyst is common disease in Saudi Arabia most of the cysts are infected or sterile. The usage of the laparoscopy will be better than open method. The presence of new diathermy machine and better suture laid instrument have made the surgery easier. Laparoscopic endcystectomy is performed to ten patients. The patient is placed on supine or lateral poison. Four 0 five trocars are placed. The cyst is surrounded by gauze soaked with 0.1% providence iodine the cyst is holded by 2-stay sutures, the cyst is aspirated first & injected with 0.1% providence iodine. The roof of the cyst is excised & edge of the cyst is sutured to the omentum. One drain is placed in the cavity. Bile leak has occurred in 3 patients, have been managed by ERCP & Sphincterotomy. The average hospital stay is 3.4 days.

Solid Organ Removal-PS243

SMALL BOWEL OBSTRUCTION AFTER LAPAROSCOPIC DONOR NEPHRECTOMY JP Regan MD, ES Cho MD, and JL Flowers MD Section of Surgical Endoscopy and Laparoscopy, Department of Surgery, University of Maryland School of Medicine, Baltimore, MD

Introduction: Laparoscopic live donor nephrectomy has become the procedure of choice for kidney procurement at many centers across the country. Decreased postoperative pain and length of stay, faster return to work, and no difference in morbidity/mortality compared to open nephrectomy have all been reported in the literature. However, few data exist regarding the complication of postoperative internal hernia and small bowel obstruction, which is unique to a laparoscopic/transperitoneal approach.

Methods: We present 3 case reports of patients who developed small bowel obstruction from an internal hernia and mesenteric defect after laparoscopic donor nephrectomy.

Results: Six hundred and thirty-five patients underwent laparoscopic donor nephrectomy from March 1996 to August 2001 at 1 institution. Small bowel obstruction developed in 3 patients (0.47%) within 1 week postoperatively. Each case involved an internal hernia through a left colon mesenteric defect at the site of nephrectomy. Re-operation was necessary in each case and was associated with prolonged hospital stay (mean 22.3 days, range 6-37 days). Two patients were managed with laparotomy and 1 patient underwent a laparoscopically-assisted exploration. One patient required an additional open exploration for intra-abdominal sepsis and cholecystectomy.

Conclusions: Small bowel obstruction from internal hernia following laparoscopic donor nephrectomy is a rare event, but can lead to significant morbidity in an otherwise healthy patient. These patients may be at higher risk for bowel obstruction given the soft tissue defect remaining after nephrectomy, and vigilance is required when mobilizing the colon to ensure mesenteric defects are recognized and repaired.

Solid Organ Removal-PS244

HAND ASSISTED LAPAROSCOPIC SPLENECTOMY FOR MASSIVE SPLENOMEGALY, Michael Rosen MD, Fred Brody MD, R. Matthew Walsh MD, Alicia Fanning MD, Frank Duperier MD, Jeffrey Ponsky MD, Department of General Surgery and Minimally Invasive Surgery Center Cleveland Clinic Foundation, Cleveland OH

Laparoscopic splenectomy is the procedure of choice for elective splenectomy at the Cleveland Clinic Foundation (CCF). However, massive splenomegaly may preclude safe mobilization and hilar control using standard laparoscopic techniques. For these difficult cases, hand assisted laparoscopic splenectomy (HALS) can offer the same benefits of minimally invasive surgery while allowing safe manipulation and splenic dissection.

This study retrospectively reviews a consecutive series of HALS performed at the CCF from March 1998 to February 2001. HALS was performed for splenomegaly extending past the midline or to the iliac crest. Patient demographics, operative indications, morcellated splenic weight, morbidity, mortality, and clinical outcomes were evaluated. With the patient in a modified lateral position, a midline incision was made for the surgeon's nondominant hand. Two other ports were placed in the left flank.

Seven men and seven women with a mean age of 57 years (range38-73) and mean BMI of 25kg/m2 (range21-29) underwent HALS. Surgical indications included malignancy (10), autoimmune hemolytic anemia (1), and splenomegaly (3). Mean morcellated splenic weight was 1517 grams (range 577-3500). No conversions to open splenectomy were required. The mean operative time was 177 min (range 75-309). Mean length of stay was 5.4 days (range 2-20). Three major postoperative complications occurred including one hemorrhage at the hilar staple line necessitating re-exploration and two subphrenic fluid collections requiring percutaneous drainage. No perioperative mortality occurred.

HALS is a safe and efficacious procedure for these extremely difficult patients. HALS provides the benefits of a minimally invasive approach in cases of massive splenomegaly

Solid Organ Removal-PS245

RESULTS OF 62 UNSELECTED CONSECUTIVE LAPAROSCOPIC SPLENECTOMIES Mitsugu Sekimoto, Shuji Takiguchi, Hirohumi Yamamoto, Masataka Ikeda, Masakazu Ikenaga, Yasuhiro Miyake, Morito Monden Department of Surgery and Clinical Oncology, Graduate School of Medicine, Osaka University

Background) Many institutes showed that laparoscopic splenectomy was feasible and safe for normal sized spleen. But, indication for splenomegaly or malignant diseases is controversial. In this paper, we evaluate the feasibility of laparoscopic splenectomy for unselected various hematologic diseases.

Method) We performed laparoscopic splenectomy on all patients who consulted us between November 1995 and April 2001. There were 63 cases including 44 idiopathic thrombocytopenic purpura (ITP), 5 hereditary spherocytosis, 6 malignant lymphoma, 2 chronic myelogenous leukemia, 2 chronic lymphogenous leukemia, and others. The weight of resected spleen was below 500 g in 52 cases, and over 500 g in 11 cases. Five cases in which the spleen was too heavy to handle with laparoscopic instruments were performed with the aid of hand assisted technique (HALS).

Results) Only one case was converted open surgery. The mean operative time was 162.7 m, and the mean blood loss was 205.1 g. Cases with splenomegaly (heavier than 500 g) needed prolonged operative time (234.9 m vs. 147.5 m), but blood loss was no different (146.0 g vs. 163.5 g). As for intraoperative complication, a bleeding from the splenic artery occurred due to dislodgment of metal clip in normal sized spleen case. There were no complications in splenomegaly cases. Postoperative morbidity occurred in seven patients. In the normal spleen cases, a subcutaneous bleeding and a portal venous thrombosis occurred. Other morbidity occurred in splenomegaly cases, specifically a bleeding duodenal ulcer, a pancreatitis, a subcutaneous bleeding at a trocar wound, and two splenic venous thrombosis. All of them improved conservatively. Except for two cases, all could walk and take liquid food on the first day postoperatively.

Conclusion) We concluded that almost all splenectomy could be performed laparoscopically safely. For even massive splenectomy, laparoscopic splenectomy is feasible with the aid of HALS technique.

Solid Organ Removal-PS246

HAND-ASSISTED LAPAROSCOPIC SPLENECTOMY FOR SPLENIC TUMOR: TWO CASES REPORT H. Takahashi M.D.1), H. Yano Ph.D.2), T. Monden Ph.D.2), T. Kinoshita Ph.D.1), K. Okada M.D.2), 1)Department of Hepatobiliary and Pancreatic Surgery, National Cancer Center Hospital East, Kashiwa city, Japan, 2)Department of Surgery, NTT West Osaka Hospital, Osaka city, Japan

[Case 1] A 38-years-old woman was admitted to our department for a splenc tumor who had undergone a hysterectomy, bilateral adnectomy and omentectomy by diagnosis of right ovarian carcinoma three years ago. The series of radiograghic examinations showed a solitary splenic tumor that was 30 mm in diameter and a swollen lymph node that was 10mm in diameter at a hitus of spleen. Hand-assisted laparoscopic splenectomy was performed by diagnosis of metastatic splenic tumor and swollen lymph node arising from right ovarian carcinoma. We could completely resected the spleen with the swoolen lymph node by the palpation of the surgeon's left hand inserted through the 7cm skin incision. The duration of surgery and intra-operative blood loss was 178 minutes and 22g respectively.

[Case 2] A 62-years-old woman was admitted to our department for a cystic tumor of spleen who had undergone a hysterectomy and bilateral adenectomy by diagnosis of uterine corpus carcinoma eighteen months ago. The series of radiographic examination showed a solitary cystic tumor of spleen that was 60 mm in diameter. Hand-assited laparoscopic splenectomy was performed by diagnosis of metastatic splenic tumor arising from uterin corpus carcinoma. We detected that the tumor had invaded to the wall of stomach intraoperatively. We could evaluate the extention of tumor invasion by the palpation of the surgeon's left hand inserted through the 7cm skin incision and completely resect the spleen including the wall of stomach which was involved by the tumor. The duration of surgery and intra-operative blood loss was 141 minutes and 10g respectively.

[Conclusion] Using hand-assisted laparoscopic splenectomy, the perfect resection of the malignant tumor was expected by both the inspection with laparoscopy and palpation of the tumor by surgeon's left hand like an opne surgery and it was less invasive, cosmetically fine in comparison with an open surgery. Hand-assisted laparoscopic splenectomy was considered to be a beneficial therapuetic option for splenectomy was considered to be a beneficial therapuetic option for splenic tumor.

Solid Organ Removal-PS247

LAPAROSCOPIC LEFT PANCREATECTOMIES WITH SPLEEN PRESERVATION JL. DULUCQ MD, P. WINTRINGER MD ILS Institute of Laparoscopic Surgery, MSPB BAGATELLE - 203, Route de Toulouse, 33401 BORDEAUX-TALENCE (France)

Ten patients were operated on laparoscopically for left-sided (body and tail) pancreatic tumors, all female. Technique was a spleen-preserving left pancreatectomy.

A transabdominal approach was used 9 times, and one case was done by a totally extraperitoneal left lateral approach. Mean age was 59 years, ranging from 34 to 82 years. Operative time ranged from 90 to 240 min. Spleen preservation was achieved except in one case, needing conversion and open splenectomy. Three splenal vein bleedings occurred, laparoscopically sutured, requiring 1, 2, and 8 blood units. There was no mortality. Two patients experienced postoperative pancreatic fluid discharge, spontaneously closing after 1 and 5 weeks.

Nine tumors were cystic, 6 being a serous cystadenoma and 3 a mucinous cystadenoma. One tumor was a solid papillary tumor, a very rare condition.

Laparoscopic left pancreatectomy with spleen preservation is difficult, but feasible, allthough morbidity, especially severe bleeding and pancreatic fistula, cannot be rued out.

Solid Organ Removal-PS248

Hematological long-term results of laparoscopic splenectomy for patients with idiopathic thrombocytopenic purpura. F.J. Berends MD, F.P.K. Wu MD, N. Schep MD (#), M.A. Cuesta MD; PhD, H.J. Bonjer MD; PhD (#), M.C. Kappers-Klunne MD, PhD (*); PhD, P. Huijgens MD (**); PhD, G. Kazemier MD (#). Department of Surgery and Department of Hematology (*) University Hospital Rotterdam 'Dijkzigt' Department of Surgery (#) and Department of Hematology (**) 'Vrije Universiteit' Medical Center, Amsterdam, The Netherlands.

Initial hematological response to laparoscopic splenectomy for ITP is usually very good. However, as the interval from the time of splenectomy increases, the success rate for excellent response will progressively decrease. It is suggested that the laparoscopic approach to the spleen potentially leads to more splenosis and missed accessory spleens, increasing the risk of secondary ITP. The objective of this study was to compare the clinical outcome and the hematological results on the longer term of a series of Laparoscopic Splenectomy (LS) with a historic series of Open Splenectomy (OS) for the treatment of ITP.

A retrospective review of medical records was done of consecutive patients who underwent LS for ITP from March 1992 through July 1999. Patient characteristics, operative outcome and hematological results were compared to a historical group of patients who underwent conventional splenectomy for ITP from January 1985 through July 1996. Minimal follow-up for inclusion was 20 months. Operative time was significantly longer in the LS group ($p < 0.05$). No significant difference was noted in operative blood loss. Postoperative complications were significantly more frequent in the OS group ($p < 0.05$). Median follow-up after OS was 66.0 months and 40.7 months after LS. Rates for complete remission, partial remission and failure were not significantly different after LS compared to OS. Relapse after splenectomy occurred in 14 out of 19 patients (73.7%) within two years, with a median time of 9 months. Accessory spleens were detected in 4/31 (12.9%) patients during OS and in 6/51 (12.0 %) during LS.

Laparoscopic splenectomy for ITP does not seem to have a detrimental effect on longer-term hematological results.

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RETROPERITONEOSCOPIC LIVE DONOR NEPHRECTOMY H.Yamada M.D., K.Sakamoto M.D., S.Arita M.D., T.Iwashita M.D., Y.Okazaki M.D., M.Kawada M.D., H.Kashiwabara M.D., Department of Surgery, Sakura National Hospital, Chiba, Japan

Advances in endoscopic technique have made endoscopic donor nephrectomy feasible. Endoscopic donor nephrectomy offers numerous advantages when compared with the traditional open approach. For the donor, it has resulted in a shorter hospital stay, fewer postoperative analgesic requirements, earlier return to activities of daily living and employment, and decreased financial loss owing to absence from the workforce. We report our initial experience with retroperitoneoscopic live donor nephrectomy. Our main technique: First, we expand the retroperitoneal cavity using the balloon. Next, we insufflate the carbon dioxide in to the retroperitoneal cavity(under 10mHg). We do retroperitoneoscopy. We can see the left common iliac artery, the left ureter, Abdominal aorta and kidney easily. We dissect the Kidney. We ligate the ureter and vessels , and cut them. We make 6cm skin incision and remove the kidney. The advantage of this technique is as follows. We can obtain excellent view (no small intestine) , and dissect the blood vessel , ureter and kidney easily. We can avoid of an injury to the intestine during nephrectomy.

SUBJECTS AND METHODS: A retrospective review of one hundred three live donor kidney transplantations were performed from 1974 to August 2001, 10 with endoscopic, 93 with open nephrectomy.

RESULTS: Ten kidneys were removed by endoscopic surgery, i.e., eight from the left and two from the right side. No conversion of this technique to endoscopic surgery was necessary. In the endoscopic and open nephrectomy groups, mean operative time was 203 and 192 minutes , mean estimated blood loss was 43 and 265 ml . In the endoscopic groups, the mean warm ischemic time was four minutes. Organ survival was 100%, and in all grafts excellent function was observed.

CONCLUSIONS: Endoscopic live donor nephrectomy is an attractive alternative to open donor nephrectomy. Endoscopic nephrectomy results in less postoperative discomfort, an improved cosmetic result and more rapid recovery for the donor with equivalent fun.

Solid Organ Removal-PS250

LAPAROSCOPIC SPLENECTOMY: BEYOND THE LEARNING CURVE D C Zacharoulis M.D., B Dobbins M.D.,H H Kumar M.D., CMS Royston M.D., C J O'Boyle M.D., PC Sedman M.D., Dept of Upper GI and Minimally Invasive Surgery, Hull Royal Infirmary,Kingston upon Hull,United Kingdom

The advantages of laparoscopic splenectomy (LS) over open splenectomy have been suggested in early reports. The purpose of this study is to report the three years experience using the Espiner bag (Anchor, IL, U.S.A) for spleen retrieval during LS as performed in a dedicated minimally invasive surgical unit

Between March 1998 and July 2001, 50 laparoscopic splenectomies were performed. Indications for surgery included benign haematological diseases 35/50 (70%) and lymphomas 15/50 (30%). Data were prospectively recorded onto a dedicated database and reviewed for the purpose of this study. The Espiner bag was used for spleen retrieval in the last 35 cases.

The most common indication was idiopathic thrombocytopenic porphyria(ITP) 20/50(40%) followed by hemolytic anemia 15/50 (30%) and lymphomas (30%). The median splenic weight was 250 gr (range100-1800 gr).Accesory spleens were found in seven patients (14%) all suffering from ITP. The mean operative time was 102 min(range 70-160 min) The conversion rate was 2/50(4%). Two patients required delayed laparotomies, one for bleeding and one for delayed gastric perforation due to iatrgenic thermal injury. In one case we had to extend the 12 mm incision due to a defective retrieval bag (1/35 , 2.8%).The overall complication rate was 3/50 (6%).No deaths occured in our series.The median hospital stay was 3 days (range 2-12). The median follow-up of 16 months (range 1-32 months) showed no long term complications.

Our results confirm the laparoscopic approach to be the technique of choice for splenectomy in experienced hands. The Espiner bag (ANCHOR, IL, U.S.A.) for spleen retrieval can be used safely.