**S001**

**TREATMENT RESULTS OF LAPAROSCOPY-ASSISTED GASTRECTOMY FOR GASTRIC CANCER,** Shinichi Sakuramoto MD, Shiro Kikuchi MD, Shinichi Kuroyama MD, Nobue Futawatari MD, Natsuya Katada MD, Nobuyuki Kobayashi MD, Masahiko Watanabe MD, Department of Surgery, Kitasato University School of Medicine.

[Aim] The aim of this study was to present treatment results of laparoscopy-assisted gastrectomy for early stage gastric cancer.

[Material and Methods] We have performed laparoscopy-assisted gastrectomy on 106 patients with gastric cancer since 1998 including laparoscopy-assisted distal gastrectomy (LADG) in 99 patients, laparoscopy-assisted total gastrectomy (LATG) in 6, and laparoscopy-assisted proximal gastrectomy (LAPG) in 1.

[Results] LADG and LAPG: In initial 9 patients, first tier nodes were laparoscopically dissected, then second tier nodes were directly dissected through the small open wound of 7 cm. In the following 45 patients, surgical technique of hand-assisted laparoscopic surgery (HALS) was used and lymph nodes were dissected in a similar way. Mean surgical time was 279.4±47.0 min and 246.1±42.4 min, respectively. Further, in next 16 patients, all lymph nodes were laparoscopically dissected, and surgical time was 228±34.5 min. The length of open abdominal wound was shortened to 4.5 cm. In the following 45 patients, surgical time was elongated to 294±53.0 min because the celiac branch of vagus nerve was preserved. Mean blood loss was 151.2±110.6 g, the number of dissected lymph nodes was 31.5±14.0, and mean postoperative hospital stay was 14.6±8.3 days. LATG: Mean surgical time was 343.3±81.6 min, blood loss was 190.0±117.3 g, the number of dissected lymph nodes was 46.8±23.3, and postoperative hospital stay was 15.2±4.4 days. Postoperative complications in all the 106 patients included wound infection in 2, anastomotic stricture in 2, cholecystitis in 1, postoperative bleeding in 1, and intra-abdominal abscess in 1, but all were conservatively alleviated.

Pathological examination revealed depth of tumor invasion; T1 in 102 and T2 in 4, lymph node metastasis; n0 in 102, n1 in 3, and n2 in 1. The n2 patient who had m cancer with long diameter 2.4 cm and the number of metastatic lymph nodes 16/39 died at 3 years and 9 months after surgery. All the patients excluding this patient are currently surviving without recurrence.

[Conclusion] In lymph node dissection in laparoscopy-assisted gastrectomy for gastric cancer, the laparoscopy-assisted procedure provides better surgical field and shorter time operation when compared with the direct procedure. Laparoscopy-assisted surgery offers radical cure equivalent to that in open surgery, as well as excellent postoperative QOL.

**S003**

**ANALYSIS OF THE SAGES OUTCOMES INITIATIVE CHOLECYSTECTOMY REGISTRY,** Vic Velanovich MD, Marian McDonald MD, Rocco Orlando MD, L W Traverso MD, Henry Ford Hospital, Virginia Mason Medical Center

Introduction: The SAGES Outcomes Initiative has been collecting data from SAGES members who performed cholecystectomies. The purpose of the initiative is to track outcomes and performance for the benefit of the membership to both document quality and assess outcomes. This is a report of cholecystectomies within the database. Methods: The SAGES Outcomes Initiative gallbladder registry is a voluntary database where SAGES members record perioperative and postoperative information on their patients who undergo cholecystectomy. Perioperative data include age, gender, work status, comorbidities, ASA class, primary/secondary diagnoses and procedures, preoperative symptoms and presence of gallstones, procedure performed, and intraoperative complications. Follow-up data include adverse postoperative events, complication severity, readmission related to gallbladder surgery, reoperation, symptomatic change, and work status.

Results: There were 1721 entries with perioperative and postoperative data. The resident was the operating surgeon in 54.6% of laparoscopic cholecystectomies (LC), 30.6% of LC with cholangiograms (LC-C), and 14.3% of LC with bile duct exploration (LC-CBDE) (p<0.001). When an attending surgeon was the operating surgeon, 95.3% of cases were completed laparoscopically, 2.2% converted to open, and 2.5% started open; compared to 94.1%, 4.3%, and 1.6%, respectively, when a resident was the operating surgeon (p=NS). There were no bile duct injuries reported. Recurrent biliary pain occurred in 0.6% of LC patients. Retained stones occurred in 0.4% of LC patients, 0.3% of LC-C patients, and 7.0% of LC-CBDE patients, compared to 0%, 0%, and 7.7%, respectively, in open patients. Wound infection/breakdown occurred in 0.9% of LC patients, compared to 8.8% of open patients (OR=11.1, p<0.0001), but there was no difference in other postoperative adverse events. Marked improvement occurred in 87.1% of LC patients, somewhat improved in 9.9%, no change in 3.0%, and somewhat worse in 0%, compared to 87.5%, 11.0%, 1.2%, and 0.2%, respectively, in open patients (p=0.003). Conclusions: The SAGES Outcomes Initiative can provide information. LC had fewer wound complications, and were more likely to return to work.

**S004**

**CO2 PNEUMOPERITONEUM PREVENTS MORTALITY FROM SEPSIS,** Eric J Hanly, Joseph M Fuentes, Alexander R Aurora, Sharon L Bachman, Michael R Marohn, Antonio De Maio, Mark A Talamini, Department of Surgery, The Johns Hopkins University School of Medicine

INTRODUCTION: CO2-pneumoperitoneum (pneumo) has been shown to attenuate the inflammatory response following laparoscopy. We tested the hypothesis that abdominal insufflation with CO2 improves survival in an animal model of sepsis and investigated the associated mechanism.

METHODS: The effect of CO2, helium- (He), and air-pneumo on mortality was studied by inducing sepsis in 143 rats via intravenous LPS. To test the protective effect of CO2 in the setting of a laparotomy, an additional 65 animals were subjected to CO2-pneumo, He-pneumo, or control following laparotomy and intraperitoneal LPS. The mechanism of CO2-protection was investigated in another 84 animals. Statistical significance was determined via Kaplan-Meier analysis for survival and ANOVA for serum cytokines.

RESULTS: Among rats with LPS-induced sepsis, CO2-pneumo increased survival to 78% compared to He-pneumo (52%, p<0.05), air-pneumo (55%, p<0.09), anesthesia-control (50%, p=0.09), and LPS-only-control (42%, p=0.05). CO2-pneumo also significantly increased survival over control (85% vs. 25%, p<0.05) among laparotomized septic animals, whereas He-insufflation did not (65% survival). CO2-insufflation increased plasma IL-10 levels by 35% compared to He-pneumo (p<0.05) and by 34% compared to anesthesia-control (p<0.05) 90 min following LPS stimulation. CO2-pneumo resulted in a 3-fold reduction in TNF-alpha compared to He-pneumo (p<0.05) and a 6-fold reduction compared to anesthesia-control (p<0.001).

CONCLUSIONS: Abdominal insufflation with CO2, but not He or air, significantly reduces mortality among animals with LPS-induced sepsis. Furthermore, CO2-pneumo rescues animals from abdominal sepsis following a laparotomy. Because IL-10 is known to down-regulate TNF-alpha, the increase in IL-10 and the decrease in TNF-alpha found among the CO2-insufflated animals in our study provide evidence for a mechanism whereby CO2-pneumo reduces mortality via IL-10-mediated down-regulation of TNF-alpha.

**S005**

**PREDICTORS OF COMPLICATIONS AFTER LAPAROSCOPIC COLORECTAL SURGERY FOR ADENOCARCINOMA IN 848 PATIENTS,** Camilo Boza MD, Salvador Delgado PhD, Dulce Mombian MD, Raquel Sanchez-Santos PhD, Raquel Bravo MD, Ainitzte Ibarzabal MD, Ernest Bombuy MD, Antoni Castells PhD, Josep M Pique PhD, Antoni M Lacy PhD, Gastrointestinal Surgery, Institute of digestive and metabolic disease, Hospital Clinic, University of Barcelona, Spain.

Laparoscopic colorectal surgery has a steep learning curve. To identify risk factors for complications is useful to select patients. The aim of this study was to assess predictors of complications.
ABSTRACTS

Thursday, April 14, 2005

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S007

LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING IN PATIENTS 60 YEARS OF AGE AND OLDER, D A Provest MD, N Dukkipati MD, S Kaza MD, M J Watson MD, The Clinical Center for the Surgical Management of Obesity, The University of Texas Southwestern Medical Center at Dallas

Objective: To evaluate the results of laparoscopic adjustable gastric banding (LAGB) in patients 60 years of age and older, and to compare complications and weight loss to the younger cohort.

Methods: The institutional bariatric surgery database was queried to identify all patients undergoing LAGB. Patients 60 years of age and older were identified and compared to patients less than 60 years of age with regards to complications and weight loss. All were Lap-Bands® placed by the pars flaccida technique.

Results: LAGB were placed in 56 patients aged 60 years and older (mean age 64.5, mean BMI 48.3), who were compared to 277 patients under 60 years of age (mean age 42.5, mean BMI 45.7) in the older patients there were 3 major perioperative complications: 1 patient with an abdominal abscess requiring celiotomy and band removal, 1 MRSA pneumonia and bacteremia, and one early prolapse (band removed). Late band related reoperations were required in 6 older patients: 4 band prolapse (2 replaced, 2 removed), one band removal for MRSA band infection (in the patient with the perioperative bacteremia), and 1 port removal for localized port infection. Late reoperations for band related complications were required in 12.5% of the older patients compared to 9.7% of the younger group. Prolapse requiring reoperation occurred in 7.1% of the older patients compared to 3.6% in the younger cohort. Major infectious complications were higher in the older patients (7.1% vs. 0.4%), as was the incidence of band extrusion (7.1% vs. 1.8%). There were no perioperative mortalities. Weight loss (expressed as mean % excess BMI lost) was comparable between the older and younger patients: 33.8% vs. 31.7% at 6 months, 40.1% vs. 44.0% at 12 months, and 46.7% vs. 54.3% at 18 months, respectively. Excellent improvement or resolution of comorbidities was observed.

Conclusions: Excellent weight loss can be achieved with the Lap-Band® adjustable gastric banding system in patients 60 years of age or older with an acceptable perioperative complication rate. Perioperative major infectious complications and the incidence of band extrusion appear to occur more frequently in the older patient population.
of life scores also did not significantly differ (p>0.05).
Conclusion. There are ethnic differences in the efficacy of the
RYGBP procedure among females one year postoperative.
The reduced surgical weight loss of AA females is significantly
associated with changes in fat mass but not eating behavior or
psychosocial issues.

S012
PREDICTORS OF SUCCESS AFTER LAPAROSCOPIC GASTRIC BYPASS; A MULTIVARIATE ANALYSIS OF SOCIOECONOMIC FACTORS,
Rami E Lutfi MD, Alfonso Torquati MD,Nikhilesh Sekhar MD,William O Richards MD, Vanderbilt University
Laparoscopic roux-en-y gastric bypass (LGB) has proven effi-
cacy in causing significant and durable weight loss, however
there have been no studies looking at the value of patient
demographics in terms of predicting postoperative weight
loss. Aim: to identify independent predictors of successful
weight loss after LGB. Methods: Socioeconomic demographics
were prospectively collected on patients presenting for LGB.
Primary end-point was % of excess weight loss (EWL) at 1-yr
follow up. EWL was plotted in a normal histogram; insufficient
weight loss was defined as EWL<52.8%. According to this
definition, 147 (81.7%) patients achieved adequate weight loss
1 yr after LGB. On univariate analysis, preoperative BMI had a
significant effect on EWL, with patients with BMI<50 achieving
higher percentage of EWL (91.7% vs. 61.6%; P<0.001). Marriage
status was also a significant predictor of successful outcome,
with single patients achieving higher percentage of EWL than
married patients (89.8% vs. 77.7%; P=0.04). Race had a noticeable
but not statistically significant effect, with Caucasian patients
achieving higher percentage of EWL than African-Americans
(82.9% vs. 60%; P=0.06). BMI and marital status remained as
independent predictors of success in the multivariate logistic
regression model after adjusting for covariates. Patients with
BMI≤50 had more than 7 times the risk of failing to achieve
adequate weight loss compared to those with BMI>49 (OR
7.3; 95% CI: 3.1-17.1, P=0.0001). Married patients were more at
than 3 times the risk of failure compared to those who were
unmarried (OR 3.0; 95% CI: 1.8-8.1, P=0.03). Conclusion:
Weight loss achieved after LGB is suboptimal in super obese
patients. Single patients with lower BMI had the best chance of
achieving successful weight loss.
POSTOP values were obtained from 15 to 537 days after surgery (median POD 175). Preop and time groups of POSTOP values were compared using the Kruskal-Wallis One-Way ANOVA.

Results: 38 women and 10 men were studied. Median age was 42 years (22-59 yrs), Preop BMI 48 kg/m2 (35-62 kg/m2), and weight 283 lbs. (178-446 lbs). The median POSTOP weight at follow up was 191 lbs. (123-730 lbs) and BMI 32.3 kg/m2 (21.1-53 kg/m2). A significant (p<0.0001) decrease in fasting glucose levels, insulin levels, and HOMA-IR were observed between Preop and all POSTOP groups. POSTOP insulin and HOMA IR levels were significantly lower at >1 year than at 1-3 months.

Conclusion: Glucose, insulin and HOMA IR levels rapidly dropped to normal levels within 1-3 months following LRYGB. Also, insulin and HOMA IR levels dropped significantly to even lower levels more than a year after surgery. The initial rapid IR improvement following LRYGP supports a short term role for incretin gut hormones in improving IR, while the subsequent additional long-term improvement suggests further modulation of IR by weight loss and by adipocytokines released from the shrinking fat mass.

S014
IMPLANTABLE GASTRIC STIMULATION TO ACHIEVE WEIGHT LOSS IN LOW BMI PATIENTS: EARLY CLINICAL TRIAL RESULTS, Ken Champion MD, Mike Williams MD, Emory-Dunwoody Medical Center, Atlanta Georgia, USA

Implantable Gastric Stimulation (IGS) offers a novel approach for surgical weight loss which may allow it to be utilized in obese patients who don’t meet NIH criteria for traditional bariatric procedures. This paper reports our early outcomes with a FDA clinical trial of IGS for low BMI patients to achieve weight loss.

With FDA and institutional IRB approval, 60 potential low BMI (30-34.9) candidates were screened by a selection psychological algorithm with 33 approved as potentially responsive to gastric stimulation, and 19 consenting to implantation. There were 18 females and 1 male, mean age 42 (range 32-60), mean BMI 33.1 (range 30.9-34.9) and mean weight 90.9 Kg (range 75-106.4). There were a total of 226 co-morbidities (mean 1.2), 38 previous abdominal surgeries, and 32% had undergone a plastic surgery? procedure related to their weight. Post-op protocol mandated monthly dietary and exercise counseling and attendance at an IGS support group.

All cases were completed laparoscopically as an outpatient procedure. Follow-up is 4-6 months. There were two intra-op mucosal perforations requiring lead repositioning. Three patients have undergone explantation due to non-compliance with protocol. Ten patients have lost a mean of 13% EWL (range 0.5-26%), and four (21%) have lost more than 25% EWL. Six patients have gained a mean of 6.4% excess weight and one patient is unchanged.

Our outcomes suggest IGS may offer a novel approach for surgical weight loss in a subset of low BMI patients, with 53% (10/19) experiencing early modest weight reduction, but patient compliance is still an issue despite aggressive pre-op screening, and further follow-up is required.

S015
CPAP AND BIPAP USE CAN BE SAFELY OMITTED AFTER LAPAROSCOPIC GASTRIC BYPASS, John Yadegar MD, William Bertucci MD, Todd Drasin MD, Amir Mehran MD, Erik Dutson MD, Carlos Gracia MD, UCLA Medical Center

Introduction: Obstructive sleep apnea (OSA) is prevalent in the morbidly obese population. The need for routine preoperative testing for OSA has been debated in the literature. Most authors advocate the use of continuous (CPAP) or bi-level positive airway pressure (BIPAP) in the postoperative setting. Others, however, have reported pouch perforations or other gastrointestinal complications as a result of their use. We reviewed our experience and present an algorithm for the safe management of patients with OSA without the use of CPAP or BIPAP.

Methods: From 1/2003 to 8/2004, 250 laparoscopic gastric bypasses (LRYGB) were performed at UCLA. Preoperative testing for OSA was not required. The data pertaining to OSA, CPAP/BIPAP use, and postoperative pulmonary complications were collected into a prospective database. Patients with OSA were not placed back on CPAP/BIPAP after surgery. They were observed in a monitored bed overnight, ensuring continuous oxygen saturation of >92%. All patients were placed on patient controlled anesthesia (PCA), trained in the use of incentive spirometry, and ambulated within a few hours of surgery.

Results
OSA/CPAP OSA/No CPAP No OSA  # Patients 31 33 5
Avg Age 50 46 46
Avg BMI 45.2 48.6 48.4
Pneumonia 0 1 0
Reintubation 0 0 0

Conclusions: Postoperative CPAP/BIPAP may be safely omitted in LRYGB patients with OSA, provided they are observed in a monitored setting and their pulmonary status is optimized by aggressive incentive spirometry and early ambulation. In the majority of these patients, OSA resolves with weight loss, obviating the need for further CPAP/BIPAP therapy.

S016
ANALYSIS OF THE SAGES OUTCOMES INITIATIVE HERNIA REGISTRY, Vic Velanovich MD, Phillip P Shadduck MD, Leena Khaitan MD, L W Traverso MD, Henry Ford Hospital, Regional Surgical Associates, Emory University, Virginia Mason Hospital

Introduction: Prospective registries serve the purposes of improving patient care, advancing medical science, and guiding healthcare decision making. The SAGES Outcomes Initiative is a voluntary, prospective, multiinstitutional registry, containing data on >12,000 surgical procedures. Methods: The SAGES Outcomes initiative hernia module contains on 656 non-incarcerated inguinal hernias. Perioperative data collected include patient age, gender, work status, comorbidities, ASA class, primary/secondary diagnoses and procedures, surgeons & assistants, hernia type, repair technique, and intraoperative complications. Follow-up data include LOS, complications and severity, narcotic use, work/activities, and symptom change. These data are analyzed and reported here for the first time.

Results: The patient demographic data are typical. The complication rates for the most frequent hernia types and repair techniques are summarized in the table. Although voluntary databases have the inherent potential for methodologic concerns, it is noteworthy and reassuring that the complication rates in the SAGES registry are consistent with those reported from clinical trials and mandatory registries. Conclusion: The first analysis of the SAGES Outcomes Initiative hernia database is encouraging. Efforts are ongoing to simplify data entry, refine data parameters, audit data, increase surgeon participation, and begin to ask clinically important questions.

S017
LAPAROSCOPIC MANAGEMENT FOR HYDROCELE OF THE CORD OR SCROTUM IN CHILDREN, Hiroo TAKEHARA MD, Hiroki ISHIBASHI MD, Masaki OHSHITA MD, Mitsuo SHIMADA MD, Dept. of Pediatric Surgery and Pediatric Endosurgery, Tokushima University Hospital, *Dept. of Digestive Surgery, University of Tokushima, School of Medicine, Tokushima, Hydorchile of the cord or scrotum is a common condition in infancy that usually presents at birth. In most children with hydrocele, the processus vaginalis closes and the hydrocele resolves during the first 12-18 months of life. The recommended management of hydrocele is therefore to observe the patient without surgery for the first 2 years of life. We have performed 475 laparoscopic percutaneous extraperitoneal closure (LPEC) procedures in 355 children with inguinal hernia, including 43 with hydrocele. Of these 43 patients, 17 (205
years of age) had communicating hydrocele, 15 (105 years of age) had noncommunicating hydrocele associated with a contralateral inguinal hernia, and the remaining 11 (206 years of age) had noncommunicating hydrocele of the scrotum. The laparoscopic correction of hydrocele involves high-circuit suturing of the processus vaginalis, as in LPEC for inguinal hernia. The distal part of the noncommunicating hydrocele is left open via the internal inguinal ring or a small incision in the scrotum. No occurrence or recurrence of hydrocele was observed in the 358 LPEC procedures in our series. The advantages of this procedure are not only cosmetic and minimally invasive closure, but also a lower risk of injury to the spermatic duct or vessels and complete closure of the communication between the peritoneal cavity and the hydrocele to a greater or lesser degree.

S018
MESH-RELATED COMPLICATIONS FOLLOWING HERNIA REPAIR, Jason H Clarke MD, Mark D Walsh MD,Thomas N Robinson MD, University of Colorado Health Sciences Center. Introduction: Specific complications following hernia repair with mesh are related to the mesh material used.
Methods: All medical device reports associated with the use of surgical mesh for hernia repair were retrieved from the FDA's Manufacturer User Facility Device Experience Database from 1/96 to 9/04. Statistics were performed using chi squared analyses and significance was determined using Fischer's exact test.
Results: There were 252 complication reports regarding the use of surgical mesh for hernia repair. The most common complications reported were infection (42%), mechanical failure (18%), chronic pain (9%), allergic reaction (8%), and intestinal complications including obstruction, perforation and fistula (7%). Less frequent complications included adhesions, seromas, and erosion/migration. Complications involved the following specific types of mesh: polypropylene, composite PTFE/polypropylene (COMP), composite sepra/polypropylene (SEGRA), PTFE alone, and biomaterial. The most common complication for each mesh type was: polypropylene infection (43%), COMP infection (42%), SEGRA mechanical failure (80%), PTFE alone infection (75%), and biomaterial allergic reaction (57%). The use of COMP mesh resulted in more intestinal complications compared to all other mesh types (14% vs. 5%, p<0.05); SEGRA mesh resulted in more mechanical failures (80% vs. 14%, p<0.05); biomaterials resulted in more allergic reactions (57% vs. 6%, p<0.05); and PTFE alone was associated with a higher rate of infectious complications (75% vs. 41%, p=0.07), but this did not reach statistical significance. Overall, death occurred in 5 of the 252 reported cases (2%). The cause of death was allergic reaction/anaphylaxis in 3 of the 5 (60%).
Conclusion: The type of mesh material used for hernia repair influences the occurrence of specific post-operative complications.

S020
IS ENDOSCOPIC TOTALLY EXTRAPERITONEAL HERNIOPLASTY (TEP) JUSTIFIED FOR THE REPAIR OF GROIN HERNIA IN FEMALE PATIENTS?, Hung Lau MD, University of Hong Kong Medical College, Tung Wah Hospital, Sheung Wan, Hong Kong. Background: Groin hernia is an uncommon surgical pathology in females. The efficacy of the laparoscopic approach in the repair of female groin hernia has yet to be examined. The present study was undertaken to compare the clinical outcomes of female patients who underwent laparoscopic incisional hernia repair. Our results suggest, that this approach has distinct advantages in comparison to conventional open approaches.
Methods: From July 1998 to June 2004, 108 female patients who underwent elective repair of groin hernia were recruited. The patients were divided into TEP (n = 30) and open groups (n = 78), based on the type of operation. Clinical data and outcome parameters were compared between the two groups of patients.
Results: The mean ages and hernia types were comparable between the two groups. All TEP were successfully performed. The mean operative time of unilateral TEP and open repair was 52 and 51 minutes respectively (P = ns). Comparison of the length of hospital stay, postoperative morbidity, pain scores and time to return to normal activities showed no significant differences between the two groups. Recurrence of hernia occurred in a single patient in the TEP group.
Conclusions: Our findings show equivalent postoperative outcomes following TEP and open repair of groin hernia in female patients. As the wound scar after open repair is well concealed underneath the pubic hair and no superior clinical benefits are observed after TEP, open repair is the technique of choice for the repair of primary groin hernia in females. TEP should be reserved for female patients with recurrent groin hernia.

S021
CINE MRI VERSUS ULTRASONOGRAPHY FOR DETECTION OF ADHESIONS AFTER OPEN AND LAPAROSCOPIC INCISIONAL HERNIA REPAIR, Thomas Mussack MD, Andreas Lienemann MD, Roland Ladurner MD, Tanja Fischer MD, Stefan Schmidbauer MD, Klaus H Halfeldt MD, Chirurgische Klinik Innenstadt, Ludwig-Maximilians Universitaet, Munich, Germany.
Introduction: Objective of this matched control study was to demonstrate long-term adhesions and changes of the abdominal wall following open and laparoscopic incisional hernia repair. We applied functional cine MRI and ultrasonography.
Methods and Procedures: Light-weight polypropylene meshes (VYPRO®) were used for open abdominal wall repair in the sublay technique and polytetrafluoroethylene meshes (GORE® Dual Mesh) for laparoscopic intraperitoneal onlay mesh repair. Both groups were matched for age, gender and type of hernia. Postoperatively, localisation, the type of adhesions as well as relative thickness and mobility of the abdominal wall were assessed applying functional cine MRI (Siemens 1.5 T) and high resolution ultrasonography (9-segment-technique).
Statistical differences were determined using the chi-square test. Significance was set at p-values less than 0.05.
Results: 25 patients (age 56-11 years; 17 male, 8 female) who underwent open or laparoscopic incisional hernia repair were postoperatively reexamined after 27±12 months and 12±4 months respectively. Functional cine MRI showed to be superior to ultrasonography in demonstrating intraabdominal adhesions (p<0.01). Most frequently, adhesions were seen between small bowel loops and the abdominal wall followed by bowel-to-bowel adhesions (p<0.05). However, adhesions between bowel loops and the abdominal wall occurred more frequently following open hernia repair (p<0.01). Furthermore, we observed a correlation between the patients complaints and the morphological changes in the cine MRI.
Conclusions: Functional cine MRI represents a reliable non-invasive technique to detect long-term adhesions and pathologies of the abdominal wall following open and laparoscopic incisional hernia repair. Our results suggest, that this approach has distinct advantages in comparison to high resolution ultrasonography.
of tacks placed approximately 2-3cm inside the edge of the mesh from above. Steep dependent patient positioning is used to ensure no bowel is caught behind the mesh. After the first row, another row of tacks and sutures are placed closer to the edge of the mesh.

Results: All patients had failed prior attempts at VHR with an average of 12 prior repairs (range 17-30). Mean defect size was 626cm² (range 15x14 cm² to 38x25 cm²). All required between two and four pieces of Gore-Tex® to allow for tension free repair. Average operative times were 285 mins. Two patients had their procedure aborted after lysis of adhesions, to avoid mesh placement, in the setting of a potential missed bowel injury. Both were returned to the operating room within a week for delayed mesh placement, only one of which was successful. The second patient had extensive bowel edema and was repaired at a later date. We had two conversions (one Reeves-Stoppa and one Component Separation), one enterotomy and one bladder injury. There were no mortalities however two of the ten patients had a prolonged hospital course and ICU stay. One developed extensive IVC thrombosis while another developed an abdominal compartment syndrome. In follow-up there were two recurrences due to infected mesh removal.

Conclusion: Patients with large ventral hernia defects and loss of domain, can still be approached laparoscopically for both lysis of adhesion and hernia repair. The technique is complex and is modified to allow for mesh fixation from above. Potential for missed bowel injury and bowel edema and abdominal compartment syndrome may be reasons to abort the procedure and delay the mesh placement for a later date.

S023

LAPAROSCOPIC VS. OPEN INCISIONAL HERNIA REPAIR: A SINGLE INSTITUTION ANALYSIS OF HOSPITAL RESOURCE UTILIZATION FOR 884 CONSECUTIVE CASES, David Earle MD, Neal Seymour MD, Erica Fellinger MD, Alexander Perez MD, Baystate Medical Center, Tufts University School of Medicine

Objective: To analyze and compare the utilization of hospital resources associated with laparoscopic and open incisional hernia repair.

Methods: Prospectively collected administrative data were examined for 1493 cases of ventral hernia repair performed between November 1999 and June 2004. 605 non-incisional hernias (556 umbilical, 36 epigastric, 13 parastomal, and 4 spigelian) were excluded and 884 incisional hernia repairs were examined for OR time, OR supply and total hospital cost (SUS), length of stay (LOS), and 30 day postoperative ER visits. Data are expressed as mean±SEM and statistical comparisons were by chi squared analysis and Student’s t-test. LOS, ER visit, and financial data were only available from 2001 on.

Results: 469 incisional hernias were repaired by laparoscopic (53%) and 415 by open technique (47%). Laparoscopic repair was associated shorter LOS (1±0.2 days vs. 2±0.6 days), longer operative time (149±4 mins vs. 89±4 mins), higher supply costs (2,237±113 vs. 664±113), lower total hospital cost (6,396±477 vs. 7,197±1,819) and a greater number of postoperative (30 day) ER visits, 1493 cases of ventral hernia repair. The recent initiative of Centers of Excellence in bariatric surgery calls for documentation of surgeon’s outcome. The SAGES Outcome Initiative is a national database introduced in 1999 as a method for surgeons to accumulate and compare their data to summary national data. A bariatric-specific dataset was later established in 2001. The aim of this study was to review the SAGES bariatric surgery outcome data accrued from 2001-2004 and compared to data derived from a national administrative database.

The SAGES Bariatric Outcome Initiative is a prospective online database available to all SAGES members. The University HealthSystem Consortium (UHC) is an administrative database of academic centers and affiliate teaching hospitals. Using ICD-9 procedural and diagnosis codes, we identified all hospitalizations during which a bariatric procedure was performed in 2003. The SAGES Bariatric-specific Outcome Initiative provides valuable data that are not currently available in an administrative database and can be utilized for benchmarking purposes.

However, the use of this database is currently underutilized.

S026

MODERATE WEIGHT LOSS PRODUCES SIGNIFICANT IMPROVEMENT IN COMORBID CONDITIONS AFTER LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING, Sergey Lyvass MD, Scott A Cunneen MD, Masanobu Hagiike MD, Monali Misra MD, Miguel Burch MD, Theodore M Khalili MD, Gary Furman MD, Edward H Phillips MD, Cedars-Sinai Medical Center, Los Angeles, California

Laparoscopic adjustable gastric banding (LAGB) has gained a wide popularity outside the US due to the low postoperative morbidity and considerable weight loss. Studies in the US have failed to reproduce these outcomes. Studies showed conflicting results regarding the reduction of comorbidities and weight loss.

Objective: To assess weight loss and changes in comorbid conditions one year after LAGB.

Patients and Methods. Of the 255 patients (pts) who underwent LAGB 126 were followed for at least 12 months. Weight loss, changes in co-morbidities and BAROS scores were concurrently collected and retrospectively analyzed using multiple linear regression.

Results. There were 32 males and 94 females with a mean age of 45±12 (19-70). Preop weight was 309±88 lbs, (199-487), with BMI 48±7, (34-68). 112 pts (89%) had at least one comorbidity condition (mean 2.6±1.7, 1-6). Excess body weight loss year after operation was 37±17% (range 0-102). Of the 326 comorbid conditions 236 (72.4%) resolved completely or significantly improved one year after operation and 30 (27.6%) remained unchanged. (Table)

BAROS score was more than 4 (good/excellent outcome) in 66 pts (52%), 1 to 3 (fair outcome) in 43 pts (34%), and less than 1
(failure) in 17 pts (14%). Weight loss was more substantial in the pts with lower preop BMI and was not related to age (b=-1.0, p=0.003, 95%CI [&x2212;1.15 to &x2212;0.88] vs. b=-1.4, p=0.02, 95%CI [&x2212;1.1 to &x2212;0.7]). BAROS scores were found to be not related to both preop BMI and age (b=0.01, p=0.7; b=0.01, p=0.2, respectively). Conclusion: Moderate weight loss associated with LAPGB at one year of follow up produced improvement in QOL and substantial reduction of comorbidities in the majority of pts. Diabetes, hypertension, GERD and coronary artery disease completely resolved or significantly improved in more than 75% of the pts. Reduction of co-morbidities and improvement of QOL can be anticipated in pts with any preop weight and age.

S027

INTRODUCTION: The advantages of laparoscopic adjustable gastric banding (LAGB) are well known. We review our experience with emphasis on outcome compared to the standard laparoscopic Roux-en-Y gastric bypass (RYGBP). METHODS: A prospective database identified patients who underwent operative management for severe obesity between February 2001 and June 2004. The study group included super morbidly obese patients (BMI &gt; 50) following LAGB and RYGBP. RESULTS: 315 patients underwent operative management for severe obesity. Among 108 patients with super morbid obesity, 55 (51%) and 53 (48%) underwent LAGB and RYGBP, respectively. Overall median follow-up was 14 months (range, 1-43 months). Preoperative factors of patient age, gender, BMI, and medical comorbidity were similar between the two groups. Compared to RYGBP, LAGB patients had a greater incidence of late complications, reoperations, less weight loss, and decreased overall satisfaction.

<table>
<thead>
<tr>
<th>LAGB(n=55)</th>
<th>RYGBP(n=53)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early compl.</td>
<td>18%</td>
<td>20%</td>
</tr>
<tr>
<td>Late compl.</td>
<td>45%</td>
<td>23%</td>
</tr>
<tr>
<td>Reoperations</td>
<td>20%</td>
<td>3%</td>
</tr>
<tr>
<td>BMI mean (kg/m²)</td>
<td>18.3 (±4.3)</td>
<td>18.1 (±4.3)</td>
</tr>
<tr>
<td>Approval</td>
<td>100%</td>
<td>100%</td>
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</tbody>
</table>

CONCLUSIONS: In super morbidly obese patients LAGB is significantly associated with more late complications, reoperations, less weight loss, and patient dissatisfaction compared to RYGBP. Further evaluation of LAGB in this patient population appears warranted.

S028
US EXPERIENCE WITH 760 LAPAROSCOPIC ADJUSTABLE GASTRIC BANDS: INTERMEDIATE OUTCOMES, Manish S Parikh MD, George A Fielding MD, Christine J Ren MD, New York University School of Medicine, Department of Surgery. Laparoscopic adjustable gastric band (LAGB) has been consistently shown to be a safe and effective treatment for morbid obesity, especially in Europe and Australia. Data from the US regarding the LAGB has been insufficient. This study reveals our experience with 760 primary LAGB over a 3-year period. All data was prospectively collected and entered into an electronic registry. Characteristics evaluated for this study include pre-operative age, BMI, gender, race, conversion rate, operative time, hospital stay, percent excess weight loss (%EWL) and post-operative complications. Annual esophagrams were retested. Demographic, operative, and endoscopic data were gathered prospectively from July 2001 through September 2004, 760 patients (540 females, 220 males) underwent LAGB for the treatment of morbid obesity, including 640 Caucasians, 61 African-Americans, and 45 Latin Americans. Mean age was 42 years (+/- 11 range 13.72) and mean BMI was 45.9 (+/- 7 range 30, 9.15). There was one conversion to open (0.01%). Median operative time and hospital stay were 55 minutes and 24 hours, respectively. The mean %EWL at 1 year, 2 years, and 3 years was 44.6 +/- 17.6, 56.8 +/- 19.1, and 58 +/- 18.4, respectively. There were no mortalities. Post-operative complications occurred in 13% of patients: 2.6% gastric prolapse (?slip?), 2.1% concentric pouch dilatation (without slip), 1.4% acute post-operative band obstruction, 1.4% port/tubing problems, 1.1% overall band removal, 0.79% wound infection, 0.79% aspiration pneumonia, 0.66% port infection/abscess and 0.03% severe esophageal dilatation (reversible). These American results substantiate the data from abroad that LAGB is a safe and effective treatment for morbid obesity.

S029
BANDED ROUX-EN-Y GASTRIC BYPASS AS A REVISIONAL PROCEDURE AFTER FAILED LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING, Akuezunkpa O Ude MD, Amna Daud MD, Daniel Davis DO, Marc Bessler, Center for Obesity Surgery, New York Presbyterian Hospital and Columbia University, New York, NY. Background: Laparoscopic Adjustable Silicone Gastric Banding (LASGB) has become an increasingly popular surgical technique for treatment of morbid obesity in the United States. Failure to achieve and maintain adequate weight loss may require revision to gastric bypass. We conducted a retrospective review of seven patients who failed to achieve adequate weight loss after LASGB, and were revised to a Roux-en-y gastric bypass (RYGBP) distal to a deflated, gastric band. Methods: We report on seven patients who presented with either inadequate weight loss or significant weight regain after LASGB. The revision consisted of deflating the existing band, transecting the stomach distal to the band and creating a 75 x 150cm retrogastric, retrocolic RYGBP. We have examined percent excess weight loss (%EWL) and complications at their most recent follow-up visit. Results: Between April 2000 and May 2004, 148 patients underwent LASGB and 14% (n=21) patients failed to achieve 25% EWL by 12 months. Seven female patients underwent revision of LASGB to RYGBP. At the time of their primary procedure, the patients had an average Body Mass Index (BMI) of 52.6 (36.4-74.5) kg/m². Patients lost an average of 10.8 %EWL from their primary procedure, resulting in a BMI at the time of revision of 48.8 (36-66) kg/m². After revision, patients lost an additional 31-49% (mean=42.2) of their excess weight, resulting in a total %EWL of 27-60 (mean %EWL=46) from the combined surgeries. All patients have seen improvement or resolution of their co-morbidities. Two patients have undergone band adjustments and are continuing to lose weight. No patients were lost to follow up, which ranged from 3 to 46 months (mean=15). Conclusions: These results indicate that leaving the deflated band in situ and performing a RYGBP distal to the band is a safe and effective revisional strategy. Advantages of this procedure include: 1) the ability to calibrate the size of the gastrojejunostomy over time to produce even greater weight loss; and 2) operating on unscarred gastric tissue which may decrease the high leak rates associated with reoperative bariatric procedures.

S030
ENDOSCOPIC EVALUATION OF THE GASTROJEJUNOSTOMY IN LAPAROSCOPIC GASTRIC BYPASS: A SERIES OF 340 PATIENTS WITHOUT POST-OPErATIVE LEAK, Nikhil R Sekhar MD, Alfonso Torquati MD, Rami E Lutfi MD, William O Richards MD, Vanderbilt University, Department of Surgery. BACKGROUND: A significant and potentially deadly complication of the Roux-en-Y Gastric Bypass is leakage from the gastrojejunostomy (GJ). The aim of our study was to evaluate the efficacy of intraoperative endoscopy in preventing postoperative anastomotic leakage. METHODS: The study enrolled 340 consecutive patients undergoing laparoscopic gastric bypass procedures performed from 1/2001 to 7/2004. In all cases, an endoscopist performed video gastroscopy to evaluate the integrity of the GJ using air inflation of the pouch after distal clamping of the Roux limb. Intraoperative leaks were repaired and the anastomosis was retested. Demographic, operative, and endoscopic data were
ABSTRACTS

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collected and analyzed. Logistic regression was used in both univariate and multivariate modeling to identify independent preoperative variables associated with the presence of intraoperative leak Model parameters were estimated by the maximum-likelihood method. From these estimates, odds ratios (OR) with 95% confidence intervals (CI) were computed.

RESULTS: There were no postoperative anastomotic leaks or mortalities in our series. Overall, endoscopic evaluation of the GJ was performed in the detection of 56 intraoperative leaks (16.4%). There was a significant difference in the incidence of intraoperative leakage for patients older than 40 (21%) vs. those younger than 40 (10.5%; P=0.01). In the initial 91 cases, the GJ was performed by the EEA technique; the subsequent 249 were performed with a combination of GIA and handsown technique. There was a trend toward more leakage in the GIA group (18%) vs EEA (12%), however the difference was not significant (P=0.188). Age remained an independent risk factor for leak detected in a variety of the multivariate logistic regression model after adjusting for covariates. An age greater than 40 increased the risk of intraoperative leakage by 2.3 times (OR 2.3; 95% CI: 1.2-4.6; P=0.01). The rate of postoperative anastomotic stricture was the same among patients detected with an intra-operative leak (5.4%) and those without (5.6%; P=0.934).

CONCLUSION: Endoscopic evaluation of the GJ is a sensitive and reliable technique for demonstrating anastomotic integrity and preventing postoperative morbidity after gastric bypass. Age greater than 40 was identified as an independent risk factor for intra-operative leak in this series.

S031

GASTROJEJUNOSTOMY STENOSIS FOLLOWING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: 21 VS. 25-MM CIRCULAR STAPLER. Jon C Gould MD, Michael J Garren MD, James S Carbonell DO, Department of Surgery, University of Wisconsin, Madison

Introduction: Stenosis of the gastrojejunostomy after laparoscopic Roux-en-Y gastric bypass is a common occurrence. The incidence varies widely among case series reported in the literature. Using a circular stapler with a larger internal diameter to create the gastrojejunostomy should result in a lower incidence of stenosis when compared to a stapler with a smaller diameter.

Methods: Our initial technique for constructing the gastrojejunostomy in laparoscopic gastric bypass involved the use of a 21-mm circular stapler (Group 1). The anvil was placed in the stomach through a gastrotomy incision or to creation of the gastrojejunostomy. After a large initial experience, we switched to a 25-mm circular stapler (Group 2). The rest of our surgical technique did not change. Stenosis was confirmed by endoscopy in patients complaining of the inability to eat or excessive vomiting.

Stenosis was defined as an internal gastrojejunostomy diameter less than that of a therapeutic endoscope (11-mm). All data was entered prospectively in a computerized database. Results: Group 1 consists of our first 145 consecutive patients. Stenosis occurred in 23 patients (15.9%) at a mean interval of 7.5 weeks (range 5-12 weeks). A mean of 1.7 dilations (range 1-3) were required to correct the stenosis. Group 2 consists of 53 consecutive patients with a 25-mm circular stapled gastrojejunostomy and at least 12 weeks follow-up. There were 2 patients who developed stenosis (3.8%, p=0.04). Each of these patients underwent endoscopic dilation at 6 weeks and responded to a single dilation. Patient groups were equal in BMI (Group 1: 49.8±7.0 kg/m2 vs. Group 2: 50.8±6.1, p=0.26), gender distribution (53% female vs. 87%, p=0.57), and age (44.0±10.6 years vs. 44.2±10.7, p>0.05).

Conclusions: The use of a 25-mm circular stapler in laparoscopic gastric bypass results in a significant decrease in the incidence of stenosis when compared to gastric bypass with a 21-mm stapler. Extended follow-up will be required to determine if weight loss is similar with each technique.

S032

CRITICAL ANALYSIS OF PERIOPERATIVELY-PLACED VENA CAVA FILTERS FOR GASTRIC BYPASS SURGERY, Alfredo M Carbonell DO, Eric J DeMaria MD, John M Kellum MD, James W Maher MD, Luke G Wolfe MS, Harvey J Sugerman MD, Minimally Invasive Surgery Center at the Virginia Commonwealth University Medical Center, Richmond, VA

Optimal prophylaxis for thromboembolism prevention following obesity surgery remains poorly defined. We analyzed our experience with obese patients undergoing gastric bypass (GB) who had peripherally placed vena cava filters to determine the impact of this preventive strategy on pulmonary embolus (PE) and define optimal patient selection for this procedure. The database was queried for patients who had undergone an open or laparoscopic GB or revision and a peripherally placed vena cava filter. Data was analyzed using standard statistical methods and multivariate analysis (Odds Ratio=OR). Since 1984, 3,742 GB procedures were performed; 161 patients received cava filters prior to surgery (n=21, 13%), intraoperatively (n=120, 75%), or postoperatively (n=20, 12%). Among patients with previous filters, 33% had a previous PE history. No patient had a PE after GB in this group. In the group undergoing filter placement after GB, 45% were placed after a PE (two, ultimately fatal), and 55% were placed for other reasons. Intraoperative filters were placed at the time of GB due to a prior history of PE in 8%. Multivariate analysis of independent variables predicting selection of patients for filter placement coincident with GB confirmed criteria used by many bariatric surgeons to select high risk patients. These include patients with venous stasis ulcers (OR 4.85, p=0.05), obesity hypoventilation syndrome (OR 4.12, p=0.05), sleep apnea (OR 2.67, p=0.05), advanced age (OR 1.03, p=0.05), and higher preoperative body weight (OR 1.00, p=0.05). Although filters did not eliminate PE following GB in the high risk group, the rate of PE was low at 3% (n=4, 1 postoperatively and 3 post-discharge including 1 fatal). There were 32 postoperative PE events (0.8%) in lower risk patients many of whom were anticoagulated but not selected for filter placement. Risk factors for PE prompting filter placement at the time of GB included venous stasis ulcers, obesity hypoventilation, sleep apnea, pulmonary hypertension, advanced age, and preoperative weight. Despite vigilance for these high-risk patients and a prophylactic anticoagulation regimen, the postoperative PE rate remained near one percent in those without filters. The persistence of PE risk in obese patients undergoing GB not meeting high risk criteria suggest that a more inclusive filter placement protocol, perhaps utilizing new removable filters to decrease long-term complications, should be evaluated prospectively.

S034

ELECTRICAL STIMULATION FOR GASTROPARESIS: GASTRIC MOTILITY RESTORED, John de Csepel MD, Stephanie L Goff MD, Brian Goldfarb MD, Alexander Shapsis MD, Nick Gabriel DO, St. Vincent's Hospital and Medical Center, New York, NY

INTRODUCTION: Gastroparesis is a disabling, and sometimes fatal, disease that often does not respond to medical treatment. This prospective case series examines the safety and six-month efficacy of electrical stimulation for the treatment of gastroparesis.

METHODS: Sixteen patients with medically refractory gastroparesis underwent laparoscopic implantation of an electrical stimulator device (Enterra Therapy, Medtronic, Inc., Minneapolis, MN) consisting of a subcutaneous generator and two gastric wall leads. Gastric emptying scans (GES) confirmed the diagnosis of gastroparesis. Patients were evaluated pre-operatively using a self-administered GI symptomatology questionnaire and the Rand 36 Health Survey. Once patients were >6 months from implantation, a repeat GES was performed and pre-operatively using a self-administered GI symptomatology questionnaire and the Rand 36 Health Survey. Ten of 16 patients in this case series were >6 months from implantation. One was lost to follow-up. An F-test was used to establish equality of standard deviations between the 16 patients evaluated pre-operatively and the 10 patients evaluated post-operatively. A Student’s t-test was used to evaluate the significance of differences in pre- and post-operative results.

RESULTS: Average operating time was 117 minutes, with no intra-operative complications and no conversions to laparotomy. The majority of patients were discharged on post-opera-
tive day #1. There were two post-operative complications. One patient required stimulator repositioning due to discomfort and another required stimulator explantation for everting skin erosion after abdominal wall trauma. Patients experienced a significant decrease in nausea and vomiting as measured by the GI symptomatology questionnaire. Half of all patients no longer require prokinetic medications, and there was a subjective reduction of GERD symptoms, early satiety and epigastric pain. A significant increase in quality of life as measured by the Rand 36 Health Survey was seen, and six of eight patients no longer demonstrated gastroparesis on GES. CONCLUSION: Laparoscopic implantation of an electrical stimulator for treating gastroparesis is safe and effective. A reproducible in vivo rat model has been achieved. This total colonoscopy model with sub mucosal injection of cecal wall resulted in a visible blister. FR was defined as failure to reach and inject the cecum. Rats were allowed to recover. CR was measured at necropsy. R was assessed by comparing TC time, FR and CR for 3 operators. The success rate when using a retrograde approach; the success rate is 99.3% of rats survived to planned sacrifice. No other complications were found at necropsy. A reproducible in vivo rat model has been achieved. This total colonoscopy model with sub mucosal injection of cecal wall should provide a valuable tool in the future for studies of solid colorectal tumors.

S035 ENDOSCOPIC RETROGRADE CHOLAGIOPANCREATOGRAPHY AND GASTRODUODENOSCOPY AFTER ROUX-EN-Y GASTRIC BYPASS, Larissa Guerrero BS, Jose Martinez MD, Patricia Byers MD,Peter Lopez MD,Brian J Dunkin MD, University of Miami Department of Surgery Background: One concern in performing Roux-en-Y gastric bypass (RYGB) for morbid obesity is that subsequent endoscopic evaluation of the gastric remnant and duodenum is difficult. By gaining percutaneous access to the gastric remnant, however, gastro-duodenedoscopy as well as endoscopic retrograde cholangiopancreatography (ERCP) can be easily performed. This report describes the results of a novel technique for performing trans-gastrostomy gastroduodenoscopy and ERCP. Methods: Four patients with a RYGB for morbid obesity underwent trans-gastric remnant endoscopic evaluations. The patients had gastrostomy tubes placed into their gastric remnants by interventional radiology. The tube tracts were sequentially dilated over time to 2F. At the time of endoscopy, the gastrostomy tube was removed, skin anesthetized, and either a pediatric duodenoscope (outer diameter 7.5 mm) or a transnasal gastroscope (outer diameter 5.9 mm) was inserted through the gastrostomy tube tract. Results: All patients were successfully evaluated. The first patient had a dilated common bile duct after RYGB; ERCP and sphincterotomy was done for papillary stenosis. The second patient presented with a dilated gastric remnant on CT scan; endoscopic evaluation of the gastric remnant and duodenum ruled out recurrence of a duodenal tumor which had been previously resected. The third patient had a nuclear medicine scan with a localized bleed to the gastric remnant; a healing pre-pyloric ulcer was seen and biopsied during endoscopy. The fourth patient necessitated endoscopy to evaluate a pre-pyloric ulcer with history of bleeding; endoscopy was successful and the ulcer was biopsied. Conclusion: The trans-gastrostomy endoscopic route assures access to the excluded stomach and proximal small bowel post RYGB. Studies of transoral endoscopic access to the duodenum after gastric bypass have reported 60-80% success rates when using a retrograde approach; the success rate is even less as the alimentary and biliopancreatic limbs become longer. Another disadvantage of the retrograde approach is the use of an enteroscope or pediatric colonoscope without an elevator for performing ERCP. These longer scopes also render a number of ERCP tools useless. By contrast, the trans-gastrostomy endoscopic route is safe and effective and the use of standard duodenoscopes should improve the cannulation success rate during ERCP in these patients.

S036 DEVELOPMENT OF A TOTAL COLONOSCOPY MODEL IN RATS FOR THE STUDY OF COLORECTAL CANCER, Chris Haugahn MD, Miro Uchal MD,Sam Rossi MD,Yannis Raftopoulos MD,Yunus Yavuz MD,Donald Mårvik PhD,Roberto Bergamaschi PhD, Minimally Invasive Surgery Center, Allegheny General Hospital, Pittsburgh, PA. Experimental models of solid colorectal tumor either require laparotomy for induction and/or an anastomosis following resection. The long murine cecum avoids the need for an anastomosis making cecum the preferred site for induction. This study aims to evaluate total colonoscopy with sub mucosal injection of cecal wall in terms of failure rates (FR), complication rates (CR) and reproducibility (R). This protocol was approved by IACUC. A gastric bolus of brovol prep was given. Anesthesia was injected s.c.. A video fibroscope (5.9-mm outer diameter, 180°/90° up/down bending, 100°/100° right/left bending, 103-cm working length, 120° view field, 2.0-mm channel) (Olympus) was allowed for irrigation, and suction. 1-ml saline was injected in cecal wall thru a 2-mm 23-G needle placed on a 2-mm wire (NM 23L, Olympus) resulting in a visible blister. FR was defined as failure to reach and inject the cecum. Rats were allowed to recover. CR was measured at necropsy. R was assessed by comparing TC time, FR and CR for 3 operators. The success rate when using a retrograde approach; the success rate is 99.3% of rats survived to planned sacrifice. No other complications were found at necropsy. A reproducible in vivo rat model has been achieved. This total colonoscopy model with sub mucosal injection of cecal wall should provide a valuable tool in the future for studies of solid colorectal tumors.

S037 LAPAROSCOPIC-ASSISTED TRANSGASTRIC ERCP AFTER ROUX-EN-Y GASTRIC BYPASS: TECHNIQUE AND RESULTS, Brian Lane MD, Samer Mattar MD,Faisal Qureshi MD, Joy Collins MD,Paul Thodiyil MD,Tomasz Rogula MD,Pandu Yenumula MD,Laura Velcu MD,Guilherme Costa MD,George Eid MD, Ramesh Ramanathan MD,Adam Slivka MD,Philip Schauer MD, Department of MIS Surgery, University of Pittsburgh Medical Center INTRODUCTION: An emerging dilemma is the difficulty in obtaining endoscopic access to the biliary tract after Roux-en-Y gastric bypass. Patients undergoing LRNYGB with resultant weight loss are at risk for gallstone formation and gallbladder/biliary disease, with a reported combined incidence of 30%. The anatomic changes of current LRNYGB techniques preclude standard ERCP. There have been isolated case reports of transgastric and transjejunal intraoperative ERCP in LRNYGB patients. The purpose of this study is to review our results and technique in a series of lap-assisted ERCP. METHODS: All consecutive post LRNYGB patients having a lap-assisted ERCP from 9/2001 to 7/2004 were included. The clinical indications for ERCP, success of biliary tree cannulation, therapeutic interventions employed, operative technique details, and complications were reviewed. RESULTS: 7 patients were identified (6 female, 1 male), ranging in age from 45 to 58. The time interval from LRNYGB was 9 months to 4 years. Indications were: obstructive jaundice (5 patients), gallstone pancreatitis (2 patients), and bile leak (1 patient). Preoperative workup included MRCP in each case. All patients underwent successful lap-assisted transgastric ERCP. Technical details will be presented and therapeutic maneuvers included: 4 sphincterotomies, 3 stone retrievals and one stent placement for a post-op bile leak. Complications included a peri-gastrostomy wound infection and a GI bleed that resolved with expectant treatment. CONCLUSIONS: Although technically complex, Laparoscopically assisted transgastric ERCP is feasible and safe after LRNYGB. These procedures will have a growing need as the national population of LRNYGB patients increases.
S038

DEPTH OF ENDOSCOPICALLY PLACED SUTURES? AN EXPERIMENTAL STUDY IN A HUMAN CADAVER MODEL, Markus H Kleemann MD, Cord Langner MD, Albrecht Müldner MD, Christian Weiss PhD, Bernd C Manegold MD, 1 University Hospital Schleswig-Holstein, Campus Luebeck, Department of Surgery, Luebeck, Germany; 2 Medical University Graz, Institute of Pathology, Graz, Austria; 3 University Hospital Mannheim, Surgical Endoscopy Unit, Mannheim, Germany

Background: Endoscopic suturing devices offer interesting access to interventional procedures at the gastrointestinal tract. For the time being main indication is the endoluminal stop of gastroesophageal reflux disease. There is some evidence that endoluminal endoscopic suturing offers an alternative to the closure of esophageal fistulas, to the fixation of feeding tubes and stents in the near future. A review of the literature missed anatomical data, which wall layers are stitched by sutures. The aim of this study was to determine the depth of endoscopically placed sutures at the esophagus of a human cadaver model.

Methods: Overall 62 sutures were placed in the esophagus of 10 cadavers (complete exenterative cadaver model) at three different suction levels, 0.4-0.6-0.8 bar using the suturing machine EndoCinch® (BARD). After preparation of the esophagus from its mediastinal bed, all sutures were fixed in formalin and stained with HE for histological examination.

Results: None of the sutures were placed in the mucosa alone, 1.6% were found in the submucosa, 4.8% in the circular M. propria, 56.5% in the longitudinal M. propria and 37.0% were placed transmurally. At a suction level of 0.4 bar (0.6, 0.8 bar) 0% (0%, 1.6%) were placed in the submucosa, 3.2% (0%, 1.6%) in the circular M. propria, 11.0% (25.8%, 12.9%) in the longitudinal M. propria and 12.9% (6.5%, 17.7%) were placed transmurally.

Conclusions: We report for the first time a systematic examination of the depth of endoscopically placed sutures in the esophagus. Most of the sutures were found in the muscular wall of the esophagus at a suction level of 0.6 bar. Also transmural placements were seen. Reduction of suction pressure may lead to reduction of transmural sutures.<@>

S040

OBJECTIVE IMPROVEMENTS FOLLOWING FULL-THICKNESS GASTRIC CARDIA Plication FOR COMPLICATED GERD, Edward Lin DO, Shahriar Sedghi MD, Leena Khaitian MD, C. Daniel Smith MD, Emory University School of Medicine and Mercer University School of Medicine

INTRODUCTION: Single full-thickness (transmural) plication of the proximal gastric cardia performed endoscopically has been proposed as a method of creating an intraluminal barrier against gastric reflux into the esophagus. We report 10 patients with complicated GERD (3 with BMI > 50 and high dose medication requirements; 2 with hiatal hernia > 2 cm; 3 failed prior antireflux surgery; 2 failed endoscopic mucosal suturing) who have undergone treatment with the Plicator device (ENDO Surgical, Mansfield, Mass.). METHODS: Prior to the procedure, all patients had objective testing (pH, endoscopy, contrast esophagograms, motility studies). Clinical outcomes were monitored for antisecretory medication use and symptom scores. Eight patients had objective post-procedure evaluations in the first 2 months after the procedure. Video documentation ensured consistent procedure application. RESULTS: Symptom scores improved for chest pain, heartburn, regurgitation, vomiting, in all patients. Complete symptom resolution in at least one category was observed in 70%. The reduction in medication use was reported in 80%, with 50% of the patients discontinuing medications completely. Amelioration of reflux was demonstrated in 6 of 8 contrast esophagograms, and 4 of 5 pH studies (3 compared to normal). All procedures were performed in the outpatient setting. There were no complications. CONCLUSIONS: Endoscopic full-thickness plication of the gastric cardia may offer surgeons another alternative for treating selected patients with complicated GERD. This is also the first report of employing endoscopic plication in patients who failed antireflux surgery with favorable early objective outcomes.

S041

THIN-LAYER ABLATION OF HUMAN ESOPHAGEAL EPITHELUM USING A BIPOLAR RADIOFREQUENCY BALLOON DEVICE (BARRX SYSTEM), Brian J Dunkin MD, Jose Martinez MD, Pablo Bejerano MD, C. Daniel Smith MD, Kenneth Chang MD, W. Scott Melvin MD, University of Miami, Emory University, University of California Irvine, Ohio State University

Background: To determine the optimal treatment parameters for the ablation of human esophageal epithelium using a balloon-based bipolar radiofrequency (RF) energy electrode.

Methods: Immediately prior to esophagectomy, subjects underwent EGD and allocation to 1 of 3 treatment arms using a circumferential segmentation of non-tumor bearing esophageal epithelium using a balloon-based bipolar RF energy electrode (BARRx, Sunnyvale, CA). Subjects were randomized to 1 of 3 energy density groups: 8, 10 or 12 J/cm2. RF was applied 1x proximal and 2x distally. Following resection, sections from each ablation zone were evaluated using H&E and diaphoresis. Histological endpoints included: 1) complete epithelial ablation (yes/no), 2) maximum ablation depth, 3) residual ablation thickness after tissue slough. Outcomes were compared according to energy density group and 1x vs. 2x treatment.

Results: Thirteen male subjects (age 49-85 years) with esophageal adenocarcinoma underwent the ablation procedure followed by total esophagectomy (transhiatal or Ivor-Lewis). Complete epithelial removal occurred in the following zones: 10 J/cm2 (2x) and 12 J/cm2 (1x and 2x). The maximum depth of injury was the muscularis mucosae; 10 and 12 J/cm2 (both 2x). A second treatment (2x) did not significantly increase the depth of injury. Maximum thickness of residual ablation after tissue slough was only 35 mm.

Conclusions: Complete removal of the esophageal epithelium without injury to the submucosa or muscularis propria is possible using this balloon-based RF electrode at 10 J/cm2 (2x) or 12 J/cm2 (1x or 2x). A second application (2x) does not significantly increase ablation depth. This data has been used to select the appropriate settings for treating intestinal metaplasia in trials currently underway.

S042

PREDICTIVE FACTORS OF COEXISTING CANCER IN BARRETT’S HIGH-GRaDE DYSPLASIA, Chadin Tharavej MD, Cedric G. Peters MD, Stephen R. DeMeester MD, Jeffrey A Hagen MD, Giuseppe Portale MD, Tom R. DeMeester MD, Department of Surgery, University of Southern California

Background: Identification of high-grade dysplasia (HGD) in Barrett’s esophagus has been considered to be an indication for esophagectomy because of the high risk of coexisting cancer. However, rigorous endoscopic surveillance programs have recently been recommended, reserving esophagectomy for patients in whom cancer is identified on biopsy. This approach risks continued surveillance in patients who already have cancer, unless reliable markers for the presence of occult cancer are identified. The aim of this study was to determine the endoscopic, histologic and demographic features associated with the presence of occult cancer in HGD patients.

Methods: Endoscopic, histologic and demographic findings in 29 patients who underwent esophagectomy for HGD were reviewed. The presence of an ulcer, nodule, stricture or raised area on preoperative endoscopy was noted. Results of endoscopic biopsies taken before resection every 2 cm along the Barrett’s esophagus, HGD, distal normal and cancer were compared. If the dysplasia was limited to a single biopsy and as multiple level if more than one level was involved. The percent length of columnar epithelium containing HGD was calculated by dividing the number of biopsies with HGD by total number of levels biopsied. Patients were divided into two groups according to the presence or absence of cancer in the resected specimens, and these variables were compared.

Results: Of 29 resected specimens, cancer was identified in 13 (44.8%) and non-cancer in 16. The presence of visible lesions was more significantly identified in cancer than in non-cancer group (6/13 vs 0/16, p=0.01) and the number of patients with multi-level HGD was higher in cancer than in non-cancer
group (8/13 vs 3/16, p=0.02). In addition, mean number of biopsy levels containing HGD was more identified in cancer than in non-cancer group (50.7 +/- 7.5% vs 27 +/- 4.5%, p=0.01). Median age was 72 years (IQR, 61.5-76) for cancer group and 62 years (IQR, 61.5-76) for non-cancer group (p=0.05). The gender and length of Barrett’s mucosa was not different between 2 groups.

Conclusions: In patients with HGD, the presence of a visible lesion on endoscopy and the presence of HGD in multiple biopsy levels are associated with an increased risk of the occult cancer. These patients should be considered for early esophagectomy.

S043
PER-ORAL TRANSGASTRIC ENDOSCOPIC SPLENECTOMY: IS IT POSSIBLE?, Sergey V Kantelev MD, Bing Hu MD, Sanjay B Jagannath MD, Cheryl A Vaughn RN, Mark A Talamini MD, Anthony N Kalloo MD, Johns Hopkins University School of Medicine

BACKGROUND: We have previously reported the feasibility of diagnostic and therapeutic peritoneoscopy including liver biopsy, gastrojejunostomy and tubal ligation by a per-oral transgastric approach. We now present results of per-oral transgastric splenectomy in a porcine model. AIM: To determine the technical feasibility of per-oral transgastric splenectomy using a flexible endoscope. METHODS: We performed acute experiments on 50-kg pigs. All animals were fed liquids for 3 days prior to procedure. The procedures were performed under general anesthesia with endotracheal intubation. The flexible endoscope was passed per-oral into the stomach and puncture of the gastric wall was performed with a needle-type sphincterotome. The puncture was extended to create a 1.5-cm incision using a pull-type sphincterotome and a double-channel endoscope was advanced into the peritoneal cavity. The peritoneal cavity was insufflated with air through the endoscope. The spleen was visualized. The splenic vessels were ligated with endoscopic loops and then mesentery was dissected using blunt electrocautery. RESULTS: Endoscopic splenectomy was performed on 3 pigs. There were no complications during gastric incision and entrance into the peritoneal cavity. The visualization of the spleen and other intraperitoneal organs was very good. Ligation of the splenic vessels and mobilization of the spleen was easily achieved using already commercially available devices and endoscopic accessories. The spleen was then removed in toto without significant bleeding. All animals remained hemodynamically stable during splenic removal.

CONCLUSION: Transgastric endoscopic splenectomy in a porcine model appears technically feasible. Further long-term survival experiments are planned.

S044
THE ROLE OF TELEMENTORING AND TELEROBOTIC ASSISTANCE IN THE PROVISION OF LAPAROSCOPIC COLORECTAL SURGERY IN RURAL AREAS, Herawaty Sebaiang MD, Patrick Trudeau MD, Allan Dougall MD, Susan Hegge MD, Craig McKinley MD, Mehran Anvari PhD, Centre for Minimal Access Surgery, McMaster University, Hamilton Ontario Canada; Centre Hospitalier de la Sagami, Chicoutimi Quebec Canada; North Bay District Hospital, North Bay Ontario Canada

PURPOSE: The aim of this study was to assess whether telementoring and telerobotic assistance would improve the range and quality of laparoscopic colorectal surgery being performed by community surgeons.

METHODS: We present a series of 18 patients who underwent telementored or telerobotically assisted laparoscopic colorectal surgery in two community hospitals between December 2002 and December 2003. Four community surgeons with no formal advanced laparoscopic fellowship were assisted by an expert surgeon from a tertiary care center. Telementoring was achieved with real-time two way audio-video communications over various bandwidths and it included 1 redo ileocolic resection, 2 right hemicolectomies, 2 sigmoid resections, 3 low anterior resections, 1 subtotal colectomy, 1 reversal of Hartmann and 1 abdomino-perineal resection. A Zeus TS microjoint system (Computer Motion Inc, Santa Barbara CA) was used to provide telepresence for the telerobotically assisted laparoscopic procedures: 3 right hemicolectomies, 3 sigmoid resections and 1 low anterior resection.

RESULTS: There were no major intraoperative complications. There were two minor intraoperative complications involving serosal tears of the colon from the robotic graspers. In the telementored cases, there were two postoperative complications requiring reoperation (intraabdominal bleeding and small bowel obstruction). Two telementored procedures were converted because of the mentee’s inability to find the appropriate planes of dissection. One telerobotically assisted procedure was completed laparoscopically with telementoring from the expert surgeon. The median length of stay was 4 days. The surgeons considered telementoring useful in all cases (median score 4 out 5). The use of remote telerobotic assistance was also an enabling tool.

CONCLUSION: Telementoring and remote telerobotic assistance is an excellent tool for supporting community surgeons and providing better access to advanced surgical care. In the future, Telesurgery may cut health care costs by proving a way to export medical expertise.

S045
MOBILE IN VIVO ROBOTS CAN ASSIST IN ABDOMINAL EXPLORATION, Mark E Rentschler MS, Jason Dempert MS, Stephen R Platt PhD, Shane M Farrill PhD, Dmitry Olevnikov MD, University of Nebraska - Lincoln, University of Nebraska Medical Center

In vivo robot-assisted laparoscopy offers distinct benefits compared to conventional robot-assisted laparoscopic approaches. These remotely controlled miniature robots provide the surgeon with an enhanced field of view from multiple angles and in the near future they will provide dexterous manipulators not constrained by small incisions in the abdominal wall. We created remotely controlled mobile robots that can traverse the abdominal organs, while providing video and sensor feedback of the abdominal cavity from multiple, unobstructed angles. The miniature mobile robots were equipped with a camera and environment sensors that provided real-time measurements of temperature, humidity, and pressure. These robots were inserted through a small incision into the insufflated abdominal cavity of an anesthetized pig. Then, the mobile camera robot was used to visualize trocar insertion and other laparoscopic tool placements. Next, the mobile robots traversed the abdominal organs as the surgeon explored the abdominal environment. Finally, during the cholecystectomy, the robot provided the surgeon with several different views of the gallbladder. These robots have shown that in vivo robots can overcome some of the limitations of current rigid, single view cameras. The robots were not confined by the entry point, and were free to move around the abdominal cavity to attain optimal camera angles and sensor readings. This approach limited the procedure to two incisions, allowed ease of exploration before the cholecystectomy and helped improve orientation and define depth during the cholecystectomy. Future work will provide a mobile manipulator that will provide task assistance which will enhance the capabilities of the surgeon. The outcome will be that patient trauma during laparoscopic abdominal surgery will be reduced to a single entry port where the robots are inserted into the abdominal environment.

S046

http://www.sages.org/
A NEW TECHNIQUE OF LAPAROSCOPIC SENTINEL NODE NAVIGATION SURGERY FOR EARLY GASTRIC CANCER
Minoru Matsuda MD, Kazuya Kato MD, Manabu Yamamoto MD, Motoy Yamagata MD, 2nd. Department of Surgery, Asahikawa Medical College, Asahikawa Japan. Pippu Clinic, Pippu Japan. Adachi Kyosai Hospital, Tokyo Japan, Department of Surgery, Niho University School of Medicine, Tokyo Japan.

Recently, a sentinel node navigation surgery (SNNS) is widely used for the intraoperative detection of metastatic lymph nodes. We employ the radioisotope SNNS (RI method) from November 2001 to optimize the surgical treatment for early gastric cancer. We also started to use an infrared scope (Infrared Ray Electronic Laparoscope System: Olympus, Japan) assisted SNNS (IR method) and RI method at the same time to improve the navigation ability. Aim of this study is to evaluate the usefulness of these 2 methods in laparoscopic surgery for early gastric cancer.

 Patients and methods
From November 2001 to April 2004, there were 22 early gastric cancer patients who underwent the laparoscopic gastrectomy with a help of sentinel node navigation. RI method: Tc-99m-phytate solution colloid was used as radioactive tracer. RI was injected under endoscopic control on 1 day before the surgery. Each injection was 0.5ml (74Mbq) and 4 submucosal injections were made around the lesion. A lymph node scintigram was done on the same day and the intraoperative scan was performed by 7A-probe (Navigator GPS: Tyco, USA).

IR method: A 2ml of ICG (5mg/ml) was injected into subserosal layer of the lesion under laparoscopic control. The injection site was found by A-probe since RI was injected around the lesion as described above. Infrared laparoscopic observation was started 20 minutes after the injection.

Results
By RI method, sentinel nodes were detected in all patients and the average number of nodes was 5.4. The sensitivity, specificity and accuracy were as high as 100%. On the other hand, only 75% of patients were detected by IR method and the average number of nodes was 3.2. Its sensitivity was 50%, specificity was 100% and accuracy was 83%.

Conclusions
RI method was reliable measure to detect the sentinel node, however, it is difficult to find the individual node by laparoscopic observation.

IR method allowed us to detect the individual node but its sensitivity and accuracy need to be improved. Further evaluation and improvement are required, however, we consider that the combination of these 2 methods could be realize the better surgical treatment for laparoscopic cancer surgery.

S049
EFFECTY AND SAFETY OF THE USE OF POLIDOCANOL 3 % MICRO-FOAM FOR THE ERRADICATION OF ESOPHAGEAL VARICES IN COMPARISON TO VARICEAL BAND LIGATION, FIRST WORLD EXPERIENCE.
ROBLES D, JOSE ISRAEL MD, YAHUACA M, JORGE MD, GUASCO G, EDUARDO MD, DE LA MORA GUILLERMO, HOSPITAL ANGELES DE QUERETARO.

INTRODUCTION: WE WANTED TO ANALYZE PATIENTS WITH ESOPHAGIC VARICEAL BLEEDING, PATIENTS WERE HEMODINAMICALLY STABLE AND THE ENDOSCOPIC PROCEDURE WAS PERFORMED AS AN OUT PATIENT. PATIENTS WERE DIVIDED IN TWO GROUPS: GROUP A FOR VARICEAL BAND LIGATION AND GROUP B FOR POLIDOCANOL MICRO-FOAM.

RESULTS: IN GROUP A, 100 % OF THE PATIENTS WERE RANDOMIZED IN A BALANCED WAY AND GROUP B, THE ETHIOLOGY OF HEPATIC DISEASE WAS DIVIDED INTO ALCOHOLIC LIVER DISEASE, VIRAL HEPATITIS AND OTHER CAUSES. CHILD ?PUGH CLASSIFICATION WAS USED TO STAGE THE HEPATIC FUNCTION. THE NUMBER OF SESIONS REQUIRED FOR ERRADICATION OF VARICES WAS DETERMINED FOR EACH GROUP. WE REPORT A ONE YEAR FOLLOW-UP, CONTROL EVERY EACH 3 MONTHS AND OBSERVED COMPLICATION.

RESULTS: WE INCLUDE A TOTAL OF 39 PATIENTS; 7 PATIENTS WERW EXCLUDE BECAUSE THAT DROPPED-OUT. FO THE REMAINING 17 WERE RANDOMIZED TO GROUP A AND 15 TO GROUP B. SEVENTY-FIVE PER CENT OF THE PATIENTS WERE MALE, AS FOR ETHIOLOGY OF HEPATIC DISEASE 81.3 % OF ALCOHOLIC LIVER DISEASE, 15.6 % HEPATIC VIRAL AND 3.1 % AND OTHER CAUSES. A 71.9 % OF THE PATIENTS WERE IN CHILD-PUGH STAGE A. THE AVERAGE NUMBER O SESIONS WAS 4.3 FOR GROUP A AND 4.1 FOR GROUP B. ( STATISTIC DIFFERENCE OF 0.9143) THE COMPLICATION RATE WAS 17.6 % IN GROUP A AND 7.1 % FOR GROUP B (WITH A P = 0.049).

ANALYSIS: WE COMPARE BOTH PROCEDURES (VARICEAL BAND-LIGATION AN POLIDOCANOL MICRO-FOAM) THERE IS NOT SIGNIFICANT DIFFERENCE BETWEEN THE NUMBER OF SESIONS REQUIRED TO OBTAIN ESOPHAGIC VARICES ERRADICATION. NEVERTHOLDS, WHEN WE ANALIZE THE COMPLICATIONS IN GROUP A WE OBSERVED DISPHAGIA, ESOPHAGIC ULCER WITHOUT STENOSIS DEVELOPMENT AND REBLEEDINGS WITHIN A 7 DAYS PERIOD. IN GROUP B WE ONLY OBSERVED ORTHOSTATIC HYPOTENSION IN ONE PATIENT (SIGNIFICANT DIFFERENCE IN FAVOR OF GROUP B). CONCLUSIONS: POLIDOCANOL MICRO FOAM COULD BE USEFUL METHOD FOR ERRADICATION OF ESOPHAGIC VARICES DEVOID OF COMPLICATIONS WHICH WERE ASSOCIATED TO POLIDOCANOL USE IN THE PAST WHICH CAUSED THIS PRODUCT TO BE BANNED BY FDA.

S050
ENDOSCOPIC TECHNIQUES TO USE THE STOMACH AND PERITONEAL CAVITY AS AN “ARTIFICIAL LUNG”, Joshua P Cantor MD, Shamus R Carr MD, Atul S Rao MD, Thirth V. Lakshman, Joshua E Collins BS, Tracey Sims, Vanessa Paris BA, Joseph S Friedberg MD, University of Pennsylvania; Thomas Jefferson University

http://www.sages.org/
INTRODUCTION: Pulmonary failure results in many deaths worldwide. Diseases such as ARDS, SARS, and pneumonia, are reversible if the victim can be kept alive and adequately oxygenated during the most severe stage while the underlying problem is treated. Current ventilatory techniques are often not adequate to accomplish this. Perfluorocarbons (PFC) are inert liquids with an extraordinary capacity to dissolve gases and may be a key to patient survival under these circumstances. The purpose of this study if perfusing the peritoneal cavity or stomach with oxygenated PFC could augment systemic oxygen (O2) levels. If successful, this technique could be implemented at the bedside with endoscopic techniques.

METHODS: 15 pigs weighing 45 to 55 kg were intubated and rendered hypoxic by ventilating them with a subatmospheric blend of O2 and nitrogen. Inflow and outflow catheters were placed in the peritoneal cavity and connected to a perfusion circuit including a pump, heater and oxygenator. 8 animals underwent peritoneal perfusion with oxygenated PFC and 7 controls with oxygenated saline. 7 more animals were perfused with catheters inside the excluded stomach. ABG's were collected at baseline and every 30 minutes for the duration of perfusion. A student's t-test was used to compare the PaO2 at baseline to the PaO2 achieved during perfusion with oxygenated saline and oxygenated PFC.

RESULTS: In the peritoneal perfusion group, an FiO2 of 14% resulted in a baseline PaO2 of 39.4±5.0, increasing to 55.3±7.6 mmHg with oxygenated PFC perfusion (p<0.001) (an arterial O2 saturation increase from 73% to 89%). At the same FiO2 the gastric perfusion group increased from a baseline PaO2 of 38.1±5.1 to 43.3±5.6 mmHg, an increase of 5.2 mmHg (p<0.0029) (an arterial O2 saturation increase from 74% to 80%). None of the control experiments with oxygenated saline demonstrated any significant gas exchange effects.

CONCLUSION: We have demonstrated in this large animal induced hypoxia model that it is possible to supplement clinically relevant amounts of oxygen by perfusing the abdominal cavity or the stomach with oxygenated PFC. Experiments are ongoing, but we conjecture that this technology may be a bridge for patients dying from reversible pulmonary failure and could be accomplished with endoscopic techniques at the bedside.

S060 LAPAROSCOPIC GASTRECTOMY FOR UPPER GASTRIC CANCER, Shinya Tamimura MD, Masayuki Higashino MD, Yusuke Fukunaga MD, Kishida MD, Akihito Ogata MD, Yushi Fujinawa MD, Department of Gastroenterological Surgery, Osaka City General Hospital

As less-invasive operations have been noted in recent years, laparoscopic gastrectomy for gastric cancer has become popular because of advances in surgical techniques. Previously, we reported about distal gastrectomy with regional lymph node dissection for middle and lower third of the stomach. We have performed laparoscopic gastrectomy with regional lymph node dissection on 426 cases of gastric malignancies since March 1998. Here we present the technique and results of laparoscopic gastrectomy for upper gastric cancer performed on 65 cases. Of all 65 cases, total and proximal gastrectomy was performed on 42 and 23 cases, respectively. In the total gastrectomized patients, D2 lymph node dissection defined according to the general rules of the Japanese Gastric Cancer Association was made in 21, while D1 dissection in 21. In the proximal gastrectomized cases, D2 and D1 was 3 and 20, respectively. All of the total gastrectomy patients were reconstructed by Roux-Y method, while in the proximal gastrectomy patients, 20 cases were reconstructed by esophagogastrostomy and 3 by jejunal interposition. The anastomosis for esophagus (esophagojejunostomy and esophagogastrostomy) was performed using conventional circular stapling device (CEEA) in 62 cases, while it was made by functional end-to-end method using linear stapling devices in 3 cases. The insertion of the CEEA's anvil into esophagus was performed after cigarette suture of the esophageal stump in 61 cases reconstructed using CEEA. However, only in one case, oral insertion of the anvil guided by naso-gastric suction tube was adopted and esophagojejunostomy using the double stapling technique was performed because of the relatively long invasion to esophagus of the tumor.

The average duration of operation and blood loss was 244 minutes and 182 mL in proximal gastrectomy, while 273 minutes and 291 mL in total gastrectomy, respectively. Minor leakage was recognized after operation in one case in the both groups. Recurrence did not occurred in all cases so far. Laparoscopic total and proximal gastrectomy is thought to be a safe and curative technique for upper gastric cancer.

S061 PROSPECTIVE RANDOMISED TRIAL OF LAPAROSCOPIC GASTROJEJUNOSTOMY (LGJ) VERSUS DUODENAL STENTING FOR MALIGNANT GASTRIC OUTFLOW OBSTRUCTION; PRELIMINARY RESULTS, A Hindmarsh MD, S Mehta MD, CE Cheong MD, R Tighe MD, J Saada MD, J Cockburn MD, M Lewis MD, M Rhodes MD, Department of Upper Gastrointestinal Surgery, Norfolk and Norwich University Hospital, Norwich, UK

Introduction: Laparoscopic gastrojejunostomy (LGJ) is the procedure of choice for relieving malignant gastric outflow obstruction (GOO) in patients who are fit for surgery. However, surgical bypass is associated with considerable morbidity and mortality. Duodenal stenting using a self-expanding metal stent (SMS) can also be used to palliate malignant GOO. Our aim is to compare the clinical outcome of patients undergoing LGJ with SMS for malignant GOO.

Patients and Methods: Since September 2001, 13 patients have been randomised to LGJ and 12 to SMS. The groups were well matched for age, sex, weight and pre-operative morbidity. One patient randomised to LGJ died before surgery. One patient in the SMS group was withdrawn from the trial before treatment because of resolution of GOO.

Results: LGJ was completed successfully in 10 patients. Nine patients underwent successful SMS. Three patients died in the early post-operative period following LGJ and one following SMS. The other early complications were gastroparesis (3), haematemesis (2), RTI (1), port-site infection (1), and DVT (1) in the LGJ group. Mean hospital stay following intervention was significantly shorter in the SMS group compared with the LGJ group (5.2 vs. 9.3 days, p=0.02). Mean visual analogue pain score at day one was lower in the SMS group (2.75+/-0.3 vs. 4.8+/-0.2).

Conclusion: Preliminary results suggest SMS is a safe and effective means of palliating malignant GOO. SMS appears to facilitate earlier discharge from hospital compared to LGJ, and may have a lower degree of post-operative pain, morbidity and mortality.

S062 MINIMALLY INVASIVE ESOPHAGECTOMY AT A COMMUNITY HOSPITAL, G Collins MD, E Johnson MD, T Kroshus MD, R Ganz MD, K Batts MD, J Seng MD, O Nwaneri MD, D Dunn MD, Virginia Piper Cancer Institute, Abbott Northwestern Hospital

Objective: Minimally invasive esophagectomy (MIE) is an evolving procedure that maybe an alternative to the open transthoracic esophagectomy. The considerable technical challenges may limit the general use of MIE in community hospitals. It was hypothesized that MIE could be effectively performed at a community hospital by a multidisciplinary team lead by surgeons experienced in open esophageal resection and laparoscopic surgery.

Methods and procedures: A multidisciplinary esophageal cancer team evaluated all patients entered in this study. A minimally invasive approach was initiated after additional surgeon training in the procedure. Twenty-three consecutive patients (20 males, 3 females; mean age 61, range 48-77) with resectable esophageal cancer (staging CT, PET scan and endoscopic ultrasound) underwent MIE between May 2003 and July 2004. Two patients underwent preoperative neoadjuvant chemo radiotherapy. Indications for resection included adenocarcinoma (55%, n = 18), high grade dysplasia (17%, n = 4) and squamous cell cancer (13%, n = 3). Outcomes evaluated included operative course, hospital and ICU length of stay, pathology, morbidity, mortality and routine follow-up.
technique included a laparoscopic Kocher maneuver and stomach/hiatus mobilization, thoracoscopic esophageal mobilization with lymphadenectomy and cervical specimen removal and esophagegastroanastomosis.

Results: One patient required conversion to open esophagectomy due to adhesions from a heart transplant. There were no deaths. Mean operative time was 5.8 hours (range: 5-8 hours). Average blood loss was 200 cc. Patients remained ventilated for a median of 0.5 days and the median ICU utilization was 1 day. Mean hospital length of stay was 9 days (range: 5-22 days). Anastomotic leaks occurred in 2 patients (treated with closed suction drainage), and a pyloric leak was seen in one patient. Minor pulmonary complications occurred in 32% (n = 7). Late anastomotic strictures requiring dilation were observed in 27% (n = 6). There was one microscopically positive margin in one cancer patient.

Conclusions: Minimally invasive esophagectomy is a technically challenging procedure that can be safely performed in a community hospital setting with comparable short-term outcomes as a traditional open approach. Success depends on a multidisciplinary esophageal cancer care team that appropriately selects patients, performs the surgery and manages postoperative care.

S064


Background: Esophagectomy is a technically demanding operation; for open procedures a mortality rate between 5% to 19% has been reported. The techniques for minimally invasive esophagectomy (MIE) were first described in 1993. Subsequently laparoscopic and thoracoscopic techniques have been limited by instrumentation. Robotic (telesurgery) instrumentation has the potential to advance MIE. The goal of this study is to report our early experience using robotic-assisted technology to perform RATE.

Methods: Between September 2001 and May 2004, 18 patients underwent RATE at our institution. Review of prospectively maintained database was performed.

Gender, age, postoperative diagnosis, operative time, conversion rate, blood loss, hospital stay, follow up length and complications were assessed.

Results: 18 patients underwent RATE; 16 men (89%), mean age of 54 (41-73 years). Postoperatively, 9 patients had Barrett’s esophagitis. Of the with high grade dysplasia, 1 patient had adenocarcinoma in situ; 5 had T1 N0 MX lesions; 1 presented a T2 N0 M0 lesion and 1 patient had a T3 N1 M0 lesion.

Conclusion: this early cohort experience demonstrated RATE to decrease mortality rate, blood loss and hospital stay compared to open esophagectomy. RATE has the potential of becoming standard of care for the treatment of esophageal cancer.

S065

BRAVO CAPSULE INDUCES ESOPHAGEAL HYPERCONTRAC-TILITY AND CHEST PAIN, Chadin Tharavej MD, Chih-cheng Hsieh MD,Tasha A Gandamihardja MD,John Lipham MD,Jeffrey H Peters MD,Jeffrey A Hagen MD,Steve R DeMeester MD,Cedric G Bremner MD,Tom R DeMeester MD, Department of Surgery, University of Southern California

Background: The Bravo catheter-free pH monitoring system showed that fifty percent of normal volunteers report intermittent chest pain during the monitoring period. Therefore, we hypothesize that the Bravo capsule may induce hypertensive esophageal contractions which may lead to chest pain.

Methods: The study group consisted of 40 consecutive patients with reflux symptoms who had stationary esophageal manometry within 24 hours of the Bravo capsule placement. The control consisted of 40 patients with reflux symptom from a population of 477 patients who were computer matched to the study group for age, sex, lower esophageal sphincter (LES) pressure, LES length, and 24 hour pH composite score. The symptom of chest pain was assessed by a standardized questionnaire. Distal esophageal contraction amplitudes (DEA) of 10 wet swallows were averaged. The number of patients with new onset of chest pain, the number of patients whose DEA exceeded the 95th percentile of normal (>180 mmHg) and the mean amplitude of the groups were compared.

Results: The mean contraction amplitude was higher in a Bravo group (144.7 vs 105.5 mmHg, P=0.002). The number of patients with a mean contraction amplitude exceeded 95th percentile of normal was also significantly higher in the Bravo group (13/40 vs 5/40, p=0.03). Ten patients in the study group developed new onset of chest pain during their study. Six of these patients had hypertensive distal esophageal contractions.

Conclusions: The intraesophageal Bravo capsule can cause hypertensive esophageal contractions which may lead to chest pain.

S066

LONG-TERM OUTCOME OF LAPAROSCOPIC REDO FUNDOPLICA-TIONS FOR THE TREATMENT OF GERD, Dave R Lal MD, Erik Jensen BS,Mark Cahill BS,Carlos A Pellegrini MD,Elena Quiroga MD,Brant K Oelschlager MD, Department of Surgery, University of Washington.

Laparoscopic antireflux surgery is an effective treatment for gastroesophageal reflux disease (GERD). In a small subset of patients, the initial operation fails, typically resulting in recurrent reflux or severe dysphagia. Although redo fundoplications can be performed laparoscopically, few studies have examined their long-term efficacy. Methods: We identified from a prospective database all patients undergoing redo laparoscopic fundoplications at the University of Washington between 1996 and 2001, and for the purpose of this study, contacted them for long-term follow-up. Seventy-seven patients were identified, 41 (53%) were contacted. Symptom questionnaires addressing the frequency and severity of 11 common symptoms and overall patient satisfaction were administered. This data was then compared to results obtained prior to the redo fundoplication. The median length of follow-up was 50 months (range 20-95). Results: After redo fundoplication, there was a significant reduction in frequency of presenting complaints, with the majority of patients having substantial improvement or complete resolution of symptoms (Table 1). The most common side effect was diarrhea (26 patients), in only six patients (23%) this was a new symptom after surgery. Overall, 88% rated the success of the procedure as either excellent or good, and when asked whether they were happy they chose to have the redo procedure, 78% said yes. Table 1. Symptom questionnaire results.

Conclusion: Although not nearly as successful as primary fundoplications, the majority of patients with reflux or dysphagia following antireflux surgery can expect a durable improvement in symptoms with a laparoscopic redo fundoplication.
**S067**

FIRST DECADES EXPERIENCE WITH LAPAROSCOPIC REDO NISSEN FUNDOPLICATION IN INFANTS AND CHILDREN.

Steven S Rothenberg MD, Presbyterian St Lukes

Introduction: Antireflux procedures are one of the most common operations performed in infants and children, but are associated with a relatively high failure rate often requiring revision. This paper evaluates the safety and efficacy of a laparoscopic approach for redo fundoplication in children.

Methods: From June 1993 to September 2004, 115 patients with recurrent GERD following fundoplication underwent a laparoscopic redo Nissen procedure. Ages ranged from 6 months to 19 years and weight 6.4 to 88 kg. 65 had previous open (54 Nissen, 10 thal, 1 Toupet) and 50 previous laparoscopic. 18 patients had more than one previous redo.

Results: All procedures were completed successfully laparoscopically. The average operative time was 100 minutes. The intra-operative complication rate was 1.1%. The time to full feeds was .8 days and average hospital stay was 2.2 days. The post-operative complication rate was 6.2% and the wrap failure rate is 6%. Six have undergone laparoscopic re-revision and one open. All are currently intact.

Conclusion: Laparoscopic redo Nissen fundoplication is a safe and effective procedure. It is associated with the same benefits as a primary repair with low morbidity and a shorter hospital stay. Early follow-up suggests the long term outcome is better than that associated with redo-open fundoplications.

**S068**

FOR WHICH ESOPHAGEAL DISORDERS IS COMBINED MANOMETRY AND IMPEDANCE MOST HELPFUL?

Leena Khaitan MD, Sandy Everett RN, C D Smith MD, Emory University School of Medicine

Background: Multichannel intraluminal impedance (MII), a new technology for evaluating bolus transit through the esophagus, is combined with manometry to more accurately evaluate esophageal function (esophageal function testing or EFT). The aim of this study is to ascertain which patients will benefit from EFT monitoring versus manometry alone.

Methods: Between December 2002, and September, 2004, all motility studies performed in the surgical esophageal physiology laboratory of Emory University were done with MII (Sandhill Scientific, Highland Ranch, CO) using a standard EFT probe. Studies were done in patients referred for evaluation of reflux disease or other esophageal symptom. All patient symptoms, study results and patient outcomes were recorded in a prospectively collected database. Results are reported as proportions. Results: During this time, 200 EFTs were completed. Patient presented with dysphagia (38%), heartburn (50%), regurgitation (35%), chest pain (18%), and respiratory or laryngeal symptoms (18%). Fifty patients had at least one prior fundoplication. Based upon manometry, patients were diagnosed with achalasia (8%), nutcracker esophagus (9%), hypertensive LES (5%), ineffective esophageal motility or IEM (18%) and scleroderma (2%). The remaining patients had normal manometry with adequate peristalsis and contraction amplitudes. Abnormalities of the lower esophageal sphincter (LES) were noted in 30% of patients. Overall, by MII findings, 26% of patients had normal bolus transit despite poor peristalsis. On the other hand, 15% of those patients with normal peristalsis had poor bolus transit. Of the patients who complained of dysphagia, those with nutcracker esophagus or hypertensive LES had normal bolus transit through the esophagus. Those with achalasia had no bolus transport through the esophagus. Of patients who were post fundoplication, half complained of dysphagia, of which only half had completely normal EFTs. Of the patients with IEM, half had abnormal bolus transit, however, half also had normal bolus transit despite poor motility. All of the patients with IEM as well as dysphagia had impairments of bolus transit.

Conclusion: Combining impedance testing with traditional esophageal motility provides further insight into patient symptoms and disease primarily for those patients who are post fundoplication or have IEM. For other patients, esophageal manometry alone provides adequate evaluation of esophageal function.
S069
RESULTS OF LAPAROSCOPIC FUNDOPLICATION AT 10 YEARS AFTER SURGERY. Bernard Daaldermaegd MD, Joseph Weerts MD, Constant Jeaheas MD, Les Cliniques Saint Joseph Background: Several studies have demonstrated that laparoscopic antireflux surgery (LAS) is efficient at short or mid term follow-up for treatment of gastroesophageal reflux disease (GERD). The aim of this study was to evaluate the results of LAS at ten years after surgery.
Methods: One hundred consecutive patients underwent LAS by a single surgeon in 1993 and were entered into a prospective database. Nissen fundoplication was performed in 68 patients; partial posterior fundoplication (modified Toupet procedure) was performed in 32 patients. Evaluations of the outcome were made at five years and ten years after surgery. A structured symptom questionnaire and a Gastrointestinal barium series were used at 5 years. The same questionnaire and a quality of life questionnaire (Gastrointestinal Quality of Life Index: GIQLI) were used at 10 years.
Results: Seven patients died from unrelated causes during the 10 years period of time. Four patients underwent revision surgery: one patient for persisting dysphagia, three for recurrent reflux symptoms. Three patients are lost for any follow-up study.
At five years, 93% of patients were free from significant reflux symptoms; at 10 years, 88% (91.8% after Nissen, 78.2% after Toupet procedure) of patients were still free from significant reflux. Major side effects were related to wind problems: flatulence, abdominal distension. They were reported by 60% of patients at 5 years and decreased to 30% at 10 years follow-up.
GIQLI scores at 10 years were significantly improved compared to the preoperative scores.
Conclusions: Elimination of GERD symptoms improved quality of life and eliminates the need for daily acid suppression in most patients. These results were apparent 5 years after the operation and were still valid 10 years later.

S070
Background: Carbon dioxide (CO2) pneumoperitoneum is usually created by a compressed gas source. This exposes the patient to cool dry gas, which has a temperature of 22°C and 0% relative humidity. Various delivery methods are available to humidify and heat CO2 gas. We designed a study to determine the effects of dry and heated humidified gas in the intra-abdominal environment.
Methods: Forty-four patients undergoing laparoscopic Roux-en-Y gastric bypass were randomly assigned to one of four arms in a prospective, randomized, single blinded fashion: (g1): raw CO2, (g2): heated CO2, (g3): humidified CO2 and (g4): heated humidified CO2. A commercially available CO2 heater humidifier was used. Perioperative bladder temperature, intra-abdominal humidity, operative time, volume CO2 used and lens fogging were monitored. Peritoneal biopsies were taken on 3 patients in each group, one at the beginning of the case and one prior to closure. Biopsies underwent H and E and Mason-trichrome histological staining as well as myeloperoxidase and CD-68 immunohistochemical assays. Post-operative narcotic use and pain scale scores were recorded. The ANOVA test was used to compare groups. A p-value of less than 0.05 was deemed significant.
Results: Demographics, volume CO2 used, intra-abdominal humidity, bladder temperature, lens fogging and operative time were not significantly different. Overall mean operative times for all 4 groups were 84.5 minutes. Bladder temperatures after 60 minutes were (g1) 36.3°C, (g2) 36.3°C, (g3) 36.2°C and (g4) 36.3°C. Intra-abdominal humidity measured 100% for all patients over the entire procedure. Total narcotic dosage and pain scale score showed no significant difference. Only one biopsy in the heated humidified group showed an increase in macrophage activity. Costs were $5 for standard tubing and $120 for heated humidified tubing.
Conclusions: The intra-abdominal environment with respect to temperature and humidity showed no difference in all four groups. There was no significant difference in intra-operative body temperature, post-operative pain medication used or post-operative pain score. No histological or immunohistochemical changes were identified. Heating or humidifying CO2 is not justified for patients undergoing laparoscopic surgery.

S072
IMPAIRED EOSPHAGEAL FUNCTION IN MORBIDLY OBESE PATIENTS WITH GERD: EVALUATION WITH MULTICHANNEL INTRALUMINAL IMPEDANCE. E Quiroga, F Cuenca-Abente, D Flum, E P Dellinger, B K Oelschlager, The Swallowing Center, Department of Surgery, University of Washington, Seattle, WA
Morbid obesity is associated with GERD, and both have an independent association with motility disorders. Impaired esophageal function can play a role in the development of dysphagia after fundoplications and bariatric procedures (especially restrictive procedures). Multichannel intraluminal impedance (MII) evaluates the effective clearance of a swallowed bolus through the esophagus, thus in combination with manometry may be able to identify patients at risk for post-operative dysphagia.
Material and Methods: We performed simultaneous MII, manometry, and pH monitoring in 10 asymptomatic subjects, 22 consecutive non-obese patients with GERD (GERD) and 22 consecutive morbidly obese patients with GERD (MO-GERD) being evaluated for antireflux and bariatric surgery at the University of Washington. MII was defined as abnormal if less than 80% of swallowed liquid boluses cleared the esophagus completely.
Results: All GERD and MO-GERD patients had abnormal pH monitoring. There were similar manometric findings between the GERD and MO-GERD patients (Table). Impedance detected many more patients with abnormal motility than did manometry. MO-GERD patients have significantly impaired esophageal clearance compared to both subjects and GERD patients.

S073
EARLY US OUTCOMES OF LAPAROSCOPIC GASTRIC BYPASS VERSUS LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING FOR MORBID OBESITY. Marc Bessler MD, Anna Daud MD, Mary DiGiorigi MPH, Akueunaka O’Ude MD, Daniel Davis DO, Center for Obesity Surgery, New York Presbyterian Hospital, Columbia University, New York, NY
INTRODUCTION: Gastric bypass (GBP) is the most common bariatric procedure in the US and is increasingly being performed laparoscopically. The laparoscopic adjustable gastric banding (LAGB) is the preferred bariatric procedure worldwide. There is limited data available comparing the two procedures in the US. This study compares complications, early outcomes of comorbidity resolution and weight loss in patients who underwent LAGB versus LAGB. METHODS: A review of prospectively collected data was performed on 332 patients undergoing primary laparoscopic gastric bypass GBP (n=192) and LAGB (n=140) procedures between 2/2001 and 3/2004. Chi-square and ANOVA were performed to determine differ-
ences in gender, age and initial BMI. Differences in complications, resolution of co-morbidities and percent excess weight loss (%EBWL) at 12 months was compared between the surgical groups (Table 1). A matched 1:1 case control study (matched for initial BMI, age and gender) was performed to control for potential confounders. A p value of <0.05 is considered statistically significant. RESULTS: Mean initial BMI was not significantly different between the groups (LAGB 47.3 vs. RYGB 48.9, p=0.53). There were significant differences in age and gender. There was a significantly greater percent excess weight loss in patients who underwent LGBP as compared to LASGB at 3, 6, 12 and 24 months after surgery. There were no significant differences in resolution of co-morbidities. There was a statistically insignificant difference in complications between the groups (8.3% vs. 5.6%; P<0.36). The matched case control study confirmed these findings. CONCLUSION: Despite similar resolution of co-morbidities, LGBP patients lose more weight than LASGB patients. As LGBP patients are reported to lose weight over 2-3 years and GBP patients regain weight, further follow up is needed to determine relative efficacy of these procedures.

TABLE 1.

<table>
<thead>
<tr>
<th>LAGB</th>
<th>LASGB</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female (%)</td>
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<td>76</td>
</tr>
<tr>
<td>Age (years)</td>
<td>38</td>
<td>43</td>
</tr>
<tr>
<td>3 mos %EWL</td>
<td>31</td>
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<td>24</td>
</tr>
<tr>
<td>12 mos %EWL</td>
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<td>33</td>
</tr>
<tr>
<td>24 mos %EWL</td>
<td>73</td>
<td>41</td>
</tr>
</tbody>
</table>

*p<0.05 is significant

S074


Background: To date in the US, the most frequently performed bariatric procedure is the Roux-en-y gastric bypass (RYGB). Outside the US the most common operation performed is the laparoscopic adjustable gastric band (LAGB). The expanding use of the LAGB is probably driven by the encouraging data on its safety and effectiveness, in contrast to the disappointing morbidity and mortality rates reported for the RYGB. The aim of this study is to evaluate the results in a single institution of the LAGB vs. the results of the established RYGB.

Methods: Between November 2000 and February 2004, 590 bariatric procedures were performed at our institution. Of these, 120 (20%) patients had laparoscopic RYGB, and 470 (80%) patients had LAGB. Prospectively collected data from a computerized database were retrospectively analyzed. Results: In the LAGB group, 376 (80%) of patients were female, the mean age was 41 years (17-65). In the RYGB group, 110 patients (91%) were female, the mean age was 41 (20-61).

Conclusions: The current study demonstrates that the LAGB is a simpler, less invasive, and safer procedure when compared with the RYGB. While mean %EBWL in RYGB patients increased rapidly during the first postoperative year, it remained nearly unchanged at 3 years. In contrast, in LAGB patients the weight loss was slower but steady, achieving satisfactory %EBWL at 3 years. Therefore, we believe that LAGB should be considered the initial approach, since it has prevailed over the RYGB in safety, and is very effective in accomplishing weight loss.

S075

DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED, PHASE III CLINICAL TRIAL OF ALVIMOPAN FOR THE MANAGEMENT OF POSTOPERATIVE ILEUS (POI) FOLLOWING MAJOR ABDOMINAL SURGERY (STUDY 14CL308), Eugene R Viscusi MD, Scott Goldstein MD, Thomas Witkowski MD, Angelo Andonakakis DO, Rehana Jan MD, Kathie Gabriel RN, Wei Du PhD, Lee Techner PhD, Bruce Wallin MD, Thomas Jefferson University, Adolor Corporation

INTRODUCTION: This study investigated the safety/efficacy of alvimopan (ALV), a peripherally active mu opioid antagonist, to accelerate the recovery of gastrointestinal (GI) function after surgery. METHODS: A total of 615 patients undergoing bowel resection (BR) or hysterectomy were randomized to receive ALV 6 mg, 12 mg, or placebo (PLA) orally 12 hours before surgery then BID until hospital discharge (HD); up to 7 days. The primary efficacy endpoint was recovery of upper and lower GI function by the COX proportional hazards model with a composite measure (GI3: passage of flatus/stool and tolerating solid food). Key secondary endpoint of interest was HD order written. Magnitude of treatment effect was estimated by Kaplan-Meier statistics. Significant covariates (CV): gender, region, age, total opioid consumption, and surgery duration.

RESULTS:

Mean time to HD order written was accelerated for ALV 6 mg by 14 hours and for ALV 12 mg by 15 hours (P &lt;0.01 for each) compared with PLA. For the BR subgroup (n = 418), mean time to HD order written was accelerated by 17 and 21 hours for the ALV 6- and 12-mg groups, respectively, compared with PLA. The most common TEAEs, nausea, vomiting, and pruritus, occurred with a lower incidence in the ALV groups compared with PLA.

CONCLUSIONS: Although ALV did not meet the GI3 endpoint, ALV 12 mg significantly accelerated GI3 recovery after adjustment for significant CVs (P = 0.02).

S076

LONG TERM OUTCOME AFTER LAPAROSCOPIC AND OPEN SURGERY FOR RECTAL PROLAPSE: A CASE CONTROLLED STUDY, Y Kariv MD, CP Delaney MD, S Casillas MD, VW Fazio MD, AJ Senagore MD, Department of colorectal surgery, Cleveland Clinic, Cleveland, Ohio, USA.

Background: Laparoscopic repair (LR) of rectal prolapse is potentially associated with earlier recovery and lower perioperative morbidity when compared to open transabdominal repair (OR). Data on long term recurrence rate and functional outcome is limited and is addressed in this study.

Methods: Perioperative data on all LRs of rectal prolapse between December 1991 and April 2004 were prospectively collected. LR patients were matched to OR patients operated during the same period by age, gender and procedure type (primary/recurrent prolapse, additional bowel resection or urogynecologic procedure). Patients with previous complex abdominal surgery or BMI &gt; 40 were excluded. Data on recurrence rate, bowel habits, continence and total satisfaction were collected using a telephone survey.

Results: 111 patients (mean age(SD)=56.8(18.1), female-87%) underwent LR using posterior mesh fixation (42 patients) or sutured (69) rectopexy. Sigmoid colectomy was performed for associated constipation in 32 patients. 8 patients were converted to laparotomy (3-anatomy,3-adhesions, 2-bleeding).

Matching was established for 94 patients. LR patients had
shorter hospital stay (4.1 vs. 6.2 days, p<0.0001). 30 day reoperation and readmission rates were similar.

Recurrence requiring surgery occurred in 8.5% LR and 4.3% OR (p=0.23) at a mean follow up of 59(LR) and 65(OR) months. Recurrence in LR patients wasn’t dependent on rectopecty technique or surgeon’s experience. An additional 11(LR) and 7(OR) patients reported possible recurrence or mucosal prolapse (p=0.32).

46% of LR patients and 46% of OR patients have constipation postoperatively (NS). Incontinence rates (of any degree) are 23%(LR) vs. 33%(OR) (p=0.17). Continence was improved in 51.6% and 40% and got worse in 6.5% and 13.3% (LR and OR, respectively, p=0.65).

Mean satisfaction rates (from 0 to 10) were 7.6(LR) and 7.8(OR) (p=0.65).

Conclusions: LR is associated with a shorter hospital stay than seen in matched OR cases. Functional outcome is equivalent to open surgery. There was no difference in the rates of recurrent rectal prolapse at a mean of 5 years follow up.

**S077**

**LAPAROSCOPIC APPENDECTOMY IS ESPECIALLY WARRANTED FOR PATIENTS WITH RUPTURED APPENDICITIS**, Formosa Chen MPH, Linda S Chan PhD, Namir Katkhouda MD, Thomas V Berne MD, Shirin Towfigh MD, University of Southern California Keck School of Medicine, Los Angeles, California

**Introduction:** Though ruptured appendicitis is not a contraindication to laparoscopic appendectomy (LA), most surgeons have not embraced LA as the first-line approach to ruptured appendicitis. In fact, in 2002, the Cochrane Database Review concluded: 1) the clinical effects of LA are small and of limited clinical relevance, and 2) the effects of LA in perforated appendicitis require further study.

**Objective:** To study the effects of LA among adults with ruptured appendicitis.

**Methods:** In 2003, 272 adults underwent appendectomy at a large County hospital, and were enrolled in a prospective clinical pathway that detailed their hospital course from time of diagnosis to discharge. Data included patient characteristics, time lapse from diagnosis to surgery (Time to Surgery), surgical technique (LA vs OA), and post-operative length of stay (LOS).

**Results:** Complete data was obtained for 264 (97%) patients. Patient characteristics were similar in the LA and OA groups (P>0.38). Patients with ruptured appendicitis had a shorter Time to Surgery (P=0.056). Patients with LA had a shorter LOS than OA (1.8 days reduction). This LOS was significantly shorter among those with ruptured appendicitis vs non-ruptured appendicitis (2.0 days vs 0.3 day reduction). Rank-order multiple regression analysis, controlling for all other factors, showed laparoscopy to have a significant effect on postoperative LOS in all appendicitis cases, especially ruptured appendicitis.

**Conclusions:** The two-day reduction in LOS among those with ruptured appendicitis who underwent LA is significant enough to overcome the smaller benefit of LA in acute appendicitis. This is the largest prospective analysis of the effects of LA in ruptured appendicitis among adults in the U.S. Given these findings, LA is a superior approach for all patients with appendicitis.

**S078**

**10 YEAR OUTCOME OF LAPAROSCOPIC COLORECTAL RESSECTION FOR CANCER**, C Sample MD, M Watson MD, A Okraine MD, R Gupta MD, D Birch MD, M Anvari PhD, Centre for Minimal Access Surgery, McMaster University, Hamilton Ontario, Canada

Multiple reports have outlined the potential benefits of the laparoscopic approach to colon surgery. Recently, randomized control trials have demonstrated the safety of applying these techniques to colorectal cancer over a 5 year follow-up. We examined our results for laparoscopic colorectal cancer resection with a 10 year follow-up and compared them to a large prospective database of open resections. A total of 231 resections were performed for adenocarcinoma of the colon or rectum between November 1992 and November 2003. Of those resections, 93 were rectal (40.3%) and 138 were colonic (59.7%). 8 (3.2%) of the resections were performed emergently. 27 (11.7%) were converted to open. Mean OR time was 150.1 (+/- 59.2) minutes. Overall complication rate was 42.9% with 14 (5.6%) wound infections, 8 (3.2%) significant peri-operative bleeds, 1 (0.4%) ureteric injury and 1 (0.4%) anastomotic leak. There were 5 (2%) peri-operative deaths. Patients were followed up to 131.5 months. A total of 51 (22.1%) of patients had recurrent disease prior to death with 14 (6.1%) local and 37 (16%) distant recurrences. Only 2 patients had wound recurrences (0.8%) and both patients had widespread peritoneal recurrence at the time of diagnosis. Overall survival at 60 and 120 months was 65.3% and 60.3% respectively. Disease free survival at 60 and 120 months was 58% and 56% respectively.

Conclusion: Laparoscopic techniques can be applied to a wide range of colorectal malignancies without sacrificing oncologic results at 10 year follow-up.

**S079**

**A RETROSPECTIVE, MULTICENTER STUDY ON LAPAROSCOPIC SURGERY FOR GASTRIC AND COLORECTAL CANCER IN JAPAN**, Seigo Kitano MD, Tsuyoshi Eto MD, Akio Shiroimizu MD, Koichi Ishikawa MD, Masafumi Inomata MD, Norio Shiraiishi MD, Department of Surgery I, Oita University Faculty of Medicine

**Objective:** Laparoscopic surgery for malignant disease technically is feasible, but not widely accepted because of the lack of large series of studies and data on long-term outcomes. We conducted a retrospective, multicenter study of a large series of patients in Japan to evaluate long-term results of laparoscopic surgery for malignancies of stomach and colorectum.

**Methods:** The study group comprised 1491 patients undergoing laparoscopy-assisted distal gastrectomy (LADG) for early gastric cancer, and 2036 patients undergoing laparoscopic colorectal resection for colorectal cancer during the period 1993 to 2002 in 18 participating surgical units (Japanese Laparoscopic Surgery Study Group).

**Results:** In 1491 patients undergoing LADG, the morbidity and mortality rate was 12% and 0%. Recurrent rate was 0.4% and the 5-year disease free survival rate was 99.2%. In 1495 patients with colon cancer, the morbidity and mortality rate was 13% and 1%. Recurrent rate was 4% and the 5-year survival rate was 96.7% for stage I, 94.8% for stage II, and 79.6% for stage III disease. In the 541 patients with rectal cancer, the morbidity and mortality rate was 14% and 2%. Recurrent rate was 6% and the 5-year survival rate was 91% for stage I, 85.2% for stage II, and 80.8% for stage III disease.

Conclusion: A retrospective, multicenter study demonstrates that laparoscopic surgery for early gastric and colorectal cancer is feasible in terms of long-term outcomes in Japan.

**S080**

**EXTRA VS INTRA-CORPOREAL ANASTOMOSIS IN LAPAROSCOPIC RIGHT HEMICOLECTOMY - A RETROSPECTIVE ANALYSIS**, Gideon Stroka MD, Amir Szold MD, Samuel Eldar MD, Ibrahim Matter MD, Department of general surgery, laparoscopic surgery unit, Bnai-zion medical center, Haifa, Israel.

**Background:** Laparoscopic right hemicolectomy (LRH) has emerged, in the last decade, as a feasible and safe procedure, for either benign or malignant disease. Recently it has been proven to be an acceptable alternative to open surgery for colon cancer. Technically, two main issues differ surgeons in choosing between extra or intra-corporal anastomosis (laparoscopic assisted). So far there is no proven benefit to either approach. The purpose of this study is to evaluate patient outcome and complication rate related to anastomotic technique.

**Methods:** Between 01/02 and 07/04 34 patients went through LRH in our department, 26 of them due to carcinoma of the right colon, 7 due to inflammatory pathologies and 1 due to adenomatous polyps. In all of the patients the approach was medio-lateral, with identification of the ureter before opening Taft’s fascia,
and early and high vascular ligation. 16 had extra-corporeal ligation and 18 went through a totally laparoscopic procedure according to surgeon preference.

Results: Both groups were similar in patient age, sex, co-morbidities, operating time and blood loss. There was no difference in the number of lymph nodes dissected (mean 10, range 5-22), the distance of tumor from specimen margins (mean 6 cm, range 3-9.5 cm), or in pathological staging. In the laparoscopic group 3 patients had anastomotic leak that mandated re-laparotomy and re-anastomosis. No patient had such a complication in the totally laparoscopic group (p<0.01).

Discussion: The totally laparoscopic anastomosis is created under vision of the proximal and distal bowel, which allow for tension-free approximation and prevent rotation of the anastomosis. The length of the operative wound was significantly shorter in the totally laparoscopic group (3.7±0.7 cm vs 6.2±1.3 cm), and its location was lower on the abdominal wall. So far there was no tumor recurrence.

Conclusions: Device failure, while more common in the S/C group and Endoloops and resealing were used in the S/C group and Endoloops and resealing were used in the LIG group. Major blood loss occurred in 15 LIG cases due to device failure and surgeon error. The mean (SD) cost per case of vessel ligation was significantly less in the LIG group ($317 ±$401 vs. $401 ±$105, p<0.0001). In total colectomy, the cost differences were greatest (LIG $317 vs. S/C $564 vs. $823) p<0.0001.

Conclusions: Device failure, while more common in the S/C group, does not result in significant blood loss. LigaSure is more cost effective during laparoscopic colectomy, especially total colectomy, and may allow the surgeon more versatility in its application.

S082
LONG TERM RESULTS OF PATIENTS WITH T2-T3-N0 DISTAL RECTAL CANCER TREATED BY PREOPERATIVE RADIOTHERAPY AND TRANSENGAL ENDOSCOPIC MICROSCOPIC SURGERY, Emanuele Lezoche MD, Mario Guerrieri MD, Alessandro Maria Pagani MD, Maddalena Baldarelli MD, Angelo De Sanctis MD, Roberto Campagnacci MD, Silvana Perretta MD, Giovanni Lezoche MD, 1 Department of Surgery, University “La Sapienza”, Rome, Italy, 2 Department of General Surgery, University of Ancona, Umberto I? Hospital, Ancona, Italy

The purpose of this study was to evaluate the results of local excision in patients with small size T2 and T3 distal rectal cancer that have been treated by preoperative high dose radiotherapy.

One hundred patients with rectal cancer (54 T2 and 46 T3) were enrolled in the study. All patients underwent preoperative radiotherapy with successively local excision by TEM. The definitive histology was as follows: 18 pT0 (18%), 9 pT1 (9%), 54 pT2 (54%) and 19 pT3 (19%). The gross histological examination of the 18 pT0 (T2-T3) has demonstrated in 15 of them the presence of microfoci of cancer cells in muscular layer (6T2 mic) or in perirectal fat (T3 mic). Minor complications were observed in 11 patients (11%) whereas major complications only in 2 patients (2%).

The probability of local failures at the end of follow-up (10 years) was 5% whereas the probability of metastasis was 2%. The rectal cancer specific survival rate at the end of follow-up (10 years) was 89% and the overall survival was 72%.

The treatment of small T2 and T3 rectal cancer with preoperative high dose radiotherapy and TEM seems to be not substantially different in terms of local recurrence and survival rate to the results reported after conventional surgery. The tumour response after radiotherapy represents a possible prognostic factor of success of local excision.

S083
OUTCOME OF EARLY RECTAL CANCER PATIENTS TREATED WITH TEM: A 5 YEARS FOLLOW UP STUDY, Francesco Stipa MD, Antonio Burza MD, Mario Ferri MD, Giorgio Lucandri MD, Alessio Pigazzi MD, Vincenzo Ziparo MD, Giuseppe Casula MD, Sergio Stipa MD, Department of Surgery, University “La Sapienza”, Rome, Italy

Objective: Local excision of rectal cancer offers low morbidity and optimal functional results but the long-term risk of local and distal failure is still uncertain. This study evaluates the clinical outcome of patients with early rectal cancer treated with transanal endoscopic microsurgery (TEM).

Methods: Sixty-nine patients with Tis/T1/T2 rectal cancer treated with complete full-thickness excision between 1991 and 1999 were reviewed. All patients underwent preoperative ultrasound examination. The mean diameter of the tumor was 2.9 cm. The mean distance from the anal verge was 6.8 cm.

Fifteen patients (21%) received adjuvant therapy. Pathology T stage was: Tis=25, T1=23, T2=21. All patients were followed until death or for more than 5 years. Median follow up was 6.5 years (range 5-10.2).

Results: Overall local recurrence rate was 8.7%. The 5 year local recurrence rate according to stage was: 8% for Tis, 8.6% for T1, and 9.5% for T2. Five of the 6 patients with local recurrence were managed surgically, and they all survived. Distal metastases occurred in 11 patients (Tis=2, T1=4, T2=5). Overall cancer related mortality was 14.5% (10 patients). Unrelated mortality was 11.5%. The 5 year disease specific survival rate was 92% for Tis, 91% for T1, and 62% for T2. Rates of recurrence and survival were similar in T2 patients receiving radiotherapy.

Conclusions: Management of early rectal cancer with local excision can result in a high rate of local recurrence. Tis/T1 patients with recurrent cancers who undergo salvage surgery may achieve good long-term outcome. The results of local treatment alone for T2 rectal cancers are inadequate. Patients with T2 tumors should not be treated with local excision unless they are unable to tolerate standard radical resection.
Portal or splenic vein thrombosis (PSVT) after laparoscopic splenectomy: Its incidence and management

M Ikeda MD, M Sekimoto MD, S Takiguchi MD, M Yasui MD, T Hata MD, T Shingai MD, T Takemasa MD, H Yasuihomo MD, M Ohue MD, M Morito MD, Department of Surgery and Clinical Oncology, Graduate School of Medicine, Osaka University

Purpose: Thrombosis of the portal venous system has been reported as a possible cause of death after splenectomy. This complication was considered as an uncommon complication. However, with the improvement in diagnostic modalities and the increased interest in this disease entity, it is becoming apparent that the incidence of PSVT may be greater than clinically appreciated.

Patients and Methods: We analyzed 33 patients who had undergone laparoscopic splenectomy and postoperatively examined PSVT either with contrast CT, ultrasound, or MRI. PSVT was classified according to the site of thrombus. dSVT: thrombus in the superior mesenteric vein; pSVT: thrombi between the portal vein and IMV, SMVT: thrombi in the superior mesenteric vein. Portal vein thrombi were divided into intra- and extra-hepatic thrombosis (iPVT and ePVT, respectively). Portal vein branches involved with thrombus were also determined.

Results: We found PSVT in 17 patients (52%). SMVT and ePVT were found in 1 and 2 patients, respectively. iPVT and dSVT were found in 12 patients, and pSVT was found in 7 patients. Spleen weight of patients with PSVT (median 218g, range 61-2315g) was heavier than that of patients without PSVT (median 101g, range 11-350g). Anticoagulant therapy was performed in 16 patients, and all SMVT, ePVT, iPV, and pSVT were successfully treated.

Conclusion: PSVT is a common complication after laparoscopic splenectomy. Especially, patients with splenomegaly were at high risk for PSVT. PSVT was safely treated by prompt anticoagulant therapy.

LAPAROSCOPIC SPLENECTOMY IN THE ELDERLY - A MORBID PROCEDURE?

Stephen M Kavic MD, Adrian E Park MD, University of Maryland

Laparoscopic splenectomy (LS) has emerged as the gold standard for elective splenectomy. Few have critically evaluated the results of LS in elderly patients. We retrospectively reviewed LS performed between 8/19/98 and 6/8/04. Of 235 procedures, 188 were performed in patients younger than age 65 (Group I), and 45 were in patients 65 years or older (Group II). The average age was 34.7 years (Group I) and 72.3 years (Group II). Principal diagnoses were similar; ITP was the largest category for both (Group I, 53% vs. Group II, 51%). ASA Class III or IV was 18.6% of Group I but 60% of Group II. Operative data was similar for Group I versus Group II, including operative time, averaging 144 minutes vs 107; average spleen weight, 416g vs 487g; and blood loss, 179 cc vs 160cc. The average length of stay differed: 2.2 days for Group I and 3.9 days for Group II (p=0.03). The overall rate of complications was 8.5% in Group I and 17.8% in Group II. The complication rate by ASA class is shown in the Figure. Elderly patients have more complications than younger patients when undergoing LS. The complication rate is similar when matched for ASA class, but a higher percentage of elderly patients fall into higher ASA classes.

CHANGING RELEVANCE OF ANATOMIC VARIATION TO LAPAROSCOPIC DONOR NEPHRECTOMY

Michael Eder MD, Rafik El Sabrout MD, Khalid Butt MD, Devon John MD, Scott Ames MD, Jonathan Bromberg MD, NYU Medical Center, Mount Sinai School of Medicine, New York Medical College

Introduction: Choice of side for laparoscopic live donor nephrectomy (LDN) is determined by knowledge of donor vascular anatomy and relative kidney size. The way organ imaging is applied to this choice has evolved with increasing surgical experience. Methods: An electronic database of consecutive donor nephrectomies was searched for imaging modality used and anatomic features leading to choice of side. Results: From 1996 to 2004, 300 LDN were performed. Right-sided procedures were totaled for the first, second and third groups of 100 donors. Imaging modalities used were: Conventional angiography 48% (in the first half of the series); MR 28% and CT 24% were dependent upon institution. The reason for choosing the right kidney is summarized in the following table:

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Cases</th>
<th>Percentage</th>
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</thead>
<tbody>
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</tr>
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<td>50%</td>
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<tr>
<td>81+</td>
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</table>

Conclusions: Despite major improvements in stapling technique to ensure ample renal vein length with a caval cuff, procurement of the right side decreased by nearly 50% over the study period. With experience, venous anomalies became a rare reason to use the right kidney. At operation two or more veins were often present on the right when multiple arteries are present on the left. A significantly smaller kidney volume is now the commonest reason to choose that side whether left or right emphasizing the need for measurement of kidney volume.
to be a routine part of imaging.

**S090**

**TRAINING SURGEONS IN ERCP**, Gary C Vitale MD, Carlos M Zavaleta MD, John C Binford, Gerald M Larson, David S Vitale, Department of Surgery and Center for Advanced Surgical Technologies, University of Louisville, Louisville, Kentucky 40292, USA

Upper GI endoscopy is commonly performed by surgeons outside major medical centers. Endoscopic training and experience with manipulation of the distal common bile duct are mandated by the American Board of Surgery. This report focuses on post-residency training in ERCP. Thirteen fellows have been trained since 1992 for periods of 6 to 14 months. Fellows were involved in 2008 cases of the 3641 ERCPs done in the intervals. Nine fellows had some previous endoscopy experience but none had ERCP training. Nine fellows had one-year training, two had 6 months, and one had 8 and 14 months. As a mark of cannulation success, a benchmark of 85% was considered excellent. Fellows’ training was evaluated in 3-month intervals. All fellows reached an 85% success rate in at least one interval and some in more than one. The ability to achieve an 85% cannulation rate required, on average, 7.1 months and 102 procedures. Four of 13 fellows (31%) reached the 85% mark in the first 3-month period, 2 of 13 (15%) in the second period, 5 of 11 (45%) in the third period, 7 of 10 (70%) in the fourth period, and 1 of 1 (100%) in the fifth period of training. In the first period, attending surgeons had a stronger hands-on introductory/assistant role with the fellows, which may explain the higher initial success. Pre-fellowship training in upper GI endoscopy facilitated earlier success with ERCP. The morbidity and mortality rates were 2.4 and 0.006% respectively and did not differ between fellows and attendings. Twelve of 13 fellows entered practice (3 in academics). Ten have continued to perform ERCPs. ERCP training is possible within a surgical department that has a dedicated faculty with experience in the procedure. An added benefit was increased operative experience in pancreatic disease for general surgery trainees. The learning curve is steep enough that meaningful training would require at least 6 months of dedicated effort.

**S091**

**NATIONAL ANALYSIS OF IN-HOSPITAL CHOLEDOCHOLITHIASIS MANAGEMENT RESOURCE UTILIZATION USING PROPENSITY SCORES**, B K Pouloude MD, P G Arbogast PhD, M D Holzman MD, Vanderbilt University School of Medicine

**BACKGROUND:** Two treatment options exist for choledochoolithiasis (CDL): endoscopic retrograde cholangiopancreatography (ERCP) and common bile duct exploration (CBDE). Resource utilization measured by total in-hospital charges (THC) and length of stay (LOS) was compared using the propensity score (PS). In this study, PS was the probability that a patient received CBDE based on comorbidities, hospital traits, and demographics. The power of this method lies in balancing groups on variables by PS, resulting in 90% bias reduction and improved inferential validity compared to traditional analytic techniques.

**METHODS:** Laparoscopic cholecystectomy (LC) patients with CDL who had ERCP or CBDE were identified in the 2002 U.S. Nationwide Inpatient Sample. Patients were ordered into 5 PS-based strata. Mean THC and LOS were compared. A linear regression model was used to estimate the contribution that LOS had on THC.

**RESULTS:** 46,864 LC patients had CDL. Mean age was 52.6±0.2 years (mean±SEM) with 70% women. ERCP was performed in 44,053 (94%) and CBDE in 2,631 (6%). Mean THC was less for ERCP ($25,641±1,966) compared to CBDE ($31,158±871; p<0.05). Mean LOS was less for CBDE (4.9±0.2 days) than ERCP (5.9±0.1 days; p<0.05). The probability of CBDE (PS) ranged from 0.01-0.19. PS analysis revealed an overall savings of $6,331±1,378 per hospitalization and reduced LOS (0.9±0.2 days) for CBDE. Mean THC and LOS by PS strata were determined (Table). LOS contributed to 52% of increased daily THC. More complications were evident with CBDE (1.9-9.9%) than ERCP (0.5-5.1%).

**CONCLUSIONS:** Based on this propensity score analysis, CBDE incurs less THC and reduced LOS for CDL when compared to ERCP. Furthermore, CBDE appears to be dramatically underutilized.

**S092**

**CONSTRUCT AND FACE VALIDITY OF THREE LAPAROSCOPIC SIMULATORS: MIST-VR, ENDOTOWER, AND CELTS**, Shishir K Maithel MD, Rafael Sierra MD, James R Korndorffer, Jr. MD, Paul F Neumann PhD, Steven L Dawson MD, Mark P Callery MD, Daniel J Scott MD, Beth Israel Deaconess Medical Center, Tulane University Health Sciences Center, Center for Integration of Medicine and Innovative Technology

**Background:** Videotrainers may best offer realistic laparoscopic simulation while virtual reality (VR) modules may best provide multi-dimensional objective measures of performance, but few comparative trials exist. This study compares the construct and face validity of three different laparoscopic simulators, including a prototype computer-enhanced videotrainer platform.

**Methods:** Subjects were voluntarily enrolled at the Learning Center during the 2004 SAGES annual meeting. Each subject completed two repetitions of a single task of similar difficulty on each of three simulators: Minimally Invasive Surgery Trainer - VR (MIST-VR), Endotower (VR Camera Navigation Simulator), and Computer Enhanced Laparoscopic Training System (CELETS); performance scores (time, motion, accuracy, and error) were automatically generated and recorded. Scores of individuals with various levels of experience were compared to determine construct validity for each simulator. Experience was defined according to four parameters: 1) PGY level, 2) fellowship training, 3) basic laparoscopic case numbers, and 4) advanced laparoscopic case numbers. Subjects rated each simulator regarding six face validity (resemblance of simulation) parameters using a 10-point Likert scale (10 = best rating). Statistical analysis included Students t-test and ANOVA (p<0.05 for significance).

**Results:** Ninety-one attendees completed the study. Construct validity was demonstrated for all three simulators; significant differences in scores were detected according to one parameter for MIST-VR, 2 parameters for Endotower, and all 4 parameters for CELTS. Face validity was rated as good to excellent for all three simulators; mean ratings were 7.0 ± 0.3 for MIST-VR, 7.9 ± 0.3 for Endotower (p=0.001 vs. MIST-VR), and 8.7 ± 0.1 for CELTS (p=0.001 vs. MIST-VR, p=0.01 vs Endotower).

Conclusions: All three simulators demonstrated significant construct and reasonable face validity. CELTS was rated highest on realism of simulation, which coupled with automated multi-dimensional metrics, may have played a role in the ability of CELTS to distinguish best the novices from experts. While virtual reality holds great promise to expand the scope of laparoscopic simulation, computer-enhanced videotrainer platforms, such as CELTS, may play an important role in future skills assessment and training.

**S093**

**INTRAOPERATIVE COMMON BILE STONE MANAGEMENT IN 2004**, Jeffrey Schiff BS, Steven D Schwartzberg MD, Tufts New England Medical Center

Classically it was taught that when a surgeon encounters a stone in the common bile duct (CBD), a bile duct exploration was to be performed during the same procedure. We hypothe-
size that the actual practice has deviated from this teaching. This study aims to discern what factors lead to actual practice when a CBD stone is discovered during laparoscopic cholecystectomy in the absence of cholangitis.

Methods: This study was performed via an online survey of current members of SAGES. The survey was designed using web-based software that provided members with an anonymous link to the survey. General demographic information including training and hospital capability and intraoperative decisions for five increasingly complex clinical scenarios was collected.

Results: 90 physicians responded. 85% of respondents to our survey were attending level surgeons. 26% stated that they had completed a laparoscopic fellowship, 13% completed a training course in laparoscopic bile duct exploration. The majority (89%) do not perform ERCP. 27% of surgeons were willing to leave a single asymptomatic stone in place, in the presence of normal liver function tests (LFTs), and do nothing unless the patient developed symptoms. 8.1% responded that they would still leave a single small stone in place in the presence of an increased ALT and AST in an otherwise asymptomatic patient. This fell to 0% when faced with multiple stones in the presence of grossly elevated LFTs. Respondents who indicated having completed a Laparoscopic Fellowship and a training course in Lap-CBDE, were inclined to perform laparoscopic common bile duct exploration as the scenarios became increasing complex from 41% in Scenario #1 to 75% in Scenario #5 (most complex) and never opted to perform open CBDE. Conversely surgeons who had no formal laparoscopic training less often performed lap-CBDE, and were far more willing to perform open CBDE or utilize post op ERCP.

In this survey of SAGES members, classic teaching has been abandoned in this era of minimally invasive surgery and therapeutic flexibility in endoscopy. There is a need to develop clear guidelines as to how CBD stones are to be managed in the context of their clinical, anatomic, and biochemical significance when varying bile duct management strategies are available. Once we figure out which stones need to be removed, training must not be the barrier to optimal stone management strategy.

S094
SETTING NATIONAL BENCHMARK PROFICIENCY LEVELS FOR LAPAROSCOPIC PERFORMANCE USING SIMULATION: RESULTS FROM THE 2004 SAGES LEARNING CENTER MIST-VR STUDY, Karla Van De Heyning MSc, Anthony G Gallagher Ph.D., Matt Ritter MD, David A McClusky MD, Andrew Lederman MD, Mercedehe Baghai MD, C. Daniel Smith MD, Emory Endosurgery Unit, Emory University School of Medicine, Atlanta GA

Background: The Minimally Invasive Surgical Trainer Virtual Reality (MIST-VR) (Mentice, Gottenberg, Sweden) has been well validated as a training device for laparoscopic skills. Training to a level of proficiency on the simulator has been demonstrated to significantly improve objectively assessed operating room performance during laparoscopic cholecystectomy. The purpose of this project was to establish a national standard of proficiency on the simulator based on the performance of experienced laparoscopic surgeons.

Methods: Surgeons attending the SAGES 2004 Annual Meeting who had performed more than 100 laparoscopic procedures volunteered to participate and were tested in the SAGES Learning Center. All subjects completed a demographic questionnaire to assess laparoscopic and/or MIST-VR experience. Each subject performed two consecutive trials of the MIST-VR Core Skills 1 program on medium settings (six basic tasks of increasing difficulty; acquire place (AP), transfer place (TP), traversal (TV), withdrawal insert (WI), diathermy task (DT), manipulate diathermy (MD)). Trial 1 was considered a warm-up and Trial 2 functioned as the test trial proper. Subject performance was scored for time, errors and economy of instrument movement for each task, and a cumulative total score was calculated.

Results: 57 surgeons participated in the study; complete data is available for 42. Trial 2 data expressed as means±SD; time in seconds; other values unitless.

Conclusion: National benchmark proficiency levels for laparoscopic skills have now been established by experienced laparoscopic surgeons using the MIST-VR simulator. Residency programs, training centers and practicing surgeons can now use these data to identify how their skills compare to laparoscopic surgeons nationwide, and to set performance goals accordingly.

S095
SAFETY OF LAPAROSCOPIC INSTRUMENTS, Arman Albayrak MSc, Yuri A Casseres MD, Jaap H Bonjer MD, Kees A Grimbergen MSc, Cees Schot MSc, Dirk W Meijer MD, Erasmus Medical Center Rotterdam, Technical University Delft, Catharina Hospital Eindhoven, the Netherlands

Background: The safety of reusable laparoscopic instruments remains an issue as there are no guidelines for testing and maintenance. The Dutch Society of Endoscopic Surgery has started a Quality Assurance Program in order to improve patient safety. In order to quantify the magnitude of the problem the following tests were done in Dutch hospitals:

1. Measuring the insulation failure of laparoscopic instruments.
2. Measuring light quality by measuring the light loss in light cables and in laparoscopes.

Methods: The tests were performed in a representative sample of 33 Dutch hospitals (30% of all hospitals). All available reusable instruments with an insulation, were tested in a High Voltage Tester. A leakage in the insulation results in a visible corona, which points to the position of the insulation defect and an audio alarm sound.

A digital light meter, which measures the luminous intensity (lux), was used to test light transmission through light guide cables and laparoscopes. The light guide cables were also tested using a device which gives the percentage broken fibers.

Results: Of the 1438 insulated laparoscopic instruments, 287 had one or more insulation defects (18.6%). Of the 195 measured light guide cables had 35% more than 70% broken fibers. Of all laparoscopes (126), 69% had a light loss of more than 50% of the light input.

Conclusion: The study revealed a (too) large number of severe defects in the tested instruments. This is a serious issue as the safety of patients might be at risk. This is caused by the lack of guidelines and an appropriate maintenance program.

The preliminary recommendations are:
1. Laparoscopic instruments, light guide cables and laparoscopes have to be tested before each procedure.
2. Replacement of all instruments with an insulation, defective.
3. Replacement of light guide cables with more than 70% broken fibers.
4. Replacement of laparoscopes with a light loss of more than 50%.

This study will be extended to other countries as well as to other instruments like cameras and monitors. Finally, Guidelines should be developed, involving Endoscopic Surgeons, Engineers, Hospital staff and laparoscopic instrument manufacturers.

S102
DOES AGGRESSIVE HYDRATION REVERSE THE EFFECT OF PNEUMOPERITONEUM ON RENAL PERFUSION?, Sebastian V Demyttenaere MD, Liane S Feldman MD, Simon Bergman MD, Saad Gholoum MD, Franco Carli MD, Gerald M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University Health Centre, Montreal, Canada

Introduction: Although pneumoperitoneum decreases renal blood flow, it remains unclear whether this impacts renal function. Our aim was to characterize the effects of pneumoperi-
ABSTRACTS

INCREASED HEPATIC TUMOUR GROWTH AND CELLULAR IMMUNOLOGICAL ANTI-TUMOURAL DEFENCE AFTER LAPAROSCOPY COMPARED TO OPEN SURGERY: AN EXPERIMENTAL MR IMAGE STUDY.  D. Inderbitzin MD, G. Marti, S. Eichenberger, H.M. Hoogewoud MD, L. Krahnenbühl MD, Department of Histology University of Fribourg1 and Department of Surgery2, Hôpital Cantonal, Fribourg, Switzerland

INTRODUCTION The influence of laparoscopy on intra-hepatic colorectal tumour growth is still under debate. However, intra-abdominal macrophages (Kupffer cells) play a key-role in local immunological anti-tumoural defence. Therefore this study aims to assess local post-operative hepatic growth of colorectal metastasis and peri-tumoural macrophage counts after laparoscopy in an experimental animal model. METHOD 36 male syngeneic WAG/Rij rats were randomized into two operative groups: Laparoscopy (LS; n=18) using CO2 at 12 mmHg and laparotomy (LT; n=18) as negative control. Total operating time was 90 min. At 45 min after setup rats were given a subcapsular superficial injection of CC531s colon adenocarcinoma cells into two liver lobes (distal and proximal from portal vein) using a silicon catheter. Animals were sacrificed on days 10, 15 and 20 after surgery (Mann-Whitney). CONCLUSION This study demonstrates an increased post-operative tumour growth independent of portal hematogenous tumourcell-spillage and decreased macrophage counts after LS compared to LT. Whether these findings are of clinical relevance need further investigation.

CARBON DIOXIDE ATTENUATES BLOOD FLOW OBSTRUCTION OF INSUFFLATED COLON. Keigo Yasumasa MD, Kiyokazu Nakajima MD, Toshiro Nishida MD, Shunji Endo MD, Toshinori Ito MD, Hikaru Matsuda MD, Department of Surgery, Osaka University Graduate School of Medicine

BACKGROUND: Bowel distension may cause colonic blood flow obstruction in addition to abdominal pain and bloating during/after colonoscopy. Intraluminal insufflation with carbon dioxide (CO2), with its higher absorbability and vasodilating effect, might attenuate parietal blood flow obstruction. The blood flow during/after CO2 insufflation, however, has not been fully evaluated. This study aimed to assess the difference of parietal blood flow of distended colon between air and CO2.

METHODS: Forty male SD rats were used. 5 cm of the colon was segmented with an intact vascular supply and insufflated with either air (AIR group) or CO2 (CO2 group). Two insufflation manners were employed: 1) temporary insufflation up to the intraluminal pressure of 60 mmHg; 2) continuous isobaric insufflation at the pressure of 5, 15, and 30 mmHg for 15 minutes. Blood flow during/after CO2 insufflation, however, has not been fully evaluated. This study aimed to assess the difference of parietal blood flow of distended colon between air and CO2.

RESULTS: No differences were noted in cardiopulmonary parameters were measured. Parietal blood flow was evaluated by laser Doppler blood flow imaging. RESULTS: No differences were noted in cardiopulmonary parameters during/after insufflation. 1) Temporary insufflation: bowel distension was prolonged in AIR group (> 30 minutes), whereas rapidly resolved in CO2 group. Blood flow during/after CO2 insufflation, however, has not been fully evaluated.

The beneficial immunomodulatory properties of carbon dioxide pneumoperitoneum are lost following chemical vagotomy, thus implying that the vagus nerve is involved in the mechanism of CO2-mediated mortality cytokine reduction in animal models of sepsis.
observed between the two groups (AIR group; 448.9 ± 55.9 PHU vs 217.3 ± 12.4 PHU, CO2 group; 413.7 ± 38.8 PHU vs 165.3 ± 21.5 PHU) (p = 0.2951). CONCLUSION: Bowel distension resolved more rapidly in CO2 insufflation compared to air insufflation. Parietal blood flow obstruction was significantly attenuated by CO2 especially in low pressure insufflation, indicating the possible involvement of vasodilating effect of CO2.

**S106**

**ALTERED MMP-9/TIMP-1 CONCENTRATION IN THE EARLY POSTOPERATIVE PERIOD IN COLON CANCER PATIENTS,** Irena Kirman PhD, Suvinit Jain DO, Vesna Cekic RN, Avraham Belizon MD, Richard L Whelan MD, Columbia University

We have previously demonstrated that insulin-like growth factor binding protein 3 (IGFBP-3) is depleted in plasma after open (OS) but not laparoscopic surgery (LS). Post-surgical IGFP-3 cleavage is a rapid process likely due to altered plasma proteolytic activity. This study’s goal was to identify a pro-tease/protease inhibitor system that is affected by surgical trauma. Methods: Plasma samples were taken from 78 patients diagnosed with stage I-III colorectal adenocarcinoma; 32 OS patients (mean incision size 18.7±5.3 cm) and 46 LS patients (mean incision 5.3±1.8 cm) preoperatively (pre-OP) and on postoperative days 1-3 (POD1-3). Plasma proteolytic activity was assessed via zymography; protease and protease inhibitor concentrations were measured in ELISA using specific antibodies. Statistical analysis was performed using Wilcoxon’s test. Results: Zymography revealed a predominant band representing a 92 KDa gelatinase corresponding to a pro-form of MMP-9, a protease known to cleave IGFBP-3. This was confirmed by Western blot analysis, which showed a single MMP-9 band. In OS patients, the mean concentration of plasma MMP-9 was significantly higher on POD1 (380.4±193.4 ng/ml) when compared to pre-OP levels (214.7±168.4 ng/ml, p<0.006); on POD 2-3 no differences were noted. In the LS group, the mean level of MMP-9 was comparable pre-OP (253.5±172.0 ng/ml) and postoperatively (POD1, 255.9±273.0 ng/ml). The cause of the rapid decrease in MMP-9 levels postop was assessed by measuring levels of a natural MMP-9 inhibitor protein, TIMP-1. In the OS group, the level of TIMP-1 was significantly elevated on POD1 (254.6±140.6 ng/ml) compared to pre-OP (253.5±172.0 ng/ml) and postoperatively (POD1, 255.9±273.0 ng/ml). Pearson’s correlation, and are expressed as mean±SD (*p<0.05). Results: LVEDD decreased with pneumo and further with pneu-mo-nitro, while RCP decreased only with the addition of nitro (table). The correlation between RCP and LVEDD was non-significant, whereas RCP correlated weakly with CO (R=0.3, p=0.03) and with PCWP (R=0.5, p<0.001).

Conclusion: While decreasing preload under extreme lab conditions also decreases RCP, simply creating a pneumoperi-toneum of 12mm Hg does not. Under clinical conditions, the decrease in renal blood flow associated with pneumoperi-toneum is likely not solely a function of preload.

**S108**

**LAPAROSCOPIC DISTAL PANCREATECTOMY,** Chandranath Are MD, Michael D’Angelica MD, William R Jarnagin MD, Ronald P DeMatteo MD, Daniel G Coit MD, David P Jaques MD, Leslie H Blumgart MD, Murray F Brennan MD, Yuman Fong MD, Memorial Sloan Kettering Cancer Centre

LAPAROSCOPIC DISTAL PANCREATECTOMY

INTRODUCTION: A minimally invasive approach to pancreatic disease is increasingly performed although its ultimate benefit is yet to be confirmed. Although technically demanding, laparoscopic distal pancreatectomy with or without splenectomy is gradually gaining acceptance as an alternative to open resection in selected patients. The aim of this study is to report our initial single-institution experience with laparoscopic distal pancreatectomy in 17 patients.

METHODS: A retrospective review of a prospectively collected database was carried out. From 2002 - 2004, we performed 64 distal pancreatectomies, of which 17 (36%) were managed by the laparoscopic approach. These 17 patients were included in the study with varying pre-operative diagnoses such as, cystic lesions (7 patients-41%), neuroendocrine tumors (3 patients-17%), adenocarcinoma (3 patients- 17 %) and miscellaneous diagnoses (4 patients 23%). The median age was 60 years (29-85) with a female to male ratio of 13: 4. In addition to 2 to 3 ports, a hand port was placed in the midline to aid in dissec- tion and the pancreas was divided with a stapler. RESULTS: One patient was found to be unrescatable due to celiac artery involvement. Of the remaining 16 patients, two were converted to an open procedure due to bleeding from the splenic hilum and inadequate exposure. The median operating time was 186 minutes (128-235) with a tumor size of 4 cm (2- 7). The median time to resuming regular diet and converting to oral pain medications was 3.5 days (2-9) and 3 days (2-9) respectively. The length of stay was 5.5 days (4-18) with a majority (11patients- 78%) staying less than 7 days. There were no mortalities. Of the 14 patients that successfully under-went the procedure laparoscopically, morbidities consisted of pancreatic leak/ fistula (2 patients- 14%) and ileus (2 patients- 14%). One of the two patients with pancreatic leak/ fistula required re-operation and the second was managed with per-cutaneous drainage. With a median follow up of 3.8 months (5-14), 11 (84%) out of 13 patients with a diagnosis of malignancy have no evidence of recurrent disease. CONCLUSIONS: A minimally invasive approach to pancreatic disease is safe and technically feasible with acceptable morbidity. Further large series studies with longer follow up are necessary to determine the role of laparoscopic surgery in the treatment algorithm of management of pancreatic disease.

**S110**

**DOES LAPAROSCOPY WORSEN THE PROGNOSIS OF INCIDEN- TAL GALLBLADDER CANCER?** Vittorio Paolucci PhD, Thorsten Goetze, Ketteler- Krankenhaus Department of Surgery Lichtenplattenweg 85 63071 Offenbach am Main Germany

Introduction:Since the first description of port site metastases
in 1991 and tumor cell seeding in 1994 it is supposed that the laparoscopic technique could deteriorate the prognosis of gallbladder cancer. These assumptions will be verified by the CAES/CAMIC registry.

Material and method: The Workgroup Surgical Endoscopy of the German Society of Surgery started in 1997 a registry of all cases of cholecystectomy -laparoscopic as well open- with a postoperative incidental finding of gallbladder cancer. The aim of our registry is to compare the prospectively collected follow up data on the outcome of these patients and to answer the questions whether laparoscopic cholecystectomy affects the prognosis of patients with incidental gallbladder cancer.

Results: 358 cases of incidental gallbladder cancer have been recorded. There are 194 patients treated by the laparoscopic procedure, 109 by the open one, 55 with an intraoperative conversion from the laparoscopic to the open procedure and one without data about the method of operation. The median follow up is about 15,4 (1-140,3) months. Following the laparoscopic procedure we registered 14 port site metastases, following the open primary procedure 8 wound recurrences.

An intraabdominal recurrence is reported in 23 laparoscopic and in 11 primary open treated cases. 122 of the 358 patients underwent a second radical surgery. It seems to be a tendency that reoperated T1-and T2 tumors have a better survival than those without a reoperation (log-rank 0.05).

The survival-rate (Kaplan- Meier) shows a significant better survival for the laparoscopic procedure in comparison with the primary open (p=0,0096) or converted group (p=0,0215).

The median survival for laparoscopic and open treated T1-tumors is about 55%, for laparoscopic treated T2- tumors 40% and open treated T2- tumors 30%.

A postoperative chemotherapy has been done in 15 cases, a combination of radiotherapy and chemotherapy in 14 cases. 79 patients already died due to the underlying disease divided up in both groups equally.

Discussion: The incidence of port site/wound recurrences is twice as high in the laparoscopic group.

The survival time is higher for the laparoscopic treated ones. The access technique open or laparoscopic does not seem to influence the prognosis of incidental gallbladder carcinoma. Until now we could not find a disadvantage for the laparoscopically operated group.

**S113**

**DOES HIDA SCAN EJECTION FRACTION PREDICT SPHINCTER OF ODDI HYPERTENSION AND CLINICAL OUTCOME IN PATIENTS WITH SUSPECTED CHRONIC ACALCULOUS CHOLECYSTITIS?** Susan B. Young DO, Maurice E Arregui MD, Kirpal Singh MD, St. Vincent Hospital Indianapolis IN

Introduction: Hepatobiliary iminodiacetic acid scan with ejection fraction (HIDA EF) is used to evaluate chronic acalculous cholecystitis (CAC). A presumed etiology of CAC is sphincter of Oddi hypertension (SOH). In this study we evaluate the value of HIDA EF to predict patient response to laparoscopic cholecystectomy and SOH.

Material and Methods: A prospective study of 93 patients with biliary pain but without gallstones (CAC) who underwent preoperative HIDA EF was conducted. At laparoscopic cholecystectomy, transcytic antegrade biliary manometry was performed to determine the sphincter of Oddi pressure. Patients were evaluated post-operatively for response to cholecystectomy. The sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated. The outcomes were compared with clinical impression.

Results: Of the 93 patients with both HIDA EF and sphincter of Oddi pressure (SOP) measurements, 50 had abnormal ejection fraction (less than 35%) and of these 29 had SOH (SOP greater than or equal to 40 mmHg). Of those 43 with normal HIDA EF, 30 had SOH. The sensitivity was 49%, specificity 38%, PPV 58% and NPV 30%. 86 of the 93 patients returned for follow-up evaluation. Follow-up ranged from 0-99 months, with a mean of 26.4 months.

Overall 73 (85%) improved. Of the 46 with abnormal HIDA EF, 42 (91%) improved. Of the 40 with normal HIDA EF, 31 (77.5%) improved. Of the 46 with normal HIDA EF, 30 (60%) improved. Of the 40 with normal HIDA EF, 31 (77.5%) improved.

**S114**

**LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN WITH CHRONIC HEMOLITIC ANAEMIA: IS THE OUTCOME RELATED TO THE TIMING OF THE PROCEDURE?** Giuseppe Curro MD, Giuliano Iannicelli MD, Cesare Lorenzini MD, Renato Palmeri MD, Eugenio Cucinotta MD, Department of Human Pathology, University of Messina, Messina, Italy

Aims. The aim of our study was to evaluate if the outcome in children with chronic hemolytic anemia (CHA) and cholelithiasis undergoing laparoscopic cholecystectomy (LC) is related to the operating timing. Methods. From January 1995 to May 2004 45 children with CHA (15 children with beta-thalassemia, 24 with sickle cell disease and 6 with different kinds of hemoglobinopathies) were referred to our Division of Surgery for cholelithiasis. All 45 children were asymptomatic at the time of surgery.
the first visit. The mean age was 12 years (range, 8 to 16). We proposed an elective LC to all children before the onset of symptoms. Surgery was previously performed in 5 children. The operation was accepted in the period of study by 24 children and refused by 21. Among these 21 patients 12 decided to undergo elective LC after the first or second episode of biliary colic and 5 patients underwent emergency LC for acute cholecystitis. All 45 children were followed up for a mean period of 55 months (range, 2 to 93). We divided the patients in three groups on the basis of the treatment choosen (Group A: 24 asymptomatic operated, Group B: 12 symptomatic operated after the onset of symptoms and Group C: 5 who underwent emergency LC for acute cholecystitis) and correlated the outcome with the treatment choosen and the operation timing. We excluded from the evaluation 4 patients who were still asymptomatic after a mean period of 18 months and who still refuse the operation. Results: Group A: no major complications reported; no conversion to open; one child developed wound infection and another one had fever for two days; no transfusion necessary; mean post-operative stay 3 days (range, 2 to 4). Group B: no major complications reported; no conversion to open; four children developed fever post-operatively; no transfusion necessary; mean post-operative stay 3.5 days (range, 3 to 5). Group C: sphincterotomy with endoscopic gallstones extraction necessary pre-operatively in 2 of them; one conversion to open; two of them developed sickle cell crisis during the post-operative stay; no further complications reported; mean post-operative stay 7 days (range, 3 to 10). Conclusions: Elective LC is a safe procedure in children with hemoglobinopathies. It should be the gold standard in children with chronic hemolitic disorders and asymptomatic cholelithiasis in order to avoid the potential complications of cholecystitis and choledocholithiasis which lead to major risks, discomfort and longer hospital stay.

S115
RESULTS OF MAJOR AND MINOR HEPATECTOMIES BY LAPAROSCOPY, ERIC VIBERT MD, ALI KOUIDER MD, THIERRY PERNICENI MD, HUGUES LEVARD MD, CHRISTINE DENET MD, BRICE GAYET MD, INSTITUT MUTUALISTE MONTSOURIS, PARIS

Aim of study: Assessment of feasibility and results of minor and major (>2 segments) laparoscopic liver resections for cancer and benign tumours (BT).

Methods: Retrospective study of the outcome of patients with symptomatic or uncertain BT or with primitive or secondary malignant liver tumours treated by laparoscopy in a specialized department.

Results: From 1995 to 2004, 70 hepatectomies were performed by laparoscopy: 19(27%) BT and 51(72%) cancer (15 hepatocellular carcinoma (HCC), 29 colo-rectal metastasis (CCM) and 9 miscellaneous tumors). The liver resection was a major heptectomy in 29 cases (22 right heptectomies (RH), 3 extended RH, 1 left heptectomy and 3 anatomical resections) and a minor heptectomy in 41 cases (21 wedge resections, 20 anatomical resections). 8(14%) patients were converted in laparotomy. 68.5% patients were transfused with a postoperative morbidity of 11% and a mortality of 1.4% due to the postoperative death of a patient after a RH for HCC on a cirrhotic liver. For CCM (n=29 heptectomies in 25 patients), overall and disease free survival at 36 months (mean follow-up of 25 months) were 87% and 50%, respectively. For HCC (n=15), overall and disease free survival at 36 months (mean follow-up of 29 months) were 65% and 83%, respectively. No port-site metastasis occurred for patients with malignancy. Conclusions: If they are performed by surgeon specifically trained and specialized, laparoscopic liver resections, even major heptectomy, are feasible with results which seem similar to laparotomy.

S116
LAPAROSCOPIC RADIOFREQUENCY THERMAL ABLATION FOR UNUSUAL HEPATIC TUMORS: OPERATIVE INDICATIONS AND OUTCOME, Eren Barber MD, Erhan Ari MD, Nora Herceg RN, Allan Siperstein MD, Department of General Surgery, The Cleveland Clinic Foundation, Cleveland, Ohio

Objectives: There is an increasing experience with laparoscopic radiofrequency ablation (RFA) for the treatment of patients with hepatic metastasis from colorectal and neuroendocrine cancer as well as with hepaticcellular cancer. Little is known about the outcome of patients with other tumor types.

Methods: Between January 1996 and September 2004, 470 patients were treated with RFA for unresectable primary and metastatic liver tumors. Ten % (49 patients) had cancers other than colorectal, neuroendocrine or hepatocellular including sarcoma (18 patients), breast (9 patients), esophagus (4 patients), lung (3 patients), melanoma (3 patients), ovary (2 patients), pancreas (2 patients), unknown primary (2 patients), cholangiocarcinoma (2 patients), rectal squamous (2 patients), renal (1 patient) and hemangioendothelioma (1 patient). Unlike the criteria for treating the more usual tumor types, those patients had liver exclusive disease by preoperative imaging. They also failed chemotherapy. Results: The 49 patients underwent ablation of 184 lesions with 8 patients undergoing repeat treatment. Hospital stay averaged 1 day with no 30-day mortality and 1 postoperative hemorrhage, 1 liver abscess and 1 wound infection. Local recurrence of tumors occurred in 19% of lesions over a mean follow up of 24 months. Overall median survival was 33 months with 45 months for breast cancer and 33 months for sarcoma.

Conclusion: Laparoscopic RFA is able to safely and effectively treat hepatic metastasis in these unusual tumor types. We feel that this heterogenous group of patients, selected for their unusual presentation of liver exclusive disease, may benefit from cyto reduction of their tumor by laparoscopic RFA when other treatment methods have failed.

S117
RELATIONSHIP BETWEEN SUBJECTIVE AND OBJECTIVE OUTCOME MEASURES AFTER HELLER MYOTOMY AND DOR FUNDOPPLICATION FOR ACHALASIA, Suad Gholoum MD, Simon Bergman MD, Sebastian Demyttenaere MD, Serge Mayrand MD, Donna Stanbridge RN, Liane S Feldman MD, Gerald M Fried MD, McGill University

Objective: To assess how subjective evaluation (heartburn, dysphagia, quality of life, satisfaction) correlates with objective data after Heller myotomy and Dor fundoplication for achalasia.

Methods: 45 consecutive patients with achalasia undergoing laparoscopic Heller myotomy and Dor fundoplication were studied prospectively. Subjective evaluation was done preop and postop using the GERD health related QOL scale (GERD-HRQL; 0=best to 45= worst), 4-point heartburn scale, 4-point dysphagia scale, 4-point SF-12, and 4-point satisfaction scale. At 3 mo postop patients underwent 24hr pH testing, manometry, and endoscopy. Preop and postop data were expressed as median (IQR) or mean (SD) and analyzed by Wilcoxon signed rank test or paired t test. Results: Comparing preop to postop, improvements were found for dysphagia score from 4 (.2) to 1 (.3), GERD-HRQL from 13 (.5) to 2 (.6), heartburn score from 2 (.4) to 1 (.3), satisfaction from 3 (.3) to 1 (.3), and mental QOL from 47 (11) to 55 (6) and physical QOL from 45 (10) to 51 (7). Conclusion: Heller myotomy + Dor fundoplication is effective surgical treatment for achalasia. Subjective evaluation can reveal patient satisfaction but does not accurately reflect postop reflux. 24hr pH study is required to accurately assess reflux disease.

S118
HELLER MYOTOMY VS HELLER MYOTOMY PLUS DOR FUNDOPPLICATION: COST-UTILITY ANALYSIS OF A RANDOMIZED TRIAL, Alfonso Torquatu MD, Rami E Lifti MD, Leena Khatian MD, Michael D Holzman MD, Kenneth Sharp MD, William O Richards MD, Vanderbilt University, Department of Surgery

OBJECTIVE: The present study is a long-term analysis to investigate the...
LAPAROSCOPIC HELLER MYOTOMY FOR THE TREATMENT OF ACHALASIA. A Markov-cycle tree simulation model was used to examine the two treatment alternatives: (a) Heller plus Dor and (b) Heller alone. The model estimated the total expected costs of each strategy over a 10-year time horizon. Data for the model were derived from our prospective, randomized, double-blind, clinical trial in which patients with achalasia were assigned to undergo Heller alone or Heller plus Dor. A societal perspective was chosen, including all relevant direct medical costs (hospital costs and costs of outpatient care) and indirect costs. Drug costs represented the average wholesale price. The strategies were compared using the method of incremental cost-effectiveness analysis.

RESULTS: The incidence of postoperative pathologic GERD was 47.6% (10 of 21 patients) in the Heller group and 9.1% (2 of 22 patients) in the Heller plus Dor group using an intention-to-treat analysis. Heller plus Dor was associated with a significant reduction in the risk of postoperative GERD (relative risk: 0.11; 95% confidence interval 0.02-0.59; P = 0.01). The cost of operation was significantly higher for Heller plus Dor than for Heller alone (mean difference $942; P = 0.04) secondary to a longer operating time (mean difference 40 minutes; P = 0.01). At a time horizon of 10 years when PPI therapy costs are considered, the cost-utility analysis demonstrates that Heller plus Dor surgery is associated with a total cost of $6,861 per patient, whereas Heller alone surgery is associated with a cost of $9,541 per patient.

CONCLUSIONS: In achalasia patients, Heller myotomy plus Dor fundoplication is preferred to Heller alone because it is both more effective in preventing the occurrence of postoperative GERD and less expensive at a time horizon of 10 years.

ST19 LAPAROSCOPIC HELLER MYOTOMY FOR THE TREATMENT OF ACHALASIA: EXPERIENCE WITH 101 CONSECUTIVE CASES.

Michael J Rosen MD, Kent W Kercher MD, Yuri W Novitsky MD, William S Cobb MD, Andrew G Harrell MD, Brent Matthews MD, Timothy Kuwada MD, Ron F Sing MD, B. Todd Heniford MD, Carolinas Medical Center

Introduction: The purpose of this study was to evaluate the clinical outcomes of patients undergoing laparoscopic esophageal myotomy for achalasia.

Methods: A retrospective analysis of all patients undergoing laparoscopic Heller myotomy form January 1997 to June 2004 was performed. Variables evaluated included preoperative symptoms, prior endoscopic interventions, preoperative manometric parameters, type of fundoplication, and perioperative outcomes. Symptoms were assessed postoperatively including the frequency and severity of reflux, dysphagia, chest pain, and regurgitation.

Results: During the study period 101 patients underwent laparoscopic Heller myotomy. There were 47 males and 54 females, with an average age of 45 years (14-84). Preoperative symptomatic complaints included severe dysphagia (37%), heartburn (20%), chest pain (29%), and regurgitation (52%). Prior to presentation 66% of patients had nonsurgical interventions including pneumatic dilatation (41%), bougie dilatation (11%), and Botox injection (29%). Manometric evaluation revealed a preoperative mean LES pressure of 44 mm Hg (12-168). A Toupet fundoplication was performed in 90 patients; 11 patients had no fundoplication due to short esophagus or other anatomic abnormality. Average operative time was 193 minutes (100-344) and two patients were converted to an open procedure due to extensive intraabdominal adhesions. There were no intraoperative complications. Nine postoperative complications occurred including: C diff colitis (n=2), DVT (n=1), urinary retention (n=1), MI (n=1), atrial fibrillation (n=2), and reexploration for a twisted wrap (n=1). One patient who underwent emergent laparoscopic esophageal repair, myotomy, and fundoplication after endoscopic perforation during pneumatic dilatation developed a postoperative empyema. Postoperative follow up was completed in 82 patients for a mean of 37 months (2-90). Reflux symptoms were reported in 16%. Occasional dysphagia was noted in 15% of patients. Eighty one percent of patients rated their outcome as excellent, 14% good, 4% fair, 1% poor. Ninety nine percent of patients would choose surgery over other treatment options again.

Conclusion: Laparoscopic anterior esophageal myotomy is a safe and effective treatment for achalasia. Long-term follow-up demonstrates effective relief of dysphagia with outstanding patient satisfaction with the procedure.

ST120 PROTON PUMP INHIBITORS REDUCE GALLBLADDER FUNCTION. Mitchell A Cahana MD, Karen Colton RN, Brittany A Palacioz, Kevin E Behrna MD, Timothy M Farrell MD, Division of Gastrointestinal Surgery, Department of Surgery, University of North Carolina School of Medicine, Chapel Hill, NC 27599-7081

In a previous study of gallbladder (GB) function before and after fundoplication, 58% of patients studied by cholecystokinin-stimulated HIDA scan demonstrated preoperative GB motor dysfunction, and 86% of those retested after operation and cessation of proton pump inhibitors (PPIs) had normalization. Despite the amino acid homology of gastrin and CCK and the physiologic redundancy of these peptides in experimental models, no study has assessed GB function in patients taking PPIs. Therefore, we measured GB ejection fraction (GEBF) in healthy volunteers before and 30 days after initiation of PPI therapy. Methods: Volunteers were consented after screening for gastroesophageal reflux (GER), biliary disease, or chronic abdominal pain. Nineteen of 22 subjects completed the study, which included: (1) baseline determination of GEBF by CCK-HIDA scan, (2) 30 days of antisecretory therapy with omeprazole (40mg daily), and (3) repeat GEBF on day 30. Results: One month of PPI therapy diminished GB motility in 15 of 19 patients (Figure). Mean GEBF decreased from 56.4 ± 30.0% to 42.8 ± 32.3%, representing a 13.6% reduction (p<0.01, paired t-test). Three subjects with decreased GEBF at 30 days reported symptoms consistent with a biliary etiology during PPI treatment.

ST21 PREFERRED LOCATION FOR THE DEVELOPMENT OF ESOPHAGEAL ADENOCARCINOMA WITHIN A SEGMENT OF INTESTINAL METAPLASIA, Joerg Theisen MD, Marcus Feith MD, David Pirchi MD, Joerg-Ruediger Siewert MD, Hubertus J Stein MD, Dept of Surgery, Klinikum re.d.Isar, TU Muenchen, Munich, Germany

Introduction: Barrett's metaplasia is the predominant precursor for the development of esophageal adenocarcinoma. This precancerous lesion has become the focus of different surveil-

http://www.sages.org/
S123
LONG-TERM OUTCOMES OF LAPAROSCOPIC ANTIREFLUX SURGERY FOR GERD-RELATED AIRWAY DISEASE. Jedediah A Kaufman MD, John E Houghland BS, Elina Quiroga MD, Carlos A Pellegriini MD, Mark Cahill BS, Brant K Oelschlager MD, University of Washington Department of Surgery
A strong link exists between gastroesophageal reflux disease (GERD) and airway diseases. We sought to determine the long-term results of multiple airway manifestations of GERD in response to LARS.
Methods: Between 12/1993 and 12/2002 750 patients underwent LARS at the University of Washington and their clinical information entered into a prospective database. Of these, 230 (31%) presented with cough, hoarseness, or wheezing more than once per week and had failed medical management. In 2004, we sought to contact each patient, by mail or phone, and succeeded in 136 patients (59%) which constitute our study group. At a median follow-up of 53 months (19-110 mo) we determined frequency and severity of airway symptoms (cough, hoarseness, wheezing, sore throat, dyspnea), esophageal symptoms (heartburn, regurgitation), anti-acid medication usage, happiness with surgery, and rating of operative treatment.
Results: Cough, hoarseness, wheezing, sore throat, dyspnea, heartburn, regurgitation, and dysphagia improved in the majority of patients (Table). Forty-five patients (33%) are currently taking daily anti-acid therapy for various reasons. One hundred eleven (88%) rated their results as excellent (n=78, 57%) or good (n=33, 24%).

Conclusion: LARS improves airway symptoms in over 2/3 of patients with typical GERD symptoms. Patients with proven GERD and airways symptoms of cough, hoarseness, and wheezing should be considered for LARS.

S124
LONG-TERM GASTROINTESTINAL SYMPTOMS AFTER LAPAROSCOPIC NISSEN FUNDOPPLICATION. Laurent Biertho MD, Herawaty Sebajang MD, Mehran Anvari PhD, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario Canada.
Methods: Between 12/1993 and 12/2002 750 patients underwent LARS at the University of Washington and their clinical information entered into a prospective database. Of these, 230 (31%) presented with cough, hoarseness, or wheezing more than once per week and had failed medical management. In 2004, we sought to contact each patient, by mail or phone, and succeeded in 136 patients (59%) which constitute our study group. At a median follow-up of 53 months (19-110 mo) we determined frequency and severity of airway symptoms (cough, hoarseness, wheezing, sore throat, dyspnea), esophageal symptoms (heartburn, regurgitation), anti-acid medication usage, happiness with surgery, and rating of operative treatment.
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Conclusion: LARS improves airway symptoms in over 2/3 of patients with typical GERD symptoms. Patients with proven GERD and airways symptoms of cough, hoarseness, and wheezing should be considered for LARS.

S122
LONG-TERM EFFECTS OF LAPAROSCOPIC NISSEN FUNDOPPLICATION ON ESOPHAGEAL MOTILITY. Laurent Biertho MD, Herawaty Sebajang MD, Mehran Anvari PhD, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada.
Background: Laparoscopic Nissen Fundoplication (LNF) has shown to affect esophageal motility but its long-term effects have not been fully assessed. The aim of this study was to evaluate the long-term impact of LNF on esophageal motility in patients with pre-operative esophageal dysmotility.
Methods: Prospective follow-up of 580 patients after LNF between 1992 and 1999. Esophageal manometry was performed before surgery and at 6 months, 2 years and 5 years after surgery.
Results: 8.1% of the patients (N=47) had low pre-operative esophageal contractile pressures (<30mmHg, Group II). The remaining 533 patients had normal esophageal manometry (Group I). LES basal and nadir pressures were significantly increased in both groups (p<0.001) after surgery. There was a statistically significant (p<0.05) but clinically insignificant decrease in lower esophageal contractile pressures in Group I patients after 5 years. In reverse, there was a significant increase in esophageal contractile pressures in Group II patients after surgery (p<0.001).

Conclusion: LNF produces a significant long-lasting increase in LES resting and nadir pressures. In patients with pre-operative esophageal dysmotility (i.e. contractile pressure <30 mmHg) fundoplication significantly improves contraction pressure for up to 5 years. Pre-operative esophageal dysmotility is therefore not a contra-indication to LNF.
Conclusion: LNF provides an efficient treatment of GERD up to 5 years, but can also be an effective treatment of associated GI symptoms. However, new bowel symptoms can develop after LNF and patients should be aware of that risk.

**S125**

**MESH HIATOPLASTY FOR PARAESOPHAGEAL HERNIAS AND FUNDOPLICATIONS,** Jason M Johnson DO, Alfredo M Carbonell DO, Brennan J Carmody MD, Mohammad K Jamal MD, Eric J DeMaria MD, Virginia Commonwealth University, Richmond, Virginia

Little Grade A medical evidence exists to guide the foregut surgeon in the decision to use prosthetic material for hiatal closure in anti-reflux surgery. Therefore, we compiled and analyzed all available literature to determine if the use of prosthetic mesh for hiatal repair in routine laparoscopic fundoplications (LF) or in the repair of large (> 5 cm) paraesophageal hernias (PEH) would decrease recurrence.

A literature search was performed using an inclusive list of relevant search terms via Medline/PubMed to identify papers (n=19) in which prosthetic material was used in the repair of the crura for patients undergoing laparoscopic PEH reduction and/or LF. Case series (n=5), retrospective reviews (n=7), and prospective randomized (n=3) and non-randomized (n=4) trials were identified. Laparoscopic procedures (n=1312) were performed for either PEH, GERD, hiatal hernia or a combination of the three. Group A (n=679) were patients who had primary suture repair of the crura, and Group B (n=633) had repair with either interposition of mesh to close the hiatus or onlay of prosthetic material after closure.

<table>
<thead>
<tr>
<th></th>
<th>Group A (No Mesh)</th>
<th>Group B (Mesh)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEH N Recurrence</td>
<td>153 (15.0%)</td>
<td>272 (2.2%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>LF N Recurrence</td>
<td>526 (0.0%)</td>
<td>361 (0.6%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Total N Recurrence</td>
<td>679 (9.6%)</td>
<td>633 (1.3%)</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

The use of mesh was associated with a decrease in recurrence when compared with primary suture repair in both the LF and PEH groups. Mean follow-up did not differ between groups (21.1 vs. 22.1 months). None of the papers cited any instance of prosthetic erosion into the gastrointestinal tract. The data support the use of prosthetic materials for hiatal repair for both routine LF and in the repair of large PEHs. Future randomized trials are needed to confirm that mesh repair is superior to simple crural closure, but the current study supports use of prosthetic material to improve outcomes in LF and PEH repair. Persistent concerns about prosthetic erosion, unconfirmed in this comprehensive review, suggest that biomaterials should be further evaluated to determine if they offer the benefits of improved hiatal repair outcomes while avoiding the small risk of erosion.
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**P001–Posters of Distinction**

**HIAL CRURAL REPAIR AS MANAGEMENT OF SEVERE REFLUX FOLLOWING LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING, GEORGE A FIELDING, WESLEY HOSPITAL, BRISBANE, AUSTRALIA**

The majority of symptomatic failures leading to removal of laparoscopic adjustable gastric bands (LAGB), previously 5% in this series of 2,450 LAGB’S, are due to reflux or dysphagia. Many have normal barium studies at band removal despite severe symptoms. Recently it was realised that these patients had large hiatal crural defects. They are now offered crural repair and repair of slip if indicated, rather than band removal, on the presumption that this was the cause of their symptoms. Twenty-three patients presented with severe reflux a mean 44 +/- 22 months (10-101) after LAGB. At time of banding mean weight was 131 +/- 29 kg (90-211), mean BMI 44 +/- 9 kg/m2 (35-62). All were on PPI’s, 9 were considering band removal, 4 had severe dysphagia. Barium studies showed normal 8, hiatus hernia/concentric dilatation 9, slip 6. At presentation, mean weight was 90 +/- 20 kg (73-154), BMI 34 +/- 5 kg/m2 (24-44) and EWL 51 +/- 20% (21-91). They had 15 +/- 9 visits (5-32) since banding and mean fill of only 1 cc. - 9 patients had empty bands. Three patients had failed weight loss - 20% EWL, empty band, 20 visits, due to inability to tolerate band tightening. Crural repair alone was performed in 13 patients, with change to an 11cm band in the 4 with severe dysphagia and with repair of concurrent slip in 6 patients. Mean follow-up is 13 +/- 12 months (4-39), weight 95 +/- 16 kg, BMI 33 +/- 4 kg/m2, EWL 54 +/- 4% There have been a mean 4 post-op visits, with 2 +/- 0.7 cc fill in the standard bands. All 23 patients are asymptomatic, off PPI’s and happy with the band. There have been no band removals in the last 14 months, compared to mean 10 per year previously. Many of the symptomatic failures of LAGB due to reflux and dysphagia may be due to undiagnosed hiatal hernia or large crural defects that have previously been filled with fat. Repair of these defects will cure reflux symptoms and greatly reduce the need for band removal. Furthermore, patients can then have their bands tightened appropriately. These large crural defects should be sought at the original LAGB surgery and repaired.

**P002–Posters of Distinction**

**EFFECT ON ANASTOMOTIC LEAK RATE WITH THE USE OF CONTINUOUS POSITIVE AIRWAY PRESSURE IN ROUX-EN-Y GASTRIC BYPASS PATIENTS, Stephen Kolakowski Jr. MD, Alan L Schuricht MD,David S Wernsing MD, Matt L Kirkland MD, Pennsylvania Hospital**

OBJECTIVE: The purpose of this study was to assess the effect of postoperative continuous positive airway pressure (CPAP) on anastomotic leak rates in patients undergoing roux-en-y gastric bypass. In addition, a comparison was made between those patients who were supported using their personal CPAP units and those using hospital-supplied units.

MATERIALS AND METHODS: Eight hundred fifty two consecutive patients undergoing roux-en-y gastric bypass at our institution between January 2001 and December 2003 were included. Four hundred ten of these patients were previously diagnosed with obstructive sleep apnea (OSA) and 104 were CPAP dependent. The patients were then stratified into 4 groups: Non OSA, OSA without CPAP, hospital-issued CPAP and patient’s own CPAP. Clinical outcomes were compared between groups using a one way ANOVA test.

RESULTS: Postoperatively, 24 anastomatic leaks (2.81%) were identified. When comparing all cpap patients vs. non cpap patients, there was no statistically significant difference in the number of leaks observed. The intragroup leak rates were Non OSA (13/443) (2.93%), OSA without CPAP (6/306) (1.96%), hospital CPAP (4/24) (16.7%), and own CPAP (1/80) (1.25%). Between group analysis revealed significantly higher leak rates with mean differences between: Hospital CPAP vs. own CPAP (.1542) (p-value <.001), Hospital CPAP vs Non OSA (.1373) (p-value <.001) and Hospital CPAP vs. OSA without CPAP (.1471) (p-value <.001).

CONCLUSION: Postoperative CPAP is a safe modality for the treatment of OSA after Roux-en-Y gastric bypass surgery when patients are able to use their own CPAP units, with settings that are familiar to them. The use of hospital-supplied CPAP units is associated with a higher anastomotic leak rate. We therefore recommend all OSA CPAP-dependent patients undergoing Roux-en-Y Gastric Bypass Surgery to bring their own CPAP machines with them for safe and effective postoperative care.

**P003–Posters of Distinction**

**IMPROVED POSTOPERATIVE OUTCOMES AFTER LAPAROSCOPIC GASTRIC BYPASS: INSIGHTS FROM THE NATIONWIDE INPATIENT SAMPLE, R Ricciardi MD, R J Town PhD, T A Kellogg, S Ikramuddin MD, N N Baxter MD, Department of Surgery, University of Minnesota, Minneapolis, MN**

**INTRODUCTION:** Gastric bypass can be performed either as an open gastric bypass (OGB) or laparoscopic gastric bypass (LGB). Differences in outcomes for LGB and OGB have not been evaluated in a population based setting. METHODS: We used data from the Nationwide Inpatient Sample (NIS), a 20% stratified random sample of US community hospitals in 33 states. Utilizing standard ICD-9-CM diagnostic and procedure codes, we identified patients who were admitted to hospital from 2001 to 2002 with a diagnosis of morbid obesity and subsequently underwent gastric bypass. Standard procedure codes were utilized to identify patients who underwent LGB as compared to OGB. Length of stay (LOS), in-hospital mortality, and major complications were calculated for OGB and LGB. A multivariate model was constructed to determine independent risk factors for morbidity and mortality while adjusting for age, race, comorbid conditions and hospital volume. RESULTS: A total of 29,761 gastric bypass procedures were performed in morbidly obese patients in our study period. LGB was attempted in 15.1% of all patients. Length of stay was 5.7 days in the OGB group and 3.3 days following LGB (p<0.05). LGB was associated with significantly less morbidity and lower mortality as compared to OGB (Table). After adjustment for covariates including age, race, co-morbid conditions and hospital volume, these differences remained significant. CONCLUSIONS: LGB is associated with significantly lower LOS and reduced mortality. LGB is also associated with fewer complications such as anastomotic complications, pneumonia, respiratory failure, and congestive heart failure. These data indicate that LGB provides a significant benefit over OGB for the morbidly obese patient.

**P004–Posters of Distinction**

**SUPER-SUPER OBESE PATIENTS UNDERGOING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS HAVE LESS POST OPERATIVE COMPLICATIONS COMPARED TO THOSE UNDERGOING OPEN ROUX-EN-Y GASTRIC BYPASS, David S Tichansky MD, Eric J DeMaria MD,Adonai Z Fernandez MD, John M Kellum MD, Luke G Wolfe MS, Jill Meador RN, Harvey J Sugerman MD, Department of Surgery, University of Tennessee, Memphis, TN; Department of Surgery, Virginia Commonwealth University, Richmond, VA; Department of Surgery, Wake Forest University, Winston-Salem, NC**

It has been suggested that super-super obese (SSO) patients have increased complications following laparoscopic gastric bypass (LGB), thus open gastric bypass (OGB) is often utilized for these patients. We hypothesize that SSO patients can undergo LGB without increased complications compared to OGB. All SSO LGB patients from 3/2000 to 3/2004 were compared to matched cohort of OGB patients from 3/1998 to 3/2000, when all SSO patients had OGB. Demographic and comorbidity data were compared by Fisher’s exact test. Complication rates and resolution of comorbidities were analyzed by Fisher’s Exact test and T-tests. Weight loss was analyzed by ANOVA.
In two groups of 56 LGB and 70 OGB patients, there were no differences in demographics, preop BMI, distribution of BMI, or incidence of comorbidities. The overall risk of having a postoperative complication was greater for OGB patients than LGB patients (57.1% vs. 14.3%, p<0.001). There were more complications per patient following OGB than LGB (0.7 vs 0.2, p<0.001).

There were no differences in comorbidity resolution or excess weight loss between the LGB group (57.4% +/- 12.4%, n=30) and the OGB group (55.6% +/- 12.8%, n=52) at one year follow-up. SSO patients have fewer postoperative complications after LGB than after OGB. Weight loss and resolution of comorbidity conditions are similar with both techniques.

P005–Posters of Distinction

CLINICAL CORRELATION OF LAPAROSCOPIC ULTRASOUND WITH EUS AND PATHOLOGIC STAGE IN PATIENTS UNDERGOING A CURATIVE RESECTION FOR GASTRIC CANCER, Chandrakanth Are MD, David J Bentrem MD, H Gerdes MD, Murray J Brennan MD, Daniel G Coit MD, Memorial Sloan Kettering Cancer Centre

INTRODUCTION: Laparoscopic ultrasound (LUS) has been utilized as a diagnostic tool for preoperative staging of gastric cancer patients. We previously reported on the concordance of LUS with pathologic assessment in an initial small series. The aim of this study was to correlate LUS staging with endoscopic ultrasound (EUS) and pathologic evaluation in a contemporary series of patients undergoing curative R0 resection for gastric cancer.

METHODS: Patients who underwent a preoperative clinical assessment of T/N stage with EUS and/or LUS and subsequent R0 resection for gastric adenocarcinoma between 9/1993 and 1/2003 were identified from a prospective database. Clinical staging results from preoperative LUS and EUS were compared to postoperative pathologic staging. Comparisons with pathologic staging were done excluding patients who had received neoadjuvant chemotherapy.

RESULTS: Two hundred four patients with gastric cancer underwent clinical staging with LUS and/or EUS followed by R0 resection. Fifty two patients had EUS alone. Ninety seven had LUS alone. For 55 patients, both EUS and LUS were performed. The accuracy of individual EUS T stage was 53% (36/68) and 43% for N stage (30/69). The accuracy of individual LUS T stage was 61% (64/105) and 59% for N stage (61/104). Using LUS staging, 28% of patients were overstaged by T stage and 19% by N stage. For those patients having both EUS and LUS, LUS was 56% accurate for determining pathologic stage compared with 47% for EUS.

Accuracy | EUS | LUS
--- | --- | ---
T stage | 53% | 61%
overstaged | 39% | 28%
N stage | 43% | 59%
overstaged | 29% | 19%

CONCLUSIONS: Combined clinical evaluation with EUS and/or LUS had lower than expected concordance with pathologic stage. Laparoscopic evaluation with LUS was comparable to EUS in preoperative staging of gastric cancer.

P006–Posters of Distinction

THE LAPAROSCOPIC TECHNIQUE OF LYMPH NODE DISSECTION AROUND INFERIOR MESENTERIC ARTERY WITH PRESERVATION OF THE LEFT COLOIC ARTERY, Michiya Kobayashi MD, Ken Okamoto MD, Tsutomu Nakamura MD, Takehiro Okabayashi MD, Takeki Sugimoto MD, Keijiro Araki MD, Tumor Surgery, Kochi Medical School

Laparoscopic assisted colorectal surgery (LAC) is now one of the surgical modalities for neoplasm of colon and rectum. From January 1997 to August 2004, we experienced 18 low anterior resection cases with total mesorectal excision for lower rectal cancer. Sigmoid colon of the Japanese is fairly long compared to that of the western people. The policies of our lymph node (LN) dissection around inferior mesenteric artery (IMA) are D2 for early rectal cancer cases with slight submucosal (sm) invasion and D3 for advanced cases. We presented our technique of LN dissection around IMA in this study. We preserve left colic artery (LCA) in both D2 and D3 dissection. For D3 dissection, we start to cut the right side peritoneum of the mesentery of the sigmoid colon on the anterior surface of the sigmoid colon. That is important to the root of IMA. The incision goes just below the root of IMA. IMA is dissected with LCS to avoid bleeding. The superior hypogastric nerve should be preserved during the procedure. The dissection around the root of IMA is performed from its right side to cranial side. Then, artery wall is exposed with spatula type electric cautery down to the root of LCA. LCA should be exposed at least 1.0 cm for D3 dissection. First sigmoidal artery arising from LCA is usually clipped and cut. Finally, adipose tissue including LNs surrounded by IMA, inferior mesenteric vein (IMV) and IMA is dissected with LCS. IMV is clipped and cut at the cranial side of left colic artery. The root of the superior rectal artery is clipped and cut. For D2 LN dissection, we do not expose the root of IMA; however, it is partially exposed to confirm the left colic artery and the root of the superior rectal artery. Usually it takes about 60 and 40 minutes until cutting the superior rectal artery for D2 and D3 dissection, respectively.

Background: Laparoscopy-assisted surgery (LAS) has been accepted for the treatment of Crohn’s disease and it was revealed that LAS had advantage for primary or recurrent Crohn’s disease patients in the short-term postoperative period. However, the long-term result is still unknown.

Patients: In the present study, we evaluated 131 patients of Crohn’s disease who underwent intestinal resection from June 1996 to August 2004. Forty-seven patients (primary: 27, recurrent: 20) underwent open surgery (OS), and 84 patients (primary: 61, recurrent: 23) were operated with LAS. Most of the patients were followed by diet therapy and medication (S-ASA) after surgery. Recurrence of the disease was diagnosed by contrast medium study, large or small bowel fiberscope, CT/MRI imaging or operative finding.

Results: 1) In the Vienna classification, L1 type (location of the affected intestine: terminal ileum) and B1/B2 types (behavior: non-penetrating) were significantly popular in the LAS group (L1/L2/L3/L4= OS: 38.4/10.6/48.3/2.1%, LAS: 51.2/14.3/33.3/1.2%, B1/B2/B3– OS: 6.4/40.4/53.2%, LAS: 2.4/86.7/31.0%). There were no significant differences in A1/A2 type (age at onset), gender or smoking. 2) There was no significant difference in the median follow up period (OS: 51.8 months, LAS: 52.5 months). 3) There were no significant differences in the recurrent rate (OS: 15 cases (31.9%), LAS: 23 cases (27.4%) or re-operation rate (OS: 13 cases (27.7%), LAS: 15 cases (17.8%). 4) Enterocutaneous fistula was rarely found in LAS group (2.4% vs. 16.2% in OS).

Discussion and Conclusion: LAS might produce lower amount of inflammatory cytokines, therefore lower rate of recurrence would be expected. On the other hand, there are some argu-
P009–Posters of Distinction
COMBINING THE PRIVATE PRACTICE AND ACADEMIC ENVIRONMENTS: A NEW MODEL FOR MINIMALLY INVASIVE SURGICAL FELLOWSHIP TRAINING, William MD, Tom Scarborough MD, Patrick R Reardon MD, Philip L Leggett MD, Morris E Franklin MD, The University of Texas Health Science Center at Houston, Minimally Invasive Surgeons of Texas

Background: Minimally invasive surgical (MIS) fellowships are in high demand by general surgical residents with 95 MIS training programs in North America. Fellowship candidates are seeking programs that provide exceptional opportunities in clinical experience, case volume, research support, and educational programs. This study reveals a new model of MIS training, combining the efforts of academic and private practice fellowships into a superfellowship.

Methods: In 2003, three independent MIS fellowships affiliated with the University of Texas Health Science Center at Houston were combined to create a common fellowship of 5 clinical fellows. The fellows rotated between 1 academic practice attended by 2 surgeons and 3 private practices attended by 1 surgeon each. Fellows were organized together for combined research and educational activities. Case volumes and variety were examined, and satisfaction surveys were reviewed from all fellows to determine the advantages of academic and private practice training.

Results: The fellows reported very high opinions of the combined fellowship with an overall mean satisfaction score of 9 on a scale of 1 to 10. The academic practice rotation averaged a score of 8 as did private practice rotations. Fellows reported the overall fellowship strengths to be the large diversity of education, clinical and operative experiences. The private practice rotations excelled in high surgical case volume whereas the academic rotation excelled in extensive educational opportunities. Case volumes per fellow for the academic rotations averaged 28 cases per month with a distribution of 33% bariatric, 16% nonbariatric laparoscopic, 40% endoscopic, and 11% open procedures. This compares to the private practice rotations averaging 46 cases per month with a distribution of 5% bariatric, 47% nonbariatric laparoscopic, 26% endoscopic, and 21% open procedures.

Discussion: The combination of individual academic and private practice fellowships into a superfellowship proved highly successful in expanding the MIS training opportunities. This new model broadened the bariatric surgical experience and educational opportunities for the fellows during the academic rotations, while the private practice rotations improved overall case volume and provided a diverse nonbariatric laparoscopic surgical experience. With this new model, the MIS training environments of private practice and academics combine the best of both worlds.

P010–Posters of Distinction
VARIATIONS IN ANTI-REFLUX SURGERY PRACTICE: A SURVEY OF 100 SURGEONS, A F Burry MD, J L Harnish MAP Shah MD, D R Urbach MD, Department of Surgery, University of Toronto and University Health Network.

Introduction. Gastroesophageal reflux disease (GERD) is common and appears to be increasing in incidence. Anti-reflux surgery (ARS) is a well-described procedure for the treatment of GERD. Our goal was to examine the surgical practices of Canadian surgeons who perform ARS. Methods. Canadian general and thoracic surgeons were identified from professional association mailing lists, and were mailed a short survey regarding their ARS practices, opinions and experiences. Surveys performed as和尚tance as early as possible. Results. A total of 134 surgeons were mailed the questionnaire, and 100 responded (response rate of 74.6%). 57% of the respondents were thoracic surgeons and 43% were general surgeons. 82% of respondents performed ARS, and 74.4% performed most of their procedures laparoscopically. Thoracic surgeons were more likely to perform ARS than were general surgeons (91.2% vs. 69.8%, P<0.01). However, general surgeons were more likely than thoracic surgeons to do their ARS laparoscopically (90.0% vs. 65.4%, P<0.05).

Similar proportions of thoracic and general surgeons routinely closed the crura (94.2% vs. 88.0%, P=0.14) and divided the short gastric vessels (42.3% vs. 30.0%, P=0.42). Thoracic surgeons were more likely than general surgeons to believe that esophageal shortening requiring a lengthening procedure was common (23.1% vs. 0%, P<0.001). Use of a laparoscopic or open approach was not associated with practices such as routine crural closure, type of fundoplication, or frequency of esophageal lengthening.

Conclusions. In Canada, both general and thoracic surgeons perform ARS. There were large variations in practices and opinions between thoracic and general surgeons. However, practices and opinions among surgeons who performed laparoscopic surgery and surgeons who performed open surgery were similar.

P011–Posters of Distinction
THE ROLE OF LAPAROSCOPIC NISSEN FUNDOPICATION IN GASTRO-ESOPHAGEAL REFLUX DISEASE IN PATIENTS WITH BARRETT’S ESOPHAGUS - PRELIMINARY REPORT, Gustavo L...
Carvalho PhD, Debora S Carvalho, Gildo O Passos Jr, Frederico P Santos, Gilvan Loureiro MD, Carlos H Ramos MD, Frederico W Silva MD, Clinica Cirurgica Videolaparoscopica Gustavo Carvalho, UPE - Universidade de Pernambuco, Recife - BRAZIL

BACKGROUND: Barrett’s Esophagus (BE) is a complication of Gastro-esophageal Reflux Disease (GERD) and can be a pre-malignant condition. Anti-reflux laparoscopic surgeries (ARLS) significantly correct physiological and anatomical abnormalities in patients with GERD; nevertheless, there is no consensus with respect to preventing malignant transformation in patients with BE. The impact of ARLS on those suffering from BE and in particular its effect not only on the regression of metaplasia but also on the progression of metaplasia and dysplasia towards adenocarcinoma, remain barely transparent.

OBJECTIVE: To analyze clinical, endoscopic and histopathological results after ARLS in patients suffering from BE.

PATIENTS & METHODS: In the period from January 2000 to June 2004, a group of 142 patients suffering from GERD underwent ARLS performed by the same surgeon. Among these, 42 patients (29.5%) suffered from BE. All the patients underwent Nissen fundoplication by laparoscopic means. There were no conversions to open surgery. All patients were discharged within 24 hours. Post-operative follow-up was carried out in all 42 patients with BE.

RESULTS: After follow-up which varied from 3 to 40 months, symptomatic control was good in most patients: three patients developed the symptoms that were making regular use of proton pump inhibitor, thus BE remains unaltered in these patients. Partial or complete regression of BE occurred in 25 patients with 14 of them not showing any further signs of BE in endoscopic or histopathological examination. And in 1 patient who remained asymptomatic after surgery, the degree of dysplasia increased, which led to his undergoing endoscopic mucosectomy of the BE area. No patient presented adenocarcinoma after surgery. No one died or suffered any significant complication as a result of surgery.

CONCLUSIONS: Laparoscopic Nissen fundoplication is safe and effective in the symptomatological control of a significant number of patients with BE. Regression of BE occurred at a randomly high percentage level in patients operated despite the control of GERD attained by most patients.

P013–Posters of Distinction

LARYNGOPHARYNGEAL REFLUX CAN EXIST WITH NORMAL DISTAL ESOPHAGEAL ACID EXPOSURE. Pami E Lufti MD, Alfonso Torquati MD, Nikhilvesh Sekhar MD, William O Richards MD, Vanderbilt University

Laryngopharyngeal reflux (LPR) has been detected in patients with gastroesophageal reflux disease (GERD). The prevalence of GERD in patients with LPR remains unknown.

Aim: to determine if pathologic proximal esophageal reflux can exist without pathologic distal reflux.

Methods: Database was reviewed for triple probe pH studies. Each included manometry and 24-hr pH study using 3 probes (distal, middle, located 5 and 15cm proximal to lower esophageal sphincter, LES, and laryngopharyngeal located at 2cm above the upper sphincter). Comparison was made using Student’s t-test for continuous, and chi square for independent variables.

Results: 113 triple probe studies were performed for different LPR symptoms (laryngitis, 31%; chronic cough, 19%; hoarseness, 9%; vocal cord nodules, 11%; and subglottic stenosis, 4%). Pathologic LPR was defined according to our previous study on healthy volunteers as >4 reflux episodes detected by the extraesophageal probe. 45 patients had pathologic LPR; of those, only 24 (53%) had abnormal distal acid exposure time (>4.1%) with elevated DeMeester score (≥22). The difference in incidence of abnormal distal acid exposure or DeMeester score was not statistically significant between patients with or without pathologic LPR. Mean DeMeester score and distal acid exposure time were both higher in LPR group, but the difference did not reach statistical significance (34±30 vs. 27±34, p=0.238, and 6.5±5.9% vs. 5.2±6.4, p=0.277, respectively).

Using t test, LES pressure, contraction amplitudes, and peristalsis were compared between the same two groups (with or without LPR); no statistically significant difference was found.

Conclusion: Pathologic LPR can exist without pathologic distal acid exposure. To accurately diagnose LPR, a hypopharyngeal sensor must be used with the standard pH sensors located at 5, and 15 cm from the LES.

P014–Posters of Distinction

POUCH ENLARGEMENT AND BAND SLIPAGE, TWO DIFFERENT ENTITIES. Frederico Moser MD, Santiago Horgan MD, M V Gorodner MD, C Galvani MD, M Baptista MD, A. Arnold MD, University of Illinois at Chicago

Background: pouch enlargement (PE) and band slippage (BS) are the most common late complications of the laparoscopic adjustable gastric banding (LAGB). Often, confusion exists among surgeons regarding the denomination or even the effect of ARS on it.

Methods: 671 patients undergoing ARS were selected from a prospective database of patients undergoing various esophageal surgeries at our institution. Exclusion criteria were: surgery before 1993 (early technique), Heller myotomy, < 6 months follow-up, or failure to complete nausea portion of the questionnaire. The prevalence of nausea (PE) or BS was determined on a visual analog scale of 0-4 with higher ordinal values representing greater frequency of symptoms. Logistic regression modeling was performed to identify factors most significant for persistent nausea following ARS. Comparisons were done using chi-square test or t-test as appropriate.

Results: Of the 671 patients, 93% had nausea preoperatively (mean severity score 2.0 ±0.88). Younger, women, and patients with other associated GI symptoms or PEH had significantly higher incidence of nausea (p < 0.05). After surgery 498 (74.2%) patients had some degree of nausea at early post-operative visit (median 3.5 weeks). At long-term follow-up (median 9 months) 149 (22.2%) patients experienced persistent nausea (45 persistent nausea, 104 new onset nausea, overall mean severity score 1.75 ±0.82). Odds of persistent nausea were higher among women (odds ratio [OR] 3.5), in patients undergoing Toupet repair (OR 6.5), Collis gastroplasty (OR 3.4), or redo ARS (OR 1.5), and in those having preoperative nausea (OR 1.14) or functional GI disorders (OR 1.17). However, none of the factors were found to be statistically significant.

Conclusion: Nausea is a frequent presenting component of GERD. It can also be a devastating postoperative complication leading to failure. Our data shows that majority (75.6%) of patients with preoperative nausea are cured with fundoplication. However, there are a significant number of patients who develop nausea after surgery. So surgeons should counsel all patients about this possibility.

http://www.sages.org/
Conclusion: a) PE is a chronic complication that can be managed conservatively, with 81% success rate in our series. Surgical treatment should be considered when medical treatment fails. B) BS is an acute complication that requires surgical treatment 100% of the times. C) Tailored adjustment allows early diagnosis of PE, therefore preventing adjustments in undiagnosed PE patients.

P015–Posters of Distinction
THE SHORT ESOPHAGUS: ANALYSIS OF VARIABLES, Ziad T Awad MD, Varun Puri MD, Sean Connolly PhD, Charles J Filipi MD, Sumeet K Mittal MD, Creighton University Medical Center, Omaha, NE
THE SHORT ESOPHAGUS: ANALYSIS OF VARIABLES, Ziad T Awad, M.D., FRCSI
Varun Puri, M.D.
Sumeet K. Mittal, M.D.
Sean Connolly, Ph.D.
Charles J. Filipi, M.D., FACS.
Department of Surgery, Creighton University School of Medicine, Omaha, NE, USA
Introduction: With the increasing utilization of antireflux surgery for gastroesophageal reflux disease (GERD) accurate assessment of the short esophagus (SE) is a necessity. Various preoperative tests may assist surgeons in determining the presence of a short esophagus but intra-operative assessment after esophageal mobilization remains the gold standard.
Methods: Seventy-eight patients, primary reflux (n=50), failed antireflux surgery (n=28) were suspected to have a short esophagus. In all, an intraoperative evaluation procedure for determination of esophageal length after esophageal mobilization was performed. Tests performed preoperatively were upright esophagram, manometry and esophago-gastroscopy. Stepwise logistic regression was conducted using Statistical Package for the Social Sciences (SPSS) to estimate the probability of a patient having a normal length esophagus. The independent variables considered were: age, sex, height, weight, obesity, manometric esophageal length (MEL), Barrett’s esophagus or stricture formation (abnormal endoscopy), hiatal hernia larger than 5 cm (abnormal esophagram), defective lower esophageal sphincter pressure (DLESP) and a motility disorder.
Results: Eighteen patients were determined to have a SE upon intraoperative evaluation. All but one of these patients underwent a gastroplasty (esophageal lengthening procedure). Manometric esophageal length (MEL) and presence or absence of obesity were the only variables that had discriminatory power in predicting a SE. For two patients presenting with the same value of MEL, the odds of a normal esophageal length are 11.24 times higher for an obese patient. For two patients with the same obesity status, the odds of having a normal esophageal length increase with higher MEL. An equation developed using obesity and MEL as variables predicted SE with a sensitivity of 73% and specificity of 77%.
Conclusion: The possibility of a short esophagus and the need for a gastroplasty can be predicted preoperatively using the equation proposed.

P016–Posters of Distinction
ANTERIOR GASTROPEXY ALONE MAY PREVENT RECURRENT AFTER LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR, A Sabnis MD, B Mirza MD, B Chaud MD, J Ponsky MD, Department of General Surgery, Minimally Invasive Surgery Center, Cleveland Clinic Foundation
ANTERIOR GASTROPEXY ALONE MAY PREVENT RECURRENT AFTER LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR, A Sabnis MD, B Mirza MD, B Chaud MD, J Ponsky MD, Department of General Surgery, Minimally Invasive Surgery Center, Cleveland Clinic Foundation
Objective: The purpose of this study is to determine if gastroscopy alone versus gastroscopy with an anti-reflux procedure could prevent recurrence after laparoscopic paraesophageal hernia repair.
Methods: A series of 55 patients underwent laparoscopic repair of hiatal hernias between July 2000 and July 2004 at the Cleveland Clinic Foundation by one surgeon. Of those patients, 8 patients underwent reduction of hernia, crural repair and anterior gastroscopy. An esophageal wrap was not done on these 8 patients secondary to a short esophagus or lack of reflux symptoms preoperatively. The remaining 47 patients had an esophageal wrap as a component of the procedure. They all had a video esophagram 24 h after surgery, then at 3-, 6-, and 12-month follow-up visits and annually thereafter. Symptomatic outcomes were assessed at each follow-up visit. Outcomes are reported from an IRB approved prospective database.
Results: In this study, 6 women and 2 men with a mean age of 73 years (range, 61-83 years) underwent successful laparoscopic paraesophageal hernia repair. One complication occurred: a patient had an esophageal tear with leak identified on the video esophagram 24 h after surgery. At this writing, all the patients have undergone video esophagram at 24 h follow-up. Of the 8 patients, 5 have undergone video esophagram at 3-month follow-up and 4 at 6-month follow-up. All were asymptomatic and all examinations were normal. At this writing, there were no radiographic recurrences. In the remaining 47 patients there were 3 (6.4%) radiographic recurrences. A chi-squared analysis showed no statistical significance (p=0.464) between gastroscopy alone versus gastroscopy with fundoplication.
Conclusion: These early results suggest that anterior gastroscopy could be the key component in reducing the recurrence rate after laparoscopic paraesophageal hernia repair.

P017–Posters of Distinction
UNSEDATED TRANNSAL NASAL ESOPHAGO-GASTROSCOPY. INITIAL OUTPATIENT EXPERIENCE WITH A 5MM GASTROSCOPE, Nikhilesh R Sekhar MD, Alfonso Torquati MD, Rami E Lutfi MD, William O Richards MD, Vanderbilt University, School of Medicine
BACKGROUND: We instituted a program at our institution to evaluate a 5 mm transnasal endoscope that can be placed without sedation in a conscious and alert patient. METHODS: Twenty-one patients were evaluated for symptoms of GERD or dysphagia. The patients nares and back of throat are numbed with cetacaine. Tetracaine, phenylephrine and viscous lidocaine are applied to the nostril to aid with dilation and passage of the scope. The scope which is 60 cm in length can visualize the esophagus, stomach and GE junction but not the duodenum in most patients RESULTS: Of the twenty-one patients who underwent endoscopy none experienced adverse effects. In one patient we were unable to pass the scope past the nasopharynx, possibly due to a lack of phenylephrine and tetracaine. All were able to resume normal function immediately and there were no complications. Biopsies were taken from 6 patients. Two patients revealed Barrett’s esophagus. Two revealed esophagitis and two are currently pending. Due to normal findings in the remaining 15 patients biopsies were not obtained. Average length of procedure was 15 +/-4 minutes.
CONCLUSION: Transnasal unsedated esophagogastroscopy is a safe and well tolerated endoscopic modality that can be done without sedation in an outpatient setting. This procedure can be integrated easily into a surgeon’s outpatient clinic.

P018–Posters of Distinction
LAPAROSCOPIC CHOLECYSTECTOMY IN THE OCTOGENARIAN, A Belizon, K Alexander, AE Pelta, GR Gechter, Long Island Jewish Medical Center
Introduction: As the life expectancy increases and our population gets older it is important to assess the safety of our opera-
tive procedures on the elderly. Recently laparoscopic cholecystectomy (LC) has been increasingly accepted as a safe and effective procedure in elderly patients with gallbladder disease. Using our large patient database we set out to determine the safety of laparoscopic cholecystectomy in patients over the age of 80.

Methods: Using our extensive patient database we identified the patients that had undergone LC between December 1994 - May 2003. Of those patients 184 (3.7%) of them were over the age of 80 (mean age 87.2). We found a significant increase in conversion rate in the elderly group compared to the younger patients (12.3% vs. 3.7%). However, when we analyzed the elective procedures alone the conversion rate was 4.9% not significantly different from the control group. Morbidity was significantly increased if conversion to open procedure took place after 30 minutes of operating time. This was mostly in the form of wound infection(3% vs. 0.5%). Overall morality was higher in the elderly group but not statistically significant (1.9% vs 1.4%). Other parameters were not significantly different between the two groups.

Conclusion: We continue to show that LC is a safe procedure in octogenarian patients. The morbidity and mortality of the procedure is similar between elderly and young patients. Every effort should be made to operate under elective conditions rather than emergent ones. In addition our data strongly supports early conversion (<30min) if necessary to avoid increasing the postoperative morbidity associated with prolonged operative time.

P019–Posters of Distinction
FIRST TRIMESTER PREGNANCY IS NOT A RELATIVE OR ABSOLUTE CONTRAINDICATION TO LAPAROSCOPIC CHOLECYSTECTOMY, Eric B Jelin BA, Ashley H Vernon MD, David C Brooks MD, Harvard Medical School, Brigham and Women's Hospital

Background: The management of biliary tract disease during the first trimester of pregnancy is controversial. Retrospective series have compared the outcomes of medical management and standard surgical therapy, but none have amalgamated the data into a model that considers the morbidity of biliary tract disease in the pregnant patient as well as fetal outcomes.

Methods: We constructed a Markov decision analysis model to compare the strategies of medical management and surgical intervention for women in their first trimester of pregnancy. The entry point of the model was arbitrarily set at 10 weeks and absorbing states were fetal death, healthy birth, and birth with complications. Using available data from over 10 series examining the management of biliary disease in pregnancy and one large Swedish series evaluating complications of laparoscopy during pregnancy, weekly rates of complications from medical management and laparoscopic cholecystectomy (lap chole) were estimated. Outcome utilities were assigned to different pregnancy states and outcomes based on generally accepted consensus among obstetricians. A non-probabilistic, quality-pregnancy-weeks (QPW) was used to incorporate utilities of outcome and comfort during pregnancy in the same measure.

Results: The results demonstrate that the utility of lap chole in the first trimester for women with biliary tract disease is higher than that of medical management. 12320 QPWs were accrued by an imaginary cohort of 100 hypothetical pregnant women with biliary tract disease treated with standard surgical therapy versus 11290 QPWs for 100 treated with medical management. Sensitivity analysis showed that the complication rate from laparoscopy would have to rise four fold to compensate for the morbidity and mortality incurred with medical management.

Conclusions: Women in their first trimester of pregnancy with biliary tract disease should be treated with the same surgical management as would their nonpregnant counterparts.
operating intervention is the most economically advantageous approach.

**P022—Posters of Distinction**

**PROSPECTIVE EVALUATION OF LAPAROSCOPIC VERSUS MINIMALLY INVASIVE OPEN DONOR NEPHRECTOMY, Niels Kok MD, May Lind MD,Khe Tran MD,Larissa Tseng MD,Jaap Bonjer PhD,Jan IJzermans PhD, Erasmus MC, Rotterdam, The Netherlands.**

Currently, living donor organ donation is the best solution to overcome cadaveric organ shortage. The increasing number of living related kidney transplantations demands optimal operative techniques that minimise discomfort to the donor. Since its introduction, laparoscopic donor nephrectomy (LDN) has gradually replaced the open donor nephrectomy (ODN) via a classical flank incision. However, ODN has improved as well; a 15-20 cm incision dividing all abdominal wall muscles and sometimes requiring dissection of the 12th rib has been replaced by a 8-12 cm muscle split rib-saving incision. Most comparative studies between LDN and ODN concerned classical flank incisions or hand assisted LDN.

We compared 48 cases of LDLN with 52 cases of ODN operated on between May 2001 and September 2004. Primary outcomes concerned length of operation time and recovery as measured by resumption of diet and time to discharge. Considering the baseline characteristics, ASA classification, age, choice for left either right kidney, presence of one or multiple renal veins and arteries, did not significantly differ between both groups. Two out of 48 laparoscopies were converted to open procedures. None of the flank incisions were enlarged. Warm ischemia time (LDN 7.1 vs. ODN 2.9 minutes) and skin-to-skin time (LDN 248 vs. ODN 162 minutes, p<0.001) were significantly longer in the LDN group. Blood loss did not significantly differ between groups (LDN 120 ml vs. ODN 180 ml, p>0.12). One complication (2%) occurred in the ODN group versus 7 complications (15%) in the LDN group (p=0.02). Costs of instruments were significantly higher for LDN (mean difference 1356 Euros, p=0.001).

Postoperatively, donors of both groups resumed diet within 24 hours after the operation (median, LDN 19 vs. ODN 20-30 hours, p=0.90). Two donors in the LDN group had postoperative complications (one capsular tear which required an open splenectomy and one continued bleeding which required another laparoscopic operation). Six complications not requiring re-operation, took place in the ODN group (UTI, persistent nausea, continued bleeding, persistent high serum creatinine, retroperitoneal haematoma and infected left eye, all n=1). Patients were discharged significantly earlier in the LDN group (hospital stay 3.4 vs. 4.1 days, p=0.009).

In conclusion, LDN was associated with shorter hospital stay at the expense of increased length of operation time, higher costs and more perioperative complications.

**P023—Posters of Distinction**


Intro: Laparoscopically-assisted spinal surgery has been reported in small series to be safe and effective. We present our experience using a balloon-assisted and gasless technique for retroperitoneal anterior lumbar fusions.

Methods: We completed a retrospective chart review of patients who underwent laparoscopically-assisted retroperitoneal spinal surgery.

Results: Between April 1996 and June 2004, 124 patients underwent lap-assisted anterior spine fusion using a retroperitoneal approach and a variety of orthopedic devices. Sixty patients were male, 64 were female, and the mean age was 40. Access to the retroperitoneal space is obtained using a balloon dissector and midline trocars, similar to TEP hernia repairs. An additional trocar is placed laterally to complete the dissection and to the anterior spine. The proliferation of surgery, staple line reinforcement devices have been used along with staple line reinforcement (SLR) materials with good success. A biodegradable material made of polyglycolic acid and trimethylene carbonate (SeamGuard by W. L. Gore & Associates, Inc.) has been used in other minimally...

**P024—Posters of Distinction**

**PROBLEMS OF PARATHYROID HORMONE MONITORING DURING MINIMALLY INVASIVE PARATHYROIDECTOMY, Stefan Schmidbauer MD, Jund A, Gailwaes MD,Thomas Mussack MD, Klaus K Halffeldt MD, Chirurgische Klinik Innenstadt, Ludwig-Maximilians Universitaet, Munich, Germany.**

Objective: Improved preoperative localisation techniques and the availability of intraoperative intact parathyroid hormone (iPTH) monitoring allow single parathyroid adenomas to be resected with minimally invasive techniques. We report on our first 110 minimally invasive videoassisted parathyroidectomies by an anterior approach with special emphasis on problems emerging in interpreting intraoperative iPTH monitoring.

Methods and procedures: Patients with primary Hyperparathyroidism (pHPT) and one unequivocally enlarged parathyroid gland in preoperative ultrasound and 99mTc-SestaMIBI scintigraphy underwent minimally invasive videoassisted parathyroidectomy in the technique initially described by Miccoli. Intraoperatively, rapid electrochemiluminescence immunoassay was used to measure iPTH levels before the operation 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.

Results: Between November 1999 and August 2004, 110 (45%) of 244 patients with pHPT were eligible for a minimally invasive approach. A conversion to open surgery became necessary in 12 patients due to technical problems or incorrect preoperative localisation. In further 13 cases intraoperative iPTH monitoring showed insufficient decrease in iPTH values. Here, subsequent cervical exploration revealed 2 double adenomas and 4 hyperplasias respectively. In 2 patients we misinterpreted intraoperative iPTH values, resulting in persistent pHPT and in 5 patients the decrease of iPTH values was prolonged, leading to unnecessary open cervical exploration in two patients.

Conclusions: Despite the use of high resolution ultrasound and 99mTc-SestaMIBI scintigraphy, the presence of multiple glandular disease can not be ruled out completely. Intraoperative iPTH monitoring to ensure operative success is indispensable for a minimally invasive approach. Despite our problems with iPTH monitoring in 7 patients, we believe that minimally invasive parathyroidectomy represents an attractive alternative to conventional surgery.

**P025—Posters of Distinction**

**LAPAROSCOPIC COLORECTAL SURGERY AND THE USE OF STAPLE LINE REINFORCEMENT MATERIALS, Morris E Franklin Jr MD, Paul P Arellano MD, Jorge M Trevino MD, Texas Endosurgery Institute.**

Introduction

Stapling devices to create anastomoses in colorectal surgery have been employed for several years with very good outcomes. Complications seen with these anastomoses include bleeding, anastomotic leak, and narrowing or stenosis of the anastomotic line. The present study sought to compare the use of a gasless technique using wound protectors in the midline and laterally. The laparoscope, a balloon retractor, and a lifting device are placed through the lateral incision. The orthopedic instrumentation is placed through the midline incision. Ninety-one percent of cases involved access to levels L4-6 or L5-S1. Three out of two patients underwent an anterior procedure. Mean operative time and EBL for the anterior cases were 165 min and 205cc. The conversion rate was 8.9% (6/11 occurred in the first 20 cases). Reasons for conversion included peritoneal tears, poor visualization, and bleeding. Mean length of stay was 3.0 days. The complication rate was 5.6%, and included iliac vein injury (3), post-op ileus (2), and requirement for posterior fusion during the same hospital stay (2).

Conclusion: Laparoscopically-assisted retroperitoneal spinal surgery is safe and reproducible. This technique allows for the benefits of a minimally invasive approach, but also for multi-level exposure, complete discectomy, endplate removal, and placement of conventional orthopedic devices.
invasive procedures, namely bariatric and thoracic. At the Texas Endosurgery Institute, we have applied SLR with the PGA/TCA material to laparoscopic colorectal surgery. Methods: Since July 2003, we've performed 7 LARs, 12 right hemicolectomies, 5 sigmoid colectomies, 3 total colectomies, 2 partial colon resections and one colostomy closure with SLR with Seaguard. All cases were performed totally laparoscopically or laparoscopically-assisted with intracorporeal anastomoses. SLR material was applied to the endoscopic linear staplers at the ends of the bowel that were used for the anastomosis. If circular staplers were used for anastomoses, the anvil was brought through the two staple lines containing the SLR. When linear staplers were used to create the anastomoses, SLR was applied to the staplers once again. All patients are followed by the attending surgeon and endoscopy done when indicated and biopsies performed.

Results: Of these 30 cases, there have been no leaks, no bleeding complications, no pelvic abscesses and no anastomotic strictures. 14 cases were done for malignancy and the rest for other benign processes. Six anastomoses have been evaluated post-operatively with flexible endoscopy. The anastomoses have been inspected at intervals ranging from 3 weeks to 6 months. To date there have been no tumor re-implants and we have found that the anastomoses appeared to be matter widely patent than expected at each interval.

Conclusion: Our initial data with the use of this SLR product has been very promising. As we employ its use in our minimally invasive colorectal cases we will be able to collect more data and follow the progress of these patients. Although meticulous surgical technique is still most important, the staple line reinforcement with Seaguard appears to aide in preventing leaks, bleeding and may result in a more widely patent anastomosis.

P026-Posters of Distinction
LAPAROSCOPIC TRANSGASTRIC ENDOSCOPY AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Federico Ceppa MD, Pavlos Papasavas MD, Daniel Gagné MD, Philip Caushaj MD, The Western Pennsylvania Hospital, Temple University Medical School Clinical Campus

Objective: Access and endoscopic evaluation of the bypassed stomach is difficult after laparoscopic Roux-en-Y gastric bypass (LRYGBP). We propose a minimally invasive technique to access the bypassed stomach after RYGBP for endoscopic diagnosis and treatment.

Description: CO2 pneumoperitoneum is established to a pressure of 12-15 mmHg. A 12mm umbilical, 5mm RUQ, 5mm LLQ, and 15mm LUQ trocars are placed. A purse string suture is placed on the anterior wall of the stomach. A gastrostomy is made using ultrasonic shears and the 15-mm trocar is placed into the stomach. The endoscope is then inserted through the 15-mm trocar and the pneumoperitoneum is decreased to 10 mmHg. Once the evaluation is complete, the gastrostomy is closed with a running suture or linear stapler.

Results: Eight patients at our institution have undergone laparoscopic transgastric endoscopy. Four patients had biliary pathology. Three of these patients underwent successful ERCPC and papillotomol. The fourth was unsuccessful due to stone impaction at the ampulla. Three patients were evaluated for GI bleeding. One patient was diagnosed with a duodenal gastrointestinal stromal tumor; one patient was diagnosed with a bleeding duodenal ulcer, requiring surgical exploration; the 3rd patient had a negative endoscopy. One patient evaluated for chronic abdominal pain had a negative endoscopy. There were no complications.

Conclusion: Laparoscopic transgastric endoscopy is a safe and minimally invasive approach for the evaluation of the gastric remnant, duodenum, and biliary tree in patients who have undergone a RYGBP.

P027-Posters of Distinction
TRANSPLANTATION OF LAPAROSCOPICALLY-PROCURED RIGHT VERSUS LEFT KIDNEYS: COMPARATIVE ANALYSIS OF INTRAOPERATIVE GRAFT ISCHEMIA AND POSTOPERATIVE GRAFT FUNCTION AND SURVIVAL, Yuri W Novitsky MD, Wil S Cobb MD, Michael J Rosen MD, Andrew G Harrell MD, Lon Eskind MD, B. Todd Heniford MD, Kent W Kercher MD, Carolinas Medical Center

Background: The feasibility and safety of laparoscopic right (R) live donor nephrectomy (LDN) has been established. However, the technical challenges of R kidney harvest and potential difficulties with the recipient operation continue to limit its use. We hypothesized that the use of laparoscopically-procured R kidneys does not result in increased perioperative donor/recipient morbidity, prolonged graft ischemia or decreased graft survival.

Methods: Retrospective analysis of consecutive laparoscopic LDN and respective transplant operations performed at a tertiary care hospital. Donor and recipient demographics, operative time and blood loss, allograft extraction time, time of cold and warm ischemia, graft function and survival were compared for left (L) and R LDN and transplantsations.

Results: Between August 2000 and July 2004, 117 laparoscopic LDN, including 20 R (17%), were performed. There were no differences in OR time, blood loss, extraction time or length of stay between L and R LDN. There were no conversions, reoperations, or deaths in either donor group. The recipients of L and R kidneys were of similar age, sex, and BMI. There were no significant differences between L and R groups in cold ischemia (37.6±15.2 v 34.5±17.3 min), warm ischemia (37.7±11.2 v 36.4±10.8 min), or EBL (322 v 228 cc). There were no major intraoperative complications in either group. One patient (5%) in the R and 3 patients (2.9%) in the L groups had transient ATN. There was one early graft loss in the L LDN group. One patient (5%) in the R and 5 patients (4.8%) in the L groups had early allograft rejection that was treated medically. Postoperative major complications occurred in 12% of L and 10% of R kidney recipients. There were no differences between the groups in the discharge, 6- and 12-month creatinines (2.86 vs 2.16 g/dL, 1.50 vs 1.46 g/dL, and 1.48 vs 1.56 g/dL, respectively). One-year graft survival in L and R recipient groups was 98% and 100%, respectively.

Conclusion: Laparoscopic right LDN is a safe approach to organ harvest. Despite the perceived difficulty of procuring and implanting a laparoscopically-harvested R kidney, it does not result in either increased perioperative donor/recipient morbidity or increased graft ischemia times. In addition, graft function and long-term survival are equivalent for transplanted R and L kidneys. We advocate the selective use of laparoscopically-procured R kidneys as a means for safe extension of the available donor pool.

P028-Posters of Distinction
THE ROLE OF THORACOSCOPY FOR PENETRATING WOUNDS OF THE CHEST, A Patel MD, J Whelan MD, N Ahmed MD, R Chung MD, Huron Hospital, Cleveland Clinic Health System, Cleveland, OH

Although many non life-threatening penetrating wounds of the thorax can be treated by tube thoracostomy, incomplete removal of clots or even development of empyema may result. We hypothesized that thoracoscopy in the same setting may have a better outcome. METHOD. The study, approved by IRB, was done in a Level II trauma service. Penetrating wounds of the hemithorax with stable vital signs were initially treated with tube thoracostomy. If open thoracotomy was not indicated by vital sign changes or the amount and rate of drainage, the patient was offered thoracoscopy (n=8). Under general anesthesia, without one lung ventilation, blood evacuation and pleural lavage through thoracoscopy was done. Hemostasis and foreign body removal was accomplished when indicated. The diaphragm was assessed for defects which, when present, was followed by laparoscopy. The outcome was compared with 21 patients treated with chest tube alone in the same institution.

<table>
<thead>
<tr>
<th>Results</th>
<th>F.R. removed</th>
<th>Diaphrag defect</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoracostomy</td>
<td>3</td>
<td>1</td>
<td>18±7</td>
</tr>
<tr>
<td>Chest tube only</td>
<td>17</td>
<td>0</td>
<td>3±3</td>
</tr>
</tbody>
</table>

*p<0.01, unpaired t-test

Additionally, 3 patients developed late empyema in the chest tube group and none in the thoracoscopy group. CONCLUSION Thoracoscopy provided a means to assess or
**P028-A—Posters of Distinction**

**PNEUMOPERITONEUM-INDUCED OLIURIA AND HEPATORENAL REFLEX**, Gideon Karplus MD, Avi Vinbroom MD, Amir Szold MD, Tel Aviv Sourasky Medical Center

**Mini-Abstract:**
The study investigates the role of the hepatorenal reflex in pneumoperitoneum induced oliguria. Blocking the hepatorenal reflex, by phenol hepatic denervation, significantly reduced the effect of pneumoperitoneum on renal function.

**Abstract:**
Objective: To investigate the role of the hepatorenal reflex in pneumoperitoneum induced oliguria.

Summary of Background Data: Hepatic blood flow is known to decrease during pneumoperitoneum. Studies have shown that changes in hepatic blood flow affect renal urodynamics through a sympathetic pathway known as the hepatorenal reflex. We therefore decided to investigate the role of the hepatorenal reflex in pneumoperitoneum induced oliguria.

Methods: Hepatic phenol denervation was performed on 15 rats. A 90% aqueous phenol solution was applied circumferentially to the portal vein and Vena Cava. The control group consisted of 15 sham operated rats. After recovery the rats were exposed to co2 pneumoperitoneum. Preinsufflation and postinsufflation urine output and renal functions were analyzed. Statistical analysis was performed using the standard student t-test and ANOVA.

Results: Denervation had no significant effect on baseline urine output. There was a significant difference in the postinsufflation urine output between the denervated and control group p=0.0006. Hepatic denervation also reduced the effect of pneumoperitoneum on creatinine clearance. While in sham operated rats creatinine clearance dropped significantly p=0.02 denervation preserved renal function with creatinine clearance dropping insignificantly from a mean of 0.46mg/ml/min to a mean of 0.33mg/ml/min (p=0.83).

Conclusion: Our study indicates that hepatic reflex plays an important role in the pathophysiology of pneumoperitoneum induced oliguria.

**P029—Bariatric Surgery**

**GASTRIC BYPASS AFTER SOLID ORGAN TRANSPLANTATION**, B Badgwell MD, W S Melvin MD,B Needleman MD, Dept. of Surgery and the Center for Minimally Invasive Surgery, The Ohio State University

Introduction: Bariatric surgery provides excellent results for weight loss in morbid obesity but is unproven in the transplant population. The purpose of our study was to determine the effects of gastric bypass in transplant recipients.

Methods: Between January 2003 and January 2004, 359 patients underwent Roux-en-Y gastric bypass at our institution. 7 patients had previously undergone solid organ transplant at our institution. 7 patients had previously undergone solid organ transplant recipients. Comparisons were made between the groups using chi-square tests of association and nonparametric Wilcoxon rank sum tests. Repeated measures models were applied to the data in order to assess any trends in weight loss over time. Results: The mean BMI among non-transplant patients was 52.7 and 52.4 among transplant patients (p = 0.82). 71.4% of the operations in the transplant population were performed laparoscopically which was similar to the general population at 74.2% (p = 1.0). Length of operation was not statistically significant (p = 0.78). Hospital stay among transplant patients was in a mean of 4.0 days compared to 3.2 in the general population (p = 0.03). Weight loss between the two groups did not differ significantly at 30, 60, or 120 days, however, at 200 days the transplant patients did show an estimated group weight loss difference of 20 pounds (p = 0.0025).

**P030—Bariatric Surgery**

**WEIGHT LOSS PRIOR TO LAPAROSCOPIC GASTRIC BYPASS DOES NOT AFFECT OUTCOMES**, Matthew T Baker MD, Pamela J Lambert RN, Rebecca A Mathaisan MD, Shanan Kothari MD, Gunderson Clinic

Objective: The goal of this study was to determine if weight loss prior to laparoscopic gastric bypass (LGB) impacted postoperative outcomes.

Methods: All patients undergoing LGB between September 2001 and July 2004 were entered into a prospective database. Based on body habitus, patients were selectively encouraged and/or required to lose weight prior to surgery. Patients who lost at least 10 lbs prior to surgery were compared to those patients who gained or maintained a stable weight. The 2 groups were evaluated to see if there was a difference in outcomes using Student’s t-test. Patient demographics were compared using Chi-square analysis and Student’s t-test.

Results: A total of 281 patients (240 female, 41 male) were included. Fifty patients (18%) lost at least 10 lbs prior to surgery. At 1 year postop, this group lost more weight overall, but this was not significant after correcting for the initial weight and sex differences.

Conclusions: Preoperative weight loss in LGB patients does not affect operative times, length of stay, incidence of postoperative complications, or % excess weight loss at one year. Our data do not support the recommendation of weight loss prior to LGB.

**P031—Bariatric Surgery**

**PREOPERATIVE ENDOSCOPIC EVALUATION IN THE MORBIDLY OBSESE POPULATION WITH GASTROESOPHAGEAL REFLUX DISEASE**, Pana Banot MD, Reena Bhargava MD, Calvin A Selwyn MD, Keith Gersin MD, University of Cincinnati

**OBJECTIVE:** Gastroesophageal reflux disease (GERD) is common in the morbidly obese population. Surveillance of the gastric remnant after laparoscopic Roux-en-Y gastric bypass is difficult and may require operative intervention. Preoperative endoscopic evaluation may help identify occult gastritis, ulcers, and other pathologic abnormalities in this selective symptomatic group.

**METHODS:** A retrospective review of sixty four patients who underwent endoscopic evaluation at a single institution from June 2003 to May 2004 was performed. These patients all had symptoms of GERD treated with daily proton pump inhibitors (PPI). Biopsy was performed when abnormal pathology was encountered.

**RESULTS:** Sixty-four patients underwent upper endoscopic evaluation at a single institution. A normal study was found in thirty-six patients (56.3%). Twenty-eight patients (43.7%) were noted to have abnormal endoscopy or pathologic findings confirmed by biopsy. Eight patients were noted to have a hiatal hernia and required no further intervention. Esophagitis was identified in seven patients (two had Barrett?s esophagus), twelve had gastritis (two had prepyloric ulcers), and one had duodenitis. Repeat endoscopy showed resolution of initial findings in all patients except one whose diagnosis was confirmed by biopsy. Patients with ulcer disease and those with severe gastritis and/or esophagitis were instructed on the importance of PPI compliance.

**CONCLUSION:** GERD is commonly found in the morbidly obese population. The adherence to a regimen of proton pump inhibitors is effective in the resolution of occult findings such as ulcer disease and severe gastritis or esophagitis. The use of endoscopy was not studied in all morbidly obese patients, however its selective use in the GERD population
allows identification and treatment of occult endoscopic pathology prior to gastric bypass.

**P032–Bariatric Surgery**

**ACUTE RENAL FAILURE ASSOCIATED WITH LAPAROSCOPIC GASTRIC BYPASS SURGERY**, Melissa M Schnell MD, Reena Bhargava MD, Calvin A Selwyn MD,Keith S Gersin MD, University of Cincinnati.

Hospital-acquired acute renal failure (ARF) increases the risk of morbidity and mortality. Roux-en-Y laparoscopic gastric bypass is a common surgical treatment for morbid obesity. Comorbid conditions such as heart disease, hypertension, and diabetes increases the risk of post-operative ARF in these patients. Treatment of comorbidities with agents that impair renal autoregulatory responses can potentially exacerbate peri-operative ARF.

We present a case series of five laparoscopic gastric bypass surgery patients who experienced post-operative ARF between November 2003 and May 2004. Our hospital performs approximately 500 laparoscopic gastric bypasses per year. There was one male and four female patients with body mass index between 45-73. The baseline serum creatinine ranged from 0.6mg/dl to 1.2mg/dl. None of these patients received other nephrotoxic agents. Anaesthetic records did not show any evidence of intra-operative hypotension. The magnitude of increase in serum creatinine by post-operative day two ranged from 60% to 350% above baseline. Of the five patients, four were on either an angiotensin converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) and a diuretic preoperatively. Three patients were also taking a COX-II inhibitor. These patients were instructed to take a clear liquid diet 24 hours prior to surgery and the standard overnight fast and continued scheduled medications. All five patients resolved their ARF and no other patients undergoing laparoscopic Roux-en-Y gastric bypass had ARF. Peri-operative volume depletion, insensible fluid loss, and the hemodynamic effects of laparoscopic surgery may create a setting for the development of ischemic renal injury. This risk can be exacerbated by use of ACE inhibitors or an ARB in combination with prostaglandin inhibitors and diuretics by impairing renal autoregulation and blunting the sympathetic nervous system response to volume depletion. In patients undergoing elective bypass surgery, it may be prudent to discontinue such medications 48-72 hours prior to surgery to minimize the risk of post-operative ARF. Further studies are necessary to evaluate the appropriate period for discontinuation of these medications prior to laparoscopic Roux-en-Y gastric bypass.

**P033–Bariatric Surgery**

**THE UTILITY OF ESOPHAGOGASTRODUODENOSCOPY PRIOR TO LAPAROSCOPIC ROUX EN Y GASTRIC BYPASS SURGERY**, D Camacho MD, J Reichenbach MD,C Badgwell BA,W Fisher MD, J F Sweeney MD, Michael E. DeBakey Department of Surgery, Baylor College of Medicine

PURPOSE: The need for routine esophagogastroduodenoscopy (EGD) prior to laparoscopic gastric bypass surgery (LGBS) remains controversial. The current study was undertaken to determine the prevalence of upper gastrointestinal disease (UGD) in obese patients undergoing LGBS. METHODS: 133 ODS: 51 patients (43 female, 8 male) with a mean age of 44 years and a mean BMI of 46.7 kg/m2 underwent LGBS for morbid obesity. All patients underwent pre-operative EGD. A retrospective chart review was conducted to document the presence of UGD symptoms or known UGD prior to surgery. Pre-operative EGD interpretations and biopsy results were reviewed to determine the presence of LGBS. Pre-operative findings where compared to pathology reports from gastric tissue collected at the time of surgery. RESULTS: Thirty-three of 51 (64.7%) patients reported symptoms of UGD prior to surgery. Of the 33 symptomatic patients, 28 (84.8%) had positive findings on EGD and were placed on acid suppressive medications. Eighteen of 51 (35.3%) patients had chronic gastritis and esophagitis. Three patients (7.6%) had both active gastritis and esophagitis. Pre-operative biopsy revealed H. pylori in 5 (12.8%) patients, one of whom also had non-dysplastic Barrett’s. All patients with H. pylori were treated prior to LGBS. Seven (13.7%) of the operative biopsies showed evidence of chronic gastritis and demonstrated a gastritis type H. pylori or H. pylori. CONCLUSIONS: In light of the significant amount of gastrointestinal pathology observed prior to surgery in symptomatic and asymptomatic patients, upper endoscopy with biopsy should be considered integral in the pre-operative evaluation of candidates for gastric bypass surgery.

**P034–Bariatric Surgery**

**LAPAROSCOPIC REVISIONS OF ROUX-EN-Y GASTRIC BYPASS**, Federico Ceppa MD, Daniel Gagné MD, Pavlos Papasavas MD,Philip Caushaj MD, The Western Pennsylvania Hospital, Temple University Medical School Clinical Campus

Introduction: We investigated whether laparoscopic revisional surgery following failed Roux-en-Y gastric bypass (RYGBP) is safe and effective in achieving further weight loss.

Methods: Retrospective chart review of all patients undergoing revisional surgery following failed RYGBP. Failed RYGBP was determined by <50% excess weight loss (EWL) at 18 months postoperatively or by weight regain. Preoperative upper GI series were performed to evaluate RYGBP: patients with an enlarged pouch underwent revision of the pouch. Others underwent Roux limb lengthening. Results: A total of thirteen patients underwent laparoscopic revision of their initial RYGBP. Six patients (46%) had revisions of their gastric pouches. This group had an EWL of 33% (range 5-48%) after their initial surgery and an EWL of 47.8% (30-71%) at a mean of 15.2 (range 5-30) months after revisional surgery. Six patients had distal revision of their Roux limbs. After initial surgery these patients had an EWL of 25.8% (range 14 - 63%) and an EWL of 17.5% (range 10-51%) at mean follow up of 11.8 months (1.5-30) after revision. One patient underwent revision of the pouch, silastic band placement, and Roux limb-lengthening. The band was removed due to intolerance; the patient had an EWL 24%. Complications in the Roux limb-lengthening group included one leak at the jejunoojeunostomy and one acute gastric dilatation. No complications occurred in the pouch revision group.

Conclusion: Laparoscopic revision of previous RYGBP is possible though technically complicated. Patients undergoing revision of a large pouch achieved better weight loss compared to patients undergoing Roux limb lengthening.

**P035–Bariatric Surgery**

**GASTRO ESOPHAGEAL REFUX DISEASE AFTER LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING IS CAUSED BY HIATAL HERNIA, Kar-Huei Cha MD, Dinee Collings BS,Duan Frederick MD,George Fielding MD,Christine Ren MD, New York University Medical Center, NYU School of Medicine, New York

Severe gastro esophageal reflux disease (GERD) can develop after laparoscopic adjustable gastric banding (LAGB). Diagnostic examination may not necessarily reveal hiatal hernia (HH). We have found a number of patients with HH during gastric banding revision for severe GERD symptoms or gastric prolapse. We discuss a cohort of patients who developed severe GERD after LAGB that resolved with HH repair. From July 2001 to September 2004, 757 LAGB (Lap-Band System, Inamed, Corp. CA) operations were performed. Twelve patients presented with severe GERD unresponsive to proton pump inhibitors. One had severe dysphagia. Mean initial body mass index (BMI) was 49.5 (40.63) kg/m2. All were female. Time to presentation was an average of 18.3 (13.4 28.7) months after LAGB. Mean percent excess weight loss (%EWL) was 51% (22%-83%). Esophogram revealed 4 gastric prolapse (eccentric large pouch with malposition of band), 6 pouch dilatation (concentric large pouch with normal band position), and 2 GERD (small pouch, normal band position, and esophageal reflux). At operation, all patients underwent band revision for pre-
sumed concentric or eccentric gastric prolapse. At that time, all patients were found to have moderate to large crural defect requiring 1 to figure-of-eight sutures. Ten underwent posterior or crurapexy and 2 underwent anterior crurapexy. Eleven patients experienced resolution of GERD without anti-reflux medication. One patient redeveloped GERD symptoms due to recurrent HH and pouch dilatation. Severe GERD after LAGB is caused by HH. Radiographic examination may not reflect diagnosis. Symptoms of GERD appear to be the only reliable indication of HH.

**P036—Bariatric Surgery**

**IMPROVED WOUND INFECTION RATES WITH ROUTINE SUB-CUTANEOUS PORT SITE DRAINAGE IN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Rashad Chowdry MD, Jocelyn Ho MD, Jennifer Denne MD, Dawn Stepnowski CRNP, Christopher Kowalski MD, Temple University Hospital, Philadelphia, PA**

Laparoscopic Roux-En-Y Gastric Bypass (LGBP) is a safe and effective approach in the treatment of morbid obesity. Technical modifications of the procedure include the trans-oral passage of the circular stapler anvil (25mm EEA, United States Surgical) via a modified Salem sump tube for the creation of the gastrojejunostomy. Port site wound infection at the retrieval site of the trans-oral placement device, the left subcostal port site (LSPS), is a recognized complication of this technique. In addition, this is the site into which the EEA is inserted to create the gastrojejunostomy. We aimed to study the incidence of LSPS wound infection in patients receiving LGBP with and without the use of a subcutaneous, wound drain.

A review of all patients who underwent a LGBP with trans-oral passage of the EEA anvil was performed. The incidence LSPS wound infection was compared in those patients receiving subcutaneous wound drainage at wound closure versus those closed without drainage. 83 consecutive patients underwent a LGBP. 35 patients did not have a subcutaneous drain. 48 patients had a LSPS drain for 24 hours. All patients received pre and post-operative antibiotic prophylaxis. All port sites were closed with staples.

The average age of all patients was 42 years (undrained 45; drained 40). The average BMI for all patients was 50.3 (undrained 48; drained 52). Gender distribution was equal with a predominance of women in both groups (undrained 86%; drained 85%). Co-morbid conditions were equally represented across both groups. Operative time was less than 120 minutes for all patients. In the undrained group, the incidence of LSPS infection was 29% (10/35). In the drained group, the incidence of LSPS infection was 4% (2/48). Analysis of those patients developing wound infection in both groups revealed no significant confounding variables. Each cohort had one patient with diabetes. All 12 patients who developed LSPS infection were treated with incision and drainage along with oral antibiotics. Routine use of a subcutaneous LSPS drain for 24 hours significantly decreases the incidence of infection. The development of LSPS wound infection is likely related to contamination with oral and gastric fluid delivered to the site along with the trans-oral placement device. The drain appears to disperse the seroma that often forms at port sites in morbidly obese patients, eliminating a potential culture environment.

**P037—Bariatric Surgery**

**INTERNAL HERNIA FOLLOWING ROUX-EN-Y GASTRIC BYPASS: ACCURACY OF DIAGNOSTIC TESTING, Jonathan S Chum MD, Karen M Flanders MS, Tanya Brown, Parresh Shah MD, David M Branst MD, Lahaye Clinic Medical Center**

Introduction: Internal hernia is a well-known potential complication following Roux-en-Y gastric bypass. The diagnosis is a clinical one, and radiologic studies and laboratory values are frequently unhelpful. High index of suspicion and low threshold for operative exploration are critical in making the diagnosis.

Methods: From 2000 to 2004, 360 Roux-en-Y gastric bypasses have been performed at LCMC. The twelve patients who subsequently developed internal hernia requiring re-operation were reviewed, looking specifically at clinical presentation, white blood cell count, radiologic studies, and operative findings. Ten patients were post-laparoscopic gastric bypass, two patients were post-open gastric bypass.

Results: Three months to two years following Roux-en-Y gastric bypass. All reported crampy abdominal pain, with six patients reporting nausea and emesis. Post-bypass weight loss ranged from ninety to two hundred pounds. White blood cell count was elevated in one patient. Patients have CT scan or abdominal plain films showing dilated stomach or small bowel. Radiologic studies were unre- markable in the remaining patients.

Eight patients underwent diagnostic laparoscopy, with the remaining patients undergoing exploratory laparotomy. Eleven patients were found to have an internal hernia, with two patients having Peterson’s hernias. One patient had a gastric volvulus around a previous gastrostomy tube site. No patients were found to have ischemic bowel or stomach, and none required bowel resections.

Conclusion: Internal hernia following Roux-en-y gastric bypass is a potentially difficult diagnosis to make. Clinical symptoms and radiologic studies are often non-specific, and laboratory values are often normal. To avoid bowel compromise, prompt diagnosis based on a high index of suspicion and a low threshold for laparoscopic or open exploration is critical.

**P038—Bariatric Surgery**

**LAPAROSCOPIC VERSUS OPEN ROUX-EN-Y GASTRIC BYPASS AFTER FAILED OPEN VERTICAL BANDING GASTROPLASTY, Joy Collins MD, Jalpa Thodiyl MD, B Lane MD, P Yenumula MD, T Rogula MD, B Sacks MD, D Taylor RN, S Mattar MD, P Schauer MD, University of Pittsburgh**

Introduction: Previous reports have demonstrated that failure after vertical gastric banding (VGB) can be effectively treated by conversion to Roux-en-Y gastric bypass (RYGBP). Although laparoscopic principles have been applied to this operation, the potential benefits of this approach are unknown. Methods: A retrospective chart review was utilized to study the incidence of complications in all patients who underwent conversion surgery from 1999 to 2004. Comparisons were made between the laparoscopic and open patient groups. Chi-square test was used for statistical analysis. Results: There were 41 patients with a median age of 51 years (range 33 to 71 years) who underwent revision surgery. Mean BMI at revision was 47 kg/m2 (range 22 to 69 kg/m2). The most common indications for conversion after VBG were weight loss failure (76%) and reflux symptoms (33%). Eighteen operations (44%) were completed laparoscopically, while the remaining 23 (56%) were done in an open fashion. Early complications occurred in 13 of 41 patients (32%). Seven gastrojejunal leaks occurred, 4 of these in the laparoscopic conversion group and 3 in the open conversion group (p=1.00). Three patients who had open operations developed early strictures at the gastrojejunostomy anastomosis requiring balloon dilatation, and one patient developed adhesive small bowel obstruction. One patient in each group developed a marginal ulcer that was treated medically. One patient in the laparoscopic group developed a port-site hernia that was repaired laparoscopically, while ventral hernia occurred in 30% of patients in the open conversion group. Conclusions: The laparoscopic approach to conversion from VBG to Roux-en-Y gastric bypass is a valid option associated with a similar early complication profile to the open approach, but with less incidence of ventral hernia formation.

**P039—Bariatric Surgery**

**LAPRA-TY APPLICATION ON LAPAROSCOPIC GASTRIC BYPASS SURGERY, AN ALTERNATIVE TO KNOT TYING, Shyam L. Daihya, M.D., MBA, Stephen J. McColgan, M.D., MBA, Amelia M. Barcenas, BSN, Bellflower Medical Center**

Since the 1980’s laparoscopic procedures have become commonplace in day-to-day surgery. The most prevalent being laparoscopic cholecystectomy. This procedure requires clip application not sewing. More advanced procedures such as laparoscopic nissen fundoplication require a minimal amount of sewing, where as laparoscopic gastric bypass requires a lot of sewing. Procedures like this, which require a lot of sewing, have stayed out of the mainstream and are limited to only highly skilled surgeons.
Laparoscopic gastric bypass procedure requires anastomosis of the bowel or closure of the mesentery, requiring stitching. Stiching itself is a complicated maneuver. A primary requirement of stitching is knot tying. Laparoscopic procedures are two dimensional in their view. Two-dimensional procedures make knot tying a daunting task. If the knots are not tied securely and adequately, an anastomotic leak would then be a natural consequence. It is because of this dreaded complication that we looked at an alternative to knot tying. The main focus of this study was to look for an easy alternative to suturing. To accomplish this we used a device called Lapra-Ty (Ethicon-Endosurgery).

Lapra-Ty is an absorbable device that once snapped/locked through the transverse mesocolon. Herniations through the entire mesenteric defect was done with the use of Lapra-Ty. The suturing material was used as absorbable or non-absorbable. Suturing was done with the running lock style. All 300 cases were then carefully followed for any sign or symptom of complication. The follow up on these 300 cases has been 3 months to 3 years. No untoward complications, secondary to the use of Lapra-Ty were noted.

Conclusion: This study's results validate that the use of Lapra-Ty obviates the complicated knot-tying maneuver and at the same time presents no increased complications related to the Lapra-Ty.

P041–Bariatric Surgery

INTERNAL HERNIAS ARE MUCH MORE COMMON AFTER PERFORMING LAPAROSCOPIC GASTRIC BYPASS SURGERY WHEN THE ANTECOLIC ROUX LIMB IS ORIENTED TO THE LEFT COMPARED TO THE RIGHT

Ramsey M Dallal MD, Brian B Quebbemann MD, The N.E.W. Program of Orange County, California

Background: The antecolic Roux en Y technique has been developed to eliminate the incidence of herniation of bowel through the transverse mesocolon. Herniations through Peterson's defect or through the jejunojejunostomy mesentery defect are still possible.

Hypothesis: Internal hernias underneath the roux limb mesentery (Peterson's space) occur more frequently when the roux limb is oriented such that the cut end is toward the lesser curve of the pouch and the bowel curves to the patient's left (Figure 1) compared with the opposite orientation (Figure 2).

Methods: A retrospective chart review was performed. A change in surgical technique occurred June 2003 in attempt to reduce internal hernia formation. We examined the 200 consecutive antecolic, left-oriented-Roux gastric bypass procedures performed immediately previous to June 2003 (group A) and compared them with the 200 antecolic, right-oriented-Roux gastric bypass procedures performed after June 2003 (group B).

Results: The average length of follow-up was 2.4 and 1.5 years in Groups A and B, respectively. Thirteen internal hernias were identified. There was a 6.0 percent rate of internal hernia formation in Group A and a zero rate of internal hernia formation in Group B. Internal hernias were repaired an average of 12 months after surgery (range 4-19 months). The difference in hernia rate was statistically significant with p<0.05.

Conclusions: With a simple change in technique, the incidence of internal herniation underneath the Roux limb mesentery may be significantly reduced or eliminated.

P042–Bariatric Surgery

LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING FOR THE TREATMENT OF MORBID OBESITY: A SINGLE INSTITUTION EXPERIENCE WITH THE LAP BAND® AT 2 YEARS

Dukkipati MD, S Kaza MD, M J Watson MD, J Provost MD, The Clinical Center for the Surgical Management of Obesity, The University of Texas Southwestern Medical Center at Dallas Objective: To evaluate the short-term weight loss as well as band related complications and reoperations in patients undergoing laparoscopic adjustable gastric banding.

Methods: The institutional bariatric surgery database was queried to identify all patients undergoing adjustable gastric banding. Perioperative and late complications were determined, as was weight loss. The Lap-Band adjustable gastric banding system was used in all cases, and all were placed using the pars flaccida technique.

Results: Lap-Bands were placed in 327 patients over a 2-year period. Mean patient age was 46.3 years (range 12 to 75 years). Mean preoperative weight was 306 lbs (139 kg), with a range of 191 to 673 lbs. Mean preoperative BMI was 49.2 (range 30-104). 2 patients required conversion to an open operation, while 3 patients had planned open band placement during repair of giant abdominal wall hernias. There were no perioperative deaths. 3 perioperative infections required band removal, including one gastroesophageal perforation. 31 additional patients required reoperation for late band related complications including prolapse in 1 (4.3%), b) band replaced, 6 removed), 3 band replacements for leakage, 1 replacement...

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with a VG band for symptomatic dysphagia with a normal radiologic and endoscopic evaluation, 1 band replacement for erosion (0.3%), and 12 port replacement or revisions (3.7%). Overall reoperation rate was 10.4%, and 2.7% of patients have had their bands removed. Weight loss, expressed as percent excess BMI lost, was 19% at 3 months, 32% at 6 months, 44% at one year, 50% at 18 months, and 61% at 2 years. Conclusions: Laparoscopic adjustable gastric banding with the Lap-Band® system produces excellent weight loss with low major morbidity.

P043–Bariatric Surgery
HOW MUCH OF THE WEIGHT LOSS AFTER LAPAROSCOPIC GASTRIC BYPASS SURGERY IS FAT?, D Farkas MD, S Laker MD,V Iannace MD, A Wasielewski RN,D Ewing MD, A Trivedi MD,H Schmidt MD,G Ballantyne MD, Hackensack University Medical Center
Introduction: The objective of this study was to determine the changes in body composition after gastric bypass surgery. There is an abundance of data regarding overall weight loss after surgery. However, little is known about the composition of this weight loss. How much of this weight loss is made up of fat?
Methods: 100 consecutive patients undergoing laparoscopic gastric bypass surgery were examined. Body composition was analyzed using a bipedal bioelectrical impedance analyzer (TBF-310, Tanita, Tokyo, Japan). Measurements were obtained prior to surgery as well as postoperatively, at regularly scheduled followup visits.
Results: Median excess body weight loss after surgery was 69% after one year. In actual weight, the median weight loss was 96 pounds. This consisted of 77 pounds of fat mass lost, and 19 pounds of lean body mass lost. Fat mass made up a median of 79% of the total weight loss for each patient. Body fat percentage decreased from 51% to 34%. The following table shows the changes over time.

<table>
<thead>
<tr>
<th>Post-op Interval</th>
<th>n</th>
<th>Fat Lost (lbs)</th>
<th>Lean Mass Lost (lbs)</th>
<th>Body Fat (%)</th>
<th>EW%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 months</td>
<td>100</td>
<td>2.06</td>
<td>2.02</td>
<td>55.21</td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>74</td>
<td>5.20</td>
<td>14.14</td>
<td>44.22</td>
<td></td>
</tr>
<tr>
<td>6 months</td>
<td>58</td>
<td>10.28</td>
<td>15.26</td>
<td>29.32</td>
<td></td>
</tr>
<tr>
<td>12 months</td>
<td>37</td>
<td>12.77</td>
<td>12.82</td>
<td>26.68</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: In addition to losing weight after laparoscopic gastric bypass surgery, patients also significantly lower their percentage of body fat. Fat mass loss accounts for a major portion of the total weight loss, while lean body mass lost only accounts for a small portion. These results are helpful in understanding the many health benefits seen after gastric bypass surgery.

P044–Bariatric Surgery
PATIENTS 12 MONTHS AFTER LAPAROSCOPIC GASTRIC BYPASS HAVE BODY COMPOSITIONS SIMILAR TO CONTROLS., D Farkas MD, S Laker MD,V Iannace MD, A Wasielewski RN,D Ewing MD, A Trivedi MD, H Schmidt MD, G Ballantyne MD, Hackensack University Medical Center
Introduction: After gastric bypass surgery patients undergo changes in their body composition. The objective of this study was to compare the body composition of patients having undergone gastric bypass surgery, with the body composition of control patients not undergoing this surgery.
Methods: 100 consecutive patients undergoing laparoscopic gastric bypass surgery were examined. Body composition was measured using a bipedal bioelectrical impedance analyzer. Measurements were obtained prior to surgery and at followup visits postoperatively. These measurements were compared with 100 patients seen in consultation for non-bariatric surgery. The relationship between BMI and body fat percentage was compared between the different groups using the heterogeneity of regression test.
Results: Prior to gastric bypass, patients in the study group had a median BMI of 47 and 51% body fat. By 12 months postoperatively this group had a mean BMI of 29 and 32% body fat. The control group had a median BMI of 28 and 34% body fat. Regression analysis demonstrated that while the preoperative bariatric patients were different from the other two groups, postoperatively they were similar to the control patients.

Conclusion: Patients undergo significant body composition changes following laparoscopic gastric bypass surgery. By 12 months postoperatively these patients not only have similar BMI's as the non-bariatric controls, they have similar body composition as well. This implies that the body composition abnormalities seen in morbidly obese patients are corrected by gastric bypass surgery.

P045–Bariatric Surgery
DRAINS AND TESTING DURING LRYGB: DOGMA OR NECESSITY?, Edward L Felix MD, Daniel E Swartz MD,Richard Hwang MD, Advanced Bariatric Center of Fresno
Background: Are prophylactic drains, intra-operative testing & postoperative contrast studies mandatory when performing laparoscopic Roux-en-Y Gastric Bypass (LRYGB)? The purpose of this study was to determine if laparoscopic gastric bypass can be performed safely without using such measures.
Methods: We retrospectively reviewed the records of all patients undergoing laparoscopic roux-en-y gastric bypass at our center between 4/99 and 7/04. The gastrojejunostomy was laparoscopically hand sewn in 2 layers and the pouches were constructed using a 3.5 mm endo-stapler. Routine intra-operative testing, drains and post-operative contrast studies were not used. Intra-operative leak studies with air were performed in only suspicious cases selected by the operating surgeon.
Results: In 2369 patients, 7 developed a postoperative pouch leak; 0.2% (5/2297) of LRYGB and 3% (2/72) of patients converted to an open RYGB. No leaks occurred post-operatively in the last 800 patients, including 3 patients that required conversion because of an air leak on selective testing. Because of symptoms, 5 patients had post-operative radiological studies, but all were interpreted as negative. In all patients the leak was confirmed by laparoscopy and in 5 an open exploration was required to manage the leak. No patients died as a result of a leak, but 3 had prolonged hospitalizations that were greater than 2 weeks. Long term follow-up of all 7 patients that developed a leak from the pouch has been uneventful.
Conclusion: Despite not using routine drains, intra-operative or post-operative testing, leaks after laparoscopic roux-en-y gastric bypass using our technique were rare and safely managed when they occurred. The risk of a leak, however, increased if the patient required conversion to an open bypass. Intra-operative testing was found to be beneficial when used in suspicious cases. If a leak was suspected postoperatively, immediate laparoscopic surgical intervention and open exploration when necessary successfully managed all patients. The routine use of contrast studies and drains can be avoided when performing laparoscopic gastric bypass potentially reducing confusion, cost, and morbidity associated with these measures without jeopardizing the safety of the procedure.

P046–Bariatric Surgery
UNEXPECTED PATHOLOGY IN LAPAROSCOPIC BARIATRIC SURGERY., Christopher W Tinnell MD, Atul K Madan MD,Craig A Ternovits MD,Suraj J Menachery MD,David S Tichansky MD, University of Tennessee, Memphis
Background: The popularity of bariatric surgery in recent years has increased with the escalating incidence of morbid obesity in our society. The improvement in minimally invasive technology and increased number of laparoscopic bariatric procedures being performed led to an increase in the discovery of unexpected pathology that was not suspected preoperatively. We hypothesized that the occurrence of unexpected pathology is not associated with immediate adverse outcomes during laparoscopic bariatric procedures.
Methods: From December 2002 to June 2004, 398 patients underwent laparoscopic bariatric surgery for morbid obesity. A retrospective chart review was performed to determine the incidence of unexpected findings and their effect on patient results.
Results: A total of 9 unexpected pathologic lesions were found in 8 (2%) patients. The findings include lesions on the small bowel (3), stomach (4), and liver (2). In all except one case (which was biopsied), the abnormal findings were found and removed laparoscopically. The final pathology revealed: gastric leiomyomas (2), gastric gastrointestinal stromal cell tumors (2) ectopic pancreatic tissue (2), arteriovenous malformation (1), biliary adenoma (1) and fibrosed hemangiomata (1). All patients underwent completion of their planned bariatric procedures without incident, had no complications postoperatively, and were discharged in 1-3 (mean = 2) days.

Conclusions: Unexpected findings occur relatively frequently during laparoscopic bariatric procedures. Biopsy and/or removal of these lesions does not increase complications nor preclude continuation of the planned bariatric procedure.

P047—Bariatric Surgery

ETHNICITY AND WEIGHT LOSS FOLLOWING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Glenn J Forrester MD, Karen E Gibbs MD,Larry Griffith MD,Babak Moeinolmolki MD,Pratibha Vemulpapalli MD,Julio Teixeira MD, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY

INTRODUCTION Several studies have attempted to predict weight loss outcomes based on various preoperative criteria; however, few have focused on ethnic background. The purpose of this study was to compare the outcomes of patients based on ethnicity following laparoscopic Roux-en-Y gastric bypass (LRYGBP) for the treatment of morbid obesity.

METHODS A retrospective analysis was conducted on all patients who underwent LRYGBP between April 2001 and August 2004. Patients were classified into four ethnic groups; Black (B), Hispanic (H), White (W) and Other (O). Patients were compared for percent excess weight loss (%EWL) at the 6- and 12-month postoperative visits. Statistical analysis was performed using ANOVA.

RESULTS Of the total patients studied, 86.7% were women and 13.3% were men, ranging from 18 to 65 years of age. Preoperative BMI ranged from 39 to 96 (mean 54). Six-month %EWL ranged from 26 to 88 (mean 49) and twelve-month %EWL ranged from 33 to 107 (mean 63) with the individual groups shown in the table below. Difference in %EWL at 6 months reached statistical significance (p=0.033) while at 12 months was not significant (p=0.224).

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>%EWL 6 mo</th>
<th>p-value</th>
<th>%EWL 12 mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>46.3</td>
<td>.033</td>
<td>59.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>53.0</td>
<td>.033</td>
<td>66.3</td>
</tr>
<tr>
<td>White</td>
<td>49.7</td>
<td>.033</td>
<td>62.2</td>
</tr>
<tr>
<td>Other</td>
<td>45.0</td>
<td>.033</td>
<td>66.3</td>
</tr>
</tbody>
</table>

CONCLUSIONS Short-term results suggest that ethnicity may initially influence weight-loss following LRYGBP; however, subsequent follow-up does not support these differences. Longer-term follow-up data are necessary to validate these preliminary results.

P048—Bariatric Surgery

SIMPLIFIED GASTRIC BYPASS APPROACH TO MORBID OBESITY? 1000 INITIAL CASES, Almino C Ramos MD, Manoela S Galvao MD, Andrey Carlo MD, Edwin Canseco, Gastro Obeso Center ? Sao Paulo, Brazil

BACKGROUND: The gastric bypass is considered the golden standard in the treatment of morbid obesity. It is considered one of the most complex procedures in laparoscopy. So, any maneuver, or approaches which can improve it’s feasibility are welcome. AIM: Evaluate initial results of Simplified Gastric Bypass (SGB) approach. CASES: From December of 2000 to March of 2004, 1000 SGB patients records were analyzed in a retrospective manner, 651 were female , age range from 13 a 65y (M= 38,5y), weight range from 85 a 220 Kg (M= 137 Kg) and BMI were between 36 a 68 Kg/m2 (M= 45,8 Kg/m2). The Simplified technique (to be presented) is based in doing all of the anastomosis in the supra-mesocolic floor with the trocars in similar position of lap Nissen procedure. RESULTS: There was no conversion to laparotomy at this series. BMI came from a mean of 45,8 to 27,4 Kg/m2 (75,1% EWL). Operative time stays between 39 to 154 min (M= 70 min), Hospital stay within 1,5 to 6d (M= 3d). Complications occurred in 2% of ulcers, 5.2% of gastrojejunojunction strictures, 1.2% of leakage, 0.7% of digestive bleeding, 0.3% bowel obstruction. Re-operation was done in 1,5% and there were 0.8% of deaths (3p with pulmonary embolism, e 2p with sepsis due to gastrojejunojunction leakage). CONCLUSION: The Simplified Gastric Bypass proved to be at it’s initial results; safe, with low operative time and efficient in reducing patients BMI with low complication and death rates.

P049—Bariatric Surgery

LAP BARIATRIC SURGERY- A TAILORED APPROACH IN A 2843 SINGLE CENTER PATIENT SERIES, Almino C Ramos MD, Manoel P Galvao Neto MD, Manoela S Gvalvo MD,Andrey Carlo MD, Edwin Canseco, Gastro Obeso Center ? Sao Paulo, Brazil

BACKGROUND: Lap bariatric surgery is quickly taking its place around the world with the benefits of minimally invasive surgery. The three main techniques done by lap are the Adjustable Gastric Band (AGB), Gastric Bypass (GBP) and the Bilio Pancreatic Diverison (BDP). To choose the best option to each patient our group tailored the surgical due to patient profile.

AIM: Analyze the results and indication of each technique in this series. CASES: Between December of 1999 and July of 2004, 2843 patients were submitted to lap bariatric procedures, being: 1111AGB (Mean 34,5y; 128Kg; 45,2BMI) 1107GBP (Mean 36,5y; 137Kg; 44,7BMI) plus 486 with Fobi-Capella Bypass (Mean 37,5y; 129Kg; 46,1BMI) and 139 with BPD (Mean 40y; 162Kg *; 48,8BMI * ) - (*p<0,005)

RESULTS: (see table), complementary to table, there was zero mortality rate on AGB * , 0.43% on GBP, 0.33% on FCB and 1.6% on BPD. (*p > 0,05).

<table>
<thead>
<tr>
<th>2843 TAILORED LAP BARIATRICS - RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI-FINAL</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>AGB</td>
</tr>
<tr>
<td>GBP</td>
</tr>
<tr>
<td>FCB</td>
</tr>
<tr>
<td>BPD</td>
</tr>
</tbody>
</table>

CONCLUSION: Comparing the numbers, goods results with low complications and mortality rates can be achieved with different Lap bariatric surgeries in a tailored approach.

P050—Bariatric Surgery

SLEEVE GASTRECTOMY VS BIB PLACEMENT IN SEVERE MORBID OBESITY PATIENTS: PRELIMINARY RESULTS, Alfredo Gonco MD, Luca Musmeci MD,Luigi Raparelli MD,Massimiliano Cipriano MD,Alessandro Pecchia MD,Nicola Basso MD, Department of Surgery “P. Stefanini”

Background
Laparoscopic biliopancreatic diversion/duodenal switch (BPD-DS) is indicated in severe morbid obesity patients. The technique combines gastric restriction achieved by sleeve gastrectomy and intestinal malabsorption by BPD-DS. Due to the high incidence of postoperative complications a two-stage technique has been proposed: sleeve gastrectomy first in order to achieve an initial weight loss with reduction of morbidity and mortality rates and BPD-DS after a 6 -12 month period. Preliminary reports on Bioenterics Intragastric Balloon (BIB) placement have suggested that it can lead to significant weight loss especially in the short term period. The aim of this retrospective study was to evaluate the effect on excess weight and comorbidities of BIB placement (6 months) or sleeve gastrectomy (6 months) in severe obese patients. Methods We reviewed our computer database charts of patients treated at the Department of Surgery 7P. Stefanini? Policlinico Umberto I, Rome (Italy). From March 1998 to May 2004, 18 patients candidate to BPD-DS and 17 patients candidate to endoscopic BIB placement were selected on the base of age, sex and BMI for a matched cohort study. The mean preoperative weight was 156.8 Kg in the sleeve gastrectomy patients group and 155.2 Kg in the BIB patients group, with mean BMI 38.5 Kg/m2.
**POSTER ABSTRACTS**

**SAGES 2005**

P051–Bariatric Surgery

**INITIATING A BARIATRIC SURGERY FELLOWSHIP TRAINING PROGRAM: IMPACT ON OPERATIVE OUTCOMES,** Rodrigo Gonzalez MD, Lana G Nelson MD, Sharon Boback, Michel M Murr MD, Department of Surgery, University of South Florida, Tampa, FL, USA.

**BACKGROUND:** Both open (ORYGB) and laparoscopic (LRYGB) Roux-en-Y gastric bypass have long learning curves, which may reflect on operative outcomes when initiating fellowship training programs. The aim of this study was to assess whether training a fellow has any impact on operative outcomes. METHODS: We reviewed prospectively collected data on the last 130 consecutive patients before (Group 1) and 130 patients after initiating the fellowship program (Group 2). Patient demographics, operative data, and outcomes were compared between groups using either Mann-Whitney U-test or Fisher’s exact test. Linear regression was used to correlate between number of operation in our experience and operative times. A p<0.05 was deemed statistically significant. Data are reported as median (range). RESULTS: A significantly greater percentage of patients were approached laparoscopically in Group 2 (48% vs 62%) (p=0.01). Patients undergoing ORYGB in Group 1 had similar age (45 [24-70] vs 48 [20-70] years), gender (26% vs 27% male), BMI (54 [39-79] vs 51 [39-94] kg/m2), incidence of previous abdominal operations (20% vs 28%), length of stay (5 [3-9] vs 5 [3-28] days), and complication rates (22% vs 17%) than patients in Group 2. Patients undergoing LRYGB in Group 1 had similar age (46 [27-68] vs 43 [21-69] years), gender (5% vs 10% male), length of stay (4 [2-17] vs 4 [2-24] days), and complication rates (13% vs 10%) than patients in Group 2. However, patients in Group 1 had lower BMI (48 [38-56] vs 50 [39-64] kg/m2) (p=0.01) and lower incidence of prior abdominal operations (7% vs 21%) (p=0.006) than patients in Group 2. Operative time was significantly shorter in patients undergoing both ORYGB (150 [65-280] vs 110 [55-210] min) (p<0.001) and LRYGB (202 [105-450] vs 134 [65-191] min) (p<0.001) in our experience and decreased operative times in Group 2, a phenomenon not observed in patients in Group 1. CONCLUSION: Initiating a fellowship training program in bariatric surgery positively impacts operative outcomes, since it allows more patients to be approached laparoscopically, reduces operative times, and increases the scope of bariatric practices.

P052–Bariatric Surgery

**QUALITY OF LIFE, WELL-BEING AND PATIENT SATISFACTION AFTER A LAPAROSCOPIC GASTRIC BYPASS: PROSPECTIVE ANALYSIS OF 222 CONSECUTIVE PATIENTS,** Piotr Gorecki MD, Robina Smith MD, Rachel Bernstein MPA, Leslie Wise MD, Department of Surgery, New York Methodist Hospital, Brooklyn, NY.

Limited data is available on quality of life and patient satisfaction after bariatric surgery. Quality of life and a self reported well being were evaluated in a consecutive 222 patients who underwent laparoscopic Roux-en-Y gastric bypass at our institution between August 2001 and August 2004. A standardized questionnaire using a 10-point scale was used for evaluation. The data was collected prospectively before surgery and during postoperative visits at one week, one month, three months, six months and 12 months. All operations were completed laparoscopically. There was no postoperative or perioperative mortality. Five patients experienced major complications requiring reoperation in the early postoperative period (leak-2, hemorrhage-3). All patients but two expressed their satisfaction with the decision to undergo gastric bypass (first post operative visit; 220 yes, 2 no). At 12-month follow-up, all patients available for follow-up (72%) were satisfied with their decision to undergo weight reduction. Operating time at POD 1: 100% yes, 0% no. The general well being score improved from 7.5 (*not acceptable) before the operation to 1.6 (*excellent) one year after the operation (Table).

<table>
<thead>
<tr>
<th>N=221</th>
<th>Initial</th>
<th>3 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI kg/m2</td>
<td>48.3</td>
<td>39.4</td>
<td>30.9</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>7.4</td>
<td>2.58</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Patients who underwent laparoscopic gastric bypass enjoy dramatic improvement of their quality of life after the operation. Patients express high satisfaction with their decision to go for weight reduction surgery. Patients’ subjective assessment of satisfaction with bariatric surgery may be a useful adjunct to the overall objective analysis used by the standardized quality of life questionnaires.
P054–Bariatric Surgery
LESSONS LEARNED IN ESTABLISHING A SUCCESSFUL BARIATRIC PROGRAM IN A NON-TEACHING COMMUNITY HOSPITAL.

James M Houston, PAC, Charles Tollinche MD, Department of Surgery, St. Mary Hospital, Hoboken, NJ.

Background: The aim of this paper is to document obstacles involved in establishing a successful bariatric practice at a non-teaching community hospital by a laparoscopic fellowship trained surgeon (AG). Methods: From 3/03 to 6/04, 100 bariatric cases (75% LGBP & 25% LB) were prospectively analyzed. Results: There were 88 women and 12 men with mean age of 38.5 (range 21 to 70). Mean preoperative BMI and weight were 135.5 kg and 48.9 kg/m² (range 36 to 87). Overall mean hospital stay was 2.7 days with 2.0 days for LB and 3 days for LGBP. Percent excess weight loss was compared with literature. Results: There were 88 women and 12 men with mean age of 38.5 (range 21 to 70). Mean preoperative BMI and weight were 135.5 kg and 48.9 kg/m² (range 36 to 87). Overall mean hospital stay was 2.7 days with 2.0 days for LB and 3 days for LGBP. Percent excess weight loss was compared with literature. Results: There were 88 women and 12 men with mean age of 38.5 (range 21 to 70). Mean preoperative BMI and weight were 135.5 kg and 48.9 kg/m² (range 36 to 87). Overall mean hospital stay was 2.7 days with 2.0 days for LB and 3 days for LGBP. Percent excess weight loss was compared with literature. Results: There were 88 women and 12 men with mean age of 38.5 (range 21 to 70). Mean preoperative BMI and weight were 135.5 kg and 48.9 kg/m² (range 36 to 87). Overall mean hospital stay was 2.7 days with 2.0 days for LB and 3 days for LGBP. Percent excess weight loss was compared with literature.

P055–Bariatric Surgery
THE ROLE OF DIAGNOSTIC LAPAROSCOPY IN THE DIAGNOsis AND MANAGEMENT OF THE POST-OPERATIVE COMPLICATIONS OF GASTRIC BYPASS PATIENTS.

Larry F Griffith MD, Glenn J Forrester MD, Babak Moeinolmolki MD, Pratibha Vemulapalli MD, Karen E Gibbs MD, Julio Teixeira MD, Montefiore Medical center and Albert Einstein College of Medicine, Bronx, NY

INTRODUCTION Roux-en-y gastric bypass is now the most frequently performed surgical procedure for the treatment of morbid obesity in the US. The number of these procedures is increasing exponentially. Post-operative abdominal pain in these patients presents a difficult diagnostic challenge. Currently there is no consensus on the best diagnostic modality to assess this subgroup. The objective of this study is to determine the value of the CAT scan versus Diagnostic Laparoscopy (DL) in this patient population.

METHODS A retrospective analysis was performed on 32 diagnostic laparoscopy cases between January 1, 2001 and September 1, 2004. All had a history of Roux-en-y gastric bypass. Of them, 26 were also evaluated by CAT scanning during the initial work-up. We report the efficacy of DL and compare intra-operative findings with the CAT scan results.

RESULTS The CAT scan was positive in 59% of the patients. Overall the CAT scan had a false positive rate of 50% and false negative rate of 35% based on operative findings. There was correlation between the two modalities in 14% of the cases. The DL found a cause for pain in 38% of the cases. The most common findings were the two groups were hernias and small bowel obstruction.

CONCLUSIONS The CAT scan was less accurate than DL especially when evaluating internal hernias. DL allowed therapy in addition to diagnosis and is a more useful modality in evaluating this patient subgroup.

P056–Bariatric Surgery
JEJUNOJEJUNAL ANASTOMOTIC OBSTRUCTION FOLLOWING LAPAROSCOPIC ROUX-Y GASTRIC BYPASS DUE TO NON-ABSORBSIBLE SUTURE. A REPORT OF SEVEN CASES.

Andrew A Gumbs MD, Rohit Chadwani MD, Andrew J Duffy MD, Robert Bell MD, Yale University School of Medicine, Department of Surgery, New Haven, CT, 06520

Introduction: Small bowel obstruction is a well-known complication of laparoscopic Roux-Y gastric bypass (LGBP). We describe seven cases of jejunjejunal anastomotic obstruction related to adhesion formation, a cause of SBO previously described in the literature, more commonly in association with open gastric bypass.

Methods: All patients undergoing LGBP from October 2002 until June 2004 were entered into a prospective, longitudinal database. All patients who subsequently presented with small bowel obstruction were analyzed.

Results: Jejunjejunal anastomotic obstruction occurred in seven out of 152 patients (4.6%) on whom LGBP was performed from October 2002 to February 2004. Since February 2004, suture used to close the jejunjejunal mesenteric leaves? defect was changed from non-absorbable Dacron (Surgidac?) to absorbable suture material. Of the 76 patients who have since undergone LGBP, none have presented with small bowel obstruction. These seven patients ranged in age from 23 to 53 years, with preoperative BMI ranging from 41 to 90, which was similar to the other patients. Six patients were female and 1 was male. For each patient, the initial LGBP operation was uncomplicated, without anastomotic leak, prolonged operative time, or conversion to open operation. All presented with nausea and vomiting and four of the seven patients also reported abdominal pain. The mean interval between initial LGBP and subsequent SBO was 153 days. Following initial history and physical examination for each patient, the diagnosis of small bowel obstruction was confirmed via imaging, either by abdominal x-ray (3/7), small bowel follow-through (1/7), or CT scan (3/7). Operative findings common to all seven cases were dilated loops of proximal small bowel, and a single adhesions just distal to the Roux-Y anastomosis. Following adhesiolysis, each patient had prompt return of bowel function without recurrence of obstruction.

Conclusions: This paper describes seven cases of SBO occurring after laparoscopic Roux-Y gastric bypass. The rate of SBO (4.6%) is consistent with the previous literature, though the incidence of adhesions specifically at the jejunjejunal anastomosis is higher than that previously encountered. It appears that the incidence of postoperative SBO at the jejunjejunal anastomosis is directly linked to the choice of suture intraoperatively. As such, absorbable suture should be used to close the jejunjejunal mesenteric leaves defect.

P057–Bariatric Surgery
RESOLUTION OF HYPERTENSION AND DIABETES FOLLOWING LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING.

Liam A. A. Revenan DO, Patrick McEnaney MD, Andras Sandor MD, Donald R Czerniach MD, Rich A Perugini MD, Demetrius E Litwin MD, John J Kelly MD, Department of Surgery, UMass Memorial Health Care Center

Laparoscopic Adjustable Gastric Banding (LAGB) is the most common bariatric operation worldwide. It results in a nearly 50% reduction in excess body weight at 1 year. However, the effects of LAGB on the resolution of metabolic conditions are less established. We evaluated our experience with resolution of hypertension and diabetes in patients after LAGB.

METHODS: We retrospectively analyzed data that was collected on consecutive morbidly obese patients who underwent LAGB. Patient demographics, medical co-morbidities, preoperative body mass index (BMI), and postoperative (6 months) resolution of hypertension and diabetes were analyzed.

Resolution of co-morbidities was defined by the absence of anti-hypertensive or diabetic medications in the follow up period.

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P058—Bariatric Surgery

**DOES THE SF-36 PREDICT POST-OPERATIVE WEIGHT LOSS?**

Gloria P Hsu BS, John M Morton MD, LI Jin BS, Bassem Safadi MD, Myriam J Curet MD, Department of Surgery, Stanford University School of Medicine

Objective: Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) is an effective treatment option for obesity that carries inherent risks. As a result, efforts have been made to distinguish which patients may benefit the most from LRYGB. The SF-36 is a well-validated and easily administered quality of life survey. We hypothesized that the SF-36 would predict post-operative weight loss in LRYGB.

Methods: Pre-operative SF-36 surveys were administered and demographic, intra-operative, and weight data were collected (n=44). Multiple regression analysis was performed for percent of post-operative excess weight loss and BMI loss while controlling for confounding variables. P-values were considered significant at p < 0.05.

Results: The total SF-36 score was positively predictive of percent excess weight loss at 6 months. At 2 weeks, the general health score was positively predictive of BMI loss while both emotional well-being and social functioning scores were negatively predictive of percent excess weight loss. At 6 weeks, social functioning score was negatively predictive while the energy level score was positively predictive of BMI loss. Ultimately, only the preoperative BMI was predictive of both 6th and 1yr BMI losses.

Conclusions: The SF-36 score may be useful for predicting post-operative weight loss in LRYGB. Individual scores were more useful for predicting weight loss earlier post-op, with the total score having a predictive result at 6 months. Further investigation will incorporate more patients, and attempt to determine additional correlations as well as a threshold score at which these correlations take effect.

P059—Bariatric Surgery

**INFECTION RATES USING WOUND PROTECTORS IN LAPAROSCOPIC GASTRIC BYPASS, Albert Im MD, Keith Zuccala MD, Pierre Saldinger MD, Danbury Hospital**

There is an increase wound infection rate associated with being morbidly obese. The increase incidence of wound infections is multifactorial including decrease oxygen tension due to the thickness of the abdominal wall to contamination of the wound from enteric contents. The use of laparoscopic techniques has decreased the incidence of wound infections from 15 to 5%. At our institution we have tried to document the change in wound infection rate with using a wound protector (Alexis wound retractor - Applied Medical ref:c8301 2.5-6 cm) at the left lower quadrant incision. This is the largest port site incision we use and there is no evidence that results from the gastrostomy and enterotomy closure. Additionally, we also use this site to introduce the EEA when we are creating the gastrojejunostomy anastomosis. Thus at no time is the subcutaneous tissue in contact with enteric contents and we feel there is less tissue trauma. To prevent leakage of CO2 after we have extended the incision to introduce the wound protector, we use a balloon tipped trocar to keep an airtight seal. We have noticed a decrease in the incidences of wound infection after using the wound protector at our trocar site.

P060—Bariatric Surgery

**LIVER DISEASE IN OBSESE PATIENTS? IS IT THE HEP C OF NEXT DECADE?**

Ashutosh Kaul MD, Karl Strom MD, Joanne Weiskopf, Edward Yatco MD, Xu Li MD, Gita Ramaswamy MD, Thomas Cerabona MD, New York Medical College, New York

Aim of this presentation is to highlight the increasing prevalence of liver disease in obese population. In a prospective study of 184 patients undergoing laparoscopic bariatric surgery liver biopsy was done. Their BMI ranged from 37 to 70 (mean 50.1) and age from 23 to 67 years (mean42.7 years). Of these 147 were females and 37 male patients.

Pathologic evidence of NASH (Non-Alcoholic Steatohepatitis) was found in 67 patients. Of these 15 had low grade (1 +2) steatosis and 52 had high grade (3+4) steatosis. Low grade inflammation (1 +2) was present in 65 cases and high grade (3+4) in 2 cases. In our series we found NASH with fibrosis in 19 cases but 48 of the patients had NASH with fibrosis. Thus 36.4% of all patients undergoing bariatric surgery had NASH.

In our presentation we plan to highlight the significant correlation we found with pre-op Body Mass index, duration of obesity, diabetic and medication status. The high prevalence of NASH is a cause of concern. If by conservative estimates about 30 million Americans are morbidly obese and our data is representative of the national disease burden then over 10 million Americans are at risk of NASH. We plan to discuss the risk of developing liver failure based on published literature in patients with NASH. In view of these statistics NASH and resulting liver failure may be a major health problem in US in the coming decade. There have been recent reports to suggest improvement in liver biopsy findings after weight reduction. If so then Bariatric surgery may be one of the strategies which should be emphasized for potential to limit this epidemic in the coming decade.

In 8 cases we took repeat biopsies during reexploration for other causes. Our data on change in liver biopsy findings is too small to make any broad generalizations.

Thus we plan to highlight the high incidence of NASH in our patient population despite minimal liver function tests abnormalities. We did find significant direct co relationship with patient's diabetic status and duration of obesity. We feel that this may be the tip of the iceberg and in the coming decades Obesity related liver disease may be a major health problem with significant financial burden on the nations health resources. Attempts to lose weight may thus be important to prevent long-term liver failure. If there is also co relationship with duration of obesity then it becomes paramount for all health care personals and HMOs to encourage early weight loss.

P061—Bariatric Surgery

**RADIOLOGICAL FINDINGS IN INTERNAL HERNIAS IN PATIENTS OF LAPAROSCOPIC GASTRIC BYPASS, Ashutosh Kaul MD, Glorimer Atiles MD, Frank Nami MD, Edward Yatco MD, Thomas Cerabona MD, New York Medical College, New York**

Aim of this presentation is to critically analyze our findings of internal hernias in laparoscopic Gastric bypass. At our center we bring our roux loop in laparoscopic gastric bypasses in a retro colic and retro gastric fashion. Despite stitching the defect we still have had 16 cases of internal hernias over the last 3 years. Aim of this presentation is to highlight the presentation of these patients and to clinically analyze the radiologic findings in these cases. CT scans were done in 14 of these cases and in only one of them was the finding of internal hernia entertained by the radiologic service. Certain findings were reported to suggest improvement in liver biopsy findings after weight reduction. If so then Bariatric surgery may be one of the strategies which should be emphasized for potential to prevent long-term liver failure. If there is also co relationship with duration of obesity then it becomes paramount for all health care personals and HMOs to encourage early weight loss.
P062–Bariatric Surgery
LESSONS FROM HISTORY AND NEW YORK STATE: TRENDS IN OBESITY SURGERY, Ashutosh Kaul MD, Laura Choi MD, Thomas Sullivan BS, Edward Yatco MD, Thomas Cerabona MD, New York Medical College, New York

Aim of this presentation is to analyze data from a statewide planning and research cooperative systems (SPARCS) that is a database maintained by New York State. We analyzed the data by DRG, patient demographics and trends in complications and mortality. We further analyzed institutions based on high volume (i.e., > 50 cases per year). According to data the total number of cases of bariatric surgery in New York State increased seven fold from about 500 in 1991 to 3500 in 2001. Though the female to male ratio of patients remained stable to about 4:1, the average age of patients undergoing bariatric surgery increased from about 35 years in 1995 to 41 years in 2001. The number of institutions doing bariatric surgery also doubled from about 31 in 1995 to 62 in 2001. Interestingly though the number of high volume institutions remained stable around 30 to 40, the number of low volume centers has mushroomed from a low of 2 in 1993 to about 22 in 2001. The average mortality rate in the state has gone down from a high of 0.8% in 1998. However, on analyzing the date the average mortality in high volume centers was 0.4% in comparison to 1.2% in low volume centers. Surgical history has shown from days of budding cardiac surgery to introduction of laparoscopic cholecystectomy that when there is a rapid increase in the number of a procedure, initially the complication rate increases more rapidly than the volume of cases. This can be seen in the mushrooming of low volume centers in New York State and their higher complication rates. As a surgical society we have thus to make sure that sharply increasing numbers of bariatric surgeries do not translate into dramatically increasing complication rates.

P063–Bariatric Surgery
LAPAROSCOPIC ROUX EN Y GASTRIC BYPASS AFTER THE AGE OF 60: A FAVORABLE ALTERNATIVE FOR WEIGHT LOSS, Colleen Kennedy MD, Samuel Szömstein MD, Emmanuelle LoMenzo MD, David Podkameni MD, Alexander Villares MD, Flavia Soto MD, Raúl Rosenthal MD, Cleveland Clinic Florida

Background: Bariatric surgery has traditionally been limited to patients between the ages of 18-55. With the advancing age of our population and the advancement of laparoscopic techniques for surgery this age limitation needs to be re-evaluated. We report a series of patients over age 60 who underwent the Roux-en-Y gastric bypass for treatment of morbid obesity.

Methods: A retrospective review was performed examining patients over the age of 60 who met the criteria for laparoscopic gastric bypass and underwent the procedure.

Results: Two surgeons at our institution performed 814 gastric bypass procedures over 3 years, 25 were performed on patients greater than 60 years of age. The average age of the patients undergoing the procedure was 66 (60-75). The average BMI of the patients was 48 kg/m2 (35-64). Comorbidities preoperatively included diabetes mellitus (65%), hypertension (80%), sleep apnea (25%), GERD (30%) and depression (60%). The excess weight loss was 54% at 6 months, 68% at 1 year. Diabetes resolved in 75% of the patients, hypertension in 35% and sleep apnea in 80%. The postoperative morbidity rate was 20%, mortality rate was 0%.

Conclusion: Laparoscopic gastric bypass is a feasible and safe option for weight loss in patients over the age of 60 with proper preoperative evaluation and screening. With the prolonged life span and overall aging of our population, it is becoming more evident that this population will require a reliable solution for treatment of morbid obesity.

P064–Bariatric Surgery
MALLORY-WEISS TEAR AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Samuel J Kuykendall BS, Atul K Madan MD, Craig A Ternovits MD, University of Tennessee, Memphis

In the United States, the most common surgical procedure for morbid obesity is Roux-en-Y gastric bypass. Pulmonary embolism, leak, bowel obstruction, and gastrointestinal bleed are some of the early and potentially fatal complications. Early post-operative bleeding after laparoscopic bypass, although uncommon, presents a dilemma due to the danger of post-operative endoscopy and the inability to easily access the gastric remnant. The usual sites of gastrointestinal hemorrhage after gastric bypass are at the gastrojejunostomy site, the gastric pouch, the gastric remnant, or the jejunojejunostomy. We encountered a case of massive upper gastrointestinal hemorrhage one week after laparoscopic Roux-en-Y gastric bypass. The patient was discharged on post-operative day three from her original surgery. After failure of endoscopy and multiple blood transfusions, the patient was taken to the operating room. During exploration, the hemorrhage was found to be from a disrupted blood vessel secondary to a Mallory-Weiss esophageal tear. Resuturing the vessel resulted in hemostasis. The patient stabilized after the procedure and was discharged without any evidence of continued hemorrhage. In retrospect, both the patient and her family recalled that she had continual retching at home before her massive hemorrhage. Mallory-Weiss tears are an uncommon cause of upper gastrointestinal hemorrhage after laparoscopic gastric bypass. Bariatric surgeons need to consider this diagnosis especially when encountering a patient with a history of significant retching after gastric bypass.

P065–Bariatric Surgery

INTRODUCTION: Bariatric surgery weight loss is often quantified using EWL. Sole use of EWL however can be misleading because percent weight lost is expressed as a function of preop weight. A new metric, BSSR, is introduced to complement EWL.

METHODS: Data analysis after laparoscopic vertical gastrectomy (VG), R-EN-Y gastric bypass, and duodenal switch (DS) was done. EWL = weight lost/(preop weight - ideal body weight). BSSR was defined as the % of patients that successfully lost enough weight such that they no longer met NIH criteria for bariatric surgery (BMI<30kg/m2).

RESULTS: After a year, all 3 operations achieved similar absolute weight loss (110-130 lbs). But based on EWL alone, VG seems less effective than RGB and DS. When EWL is compared between RGB and DS, no difference was found and yet 42/55 of RGB patients (BSSR 72%) no longer met NIH criteria for surgery versus 30/33 DS patients (BSSR 91%).

CONCLUSIONS: Use of EWL alone can be misleadingly and should only be used in conjunction with absolute weight loss. However, absolute weight loss itself can also be misleading if the patient is still very obese despite significant weight loss. Use of all three measures, EWL, absolute weight, and BSSR, is recommended when quantifying weight loss to measuring efficacy after bariatric surgery.
**P066–Bariatric Surgery**

**THE BEST BARIATRIC OPERATION FOR PATIENTS OF BMI<45KG/M2?: LAPAROSCOPIC VERTICAL GASTRECTOMY (VG) PROVES TO BE SUPERIOR TO BAND PLACEMENT (BAND) AND ROUX-EN-Y GASTRIC BYPASS (RGB)**

**Crystine M Lee BA, Janos Taller MD, John J Feng BA, Gregg H Jossart MD, Paul T Cirangle MD, Dept. of Surgery, California Pacific Medical Center**

**INTRO:** Patients of BMI<45kg/m² (Pt<45) typically undergo the Band or RGB. The VG was first done as the first stage of a two-stage duodenal switch (DS) for high-risk, superobese patients in which the risk of a one-stage DS was significant. This study compares outcome of VG in Pt<45 to that of the established operations. **METHODS:** A retrospective comparison of totally lap VG, Band and RGB in Pt<45 was done. By stapling along a 32 Fr bougie, a VG created a 60-80 ml gastric tube. The Lap-Band® was placed using the pars flaccida technique, creating a 20cc gastric pouch. A hand-sewn RGB with an antecolic Roux limb was done. RESULTS: Average preop weight was similar in the groups (240-252lbs). OR time in the VG, Band, and RGB groups was 93±25, 89±23, and 135±29 mins, respectively (P<0.05 RGB vs others). At 9 months postop, all VG patients achieved a BMI<30kg/m², versus 36% Band and 92% of RGB (P<0.05 Band vs others). Complications occurred in 3.4%, 4.5%, and 20.3%, in the VG, Band, and RGB groups, respectively (P<0.05 for RGB vs others).

<table>
<thead>
<tr>
<th>Group</th>
<th>Preop BMI</th>
<th>Band (n=116)</th>
<th>RGB (n=113)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preop Wt</td>
<td>41.6±12.7</td>
<td>36.3±9.3</td>
<td>41.0±12.7</td>
</tr>
<tr>
<td>9 mo Wt</td>
<td>25.3±13.5</td>
<td>107±20</td>
<td>167±33</td>
</tr>
<tr>
<td>9 mo %</td>
<td>93±13</td>
<td>62±22*</td>
<td>83±23</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Similar weight loss with decreased morbidity. Risks were comparable, with a weight range of 211 to 502 lbs. Histologic evidence of NAFLD was present in 94% of patients. Associated hepatic inflammation (steatohepatitis) was seen in 85% and hepatic fibrosis was noted in 46% of patients overall. Two or more comorbidities associated with central obesity (sleep apnea, hypertension, type II diabetes, and hyperlipidemia) were seen in 51% of patients, however, there was no correlation with the presence of inflammation nor fibrosis in this study. There were no bile leaks or adverse bleeding events from the liver biopsies.

**CONCLUSIONS:** Laparoscopic wedge liver biopsy at the time of laparoscopic bariatric surgery is quick, easy to perform, and safe. The incidence of NAFLD in this group of morbidly obese patients is high, with many patients having developed hepatic fibrosis. Routine liver biopsy during laparoscopic bariatric surgery should be considered.

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**P068–Bariatric Surgery**

**LAPAROSCOPIC WEDGE LIVER BIOPSY IS SAFE TO PERFORM AND IDENTIFIES SIGNIFICANT LIVER PATHOLOGY AT THE TIME OF BARIATRIC SURGERY**

**Michael Schweitzer MD, Anne Lidor MD, Alberto Ingelisias MD, Thomas Magnuson MD, The Johns Hopkins Medical Institutions**

**Background:** Morbidly obese patients have been shown to be at high risk for the development of nonalcoholic fatty liver disease (NAFLD). NAFLD related steatohepatitis and fibrosis could progress to cirrhosis and hepatic failure if left untreated. The presence and severity of NAFLD is difficult to determine without a sample of liver tissue for histologic exam. For this reason, routine hepatic biopsy at the time of bariatric surgery may be warranted. The aim of this study is to show that laparoscopic wedge liver biopsy is safe, yields an adequate sample size through a 12mm trocar and can be performed easily at the time of a laparoscopic bariatric procedure.

**Methods:** Laparoscopic wedge liver biopsies were performed on 104 patients at the time of laparoscopic Roux-en-Y gastric bypass or Lap-Band. Complications occurred in 21.1% of DS patients versus 16% in RGB and DS performed on patients of BMI>50kg/m² (BMI>50).

**RESULTS:** OR time in the DS and RGB groups was 252±52 and 20cc linear gastric pouch. DS is performed with a 250cm alimentary limb, a 100cm antecolic Roux limb, and a hand-sewn gastroenterostomy to a 20cc linear gastric pouch. DS is performed with a 250cm alimentary limb, a 100cm common channel, and a retrocolic hand-sewn duodenoejejunostomy. RESULTS: OR time in the DS and RGB groups was 252±52 and 149±36 mins (P<0.05). At 1 year postop, 88% of DS patients achieved a BMI<30kg/m², versus 91% of RGB; 69% of DS patients achieved a BMI<30kg/m² versus 59% of RGB (P=NS). Complications occurred in 21.1% of DS patients versus 16% in RGB (P=NS).

**CONCLUSIONS:** Unlike previous data which have shown that DS confers greater weight loss, this study finds comparable weight loss in DS and RGB. Although the OR time is longer for DS, the complication rate was similar. This study finds that RGB may achieve just as much weight loss as DS.
P070—Bariatric Surgery
AN ANALYSIS OF GASTROJEJUNOSTOMY STRUCTURES IN 222 CONSECUTIVE PATIENTS UNDERGOING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, John C Lohlin MD, Piotr J Gorecki MD,Won Sohn MD,Rahel Bernstein,Leslie Wise MD, Departments of Surgery and Gastroenterology, New York Methodist Hospital, Brooklyn, New York, USA
Introduction: Stenosis of the gastrojejunostomy after Roux-en-Y gastric bypass is a complication that has been reported with all surgical techniques used to construct the gastroenterostomy and occurs between 2 to 27% of patients after gastric bypass. The incidence, management, and outcomes of gastrojejunostomy stenosis in 222 consecutive patients undergoing laparoscopic Roux-en-Y gastric bypass were analyzed. Materials and Methods: 222 consecutive patients underwent laparoscopic Roux-en-Y gastric bypass at our institution between August 2001 and August 2004. Data was entered prospectively into the database. The gastrojejunostomy was performed in all patients with the same technique using a 25-mm circular stapler inserted transorally. Anastomotic stenosis was defined as a combination of symptoms of progressive inability to tolerate solid food with the endoscopic finding of stenosis that did not permit the passage of a 9 mm endoscope. Results: Sixteen patients suspected to have stenosis of the gastrojejunostomy underwent 24 upper gastrointestinal endoscopies. The average interval between surgery and the diagnosis of stricture was 6 weeks (2-22 weeks) and the mean time from the onset of symptoms to the time of endoscopy was 1.3 weeks (0.5 to 6.5 weeks). Stricture was found in 14 out of 222 patients (6.3%). Two patients suspected to have stenosis were diagnosed with marginal ulcers. Two patients with diagnosed stricture had concomitant marginal ulceration. The average size of the stenotic anastomosis was 4.6 mm (3mm ? 7 mm). All patients with stricture underwent balloon dilatation at the time of endoscopy. Eight patients required one dilatation, four patients required two dilatations, and two patients required three dilatations. Four patients were admitted to hospital for IV hydration. There were no complications associated with dilatations and no need for reoperation in any of the patients. There were no deaths in these 14 patients. All patients with stricture resumed tolerance to solid food and no further recurrences were noted at the mean follow up of 20.35 months (2 ? 37 months).
Conclusion: Balloon dilatation is an effective treatment for gastrojejunostomy stenosis. Controlled radial expansion with cessation of further dilatation if any evidence of trauma becomes evident, is important to avoid perforation. It is not necessary to dilate the anastomosis beyond 9 mm to achieve a satisfactory long-term result.

P071—Bariatric Surgery
RESOLUTION OF OBSTRUCTIVE SLEEP APNEA SYMPTOMS AFTER LAPAROSCOPIC GASTRIC BYPASS, Mario Longoria MD, Trung Bui MD,Sara Chalifoux BS,Ninh T Nguyen MD, University of California, Irvine Medical Center, Orange, CA
Introduction: Obstructive sleep apnea is a common respiratory condition in the morbidly obese. Medical therapy includes the use of continuous positive airway pressure (CPAP); however, weight reduction is the ideal treatment for obese patients suffering from obstructive sleep apnea. The aim of this study was to characterize the effect of weight loss after Roux-en-Y gastric bypass on the symptoms of sleep apnea.
Methods: The charts of 24 morbidly obese patients with documented obstructive sleep apnea based on sleep polysomnography were reviewed for demographics, the use of CPAP, and weight loss. Symptoms of sleep apnea were measured preoperatively and postoperatively based on the scores of Epworth sleepiness scale (ESS). An ESS score greater than 7 was considered abnormal.
Results: There were 19 females and 5 males with a mean age of 41 years. The mean preoperative body mass index decreased from 46 kg/m2 preoperatively to 33 kg/m2 at 6 months postoperatively. The mean preoperative ESS decreased from 12 ± 2 preoperatively to 4 ± 1 at 6 months postoperatively (p<0.01). Preoperatively, 11 (46%) of 24 patients were dependent on the use of CPAP; at 3 months postoperatively, 5 of 11 patients did not require CPAP; and at 6 months postoperatively, 10 of 11 patients did not require CPAP. Conclusion: Weight loss after laparoscopic gastric bypass effectively improves obstructive sleep apnea symptoms as early as 6 months postoperatively.

P072—Bariatric Surgery
ESTABLISHING A LAPAROSCOPIC BARIATRIC PROGRAM IN A SAFETY NET HOSPITAL, Atul K Madan MD, Karen E Speck BS,Craig A Ternovits MD,Bruce Steinhauer MD, Martin A Croce MD,David S Tichansky MD, Timothy C Fabian MD, University of Tennessee, Memphis and Regional Medical Center at Memphis
Most laparoscopic bariatric programs (LBP) are situated in a community- or university-based hospital. We initiated a program at a safety net hospital (SNH) which was based on a dedicated bariatric team, a clinical pathway, and a large metropolitan area (pop. 1,100,000) and its surrounding region. This study hypothesizes that a LBP can be established at a SNH with good clinical and financial results. A LBP was initiated in 12/02 which included a dedicated bariatric suite, operative team, bariatric unit, and a clinical pathway. Patients who underwent laparoscopic gastric bypasses were prospectively into the database. The gastrojejunostomy was analyzed. Materials and Methods: 222 consecutive patients undergoing laparoscopic Roux-en-Y gastric bypass were analyzed.
Results: There were 19 females and 5 males with a mean age of 41 years. The mean preoperative body mass index decreased from 46 kg/m2 preoperatively to 33 kg/m2 at 6 months postoperatively. The mean preoperative ESS decreased from 12 ± 2 preoperatively to 4 ± 1 at 6 months postoperatively (p<0.01). Preoperatively, 11 (46%) of 24 patients were dependent on the use of CPAP; at 3 months postoperatively, 5 of 11 patients did not require CPAP; and at 6 months postoperatively, 10 of 11 patients did not require CPAP. Conclusion: Weight loss after laparoscopic gastric bypass effectively improves obstructive sleep apnea symptoms as early as 6 months postoperatively.

P073—Bariatric Surgery
THE INFLUENCE OF AGE ON VITAMIN DEFICIENCIES FOLLOWING GASTRIC BYPASS, Robert T Marema MD, Michael Perez MD,Nadege Francois BS, Cynthia Buffington PhD, U.S.
Introduction. Aging is often associated with micronutrient deficiencies, such as vitamin B12, calcium, iron and folic acid. Roux-en-Y gastric bypass (RYGBP) may also cause deficits in these micronutrients. Older RYGBP patients, therefore, may have an increased risk for vitamin and mineral deficiencies postoperatively. The purpose of our study was to examine the effects of age on post-RYGBP micronutrient status.
Methods. The study population included 3 age groups of postsurgical gastric bypass patients, Group 1 = ages 20-35 yrs., average age = 29; Group 2 = 36750 yrs., average age = 43; and Group 3 = 51773 yrs., average age = 57. All patients were similar with regard to body size, gender distribution, and time of nutrient assessment. Blood nutrient measurements included vitamin B12, folic acid, ferritin, iron, and calcium.
Results. The data show that RYGBP patients in the oldest age category (Group 3) had a lower, rather than higher, incidence of vitamin and mineral deficiencies, as compared to their younger cohorts (Group 1). Vitamin B12, folic acid, ferritin, and iron were all significantly (p<0.05) higher for Group 3 vs. Group 1 patients. Data obtained from regression analyses show positive, rather than negative, correlations between age and blood levels of iron (p=0.05), ferritin (p=0.003), folic acid (p=0.0006), and vitamin B12 (p=0.03). Differences in nutrient status between the age groups were not associated with weight loss or nutrient intake. However, the younger RYGBP patients were far less compliant in daily usage of vitamin and mineral supplements than were the older aged populations.

A LBP can be established in a SNH with good clinical results. One year weight loss and comorbidity improvement/resolution compares favorably with other programs. Despite overall poor payor mix of this SNH, a LBP can be established with a high rate of commercially insured.
**P074—Bariatric Surgery**

**IS RESOLUTION OF HYPERTENSION FOLLOWING LAPAROSCOPIC GASTRIC BYPASS RELATED TO INSULIN RESISTANCE?**

Patrick McEnaney MD, Richard Perugini MD,Andras Sandor MD,Liam Haveran DO,Donald R Czerniach MD,Demetrios Litwin MD,John J Kelly MD, Department of Surgery, UMASS Memorial Medical Center

**INTRODUCTION:** Laparoscopic Roux-en-Y Gastric Bypass (LRGB) has become one of the major treatment options for individuals with morbid obesity, a proportion of which have insulin resistance. Insulin may act to increase sympathetic tone as well as sodium reabsorption with resultant impact on hypertension. Based on some data from our institution, individuals with insulin resistance have significantly improved insulin sensitivity 12 days postoperatively where as those with lesser insulin resistance have early worsening of their insulin sensitivity. The purpose of our study was to determine if individuals undergoing LGB with insulin resistance would have better resolution of their hypertension as compared to those undergoing the same procedure with less perturbations in insulin glucose metabolism.

**METHODS:** We retrospectively reviewed the medical records of patients with hypertension who had preoperative fasting insulin and glucose levels to determine their metabolic profile. Patients were categorized as insulin resistant if their preoperative HOMA-IR level was greater than 3.8. Patients were defined as being hypertensive if they were taking one or more medications for blood pressure control. The records were subsequently reviewed to evaluate for resolution of their hypertension while not requiring antihypertensives.

**RESULTS:** Of the 72 patients who underwent LGB between June 2003 and June 2004, 24 of these were hypertensive preoperatively and 11 of these were insulin resistant. Of the six patients with six month follow up postoperatively, three were cured of their hypertension, where as one of the eleven patients who had not yet reached the 6-month follow up visit was cured of hypertension. Of the thirteen patients with hypertension and HOMA-IR levels<3.8, seven have had reached the 6 month follow up visit. Four of these seven have been cured of their hypertension where as three have not. The remaining six patients have not yet reached their 6 month follow up visit and as of yet have not been cured of their hypertension.

**CONCLUSION:** Despite improvements in insulin resistance postoperatively following LRGB, patients did not experience more rapid correction of their hypertension relative to those without insulin resistance. Further follow up on a larger population of patients may elucidate a difference between these groups.

**P075—Bariatric Surgery**

**OUTCOME OF LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS IN PATIENTS 50 YEARS AND OLDER, Babak Moeinolmolki MD, Glenn J Forrester MD,Larry Griffith MD,Pratibha Vemulapalli MD, Karen E Gibbs MD, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY**

**INTRODUCTION** Because of increased morbidity in older patients, we wanted to assess their performance in comparison to our general population of patients undergoing laparoscopic Roux-en-Y gastric bypass (LGBP) for the treatment of morbid obesity.

**METHODS** In our series of patients between the years 2001 and 2004, 14.5% were aged 50 years or older. Our database was reviewed for % excess weight loss (%EWL) at 6- and 12-month postoperative visits. Outcomes were compared to patients under 50 years old at similar intervals. Statistical analysis was performed using Student’s t-test.

**RESULTS** Patient ages varied between 50 and 65 years, with a mean age of 55 years. Preoperative weights ranged between 225 and 435 lbs (mean 307). Average BMI was 51. Ninety four percent of patients had obesity-related co-morbidities. Six- and 12-month %EWL is listed in the table below along with complication rates. There were two late deaths in our series. There were 4 major morbidities: 1 enterotomy, 1 CVA, 1 intrahepatic abscess, 1 C. Diff colitis, and 3 minor morbidities: 2 gastric distention, and 1 anastomotic ulcer. There was no statistically significant difference in outcome between the groups studied (p>0.05).

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>%EWL 6 mo</th>
<th>%EWL 12 mo</th>
<th>% major comp</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>48.76</td>
<td>63.87</td>
<td>5</td>
</tr>
<tr>
<td>≥50</td>
<td>46.21</td>
<td>62.40</td>
<td>7.5</td>
</tr>
</tbody>
</table>

CONCLUSION Short-term follow-up suggests that bariatric surgery is safe and effective in patients over 50. Older patients had higher preoperative co-morbidities, but that did not negatively affect their outcome. Longer-term follow-up data are necessary to validate these preliminary results.

**P076—Bariatric Surgery**

**QUALITY OF LIFE PRIOR TO LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS DOES NOT VARY WITH BODY MASS INDEX, Jason G Murphy MD, Ruth R Leeth MPH,Teresa D Leath RN,Ronald H Clements MD, Department of Surgery, Section of Gastrointestinal Surgery, The University of Alabama at Birmingham, Birmingham, AL**

**INTRODUCTION** - Quality of life (QOL) has been shown to be markedly diminished due to morbid obesity. However, there is little data comparing the effects of morbid obesity (MO), super morbid obesity (SMO) and super super morbid obesity (SSMO) on QOL.

Methods - 370 patients seeking laparoscopic Roux-en-Y gastric bypass for morbid obesity between 8/01 and 8/04 were included in this study to assess preoperative quality of life, measured by the SF-36 Health Survey version 2. Participants were grouped into 3 categories according to body mass index (BMI): MO (BMI between 35 and severe co-morbidities and 50, n=226), SMO (BMI 50-59, n=114), and SSMO (BMI >60, n=30). Demographic information was collected in regards to gender (n=322 women and n=48 men), race/ethnicity (n=316 White, n=53 Black, and n=1 Hispanic), and pre-existing co-morbidities, including HTN (n=211), sleep apnea (n=201), DM (n=135) and GERD (n=113). Two-tailed Student’s t-test were used to compare the mean values of the 8 SF-36 scales for the 3 BMI categories to each other and to national normal values for women and men ages 35-44. Multiple linear regression analysis (MLRA) of the full model including both demographic and co-morbidity patient variables was performed to test if the impact of BMI on QOL at each of the 8 SF-36 measures.

Results - All patients had significantly worse QOL score in all 8 scales compared to national normal values for women and men ages 35-44. There were significant differences in the mean QOL among patients in the 3 BMI categories, specifically on physical function (PF) scale. In the full model using MLRA, QOL scores for the PF and role of physical scales were significantly lower for patients with a BMI>60 compared to patients with a BMI<50, p<0.01 and 0.05 respectively. Patients with a BMI between 50-59 had significantly lower PF scores than those with BMI<50, p<0.01. There were no statistically significant differences in the other SF-36 health survey scales among the 3 BMI categories.

Conclusion - Patients who are morbidly obese have a significantly lower self-reported QOL compared to national normal values for women and men in the same age range. Among those morbidly obese, higher BMI significantly reduces QOL only as it relates to actual and perceived PF. No other scale is significantly increased after patients reach morbid obesity.

**P077—Bariatric Surgery**

**PREGNANCY OUTCOME FOLLOWING LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING: WHAT IS THE OPTIMAL BAND ADJUSTMENT REGIMEN, Jonathan A Myers MD, Felise May G Barte BA,Sharfi Sarker MD,Vafa Shayani MD, Loyola University Medical Center**

Background: Pregnancy in obese women carries an increased risk of maternal and neonatal complications including gestational diabetes, hypertension, macrosomia, preeclampsia, neural tube defects, and late fetal death. As bariatric surgery...
becomes increasingly popular, more information is needed to determine the effect of rapid maternal weight loss on pregnancy and childbirth. Specifically, management of patients who have undergone laparoscopic adjustable gastric banding (LAGB) requires vigilant follow-up to define the optimal balance between maternal weight loss and appropriate fetal growth with relation to band adjustments during pregnancy.

Methods: A retrospective study of 331 patients who underwent (LAGB) between November 2001 and August 2004 was performed. Women of childbearing age were identified and further surveyed for history of pregnancy. Patients who had become pregnant since LAGB were questioned regarding their pre and post-bandning obstetric history, maternal complications, neonatal history, and band management during pregnancy.

Results: Of the 216 women who underwent LAGB, 14 pregnancies among 12 women were identified resulting in 7 live births and 1 miscarriage. Six women are currently pregnant. Patients became pregnant an average of 7 months after their banding surgery (1-27 months). They had lost 25.9 kg prior to becoming pregnant (2.3-45.5 kg) resulting in an average BMI of 38.2 (30.1-60.0 kg/m2) at conception. During pregnancy, the average weight gain was 4.8 kg (-11.8 to 22.7 kg), and the patients underwent an average of 1 band adjustment (0-3). The only maternal complication occurred in 1 patient who developed gestational diabetes. The average birth weight was 3.6 kg (2.8-4.5 kg) with delivery at 39 weeks (38-40 weeks).

Conclusions: Morbidly obese patients undergoing LAGB have no increased incidence of maternal complications relating to pregnancy. In our patient population, weight gain or loss during pregnancy is not an indication of fetal health. Although close follow-up is essential, removal of fluid from the band is not mandated in asymptomatic patients.

**P078—Bariatric Surgery**

**FIBRIN SEALANT REDUCES SEVERITY OF ANASTOMOTIC LEAKS FOLLOWING ROUX-EN-Y GASTRIC BYPASS, Lana G Nelson DD, Rodrigo Gonzalez MD, Krista Haines BA, Taylor Martin BA, Scott F Gallagher MD, Michel M Murr MD, Department of Surgery, University of South Florida, Tampa, FL, USA.**

INTRODUCTION: Anastomotic leaks contribute significantly to morbidity and mortality of Roux-en-Y gastric bypass (RYGB). We hypothesized that intraoperative application of fibrin sealant to the cardiojejunalostomy decreases the incidence and severity of leaks after RYGB. METHODS: Prospectively collected data on 144 consecutive patients who underwent RYGB using fibrin sealant (Tisseel, Baxter) (Group 1) were compared to our last 158 consecutive patients who underwent RYGB without fibrin sealant (Group 2). Clinical characteristics and operative outcomes were compared. Data are mean±SD. RESULTS: Patients in Group 1 and 2 had similar age (46±11 vs. 45±9 years), BMI (51±10 vs. 51±10 kg/m2) and gender distribution (81% vs. 81% women) (all p=NS). A significantly higher percentage of patients in Group 1 underwent laparoscopic RYGB (Table). The incidence of leaks was similar in both groups. However, 3/6 leaks in Group 1 and 3/5 leaks in Group 2 required operative treatment. Of the 3 patients in Group 2 who required operative treatment, 2 were found to have diffuse peritonitis. The 3 patients who required operative treatment in Group 1 had localized peritonitis. The remaining patients were treated non-operatively. Length of stay was significantly shorter in Group 1. CONCLUSION: Applying fibrin sealant to the cardiojejunalostomy reduces the severity of leaks in patients undergoing RYGB and significantly reduces length of hospital stay, which may translate into cost savings, and supports the ongoing use of fibrin sealant.

<table>
<thead>
<tr>
<th>Laparoscopic</th>
<th>Leaks</th>
<th>Length of stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>5/26*</td>
<td>4/4 12±6**</td>
</tr>
<tr>
<td>Group 2</td>
<td>4/41%</td>
<td>3% 43±27</td>
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*p<0.049; **p<0.001

**P079—Bariatric Surgery**

**ALTERATIONS IN PERIPHERAL BLOOD LYMPHOCYTE FREQUENCY IN UNDERWEIGHT, OBSESE PATIENTS*, Rober W O’Rourke MD, Thomas Kay BS, Clifford W Deveney MD, Lewinsohn David MD, Antony Bakke MD, Oregon Health and Science University Background:** Recent data suggests that obesity is associated with a state of immunocompromise. The mechanisms of altered immune function in obesity are unknown. Lymphocyte function is altered in many co-morbidities of obesity. Lymphocytes are therefore excellent targets for study of the mechanisms of obesity’s effects on immunity.

**Methods:** A panel of antibodies directed against lymphocyte cell surface markers was used to study peripheral blood lymphocyte phenotype in obese patients and lean controls.

**Results**

Obese patients demonstrate elevated total lymphocytes (mean difference = 17%, p < 0.001) and monocytes (mean difference = 1.4%, p= 0.01), and decreased frequency of CD8+ cells (mean difference = 8%, p = 0.02). Obese patients also demonstrated alterations in expression of CD95 and CD62L on a CD4dim lymphocyte subset, likely a monocyte population based on forward and side scatter characteristics.

**Conclusion:** These data support the hypothesis that lymphocyte phenotype and function is altered in obese patients. These alterations affect primarily monocytes and CD8+ lymphocytes. Alterations in CD95 and CD62L expression on monocyte subsets suggest accompanying functional abnormalities in lymphocytes in obese patients.

**P080—Bariatric Surgery**

**USE OF 48 HOUR CONTINUOUS INFUSION LOCAL ANESTHETIC SYSTEM IN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS APPEARS TO REDUCE POSTOPERATIVE PAIN, J T Paige MD, B P Gouda MPH, G P Scalia MD, T E Klainer MD, W J Raun MD, L F Martin MD, The Weight Management Center at St. Charles General Hospital and Louisiana State Health Sciences Center, New Orleans, LA USA.**

Background: Laparoscopic Roux-en-Y gastric bypass (RNYGB) is currently a very popular bariatric procedure in the United States. Although less painful than an open incision, lap RNYGB port sites can cause postoperative discomfort. Since 2003, we have been using a 48 hour continuous infusion local anesthetic system (On-Q®) from I-Flow Corporation at our largest port incision in an attempt to reduce postop discomfort. We have reviewed our experience using this system.

**Methods:** A retrospective, single institution review of 80 patients undergoing lap RNYGB was performed. Thirty-nine patients were selected from those undergoing the procedure between July to Dec. 2002 (without On-Q®). Forty-one were selected from July to Dec. 2003 (with On-Q®). Patient hospital records were reviewed for collection of data.

**Results:** Patients undergoing lap RNYGB in 2002 were on average younger (39.6 vs. 42.2 yrs) with slightly more morbidities (8.2 vs. 7.8) and higher BMI (46.7 vs. 46.2) than those in 2003. Patients from 2002, had, on average, lower admission post anesthesia care unit (PACU) pain scores (1.6 vs. 2.2) but higher discharge PACU pain scores (1.1 vs. 1.0) compared to 2003. Finally, on average, post-op pain scores for 2002 patients were lower on admission to the floor (1.4 vs. 2.1), but higher at 8 hr (1.1 vs. 1.0), 16 hr (0.9 vs. 0.7), 24 hr (1.1 vs. 0.9), and 48 hr (1.0 vs. 0.6) following arrival to the floor.

**Conclusion:** Use of a 48 hour continuous infusion local anesthetic system at the largest port incision site after lap RNYGB appears to decrease postoperative pain immediately in the PACU as well as up to 48 hours after arrival on the hospital floor. Further validation of these findings via a randomized prospective trial would be useful.

**P081—Bariatric Surgery**

**REINFORCING GASTRIC STAPLE LINE WITH A BODEGRADABLE MEMBRANE FROM PORCINE INTESTINAL SUBMUCOSA DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS.** Ricardo Cohen MD, Jose S Pinheiro MD, Jose Correa MD, Carlos A Schiavon MD, Center for the Surgical Treatment of Morbid Obesity, Hospital Sao Camilo, Sao Paulo, Brazil

Introduction: The purpose of this study was to evaluate the ease of use, efficacy and safety of a porcine small intestinal submucosa membrane applied over gastric staple lines. Acute staple line leak after divided Roux-en-Y gastric bypass (RYGB)
is reported to occur in 1% to 6% of cases and can be devastating. The true incidence, however, is not known. Many authors do not distinguish between staple line failure and anastomotic leak. Another complication of lesser consequence than leak, is staple line bleeding, that may require transfusion or reoperation. In most cases, it’s a situation that can increase operative time, requiring measures to stop the bleeding. We have been using a biomembrane derived from porcine small intestinal sub mucosa (SIS) to decrease staple line failure and bleeding. SIS membrane was already used in Urology and even reinforcing the gastrojejunal anastomosis in laparoscopic RYGB. Methods: The SIS biomembrane was used in 25 patients undergoing laparoscopic Roux-en-Y gastric bypass. SIS membrane was employed on a blue 45 mm Endoga cartridge (US Surgical Instr, Norwalk, CT, USA) during the creation of the gastric pouch. Operative time, intraoperative complications, visual staple line bleeding, operative blood loss, postoperative drainage output, and staple line leaks were recorded. Data was compared to 25 non-SIS cases performed during the same period. Results: The average operative time in both groups was similar (mean of 48 minutes). There were no intraoperative complications in both groups. SIS patients had no visual staple line bleeding and mean intraoperative blood loss was 25 ml. The non-SIS group had 2 cases of staple line bleeding requiring cauteterization and longer operative time. Operative blood loss in these patients was 75 ml. Drain output was significantly lower in the SIS group. No staple line leaks were found in both groups. Conclusions: SIS device was easy and safe to use. Staple line bleeding was non existent and intraoperative bleeding was less after SIS application. Although no staple line leaks were observed in both groups, handling the gastric reservoir was much easier with SIS reinforcement. Postoperative drain output was considerably lower in the SIS buttressed group. The use of SIS reinforcement is quicker than oversewing the staple line and less costly than using fibrin glue, while more practical than covering it with omentum or jejunal limb coverage.

P082–Bariatric Surgery

LAPAROSCOPIC GASTRIC BYPASS AND PHYSICIANS. A CONTRAINDICATION? Jose S Pinheiro MD, Ricardo Cohen MD, Jose Correa MD, Carlos A Schiavon MD, Center for the Surgical Treatment of Morbid Obesity, Hospital Sao Camilo, Sao Paulo, Brazil

Introduction: The purpose of this study was to compare the results of laparoscopic Roux-en-Y gastric bypass (RYGB) in physicians and in non-physician patients. Physicians are a special group of patients. Generally, they are reluctant in receiving and following medical instructions. LRYGB for the treatment of morbid obesity requires multiple patient commitments and a strict and life-long follow-up. Methods: We reviewed the data of 19 physicians who underwent LRYGB in our Institution (1.7% of our patients). OR time, intraoperative and postoperative complications, length of hospital stay, drain output, EWL, cure of comorbidities and follow-up were compared to non-physicians patients data when possible. Results: Most patients were women (15) and mean age was 38 (30 to 45). Mean preoperative BMI was 42. Patients presented with a mean of 2 comorbidities. One general surgeon, 1 endocrinologist, and 17 from other medical specialties formed the group. There were 3 revisional bariatric procedures. Two due to adjustable gastric band erosion and one due to failed open gastric bypass (weight regain). Mean OR time was 51 minutes. There were no intraoperative complications. There was 1 pulmonary embolism. Mean length of hospital stay was 39 hours. These results were similar to non-physician patients. Drain was removed in the first preoperative visit (a Jackson-Pratt drain is placed in all patients). After this one visit, only 1 patient continued the regular follow-up (the endocrinologist). This patient’s BMI is 24 and diabetes and GERD are cured. Conclusions: OR time, intraoperative complications, length of hospital stay, and drain output were similar to non-physician patients. Follow-up was extremely low resulting in a shocking and worrisome situation.

P083–Bariatric Surgery

OUTCOME OF SIMULTANEOUS VS. DEFERRED LAPAROSCOPIC CHOLECYSTECTOMY FOR CHOLELITHIASIS IN BARIATIC SURGERY. Raul J Rosenthal MD, David Podkameni MD, Flavia E Soto MD, Priscilla Antozi MD, Fernando Arias MD, Natan Zundel MD, Samuel G Steinmein MD, Bariatric Surgery, Cleveland Clinic Florida

Introduction: Lithogenesis and cholesterolosis are well-recognized side effects after bariatric procedures. Prophylactic cholecystectomy at the time of surgery remains controversial. The aim of this study was to analyze the outcome of laparoscopic cholecystectomy (LC) for cholelithiasis performed concomitant with bariatric surgery or deferred until after bariatric surgery when symptoms ensue. Materials & Methods: The medical records of 820 patients undergoing Laparoscopic Roux En-Y Gastric Bypass (LRYGBP) between January 2000 and October 2003 were retrospectively reviewed. All patients were considered morbidly obese and had sonographic documented cholelithiasis. Patients were divided into 2 groups: Group A: patients underwent simultaneous LRYGBP + LC and Group B: patients underwent deferred LC weeks or months after LRYGBP due to cholecystitis. Results: 190 patients (23%) presented with gallstones at the time of preoperative evaluation. In Group A, 50 patients (26.3%) had simultaneous LC while in Group B, 23 patients (16.4%) underwent deferred LC. In Group A, one patient (4.3%) developed LC and was successfully treated by laparoscopic assisted gastroscopy, transgastric ERCP and stent placement. In Group B, one patient (1%) developed acute cholecystitis and obstructive jaundice and underwent successful LC and transcyctic common bile duct exploration. Conclusions: There appears to be no significant difference in complications after simultaneous LRYGBP+LC when compared to LRYGBP and deferred LC. Complications of LC after LRYGBP require advanced laparendoscopic skills in order to be diagnosed and managed. Indications for simultaneous versus deferred LC remain unproven.

P084–Bariatric Surgery

RADIO FREQUENCY ABLATION (STRETTA) IN PATIENTS WITH PERSISTENT GERD AFTER ROUX-EN-Y GASTRIC BYPASS, Faisal G Gureshi MD, Joy Collins MD, Debra Taylor RN, Laura Velcu MD, Pandu Yenumula MD, Brian Lane MD, Tomazs Rogula MD, Pam R Schauer MD, Sam M Mattar MD, University of Pittsburgh, Department of Surgery

Background: Morbid obesity is associated with gastroesophageal reflex disease (GERD), which in the majority of cases, completely resolves after Roux-en-Y gastric bypass (RYGB). Patients with persistent symptoms have limited surgical options. We sought to evaluate the application of the STRETTA procedure in these patients. Methods: The medical records of all patients who underwent STRETTA for GERD following RYGB were reviewed. Demographic, preoperative and postoperative reflux data were collected. Follow up was 12.6±2.2 months. Data are mean±SEM; t-test was used for comparison purposes. Results: Seven patients received STRETTA 27.6±1 months after RYGB. All were women with a mean age of 49.4 years ±2.5 yrs. All patients had pre-bypass GERD symptoms for a duration of 45.6±8.0 months. Mean pre-bypass BMI was 45.9±2.3 kg/m2 and this was reduced to 29.3±2.4 kg/m2 after RYGB (p<0.001). Pre-STRETTA, all patients underwent a 48hr Bravo pH study that demonstrated significant reflux with a mean fraction time pH <4 of 6.7±2.3%. After STRETTA, 4 patients had complete resolution of their symptoms with normalization of pH studies. (mean fraction time pH <4, 1.8±0.7%). Two patients did not have adequate relief of symptoms after STRETTA and one patient was lost to follow up. Conclusion: STRETTA is a potential option in the treatment of persistent GERD in patients who have undergone gastric bypass. Further study will be required to evaluate the long term efficacy of this procedure and the potential role of booster therapy for those patients with suboptimal outcomes.

P085–Bariatric Surgery

USE OF THE GASTRIC ANTRUM IN LAPAROSCOPIC ROUX-Y GASTRIC BYPASS, Patrick R Reardon MD, Wiljon Beltre
Introduction: Laparoscopic roux-y gastric bypass (RYGB) is a frequently performed procedure. We present our technique for using the gastric antrum as an anchor point for the roux limb during and after the operation.

Methods: During RYGB we perform the creation of the roux limb as the first portion of the operation, bringing it in a flat, supine position during this portion of the surgery. We routinely use an antecolic, antegastric approach for the roux limb. During creation of the gastric pouch and gastrojejunostomy, we place the patient in a steep head-up, reverse Trendelenburg (RT) position. This position makes retrieval of the proximal end of the roux limb difficult later in the surgery. Therefore, once the roux limb has been created, the greater omentum is divided in its midportion. The roux limb is then properly oriented and the proximal end brought up and sutured to the gastric antrum. The patient is then placed in RT position and the suture holds the roux limb in proximity and properly oriented without interfering with the gastric pouch creation. When the gastric pouch has been created, the roux limb is then cut loose from the antrum and advanced to create the gastrojejunostomy. When the gastrojejunostomy is complete, the roux limb is then sutured to the adjacent antrum as it passes over this area, keeping slack on the portion of the roux limb proximal to the antrum suture. When the patient is in an upright position postoperatively, this should let the antrum bear the weight of the roux limb instead of the gastrojejunostomy anastomosis doing so.

Conclusion: Suturing the roux limb to the gastric antrum is beneficial during and after laparoscopic RYGB. We believe that our described technique makes it easier to find the proximal roux limb at the time of antecolic, antegastric, roux-Y limb formation. In addition, we believe that, postoperatively, it will cause the antrum of the gastric remnant to bear the weight of the roux limb when the patient is upright, and not the gastrojejunostomy anastomosis.

This may lead to fewer leaks and a lower stenosis rate.

P086–Bariatric Surgery


OBJECTIVE: Many techniques for performing the gastrojejunostomy required in the laparoscopic roux-en-Y gastric bypass (LRYGB) have been described. The current study presents the results of a previously unreported method. METH-ODS: Twenty-one patients (2 males and 19 females) with morbid obesity underwent laparoscopic roux-en-Y gastric bypass over a 3-month period. The gastrojejunostomy was created by performing a gastric transection to form a 20-30cc pouch using a linear stapler, followed by gastrostomy with an ultrasone scalpel along the anterior surface of the pouch. A purse string suture is then placed circumferentially using standard laparoscopic intracorporeal suturing with an endo-stitch device. (US Surgical Corporation, Connecticut) Finally a 25mm purse string circular stapler anvil is placed within the abdomen via the 15mm left lower quadrant port site. The shaft of the anvil is grasped, and the head of the anvil is dunked? into the gastrostomy. The purse string is then tied intracorporeally. RESULTS: A total of 21 patients have undergone LRYGB at our institution using this technique. The early results have been excellent in all cases with no leaks, no strictures, and no obstructions.

CONCLUSION: The gastrostomy with anvil dunk is a reproducible and safe method of constructing the gastrojejunostomy. It is an advanced laparoscopic technique, which closely resembles open surgical techniques and provides a safe alternative to existing methods.

P087–Bariatric Surgery

REVISIONAL BARIATRIC SURGERY: LESSONS LEARNED, Adheesh A Sabnis MD, Bipan Chand MD, Department of General Surgery, Minimally Invasive Surgery Center, Cleveland Clinic Foundation

Introduction: A historical review of bariatric operations reveals surgeries that have fallen out of favor as a result of poor outcomes and complications. Complications include mal-absorptive syndromes, severe gastroesophageal reflux, anastomatic strictures, and inadequate long-term weight loss. Revisional surgery has itself many complications including sepsis and failure to improve on weight loss.

Methods: A series of 20 patients underwent revisional operations over a three year period at the Cleveland Clinic Foundation. Previous operations included vertical banded gastroplasty (11), roux-en-y gastric bypass (4), horizontal gastroplasty (3), bilipancreatic diversion (1) and jejunal-ileal bypass (1). Indications for revision included poor weight loss (9), severe gastroesophageal reflux (7), anastomatic stricture or intestinal obstruction (6) and failure to thrive (1). Some patients had multiple indications for surgery. Pre-operative workup included esophageal manometry, esophageal pH studies, EGD, and upper GI series in the majority of patients.

Outcomes are reported from an IRB approved prospective database.

Results: All 20 patients, including 18 women and 2 men, underwent successful operations. The mean pre-op BMI for the entire group was 45.7 kg/m2 with a mean reduction of 12% of BMI. Nine patients underwent revisional surgery for failed weight loss (BMI >30). All nine patients had prior gastropasty. Seven patients underwent revision for severe gastroesophageal reflux. Pre-operative pH studies and manometry and abnormal esophageal pH studies. Five patients have complete resolution of symptoms while two patients have occasional breakthrough symptoms requiring intermittent anti-reflux medications. Five patients underwent either revision of an anastomatic stricture, alleviation of an internal hernia, or lysis of adhesions for obstructive systems. One patient underwent reversal of a jejunal ileal bypass for failure to thrive. Most patients in the series had a RYGB as the revisional surgery. Complications include ventral hernia (1), wound infection (1) and splenic injury (1). There were no anasto-motic leaks in our group.

Conclusion: When weight loss is inadequate or complications occur after bariatric surgeries, we found that RYGB is an effective revisional procedure. Surgeons must have a thorough knowledge of the various surgical techniques employed, both past and present, in order to deal with their complications.

P088–Bariatric Surgery

AVOIDANCE OF SELECTIVE COINCIDENT CHOLECYSTECTOMY IN PATIENTS UNDERGOING LAPAROSCOPIC BARIATRIC SURGERY, Andras Sandor MD, Donald R Czerniak MD, Patrick McEnaney MD, Lian Haveran DO, Richard A Perugini MD, Demetrius E.M. Litwin MD, John J Kelly MD, Department of Surgery, UMASS Memorial Medical Center, Worcester, MA, USA.

The association between rapid weight loss after bariatric surgery and the development of cholelithiasis is well established. Simultaneous laparoscopic cholecystectomy (LC) coincident with laparoscopic Roux-en-Y gastric bypass (LGBP) has been advocated but can be technically challenging. Our objective was to evaluate the risk associated with avoiding simultaneous LC in bariatric patients. Patients were divided to two groups. In Group I (6/30/99 ? 11/25/01) all pts with a positive preoperative US for the presence of gallstones. Prospectively collected data in a tertiary care academic medical center entered into a patient database was retrospectively reviewed. 268 consecutive pts underwent LGBP for morbid obesity between 6/30/99 and 10/30/02. Pts with previous cholecystectomy (n=71) were not included in the study. All pts with intact gallbladder had preoperative transabdominal US to rule out cholelithiasis. Patients were divided to two groups. In Group I (6/30/99 ? 11/25/01) all pts with a positive preoperative US underwent selective LC coincident with the LGBP. In Group II (11/26/01 ? 10/30/02) all pts were treated conservatively regardless of the preoperative US result. Patients in Group II with symptomatic cholelithiasis at the time of surgery (n=1) underwent coincident LC and were excluded from the follow-up.

In Group I (n=123) 26 pts with a positive US underwent selec-tive LC.
operative LC. Of the 97 pts with an initial negative US 13 pts (13.4%) developed symptomatic cholelithiasis and underwent subsequent LC after a median follow-up of 48.5 months. The mean delay period from the LGBP to LC was 14 months. In Group II (n=73; median follow-up=28.5 months) 17 pts were identified with cholelithiasis preoperatively, of whom 3 pts (17.6%) developed symptomatic disease requiring LC after a mean delay of 21 months. Of the pts with negative US (n=56) 7 pts (12.5%) developed symptomatic disease requiring LC (mean delay = 17 months). The two ratios are not significantly different with 95% confidence (CI=16.86 to 27.06). None of the interval cholecystectomies had any complications and one pt underwent successful lap common bile duct exploration. Simultaneous LC coincident with laparoscopic bariatric surgery can be difficult due to trocar positioning and anatomic constraints. Patients with or without preoperative evidence of cholelithiasis can be followed clinically for the development of symptomatic gallstone disease. LC can be performed safely at a later time in this population should symptoms arise.

**P089—Bariatric Surgery**

**AVOIDING OBSTRUCTION AT THE JEJUNO-JEJUNOSTOMY DURING LAPAROSCOPIC GASTRIC BYPASS,** Rebecca Shore MD, Scott Shikora MD, Julie Kim MD, Michael Tarnoff MD, Laurent Layani MD, Gold Coast Medical Center, Center for Minimally Invasive Surgery, TUFTS-New England Medical Center.

Introduction: Laparoscopic gastric bypass (LGBP) is rapidly gaining popularity in the treatment of morbid obesity in the United States. Many technical variations of the operation currently exist. Commonly a side to side anastomosis is created between the biliopancreatic limb and the roux limb with a 60mm Endo GIA (USCC, Norwalk, CT). The entry site for the stapler must then be closed. Initially, we closed this opening linearly, along the length of the jejunum-jejunostomy (JJ), with this technique we encountered a 4.8% JJ obstruction rate. Subsequently, we changed our technique in an attempt to decrease this troubling complication. This abstract describes a bi-directional stapled JJ to assure a wide opening between the two limbs.

Method: After the 60mm Endo GIA is used to create the side to side anastomosis a 30mm Endo GIA is positioned in the opposite direction and fired creating a 90mm anastomosis. The opening is then closed transversely similar to the Heineke-Mikulicz pyloroplasty with a single firing of the 60mm Endo GIA. The stapled jejunal specimen is removed and inspected to assure continuity of the serosal layer. We then close the mesenteric defect with a running suture and incorporate an anti-obstruction stitch.

Results: A review of our institution’s data reveals that with the unidirectional closure we had a 4.8% anastomotic obstruction rate (6/125 cases). Four of these six patients required operative intervention. Since implementing the bi-directional anastomosis our obstruction rate is 0% (0/733 cases).

Conclusion: Bi-directional stapling of the JJ results in a wide opening, is technically feasible and decreases the incidence of obstruction.

**P090—Bariatric Surgery**

**A NEW DEVICE BY USING OMENTUM FOR PREVENTING COMPLICATIONS DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY,** Nobumi Tagaya PhD, Kazunori Kasama MD, Yasuharu Kakihara MD, Suhail Shaikh MD, Bruce Bernstein PhD, Martindale Carolyn RN, Manuel Lorenzo MD, Richard Newman MD, Carlos Barba MD, Department of Surgery, St. Francis Hospital and Medical Center, University of Connecticut School of Medicine.

The purpose of this study is to compare the safety and efficacy of Roux-en-Y gastric bypass (RYGB) surgery for morbid obesity between patients 55 years and older with patients younger than 55 years and to evaluate whether or not the laparoscopic approach provides a better outcome in the older age group.

A retrospective chart review was conducted at a single tertiary care institution. Morbidly obese patients 55 years and over were included if they underwent laparoscopic (lap) or open RYGB surgery between January 1999 and March 2004. A random sample of 122 patients were selected from a total of 494 patients younger than 55 who had lap or open RYGB during the same study period. Demographics, preoperative body mass index (BMI), comorbidities, length of stay (LOS), perioperative complications, and percent weight loss were compared between the two age groups.

A total of 61 consecutive patients 55 years and over underwent RYGB surgery during the study period. There were no significant differences between the two age groups with respect to gender, preoperative BMI, LOS, and percent weight loss at 3, 6, and 12 months. When comparing comorbidities (young vs old), there were significant differences (p < 0.05) in the prevalence of coronary artery disease (3.3 vs 13.1%), diabetes mellitus (20.7 vs 39.3%), and hypertension (39.8 vs 77.0%). There were no significant differences between the prevalence of COPD and sleep apnea. There were two perioperative mortalities in the younger group and one in the older group. When comparing perioperative complications between the two age groups (young vs old) there were no significant differences in the rates of cardiopulmonary complications (1.6 vs 6.6%), anastomotic leaks (4.1 vs 4.9%), postoperative bleeding (0 vs 3.3%), and wound infections (15.0 vs 18.0%). The lap approach was utilized in 49.2% of the younger group and 29.5% of the older group (p < 0.05). When comparing the lap and open approach in the older age group there were no significant differences in demographics (except BMI), LOS, and perioperative complications.

Despite the higher rate of comorbidities in the older age group, this study demonstrates that RYGB surgery for morbid obesity in properly selected patients age 55 years and over can safely and efficaciously be performed when compared to younger patients. In addition, the lap approach in patients 55 and over does not result in a shorter LOS or less perioperative complications.

**P092—Bariatric Surgery**

**LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING: RESULTS OF THE FIRST 500 CASES USING THE PARIS FLACCIDA TECHNIQUE,** Craig J Taylor MD, Laurent Layani MD, Gold Coast Obesity Surgery Centre, Gold Coast Queensland Australia.

INTRODUCTION. Whilst the Paris Flaccida technique of LAGB placement has been shown by experienced bariatric surgeons
to have a fewer complications and similar efficacy to the peri-gastric approach, it is unclear what results can be achieved by general surgeons using the pars flaccida technique without extensive previous gastric banding experience. We sought to clarify this by analysing the results of all LABG's placed using the pars flaccida approach by a general surgeon. The relationship between the degree of visually identified liver disease and portal fibrosis was measured by the presence of a histologic diagnosis of steatosis and fibrosis, respectively. The relationship between the visual identification of liver disease, biopsies should be taken in all patients to guide further management. The relationship between the visual appearance of a diseased liver and actual pathology in the morbidly obese patient is undefined.

METHODS: A total of thirty-seven morbidly obese patients undergoing laparoscopic Roux-en-Y gastric bypass were enrolled in a prospective study. The appearance of their livers was independently scored by two surgeons on a 4 point scale based on the degree of fat deposition visualized (>67% fat - severe; 33-66% fat - moderate; <33% fat - mild; and no obvious pathology). Liver biopsies were performed in all patients and reviewed by an experienced pathologist without knowledge of the intraoperative scoring or the clinical history of the patient. Data was analyzed using chi squared and odds ratio with 95% CI and positive predictive values calculated.

RESULTS: The mean BMI of patients in the study was 49.2 and the average age of enrolled patients was 40 years. Eighty-one percent of the patients were female, which was representative of the gastric bypass patient population. In patients with a visual scoring greater than mild disease, there was a correlation with the presence of a histologic diagnosis of steatosis (x2=11.65, p=0.0006, PPV 63%). However, there was no correlation between the degree of visually identified liver disease and other pathology identified histologically (steatohepatitis and portal fibrosis).

http://www.sages.org/
CONCLUSION: Although surgeons commonly comment on the degree of liver disease at the time of obesity surgery, the ability to reliably identify liver pathology without biopsy in the morbidly obese patient is limited. Even in patients with no visually appreciable liver disease, it is commonplace for a biopsy to histologically demonstrate steatosis, fibrosis, or steatohepatitis. Because of the increased prevalence of liver disease in the morbidly obese patient, we recommend that a liver biopsy be routinely performed on all patients at the time of obesity surgery to guide further monitoring, risk stratification, and future treatment options.

P096--Bariatric Surgery
THE RELATIONSHIP OF GASTRIC EMPTYING & POSITION OF THE GIANTSTROEJUNOSTOMY (GJ) IN THE LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS (RYGBP) PATIENTS, ANTECOLIC VS. RETROGASTRIC; IS THERE A DIFFERENCE?, John Vadegar MD, Oliver Block MD, William Bertucci MD, Todd Drasin MD, Eric Dutson MD, Salvador Valencia MD, Debbie Frickel RN, Barbara Kadell MD, Carlos Gracia MD, Amir Mehran MD, UCLA Medical Center, Los Angeles, California
Introduction: It is often claimed that retrogastric GJ is more anatomical/physiological & hence drains better. It was our contention to assess this in the RYGBP group.
Method: From 1/2003 to 6/2004, one hundred of each Retrocolic-Retrogastric (RC/RG) vs. Antecolic-Antegastric (AC/AG), RYGBP were performed by the UCLA bariatric group. The data pertaining to gastric emptying, time to discharge, comorbidities & any complications were collected to a prospective database. All the patients obtained an upper GI swallow on postoperative day one. Same radiological techniques were used in all the cases, and same group of radiologists reviewed the films. All the studies with delayed emptying, i.e.: contrast hold up of various degree, were labeled as such. The patient records were subsequently reviewed and the data was then analyzed.
Results: There were 12 delayed gastric emptying in the RC/RG group vs. 19 in the AC/AG group. Statistical analysis of the data using Chi-Square test, showed no significant difference between the 2 groups, with a P=0.17. There was also no association with relation to Body Mass Index (BMI), diabetes or hospitalization period.
Conclusion: Our data suggests that there does not appear to be a statistically significant difference, between the gastric emptying, in the RC/RG vs. AC/AG group in the RYGBP population. This may also hold true in the non-bariatric patient population, although a larger study group should be reviewed.

P097--Bariatric Surgery
THE INCIDENCE OF SMALL BOWEL OBSTRUCTION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS USING AN ANTECOLIC ROUX LIMB, Sherman Yu MD, Michael Snyder MD, Patrick Sawyer, PA-C, University of Colorado Health Sciences Center and Rose Medical Center
Background: Laparoscopic Roux-en-Y gastric bypass (RYGB) is a safe and effective alternative to standard open Roux-en-Y gastric bypass. Reports suggest that a retrocolic roux limb in RYGB may result in as high as a 5% incidence of small bowel obstruction (SBO) due to internal hernias and mesocolonic constrictions. The placement of the roux limb in an antecolic position reliably identify liver pathology without biopsy of SBO. We hypothesized that an antecolic roux limb would result in a decreased incidence of SBO in patients undergoing RYGB.
Methods: The charts from the first 400 consecutive RYGB patients operated on from 3/01-2/04 at a university affiliated community hospital were retrospectively reviewed. All cases were performed using an antecolic, antegastric roux limb placed through a small defect made in the omentum. A circular stapler with transoral placement of the anvil was used for the creation of the gastrojejunostomy. Omental and mesenteric sertmers were not closed.
Results: Four hundred patients underwent RYGB with a mean BMI of 48 (37-71). The average age was 45 years. Eighty-six percent of the patients were female. Five patients developed SBO (1.3%). Three obstructions occurred at the omental window, 1 obstruction was secondary to a stricture at the jejunal-jejunostomy, and 1 obstruction occurred from an incarcerated umbilical hernia resulting in an anastomotic leak. One additional anastomotic leak occurred unrelated to a SBO. All patients underwent operative repair of the SBO with no resultant mortality.
Conclusions: In our series of 400 patients undergoing RYGB, the incidence of SBO was 1.3%. The anecolic placement of the roux limb eliminated the mesocolon as a source of SBO. Hence, we did not introduce a new risk factor that resulted in SBO. Therefore, we conclude that the anecolic placement of the roux limb decreases the risk of SBO compared to a retrocolic roux limb.

P098--Bariatric Surgery
PORT COMPLICATIONS FOLLOWING LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING FOR MORBID OBESITY, Subhi Abu-Abied MD, Andrei Keidar MD, Dan Bar-Zohar MD, Joseph Klausner MD, Department of Surgery B, Tel-Aviv Sourasky Medical Center
Objectives: Laparoscopic adjustable gastric banding (LAGB) is gaining widespread acceptance, but the technique has disadvantages secondary to the material wear and tear around the port and the connecting tubing, that can lead to system failure. Port site complications are considered common; however, only few authors analyze them, and no optimal technique of port implantation and management is suggested.
Method and Procedure: LAGB includes placement of an adjustable band, 2 cm below the gastroesophageal junction, thus restricting the gastric reservoir. The inner part of the band is a silicon sleeve connected to a subcutaneous port (Bioenteries®, Carpenteria, CA, USA), which enables band width adjustment. All patients who suffered from complications involving the tubing or the access port were included in the study. Their preoperative complaints, operative notes and hospitalization files were retrospectively reviewed.
Results: Only 1272 patients (of a total of 2134 operated on) were available for a mean follow-up of 57 months. During this period, 91 (7.1%) patients suffered from port complications that required 103 revisional operations. 63/91 suffered from system leak, 17/91 from infectious problems and 10/91 from miscellaneous problems. Overall, port complications led to band removal in 6/91 patients and port replacement in one.
Conclusions: Although among the most common complications of LAGB, access port complications are the most annoying ones, rendering the device susceptible to failure. The combination of careful surgical technique, routine use of radiological guidance for band adjustment and improvement of the port design may be keys for minimizing complications, obviating further, unnecessary surgical procedures.

P099--Colorectal/Intestinal Surgery
LAPAROSCOPIC LIGASURE SMALL BOWEL ANASTOMOSIS, Abdullah Al Dohayyan MD, King Khalid University Hospital
Ligasure is a machine used to seal vessels. The same concept is applied to use the dieharry capability in cutting and sealing the mucosa of small bowel. The procedure was done in 3 dogs using 3 trocars size 5 mm. A loop of small bowel was choosen and side to side anastomosis was carried out in two layers with outer continous seromuscular suture using silk.
Entromtomy is done in both edge of the small bowel. The jaws is applied to use the diathermy capability in cutting and sealing the mucosa of small bowel. The procedure was done in 3 dogs using 3 trocars size 5 mm. A loop of small bowel was choosen and side to side anastomosis was carried out in two layers with outer continous seromuscular suture using silk.

P100--Colorectal/Intestinal Surgery
LAPAROSCOPIC RESECTION FOR COMPLETE AND INTERNAL RP, Ravinder K Annamneni MD, John H Marks MD, Thomas Curran BA, Gerald Marks MD, The Lankenau Hospital and Lankenau Institute of Medical Research, Wynnewood, PA, USA
OBJECTIVE: The aim of this study is to assess the efficacy and safety of laparoscopic (lap) resection for rectal prolapse (RP).
METHODS: From 1996 to 2004, 32 consecutive patients (27 women) had lap resection with rectopexy for complete (CRP) (N=16), or hidden (HRP) (N=16) rectal prolapse. Data was analyzed from a prospective database.
RESULTS: The mean age was 56 years (range, 28-84). Primary complaints were transanal protrusion (16), impaired fecal eXtrusion (13) and fecal incontinence (3). Preoperative assessment included clinical examination, selective imaging including barium enema, defecography, colonoscopy and transit studies. Twenty-five pts (78%) had sphincter disorders with dissection rectopexy, 5 pts (16%) had a left colectomy with rectopexy, and 2 pts (6%) had total abdominal colectomy and rectopexy. There were 18 conversions open. Mean estimated blood loss was 205 (range, 50-800) cc. No pt needed blood transusion. Mean number of incisions was 3.5 (range, 3-5). Mean length of largest incision was 4 (range, 3-6.1) cm. There was no mortality. Complications noted in 4 pts (12%): two developed small bowel obstruction, one requiring surgery; one instance of minor incisional bleeding and one urinary tract infection. Mean follow-up was 15.3 (4-52) months. Mean post-operative hospitalization was 4.5 (range, 2-8) days. Two (6%) pts developed full thickness recurrence: one in 10 months and another in 18 months after surgery, both of which were repaired by a Delorme procedure without recurrence. Pts with fecal extrusion impairment required a transanal mucosal excision, in 7/16 pts, all successfully treated. Twenty pts (62.5%) had complete resolution and 12 (37.5%) while improved had minor residual functional complaints.

CONCLUSION: Colectomy with rectopexy for CRP or HRP can be safely performed laparoscopically with low morbidity and acceptable functional outcome. As in open surgery mucosal resection, the operative hospitalization was 4.5 (range, 2-8) days. Two (6%) pts developed full thickness recurrence: one in 10 months and another in 18 months after surgery, both of which were repaired by a Delorme procedure without recurrence. Pts with fecal extrusion impairment required a transanal mucosal excision, in 7/16 pts, all successfully treated. Twenty pts (62.5%) had complete resolution and 12 (37.5%) while improved had minor residual functional complaints.

CONCLUSION: Colorectal surgery may be performed laparoscopically with low mortality and acceptable functional outcome. As in open surgery mucosal resection, the operative hospitalization was 4.5 (range, 2-8) days. Two (6%) pts developed full thickness recurrence: one in 10 months and another in 18 months after surgery, both of which were repaired by a Delorme procedure without recurrence. Pts with fecal extrusion impairment required a transanal mucosal excision, in 7/16 pts, all successfully treated. Twenty pts (62.5%) had complete resolution and 12 (37.5%) while improved had minor residual functional complaints.

P101–Colorectal/Intestinal Surgery
SAME DAY DISCHARGE AFTER LAPAROSCOPIC COLORECTAL RESECTION, Mehran Anvari PhD, Allan Okrainec MD,Cliff Sample MD,Herawaty Sebajang MD,Ann Brannigan MD, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

Laparoscopic colorectal resection has been associated with reduced length of stay. We have initiated a program of discharging patients within the same day (24 hours) after laparoscopic colorectal resection and with a pain pump to provide local analgesic control to the extraction excision site. 5 patients with a mean age of 65.4 (range 44-83) underwent laparoscopic colorectal resection (3 Right Hemicolectomy for cancer, 1 Anterior Resection for cancer, 1 sigmoid resection with stomal closure). The mean OR time was 131±9 mins and the median ASA Score was 3 (range 2-4). The mean time to discharge was 20.6±0.7 hours. Prior to discharge, 2 patients required oral narcotics for abdominal pain. There were no peri-operative complications and all patients were satisfied with early discharge and had unremarkable recoveries.

Conclusion: Same day discharge after laparoscopic colorectal resection is safe and feasible in select patients with good home support. Use of a local pain pump helps reduce the need for post-operative narcotics.

P102–Colorectal/Intestinal Surgery
LAPAROSCOPIC HAS A PLACE IN THE REVERSAL OF HARTMANN PROCEDURE, George Bouras MD, Maria Mara Arenas Sanchez, MD,Hartataka Inoue MD,Joel Leroy MD,Francesco Rubino MD,Didier Mutter PhD,Antonello Forgione MD,Jaques Marescaux MD, IRCAD/EITS, University Hospital of Strasbourg, France

Background: It has been suggested that laparoscopic reversal of Hartmann procedure (LRHP) is associated with less patient morbidity and shorter hospital stay compared to open surgery. The aim of this study was to evaluate the outcomes of LRHP in order to assess whether such advantages are conveyed in our experience.

Methods: A retrospective analysis of all patients who underwent reversal of Hartmann procedure between August 1998 and August 2004 was performed. Data collection included pre-operative (age, sex, ASA score, BMI, diagnosis, interval to reversal), intra-operative (operative time, intra-operative findings, conversion) and post-operative (morbidity, mortality, hospital stay, follow-up) data.

Results: Reversal of Hartmann procedure was performed in 36 patients. Twenty-two cases were performed by laparoscopy and 14 cases were performed by open surgery. There was no significant difference between laparoscopic and open groups in terms of age, sex, ASA score, BMI, diagnosis, follow-up and time to reversal. For the laparoscopic group, the male to female ratio was 55.9 years (range 40-82). mean ASA score was 2.09 (range 2-3), mean BMI was 26.1 kg/m2 (range 21.2-33.1), mean interval to reversal was 5.8 months (range 1-13), and mean follow-up was 10.1 months (range 1-72). The mean BMI was lower for the laparoscopic group compared to the open group (26.1 vs 29.1 kg/m2, p<0.05). Laparoscopic RHP was completed in 21/22 patients (conversion rate 4.5%), the only conversion being due to due to severe adhesions. Compared to open surgery, the mean operative time was less (174 vs 223 minutes, p<0.05) and the mean hospital stay was shorter (9.3 vs 12.7 days, p<0.05) for LRHP. The morbidity rate following LRHP was 27%, the commonest complication being anastomotic stenosis requiring endoscopic dilatation which occurred in 4/22 (18%) following LRHP and 3/14 (21%) following open surgery (p=NS). One rectal fistula and two post-incisional hernias were observed only after open surgery. There were no deaths attributable to the operation during the study period.

Conclusions: LRHP was feasible and associated with a low complication rate. When applicable, the operative morbidity of LRHP compares favourably with that of open surgery in our experience.

P103–Colorectal/Intestinal Surgery
THE POSSIBLE INFLUENCE OF LAPAROSCOPIC SURGERY ON INTRA-ABDOMINAL TUMOR SPREADING IN PATIENTS OF COLORECTAL CANCER — CLINICAL AND ANIMAL STUDY, Wei-Shone Chen PhD, Div. of Colorectal surgery, Veterans General Hospital medical center, National Yang-Ming University, Taipei, Taiwan

INTRODUCTION: The main purpose of this study is to investigate the influence of local tumor staging (T-staging) on the outcome of patients with colorectal cancer undergoing laparoscopic surgery. To reinforce our clinical results, we also established a more objective murine model by using marker-gene transfected colon cancer cells for further investigation. METH- ODS: We retrospectively examined 270 laparoscopic operations since 1993 done by a same surgeon with the median follow-up period of 62 months. 172 of them received operations due to colorectal malignancy. We tried to investigate the association of tumor staging, especially the local tumor invasion, with the outcome of patients. We also designed an animal model by inoculating 106 tumor cells into lower abdominal cavity of BALB/c mice by a mini-laparotomy. The mice were randomized to undergo pneumoperitoneum with CO2 (n=10), helium (n=10), or to act as controls (n=10). Penumoperitoneum was established over 20 min at a pressure of 10 cmH2O. The distribution pattern and the weight of peritoneal tumor growth of each mouse were recorded and analyzed at 15 days after surgery. RESULTS: Patients of staged III had a significantly higher recurrence rate (17%) than that of staged II patients (4.4%) (p<0.006). Patients of T3, T4 had high recurrence rate either locally (4.6%) or carcinomatosis (5.7%). However, none of the T2 patients developed recurrence during the follow-up period. Regarding to the murine model, the mean tumor weight ratio (3.23%±0.138%) of the pneumoperitoneal group was 4 times larger than that of the control group (p<0.001). Regarding the use of different insufflation gases over tumor growth, CO2 accelerates tumor growth more significantly than helium (p<0.001). Intra-abdominal distribution (p=0.047) and diaphragm spreading (p<0.001) were significantly greater in the pneumoperitoneum group than the control group. CONCLUSION: The results of our current study suggest that insufflation during pneumoperitoneum may increase the risk peritoneal dissemination while existing of free tumor cells in the intra-abdominal cavity, and the above risk is greater in those of CO2-insufflation than of helium-insufflation. Patients with locally advanced tumor (T4) should be carefully re-evaluated the indication for laparoscopic resection.
P104—Colorectal/Intestinal Surgery
PRELIMINARY EXPERIENCE OF LAPAROSCOPY-ASSISTED EXPLORATION OF OBSCURE INTESTINAL BLEEDING AFTER CAPSULE ENDOSCOPY, THE KOREAN EXPERIENCE. MINYOUNG CHO MD, JIN KIM MD, JEOUNG WON BAE, JONG SUK KIM, JAE YOUNG CHUL KIM, CHEONG W, SUNG OCK SUH, Surgery, College of Medicine, Korea University.
Background: Obstructive intestinal bleeding (OIB) is generally defined as recurrent acute or chronic bleeding for which no source has been identified by routine radiologic and endoscopic examination. The aim of this study was to report our early experiences detecting small bowel bleeding by capsule endoscopy (CE), and the results of laparoscopic-assisted operations for OIB.
Materials and Methods: 75 patients with obscure gastrointestinal bleeding were examined by CE. Twelve patients of the active bleeding group underwent laparoscopy-assisted operation, and we carried out intra-operative enteroscopy to find the focus of the bleeding.
Results: Laparoscopic localization of the lesion was successful only for 4 patients?those with Meckel's diverticulum, gastrointestinal stromal tumor, lymphoma, and ischemic necrosis. In 3 cases in which there was no natural passage of the capsule endoscope, lesions were identified by small bowel exploration through simple palpation. Intra-operative enteroscopy was performed in 5 cases, in order to localize the lesion. The lesions that were identified by CE pre-operatively were resected successfully, via laparoscopic or laparoscopy-assisted operation. The gastrointestinal bleeding has not recurred during the post-operative follow-up period (mean 10.6 months).
Conclusion: Intraoperative enteroscopy needs to identify small intestinal lesions that cannot be detected by laparoscopy, or by conventional small bowel exploration. Our results suggest that laparoscopic or laparoscopy-assisted surgery is a feasible method for managing OIB patients whose lesions are identified by pre-operative CE. The laparoscopy-assisted operation is effective in explorations of the intra-abdominal cavity and the identification of some lesions. It can also be performed as an adequate "mini-laparotomy?"
surgeons working in a community hospital, were reviewed. Data extracted from the charts included patients’ demographics, surgical indications and procedures, conversion rate, past history, operative time, post-operative recovery time and complication rates.

Results: Of the 154 patients, 70 were men. The mean age was 60. Overall, 62% of the patients had a history of prior abdominal surgery. The majority of cases (77%) were done for benign disease. Segmental resection involving the left colon was done in 122 patients and right hemicolectomy in 32. The rate of conversion to open surgery was 9.6%, and 12% for diverticulitis (n=83). For LCR, the median operative time was 120 minutes and median hospital stay 5 days. The complication rate was 21.6% for LCR. Mortality rate was 2.1%.

Conclusion: Outcomes of LCR done by a team of general surgeons working together in a community hospital are similar to historical results from academic health science centers.

**P109—Colorectal/Intestinal Surgery**

**LAPAROSCOPIC TREATMENT OF SMALL BOWEL OBSTRUCTION FROM MECKEL’S DIVERTICLUM, Robert J Wilmoth MD, Michael E Harms MD, Aimen Shabaan MD, Jon C Gould MD, Bruce A Kent W, Robert J Wilmoth MD, Craig S Swafford MD, Matthew L Mancini MD, Department of General Surgery, University of Tennessee Medical Center, Knoxville, TN**

**Objective:** Laparoscopy is an effective means for the evaluation of uncertain intra-abdominal pathology. We present a case-report utilizing laparoscopy for diagnosis and treatment of a mechanical small bowel obstruction secondary to a Meckel’s diverticulum.

**Case Report:** Patient is a 14-year-old male who initially presented with non-specific abdominal pain, nausea, and vomiting in December, 2003. CT scan of the abdomen and pelvis revealed a normal appendix with a small amount of free fluid in the pelvis. There was suggestion of mechanical small bowel obstruction with transition zone in the pelvis. The patient was taken to the operating room for diagnostic laparoscopy.

**Results:** Operative exploration revealed a large inflamed Meckel’s diverticulum with an adhesive band to the retroperitoneum creating an internal hernia and resultant small bowel obstruction. The hernia was reduced laparoscopically and intracorporeal resection of the Meckel’s was performed. The patient improved and was discharged home on post-operative day one.

**Conclusion:** Meckel’s diverticulum is the most common congenital abnormality of the small intestine. When symptomatic, its most common presentations are bleeding or obstruction. Meckel’s diverticulum and its complications can be safely and effectively managed via the laparoscopic approach.

**P110—Colorectal/Intestinal Surgery**

**LAPAROSCOPIC SIMPLE CECECTOMY: MINIMALLY INVASIVE THERAPY FOR CECALE POLYPS, Andrew G Harrell MD, Kent W Kercher MD, William S Cobb MD, Michael J Rosen MD, Yuri W Novotsky MD, Timothy S Kuwada MD, B. Todd Heniford MD, Carolinas Medical Center**

**Background:** Cecal cap polyps may be endoscopically unresectable due to size or position. Previously, a right hemicolectomy with with intact cecum was used for colon extraction, proctectomy and pouch construction. In comparison to the open approach, the minimally invasive technique allowed for a shorter hospital stay.

**Methods:** A retrospective review of all patients with endoscopically unresectable, proximal cecal cap polyps (not involving the ileocecal valve) who underwent laparoscopic cecectomy was performed. The study was divided into two cohorts: those who were offered a laparoscopic cecectomy as an alternative to a right hemicolectomy, and those who were offered a laparoscopic approach to cecectomy. The primary outcome measures were the rate of successful laparoscopic cecectomy, the length of stay, and post-operative complications.

**Results:** Of the 50 patients enrolled in the study, 30 underwent laparoscopic cecectomy. The mean length of stay was 87 minutes (46 min to 184 min), including frozen section. The average age of stay was 1.6 days (1 to 3 days). There were no postoperative complications.

**Conclusion:** Laparoscopic cecectomy is a safe and effective procedure for the treatment of cecal cap polyps. It offers several advantages over open surgery, including a shorter hospital stay and reduced post-operative morbidity.
ileostomy or bowel exploration was performed, mostly for hospitalization for more than 14 days. There were no mortalities or significant complications in this group.

Wanda J Wu, MD, Kim A. Donaldson, MD, Stanford University School of Medicine, San Francisco, California

We reviewed the outcomes of laparoscopic colorectal surgery for curable cancers. We identified 78 consecutive patients who underwent curative laparoscopic resection for colorectal or rectal cancer between January 1998 and June 2003. All patients were reviewed. The median follow-up time was 20 months. The median number of postoperative days on which oral intake was resumed was 3 days. The median length of stay was 12 days. There were no mortalities or serious complications in this group. The hospital stay was shorter compared to patients who underwent open surgery. This study demonstrated the feasibility and safety of laparoscopic surgery for selected patients with rectal carcinoma. The morbidity and mortality rates and oncologic outcome appear to be comparable to those of conventional surgery.

Conclusion: The results of this study demonstrate the feasibility and safety of laparoscopic surgery for selected patients with colorectal cancer. The short- and long-term outcomes of the laparoscopic approach are similar to the open approach.

Purpose: The purpose of this study was to evaluate the short-term outcomes of laparoscopic colorectal surgery for patients with curable cancers.

METHODS: A prospective study of 78 consecutive patients who underwent curative laparoscopic resection for colorectal or rectal cancer between January 1998 and June 2003. All patients were reviewed. The median follow-up time was 20 months. The median number of postoperative days on which oral intake was resumed was 3 days, and the median length of hospital stay was 12 days. A total of 10 postoperative complications occurred in 8 patients (11.1 percent) and included anastomotic leakage in 4 (5.5 percent) and bowel obstruction in 2 (2.7 percent). Reoperation was required in 4 patients. One patient developed a recurrence of the cancer in the pelvic cavity. CONCLUSION: The results of this study demonstrate the feasibility and safety of laparoscopic surgery for selected patients with rectal carcinoma. The morbidity and mortality rates and oncologic outcome appear to be comparable to those of conventional surgery.

Conclusion: The results of this study demonstrate the feasibility and safety of laparoscopic surgery for selected patients with colorectal cancer. The short- and long-term outcomes of the laparoscopic approach are similar to the open approach.

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Conclusion: The results of this study demonstrate the feasibility and safety of laparoscopic surgery for selected patients with colorectal cancer. The morbidity and mortality rates and oncologic outcome appear to be comparable to those of conventional surgery.
One patient had undergone a previous non-diverted transanal repair, which failed. All four patients were doing well after their initial laparoscopic postop, whereby pneumaturia and fecaluria occurred. The injury occurred during dissection at the initial laparoscopic procedure. This is most likely a result of heat transfer which lead to the fistulas to open a week later.

Conclusion: RUF is rare, but since the etiology is associated with therapy for common disease, they will continue to be encountered. Despite performing the prostatectomy laparoscopically, there is still a risk of rectourethral injury. The perineal approach with gracilis muscle interpositional is a reliable although relatively complex method of RUF repair which results in healthy, well vascularized tissue between the rectum and urethra, while at the same time affording optimal opportunity for urethral mobilization and repair.

**P117—Colorectal/Intestinal Surgery**

**LAPAROSCOPIC VS OPEN COLO-RECTAL RESECTION FOR CANCER: LONG TERM RESULTS ELEVEN YEARS ON,**

Emanuele Lezoche MD, 1 ?Paride Stefanini? Department of Surgery, 2nd Surgical Institute, ?La Sapienza? University, Rome, Italy

Aims of this clinical study were to compare the long-term outcome with a minimum follow-up of 12 months between laparoscopic and open approach for the treatment of colorectal cancer.

Between 1992 and 2003, of 397 patients (pts) with colonic cancer, 274 underwent Laparoscopic Resection (LR), whereas 123 were treated by Open Resection OR. Three hundred two pts were included in this study (207 LR, 95 OR); we excluded pts who underwent a palliative resection (39 LR, 20 OR), conversion to open surgery (8), pts lost to follow-up (4 LR, 2 OR) and pts died from causes not related to cancer (13 LR, 5 OR). Mean follow-up was 53.6 months during which time we observed 1 case of port-site metastases (0.5%) in Dukes’ stage C. No Statistically Significant Difference (SSD) was observed in the Local Recurrences rate (3.4% after LR and 7.3% after OR) (p=0.24) and in the incidence of Distant Metastases (11.6% after LR and 10.5% after OR) (p=0.96). At 84 months of follow-up cumulative survival probability in LR was 0.927 as compared to 0.842 after OR (p=0.65). One hundred-seventy-two pts in the laparoscopic group (83.1%) and 78 in the open group (82.1%) are disease free.

Between 1992 and 2003, of 156 pts with rectal cancer, 110 underwent LR and 46 OR. One hundred-twenty-four pts were included in this study (85 LR, 39 OR); we excluded pts who underwent a palliative resection (10 LR, 6 OR), conversion to open surgery (8), pts lost to follow-up (1 LR) and pts died from causes not related to cancer (13 LR, 1 OR). Mean follow-up was 58.7 months. No SSD was observed in the Local Recurrences rate (19.2% after LR and 17.6% after OR) (p=0.900) and in the incidence of Distant Metastases (15.3% after LR and 20.5% after OR) (p=0.815). At 84 months of follow-up cumulative survival probability in LR was 0.711 as compared to 0.617 after OR (p=0.819). Thirty six pts (69.2%) in the laparoscopic group and 21 in the open group (61.7%) are disease free. Regard the higher incidence of local recurrences in the present series of pts with rectal cancer we must take into account that the majority of this pts represent an oncologically unfavourable patient group because they had little or no response to neoadjuvant therapy; a selected group of pts who had demonstrated a better response to neoadjuvant therapy was underwent Transanal Endoscopic Microsurgery (TEM) where the local recurrence rate was 1.5%.

We conclude that no adverse long-term oncologic outcomes of laparoscopic resections for colorectal cancer were observed.

**P119—Colorectal/Intestinal Surgery**

**SURGEO-INITIATED SCREENING COLONOSCOPY PROGRAM BASED ON SAGES AND ASCRC RECOMMENDATIONS IN A GENERAL SURGERY PRACTICE,**

Edward Lin DO, Leena Khaitan MD,Dianne Williams RN,C. Daniel Smith MD, Emory University School of Medicine and Emory Crawford Long Hospital

PURPOSE: To determine the utility of a screening colonoscopy program initiated by general surgeons in an academic center.

METHODS: New patients who meet screening colonoscopy indications presenting to three general surgeons were asked if they have had colorectal cancer (CRC) screening. Patients who did not have CRC screening were offered screening colonoscopies or referred to their gastroenterologists. RESULTS: In the first 9-month period of the program, 200 patients who met the SAGES/ASCRc indications for CRC screening were asked if they had had screenings, but only 46% (92) had any appropriate screenings. Of the patients who elected CRC screening by the surgeons, patients underwent full-colonoscopies (2 concurrently with hemorrhoidectomies) and 2 patients had flexible sigmoidoscopies. Ten patients (18%) required treatment as a result of screening; 7 patients had polypectomies, 2 patients required partial colectomies, and 1 patient with indication for surgery deferred treatment. CONCLUSIONS: The majority of patients presenting to the general surgeon likely have not had CRC screening and diligence in making appropriate recommendations should be routine. Colonoscopic findings requiring intervention is not insignificant.
P120–Colorectal/Intestinal Surgery
DYNAMIC GRACILOPLASTY VERSUS IMPLANT OF ARTIFICIAL SPHINCTER FOR TOTAL ANORECTAL RECONSTRUCTION AFTER LAPAROSCOPIC ABDOMINOPERINEAL EXCISION, Marco Maria Lirici MD, Massimiliano Di Paola MD,Cecilia Ponzano MD,Yoshinori Ishida MD,Christiano Hüschers MD, Department of Surgery, San Giovanni Hospital. Rome. Italy
Ablominoperineal resection (APR) is still the standard treat- ment of cancers close to the dentate line. Unfortunately a per- manent iatric colostomy is a severe limitation of the quality of life. Attempts to construct a continent perineal colostomy after anorectal excision have been done over the past 15 years with uncertain benefits. The early results of 2 procedures consisting of a laparoscopic approach to APR or reversal of APR, fashion- ing of a perineal colostomy with dynamic graciloplasty or implant of an artificial sphincter are herein reported.
Methods: Overall 6 patients underwent laparoscopic APR or laparoscopic APR reversal and construction of perineal colostomy with dynamic graciloplasty (3 pts) or implant of an artificial sphincter (3 pts) in the last 4 years. All patients had a diverting loop ileostomy at the time of surgery. Data concerning operative management, morbidity and mortality and the function of total anorectal reconstruction at the time of operation, at postoperative month 1 and after ileostomy closure were collected and analyzed (SF36 form) in a prospective non randomized fashion.
Findings: No postoperative complications occurred in the group of dynamic graciloplasty (DG), whilst 1 patient of the artificial sphincter (AS) group died for myocardial infarction after ulceration of the prosthesis through the transposed colon wall. Postoperative stay of remaining patients ranged 2 to 27 days. After 3 months the ileostomy was closed in all patients but 1 in the DG group who died one day before readmission for ostomy closure because of accidental not disease/operation related reason. Follow-up of patients of the DG and AS group ranged 3 to 24 and 2 to 8 months respectivly. Patients in the DG group had no complication and satis- factory continence was showed at follow-up whereas all patients in the AS group had early or late local complication with ulceration of the prosthesis through the wall and conse- quent removal and fashioning of a permanent iatric colostomy. Interpretation: There are no published data on laparoscopic APR and APR reversal with total anorectal reconstruction with either dynamic graciloplasty or implant of artificial sphincter. Preliminary results showed that laparoscopic APR or APR reversal with continent perineal colostomy and dynamic graciloplasty is a possible option in selected patients whilst the implant of an artificial sphincter should be considered as an unsafe procedure in such patients.

P121–Colorectal/Intestinal Surgery
COMPARATIVE STUDY BETWEEN LAPAROSCOPIC AND OPEN ELECTIVE SURGERY FOR DIVERTICULAR DISEASE., Francisco López-Köstner MD, Gonzalo Soto D. MD,Ángelica García-Huidobro D. MD,Francisca León G. MD,Maria Francisca Arancibia,George Pinedo M. MD,Maria Elena Molina P. MD,Demian A. Fullerton MD,María Zuñiga D. MD, Department of Digestive Surgery, Hospital Clínico Pontificia Universidad Católica de Chile. Santiago. Chile
INTRODUCTION. Laparotomy has been the classical access to the abdomen in elective surgery for diverticular disease (DD). During the last decade, laparoscopic surgery of the colon has showed a progressive development with results comparable to open surgery. The aim of this study is to compare early results of patients who underwent elective surgery for DD.
METHODS AND PROCEDURES. In 1998, we started a prospect- ive protocol on laparoscopic colorectal surgery. At present (July 2004), we have operated on 139 patients and the surgical indication was recurrent diverticulitis in 51 of them. This group was compared to the laparotomy group in the same period of time. We excluded emergency surgery, and patients with colonic fistulas. Fifty nine patients were operated on via laparotomy (OS), and 51 laparoscopically (LS). Both groups were statistically comparable in gender, previous laparo- tomies, type of surgery performed, length of surgical speci- mens and degree of histopathologic inflammation. The LS group was nevertheless significantly younger than the OS group (53 v/s 59 years; p< 0,05). The continuous variables were analyzed with the Student’s t test, and the categorical variables with the Chi-square test, considering statistically sig- significant a p value < 0.05.
RESULTS. The mean operative time was significantly longer in LS group (219 min. v/s 166 min.; p<0.001). The analgesia requirements for morphine PCA and i.v. ANES was shorter in LS group (1.07 v/s 2.2 days, p=0,001; and 2.4 v/s 4 days respec- tively, p=0,001). The intensive surgical ward stay was shorter in LS group (0.4 v/s 1.3 days; p<0.001). The mean time of passing flatus and the time to reintiate solid oral feeding, were both shorter for LS group (1.8 v/s 4.1 days, p<0,001) and 2.4 v/s 5.8 days p<0.001, respectively). The morbidity rate was sig- nificantly lower for LS group (17% v/s 34.5%; p<0.05). No oper- ative mortality was observed in the mean. The postoperative stay was shorter for LS group (4.5 v/s 10.4 days, p<0,001). The total costs of the laparoscopic group was statisti- cally higher than the open group (US$ 5075 v/s 5961; p<0.05).
However, if we consider the time for return to work, no differ- ences were found. (Ap: 0).
CONCLUSIONS. This study confirms the advantages of laparo- scopic surgery in patients with recurrent diverticular disease. This approach might be, in the future, the gold standard treat- ment for this group of patients.

P122–Colorectal/Intestinal Surgery
PPH: A COMMUNITY HOSPITAL EXPERIENCE., Sandip T Maru MD, Glenn Parker MD,Thomas Lake MD,Adam Silverman MD, Monmouth Medical Center, Long Branch NJ
Background: Hemorrhoidal symptoms affect over 10.5 million Americans. Approximately 10% of the patients with sympto- matic hemorrhoids will eventually need surgery. The challenge lies in offering the best mode of treatment offering minimal embarrassment, minimizing pain, and a low complication rate. The procedure for prolapse and hemorrhoids (PPH) seems to offer this as opposed to the traditional Fergusson and Milligan-Morgan hemorrhoidectomies.
Methods: A retrospective chart review of over 200 patients who underwent PPH was conducted. We will be specifically looking for indications for use of PPH, additional calls for pain management, and postoperative complications. Two attending colorectal sur- geons at local community hospitals performed all the cases.
Results: A preliminary review shows that PPH is a well-tolerat- ed procedure. The majority of PPH was performed as outpa- tient same day surgery. All operations were performed for stage III and IV hemorrhoids and prolapse. In over 90% of the cases pain was controlled with twenty-four hours of narcotic prescription pain medication and then over the counter pain medications. There were no cases in which additional transfu- sions were needed, and only 1 patient was taken back to the operating room for postoperative bleeding. Five patients had to be admitted postoperatively for urinary retention. In long term follow up, there were two patients noted to have fissures. Conclusion: PPH is a new tool in the armamentarium of the surgeon for the treatment of hemorrhoids. PPH is gaining pop-ularity in the community surgeon. PPH is safe, and effective, and seems to involve minimal postoperative pain and early recovery. In a majority of cases it is performed as an outpa- tient procedure. PPH is becoming the favored method of treatment of hemorrhoids among community surgeons.

P123–Colorectal/Intestinal Surgery
SURGICAL MANAGEMENT OF INTESTINAL MALROTATION IN ADULTS: COMPARATIVE RESULTS OF OPEN AND LAPAROSCOPY LADD PROCEDURES, Gregory M Marzke MD, David W Larson MD,Eric J Dozois MD,Christopher R Moir MD, Mayo Clinic Rochester, MN
Objective
The aim of this study was to characterize the clinical features of intestinal malrotation in adults and to compare the results of the open and laparoscopic Ladd procedure.
Methods and Procedures.
Between 1984 and 2003, 21 adult patients with a mean age of 36 years (range, 14 - 89 years) were surgically treated for intes- tinal malrotation. Clinical data collected included age, gender, presenting symptoms, diagnostic tests, type of operation,
operative time, narcotic requirement, time to oral intake, length of hospital stay, and outcome. Comparison between groups (open vs. laparoscopic) was analyzed using two-sample t-tests and Wilcoxon rank sum tests.

Results
The two groups were similar in terms of age, clinical presentation and diagnostic tests performed. The most common presenting symptoms were chronic abdominal pain, nausea and repeated vomiting. Symptoms such as chronic diarrhea, constipation, weight loss and gastroesophageal reflux disease (GERD) were also present but uncommon. Upper gastrointestinal barium studies (UGI/SBFT) were diagnostic in all patients with malrotation as compared to computed tomography (CT) scanning which were falsely negative in 25%. Twenty-one patients underwent the Ladd procedure, either open (n = 10) or laparoscopic (n = 11). Three laparoscopic procedures were converted to open but were analyzed in the laparoscopic group in an intent-to-treat fashion. Overall, the laparoscopic group resumed oral intake earlier than the open group (1.8 vs. 2.7 days; p = 0.092), had a shorter hospital stay (4.0 vs. 8.1 days; p = 0.056) and required less narcotics on the first postoperative day (4.9 vs. 48.5 mg; p = 0.002). The laparoscopic group underwent a longer operation (194 vs. 143 minutes; p = 0.053).

Follow-up ranged from 2 weeks to 97 months (mean, 42 months) and was complete in 18 of 21 (86%) patients. Sixteen patients reported complete resolution of symptoms, while 2 felt greatly improved. No patient required a second operation related to volvulus or recurrent symptoms.

Conclusions
The laparoscopic Ladd procedure is feasible, safe, and effective as the standard open Ladd procedure to treat adults with intestinal malrotation without midgut volvulus. Patients also benefit from this minimally invasive approach as manifested by earlier oral intake, a decreased need for intravenous narcotics and an earlier dismissal from the hospital.

P124—Colorectal/Intestinal Surgery

ABNORMAL LIPID PROFILE-RISK FACTOR FOR THE FORMATION OF COLONIC DIVERTICULOSIS AMONG YOUNG PATIENTS? Leondias S Miranda MD, Kenneth Lee MD, Fairview Hospital, Cleveland Clinic Health System, Department of Surgery

Purpose: Colonic diverticulosis among young patients may have different risk factors when compared to the known factors for the disease affecting the elderly. Because obesity has been reported as comorbidity, we hypothesized that abnormal lipid profile (also related to obesity) is a risk factor for the disease among young patients.

Methods: Following IRB approval, patients aged 45 years and younger (n = 107) admitted at a teaching hospital with diverticulitis between January 1997 and December 2001 as well as healthy adults (controls) were invited for a fasting lipid profile (also related to obesity) is a risk factor for the disease affecting the elderly. Because obesity has been reported as comorbidity, we hypothesized that abnormal lipid profile (also related to obesity) is a risk factor for the disease among young patients.

Conclusions
The laparoscopic Ladd procedure is feasible, safe, and effective as the standard open Ladd procedure to treat adults with intestinal malrotation without midgut volvulus. Patients also benefit from this minimally invasive approach as manifested by earlier oral intake, a decreased need for intravenous narcotics and an earlier dismissal from the hospital.

P125—Colorectal/Intestinal Surgery

LAPAROSCOPIC COLECTOMY FOR ATTENUATED FAMILIAL ADENOMATOUS POLYPOSIS (AFAP), E Monteferante MD, N Pitrelli MD, E Liberatore MD, G Palka MD, G Colecchia MD, Department of Surgery “Santo Spirito” Hospital Pescara, Italy

Introduction
Over the past decades has been described a variant of familial adenomatous polyposis (FAP) called attenuated FAP (AFAP). AFAP is not well-defined as a disease entity and the diagnostic criteria and methods of investigation differ markedly. The incidence and frequency of AFAP is unknown. The mutations in APC gene, associated with AFAP, have mainly been detected in three parts of the gene: in the 5’ end (the first five exons), in exon 9 and in the distal 3’ end. The main features of AFAP are 100 or less colorectal adenomas with a tendency to rectal sparing, a delay in onset of adenomatosis and bowel symptoms of 20-25 years, a delay in onset of colorectal cancer (CRC) of 10-20 years and death from CRC of 15-20 years, and although the lifetime penetrance of CRC seems to be high, CRC doesn’t seem to develop in nearly all affected patients. A more limited expression of the extracolonic features is seen, but gastric and duodenal adenomas are frequently encountered.

Case Report:
The patient is a female, aged 41 years, with a diagnosis of AFAP characterized by a mutation in the distal 3’ end of APC gene, undergoing annual colonoscopy with polypectomy from about ten years. The biopsy (histologic test) of a polyp in the distal transverse, ablated not with endoscopy, evidenced areas of severe dysplasia. The patient underwent total colectomy with ileorectal anastomosis (IRA) with laparoscopic surgery. Five trocars had been used and an incision according to Pfannenstiel. Duration of surgery has been 350 minutes and no complications have been recorded during and after surgery. In ninth day the patient has been discharged with 3-4 daily evacuations. Besides the presence of multiple adenomatous polyps (< 20) the definitive histologic exam has also evidenced, in the previous polyp, areas of adenocarcinomatosis, which infiltrated the muscularis mucosae. The examined 36 lymphnodes have not been infiltrated. The rettectomy performed after 6-12 months has resulted negative.

Conclusion
Prophylactic colectomy with IRA is recommended in most patients with AFAP. Laparoscopic surgery is possible, safe and efficacious.

P126—Colorectal/Intestinal Surgery

LAPAROSCOPIC LOW ANTERIOR RESECTION FOR ADVANCED RECTAL CANCER, YASUHIRO MUNAKATA MD, HITOSHI SEKI MD, YUSUKE MIYAGAWA MD, HIROSI SAKAI, KEN HAYASHI, NAGANO MUNICIPAL HOSPITAL

[purpose] The Japanese RCT of laparoscopic and open surgical therapy for the advanced colon cancer is going to begin by main institutions of the whole country since autumn, 2004. In most of the past RCT for colon cancer, treatment outcome was similar between laparoscopic and open surgery. If operative procedure is good, the superiority of laparoscopic surgery for advanced rectal cancer will be similar with colon cancer, although the operation procedure for rectal cancer is more complicated than colon cancer. Therefore, we reviewed low anterior resection for the advanced rectal cancer treated under laparoscopic and open procedure.

[subjects and methods] We performed laparoscopic low anterior resection in 34 cases of curative advanced rectal cancer (LLAR), and open low anterior resection in 20 cases (OLAR). We reviewed about operation results, complications and long term prognosis.

[results] There were 34 cases of curative laparoscopic low anterior resection among 85 cases of rectal cancer treated by endoscopic surgery. We compared LLAR with OLAR. We performed lymph node dissection of D2 or D3 under pneumoperitoneum in LLAR. We experienced 3 examples of transient urinary disorder, 2 examples of wound infection and a bowel obstruction for a complication of LLAR. A complication of
OLAR showed 2 cases of anastomotic leakage, 2 wound infection, 2 paralytic ileus and one atelectasis. In long-term results of LLAR, there were one lung metastasis, one lymph metastasis and one death from the other disease. We showed a recurrence in 5 cases in OLAR, and including one peritoneal and peritoneal metastasis and 4 liver metastases. In LLAR, the number of removed lymph node was greater than OLAR, and mean blood loss was less than OLAR. There was no difference to operation time and days of hospitalization in both groups. [conclusion] LLAR showed better curability and safeness of treatment for advanced rectal cancer by its good long term prognosis, little quantity of operative haemorrhage and complications. However, from a complication such as transient urination disorder, the hospitalization was equal with OLAR. By further improvement of operative procedure such as nerve preservation utilizing magnifying view under laparoscopy, LLAR could become the standard therapy for advanced rectal cancer.

P127–Colorectal/Intestinal Surgery

LAPAROSCOPIC-ASSISTED ABDOMINO-PERINEAL RESECTION FOR RECTAL CANCER BY 4 PORTS METHOD, Minoru Naito MD, Hideo Ino MD, Masakazu Murakami MD, Nobuyoshi Shimizu MD, Department of Cancer and Throcic Surgery, Okayama University Graduate School of Medicine and Dentistry, Okayama, Japan

We have performed 5 cases laparoscopic-assisted abdomino-perineal resection for patients with rectal cancer between May 1999 and August 2004. All cases were successfully performed laparoscopically without intraoperative complication. The patient was placed in the lithotomy position with Trendelenburg position. We used four ports, initial port for a laparoscope was inserted just right side of the umbilicus, then CO2 pneumoperitoneum was created. After pneumoperitoneum was initiated, three ports were placed (suprapubic and bilateral pararectal). We used a medial approach for colorectal mobilization and had performed all cases with autonomic nerve preservation. Finally a 3 cm circular incision was made over the port site in the left lower quadrant and the stapled bowel end was pulled through extraperitoneal for colectomy. Results: The mean age was 78 years. The male to female ratio was 1:1.5. The mean operative time was 360 minutes. The mean hospital stay was 12 days. Conversion to open surgery was none. No operative mortality, no portsite metastasis and morbidity. All patients are alive without recurrence.

Laparoscopy affords improved visualization of the rectum in the confined space of the pelvis. Laparoscopic-assisted abdomino-perineal resection for patients with rectal cancer is a feasible and safe operation. Recurrence rate or long-term functional outcome needs longer follow up.

P128–Colorectal/Intestinal Surgery

CLINICAL OUTCOME OF LAPAROSCOPIC COLORECTAL CANCER SURGERY, Takeshi Naito MD, Takashi Tsuchiya MD, Satoshi Akaishi MD, Hiroshi Honda MD, Masao Kobari MD, Department of Surgery, Sendai City Medical Center

[Backgrounds] Laparoscopic colorectal cancer surgery has been widely accepted because of less pain, faster recovery and good cosmetic results. Although several authors presented results of prospective studies which support advantages of laparoscopic colorectal cancer surgery, an oncological validity of this surgery is not well analyzed yet. The aim of this study is to assess the clinical outcome of the laparoscopic colorectal cancer surgery in our hospital. [Patients and Methods] During June 1999 and Aug. 2004, we operated more than 700 cases of colorectal cancer patients. Of those 205 patients underwent laparoscopic colorectal surgery. We assessed an operative time, estimated blood loss, postoperative complications, duration of hospitalization, and clinical outcome, retrospectively. [Results] Male female ratio was 118:87, and mean age of these patients was 64.6 year-old. Among these cases, 71 tumors were localized in Rs, which is rectosigmoid region, 30 in Rb, which is rectum below the peritoneal reflection, and 5 in Rb, which is rectum below the peritoneal reflection according to the Japanese classification of colorectal cancer. Histological T numbers of the tumor according to the UICC classification were as follows: 113 cases of T1, 43 cases of T2, 33 of T3, and 11 of T4. Forty nine cases (23.9%) of them were node-positive. Mean operative time was 178 min., and mean estimated blood loss was 62 ml. Twelve cases (5.9%) were converted to conventional surgery because of the severe adhesion. Posterior ones were identical more than anterior cases (7.8%), of those 6 cases represented an anastomotic leakage, and 5 of them required further operation. Two cases were complicated with postoperative hemorrhage which required reoperation. No operative mortality was observed in these patients. Mean postoperative hospitalization was 16 days. Mean follow-up time was 23 months. Five patients have tumor recurrence; 1 case with local recurrence, 2 with liver metastasis, 1 with lung metastasis, and 1 with peritoneal carcinomatosis. Only one patient with local recurrence died of cancer 2 years after initial surgery, so far. [Conclusion] Although further evaluation is mandatory, laparoscopic colorectal cancer surgery is safe and would be oncologically adequate procedure.

P129–Colorectal/Intestinal Surgery

LAPAROSCOPIC SURGERY FOR DIVERTICULAR DISEASE COMPLICATED BY ENTERIC FISTULAS, Scott O Nguyen MD, Celia M Divino MD, Anthony Vine MD, Mark Reiner MD, Lester B Katz MD, Barry Salky MD, Mount Sinai Medical Center

Introduction. Enteric fistulas complicate diverticular disease in up to 20% of cases. Elective laparoscopic surgery for uncomplicated diverticular disease is considered safe and effective, however little data exists for disease complicated by fistulas. This study describes a series of patients who underwent laparoscopic assisted sigmoid resection for diverticulitis complicated by fistulas.

Methods. A retrospective chart review was performed of patients who underwent laparoscopic treatment of enteric fistulas complicating diverticular disease by four surgeons specializing in minimally invasive surgery at the Mount Sinai Medical Center.

Results. During a 10-year period (1994-2004), 14 patients underwent elective laparoscopically assisted sigmoid resections for diverticular disease complicated by enteric fistulas. The average age was 62 and the male/female ratio was 10:4. Twenty-nine percent of patients had previous abdominal surgery and 21% had multiple fistulas. There were 8 colovesical, 5 enterocolic, 2 colovaginal, 1 colosalpingal, and 1 colocolonic fistulas. 100% patients successfully underwent sigmoid resection and 2/14 (14%) required additional bowel resections. No cases were proximally diverted. Thirty-six percent of cases were converted to open, all due to dense adhesions and severe inflammation resulting in difficult dissection. The mean operative time was 209 minutes and the mean blood loss was 326 ml. There were two (14%) postoperative complications, including one self-limiting anastomotic bleed and one prolonged ileus. No anastomotic leaks occurred and there were no mortalities. The mean postoperative stay was six days. Conclusions. Laparoscopic management of diverticular disease complicated by fistulas can be performed effectively and safely with minimal morbidity and mortality. The conversion rate is higher than in uncomplicated cases of diverticulitis and is associated with severe adhesions and inflammation interfering with safe laparoscopic dissection.

P130–Colorectal/Intestinal Surgery

LESS INVASIVE SURGERY ON THE PATIENTS WITH SEVERE CONSTIPATION, Hirotsugu Ohara MD, Yasuhiro Masuda MD, Toshiyuki Hirai MD, Department of Surgery, Fujieda Heisei Memorial Hospital, Fujieda, Sizuoka, Japan

INTRODUCTION: Until now, operation for severe constipation have seldom been performed, because severe constipation was most common in the elderly or the institutionalized patients, and in patients with a variety neurologic disorders. Recently, we have been able to perform less invasive surgery on the the patients with severe constipation. In all cases we achieved good results by our own unique method. This method, including the indication to operate, will be discussed. METHODS AND PROCEDURES: At first, these diseases are
divided to two major categories, the Mega-colon involving only the sigmoid colon (sigmoid colon volvulus) and the extended Mega-colon involving all part of the colon. On the patients with sigmoid colon volvulus (Type II), we have performed sigmoidectomy through a 4 cm incision (with a laparoscope as a back-up). On the patients with the extended Mega-colon involving all proximal colon (Type I), we have performed subtotal colectomy using gasless HALS with our unique lifting technique. It consists of anastomosis of the stump, stainless steel rod 5mm in diameter. We have performed these methods on 11 patients consisting of 9 Type I patients and 2 Type II patients, after enough bowel preparation.

RESULTS: There are neither major complications nor conversions to conventional open surgery. All of the patients had more than one bowel movement a day with a low dose of laxatives.

CONCLUSIONS: On the patients with Type II, the sigmoid colon was not attached to retroperitoneal tissue, therefore the elongated sigmoid colon could be easily removed from the abdominal cavity and operated on extracorporeally. On the patient with Type I, by performing the operation not only under laparoscopy, but also via the small incision, the operation time can be shortened and the operation procedure is simplified. This combined technique is an advantage of gasless surgery.

P131–Colorectal/Intestinal Surgery
A CASE OF PERITONEAL DISSEMINATION ACCOMPANIED BY PORT SITE METASTASIS EIGHT MONTHS AFTER INITIAL LAPAROSCOPIC RESECTION OF SIGMOID COLON CANCER., Mitsuyoshi Ota MD, Shigeki Yamaguchi MD, Hirofumi Morita MD, Masayuki Ishii MD, Shizuoaka Cancer Center
A sixty-one year old woman who developed sigmoid colon cancer, underwent sigmoidectomy at our institution on October second, 2003. Intraoperative peritoneal lavage cytology was negative. We had difficulty with dissection of the firm adhesion of the greater omentum in the lower peritoneal cavity. After high ligation of IMA and mobilization, we made a transverse incision in the lower abdominal region, 8cm in diameter, attached a wound protector, extracted the intestine, cut the proximal and distal side of the intestine, and anastomosed the intestine using functional end-to-end anastomosis. During the course of this procedure, the mesocolon was widely damaged. Pathological finding confirmed that the tumor was resected curatively and the staging was pT4 N1 M0. Eight months after the initial operation, multiple disseminated tumor was detected in CT scan and Positron Emission Tomography, accompanied intestinal obstruction which recognized at the assistant’s port site of right lower abdomen.

P132–Colorectal/Intestinal Surgery
LAPAROSCOPIC COLON RESECTION PERFORMED IN A COMMUNITY-BASED TEACHING HOSPITAL., D J Reichenbach MD, A D Tackett MD, A Stiles BS, J Harris MD, New Hanover Regional Medical Center
PURPOSE: The purpose of this study was to review the first 50 laparoscopic colon resections performed by two surgeons at a community-based teaching hospital. METHODS: A retrospective chart review was conducted of the first 50 patients undergoing laparoscopic colon resection at New Hanover Regional Medical Center from January 2002 to May 2003. Conversions to open resections were included in the data collection and analysis. RESULTS: The majority of the patients were Caucasian and female (92% and 68% respectively). Sixty-two percent had undergone previous abdominal surgery. The mean age of patients undergoing resection was 64 ± 13.5 years, and the male/female ratio was 29/21. The most common indications for surgery were diverticulitis (44%) and polyps (32%). Twenty percent of resections were undertaken with a pre-operative diagnosis of malignancy. The majority of procedures performed were sigmoid colectomies (56%), followed by right hemicolectomy (34%), and transverse colectomy (10%). Sixty-four percent were total laparoscopic procedures, 10% were lap-assisted, and 14% were hand-assisted. The conversion to open rate was 12%. Mean operating time was 161 ± 41 minutes. The overall complication rate was low, with 5 (10%) wound infections, 1 (2%) wound dehiscence, 3 (6%) small bowel obstructions, and 2 (4%) instances of perioperative bleeding requiring transfusion. The 30-day mortality rate was zero. The mean hospital stay for the entire study group was 5.0 ± 4.1 days. CONCLUSIONS: Laparoscopic colon resection offers several advantages to the traditional open technique. Laparoscopic colon resection can be performed safely in the community hospital setting provided that the surgeon possesses advanced laparoscopic skills. A learning curve exists, and the transition from open to laparoscopic resection can be bridged by the use of hand-assist devices.

P133–Colorectal/Intestinal Surgery
LAPAROSCOPIC VERSUS OPEN COLOSTOMY REVERSAL: A COMPARATIVE ANALYSIS., Michael J Rosen MD, William S Cobb MD, Kent W Kercher MD, Andy G Harrell MD, Yuri W Novitsky MD, Ron F Sing DO, B Todd Heniford MD, Carolinas Medical Center
Purpose: Open colostomy reversal carries significant rates of anastomotic leak, wound infection, and incisional hernia often limiting its acceptance. We hypothesized that the laparoscopic approach to the restoration of intestinal continuity may result in lower perioperative morbidity and faster postoperative recovery.

Methods: 22 cases of laparoscopic colostomy reversals performed at a single institution were identified and compared to 22 randomly selected open colostomy closures performed during the same time period. Patients were compared based on demographics, previous indications for colostomy procedures, and perioperative outcomes.

Results: A total of 150 patients underwent reversal of left sided colostomies during the study period. The laparoscopic approach was successful in 20 of 22 cases; there were 2 conversions to open (10%) secondary to inability to localize the rectal stump. The laparoscopic and open groups were comparable based on mean age (54 years v 49 years; p=0.23), BMI (26kg/m² v 27kg/m²; p=0.66), Sex (9%males v 13%; p=0.23), ASA (2.6 v 2.3; p=0.07), and history of previous intra-abdominal sepsis (17 v 16 cases). Operative times were similar (158 min v 189 min; p=0.16), and EBL was significantly less in the laparoscopic group (113cc v 270cc; p=0.01). No intraoperative complications occurred in the laparoscopic group and two enterotomies occurred in the open group. The laparoscopic group had earlier passage of flatus (3.5d v 5.0d; p=0.001) and shorter hospitalization (4.2d v 7.3d; p=0.001). Perioperative complications occurred in 3 (14%) laparoscopic and 13 (59%) open cases (p=0.01). There was no mortality in this series.

Conclusions: The laparoscopic approach can be safely employed in the restoration of intestinal continuity. It results in a decreased perioperative morbidity and faster recovery. It offers distinct advantages over the open approach to colostomy reversal.

P134–Colorectal/Intestinal Surgery
SHORT AND LONG TERM RESULTS IN 306 LAPAROSCOPIC COLORECTAL PROCEDURES., Danny Rosin MD, Oded Amora MD, Aviad Hoffman MD, Marat Khakim MD, Barak Bar Zakai MD, Yaron Munz MD, Moshe Shabtai MD, Amram Ayalon MD, Sheba Medical Center, Tel Hashomer, Sackler Scool of Medicine, Tel Aviv, Israel
Background: Laparoscopic surgery has recently gained wide acceptance in the treatment of colorectal pathologies, including cancer. Long term outcome however requires further assessment. The aim of this study is to evaluate short and long term outcomes after 8 years of performing laparoscopic colon and rectal surgery.

Methods: Data relative to all patients who underwent laparoscopic colon and rectal surgery during the period January 2000 to May 2008 in our department was prospectively recorded. Demographics, operative procedure, post operative course, oncologic treatment and follow-up data were reviewed in this study. Survival was calculated for patients with cancer who completed at least 3 years of follow-up.

Results: 306 procedures were performed over a period of 8 years, 184 (60%) for malignancy and 122 (40%) for benign conditions. The number of procedures stabilized at around 50 per year, and included right colectomy (81), sigmoidectomy (80), Anterior resection (55) and left colectomy (34), and other procedures (22) performed at a single institution were identified and compared to 22 randomly selected open colostomy closures performed during the same time period. Patients were compared based on demographics, previous indications for colostomy procedures, and perioperative outcomes.

Results: A total of 150 patients underwent reversal of left sided colostomies during the study period. The laparoscopic approach was successful in 20 of 22 cases; there were 2 conversions to open (10%) secondary to inability to localize the rectal stump. The laparoscopic and open groups were comparable based on mean age (54 years v 49 years; p=0.23), BMI (26kg/m² v 27kg/m²; p=0.66), Sex (9%males v 13%; p=0.23), ASA (2.6 v 2.3; p=0.07), and history of previous intra-abdominal sepsis (17 v 16 cases). Operative times were similar (158 min v 189 min; p=0.16), and EBL was significantly less in the laparoscopic group (113cc v 270cc; p=0.01). No intraoperative complications occurred in the laparoscopic group and two enterotomies occurred in the open group. The laparoscopic group had earlier passage of flatus (3.5d v 5.0d; p=0.001) and shorter hospitalization (4.2d v 7.3d; p=0.001). Perioperative complications occurred in 3 (14%) laparoscopic and 13 (59%) open cases (p=0.01). There was no mortality in this series.

Conclusions: The laparoscopic approach can be safely employed in the restoration of intestinal continuity. It results in a decreased perioperative morbidity and faster recovery. It offers distinct advantages over the open approach to colostomy reversal.
Herawaty Sebajang MD, RESECTIONS: TWO COMMUNITY SURGEONS? EXPERIENCE, P136–Colorectal/Intestinal Surgery

CONCLUSIONS: Laparoscopic colorectal surgery allows for acceptable short term and oncologic outcome, comparable to that achieved by open surgery.

P135—Colorectal/Intestinal Surgery
TOTALLY LAPAROSCOPIC COLON RESECTION WITH INTRACORPOREAL ANASTOMOSIS FOR BENIGN AND MALIGNANT DISEASE, Bethany Sacks MD, S G Mattar MD, G Eid MD, L Velcu MD, T Rogula MD, P Thodyil MJ, Collins MD, F Qureshi MD, P Yenumula MD, B Lane MD, R C Ramanathan MD, P R Schauer MD, Magee-Womens Hospital, University of Pittsburgh Medical Center

Introduction/Objective: The advantages of intracorporeal anastomotic principles include optimal exposure, reduced bowel manipulation, and superior anastomotic integrity in patients with shortened mesentery or thick abdominal wall. We report our experience with colon resections for both benign and malignant disease using a totally laparoscopic approach utilizing an intracorporeal anastomosis.

Methods: 57 patients underwent laparoscopic colon resections with an intracorporeal bowel anastomosis from August 1996 to July 2004. Information on the following were collected for each patient: age, sex, indication for surgery, procedure performed, concurrent procedures, complications, length of stay, pathologic number of nodes, and length of disease-free follow-up.

Results: Of the 57 patients, 30 were female (53%), with an age range of 25-88 years (median 69). Indications for surgery included polyps (52.6%), adenocarcinoma (21.1%), diverticular disease (17.5%), and other benign indications (8.8%). Of the colonic polyps, 11 contained adenocarcinoma, 7 contained dysplasia, and 9 were unresectable endoscopically. The most common procedures performed were right hemicolectomy (46%), sigmoidectomy (26%), left hemicolectomy (9%) and low anterior resection (9%). When operating for malignancy, the average number of lymph nodes removed was 10.8 (range 1-39). The median length of stay was 4.0 days (range 2-18). There were three intraoperative complications and no major complications. Long-term complications included five rectocutaneous fistulae and site hernias (8.8%) and four patients had small bowel obstruction. There were three intraabdominal recurrences (5.3%), but no port site or wound recurrences.

Conclusions: Laparoscopic colon resection with intracorporeal anastomosis is a safe and effective treatment for both benign and malignant disease.

P136—Colorectal/Intestinal Surgery
THE LEARNING CURVE OF 100 LAPAROSCOPIC COLORECTAL RESECTIONS: TWO COMMUNITY SURGEONS? EXPERIENCE, Herawaty Sebajang MD, Laurent Biertho MD, Mehran Anvari PhD, Susan Magee MD, Craig McKinley MD, Centre for Minimal Access Surgery, McMaster University Hamilton Ontario Canada; North Bay District Hospital, North Bay Ontario Canada

PURPOSE: The learning curve for laparoscopic colorectal surgery has been questioned. The purpose of this article is to assess the learning curve and steps taken by two community surgeons who have created a laparoscopic colorectal surgery program in their local hospital.

METHODS: Between October 2000 and December 2003, 100 laparoscopic colorectal resections were performed for benign and malignant disease at the North Bay District Hospital, a 200 bed community hospital located 400 km away from the nearest tertiary care center. All cases were performed by two community surgeons with no formal advanced laparoscopic fellowship. We have evaluated the changes in patient outcome during the two surgeons? learning curve.

RESULTS: During the initial 50 cases, the indication for laparoscopic colorectal surgery was mostly benign disease and the primary surgeon was assisted by another general surgeon. Initially, both surgeons attended laparoscopic colorectal surgery courses. During the last 50 cases, a wider range of procedures was performed and telementoring or telerobotics assistance was used selectively. The learning curve had an impact on the operating time as well as the conversion rate.

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<thead>
<tr>
<th>Outcomes</th>
<th>Case 1 to 50</th>
<th>Case 51 to 100</th>
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<tbody>
<tr>
<td>Median ORS time</td>
<td>105 min</td>
<td>158 min</td>
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<tr>
<td>Morbidity</td>
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<td>Conversion rate</td>
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<td>2%</td>
</tr>
<tr>
<td>Median LOS</td>
<td>4 days</td>
<td>4 days</td>
</tr>
</tbody>
</table>

CONCLUSION: A laparoscopic colorectal surgery program can be safely developed in a community hospital. Laparoscopic work courses, telementoring, telerobotic assistance, dedicated nursing staff and appropriate instrument acquisition are important factors that minimize complications during the learning curve.

P137—Colorectal/Intestinal Surgery
A SURVEY OF LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER IN JAPAN, Mitsugu Sekimoto MD, Hirofumi Yamamoto MD, Masatake Ikeda MD, Ichiro Takemasa MD, Reiz Suzuki MD, Shuji Takiguchi MD, Morito Monden MD, Tetsuichiro Muto MD, Department of Surgery and Clinical Oncology, Osaka University, Japanese Society for Cancer of the Colon and Rectum

 Aim) Increasing laparoscopic resections of colorectal cancer (LC) are performing in Japan. Results of survey of LC in Japan were reported. Method and Result) The survey was performed on the home page of the organizer of 60th Japanese Society for Cancer of the Colon and Rectum(JSCCR) meeting in January, 2004. The questionnaires referred to the experiences and points of view on LC of Japanese colorectal surgeons. A total of 110 colorectal surgeons completed the questionnaire. Ninety one of them had experiences of LC, and 19 did not. Most surgeons performing LC indicated LC for curative resection of advanced cancer. Eighty one thought that LC was less invasive than open surgery. Fifty nine thought that LC had some insufficient points regarding the accuracy of the procedures, such as insufficient lymph node dissection and/or resection margin. Fifty three surgeons answered that LC did give no merits to the hospitals. Income increased only in 16 hospitals. Most of the nineteen surgeons who did not perform LC, answered that they would start performing LC when they gain the confidence of the superiority of LC over conventional surgery. Conclusion) Many Japanese colorectal surgeons indicated LC for advanced cancer. Although most surgeons agree regarding the less invasiveness of LC, more than half of them had doubts about the accuracy of the operation.

P138—Colorectal/Intestinal Surgery
LAPAROSCOPIC APPENDECTOMY: LOOP LIGATION OR ENDOSCOPIC STAPLING? A COMPARISON OF TWO TECHNIQUES, Thomas P Stites MD, Jon C Gould MD, Charles P Heise MD, University of Wisconsin, Madison

Introduction: Several methods of laparoscopic appendectomy have been described, yet few studies compare the outcome of different techniques. Two methods predominated in our institution: 1) endoscopic stapling of the appendix and mesoappendix and 2) ultrasonic division of the mesoappendix with endoscopic loop ligation of the appendix. It is not known whether the technique utilized contributes to post-operative abscess formation.

Methods: We hypothesized that endoscopic loop ligation is associated with an increased rate of post-operative, intra-abdominal abscess formation. This is a retrospective review of consecutive laparoscopic appendectomies performed over the last 4 years for presumed acute appendicitis at a single hospital by attending surgeons with junior level assistants. The primary outcome measured was post-operative, intra-abdominal abscess formation. Outcomes were stratified by operative findings and comparisons made by the Fisher?s exact test.

Results: This review identified 724 laparoscopic appendec-
tomies during this time period. The following table summarizes the incidence of intra-abdominal abscess formation based on surgical technique.

<table>
<thead>
<tr>
<th>Condition</th>
<th>LOOP</th>
<th>STAPLED</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perforated</td>
<td>1/18 (5.3%)</td>
<td>5/36 (14.3%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Gangrenous</td>
<td>3/17 (17.6%)</td>
<td>2/30 (6.6%)</td>
<td>0.04</td>
</tr>
<tr>
<td>Infarimed</td>
<td>3/22 (1.3%)</td>
<td>4/36 (1.2%)</td>
<td>p=1.0</td>
</tr>
<tr>
<td>Normal</td>
<td>6/23 (0%)</td>
<td>2/25 (0%)</td>
<td>n.a.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11/80 (25%)</td>
<td>11/80 (25%)</td>
<td>p=0.80</td>
</tr>
</tbody>
</table>

Conclusion: The two common methods of laparoscopic appendectomy evaluated in this study are associated with similar rates of post-operative intra-abdominal abscess formation. Use of endoscopic loop ligation may be associated with an increased rate of abscess formation in cases of gangrenous appendicitis, though further confirmation based on histopathology is required.

P139-Colorectal/Intestinal Surgery
CLINICAL AND EXPERIMENTAL STUDY ON ENDOSCOPIC HEMOSTASIS BY LOCAL INJECTION OF FIBRIN GLUE—HISTOPATHOLOGICAL OBSERVATION OF ITS HEMOSTATIC AND WOUND HEALING EFFECTS, Hiroyasu Suwa MD, Takao Nakagawa MD,Yukihiro Soga MD,Haruki Takahashi MD,Yoshizumi Deguchi MD,Takahiro Terada MD,Masatake Ishikawa* MD,Tadashi Suzuki* MD,Yoshiaki Imamura** MD,Masaru Fukuda** MD, Department of Endo, Gynecology, Internal Medicine, Tokyo Women’s Medical University Daini Hospital.*Department of Emergency Medicine,Tokyo Women’s Medical University.**Department of Surgical Pathology, University Hospital, Faculty of Medicine, University of Fukui

[Introduction] Since October 2000, a fibrin glue has been used for endoscopic hemostasis on 37 cases of hemorrhagic ulcer, polypectomy, and control of hemorrhage in the EMR, and found to be effective. In addition, the histological effect of a local injection of fibrin glue was observed in rats. It was found that, compared with a local injection of ethanol, a fibrin injection resulted in less tissue trauma; and when compared to HSE, its hemostatic effect was more reliable and longer lasting. In the current study, dogs were used to evaluate the tissue regenerating effect of a local injection of fibrin glue. The results are introduced below.

[Methods] Under Nembutal anesthesia, mongrels were subjected to a laparotomy and a hemorrhagic ulcer was mechanically created in the pyloric vestibule. After prepared ulcers, the lesion was treated with a local injection of fibrin glue (FG), ethanol (ET), hypertonic saline-epinephrine (HSE), or physiologic saline (sham). Then the wound was closed. The animals were fed liquid feed on day 1 after surgery, then placed on a normal diet and received postoperative care. On the 5th day following surgery, the animals were subjected to a second laparotomy and gastrectomy on the pyloric side (where the ulcer had been created) to compare and evaluate the hemostatic effects of the 4 agents.

[Results] The development of the regenerative epithelium was most satisfactory in the FG group. The local injection did not cause tissue damage but hemorrhage into the mucous membrane and submucosal area was noted in the sham group. In the former group, some tissue damage was recognized but fibrin remained in the submucosal region until the 5th day, indicating that the procedure had a sustained hemostatic effect.

The development of a regenerative epithelium was recognized in the ET group. Although there was no hemorrhage, infiltration by inflammatory cells was accentuated in this group. The tissue damage was slight in the HSE group, but the development of a regenerative epithelium was poor.

[Conclusion] Because fibrin persisted for a long period in the area where it was injected, it was believed that a local injection of fibrin glue has a sustained hemostatic effect. Compared with the hemostatic agents that have been in use (such as ethanol and HSE), the development of a regenerative epithelium was good. Fibrin glue appears to be promising as a hemostatic agent, as well as an agent to promote wound-healing.

P140-Colorectal/Intestinal Surgery
EFFECTIVENESS OF ELECTROTHERMAL BIPOLAR VESSEL SEALER IN LAPAROSCOPIC COLECTOMY, Moriatsu Takada MD, Takao Ichihara MD,Yoshikazu Kuroda MD, Department of Gastroenterological Surgery, Graduate School of Medical Sciences, Kobe University

INTRODUCTION: Lymphadenectomy at the origin of the middle colic artery is sometimes difficult in laparoscopic transverse colectomy (LTC). Recently, an electrothermother bipolar vessel sealer (EBVS) has been invented. We have developed the affordable extended lymphadenectomy in LTC using EBVS.

METHODS AND PROCEDURES: From August 2001 through July 2004, thirty-five consecutive patients with transverse colon cancer underwent laparoscopic colectomy using non-clipping technique in Kobe University Hospital. Median patient age was 69.4 years. After the isolation of transverse colon, all vessels were isolated and divided using EBVS except the main artery. The transverse colon is rotated by centering at the base of meso-colon and the anal side of the colon is pulled up vertically. The middle colic artery was divided at the root with the dissection of lymph nodes around the base of meso-colon. The origin of main artery was then divided using EBVS. All other surgical procedures were performed after the manner of standard laparoscopic colectomy.

RESULTS: All procedures were performed successfully without any kind of troubles. The average blood loss was 86.2 ± 22.6 mL. The average operation time was 186.4 ± 26.2 min. Successful lymphadenectomy of the lymph node along the origin of middle colic artery have been performed. There was no postoperative death.

CONCLUSION: The method using EBVS may contribute to the easy and safe LTC by improving the limited view of laparoscope and raise a possibility for the laparoscopic resection of advanced colon cancer. We convince that this rotation technique and use of EBVS contribute to the easier and safer LTC.

P141–Colorectal/Intestinal Surgery
SURGERY OF RECTAL CANCER: LAPAROSCOPY DECREASE THE LONG TERM MORTALITY BY CANCER, ERIC VIBERT, CHRISTINE DENET MD,THIERRY PERNICENI MD,HUGUES LEVARD MD,CHRISTOPHE VINDEVOGEL MD,BRICE GAYET MD, INSTITUT MUTUALISTE MONTSOURIS, PARIS

Introduction: Laparoscopy in cancer remains discussed. This study compared the long-term results of the treatment of the rectal cancer by coelioscopy (C) and laparotomy (L).

Methods: Monocentric retrospective study of 245 patients operated curatively (C=124 group and L=121 group) between 1994 and 2004. Groups were comparable (p>0,05) for the sex, the age, the ASA score, the preoperative radiotherapy, the T stage, the N stage, The M stage, and the post-operative chemotherapy. Even if the rate of morbidity and the length of hospitalization was comparable between the two groups, the rate of post-operative reintervention was higher in coelioscopy (p=0,04). The follow-up of the groups were different: C=46 months/L=59 month (p=0,002).

The conversion rate was 13.2%. The role of the laparoscopy (analyzes in intent-to-treat) was evaluated by a univariate analysis then multivariate of the long-term results.

Results: In univariate analysis, the laparoscopy increased specific survival (SS) (mortality by cancer) but not influence global survival (GS) and survival without recurrence (SWR). In multivariate analysis, the laparoscopy increased specific survival (RR=0,355(0,126-0,995),p=0,04) like T1-T2 stage (RR=0,121(0-0,943),p=0,04) and contrary to the age (RR=1,061(1,01-1,11),p=0,007). At 36 months, the SS was 95.8% after laparoscopy (68 patients at risk on 124) versus 88% after laparotomy (84 patients at risk on 121) (p=0,005). At 36 months GS, 93%(C) versus 83%(L), and SWR, 82%(C) versus 72%(L) were not statistically influenced by the laparoscopy.

Conclusions: This study suggests that the laparoscopic treatment of rectal cancer decrease the long term mortality by cancer.

P142–Colorectal/Intestinal Surgery
LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER: EXPERIENCE IN 500 SUCCESSFUL CASES, HM WANG MD, JB CHEN MD, Division of Colorectal Surgery, Department of Surgery, Taichung Veterans General Hospital

http://www.sages.org/
AIM: Controversial issues surrounding the use of laparoscopic surgery (LAP) for colorectal cancer include high conversion rates, high recurrence and poor outcome than open surgery (OPEN) previously reported. The purpose of this single center, prospective study was to assess the oncological outcomes achieved after curative LAP for cancer.

MATERIALS & METHODS: We enrolled 514 consecutive patients with colorectal cancer undergoing LAP between July 1998 and May 2004. The data were including patient profile; operative complication; pathology and oncological outcome. We compared the oncologic outcomes achieved using LAP and OPEN during period from July 1998 to June 2001. Patient follow-up ranged from 36 to 72 months. The follow-up rate was 95%. We recorded the final status of all cancer patients as of June 30, 2004.

RESULTS: We attempted to perform LAP in 514 patients and 14 patients (2.7%) needed conversion to open surgery. The LAP was successfully in 500 patients with 308 males and 192 females, age from 26 to 96 years, av. 64.2 years. Of the 500 LAP patients, 85 (17.0%) experienced complications & 42 (8.4%) patients had major complications that required further surgery. Major complication of LAP for rectal cancer was higher than colon cancer: 11.4% (34/298) vs. 4.0% (8/202). There were two (0.4%) port site recurrence found in LAP patients. There were three (0.6%) operative mortality due to sepsis, CVA and hepatic failure. We examined the oncologic results achieved in 185 patients who had curative LAP between July 1998 and June 2001. The 3Y-DFS between LAP and OPEN were no difference in stage I (94.2% vs. 93.9%), stage II (79.7% vs. 73.4%), stage III (57.2% vs. 56.7%) and over-all (75.8% vs. 70.3%). There were two (0.4%) port site recurrence found in LAP patients.

Conclusion: The LAP for cancer was feasible for the acceptable morbidity rate & operation time. The oncological results are encouraging and equal to OPEN.

P143—Colorectal/Intestinal Surgery
LAPAROSCOPIC COLORECTAL SURGERY: EARLY AND LATER EXPERIENCE, David A Vivas MD,Seong-yeop You MD,Dan Ruiz MD,Jonathan Efron MD,Eric Weiss MD, Juan J Nogeras MD,Dana Sanders MD,Anthony Vernava MD, Steven Wexner MD, Department of Colorectal Surgery, Cleveland Clinic Florida, Weston, FL

Background: The aim of this study was to compare early and more recent results of laparoscopic colorectal surgery to assess any differences in indications or procedures and any changes in results. Methods: After IRB approval, the medical records of all patients who underwent elective laparoscopic colorectal surgery between August 1991 and April 2004 were reviewed. Group I included patients operated upon between August 1991 and December 1995 (53 months), Group II included patients who were operated between January 1996 to September 1999 (45 months) and Group III included patients who underwent laparoscopic colorectal surgery between October 1999 and April 2004 (55 months). Results: 644 patients underwent elective laparoscopic colorectal surgery during this period, including 175 patients in Group I, 199 patients in Group II and 270 patients in Group III. While there were no differences among Group I, Group II and Group III related to gender (p=NS), patients in Group II were significantly older than those of Group I (50.2 (range 15-88) versus 55.3 (range 15-89); p = 0.05); there was no difference between Group II and Group III (p=NS) respect to age. Significantly more patients underwent sigmoid colectomy in Group III than in Groups I and II (24% versus 13.7% and 15.6%, respectively; p = 0.05). Interventions for diverticular disease increased significantly during this period from 10.9% in Group I, to 14.1% in Group II to 24.8% in Group III (p = 0.05). Right hemicolectomy was one of the most common procedures performed, representing 24.6%, 39.7% and 22.2% for Groups I, II and III, respectively; 11 procedures in Group III were ileocolic resections for Crohn’s disease. Intraoperative complications decreased significantly from Group I to Group II (16.0% versus 4.5%, respectively; p = 0.05) but remained unchanged between Group II and Group III (4.5% versus 6.6%, respectively; NS). Although the operative time decreased significantly between Group I and II (180.5 min versus 148.6 min, respectively; p = 0.05), it increased between Group II and Group III (148.6 min versus 170.02 min, respectively; p = 0.05).

Conclusion: Increasing experience in laparoscopic colorectal surgery may lead to better results as attested to by the decrease in morbidity. However, the selection of more challenging cases like sigmoid diverticulitis and ileal Crohn’s disease may be the reason for the increase in operative time.

P144—Colorectal/Intestinal Surgery
SHORT TIME RESULTS OF LAPAROSCOPIC COLORECTAL RESECTION BY DIFFERENT SURGEONS, Shigeaki Yamaguchi PhD, Ota Mitsuyoshi MD,Masayuki Ishii MD, Hirofumi Morita MD, Shizuka Cancer Center

Purpose: The purpose of this study is to assess short term results of laparoscopic colorectal cancer resection and to clarify the difference between surgeons.

Patients: One hundred thirteen colorectal cancer resection were included since 2002 September to 2004 April by surgeons. Surgeon A was tutor, B had some experience, and C, D were beginner. When B, C, D did operator, A assisted them in 80% cases. Numbers of patients was A: 59, B: 20, C: 22, D: 12, respectively.

Results: Each tumor location was as right colon/ left colon/ rectum, A: 11/ 29/ 19, B: 7/ 9/ 4, C: 7/ 12/ 3, D: 5/ 4/ 3. Lymph node dissection was as D1/D2/D3, A: 2/ 16/ 41, B: 2/ 5/ 13, C: 0/ 9/ 13, D: 2/ 4/ 6. Mean BMI was A: 23.1, B: 23.6, C: 23.2, D: 22.6.

Mean operating time was A: 238 minutes(1287 459), B: 227(1357 459), C: 209(1367 300), D: 204(1367 279). Each operating time of the first half and second half were A: 2407234 min. B: 2737180, C: 2407179, D: 2347174, B, C, D had shortened operating time except A. Mean blood loss count was A: 657, B: 74, C: 45, D: 29, and no patient received blood transfusion. Three patients in group A were converted to open surgery because of blood supply insufficiency, mesorectal inflammation and obesity. Median postoperative hospital stay was 8 in all groups. Postoperative complications were 1) anastomotic leakage A: 3, B: 0, C: 0, D: 0, 2) ileus A: 2, B: 1, C: 0, D: 1, 3) wound infection A: 1, B: 1, C: 1, D: 0.

Conclusion: Because of making operating team and assisting beginner surgeon, operating time and blood loss were no difference between all surgeons.

P145—Colorectal/Intestinal Surgery
LAPAROSCOPIC APPROACH TO A JEJUNAL STROMAL TUMOR, Nihat Yavuz MD, Abdullah As MD, Fatih Aydogan MD, Sabri Erguney MD, Osman Tortum MD, Istanbul University, Cerrahpasa Medical School, General Surgery Department

Introduction: Small bowel tumors are rarely seen and are difficult to diagnose. As other small bowel tumors, they lead to either obstruction or hemorrhage. In recent years with the introduction of capsule endoscopy procedure, their preoperative recognition has become possible.

Material-Method: We report here a 61 years old woman with a jejunal tumor which led to an acute lower gastrointestinal hemorrhage. She had two more episodes of bleeding in the last year. All investigations including upper and lower gastrointestinal endoscopies, abdominal CT scan and a barium enema appeared normal. The corresponding meniscus was dissected with the use of LigaSure Vessel Sealing System (LVSS) intracorporally, the specimen was exteriorized through a small incision of cm 4 length and the jejunal anastomosis was performed extracorporally.

Results: The operation time was 120 minutes. The oral intake was begun on the 3th postoperative day and patient was discharged the day after. No any postoperative complication was seen. Histopathological exam revealed a malignant stromal...
Results: VR didactic resources have been defined and classified in three main categories: Fidelity, Virtual and Evaluation resources. Fidelity refers to the different levels of realism offered by a simulator in its interaction and behaviour. They can be further divided into sensorial, mechanical and physiological. Virtual resources are features unique to a computer simulated environment that can enhance training, like cues and instructions given to the user to guide a task, or to manage a transition in difficulty. Evaluation resources are used to evaluate performance, follow up progress and ways to deliver constructive feedback to the user. The differences between the basic skills packages of MIST-VR and LapSim have been studied and taken into account this taxonomy. The fidelity resources of MIST-VR have been assessed to give a 16% degree of reality, whereas LapSim was estimated to have a realism of 37%. LapSim was also found to employ more virtual (LapSim: 61%; MIST-VR: 49%) and evaluation (LapSim: 27%; MIST-VR:15%) resources than MIST-VR.

Conclusion: The proposed taxonomy is a first step to assess the relationship between simulation design and training effectiveness. Both MIST-VR and LapSim have previously been shown to train surgeons in basic laparoscopic skills. Our taxonomy reveals in detail how the different didactic resources are used by each of the simulators. Future research will concentrate on a thorough evaluation of the degree of fidelity required to teach basic and more advanced laparoscopic skills.

P148—Education/Outcomes

DEXTERITY ANALYSIS FOR THE ASSESSMENT OF LAPAROSCOPIC PROCEDURES IN THE OPERATING ROOM, R Aggarwal MD, K Moorthy MD, T Grantcharov PhD, P Papasavas MD, T Milland, A Dosis, F Bello PhD, A Darzi MD, Department of Surgical Oncology & Technology, Imperial College London, United Kingdom; Department of Surgical Gastroenterology, Glostrup University Hospital, Glostrup, Denmark; Department of Surgery, Western Pennsylvania Hospital, Pittsburgh, PA, USA.

Introduction: The assessment of technical skills is paramount to the development and maintenance of competence in surgery. However, marking a procedure on a rating scale is time-consuming and open to subjectivity, whilst motion analysis, though instant and objective, does not provide any information regarding errors and resultant safety of the operation performed. The aim of this study is to establish the feasibility and validity of a synchronised video-based motion analysis system (RoVIMAS) for instant, objective assessment of a real laparoscopic procedure.

Methods: Twenty-eight laparoscopic cholecystectomies (LCs) performed by 17 surgeons of varying experience levels were recorded using RoVIMAS software. Each LC was rated by three expert surgeons in a blinded manner using the OSATS (Objective Structured Assessment of Technical Skills) global rating scale. Motion analysis data in terms of time taken (TT), total path length (TPL) and total number of movements (TM) were also noted for the whole procedure, and for its constituent parts: dissection of Calot’s triangle; clip and cut duct; and dissection of the gallbladder from the liver bed. Dexterity values were correlated with the mean video rating score derived from those of the three expert observers. Statistical analysis used Spearman’s rank correlation, and Cronbach’s alpha for inter-rater reliability, with p<0.05 deemed significant.

Results: There were significant negative correlations between all three motion analysis parameters and the mean video rating score for the whole procedure: TT (r=-0.764, p<0.001); TPL (r=-0.785, p<0.001); TM (r=-0.785, p<0.001). The pattern was replicated for clip and cut duct, and dissection of the gallbladder from the liver bed, though not for dissection of Calot’s triangle and clip and cut artery. Inter-rater reliability between the three expert surgeons for video rating was 0.79.

Conclusions: Motion analysis is a feasible and valid tool for assessment of technical skills during real laparoscopic procedures, and possesses concurrent validity when compared to an established global rating scale. This technology can reduce the amount of time required for qualitative assessment of an operation, limiting video-based assessment to key parts for confirmation of a safe and error-free procedure.

http://www.sages.org/
P149—Education/Outcomes
EXPERIENCE WITH THE OPTICAL ACCESS TROCAR FOR SAFE AND RAPID ENTRY IN PERFORMING THE LAPAROSCOPIC GASTRIC BYPASS, Barry R Berch MD, Rami Lufti MD,Alfonso Torquati MD,William O Richards MD, Vanderbilt University Medical Center.
BACKGROUND: In laparoscopic surgery, serious complications caused by the blind insertion of trocars and the Veress needle are well known. The open technique is compromised by the leakage of carbon dioxide and can also be time consuming, especially in the obese population. Our aim is to determine whether the optical access trocar can be used to establish a safe and rapid entry during laparoscopic gastric bypass.
METHODS: The data on a single Surgeons experience with over 350 laparoscopic gastric bypass procedures during a 4 year period was reviewed. The Optiview (Ethicon Endosurgery) trocar was used on all but the initial 21 patients. The entry time for the optical trocar was measured in 10 patients. RESULTS: Of the 350 patients undergoing laparoscopic gastric bypass from 11/2000 to 9/2004, the initial 21 were performed using the standard Veress needle to create the pneumoperitoneum. The next 22 were performed using the Veress needle to create the pneumoperitoneum followed by the optical access trocar in the left upper quadrant as the initial trocar inserted. From this point to present, the optical access trocar has been inserted without the use of a Veress needle. There have been no trocar related bowel or vascular injuries in the entire series. Mean optical trocar insertion times were 28 ± 1.26 seconds.
CONCLUSIONS: This is the first laparoscopic gastric bypass series to report the results of its experience with the optical access trocar. This device provides a safe and rapid technique for the initial trocar placement in the laparoscopic gastric bypass. Insertion of the optical trocar with a 10mm laparoscope into the left upper quadrant is our procedure of choice for obtaining the pneumoperitoneum in this patient population.

P150—Education/Outcomes
TELEMENTORING VERSUS ON-SITE MENTORING IN SIMULATION TRAINING, Lucian Panait MD, Alfredo M Carbonell DO, Victor Tomulescu MD,Azhar Rafiq MD,cosmin Boanca BS,irinel Popescu MD,Ronald C Merrell MD, Virginia Commonwealth University Medical Center, Richmond, VA & Fundeni Clinical Institute, Bucharest, Romania
Telemantoring could be an adjunct tool to surgical training using virtual reality (VR) surgical simulation. The hypothesis of this study was that telemantoring is just as effective as proximal mentoring for acquisition of surgical skills in simulation. Twenty Romanian medical students, with no previous laparoscopy experience, were randomly assigned to two groups that trained with a VR surgical simulator (LapSim, Surgical Science) under supervision of a telemantor or a proximal mentor, respectively. The telemantor, located in the US, interacted with the students by videoconferencing, coaching both vocally and demonstrating on another VR simulator. The simulator screen and two other room cameras were integrated into a videoconferencing unit with audio for Internet broadband transmission. All students watched an instructional module at the beginning of the exercise. Skill assessment before and after the training sessions involved measurement of path length and time for completing four basic laparoscopic tasks: grasping, cutting, clip applying, and suturing. Student t-test statistical analysis was used to compare the results within each group at the beginning and end of study. The combined use of instructional media and practice session with mentoring prior to testing resulted in similar a level of performance between proximal and telemantored groups. After adjusting for other covariates, right and left hand path length and time decreased significantly within each group from the initial to the final evaluation (p<0.05) for most of the tasks (grasping, cutting, suturing). No significant difference was achieved for any of the parameters in clip applying, one of the most complex exercises, in which superior eye-hand coordination was required for correct completion. Integration of high-quality instructional media with telemantoring simulation can be as effective in developing surgical skills as proximal mentoring.

P151—Education/Outcomes
WEBSITE NAVIGATION AND SURGICAL EDUCATION, D Mutter MD,F Beemdeur MD,H Maisonneuve MD,J Marescaux MD, Ed Chekan MD, University Louis Pasteur, University Hospital of Strasbourg, Groupe hospitalier Lariboisiere St. Louis, Sewickley Valley Hospital
Intro: Little is known about the way in which students interact with online surgical educational content. This study evaluates the web-surfing habits of medical student within a surgical education website (Websurg.com).
Methods: Ten medical students on their pediatric surgery rotation were placed in front of a computer and were asked to study an online chapter, ?Acute Intestinal Intussusception? for one hour. The computer was connected by video link to a video-recorder that recorded their navigation, i.e. navigation time, time in front of the pages, chronology of study, and use of interactive links. The students were asked to complete a questionnaire designed to identify overall competency in computers and Internet navigation.
Results: Mean time spent viewing the entire website: 47.9 mins (30.7-63.4 mins); mean time spent on the assigned chapter: 38 mins (8.06-62.7 mins). Each page within the chapter was visited between 0 and 10 times. Access to video selections: after a mean of 9.62 mins from the beginning of the session. A connection was made to the video a mean of 2.3 times per session. Mean time spent viewing video: 5.15 mins (24% of time spent viewing the chapter). The questionnaire results showed that few students regularly access the Internet for educational purposes.
Conclusion: In this study, few medical students connect to the Internet at their own discretion for educational reasons; however, if prompted to do so will tend to have reasonable connection times. The medical students in this study had a keen interest in video content.

P152—Education/Outcomes
THE PRE-VESICAL SEAT OF THE HYDATID CYST, AN EXCEPTIONAL LOCALIZATION : CASE REPORT AND LITERATURE REVIEW, ADEL CHOKKI MD, SOUFINE NOUIRA MD,YOUSSEF HARRATH MD,MOHAMED TAHAR KHALFALLAH MD,CHEDLY DZIRI MD, Service de chirurgie, hôpital de Siliana. Siliana Tunisia
The hydatid disease is a common condition in endemic countries. The organ most usually affected is the liver and then the lungs. In fact, all organs in the human body may be affected by hydatid disease.
Urinary tract involvement is quite uncommon, corresponding to only 2-4% of cases. A 53 year old man presented with a large suprapubic mass which appeared three years before and increased size gradually. Ultrasonography revealed that the mass was a hydatid cystic classified stage IV and sitting in front of the urinary bladder. Computed tomography suggested that the mass could be an echinococcal cyst. Moreover, there were no evidence of hydatidosis in any other organ. The radiography of the thorax was normal. The patient underwent surgical exploration during which the diagnosis of hydatid cyst located in front of the urinary bladder was confirmed. The cyst was completely excised and the pathologic examination confirmed the diagnosis. The isolated hydatid cyst sitting in front of the urinary bladder is exceptional and was never described in the literature, even in the endemic countries. Ultrasonography is essential for diagnosis. The CT scan plays a role when diagnosis is unclear and to show the anatomical reports. The diagnosis of hydatid cyst must be evoked and confirmed before any gesture of puncture, biopsy or cystectomy, in order
to avoid dissemination of the cystic contents or a anaphylactic shock.
Cystectomy and pericystic resection, (by open surgery) as extensive as possible, is the adequate treatment that gives successful results in most cases.

note: I wish to present this clinical case in the form of poster.

P153–Education/Outcomes
A PRIMARY HYDATID CYST OF THE GLUTERAL MUSCLE: A CASE REPORT, Adel Chokki MD, Youssef Harrath MD, Soufiene Nouira MD, Jalel Kdous MD, Chefdly Dziri MD, Mohamed Tahar Khalifallah MD, Service de chirurgie Hopital de Siliiana. Siliiana. Tunisia

hydatidosis remains an endemic surgical problem in many Mediterranean countries like Tunisia, the hydatid cyst can touch all the organs of the human body.
The muscular localization of the hydatid cyst is uncommon (0.5 to 5.4%) and it is usually secondary to hepatic or pulmonary disease.
A 59 year old woman presented with a mass of the left buttock which appeared two years before and increased size gradually.
Clinical examination, noted the presence of two masses of the left buttock
Ultrasoundography revealed that the masses were a hydatid cystic classified stage III (Garbi’s classification).
Serology was positive.
Thoracic radiography and abdominal Ultrasonography were normal and did not revealed another localization of the hydatid cyst.
At surgical exploration, three hydatid cyst were found.
Two cyst were totally removed and the third cyst was treated by pericystic resection.
Follow up : four years later, there was no recurrence.
An isolated hydatid cyst can be the unique manifestation of hydatid disease. Preoperative diagnosis is desirable for the selection of a surgical approach and prevention of allergic reactions and operative spillage.
The purpose of this work is to call attention to this atypical localization of the disease, which should be taken into account in the practice of surgery.
In the light of this case, we discuss the epidemiological, diagnostic and therapeutic aspects of muscle hydatidosis.

P154–Education/Outcomes
CHARACTERIZING THE LEARNING CURVE FOR A BASIC LAPAROSCOPIC DRILL, Shannon A Fraser MD, Liane S Feldman MD, Donna Stanbridge RN, Gerald M Fried, Steinberg-Bernstein Center for Minimally Invasive Surgery, McGill University

CHARACTERIZING THE LEARNING CURVE FOR A BASIC LAPAROSCOPIC DRILL
Shannon A. Fraser MD, Liane S. Feldman MD, Donna Stanbridge RN, Gerald M. Fried MD Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.

Background: Psychomotor challenges inherent in laparoscopic surgery are evident by the steep procedural ?learning curves? documented throughout the literature. Few methods have been described to evaluate learning curves. The cumulative summation (CUSUM) method is a criterion-based evaluation of the learning process. The purpose of this study is to describe the CUSUM learning curves for a simple task for individuals and for a group of novice laparoscopists. Methods: 16 medical students did 40 repetitions of MISTELS laparoscopic peg transfers. Performance was recorded for each trial. CUSUM learning curves were constructed based on the goal of achieving mean scores for senior, intermediate or junior laparoscopists >95% time. Results: Based on senior criteria, 1 student achieved the goal by the 40th trial; based on intermediate criteria, 3 achieved the goal by the 40th trial (trials 21, 36), and for junior criteria, 10 achieved the acceptable success rate by the 40th trial (range = 26-40).

Conclusion: CUSUM analysis suggests criterion-based practice is useful for novice laparoscopists. It allows educators to track individual progress toward specific performance goals for each MISTELS task, to more logically allocate the required time for training and set attainable goals, to objectively evaluate trainee acquisition of basic laparoscopic skills, and to identify trainees who need remediation.

P155–Education/Outcomes
OBJECTIVE ASSESSMENT OF LAPAROSCOPIC SKILLS USING A VIRTUAL REALITY SIMULATOR: CORRELATION WITH PERFORMANCE IN THE OPERATING ROOM, Theodor P Grantcharov PhD, J Ravn Eriksen MD, PF Caushaj MD, P Funch Jensen MD, Department of Surgery, Copenhagen University, Glostrup Hospital, Denmark, Department of Surgery, Aarhus University, Kommunehospitalet, Denmark, The Western Pennsylvania Hospital, Pittsburgh, USA

BACKGROUND
The study was carried out to validate the role of virtual reality computer simulation as a method for assessment of psychomotor skills in laparoscopic surgery. We aimed to investigate whether performance in the OR, assessed using a modified OSATS correlated with the performance parameters, registered by LapSim during simulated laparoscopic tasks.

MATERIALS AND METHODS
Ten surgical residents with similar, limited experience in laparoscopic surgery (median 5 (range 1-16) laparoscopic cholecystectomies) were included in the study. All participants performed 3 repetitions of all 7 tasks on the LapSim trainer and one laparoscopic cholecystectomy in the OR. The OR procedure was video recorded and blindly assessed by 2 independent observers using a modified OSATS rating scale. Assessment in the OR was based on 3 parameters: time used, error score and economy of motion score. During the tasks on LapSim, time, error- (tissue damage, mm tissue damage (tasks 2-6) and error score (task 7)) and economy of movement parameters (path length, angular path) were registered. Data was analysed using Spearman’s test.

RESULTS
Significant correlations were demonstrated between time used to complete the OR procedure and task 7 (p=0.015). Error score demonstrated during the laparoscopic cholecystectomy correlated well with tissue damage (task 4 (p=0.04), task 5 (p=0.05) and task 6 (p=0.01)); mm tissue damage (task 3 (p=0.001), task 6 (p=0.028)); and error score in task 7 (p=0.034). Furthermore, statistically significant correlations were observed between economy of motion score from the operative procedure and LapSim’s economy parameters? path length (task 1 (p=0.028), task 2 (p=0.006), task 3 (p=0.004), task 4 (p=0.001), task 5 (p=0.001), task 7 (p=0.005)); and angular path (task 2 (p=0.004), task 3 (p=0.002), task 4 (p=0.001), task 5 (p=0.001), task 6 (p=0.001), task 7 (p=0.001).

CONCLUSION
The current study demonstrates significant correlations between operative performance (assessed using a well-validated rating scale) in the OR and psychomotor performance in virtual environment assessed by a computer simulator. This provides strong evidence on the validity of the simulator system as an objective tool for assessment of laparoscopic skills.

P156–Education/Outcomes
IMPROVEMENT IN SUTURING AND TYING TIMES IN PEDIATRIC SURGERY FELLOWS ATTENDING A WORKSHOP FOR AN ADVANCED LAPAROSCOPIC PROCEDURE, Carroll M Harmon, MD PhD, Thomas H Inge, MD PhD, Timothy D Kane, University Hospital, Pittsburgh, USA

http://www.sages.org/
The purpose of this study was to investigate the effectiveness of the training with robotic surgical system on performance of conventional endoscopic procedures. Seventy four medical doctors and 15 non-medical doctors were included in this study. The surgical skill levels were evaluated by the following five tasks. The trainees were evaluated the endoscopic surgical skills by performing the same tasks with and without the da Vinci surgical system. The tasks were pegboard pattern, running string, pattern cutting, ligation and suturing. The total score was calculated by subtracting a penalty score from a timing score. (1) Pegboard pattern: Through the use of two pegboards and six pegs, the operator was required to lift each peg from one pegboard with the left hand, transfer it to the right hand, and place it on the other pegboard. Cutoff time was 120 seconds. (2) Running string: Two graspers were used to run a 120cm string from one end to the other, grasping the string at colored sections marked at 10cm intervals. Cutoff time was 100 seconds. (3) Pattern cutting: The operator was required to cut a circle 2.5cm in diameter. The cutoff time was 180 seconds. (4) Ligation: The operator was required to ligate at the two pre-marked positions. He must ligate three times at the one position. Cutoff time was 300 seconds. (5) Suturing: The operator was required to continuously suture a circle 2.5 cm in diameter. At first, the suture must be tied using an intracorporeal knot. Cutoff time was 600 seconds. All trainees performed the tasks by endoscopic procedures both with and without using the da Vinci surgical system before and after the two days animate and inanimate training. The total score was significantly higher after the training in both groups of medical doctors and non-medical doctors. There were significant differences in the total scores with and without the da Vinci surgical system among both groups. The total score was significantly higher in the ligation and the suturing tasks especially when the medical doctors used the robotics. The robotic surgical system assisted both medical doctors and non-medical doctors to perform endoscopic procedures significantly more precisely and faster compared with those without using the robotic system. The training has a significant effectiveness on performance, especially in the complicated endoscopic procedures.

P157–Education/Outcomes

EFFECTIVENESS OF TRAINING WITH ROBOTIC SYSTEM ON ENDOSCOPIC SURGERY, Makoto Hashizume MD, Satoshi leiiri MD, Yoshinori Kakeji MD,Kozo Konishi MD,Hirotumi Kawanaka MD, Kefei Yan Yusuana BA, Kyushu University Faculty of Medicine.

The purpose of this study was to investigate the effectiveness of the training with robotic surgical system on performance of advanced laparoscopic surgery. These results document short-term skills value of animate advanced laparoscopic skills training courses for pediatric surgery residents.

P158–Education/Outcomes

POTENTIAL FORAMEN ALONG THE ATTACHMENT OF THE DIAPHRAGM TO THE LOWER RIBS DURING LAPAROSCOPIC RENAL AND ADRENAL SURGERY, Michihiro Kawada MD, Gen Murakami PhD, Department of Anatomy, Sapporo Medical University School of Medicine

We studied the lumber triangles and the potential foramen. Because existing of the lack of diaphragmatic covering at the end of the 12th in some cases, the careful dissection should be required during making retroperitoneal cavity.

P159–Education/Outcomes

VALUES OF A VIRTUAL SIMULATOR AND TRAINING BOX IN TRAINING FOR ENDOSCOPIC SURGERY, Taizo Kimura MD, Akhiro Kawabe MD,Kenji Suzuki MD,Hidetoshi Wada MD, Department of Surgery, Fujinomiya City General Hospital

We investigated the value of a virtual simulator and a training box in training for endoscopic surgery. Sixteen medical students were divided into the following three groups: the VR group (six students who trained with a virtual simulator for one week), the TB group (six students who trained with a training box for one week), and the control group. After the training, they performed the following three surgical procedures in pigs for assessment: 1) small bowel resection, 2) clo-
sured of a gastric perforation (using two suture ligatures), and 3) laparoscopic cholecystectomy. The students alternately worked as operators or cameramen, and endoscopic surgeons with more than 10 years of experience were their assistants. Their performance was assessed from the time required for each procedure and the error score. There were no significant differences between the three groups in the total operating time for the three procedures, the operating time for LC, and the error score. However, there was a significant difference in the time required for suturing the gastric perforation between the VR group and the control group (p=0.0002), as well as between the TB group and the control group (p=0.0012). The time for the second suture comparing for the first suture was significantly reduced in the VR group compared to the TB group (p=0.0181). In the TB group, the time required for suture ligatures by three students who were given instructions by the trainers watching the procedure was shorter than that required by students who received instructions from the trainers not watching the procedure (p=0.0495). Based on these findings, both the virtual simulator and the training box were useful in training for placement of suture ligatures, but were not useful in training for suturing or grasping. The virtual simulator was also useful for shortening the learning curve, while the training box became more useful if instructions were given by a trainer who was viewing the surgical procedures.

P160—Education/Outcomes
VALIDITY AND RELIABILITY OF A VIDEOTRAINER LAPAROSCOPIC CAMERA NAVIGATION SIMULATOR, J R Korndorff Jr MD, D Stefanidis MD, R Sierra MD, J L Clayton PhD, C L Touchard BS, J B Dunne PhD, D J Scott MD, Tulane University Health Sciences Center, Department of Surgery

The videotainer laparoscopic camera navigation (LCN) simulator has previously been shown to develop skills which translate to the OR. The purpose of this study was to determine the construct and face validity and the reliability of the LCN simulator.

Subjects (n=31) including novices (R1, n=20), intermediates (R2-5, n=7), and experts (>200 lap cases, n=4) were enrolled in an IRB-approved protocol. Each subject performed 3 repetitions on the 0° and 30° simulators and was scored (accuracy and time) by direct observation. To evaluate construct validity, scores were compared between groups using ANOVA and with LCN experience using Pearson Correlation. To evaluate face validity, intermediate and expert subjects rated the simulators using a 10-point Likert scale. To evaluate reliability, scores were analyzed by Pearson Correlation (test-retest) and Cronbach alpha (internal consistency).

For the 0°&x88;B0; simulator, no significant difference was detected between groups and LCN experience did not correlate with performance (r=0.026, p=0.16). For the 30°&x88;B0; simulator, a significant difference was detected between groups and LCN experience correlated significantly with performance (r=0.39, p=0.01). The rating scales were 8.7 for &quot;simulates movements required for LCN,&quot; 8.2 for &quot;relevance to actual LCN,&quot; and 8.2 for &quot;usefulness for training.&quot; Test-retest reliability was 0.8 (p=0.001) for both the 0°&x88;B0; and 30°&x88;B0; simulators and Cronbach alpha was 0.6 (0°&x88;B0;) and 0.9 (30°&x88;B0;).

Although a trend was noted in the 0°&x88;B0; simulator scores, statistical significance was not reached due to the easy level of difficulty and limited group sizes (further accrual is underway). However, the more difficult 30°&x88;B0; simulator was able to discriminate between groups and clearly demonstrated construct validity. Both simulators showed excellent face validity and moderate to high reliability. These data further support the use of the LCN simulator for training and possibly assessment purposes.

P161—Education/Outcomes
PROFICIENCY-BASED TRAINING FOR LAPAROSCOPIC SUTURING: VR, VT, OR BOTH?, J R Korndorff Jr MD, J B Dunne PhD, D Stefanidis MD, R Sierra MD, C L Touchard BS, D J Scott MD, Tulane University Health Sciences Center

The purpose of this study was to compare the effectiveness of laparoscopic suturing curricula using videotrainer (VT) and virtual reality (VR) simulators, and to examine the role of VR training as a cost effective adjunct to VT training. Medical students (MS, n=8) with no laparoscopic suturing experience were enrolled in an IRB-approved, randomized, controlled protocol. Subjects were pre-tested on a live porcine laparoscopic Nissen fundoplication model, stratified according to pre-test scores and randomized into three groups. The VT group (n=3) practiced on a VT suturing model and the VR group (n=3) practiced on the MIST-VR suturing module (stitch and square-knot tasks) until predetermined proficiency scores were achieved. The control group (n=2) received no training. All groups were post-tested on VT. Analysis was by ANOVA and paired t-test (mean ± sd, p=0.05 significant, higher scores indicate superior performance).

Mean time spent on the VT simulator was 224 min. (176 - 274) for the VT group vs. 119 min. (100 - 145) for the VR crossover group (p=0.03). Mean number of repetitions on the VT simulator was 56 (range 46 - 74) for the VT group vs. 35 (range 31 -39) for the VR crossover group (p=0.08). While mean total simulator time (VR + VT) was 351 min. for the VR crossover group, cost analysis yielded a savings of $96 per trainee due to decreased required materials (sutures) and manpower (proctor time on VT). These data suggest that training to a predetermined proficiency level on both VR and current VR suture models provides subjects with skills which translate into significant improvement in operative performance; however, VT results in greater ultimate performance. Nevertheless, VR may be part of a cost effective strategy for training large numbers of individuals by alleviating the need for consumable materials and supervisory personnel; with further development VR may prove equally effective.

P162—Education/Outcomes
OCCUPATIONAL EXPOSURES AMONG SURGICAL RESIDENTS DURING LAPAROSCOPIC SURGERY: INCIDENCE AND ATTITUDES, Pavi S Kundhal MD, Patrick Cervini MD, Julie L Harnish MSc, David R Urbach MD, University Health Network, Toronto, Canada

Objectives: Little data exist on occupational exposures during laparoscopic surgery (LS). We describe occupational exposures during LS among surgical residents at a large university. In addition, we describe residents' perceptions of the relative safety and use of body substance precautions (BSP) during LS.

Methods: All residents in the Department of Surgery at the University of Toronto were invited to participate in an online survey that focused on specific occupational exposure types, perceived safety and the use of BSP during LS.

Results: 69 surgical residents responded to the online survey. 82% of the respondents were male, and the mean age (SD) was 29 years (2.5). Of the respondents, 26 were in general surgery, 6 in urology, 17 in orthopedic surgery, 6 in plastic surgery and 14 in various other programs. Respondents by year of residency were 15 in year 1, 17 in year 2, 13 in year 3, 11 in year 4 and 13 in year 5 and above. 85% of resident had participated in LS during their residency. 7% of residents indicated they had an occupational exposure during LS, as compared with 72% during open surgery (P=0.01). 3 residents had suture needle injuries, 2 drill related injuries, and 1 injury with a hollow bore needle during LS. 83% of residents indicated that they use the same BSP during open and LS. 56% of residents felt LS was safer then open surgery, with 43% of residents that they use the same BSP during open and LS. 56% of residents indicated that they had an occupational exposure during LS. 83% of residents indicated that they use the same BSP during open and LS. 56% of residents felt LS was safer then open surgery, with 43% of residents that they use the same BSP during open and LS. 83% of residents indicated that they use the same BSP during open and LS. 56% of residents felt LS was safer then open surgery, with 43% of residents that they use the same BSP during open and LS. 83% of residents indicated that they use the same BSP during open and LS. 56% of residents felt LS was safer then open surgery, with 43% of residents that they use the same BSP during open and LS.
BSP used or perceptions of the relative safety of LS.
Conclusion: Occupational exposures among surgical residents are less common in LS as compared with open surgery. Operating laparoscopically did not influence the BSP used by surgical trainees during surgery, even though the majority of surgical residents feel LS is safer.

P163–Education/Outcomes
EARLY VERSUS DELAYED INTERVAL LAPAROSCOPIC CHOLECYSTECTOMY FOR ACUTE CHOLECYSTITIS: A META-ANALYSIS, Hung Lau MD, University of Hong Kong Medical Center, Tung Wah Hospital, Sheung Wan, Hong Kong
Background: Early laparoscopic cholecystectomy has been advocated for the management of acute cholecystitis but little data exists to support the superiority of this approach over delayed interval laparoscopic cholecystectomy for acute cholecystitis. Accordingly, a meta-analysis was undertaken to compare the outcomes and efficacy of early and delayed interval laparoscopic cholecystectomy for acute cholecystitis in an evidence-based approach using meta-analytical techniques.
Methods: A search of electronic databases, including MEDLINE and EMBASE, was conducted to identify relevant articles published between January 1988 and June 2004. Only randomized or quasi-randomized prospective clinical trials in English language comparing the outcomes of early and delayed interval laparoscopic cholecystectomy for acute cholecystitis were recruited. All papers were critically appraised with respect to their methodology and outcome. Both qualitative and quantitative statistical analyses were carried out. The effect size of outcome parameters was estimated by odds ratio and weight mean difference where feasible and appropriate.
Results: A total of 4 clinical trials comprising 504 patients met the inclusion criteria. Failure of conservative treatment requiring emergency cholecystectomy occurred in 42 patients in the delayed group. Meta-analyses demonstrated a significant shortening in the total length of hospital stay in the early group (mean difference = -1.12, 95% CI [-1.42 to -0.82], p<0.001). Pooled estimates of operative time, conversion rate, overall complication rate, bile leakage and intraabdominal collection showed no significant differences between two approaches.
Conclusions: The safety and efficacy of early and delayed interval laparoscopic cholecystectomy for acute cholecystitis were comparable. Evidence suggested that early laparoscopic cholecystectomy conferred a significant shortening in the total length of hospital stay. Early cholecystectomy is therefore a cost-effective approach and reduces the risk of recurrent acute cholecystitis or development of other biliary complications.

P164–Education/Outcomes
TELESURGERY ENHANCES EDUCATION OF MEDICAL STUDENTS, Thomas P McIntyre MD, Leonardo Villegas MD, Jennifer Doyle BA, Daniel B Jones MD, Beth Israel Deaconess Medical Center, Harvard University
INTRODUCTION: Telesurgery (TS) may improve the learning environment for third year medical students. Our aim was to evaluate the TS environment vs. the traditional Operating Room (OR) in two aspects: student satisfaction and student-faculty interaction. METHODS: Typical OR learning during the third year medical student surgery clerkship was supplemented with two TS sessions to which all students (n=11) were invited. Faculty-student interaction was evaluated by an independent observer in both settings. Surgeons and students were blinded to the study. Students also completed a questionnaire evaluating each setting. (scale: 1=not at all; 5=completely). Analysis was performed using a T-Test. RESULTS: The average time allotted to sessions were; TS=77.5 min; OR=76 min. A total of 12 observations were conducted (TS=2; OR=10), and 29 evaluations were returned (TS=19; OR=10). Observations revealed that nearly 4 times as many teaching points were made in TS sessions: students asked 5 times more questions; and faculty asked 3 times more questions of students. In addition teaching points made in TS sessions were broader than anatomy and surgical technique. (See Table)
Student evaluations of the TS sessions were more positive: they felt freer to ask questions, reported leaving TS sessions with fewer unanswered questions and more felt TS sessions were a good use of their time.

CONCLUSIONS: This study suggests that TS sessions provide a positive learning environment for third year students, enabling greater student-faculty interaction. TS sessions allow the scope of clerkship teaching to expand beyond anatomy and surgical technique.

P165–Education/Outcomes
VIRTUAL REALITY TESTING ON THE EFFECTS OF SLEEP DEPRIVATION, Benjamin E Schneider MD, Louis C Rivera BS, Leonardo Villegas MD, Daniel B Jones MD, Beth Israel Deaconess Hospital, Harvard Medical School
Background: Sleep deprivation has been shown to increase technical errors in a virtual reality simulated environment among surgical residents averaging 2 hours of sleep on call. Recent adoption of resident work hour restrictions may obviate the impact of sleep deprivation.
Aim: The purpose of this study was to objectively measure the performance of residents when rested and when sleep deprived.
Methods: Volunteer surgical residents (N=18) were enrolled prospectively. Residents underwent pre-test instruction, randomization, and served as their own controls. Questionnaires assessed sleep, caffeine intake, and subjective measure of tiredness. Testing was directly observed, although actual assessment was computer-generated using the Minimally Invasive Surgery Trainer, Virtual Reality (MIST-VR) with a series of six tasks designed to simulate simple laparoscopic procedures. Outcomes included speed, error, economy of motion, and economy of diathermy.
Results: Rested residents reported an average of 8.45 hours (range 1-13) since last period of sleep compared to an average of 18.76 hours (range 5.8-33.5) for sleep-deprived residents. Rested residents reported the length of their last sleep period to be an average of 5.89 hours (range 4.5-8) while sleep-deprived residents reported their last sleep as an average of 4.83 hours (range 1.75-7).

<table>
<thead>
<tr>
<th></th>
<th>Rested</th>
<th>Sleep Deprived</th>
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<tbody>
<tr>
<td>Fatigue (1-10)</td>
<td>5.32</td>
<td>6.50</td>
</tr>
<tr>
<td>Error/Task</td>
<td>28.23</td>
<td>34.52</td>
</tr>
<tr>
<td>Speed/tissue (s)</td>
<td>53.98</td>
<td>34.21</td>
</tr>
</tbody>
</table>

Conclusion: In the era of shortened workweek, while residents report fatigue, resident performance in a simulated learning environment does not seem to be adversely affected due to sleep deprivation.

P166–Education/Outcomes
Experts and novices may have different expectations when confronted with a novel simulated environment. The Lapsim® is a computer-based virtual reality laparoscopic trainer. We sought to analyze the performance of experienced basic laparoscopists and novices during their first exposure to the Lapsim® Basic Skill set and Dissection module.
Experienced basic laparoscopists (n=16) were defined as attending surgeons and chief residents who performed > 30 laparoscopic cholecystectomies. Novices (n=13) were surgical residents with minimal laparoscopic experience. None of the
subjects had used a computer generated laparoscopic simulator in the past. Subjects were given one practice session on the LapSim® tutorial and dissection module and were supervised throughout the testing. Instrument motion, time, and errors were recorded by the LapSim®. A Performance Score (PS) was calculated using the sum of total errors and time to task completion. A Relative Efficiency Score (RES) was calculated using the sum of the path lengths and angular path lengths for each hand expressed as a ratio of the subject’s score to the worst score achieved among the subjects. Thus, a lower PS and RES indicated better performance. All groups were compared using the Kruskal-Wallis and Mann-Whitney U-test.

Novices achieved better PS and/or RES in Instrument Navigation, Suturing, and Dissection (p<0.05). There was no difference in the PS and RES between experts and novices in the remaining skills.

Novices tended to have better performance compared to the experienced basic laparoscopists during their first exposure to the LapSim®: Basic Skill set and Dissection module.

P167–Education/Outcomes
SELF-APPRAISAL OF CONSULTANT SURGEONS PERFORMING LAPAROSCOPIC CHOLECYSTECTOMIES USING HIERARCHICAL TASK ANALYSIS, Sudip K Sarker MD, Richard Hutchinson BS, Avril Chang MD, Charles Vincent PhD, Ara W Darzi MD, Department of Surgical Oncology & Technology, Imperial College London, UK

Objectives
Evaluation of surgical skill is notoriously difficult, due to its subjectivity, and demands of requiring time-consuming expert analysis. Assessment techniques in laparoscopic surgery are currently only applied in the training of junior surgeons, to assess skills as they enter the field. No ongoing evaluation scheme exists to assess the continuing competency of surgeons throughout their careers. The use of the surgeons themselves to evaluate their own technique, employing objective analysis techniques would circumvent the need for constant external analysis. This study examines whether surgeons, self-assessment accurately reflects their actual surgical technique.

Methods
Using hierarchical task analysis, a task breakdown of the laparoscopic cholecystectomy was constructed. 9 expert (>250 procedures) consultant surgeons were asked to complete the task breakdown pre-operatively, regarding the tools used and method employed, for tasks in an `ideal' procedure. The self-assessment was then compared with the surgeon's actual operations, which had been recorded onto DVD after the task analysis was done, and analyzed for tool use and method used, by 2 independent observers.

Results
All patients were between ASA 1-2, BMI < 30 and had clinicopathological grade 1-2 gallbladders. Inter-rater reliability task analysis was kappa = 0.77. The concordance between surgeons' perceived and actual styles varied from 73-91%. The majority of discordance occurred in non-technical tasks, as opposed to technical actions. Surgeons were unable to describe the manner in which they used some specific tools. Conclusions
Surgeon self-evaluation is accurate for technical skills aspects of the procedure, but is not sufficiently detailed to allow self-evaluation of technical styles. Surgeon self-evaluation is poor in non-technical aspects of the procedure. This study demonstrates that self-appraisal using hierarchical task analysis is feasible, accurate and practical. We aim to increase the numbers in our study and recruit also resident surgeons.

P168–Education/Outcomes
CONSTRUCT VALIDITY OF ASSESSORS OF STRUCTURED SURGICAL TECHNICAL SKILLS ASSESSMENT IN LAPAROSCOPIC SURGERY, Sudip K Sarker MD, Avril Chang MD, Charles Vincent PhD, Ara W Darzi MD, Department of Surgical Oncology & Technology, Imperial College London, UK

Objectives
Objective structured assessment of technical skills in live operations removes subjectivity and bias. To date these assessments have been done blindly and independently, but require experienced surgeons and are time consuming. We aim in this present to evaluate novice assessors, with and without surgical experience, can assess technical skills in live laparoscopic surgery.

Methods
Two full length versions of laparoscopic cholecystectomies (LC) performed by two attending/consultant surgeons were digitally recorded and converted to DVD. A Likert scale for generic and procedure specific technical skill aspects of LC were devised. LC were assessed by two experienced surgeons and then assessed by two groups of 15 clinical medical students and 15 junior surgical residents respectively. The two groups assessed the LC without specific instruction but only using the Likert scales devised.

Results
Inter-rater reliability between the 2 experienced surgeons was kappa = 0.93, p< 0.05. Kappa coefficient between the 2 experienced surgeons and the medical students collectively was k = 0.37, p> 0.05 and for the surgical residents collectively was k = 0.62, p> 0.05. Mann-Whitney test for construct validity was significant p< 0.05 for the groups (experience surgeons, junior residents, medical students).

Conclusions
Our study shows that novice technical skills assessors with or without any surgical experience can not assess live laparoscopic operations. We aim in the future to assess if surgeons, with varying surgical experience and specified training in technical skills assessment can assess technical skills in live open and laparoscopic surgery.

P169–Education/Outcomes
DEVELOPMENT OF A STRUCTURED GLOBAL TECHNICAL SKILLS ASSESSMENT TOOL IN OPEN & LAPAROSCOPIC SURGERY, Sudip K Sarker MD, Avril Chang MD, Charles Vincent PhD, Ara W Darzi MD, Department of Surgical Oncology & Technology, Imperial College London, UK

Objectives
A global assessment for primary inguinal hernia repair (IH) and laparoscopic cholecystectomy (LC) using generic and procedure specific scales for each operation were devised. All operations were recorded in their entirety and converted to DVD. Two experienced surgeons assessed the full length operations on DVD blindly and independently.

Results
All patients were between ASA 1-2, BMI < 30, < 75 years old. They were all discharged the same or next day. There were no post-operative complications. All IH were primary repairs and LC were grade 1-2. 60 live procedures were assessed (30 IH and 30 LC). 19/30 IH were performed by consultants, 11/30 performed by trainees. 22/30 LC were performed by consultants, 8/30 performed by trainees. Using Mann-Whitney comparing the generic and procedure specific scores for IH between consultants and trainees was significant, p = < 0.05, and for LC generic and procedure specific scores was also significant, p = < 0.05.

Conclusions

http://www.sages.org/
Our study shows that this global assessment tool for live surgery has construct validity and is able to differentiate from generic surgical technical skills and procedure specific skills. We aim to recruit more surgeons to our study and develop a parallel technical skills error scoring system. Also we aim to assess other common open and laparoscopic operations.

P170—Education/Outcomes

ANALYSIS OF PSYCHOMOTOR SKILLS USED IN LEARNING TEP Scott Ellner DO, David Easter MD, Michelle K Savu MD, UCSD, VA San Diego Healthcare System, San Diego, CA

Introduction: Acquisition of advanced laparoscopic skills is necessary for continued learning of new emerging laparoscopic procedures. Which skills are essential for rapid and safe learning have yet to be defined. By using a standardized technique for dissection of hernias by TEP, we compared two groups of residents, one more novice (PGY-3) and one more experienced (PGY-4-5) to assess the learning ability and skills necessary for acquisition of this technique.

Methods: During a period from October 2003 until August 2004, 31 patients underwent 55 hernia repairs, the majority of patients had bilateral hernias (23 patients) while the remaining 9 had recurrent hernia repairs. All participating residents had seen or performed less than 1 TEP before starting in this study. Each resident was proctored by the same attending using a standardized approach to the TEP procedure. All procedures were recorded and analyzed according to psychomotor skills performed and at which frequency. Skills included use of 2 hands for grasping, dissection, counter traction, cutting, manipulation of mesh, and ability to staple at fixation point with accuracy (i.e., lack of slippage from intended insertion point).

Results: The average age of the patient was 58 (31-81) years old. Three of 31 patients (5 hernias) were converted to open technique for inability to identify anatomy (2) or bleeding (1). Group 1 (PGY-3) performed 20 hernia repairs while group 2 (PGY-4-5) performed 30 repairs by the TEP method. The average operating time for Group 1 vs. 2 was 64 vs. 52 minutes (p < 0.05). Analysis of skills used and errors perceived Group 1 used less 2 hand dissection and counter traction movements compared to group 2 (p < 0.05) but cutting, grasping movements were not significantly different in either group. The attending intervention necessary for manipulation of the mesh, and ability to staple to fixed point were similar between the two groups.

Conclusion: More experienced residents performed a new technique in significantly less time than less experienced residents. The most significant skills required for this decreased learning time depended on obtaining the psychomotor skills of 2 hand dissection and counter-traction. New skills specific to a particular technique were learned at similar rates in both groups.

P171—Education/Outcomes

VALIDATION OF SUMMARY METRICS FOR THE LAPSIM VIRTUAL REALITY (VR) SIMULATOR, Vadim Sherman MD, Liane S Feldman MD, Dennis L Fowler MD, Nancy Hogle RN, Donna Stanbridge RN, Gerald M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada; Minimal Access Surgery Center, Columbia University, New York

Introduction. In a previous study, 3 groups (expert laparoscopicists, junior residents, medical students) underwent testing on the LapSim grasping, cutting and clipping tasks. Using the metrics generated by the software, formulae for efficiency (time-error) and economy of motion (motion) were developed to minimize differences between groups. The purpose of this study was to prospectively validate these summary metrics.

Methods. 82 subjects were tested at an outside institution and time-error and motion scores were calculated. Construct validity was assessed by comparing expert (n=15) to novice (n=67) scores. External validity was evaluated by comparing these subjects to 24 subjects previously tested in our institution, stratified by level of training. Data (mean ± SD) were evaluated by t-test (*p < 0.05).

Results. For the time-error score, experts had higher scores in all three tasks. For the motion score, experts only had higher scores in the clipping task (Table). There were no significant differences in scores between the two institutions except for motion analysis of the clipping task (data not shown).

P172—Education/Outcomes

INTERNATIONAL TRANSMISSION OF UNCOMPRESSED ENDOSCOPIC SURGICAL IMAGES OVER BROADBAND INTERNET, Shuji Shimizu MD, Naoki Nakashima MD, Koji Okamura PhD, Young-Woo Kim MD, Joon-Soo Hahm MD, Byung-In Moon MD, Masao Tanaka MD, Kyushu University, Department of Endoscopic Diagnostics and Therapeutics.

Although telecommunication is becoming more and more popular, poor quality images with narrow band network are of little use in medical field and are even misleading for both diagnosis and treatment. We have established a high-quality, medically practical teleconference system using big broadband Internet between Korea and Japan. Kyushu University Hospital in Fukuoka, Japan, and three hospitals in Seoul, Korea, about 600 km away, were connected with bandwidth of 1 G bps, using Kyushu Gigabit Network (Japanese side), the Korea Advanced Research Network (Korean side), and the Korea-Japan Cable Network (international line). The digital video transfer system (DVTS), which can transmit digital videos without any loss of image quality, was attached to an image controller of endoscopic surgery unit. The bandwidth is 30 Mbps for a line and two lines were usually used. A security program (IC4-VPN) was also used to protect the patients?Eprivacy.

Between February 2003 and August 2004, 14 teleconferences were performed, in 7 of which real-time demonstrations of endoscopic surgery, microscopic neurosurgery or endoscopic retrograde cholangiopancreatography were carried out. Not only surgical images but also those of operators?Ehand maneuvers, preoperative X-rays and staffs in the conference room were transmitted to achieve precise discussion. The frame rate was 30 per second as many as that of television and the sound delay was restricted to 0.3 sec between both endpoints of the network. Quality of DV-formatted recorded video images was also preserved well in the other 7 video conferences.

Transmission of exactly the same quality images with surgical monitors for the operators to other remote areas is an ideal condition for surgical education. We have established the advanced telesurgical system, which is easy to perform as well as economical by taking full advantage of public Internet and DVTS. Because patient-friendly endoscopic surgery spreads rapidly and needs training of specialized techniques, this system is a promising tool in remote education beyond geographical borders.

P173—Education/Outcomes

PROFOCENCY-BASED TRAINING: A NEW STANDARD FOR LAPAROSCOPIC SIMULATION, P Sierra MD, J R Konnorffer Jr MD, D Stefanidis MD, L C Touchard BS, J B Dunne PhD, D J Scott MD, Tulane University Health Sciences Center, Department of Surgery

BACKGROUND: Basic laparoscopic skills can be effectively taught on virtual reality (VR) and videotrainer (VT) simulators, but an optimal curriculum design has not yet been established. The purpose of this study was to compare the efficacy and efficiency of proficiency-based versus repetition-based training.

METHODS: General surgery residents (R1, n=21), with no previous VR or VT experience were enrolled in an IRB-approved protocol. All subjects were pre-tested by completing 3 repetitions on 6 MIST VR Core Skills 1 (CS1) tasks, 6 Core Skills 2
CTS2) tasks, and 5 validated VT tasks. Participants were then stratified according to pre-test composite score (sum of each task mean), and randomized into two groups. All subjects trained during one-hour weekly sessions over a 1-year period. In Group I (n=10) training continued until previously reported proficiency levels were achieved on each task (maximum attempts ~80); in Group II (n=11), training continued until 30 repetitions where performed on each task. Statistical analysis was performed using t-tests, and chi-square.

RESULTS: At pre-test there was no significant difference between scores of the two groups. During the study period all subjects completed the assigned training on all 17 tasks. Upon curriculum completion, proficiency was demonstrated for 98% of tasks by Group I compared to 72% of tasks for Group II (p=0.001). Compared to Group II, Group I achieved a significant better final score after fewer repetitions, which suggest that goal directed criteria might have enhanced motivation and maximized learning. Additionally, a non-significant trend towards a shorter training duration was noted for Group I.

CONCLUSIONS: These data indicate that proficiency-based training results in superior performance and is more efficient compared to task-based ended training. Future studies should incorporate predetermined proficiency scores as training goals and repetition-based training should be abandoned.

P174—Education/Outcomes
THE ROLE OF OBSERVATION IN THE ACQUISITION OF LAPAROSCOPIC TECHNICAL SKILLS, Donna D Stanbridge RN, Melina C Vassiliou MD, Liande S Feldman MD, Simon Bergman MD, Gerald M Fried MD, Advocate Illinois Masonic Hospital, Chicago, IL.

INTRODUCTION: The observation of a motor task can activate cognitive processes similar to those seen during actual performance of that task. The technical challenges inherent to laparoscopic surgery have created a growing interest in how these skills are acquired. Research in surgery and motor learning has focused primarily on hands-on practice of skills, either in the operating room or in a simulation laboratory. The purpose of this study was to examine the relationship between repeated observation during MIS surgery without hands-on experience and the acquisition of laparoscopic technical skills in a physical simulator.

Methods: After demonstration and explanation, 12 perioperative nurses (6 MIS-trained and 6 non-MIS trained) were scored during 2 iterations of the peg transfer task in the MISTELS (McGill Inanimate System for Training and Evaluation of Laparoscopic Skills) physical simulator. Scores and baseline characteristics (age, gender, handedness, years of OR experience) were compared between the MIS-trained group (n=6) and the non-MIS group (n=6). Fisher’s Exact test was used to analyze proportions and the Students t-test was used for continuous data.

Results: There were no differences in baseline characteristics between the MIS and non-MIS trained nurses. The mean score in the peg transfer task (average of both iterations) for the MIS group was 71.5 (95% CI 61.1-81.9) compared to 44.6 (36.2-52.9, p=0.0025) for the non-MIS group. Conclusions: Active observation and participation in a MIS surgical team may contribute to the acquisition of laparoscopic technical skills. The role of observation in the training and evaluation of laparoscopic skills merits further study.

P175—Education/Outcomes
INTEGRATING BASIC SKILLS IS COST-EFFECTIVE FOR TEACHING LAPAROSCOPIC SUTURING, Dimitrios Stathinidis MD, Sarah Markley MS, Rafael Sierra MD, James W. Korndorffer Jr MD, Bruce J Dunne PhD, Daniel J Scott MD, Tulane University Health Sciences Center

Background: Laparoscopic suturing is an advanced skill that requires specialized training and is difficult to acquire. We hypothesize that mastering basic skills first may enhance skill acquisition and reduce resource requirements for a videotraining (VT) suturing curriculum.

Methods: Medical students (n=18) with no previous VT experience were enrolled in an IRB-approved protocol, pre-tested on a validated suturing model, and randomized into two groups. Group I (n=9) trained (unsupervised) until proficiency levels were achieved on 5 basic tasks, whereas Group II (n=9) received no basic training. Both groups then trained (supervised) on the suturing model (1hr every other day) until previously reported proficiency levels were achieved. Scores (based on time and errors), training parameters, instruction requirements (interventions), and cost (material and personnel) were compared between groups using t-test.

Results: Pretest scores were similar for both groups and all subjects achieved the proficiency levels. The overall time required to finish the curriculum was similar for both groups (Group I 1353 ± 58 vs. Group II 1310 ± 98 min, NS). The Group I training strategy was more cost-effective with a savings of $147 per trainee. Group I required less active instruction (3 ± 1 interventions) compared to Group II (7 ± 4), p < 0.01.

Conclusions: Teaching basic skills first allows novices to more easily achieve suturing proficiency (fewer repetitions and shorter duration), which translates into substantial cost savings. Additional studies are needed to assess the impact of such integrated curricula on skill retention and ultimate educational benefit.

P176—Education/Outcomes
CONTRIBUTION OF TIME, ERRORS, AND ECONOMY TO MIST-VR SCORE IS INDEPENDENT OF DIFFICULTY LEVEL, Joseph A Talarico MD, Muhammad M Amin MD, Azam Jan MD, Vijay K Maker MD, Marek Rudnicki MD, Advocate Illinois Masonic Hospital

Introduction: MIST-VR challenges novices in simulated techniques at several difficulty levels with increasingly complex tasks that are functionally related to laparoscopic surgery. Performance is determined by total score that consists of the following variables: errors, economy, and time. It might be expected that quantitative contribution of different score components is related to level of difficulty. The purpose of this study was to identify which variable contributes most to overall score at easy level (EL) and more difficult, hard level (HL).

Methods: Eight right handed students (6M: 2F) who played video games at least 6hrs/week were recruited for this study. They had no prior exposure to MIST-VR or laparoscopic surgery. Students completed two sessions with standard weightings on EL of 6 tasks each: Acquire Place (AP), Transfer Place (TP), Withdraw/Insert (WI), Traversal (TV), Diathermy (D), and Manipulation Diathermy (MD). On a separate day, the six tasks were repeated on HL. Mean percentage contribution of variables to total score was calculated. Data was analyzed with t-test or ANOVA as needed.

Results: Time and errors were major contributors to total score within each task (p<.05 vs. economy). Time and errors contributed similarly to total score, independent of difficulty level, in all tasks except WI and D where time component was greater than errors and economy. There was also no difference in performance between right and left hands. Total scores for EL and HL were similar. Conclusion: In order to use MIST-VR effectively, an experienced instructor must be cognizant of vari-
able weightings contributing to score. We feel that the number and type of errors in laparoscopic training are more significant than either time or economy. MIST-VR variable weightings and type of errors in laparoscopic training are more significant than either time or economy. MIST-VR variable weightings contributing to score should be modified according to training purposes.

**P177—Education/Outcomes**

PREVENTING COMMON BILE DUCT INJURIES IN LAPAROSCOPIC CHOLECYSTECTOMY - A TEACHING INSTITUTE EXPERIENCE, Abhay N Dalvi MS, Pinky M Thapar MS, Aparna A Deshpande MS, Sameer A Rege MS, Seth G S Medical College & King Edward VII Memorial Hospital

Common bile duct (CBD) injuries after laparoscopic cholecystectomy (LC) have faulted the learning curve or experienced surgeons. Conversion rates range from 4.3 to 19% (1-3). Teaching institutes are reported to have higher incidence of complications (0.65% to 0.3%) (4-6). In our Institute, starting the LC in 1994, we had a policy of converting the LC to open as soon as the operating surgeon or the supervising surgeon realized that it could cause CBD injury. A record was kept of all surgeons in training that varied on time scale. The aim was to convert before CBD injury. Factors were analyzed as to the causes of conversion. The results of the study on varying factors that influenced the reason for conversion are presented.

From 1994 to 1996 while the faculty was under training, we analyzed the factors responsible for conversion. Nineteen factors were analyzed and a computer-generated multivariate analysis was done. Of the 276 patients subjected to LC, conversion was in 22 (7.9%) with CBD injury in 2 (0.72%). Age greater than 65 years, prior upper abdominal surgery, ERC, palpable lump, wall thickness more than 4 mm, shrunken GB were the cause for conversion. From 1997 onwards, we had trained teachers; and resident doctors under training. Keeping the same principle of "convert before CBD injury", we kept on performing LC under supervision and being taken over by a senior as required. We have performed a total of 1260 LC with a conversion rate of 7.85% (n = 99). While the conversion rate was comparable, analysis of the cause of conversions was different. Contracted gall bladder (44.52%), pericholecystic collection (18.75%), adhesions (13.02%) and anatomical cause (13.23%) were the cause of conversions. The CBD injury rate in 1260 cases done was 3 (0.23%) comparable to literature. (13.23%) were the cause of conversions. The CBD injury rate in 1260 cases done was 3 (0.23%) comparable to literature.

Literature review suggests that visual perception illusion (7-9) and adhesions are common cause of CBD injuries. A common aim in a teaching institute can bring down the morbidity of CBD injury in LC. Constant supervision and vigilance can stem down the rate of CBD injuries.

1. Sikora WJS 1999
8. Krähenbühl WJS 2001

**P178—Education/Outcomes**

OPERATIVE END-PRODUCT QUALITY AND PROCEDURE EFFECTIVENESS COMPARING ROBOTIC CAMERA HOLDER TO HUMAN CAMERA HOLDER IN A LAPAROSCOPIC INANIMATE SIMULATOR, Miro Uchal MD, Chris Haughn MD, Sam Rossi MD, Yannis Raftopoulos MD, Marc Torpey, Roberto Bergamaschi PhD, Dept. of Research and Develop., Forde Health System, Bergen University, Forde, Norway and Minimally Invasive Surgery Center, Allegheny General Hospital, Pittsburgh, PA

Some reports suggested that robotic camera holders (RCH) may be superior to a human camera holder (HCH) in terms of motion efficiency, and rate of surgical error. This study aims to compare RCH to HCH with regard to operative end-product quality (OEPQ) and procedure effectiveness (PE) of suturing a perforated ulcer in a laparoscopic simulator.

This was a prospective randomized crossover trial including voluntary post-graduate year (PGY) residents. Block randomization generated RCH - HCH or HCH - RCH sequence allocation. Tasks were suturing a perforated ulcer in a foam stomach and intracorporeally tying a suture knot in an inanimate physical simulator. The same voice-controlled robot and the same surgeon performed the camera during all tasks. OEPQ was measured by accuracy error (AE), tissue damage (TD), sliding knot (SK) and leak rates. PE was measured by operating time (OT), non-goal-directed actions (NGDA), and dangerous movements (DM). 44 subjects were needed to declare significant a 1-min difference in operating time at the alpha = 0.05 with 90% power. Data were presented as median (range). McNemar, Wilcoxon matched pair rank sum, and t-test were used for binary (SK, leak), ordinal (AE, TD, NGDA, DM), and continuous variables (OT), respectively. Kendall's coefficient tau_b was used for concordance of 2 raters? evaluation to assess inter-rater reliability (IRR).

44 subjects performed tasks as allocated. There were 15 PGY1, 8 PGY2, 5 PGY3, 4 PGY4, 6 PGY5, 6 PGY6. All variables were not significantly different comparing 1st to 2nd task ignoring camera holder type. There was no evidence of unequal carry-over effect when comparison was stratified by RCH - HCH or HCH - RCH sequence. Comparing RCH to HCH, leak rates (15.9% vs 34% p=0.001) and operating time (139 vs 159 p<0.05) differed significantly, while SK, AE, TD, NGDA and DM did not. IRR was good (p<0.80) except for DM (tau_b=0.72, p=0.08).

RCH compared to HCH led to decreased leak rate and operating time in suturing a perforated ulcer in a simulator.

**P179—Education/Outcomes**

LARGE-SCALE ASSESSMENT OF LAPAROSCOPIC SKILLS USING SIMULATION: ANALYSIS FROM THE 2004 SAGES LEARNING CENTER MIST-VR STUDY, Kent Van Sickle MD, Anthony G Gallagher PhD, Eric H. F. Ritter MD, David McClusky MD, Andrew Lederman MD, Mercedeh Baghai MD, Daniel Smith MD, Emory Endosurgery Unit, Emory University School of Medicine, Atlanta GA

Background: The MIST-VR (Mentice, Gothenburg, Sweden) simulator has been validated as a training and assessment tool for technical skills in laparoscopy. The purpose of this study was to assess performance on the MIST-VR using a large number of experienced laparoscopic surgeons. Methods: Surgeons attending the SAGES 2004 Annual Meeting who had performed more than 100 laparoscopic procedures volunteered to participate and were tested in the SAGES Learning Center. All subjects performed two consecutive trials of the MIST-VR Core Skills 1 Program (acquire place, transfer place, traversal, withdrawal insert, diathermy task, manipulate diathermy). Trial 1 was considered a "warm-up" and Trial 2 functioned as the test trial proper. The mean performance results were analyzed for differences from Trial 1 to Trial 2 using a paired t-test. Correlations between simulator performance and demographic information (i.e. age, experience, etc.) were made using a Pearson's Correlation Coefficient r. Results: 57 surgeons participated in the study, 42 of which had complete data for both Trials. Average age was 42±8 years, average laparoscopic surgery experience was 8.5±5 years, and 1160±1250 cases, and 16 surgeons (38%) had prior MIST-VR experience.

The strongest predictors of performance were previous MIST-VR experience (r=-0.63, p<0.0001), and younger age (r=0.36, p<0.02). No correlations were seen between MIST scores and years of laparoscopic experience (r<0.19, p>0.23) or number of laparoscopic procedures (r<0.07, p=0.64), but greatest improvements in scores from Trial 1 to Trial 2 were seen in surgeons with no prior MIST-VR experience. Conclusions: Large-scale assessment of surgeons' skills is possible using MIST-VR. There is a learning curve associated with the simulator, and should be taken into account when establishing performance criteria. Performance appears to be independent of laparoscopic experience and correlates well with prior MIST experience.
P180—Education/Outcomes
CANNULATION: A POTENTIAL ADDITION TO THE FLS PROGRAM,
Melina C Vassiliou MD, Donna D Stanbridge RN, Liane S Feldman MD, Gerald M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.

In developing the simulator component of the SAGES FLS (Fundamentals of Laparoscopic Surgery) curriculum, cannulation was one of three deficiencies identified by a panel of experts. The purpose of this study was to create a cannulation task and evaluate its reliability, validity and internal consistency.

Methods: Intravenous tubing with a premade defect is suspended in the endotrainer box. After viewing an instructional video, the operator uses 2 curved forceps to introduce a cholangiogram catheter into the box, threads it into the tubing up to a marked length and then removes it. The score is based on a cut-off time and normalized using the best performance of the sample. Participants (n=38) at all levels of training were timed and video-taped (n=34) during 2 sequential iterations of the task by one of 2 examiners. Participants (n=30) were also tested in the FLS tasks. Inter-rater reliability was assessed by having the other examiner score the taped performances (intraclass correlation coefficient, ICC). Internal consistency was estimated using Cronbach’s alpha. Construct validity was evaluated by comparing novice (medical student ? PGY2, n=22) to experiential (PGY 3 ? attending, n=16) operators (t-test) and concurrent validity was ascertained by correlating cannulation scores to total FLS score (manual component). Results: The inter-rater reliability for the mean score (both iterations) between examiners was 0.99 (ICC). Cronbach’s alpha with the addition of the cannulation task to the other tasks was 0.91 and was not improved with deletion of the new task. The mean score for novices was 37 (95% CI 24-50) and for experienced operators was 86.2 (80.5 ? 91.9, p<0.001). The correlation coefficient for the 30 participants who also performed the FLS tasks was 0.79 (p<0.001). Conclusions: This new cannulation task meets the standards established by the other components of the FLS system. It reflects an important skill that is not currently addressed and may be a valuable addition to the FLS system.

P181—Education/Outcomes
RESULTS OF A CHANGE TO MANDATORY LAPAROSCOPIC SKILLS CRITERIA AMONG SURGICAL RESIDENTS,
Leonardo Villegas MD, Leonardo Claros MD, Vivian Sanchez MD, Thomas McIntyre MD, Benjamin Schneider MD, Daniel B Jones MD, Section for Minimally Invasive Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School.

Background: Videotrainers and simulators are available to many surgical residents during training to hone eye-hand coordination and laparoscopic skills. While trainees are encouraged to practice, to date performance criteria have not been mandated for promotion or credentialing.

Aim: The purpose of our study was to determine if mandatory basic skills criteria increases practice and performance on inanimate models in the skills lab.

Methods: Surgical residents (n=56) were provided card access to the Skills Lab, which included 10 laparoscopic videogame simulators. Drills included checkerboard, bean drop, running string, block move, and foam suture. All drills were demonstrated during Orientation Week, residents were pre-tested, and explained that practice would improve operative performance based on previous studies. An instructor was available during the week that practice would improve operative performance based on previous studies.

Results: Between July 2003 and May 2004 attendance of mandatory monthly protected time varied. No resident had achieved benchmarks for all five laparoscopic drills. After mandatory minimal criteria instituted, all residents met basic skill criteria by July 2004. No resident required remediation.

Conclusion: Skills Lab access, protected training time, and posted benchmarks are not sufficient to ensure acquisition of laparoscopic skills. Performance can be improved significantly with mandatory performance standards.

P182—Education/Outcomes
A COMPARISON OF NURSES’ ATTITUDES TOWARDS LAPAROSCOPIC AND CONVENTIONAL SURGERY,
Shirley Yeung RN, Julie L Harnish MSc, David Khadaroo PhD, David R Urbach MD, University Health Network.

Introduction: In July 2000, a minimally invasive surgery program was established at Toronto Western Hospital. Nurses at this hospital have had to become proficient working in a minimally invasive surgical suite learning new procedures and become familiar with the new equipment. Over the past few years several orientation sessions have been held to familiarize the nursing staff with laparoscopic techniques. We sought to determine if the nurses are as confident with laparoscopic surgery as they are with open surgery.

Methods: We surveyed nurses working in the minimally invasive surgery units at Toronto Western Hospital. We obtained demographic information and asked about length of time in nursing and working in the OR. We also asked nurses to compare their experiences working in laparoscopic surgery and open surgery.

Questions were asked on a 5 point Likert scale with responses ranging from strongly agree to strongly disagree. Results: 35 of 47 nurses returned a completed questionnaire (response rate of 74.5%). 57% of the nurses were over 40 years old, and all were women. The median length of time working as a nurse was 15 years (range 1 ? 42), 10 years in the OR (range 1 ? 42) and 4 years in laparoscopic surgery (range 1 ? 30). Nurses were comparable in their level of expertise in both laparoscopic and open surgery. 82.8% (29) said they knew the names of all the laparoscopic surgical instruments vs 91.4% (32) for open, and are able to assemble the necessary instruments (88.5%). The nurses were slightly more worried about injuries and exposure to bodily fluids during open surgery (40% vs 31.4%). However most feel confident that they know the procedures, are able to follow the steps and can anticipate what the surgeon will need next in both forms of surgery (91.4%, 91.4%, 80% respectively).

Conclusion: Nurses at Toronto Western Hospital are very comfortable participating in laparoscopic surgery. Given the proper training, nurses can become as confident in laparoscopic surgery as they are in conventional surgery.

P183—Education/Outcomes
RURAL/NON-RURAL DIFFERENCES IN SURGEON PERFORMED ENDOSCOPY, RESULTS OF A NATIONAL SURVEY,
Randall S Zuckerman MD, Michael Gold MD, Steven Heneghan MD, Randall Zuckerman MD, Michael Gold MD, Steven Heneghan MD

Over 24% of the US population live in rural areas, but it is estimated that 10% of general surgeons currently practice in a rural environment. The number of general surgeons needed to adequately care for the rural population is projected at 19%. This gap will be very difficult to close, and this will be compounded by the fact that rural surgeons are an aging cohort and younger surgeons are reluctant to take rural jobs.

Additionally, general surgery residencies are not adequately training surgeons for rural practice. We surveyed a cohort of rural and non-rural surgeons to elucidate practice differences. The results in the different rates of surgeon performed endoscopy are reported here.

A national survey of rural and non-rural surgeons was mailed June 2004. 1700 surveys were mailed with a 25.2% response rate. Names were gathered from the AMA Physician master file, and the Office of Management and Budget Metropolitan-Nonmetropolitan definition of rural employed.

66% of our rural respondents practiced in a community size between 2500 and 10,000 as compared to 69% of the non-rural cohort that practiced in a community of > 50,000. 74% of rural surgeons performed more than 50 flexible endoscopies a year with 42% doing more than 200 procedures. This contrasts with the 33% of non-rural surgeons who did more than 50 endoscopies a year (p < 0.05) and only 12% of this cohort did more than 200 cases a year. Of note, 63% of rural surgeons wished to perform more than 50 flexible endoscopies a year.
they had further training in endoscopy prior to starting prac-
tice as opposed to 46% (p= 0.05) of non-rural surgeons.
Rural surgeons perform flexible endoscopy at a much higher
rate than their non-rural counterparts. The majority of rural
surgeons feel they would have benefited from additional flexi-
ble endoscopy training prior to entering practice.

P184–Hepatobiliary/Pancreatic Surgery
TO DETERMINE THE VALUE OF DIAGNOSTIC LAPAROSCOPY IN PATIENTS WITH POTENTIALLY RESECTABLE ADENOCARCINOMA OF THE PANCREAS, Swed I Ahmed MD, Dmitry Olynykov MD,Brian K Zebrowski MD,Aaron Sasson MD, University of Nebraska medical center, Omaha
Introduction: Minimally invasive surgical techniques especially staging
laparoscopy can determine resectability of pancreatic adenocarcinoma. This may spare unnecessary laparotomy and its associated morbidity to non resectable patients with advanced disease. Therefore the aim of this study is to identify patients at our institution with unresectable pancreatic adenocarcinoma prior to non therapeutic laparotomy.
Method: The records of patients undergoing pancreatic surgery were reviewed from 2001 to 2004 from a prospectively maintained data base. Inclusion criteria consisted of patients with adenocarcinoma of the pancreas whereas non pancreatic peri-ampullary carcinomas, cystic neoplasm, and endocrine tumors were excluded. All patients were staged with a high resolution computed tomography (CT) scan prior to surgical intervention.
Results: Fifty four patients meeting the above criteria were included in the study. These patients were identified and deemed resectable by routine preoperative staging. Thirty five patients underwent exploratory laparoscopy (Group I). Nineteen proceeded directly to laparotomy (Group II). In Group I, 10 patients (28.6%) had observable metastatic disease at laparoscopy and were deemed unresectable. An additional 6 patients were deemed locally unresectable radiographically and had staging laparoscopy only. The remaining 19 patients (Group I) proceeded to resection with curative intent but 2 were found to have metastatic disease at laparotomy (false negative rate of 10.5%). 2 had locally advanced but non metastatic disease and were deemed unresectable. The combination of these 2 false negative patients and the 10 patients identified as having metastatic disease (true positive) represent 34.2% of patient that were not resectable and would have ultimately benefited from laparoscopic staging. The reason for not performing laparoscopy in group II included need for bilio decompression, and extensive adhesive adhesions. Conclusion: In this series, laparoscopy altered the management in 28.6% of the patient undergoing resection for pancreatic malignancy. The morbidity and hospital stay was reduced significantly by not having to proceed to laparotomy in non resectable cases. Potentially up to 10.5% patients could have avoided laparotomy if all false negatives were detected. This false negative could be decreased by adding intraoperative laparoscopic ultrasound in future.

P185–Hepatobiliary/Pancreatic Surgery
LAPAROSCOPIC DISTAL PANCREATECTOMY WITH SPLenic PRESERVATION FOR SEROUS CYSTADENOMA OF THE PANCREAS: A CASE REPORT AND LITERATURE REVIEW, Kanayo Chukuwuj Aiuka MD, Cynthia Long MD,Terrence M Fullum MD, Providence Hospital
Introduction: A minimally invasive approach can be beneficial in spleen preserving distal pancreatectomy. We present a 71 year old female in which laparoscopy was used for resection of an incidental 4cm x 3cm x 2cm serous cystadenoma of the pancreas.
Method: A 71 year old female who presented to her internist with HTN and persistent hypokalemia had an MRI to rule out an adrenal mass. The MRI revealed a lesion of the distal pan-
creas and normal adrenal glands. She was referred to the General Surgery Service for resection of the distal pancreatic lesion. A laparoscopic spleen preserving distal pancreatectomy was performed using the EndoGIA? linear cutter stapler with PeriStrips®. Results: The pathology report revealed a completely excised cystic lesion with a diagnosis of serous cystadenoma with focal fibrosis and atrophic acini. Postoperatively the advan-
tages of the laparoscopic approach were exemplified with the patient’s early return of bowel function, minimal narcotic requirements and early resumption of normal activities. Conclusion: This case illustrates the advantages of minimally invasive surgery in the performance of a spleen preserving distal pancreatectomy.

P186–Hepatobiliary/Pancreatic Surgery
THE EFFECTS OF PRE-OPERATIVE ROFECOXIB, METOCLO-
PRAMIDE HYDROCHLORIDE DEXAMETHASONE, AND Ondansetron on Post Operative Pain and Nausea in Patients Undergoing Laparoscopic Cholecystectomy, Marc C Antonetti MD, Phiet Bui, Orlando Kirton MD,Richard Lilly MD, University of Connecticut Improvements in the safety and efficiency of laparoscopic cholecystectomy (LC) have transformed this operation into an outpatient procedure with the goals of minimizing the deterents to eventual same day discharge. No trial to date has evaluated the combined effect of pre-operative Rofecoxib, Metoclopramide, Dexamethasone, and Ondansetron on post-operative pain and nausea in patients undergoing LC. A prospective randomized double-blinded placebo controlled trial was conducted on patients undergoing elective LC at a single tertiary referral center from January 2002 until June 2004. The patients in the intervention group received Rofecoxib 25 mg PO during the admission process. All patients were given a standard anesthetic regimen. Additionally the study group received Metoclopramide 10 mg IV and Dexamethasone 4 mg IV after induction; and Ondansetron 4 mg just prior to closure. Local anesthetic was administered to all wounds at the conclusion of the procedure. A 0-10 box scale was used to rate pain and nausea pre-operatively, on arrival at PACU, 0.5, 1.5, 3, 6 and 9 hours after arrival, and at 24 hour follow-up. Of the 249 patients consented, 44 were excluded for a final study sample of 205. There were 97 patients in the control group, and 108 received intervention. 16% of the patients were male; 84% were female. The intervention and control groups were compatible on most demographic and health characteristics. The intervention group had a significantly smaller propor-
tion of men than control group (10% vs. 23%; p<.015). 191 patients (93%) completed the follow-up survey at 24 hours. There were significant differences in: length of stay (LOS) until patients met discharge criteria, control 12.88 hours, interven-
tion 9.95 hours (p=0.006); pain rating on arrival to floor 3.55 vs. 2.48 (p=.003); highest pain rating during hospital stay 4.38 vs. 3.56 (p=.032); highest nausea rating during hospital stay 2.99 vs. 1.47 (p=.001); worst nausea since discharge 2.58 vs. 1.26 (p=.005); the use of post-op anti-emetics in women 64% vs. 37.1% (p=.001). The use of this preoperative regimen resulted in decreased LOS, maximum pain and nausea ratings. Patients in the interven-
tion group required less postoperative anti-emetics but there was no difference in the use of pain medications. There were fewer differences between the men in the control and intervention group when compared to the women.

P187–Hepatobiliary/Pancreatic Surgery
MINILAPAROSCOPIC CHOLECYSTECTOMY ? REDUCING ORI-
FICE SIZE WITHOUT INCREASING SURGERY COST, Gustavo L Carvalho PhD, Mariane Cibelle B Silva,Gildo O Passos Jr,Frederico P Santos,Frederico W Silva MD,Carlos H Ramos MD,Claudio M Lacava PhD, Clinical Cirurgica Videolaparoscópica Gustavo Carvalho, UPE- Universidade de Pernambuco, Recife ? BRAZIL
BACKGROUND: With the increasing advance of minimally invasive surgeries, it has been possible to make more precise
laparoscopic equipment with very reduced diameter, which has led to "state of the art" of 2mm instruments, also known as mini or needle instruments.

OBJECTIVE: To present modifications to mini-laparoscopic technique which may make it possible to conduct mini-laparoscopic procedures safely and effectively, thereby reducing considerably the cost of this type of surgery.

PATIENTS: Patients suffering from chronic lithiasic cholecystitis at various stages of the disease were submitted to procedures fully performed by mini-laparoscopy, including acute cholecystitis and per-operative cholangiography.

METHOD: After performing the pneumoperitoneum in the umbilical site, four trocars are inserted; two of 2mm (support trocars), one of 3mm (work trocar) and one of 10mm, through which a 10 mm 30 degrees laparoscope is inserted. Neither the 3mm laparoscope nor clips are used, the cystic artery is safely sealed by electrocautery, near the gallbladder and the cystic duct is sealed with surgical knots. Removal of the gallbladder is carried out, in a bag made with a glove wrist, through the 10mm umbilical site.

CONCLUSION: Mini-laparoscopic cholecystectomy is a safe and effective procedure which results in a better aesthetic effect for the patients, when compared to conventional laparoscopy. The technique described above allows a considerable reduction in the costs associated with the original mini-laparoscopic procedure, since neither clips, endobags, nor mini-loops are used. Neither is any use made of 3mm laparoscope which is the most expensive component among mini-laparoscopic instruments.

P188–Hepatobiliary/Pancreatic Surgery

LAPAROSCOPIC CBD EXPLORATION WITHOUT T-TUBE, In Seok Choi PhD, Ji Hoon Park MD,Won Jun Choi PhD,Dae Gyoong Go MD,Dae Sung Yoon MD, Dept. of Surgery, Konyang University Hospital, Konyang University College of Medicine, Daejeon, Korea

(Objective) Laparoscopic common bile duct exploration(LCBE) is feasible and becoming popular. LCBE has traditionally been accompanied by T-tube drainage which has a 4.7-17.5% morbidity rate and increases hospital stay. Avoidance of T-tube drainage therefore should advantageously contribute to the ideal approach for LCBE. The authors report a prospective study of LCBE without T-tube drainage.

(Methods and Procedures) Between March 2001 and August 2004, 30 patients with common bile duct(CBD) stones underwent this approach. We adopted internal endobiliary stent in 11 patients and performed primary closure for cholecdochojomy. Other 19 patients who had external drainage such as, endoscopic nasobiliary drain(ENBD), percutaneous transhepatic biliary drain(PTBD), were treated by LCBE with primary closure.

(Results) Open conversion, because of impacted large CBD stones, was 1 case (3.5%). The mean operative time of LCBE was 134 minutes, postoperative hospital stay was 8.5 days. Complication rate was 13.8% (4/30 cases, 2 cases : migration of endobiliary stent in CBD, 1case : subhepatic biloma, 1case : retained stone) and no mortality. The rate of successful stone removal was 96.6%. Biliary stents were eliminated spontaneously via the gastrointestinal tract among 4 patients, and for 6 patients, the stents had to be removed endoscopically. The other 1 patient underwent laparotomy for stent removal.

(Conclusions) LCBE without T-tube was safe and feasible technique. Further study and assessment of internal biliary stent should be warranted.

P189–Hepatobiliary/Pancreatic Surgery

LAPAROSCOPIC LIVER RESECTION IN PORCINE: DEVELOPMENT OF AN EXPERIMENTAL MODEL, Alex Escalona MD, Felipe Bellolio MD,Nicolás Jarufe MD,Luis Ibarra MD,Matias Guajardo MS, Pontificia Universidad Catolica de Chile

Introduction: The development of the laparoscopic surgery has permitted to incorporate this technology to the surgical treat-ment of different pathologies. The left lateral segmentectomy (LLS) (segments II and III of Couinaud) is the more frequently carried out laparoscopic liver resection. The objective of this study is to evaluate the feasibility to carry out laparoscopic LLS in porcine model and to compare the results with the open technique. Material and Methods: Ten animals of similar age, weight and size were undergone to LLS. In 4 cases the procedure was performed by open technique (group 1) and in 6 cases by laparoscopic (group 2). The operative time, bleeding and weight of the resected liver segment was registered in a prospective database. Autopsy was carried out at seventh postoperative day. Results: The operative time was 77 ± 19 minutes in the group 1 and 52 ± 38 minutes in the group 2 (p = 0.21). Intraoperative bleeding was of 185 ± 67 and 70 ± 52 ml. in the group 1 and 2 respectively (p = 0.01). The weight of the extracted segment was of 27 ± 21 and of 128 ± 16 grams in groups 1 and 2 respectively (p = NS). One animal operated by open technique presented a wound infection. There were no other complications or deaths. Conclusions: Laparoscopic LLS in porcine model is a feasible procedure. In this series a less intraoperative bleeding was observed in the animals operated by laparoscopic technique. The operative time and weight of the specimen is comparable in both techniques. The implementation of this procedure in an animal model could be useful in the development of research, acquisition of laparoscopic skills in liver surgery and implementation of the technique in humans.

P190–Hepatobiliary/Pancreatic Surgery

IMPROVEMENT IN GASTROINTESTINAL SYMPTOMS AND QUALITY OF LIFE FOLLOWING CHOLECystECTOMY, Kelly R Finan MD, Leeth R Ruth MPH,Brian M Whitley MPH,Joshua C Klapow PhD,Mary T Hawn MD, University of Alabama at Birmingham

Background: Laparoscopic cholecystectomy (LC) is the accepted treatment for symptomatic gallstone disease, but has been criticized as an over-utilized procedure. The aim of this study is to assess the effectiveness of LC on reduction of specific gastrointestinal (GI) symptoms and the impact on quality of life (QOL). Methods: A prospective cohort of consecutive subjects evaluated for gallstone disease between 8/2001 and 7/2004 were given the SF-36 QOL survey and a gallbladder symptom survey. The latter was developed to assess symptom frequency, severity and distressfulness for 16 related GI symptoms. Postoperative surveys were sent to all subjects who underwent LC. A chart abstraction was performed to collect demographic information and operative details. The surveys were scored and evaluated using paired t-tests. Results: 100 patients were mailed postoperative surveys with a 61% response rate at a mean follow up of 17.5 months (2-31). Preoperative indications were biliary colic (64%), cholecystitis (15%), biliary pancreatitis/choleodocholithiasis (11%) and biliary dyskinesia (8%). Preoperative QOL scores measured by the SF-36 were significantly below normative values in 6 of 8 categories (p<0.001). Significant improvement was seen in QOL following LC, specifically those related to physical (p<0.009), bodily pain (p<0.0001) and social aspects (p<0.0001). The gallstone symptom survey revealed improvement in biliary type symptoms but not reflux or irritable bowel symptoms after LC (table 1).

Conclusion: In the era of laparoscopic surgery, elective LC has been criticized for its over-utilization in the treatment of biliary colic. This study demonstrates elective LC not only significantly improves GI symptoms, but improves patient's general QOL. These data are useful in a cost effectiveness analyses of LC for biliary symptoms.
P191—Hepatobiliary/Pancreatic Surgery
MINIMALLY INVASIVE INCISION FOR CYSTGASTROSTOMY IN LARGE PANCREATIC PSEUDOCYSTS, S Dissanaike MD, B Barragan MD, J A Griswold DO, E E Frezza MD, Texas Tech University Health Sciences Center

There are many approaches to the treatment of pancreatic pseudocysts, including laparoscopic, endoscopic and open surgical drainage. We have previously described the merits of the posterior approach to laparoscopic cystgastrostomy (LCG). We describe a minimally invasive approach to open drainage in patients with very large pseudocysts and compare this to our previous experience with both laparoscopic and open cystgastrostomy.

METHODS

Seven patients underwent LCG, two patients underwent open CG via standard incision and two patients underwent open CG (OCG) with a small (less than 10cm) left subcostal incision. The laparoscopic group consisted of both anterior and posterior approaches. The open group consisted of those with a midline incision. The minimally invasive open group had a left subcostal incision placed approximately 3-4 cm below the costal margin for direct approach to the pseudocyst.

RESULTS

All of the patients developed pancreatitis and pseudocyst sec- ondary to gallstones. Three patients had LCG via the anterior approach; four via the posterior approach. Two patients had OCG via the midline incision, and two via the smaller subcostal incision.

The open group had larger pseudocysts (21 +/- 3cm diameter) than the laparoscopic group (10 +/- 2cm). Most of the patients in the open group also had previous major abdominal operations (n=3). The combination of large cysts and previous operations made these patients less suitable for the LCG approach and at a higher risk of conversion. The patients with the mini- mal subcostal incision had pseudocysts of 22 and 24 cm, respectively. The post-operative analgesic requirements, time to return of bowel function and length of stay was shorter in the laparoscopic (4 +/- 2 days) and minimally invasive open groups (5 +/- 2 days), compared to the midline approach (10 +/- 2 days).

CONCLUSION

We have previously reported that LCG is usually associated with less post-operative pain and quicker return to function than the open approach. However, patients with a very large pseudocyst may not be suitable candidates for safe LCG. In these patients, we found that we were able to successfully perform OCG using a minimal subcostal incision. This enabled an earlier return to function and less post-operative pain when compared to the open midline approach, with a mean hospital stay similar to patients with LCG.

P192—Hepatobiliary/Pancreatic Surgery
LAPAROSCOPIC#12288;PANCREATIC CYSTGASTROSTOMY, Kazunori Furuta PhD, Hiroki Hoshino MD, Masamichi Katori PhD, Kouichi Takehashi PhD, Tsuyoshi Takahashi PhD, Muneki Yoshida PhD, Masahiko Watanabe PhD, Kitasato University

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 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 gas- tric wall.

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 or gastric wall and cyst wall can be incised and drainage ori- nce 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 gas- tric walls are closed with sutures in laparoscopically. 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 conven- tion surgery, catheter drainage of cysts, using interventi- onal radiology technique and endoscopic interventions. Laparoscopic pancreatic cystgastrostomy is one of the treat- ment options. ?@This procedure should be the one of the method of choice when the interventional methods are not effective.

P193—Hepatobiliary/Pancreatic Surgery
QUALITY OF LIFE AFTER LAPAROSCOPIC AND OPEN CHOLE- CYSTECTOMY—A COMPUTER BASED ANALYSIS USING THE GASTROINTESTINAL QALITY OF LIFE (GIQLI) INDEX, Istvan Gal PhD, Lorand Nagy, Department of Univ.Teaching Surgery Bugat Pal Hospital, Gyöngyös Hungary

Quality of life is a multifactorial construction of several dimen- sions: emotional or psychological well being, physical func- tion, social relations and symptoms of diseases as well as results of treatment. For assessment of these dimensions the Gastrointestinal Qality of Life Index (GIQLI) developed by Eypasch et al. was used. The GIQLI is a questionnaire containing 36 questions each with five response categories. These data were analysed with a computer program ( SPSS for Windows)

In the present study the GIQLI was tested in 240 patients who were randomised for laparoscopic (LC)-120pts- or open (OC)- 120 pts- cholecystectomy. The obtained data were compared to data of healthy volunteers . The questionnaires were filled by the operated patients under the control of a physician at the follow-up visits at 1 to 5 years after surgery. There was significant ( p less 0.05) difference between the mean score of the LC group (115.00 plus-minus 18.98 GIQLI points) and that of the patients underwent OC (108 plus-minus 22.48 GIQLI points). The mean value of healthy volunteers group (124, 8 plus-minus 13 GIQLI points) was not significantly higher than that LC group , while it was significantly higher ( p less 0.01) than that of the OC group. The mean values meas- ured at different time points following the operations ( within 1 year 107.65 OC vs. 112.94 LC, in the 5th year 111.76 OC vs 119.39 LC) were similar, and they did not show significant differ- ences ( p less 0.05) comparing the starting values.

In conclusion, the quality of life can be a measurable parameter for the clinical practice. The computer program SPSS for Windows seems to be useful for statistical analysis of quality of life data. The GIQLI scores demonstrated that quality of life following LC does not differ significantly from that of healthy volunteers, while after the OC a significantly poorer quality of life was registered.

P194—Hepatobiliary/Pancreatic Surgery
ENDOSCOPIC ULTRASOUND EVALUATION DIRECTS LAPARO- SCOPIC RESECTION OF PANCREATIC NEOPLASMS, T C Gamblin MD, N Jani MD, K McGrath MD, K K Lee MD, Divisions of Surgical Oncology and Gastroenterology, Hepatology, and Nutrition, University of Pittsburgh, Pittsburgh, PA, USA

Introduction: Although laparoscopic resection of the distal pancreas is technically feasible and safe, its oncologic approp- riateness for the treatment of invasive pancreatic cancer remains undetermined. Endoscopic ultrasonography (EUS) provides detailed imaging of pancreatic abnormalities and can guide fine needle aspiration (FNA) of these abnormalities. We describe in two patients the use of EUS with FNA to establish the low malignant potential of solid pancreatic masses and their subsequent treatment by means of laparoscopic distal pancreatectomy.

Methods/Procedures: Two patients were found on abdominal CT to have solitary solid masses in the body of the pancreas. EUS demonstrated the masses to be hypoechoic with well-
defined borders, and with no signs of invasion into the splenic artery or vein. EUS-guided FNA in both patients confirmed the diagnosis of a pancreatic solid pseudopapillary tumor (SPT), an uncommon tumor of the pancreas possessing low malignant potential and usually cured by surgical resection alone. Based upon this definitive preoperative diagnosis, complete resection of both masses was accomplished by means of a laparoscopic distal pancreatectomy. Final pathologic examination of both resected specimens confirmed the diagnosis of SPT.

Conclusions: Until laparoscopic treatment of pancreatic cancer is proven to be comparable to open treatment, laparoscopic resection should be limited to abnormalities that are benign, premalignant, or of low malignant potential. These two cases demonstrate the utility of a management algorithm that combines preoperative evaluation by means of EUS with FNA, followed either by laparoscopic or open resection as directed by the EUS and FNA results.

P195—Hepatobiliary/Pancreatic Surgery

Mirizzi syndrome is an uncommon disorder characterized by benign extrinsic compression of the extrahepatic bile duct by a gallstone impacted in the cystic duct. Following Roux-en-Y gastric bypass, performance of ERCP to establish the diagnosis of Mirizzi syndrome is challenging because the distal stomach and duodenum are excluded. A 46-year-old female who underwent laparoscopic Roux-en-Y gastric bypass 30 months ago presented with right upper quadrant pain and nausea. Laboratory data revealed conjugated bilirubin 0.5, total bilirubin 0.5, alkaline phosphatase 975, AST 155, ALT 191. Amylase and lipase were elevated at 193 and 785, respectively. Right upper quadrant ultrasound demonstrated a 1.7 cm gallstone and dilatation of the right hepatic duct. Preoperative imaging with CT demonstrated a stone impacted in the common bile duct. The patient underwent an attempted laparoscopic cholecystectomy. Because a calculus was impacted in the cystic duct, intraoperative cholangiography was not possible. Intraoperative ERCP was performed through a gastrostomy created in the excluded distal stomach and established the diagnosis of Mirizzi syndrome. The proximal common bile duct was dilated and was compressed by a 2 cm stone impacted in the cystic duct that was eroding through the distal cystic duct wall, causing ductal necrosis. An additional 2 cm stone was identified within the common bile duct. Endoscopic stone extraction and lithotripsy were attempted but were unsuccessful. The procedure was then converted to an open cholecystectomy and common bile duct exploration. Intraoperative cholangiography confirmed clearance of the common bile duct. The patient recovered uneventfully. Mirizzi syndrome after Roux-en-Y gastric bypass presents a unique challenge for both diagnosis and surgical management. ERCP through the excluded stomach is valuable in establishing the diagnosis.

P196—Hepatobiliary/Pancreatic Surgery
Totally laparoscopic right posterior sectionectomy (segments VI-VII) for hepatocellular carcinoma, Ho-Seong Han MD, Yoo-Seok Yoon MD, Yoo Shin Choi MD, Sang Il Lee MD, Jin-Young Jang MD, Sun-Whe Kim MD, Yong-Hyun Park MD, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea.

Introduction: Localization of lesions is considered as a major determinant in the indication of laparoscopic liver resection. Until now, reports on laparoscopic liver resections mainly involved the antero-lateral segments (Couinaud segments II-VI). We report on a totally laparoscopic right posterior sectionectomy for hepatocellular carcinoma. To our knowledge, this is the first reported case in terms that it was totally performed laparoscopically.

Methods and Procedures: A 57-year-old man known as a HBs Ag carrier presented with a liver mass detected in the physical checkup. Abdominal USG and CT revealed a 5 cm sized single nodular hepatoma located in S6-7, multi-septated cystic tumor presumed to originate from the liver. Preoperative liver function tests showed Child A. A totally laparoscopic right posterior sectionectomy was performed. Five trocars were inserted at the proper position. After cholecystectomy, the ligaments around the liver and right triangular ligament were dissected. Liver was dissected from the IVC and short hepatic veins were treated with double application of endoclips. After full mobilization of the right liver, major Glissonian cord to right post section was dissected and transected with endo-GIA. The hepatic parenchyma was dissected with Harmonic scalpel and Ligasure along the ischemic line. The small branches of hepatic veins were controlled with endoclips and large branches were transected with endo-GIA. The hepatic veins were transected with endo-GIA. The epigastric trocar site was extended in incision for the removal of the specimen. Results: The operative time was 540 minutes. The estimated intraoperative blood loss was about 1450 cc, and 3 units of red blood cells were transfused. The patient was discharged on postoperative day 13 without postoperative complications.

Conclusion: This case confirms that totally laparoscopic liver resection is a possible operative procedure in the patient with the lesion in the right posterior section of the liver. However, the technical problems such as long operation time and large amount of blood loss should be resolved in order that this procedure can be more safely accomplished.
P198—Hepatobiliary/Pancreatic Surgery
SURGICAL TREATMENT OF BILE DUCT INJURIES FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY, Faton T Hoxha, University Clinical Center, Surgery Clinic, Hepato-biliary Service, Medical Faculty of Pristhina, Kosovo
Background: Bile duct injuries remain one of the most devastating injuries during Laparoscopic cholecystectomy. In a retrospective study, we analyses the clinical presentation, diagnostic, therapeutic treatment and results of ten patients with bile duct injuries.
Methods: Retrospective analysis of patients requiring biliary reconstruction with bile duct injuries during Laparoscopic cholecystectomy at our Center and other Regional Centers between 2000-2003.
Results: Three patients presented with circumferential bile duct injuries (one with wall defect); two tangenional lesions, one bile stricture after suture of the lesion; Less severe injuries (four were bile leaks from Luschka canals). According to the Strasberg classification are 2 patients - E1; 1-E2; 1-E4; 2-D, and 4-A injuries. According to Stewart-Way Classification of Laparoscopic bile duct injuries are 2 patients - I class; 1-II; 2-III and 1-IV class. All of them were treated surgically. Suture at 4 patients with Luschka canals, and suture with T drainage at tangential lesions at two patients and one with thermal lesion; Hepatico-duodenostomy with good mobilization of duodenum at one patient with T drain, and two R-Y hepatico-jejunostomy procedures. Patients were dismissed from Hospital after a median of 24 days after operation. Signs of cholangitis presents at three patients.
Conclusions: High morbidity, prolonged hospitalization is present at Bile duct injured patients. Early recognition of injury and early referral to more experienced center is then main determinant of the success.

P199—Hepatobiliary/Pancreatic Surgery
LAPAROSCOPIC HEPATECTOMY FOR METASTATIC LIVER TUMOR AFTER LAPAROSCOPIC COLECTOMY - REPORT OF 2 CASES, Hitoshi Inagaki MD, Tsuyoshi Kurokawa MD, Hiroshi Nagata MD, Katsuhiko Kotake MD, Yoshihiro Owa MD, Ichiro Horikoshi MD, Mari Tsubamoto MD, Takashi Arikawa MD, Toshiaki Nonami MD, Department of Surgery, Aichi Medical University.
From December 1997 to August 2004, we performed in a total of 54 laparoscopic hepatectomies. Among them were 7 patients with metastatic liver tumor. Two of these cases had a past history of laparoscopic colectomy for primary disease. The first patient was a 60-year-old man who was diagnosed with a metastatic liver tumor located in segment 6 after right colectomy for the ascending colon cancer. The second patient was a 73-year-old man with a metastatic liver tumor located in segment 5 after sigmoidectomy for the sigmoid colon cancer. The operative therapy for primary disease was pathologically curative. Both liver tumors were solitary. There was little adhesion to the abdominal wall in both patients, and no recurrence in the port sites. In the first patient we used hand-assisted laparoscopic surgery (HALS), and we made a small incision for HALS to confirm the existence of adhesion. In the second patient we did not use HALS. Both patients began to walk at post operative day 1. Their hospital stay after operation was 11 days and 14 days, respectively. Although the indications for laparoscopic hepatic resection are determined, we believe that laparoscopic hepatectomy is also one useful strategy for metastatic liver tumor, especially after laparoscopic colectomy for primary tumor.

P200—Hepatobiliary/Pancreatic Surgery
TOTALLY LAPAROSCOPIC MANAGEMENT OF CHOLEDOCHAL CYST USING 4 HOLES METHODS, JY Jang MD, SW Kim MD, HS Han MD, YS Yoon MD, MG Choi MD, YH Park MD, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea
Objectives: Choleodochal cyst is a rare benign disease in a biliary tract. However it must be excised with gallbladder (GB) due to the risk of cancer development in biliary tree including GB. Here we introduce new surgical technique for totally laparoscopic excision of choledochal cyst and hepaticejejunostomy using 4 holes methods.
Methods: Between October 2003 and September 2004, we performed totally laparoscopic choledochal cyst excision in seven patients. All were female with mean age (range: 19-46) years old. According to the Todani classification, four were type Ia, one type Ic and two type IV. Choleodochal cyst excision and Roux-en-Y hepaticejejunostomy was entirely performed laparoscopically using 4 port technique.
Results: The mean operation time was 272 (200–330) minutes. There was no operative or postoperative transfusion. An oral diet was started on the 3rd operative day. The average length of hospital stay was 5.5 days. There was no morbidity associated with anastomosis leakage or obstruction. All patients have showed no specific symptoms or laboratory abnormalities during 5–9 months follow-up periods.
Conclusions: Considering that choledochal cyst is common in very young ages and females, who are especially interested in cosmetic results as well as cure of disease, laparoscopic management of choledochal cyst can be an attractive treatment option.
P203—Hepatobiliary/Pancreatic Surgery

POST LAPAROSCOPIC CHOLECYSTECTOMY BODY TEMPERATURE, Fumito Kuranishi PhD, Yosihori Kuroda PhD, Yuuzou Okamoto PhD, Masahiro Nakahara PhD, Toshikatsu Fukuda PhD, Hideichi Wada PhD, Manabu Shimomura, Masatake Anshohudani, Junnko Nanbu, Taketomo Mizukami, Onomichi General Hospital

INTRODUCTION: We have introduced laparoscopic cholecystectomy (LC) from 1992, and performed it 800 cases. At the beginning, we have adopted pneumoperitoneum (8 mmHg, 8 liter/min), we have started combined method (pneumoperitoneum: 4 mmHg, 4 liter/min and abdominal wall lifting method) from 1993. Combined method enables to perform LC by low pressure. From the standpoint of the body temperature (BT) we report the effect of combined method.

OBJECT & METHOD: Exclusion criteria was combined operation (28 cases: Modified radical mastectomy etc), open conversion (52 cases), complication (18 cases). We could find no change.

RESULT: Between three groups (A, B & C) there was no significant difference about first walking, first stool, laboratory data (WBC, CRP), pain killer usage and post operative hospital stay. There was no significant difference between Group A & B about oral intake. In the Group A combined method (0.33±0.25 ?) showed higher BT than pneumoperitoneum method (0.25±0.15 ?) (? = 0.053). In the Group B the degree of BT decrease showed significant difference between pneumoperitoneum method (0.56±0.33 ?) and combined method (0.44±0.29 ?) (? = 0.070).

CONCLUSION: No remarkable effect of post operative BT change was seen. Combined method showed more high BT tendency. Physiologically speaking post operative high BT may be better, so far as these data the merit of high BT is unknown.

P204—Hepatobiliary/Pancreatic Surgery

INTRAOPERATIVE MAGNETIC RESONANCE IMAGING ABLATION OF HEPATIC TUMORS, R Martin BA, S Hushek BA, K McMasters BA, University of Louisville Department of Surgery and The Center for Advanced Surgical Technology

Background: The utilization of hepatic ablation of tumors for both primary and secondary cancers has continued to rise at a significant rate. The most significant rise in the utilization of hepatic ablation has come from image guided techniques with both computer tomography and ultrasound. The limitations of targeting hepatic lesions by these techniques remain morbid obesity, abnormal hepatic parenchyma and inability to visualize lesions without the utilization of intravenous contrast.

Magnetic Resonance Imaging (MRI) on the other hand, has continued to provide a high contrast of soft tissue to lesion conspicuity without the need of IV dye. The recent development of an open configuration magnetic resonance scanners, which have allowed improved patient access, near real time imaging, and more available MR compatible equipment, has opened up an entire new area of image guided surgical and interventional procedures. Thus the aim of this study was to evaluate the use of iMRI ablation of hepatic tumors performed by surgeons.

Method: iMRI hepatic ablation was performed on 10 patients from 1/2003 to 4/2004 for control of either primary or secondary hepatic disease. These lesions were defined as inaccessible by computer tomography and thus were ablated using real-time intraoperative MRI guidance.

Results: Hepatic ablation was performed on 5 women and 5 men with a median age of 71 (range 51-81) years. Eighteen hepatic lesions were ablated were successfully ablated, with a majority of lesions being located in segments 6 and 7. Median hospital stay was 1 day, with complications occurring in 2 patients.

Conclusions: Image guided hepatic ablations represent a useful technique in managing hepatic tumors. Intra-operative MRI (iMRI) represents a new technique with initial success that has been limited to European centers. Further evaluation in U.S. centers has demonstrated iMRI to be useful for certain hepatic tumors that cannot be adequately visualized by ultrasound or computer tomography. This study demonstrates the importance of a multi-disciplinary approach involving a surgical oncologist and interventional radiologist to the integral short and long-term success of image guided ablations.

P205—Hepatobiliary/Pancreatic Surgery

LAPAROSCOPIC CHOLECYSTECTOMY IN PATIENTS WITH SEVERE CARDIAC DISEASE, M. Misra MD, J. Schiff BS, G. Rendon MD, J. Rothschild MD, S. Schwartzberg MD, T. NEMC

Objective: Cardiac disease is frequently a co-morbidity of patients undergoing cholecystectomies (CCYs). However, congestive heart failure (CHF) is often considered a contraindication to laparoscopic cholecystectomy (LC). As LC is considered the standard of care for removal of the gallbladder, this reviews the outcome of LC in this high-risk population.

Methods: This study is a retrospective review of medical records of 1285 consecutive CCY patients operated from 7/1996-6/2003 in a tertiary care medical center.

Results: 100 patients in this population had cardiac disease (7.8% of total population). 86 patients had coronary artery disease (CAD). 44 of the CAD patients underwent LC. The remaining patients had open CCYs, or conversions to open surgery. 14 (1.1%) patients in this study had congestive heart failure. 12 of these patients underwent LC. Pre-operative left ventricular ejection fraction (LVEF) of the LC CHF patients ranged from 15% to 65%. 8 of the 12 CHF patients had heart transplants. 7 of 8 transplant patients had LC. Indications for surgery for these patients included biliary colic (n=4), acute cholecystitis (n=2), and chronic cholecystitis (n=1). The one transplant patient with an open CCY had acute gangrenous cholecystitis with hydrops. 3 of the transplant patients had their transplant before their CCY, the time period between transplant and CCY ranged from 1 to 13 years. 5 of the transplant patients had their CCY before their transplant. Time periods between transplant and CCY in these patients ranged from 1 to 3 years. Acute complications of transplant patients included 2 patients with post-op electrolyte abnormalities, 1 patient with post-op pneumonia, and 1 patient with retained gallstones. There were no deaths in the cardiac population. There were no conversions because of inability to tolerate pneumoperitoneum.

Conclusions: The severity of gallstone disease in cardiac populations is greater compared to that of the general population. Laparoscopy does not increase the risk of intra-operative or post-operative complications in patients with even severe CHF compared to the general population. Asymptomatic patients (from a biliary standpoint) awaiting cardiac transplant can undergo LC following transplantation with good results. LC is a safe procedure for gallbladder resection in high-risk populations.

P206—Hepatobiliary/Pancreatic Surgery

CRYOABLATION OF HEPATIC TUMORS: A COMPARATIVE STUDY BETWEEN TWO INSTRUMENTS, A. Maria

http://www.sages.org/
Paganini MD, Mario Guarrieri MD, Jlenia Sarnari MD, Giancarlo D’Ambrosio MD, Luigi Solinas MD, Emanuele Lezoche MD, Department of General Surgery, University of Ancona, Ancona, Italy; “Il Clinica Chirurgica , Università La Sapienza, Rome, Italy.

Aim: to compare the results of Cryosurgical Ablation (CSA) of hepatic tumors in two consecutive series of patients (pts) treated with two different instruments both using liquid nitrogen. Methods: between February 1996 and August 2004, 86 pts (41 males, 45 females, mean age 57.3 years, range 30-79) were treated with the CMS AccuProbe System (Rockville, MD, USA) using 5.8 mm probes (laparoscopically 29%, open surgery 71%) (group A); 7 pts (3 males, 4 females, mean age 57.1, range 38-73) were treated with the Cryo 6 Erbe (Tuebingen, Germany) using 3 mm probes (open surgery).

Results:

Group A
- Intra operative Transfusions, pts 47 (55%) 1 (14%)
- Post operative Transfusions, pts 36 (42%) 0
- Major Complications 2 (29%) 0
- Minor Complications 44 (51%) 0
- Local recurrence 0 0
- Mortality 4 (6%) 0

Group B
- Intra operative Transfusions, pts 3 (43%) 1 (14%)
- Post operative Transfusions, pts 4 (57%) 0
- Major Complications 2 (29%) 0
- Minor Complications 4 (57%) 0
- Local recurrence 0 0
- Mortality 0 0

Conclusions: the Cryo 6 Erbe instrument was equally effective as compared to the CMS AccuProbe System but with less intra and postoperative bleeding, lesser need for blood transfusions and lower morbidity.

P208—Hepatobiliary/Pancreatic Surgery

ACUTE ACALCULOUS CHOLECYSTITIS: INCIDENCE, TREATMENT OPTIONS AND EVENTUAL OUTCOME, Brian J Schmidt MD, Heidi K Chua MD, Mayo Clinic Jacksonville

ACUTE ACALCULOUS CHOLECYSTITIS: INCIDENCE, TREATMENT OPTIONS AND EVENTUAL OUTCOME. Brian J. Schmidt, M.D., Heidi K. Chua, M.D., Department of Surgery, Mayo Clinic Jacksonville, FL 32224

Introduction:

Percutaneous cholecystostomy is a reasonable treatment alternative in patients with acute acalculous cholecystitis. Our objective was to determine if percutaneous cholecystostomy was a reasonable treatment option for these patients and if so, what percentage ultimately required cholecystectomy, either open or laparoscopically.

Methods and Procedures:

We examined all patients at our institution over an eleven-year period with the diagnosis of acute acalculous cholecystitis to evaluate the demographics, optimal therapeutic sequence and outcomes in patients with the diagnosis of acute acalculous cholecystitis. We identified 18 patients with this diagnosis. Of these, 83% were male and 33% occurred in patients who had recently undergone non-biliary tract surgery. We examined the patients in regards to initial therapy (percutaneous cholecystostomy vs. surgery), eventual outcome and whether or not the interval cholecystectomy could be completed laparoscopically.

Results:

Preoperative laboratory testing was non-specific, while presenting signs or symptoms ranged from abdominal pain to sepsis in the critically ill. Eighty-nine percent of patients whose initial therapy was percutaneous cholecystostomy tube placement did not require interval cholecystectomy. Many of these patients had severe systemic illness, which limited their survival. Of the patients who required early surgical intervention, 78% underwent laparoscopic cholecystectomy. The in-hospital mortality rate was 22%.

Conclusions:

We conclude that percutaneous cholecystostomy is a reasonable treatment alternative in patients too ill to undergo surgical therapy. The majority of these patients will not require surgical therapy after resolution of the presenting comorbid illnesses. In those who undergo early surgical therapy, a majority of these cases can be completed laparoscopically.

P209—Hepatobiliary/Pancreatic Surgery

INFLUENCE FOR HEMODYNAMICS OF THE HEPATIC ARTERIAL BLOOD CIRCULATION BY PNEUMOPERITONEUM IN LAPAROSCOPIC CHOLECYSTECTOMY, Masamori Shimabuku MD, Toshiomi Kusano PhD, Kazuyuki Tachibana MD, Hirohiko Yuzawa MD, Masahiro Kamachi MD, Department of Surgery, Digestive Disease Center, Tenjin-ku Koga Hospital, Kurume, Japan

The influence due to pneumoperitoneum on respiratory and circulatory kinetic during laparoscopic cholecystectomy (LC) has been reported thus far. However, there were few reports regarding the hepatic arterial circulation. The purpose of this study was to investigate the influence due to pneumoperitoneum on the hepatic blood flow during LC. The subjects were 32 cases undergoing LC for 6 months. In this study, an arterial keton body ratio (AKBR) which was proportional to the hepatic arterial blood flow. Furthermore a partial pressure of carbon dioxide (PaCO2) were measured. During surgery, under anesthesia with neuroleptic analgesia, a muscle relaxant was administered at a sufficient dose; quantitative ventilation was performed at a laughing gas-oxygen ratio of 2:1. Average operation time was 1 hour and 47 minutes. Influence with the pneumoperitoneum included the temporarily lowered AKBR just after the pneumoperitoneum under anesthesia. However, when AKBR could be kept at a pressure of 10 mmHg or lower, AKBR remained in the safety range. PaCO2 stayed around 30 mmHg until 180 minutes, when the pressure due to pneumoperitoneum was maintained low, but it is measured at over 14mmHg, at 120 minutes later PaCO2 exceeded 40 mmHg. In conclusion, if maneuvered at a low pneumoperitoneum pressure, LC is a safe operative procedure with a slight negative general influence.
P210–Hepatobiliary/Pancreatic Surgery

GALLSTONES: BEST SERVED HOT, Tarun Singhal MS, Santosh Balakrishnan MS,S El-Hasani,Starlene Grandy-Smith, Princess Royal University Hospital, Kent, U. K.

Background: Acute gallstone related diseases have traditionally been managed conservatively. Endoscopic extraction of common bile duct stones is attempted in a small percentage of patients. The gall bladder is usually left in situ for interval cholecystectomy after 4 to 6 weeks when the acute inflammatory changes have subsided. This places the patient at increased risk of recurrent pancreatitis or other complications of cholelithiasis.

Method:

Patients who presented with acute gallstone related disease were investigated for Common Bile Duct (CBD) stones and underwent Laparoscopic cholecystectomy (LC) in the same admission according to a pre-determined treatment protocol (Table 1).

Results:

All 119 patients who were treated according to the study treatment protocol had good results with no mortality and no biliary tract injuries. One patient had bleeding from cystic artery, and six patients required conversion to open surgery.

Discussion:

The traditionally quoted rationales for interval cholecystectomies were the increased risk of causing damage to adjoining structures, primarily extra-hepatic biliary tree and cystic artery, while dissecting oedematous and inflamed tissues with distorted anatomy. Further, failure to complete the operation laparoscopically due to technical difficulties often left the patient with a large laparotomy scar. However, it has long been recognised that this results in significant increase in risk of intercurrent attacks of gallstone related diseases [1,2,3,4]. Introduction of laparoscopic cholecystectomy (LC) and steadily increasing expertise has made it possible for surgeons to perform cholecystectomies in the presence of acute gallstone related disease without having to commit oneself to a major laparotomy [2,5,6,7,8,9]. Our experience of managing gallstone disease with prompt cholecystectomy in the index admission after evaluation of common bile duct (CBD) showed that this approach is not only safe but also economical.

P211–Hepatobiliary/Pancreatic Surgery

NEEDLESCLIC CHOLECYSTECTOMY VS NEEDLESCOPE-ASSISTED LAPAROSCOPIC CHOLECYSTECTOMY, Nobumii Tagaya PhD, Norio Suzuki MD,Kyu Rokkaku MD,Keiichi Kubota PhD, Second Department of Surgery, Dokkyo University School of Medicine, Tochigi, Japan

Background: Laparoscopic cholecystectomy with needlescopic instruments has been progressed. However, this refinement has several limitations to perform surgical procedure. We performed a prospective study to evaluate the feasibility of needlescopic and needlescopic instruments.

Materials and Methods: Needlescopic or needlescope-assisted cholecystectomy was performed in 40 cases of cholecystolithiasis or gallbladder polyp. They were 12 men and 28 women with mean age of 51.8 years (range: 27-79). After creation of pneumoperitoneum, the port sites consisted of three 5mm ports at the right upper quadrant and one 10 mm needlescope in the right hand during all procedures. The assistant manipulated two grasping forceps and needlescopic instruments. The assistant manipulated dissecting forceps or electrocautery in the left hand and two-mm needlescope in the right hand during all procedures. The assistant manipulated two grasping forceps and needlescope in the right hand. When we perform clipping or cutting of cystic duct and artery, we performed a sequential approach to remove the gall bladder and clear the bile duct is possible. This approach avoids ERCP and its associated risk of pancreatitis. LCBDE techniques and instrumentation continue to evolve. Our experience using the MIG (multi-channel instrument guide) and techniques from urologic surgery adapted for LCBDE is presented.

Method: A prospective case study that includes all patients with choledocholithiasis that underwent LCBDE using the MIG is reviewed. Choledocholithiasis was identified by DFIOC (dynamic fluoroscopic intra-operative cholangiography) during laparoscopic cholecystectomy. Both trans-cystic duct and choledochotomy techniques were employed. A staged pre-dural algorithm was applied based on operative and DFIOC findings. 79% of these patients had difficult stone features, including large stones over 8mm, multiple stones, hepatic duct...
POSTER ABSTRACTS

 Stones, impacted stones or fibrin embedded stones. Cholecodochoscopy was employed in all patients. Simple choledocholithiasis' stones that resolved using trans-cystic duct flushing, glucagon and passage of a catheter were excluded from analysis.

Results: A total of 43 patients met study inclusion criterion. Total bile duct clearance was achieved in 98% of these patients. 9% of these LCBDE cases were completed via the cystic duct and 91% using choledochotomy techniques. No cases of pancreatitis resulted from LCBDE in this study.

Conclusion: LCBDE using the MIG, cholecodochoscope, stone baskets and lithotripter is safe and effective. A 98% success rate was achieved in this series of patients. Trans-cystic duct techniques and choledochotomy techniques are complementary, and laparoscopic biliary tract surgeons need to be familiar with both of these procedural methodologies. Urologic surgery has developed effective methods to deal with ureteral stones that can be adapted for cases of choledocholithiasis with great efficacy. The necessary instrumentation for LCBDE is available, relatively inexpensive, and can be cross utilized with urologic surgery.

P215–Hepatobiliary/Pancreatic Surgery

LAPAROSCOPIC ANATOMICAL LIVER RESECTION IN A PEDIATRIC PATIENT WITH BENIGN CYSTIC LESION, Ho-Seong Han MD, Yoo-Seok Yoon MD, Yoo Shin Choi MD, Sang Il Lee MD, Jin-Young Jang MD, Sun-Whe Kim MD, Yong-Hyun Park MD, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea

Introduction: Despite recently increasing numbers of reports on laparoscopic liver resection, cases performed in pediatrics have been rarely documented. We report on a totally laparoscopic left lateral sectionectomy in a pediatric patient with benign cystic lesion. To our knowledge, this is the first reported case of laparoscopic anatomical liver resection in a pediatric patient.

Methods and Procedures: A 5-year-old girl presented with a 1-month history of right upper quadrant pain. Abdominal CT revealed a large (10 x 10 cm), multi-cystic septated cystic tumor presumed to originate from the liver. At the inspection via laparoscopy, an exophytic tumor originating from the left lateral section was identified, and so a totally laparoscopic left lateral sectionectomy was performed. Three 10 mm and one 12 mm trocars were placed, and a 30°/AE laparoscope was used. Intraabdominal pressure was maintained below 10 mmHg.

Results: The operative time was 150 minutes. The estimated blood loss was about 100 cc, and no intraoperative transfusion was needed. The patient was discharged on postoperative day 11 without postoperative complications. Postoperative pathology confirmed a mesenchyal hamartoma of the liver with a free resection margin.

Conclusion: This case shows that laparoscopic liver resection can be a safe and feasible operative procedure in the pediatric patient with liver disease. Thus we believe that laparoscopic liver resection can be a promising surgical technique in selected pediatric patients.

P216–Hepatobiliary/Pancreatic Surgery

THE USEFULNESS OF CUSA DURING LAPAROSCOPIC LIVER RESECTION, Yoo-Seok Yoon MD, Ho-Seong Han MD, Yoo Shin Choi MD, Sang Il Lee MD, Jin-Young Jang MD, Sun-Whe Kim MD, Yong-Hyun Park MD, Department of Surgery, Seoul National University College of Medicine, Seoul, Korea

Introduction: The major problem of laparoscopic liver resection is bleeding during liver parenchymal transection, which is difficult to control laparoscopically and may increase postoperative complications. Although Harmonic scalpel, Ligasure, and endo-vascular GIA etc are being widely employed in parenchymal dissection, these have a possibility of incomplete vascular control due to somewhat blind application. We experienced reduced intraoperative blood loss after adoption of CUSA (Cavitron Ultrasonic Surgical Aspirator). In this study, we evaluated the usefulness of CUSA in laparoscopic liver resection by analyzing our experiences.

Methods and Procedures: Between May 2003 and August 2004, a total of 21 cases of laparoscopic liver resection (11 left lateral sectionectomy, 5 left hepatectomy, 4 tumorectomy, 1 right posterior sectionectomy) were performed by one surgeon (Dr. Han HS). Of total cases, we selected the cases of left-sided liver resections (left: 5 cases, left lateral: 11 cases) and compared the clinical results between 10 cases before use of CUSA (Harmonica scalpel or Ligasure was used) (group A) and 6 cases after use of CUSA (group B) for of total cases.

Results: The patients comprised 8 men and 8 women, ranging from 5 to 74 years with a mean age of 55.9 years. Indications for this procedure included 10 cases of localized IHD stones, and 6 cases of tumor (3 benign tumor, 3 hepatocellular carcinoma). No significant differences between two groups were observed in sex, age, and indications between the two groups. Group B showed improved results compared to group A in operation time (group A vs. group B: 382.3±175.4 vs. 250.0±87.5 minutes), blood transfusion amount (2.1±2.9 vs. 0 units), postoperative hospital stay (15.6±8.6 vs. 9.3±3.3 days), postoperative complications (30% vs. 0%), although statistical analysis was not done due to a small number of cases. Three cases of postoperative complications (sepsis, biliary fistula, intraabdominal fluid collection) were present in group A, and postoperative mortality occurred in one patient due to sepsis. However, there was no postoperative complication and mortality in group B.

Conclusions: Our experiences, although limited, indicate that CUSA enables more precise resection of the liver parenchyma in a dry field, and eventually can lead to reduction of blood loss, shorter operator time, and decreased postoperative complications.

P217–Hepatobiliary/Pancreatic Surgery

CLINICAL OUTCOMES AFTER LAPAROSCOPIC CBD EXPLORATION, Yoo-Seok Yoon MD, Ho-Seong Han MD, Seoq Ki Min* MD, Hyeon-Kook Lee* MD, Yoo Shin Choi MD, Sang Il Lee MD, Jin-Young Jang MD, Sun-Whe Kim MD, Yong-Hyun Park BA, Department of Surgery, Ewha Women’s University Mokdong Hospital and Seoul National University Bundang Hospital. Excluding 19 cases of combined intrahepatic duct stones, 91 patients who underwent the LCBDE for choledocholithiasis confined to CBD were retrospectively analyzed by reviewing the medical records.

Results: The patients were composed of 51 men (56%) and 40 women (44%), with a mean age of 67.47±7.7 years. Endoscopic sphincterotomy (ES) was performed in 32 cases (35.2%) during preoperative period. The mean operation time was 21870 minutes, and the open conversion rate was 2.2% (2 cases). The mean postoperative hospital stay was 13±6.7 days.

Postoperative complications occurred in 9 cases (11%), all of which responded to the conservative medical management. There was no postoperative mortality. Excluding 15 cases of follow-up loss, recurrent CBD stones were detected in 5 cases (6.6%) after a mean follow up period of 35 months. Among the recurrent cases, 2 cases were treated with ES and lithotripsy, and the remaining 3 cases were not managed due to asymptomatic small stones.

Conclusions: LCBDE is a safe and effective method in clearing of CBD stones.
P218–Basic Science (cellular bio, physiology)  
NORMAL INTRA-ABDOMINAL PRESSURE IN HEALTHY ADULTS  
William S Cobb MD, Justin M Burns MD, Kent W Kercher MD, B Todd Heniford MD, Carolinas Medical Center  
Purpose: The goal of this study is to measure the normal range of intra-abdominal pressure in healthy, non-obese adults and correlate this with sex and body mass index (BMI).  
Methods: After Institutional Review Board approval, healthy young adults with no prior history of abdominal surgery were enrolled. Intra-abdominal pressure readings were obtained through a transurethral bladder (Foley) catheter. Each subject performed 13 different tasks including standing, sitting, bending at the waist, bending at the knees, performing abdominal crunches, jumping, climbing stairs, bench pressing 25 pounds, arm curling 10 pounds, and performing a Valsalva and coughing both while sitting and standing. Three separate readings were taken during each maneuver. Data were analyzed by Student t-test and Pearson’s correlation coefficients.  
Results: Measurements were taken in 10 male and 10 female subjects. Mean age of the study group was 22.7 years (range; 18 - 30 years), and BMI averaged 24.6 kg/m² (range; 18.4 - 31.9 kg/m²). The mean pressures were not different between males and females for each maneuver. There was a significant correlation between higher BMI and increased intra-abdominal pressure in 5 of 13 exercises. The mean maximum pressures and their correlation coefficients with BMI for these maneuvers are shown below.  

<table>
<thead>
<tr>
<th>Maneuver</th>
<th>Max (mm Hg)</th>
<th>BMI r</th>
<th>p-value</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing</td>
<td>20.0</td>
<td>0.63</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bend at waist</td>
<td>20.6</td>
<td>0.65</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough (upright)</td>
<td>10.76</td>
<td>0.84</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough (down)</td>
<td>10.13</td>
<td>0.84</td>
<td>0.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valsalva (lateral)</td>
<td>65.7</td>
<td>0.53</td>
<td>0.02</td>
<td></td>
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</tr>
</tbody>
</table>

Conclusion: Normal intra-abdominal pressure correlates with BMI, but does not vary based on sex. The highest intra-abdominal pressures in healthy patients are generated during coughing and jumping. Patients with higher BMI and chronic cough appear to generate significant elevation in intra-abdominal pressure and may potentially be at increased risk for abdominal wall hernia formation.

P219–Basic Science (cellular bio, physiology)  
CARBON DIOXIDE PNEUMOPERITONEUM POSTTREATMENT ATTENUATES IL-6 PRODUCTION, CARBON DIOXIDE PNEUMOPERITONEUM POSTTREATMENT,  
Justin M Burns MD, Kent W Kercher MD, Carolina Medical Center  
Purpose: The purpose of this study was to determine if CO2 pneumoperitoneum posttreatment would reduce the cytokine response to lipopolysaccharide (LPS) sepsis. Forty rats (n=10) were randomized into four groups: CO2 pneumoperitoneum, helium pneumoperitoneum, anesthesia control, and laparotomy control.  
In all groups a laparotomy was performed. Simultaneously, all animals received intraperitoneal Escherichia coli LPS (1mg/kg). Immediately after all animals were closed, the first three groups received their respective posttreatment for 30 minutes. Blood samples for serum cytokine assays were collected via cardiac puncture 2 hours following LPS injection. Compared to laparotomy/LPS only treatment, plasma levels of IL-6 were depressed 54.6% by anesthesia control, 77% by CO2 pneumoperitoneum posttreatment, and 74.1% by CO2 pneumoperitoneum posttreatment (*P<0.05). Statistical differences between groups were determined by one-way ANOVA.

<table>
<thead>
<tr>
<th>Group</th>
<th>IL-6</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>477±280</td>
<td>0.025</td>
</tr>
<tr>
<td>ISO</td>
<td>458±287</td>
<td>0.001</td>
</tr>
<tr>
<td>CO2</td>
<td>285±185</td>
<td>0.001</td>
</tr>
<tr>
<td>LPS</td>
<td>235±147</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Cytokines expressed as mean +/- SEM in pg/ml. LPS, lipopolysaccharide; ISO, isoflurane; CO2, carbon dioxide; P=0.05 vs L-control; *P<0.05 vs L-He-P.
plantation. Parameters before and after transplant are expressed as group median values ± 1st and 3rd quartile deviating line.

RESULTS: To date, 4 dogs have been studied. All animals tolerated the surgery (100% survival 9 months post-transplant.) They maintained their body weight after transplant and there were no pre/post differences in activity level. All four parameters that make up the 24-h pH monitoring increased after transplant: total number of reflux episodes were 7 (5,13) before versus 12 (4,28) after; the number of reflux episodes longer than 5 min were 0 (0,1) before versus 1 (0,3) after; the longest reflux episode was 3.5 (1.8,8.0) min before versus 8.0 (1.0,20.0) min after; and the total time esophageal pH <4.0 was 8.5 (4.3,15.3) min before versus 29.2 (2.0,53.0) min after. Direct statistical comparisons were limited by small sample size; additional experiments are currently underway.

CONCLUSIONS: The preliminary data indicate that the surgical manipulation performed during lung transplantation may initiate post-transplant reflux. Overall, the results re-enforce the utility of this model for assessing reflux pathology.

P222—Basic Science

INCLUSION OF A NITRIC OXIDE DONOR IN THE INSUFFLATING GAS DOES NOT ALTER GASTRIC EMPTYING FOLLOWING PNEUMOPERITONEUM, Megha K Shah, Kazufumi Shimazutsu MD, Toku Takahashi MD, KURT A Campbell BS, Jonathan S Stamler MD, Sandhya A Lagoo-Deenanadayalan MD, James D Reynolds PhD, Duke Endosurgery Center

We have previously shown that mixing the nitric oxide (NO) donor ethyl nitrate (ENO) with carbon dioxide (CO2) can attenuate pneumoperitoneum-induced decreases in splanchnic blood flow. However, increasing the circulating levels of NO has the potential to alter gastrointestinal (GI) activity; such an effect could limit the clinical utility of ENO. As a result, the purpose of the present study was to determine if ENO delayed gastric motility following CO2 pneumoperitoneum.

Using rats, gastric emptying and GI transit times were determined with radioactive chromium (51Cr). There were 4 experimental groups: absolute control; anesthesia control, CO2 alone, and CO2 + ENO (300 ppm). Each rat received 0.5 µCi of 51Cr in sterile saline by gastric gavage. 1.5 h later, animals in the 3 treatment groups were anesthetized with isoﬂurane, and surgical anesthesia maintained by posi-tive-pressure ventilation. Rats in the pneumoperitoneum groups were then recovered from anesthesia and GI transit times were determined with radioactive chromium (51Cr). There were 4 experimental conditions: absolute control; anesthesia control, CO2 alone, and CO2 + ENO (300 ppm). Each rat received 0.5 µCi of 51Cr in sterile saline by gastric gavage. 1.5 h later, animals in the absolute control group, 22 ± 6% of the 51Cr remained in the stomach after 6 h. In the anesthesia group, this was increased to 34 ± 21 ± 20%, respectively. With respect to GI transit time, no specific group differences were identified.

In summary, these preliminary data show no adverse effect of ENO on post-operative GI function following CO2 pneumoperitoneum. Additional work is planned to assess the actions of other ENO concentrations.

P223—Complications of Surgery

LAPAROSCOPIC REPAIR OF A URETER DAMAGED DURING OPEN INGUINAL HERNIORRHAPHY, Gustavo L Carvalho PhD, Emanuel F Santana MD, Roberto C Foinquinos MD, Gildo O Passos Jr, Frederico P Santos Carvalho, T Brandt PhD, C Costa M Lacerda PhD, Clínica Cirúrgica Videolaparoscópica Gustavo Carvalho, UFPE - Universidade Federal de Pernambuco, UPE - Universidade de Pernambuco, Recife, BRAZIL

BACKGROUND: Dealing with ureteral injury has generally been performed by laparotomy. Recently a few papers have reported the repair of gynecological ureteral injuries by laparoscopic, with encouraging results, but, the successful repair of a ureter damaged during an open inguinal herniorrhaphy fully performed by laparoscopy has not been reported yet.

PATIENT: A 49 year-old obese man, (BMI=35), in the 10 years prior to surgery began to note a protrusion in the scrotal region. The protrusion evolved asymptptomatically for eight years, when it began to cause pain in the right side of the lumbar spine and paresthesia of the right leg.

METHOD: An open right inguinal herniorrhaphy was performed. When the exeresis of the fatty tissue around the spermatic cord was being done, a resection of a tubular structure with approximately 12cm, supposedly the appendix, was done. Wall defect was closed by a polypropylene mesh. Acute abdomen developed in the immediate post-operative period being made the option to investigate using laparoscopy. After confirmation of ureteral injury, laparoscopic repair was performed, with the ureter being anastomosed over a double-J catheter. A suction drain was left near the anastomosis.


RESULTS: Post-operative course was uneventful. The vesical catheter was withdrawn on the 8th post-operative day (POD) and the drain on the 12th POD. The histopathological report confirmed that the resected structure was the ureter. The patient has remained asymptomatic for the 6 months since the surgery.

P224—Complications of Surgery

ENDOSCOPIC TREATMENT OF ESOPHAGO-PLEURAL FISTULA BY APPLYING FIBRIN GLUE, Gustavo L Carvalho PhD, António C Conrado MD, Gildo O Passos Jr, Frederico P Santos, Clínica Cirúrgica Videolaparoscópica Gustavo Carvalho, HR - Hospital da Restauração, UPE - Universidade de Pernambuco, Recife, BRAZIL

BACKGROUND: Esophageal fistulas are complex nosological entities with a high morbimortality, which in general get worse when conventional surgical treatment is chosen. The use of fibrin glue has been reported for closing several types of digestive fistulas. Nevertheless, there is still no consensus on using this method for esophageal fistulas.

OBJECTIVE: To present an alternative therapeutic option for esophageal fistulas through the use of fibrin glue by endoscopic means.

PATIENT: A 56 year-old male patient, submitted to laparoscopic converted to open Nissen surgery, developed right pleural effusion, hypertensive pneumothorax and sepsis on the 3rd POD. On being submitted to right thoracotomy, he was diagnosed as having esophageal-pleural fistula. Cleaning the pleural cavity was immediately carried out as was re-routing esophageal passage. The patient developed mediastinitis, multiple organ failure and perpetuation of the fistula exiting by the right thoracic drain and by upward coursing through the mediastine to the incision of the cervical paraesophageal esphagostomy. Due to the severity of the case, the patient was considered beyond the possibility of major surgery, and endoscopic treatment of the fistula was opted for.

METHOD: 3 ml of fibrin glue (BERIPLAST) was used in each session, injected by a needle at the inside edge of the fistula, using a video-endoscope and injector catheter with a needle of double lumen. For dilation of the fundoplication, a pneumatic 3 cm balloon was used on a guiding wire.

RESULTS: Three sessions applying 3ml of fibrin glue in each were conducted. There was re-opening of the fistula on the third day after the first and second applications. After dilation of the antireflux valve, which was tightening the distal esophagus, a third application was applied without further re-opening of the fistula. The patient progressively overcame the sepsis and was discharged from hospital. Cervical esphagostomy had resulted in spontaneous closure.

CONCLUSION: Endoscopic treatment with fibrin glue showed itself to be effective in this case and seems to be a good theraeutic option for esophageal-pleural fistula.
P225–Complications of Surgery
PITFALLS AND COMPLICATIONS OF LAPAROSCOPIC NISSEN FUNDOPICATION, Mohey El-Banna, Mahmoud El-Meteini, Osama Fouad, Department of General Surgery, Ain Shams University

Background: Since the introduction of laparoscopic Nissen fundoplication by Dallmagne 1991, its importance increased dramatically. In this study, the lessons learned from 60 consecutive laparoscopic Antireflux procedures (LAP) procedures are analyzed.

Methods: Between March 2001 and March 2004, 60 cases were subjected to LAP for gastroesophageal reflux disease (GERD). The preoperative decision depended on Esophagogastroduodenoscopy (EGD) and Esophageal Manometry (EM) to record the lower esophageal sphincter pressure and length and the esophageal body motility pattern. Barium study was done for hiatus hernia. The operative details were recorded, as well as the postoperative outcome and complications. The postoperative study included a standardized questionnaire, EGD and EM.

Results: Of the sixty cases studied, 6 cases were converted to open fundoplication due to gastric perforation, equipment failure and procedural difficulties. Four patients underwent Laparoscopic Toupet Fundoplication (LTTF). Except three patients, all demonstrated subjective and objective improvement or cure of GERD.

Conclusion: We concluded that LAP is a safe and effective approach for the management of GERD. However, the success of LAP depends on the ability of the surgeon to take into consideration the possible intra-operative complications and factors contributing to dissatisfaction with the functional outcome.

P226–Complications of Surgery
BLADELESS TROCAR HERNIA RATE IN UNCLOSED FASCIAL DEFECTS IN BARIATRIC PATIENTS, Alison M. Fecher MD, Ross L. McMahon MD, John P. Grant MD, Aurora D. Pryor MD, Duke University Medical Center

Objective Utilization of the bladeless step trocar system has the perceived advantage of minimal trocar related hernias in patients undergoing laparoscopic Roux en Y Gastric Bypass surgery (RYGB). We propose a retrospective review of hernias in these patients and a review of the literature.

Methods & Procedures A retrospective chart review was performed on 591 patients who underwent RYGB at Duke University Weight Loss Surgery Center from July 2002 through June 2004. A total of 2955 bladeless trocar sites were used. Step trocars were used in all cases. The configuration of ports included one Hasson port, two 12-mm and three 5-mm ports. All other trocar sites did not have fascial closure. The gastrojejunostomy was created with a linear stapler in all of the laparoscopic cases with hand suturing of the residual enterotomy. The charts were reviewed for fascial defect, subsequent surgeries and intra-operative findings.

Results There were no hernias seen at any of the unclosed bladeless trocar sites for a 0% incidence. There were four ventral hernias at the Hasson port site which required re-operation for repair for a 0.68% incidence.

Conclusion There were no hernias from the unclosed bladeless trocar site with radial expanders out of a total of 1182 12-mm ports. Four hernias occurred at the Hasson port site. In the bariatric RYGB population the routine closure of radially expanding step trocars does not appear to be necessary due to the extremely low rate of subsequent hernia.

P227–Complications of Surgery
DELAYED PRESENTATION OF SPLENIC RUPTURE AFTER COLONOSCOPY, Richard Fortunato DO, Daniel Gagné MD, Pavlos Papasavas MD, Philip Caushaj MD, The Western Pennsylvania Hospital, Temple University Medical School Clinical Campus

Splenic rupture after a colonoscopy is a rare but potentially fatal complication. Patients typically present with signs of abdominal pain and hemorrhagic shock within minutes to days after the procedure. We present a case of a 59 year-old woman with a past history of Hodgkin’s disease and gastric bypass who developed increasing abdominal pain three weeks after a routine colonoscopy and polypectomy. The patient presented with hypotension and underwent resection with IVF and IV pressors. CT scan demonstrated a large subcapsular hematoma of the spleen. Angiography did not reveal active bleeding. Due to the patient’s continued clinical deterioration, she was taken emergently to the operating room for a exploratory laparotomy, which demonstrated a full splenic capsular avulsion and hemorrhage. The patient underwent splenectomy and had an uneventful recovery. Though usually presenting hours to a few days after colonoscopy, severe splenic injury can have an insidious onset weeks from the original insult. This is the most delayed presentation of such an injury after colonoscopy to date.

P228–Complications of Surgery
INCIDENCE OF INTERNAL HERNIA FOLLOWING LAPAROSCOPIC RETROCOLIC RETROGASTRIC ROUX-EN-Y GASTRIC BYPASS, Giselle G Hamad MD, Gina M Kozak, PA-C, University of Pittsburgh

The optimal route of the Roux limb in the laparoscopic Roux-en-Y gastric bypass remains controversial. The retrogastric-retrocolic approach to Roux-en-Y gastric bypass has been criticized for the incidence of internal hernias at Petersen’s defect and the transverse mesocolon window. The postoperative weight loss coupled with the reduction in postoperative adhesions associated with the laparoscopic approach may contribute to a higher incidence of internal hernias. Internal herniation may lead to a closed loop obstruction and necessitates early surgical intervention. The purpose of this study was to determine the incidence of internal hernias among patients who underwent a retrocolic-retrogastric Roux-en-Y gastric bypass. Between 2001 and 2004, 520 patients underwent a retrocolic-retrogastric Roux-en-Y gastric bypass with continuous sutured closure of Petersen’s, transmesenteric, and small bowel mesenteric defects. Three patients were converted to open procedure (0.6%). There were 500 females and 20 males. Mean age was 40 years (range 18-65) and mean preoperative body mass index was 46.4 kg/m2 (range 36-68). Mean follow-up for all patients was 11 months and mean excess weight loss at 18 months was 70%. One patient (0.19%) who had lost 57% of excess weight three months after laparoscopic gastric bypass developed a high-grade small bowel obstruction and was diagnosed with an internal hernia by CT scan. An exploratory laparotomy was performed for reduction and repair of Petersen’s defect and the patient recovered uneventfully. Internal herniation is an infrequent complication following retrocolic-retrogastric laparoscopic Roux-en-Y gastric bypass. Meticulous continuous suture closure of the potential hernia defects is essential to reduce the incidence of this dreaded complication.

P229–Complications of Surgery
INCIDENCE OF STOMAL STENOSIS FOLLOWING LAPAROSCOPIC RETROCOLIC-RETROGASTRIC ROUX-EN-Y GASTRIC BYPASS, Giselle G Hamad MD, Gina M Kozak PA-C, University of Pittsburgh

Stomal stenosis is a complication reported in 3 to 37% of patients following Roux-en-Y gastric bypass. Contributing factors include tension of the Roux limb, ischemia, preserved acid secretion in the gastric pouch, NSAID use, and smoking. The optimal route of the Roux limb in the laparoscopic Roux-en-Y gastric bypass remains controversial. The retrocolic-retrogastric route has been said to subject the Roux limb to less tension on the gastrojejunal anastomosis than the antecolic-antegastric approach. The purpose of this study was to determine the incidence of stomal stenosis among patients who underwent a retrocolic-retrogastric Roux-en-Y gastric bypass. Between 2001 and 2004, 520 patients underwent a retrocolic-retrogastric Roux-en-Y gastric bypass with gastric pouch size of 15 mL and Roux limb lengths of 75 or 150 cm. The gastroje-
junostomy was created using a combined linear stapled and handsewn technique. Three patients were converted to open procedure (0.6%). There were 500 females and 20 males. Mean age was 40 years (range 18-65) and mean preoperative body mass index was 46.4 kg/m² (range 36-68). Mean follow-up for all patients was 11 months and mean excess weight loss at 18 months was 70%. None of the patients presented stomal stenosis postoperatively. Eleven (2.1%) were diagnosed with marginal ulceration by upper endoscopy. Stomal stenosis is an infrequent complication following retrocolic-retrogastric laparoscopic Roux-en-Y gastric bypass with combined linear stapled and handsewn gastrojejunostomy. A reduction in Roux limb tension with the retrocolic-retrogastric approach may play a role in reducing the incidence of this complication.

P230—Complications of Surgery
LATE GASTRIC PERFORATIONS AFTER LAPAROSCOPIC FUNDOPLICATION, K L Huget MD, T Berland, R A Hinder, Mayo Clinic Jacksonville

Introduction: Late complications are rarely encountered after laparoscopic Nissen fundoplication (LNF). We report a series of delayed gastric perforations complicating LNF and review the potential etiologies.

Methods: In the authors’ series of 1600 laparoscopic antireflux procedures performed between July 1991 and March 2002, we report a new finding of six delayed gastric fundal perforations in three patients 1, 41, 48, 51, 60, and 64 months after surgery. All had been taking celecoxib.

Patient # 1: 71 yo WM presented 3 years after LNF with pneumoperitoneum while on celecoxib. Exploratory laparotomy revealed a gastric perforation on the gastric fundus, which was oversewn. Several months later the patient again presented with pneumoperitoneum and exploratory laparotomy revealed a gastric perforation at the same site, which was oversewn. Patient # 2: 58 yo WF presented 1 month after LNF with pneumoperitoneum while on celecoxib. Exploratory laparotomy revealed a gastric perforation on the anterior surface of the fundus. This was oversewn without complications.

Patient # 3: 67 yo WM presented 4 years after a LNF with pneumoperitoneum while on celecoxib. Exploratory laparotomy revealed an infected gastrojejunostomy. One year later the patient again presented with pneumoperitoneum and exploratory laparotomy revealed a gastric perforation on the anterior surface of the fundoplication, which was oversewn. Several months later the patient again presented with pneumoperitoneum. He recovered well after percutaneous aspiration and medical management.

All patients had minimal peritoneal contamination leading to the conservative management of patients 1 & 3.

Conclusion: This series of late gastric fundal perforations in 0.2% of patients after laparoscopic fundoplication could potentially have been caused by celecoxib, gastric stasis, ischemia, or foreign body such as a stitch or pledget. Patients after laparoscopic fundoplication should be advised to avoid the use of non-steroidal anti-inflammatory drugs, which may cause acute gastric ulceration with perforation.

P231—Complications of Surgery
PANCREATIC COMPLICATIONS AFTER LAPAROSCOPIC SPLENECTOMY, Kotaro Kitani MD, Masatake Ikeda PhD, Mitsugumi Yamamoto PhD, Masakazu Ohue PhD, Hirofumi Yamamoto PhD, Masakazu Ikenna PhD, Ichiro Takemasa PhD, Shuji Takiguchi MD, Masayoshi Yasui MD, Taishi Hata MD, Tatsushi Shingai MD, Morito Monden PhD, Department of Surgery and Clinical Oncology, Graduate School of Medicine, Osaka University

Background: Laparoscopic splenectomy (LS) has been accepted as a standard operational procedure for hematological disorders. Pancreatic complication is one of major complications associated with this procedure. We reviewed pancreatic complications following LS to find out the incidence of pancreatic injury and its impact on postoperative management.

Methods: Case log analysis of hospital charts were reviewed. 85 patients’ charts were reviewed in a variety of hematological disorders undergoing LS (including Hand-Assisted LS) between May 1996 and March 2004. We selected to perform Hand-Assisted LS (HALS) for patients with splenomegaly. We measured postoperative serum amylase level (S-AMY) and amylase concentration of portal venous fluid (D-AMY). Pancreatic fistula was defined as infected drainage with high D-AMY.

Results: Two patients (2.4%) had pancreatic fistula and one patient had concomitant pancreatitis. Their D-AMY was extremely high level (66800 and 4458 IU/L), while their S-AMY was almost within normal range (91 and 171). Their surgical drains were removed on 15 and 8 postoperative days, respectively. For the rest of the other patients, drains were removed within three days of operation. In the first patient, HALS was employed, and operative time was 245 and 315 minutes, blood loss was 100 and 120ml, resected splenic weight was 2315 and 1100g, respectively. Fifteen patients (20%) had asymptomatic hyperamylasemia, and recovered uneventfully. Eleven patients (11%) developed high D-AMY level without any symptoms. Mean splenic weight of these patients was 654g and statistical analysis showed a significant relationship between D-AMY and resected splenic weight.

Conclusions: We report two cases of postoperative pancreatic fistula which required long drainage. Patients with splenomegaly need special attention for postoperative pancreatic complications.

P232—Complications of Surgery
PORTAL VEIN THROMBOSIS AFTER LAPAROSCOPIC SPLENECTOMY FOR SYSTEMIC MASTOCYTOSIS, Najed Maalouf MD, Daniel Gagné MD, Pavlos Papasavas PhD, David Goitein MD, Philip Caushaj MD, The Western Pennsylvania Hospital, Temple University Medical School Clinical Campus

Laparoscopic splenectomy has become the surgical technique of choice for various diseases of the spleen. Portal vein thrombosis (PVT) following splenectomy occurs in 0.5-22% of patients. Symptoms are non-specific and include fever, abdominal pain, and epigastric distress. Risk factors for PVT following splenectomy include underlying hematological disorders, massive splenomegaly (>1kg), thrombocytosis (>106) and other hypercoagulable states.

We describe a case of PVT in a woman who underwent laparoscopic splenectomy for symptomatic splenomegaly secondary to systemic mastocytosis. The patient was discharged from the hospital without anticoagulation and experienced nonspecific symptoms beginning 10 days postoperatively. Diagnosis of PVT was made by contrast enhanced abdominal computed tomography. The patient had no underlying risk factors. Anticoagulation treatment facilitated recanalization of the portal vein and this was verified by Doppler ultrasound at follow-up.

PVT following laparoscopic splenectomy is not uncommon. Signs and symptoms are vague and require a high index of suspicion for timely diagnosis. Anticoagulation is the treatment of choice and allows recanalization of the portal system in the majority of cases.

P233—Complications of Surgery
DOES LAPAROSCOPIC APPENDECTOMY INCREASE THE RISK OF INTRAABDOMINAL ABSCESSES, J M Saxe MD, D Tong MD, K Kralovich, Henry Ford Hospital

The laparoscopic approach to appendectomy has been gaining in popularity. Some reports have indicated however an increased incidence of postoperative abscess formation in complex appendicitis treated by laparoscopy.

Recommendations have favored open procedures when abscess was known preoperatively. Perforation and infected fluid is not always allowed to be determined preoperatively. Our hypothesis is that postoperative intra-abdominal abscess formation is not higher after laparoscopic appendectomy when compared to open appendectomy for appendicitis.

Methods: A retrospective study of all patients who underwent an appendectomy at our single institution between January 2002 and March 2003. Exclusion criteria included patients under 18 years of age and incidental appendectomy. Charts were reviewed for pre and postoperative abscess formation, operative procedure, postoperative complications, and length of stay. Operations were classified as laparoscopic (LA), lap. converted to open (CO), and open appendectomy (OA). Diagnosis was classified as normal, acute appendicitis, gangrenous and
PERFORATED APPENDIX

Results: A total of 302 patients underwent appendectomy during the study time. 203 patients were studied. LA was performed in 77 patients, 115 underwent OA, and 11 patients were converted. Complications in LA included abscess (3), ileus (3), and wound infection (2). OA complications include wound infection (12), ileus (11), Abscess (7), enterocutaneous fistula (1), cardiac (1), and hernia (1). Wound infection differences were statistically significant.

Conclusion: LA does not appear to increase the incidence of intra-abdominal abscess formation. Furthermore, overall complications seem to be less with LA than those seen in OA. Prospective studies of OA vs. LA are necessary to validate these findings.

P234–Complications of Surgery

CASE REPORT OF DELAYED SMALL BOWEL OBSTRUCTION FOLLOWING LAPAROSCOPIC-ASSISTED HEMIColecToMy, David J. Swier MD, Robert J. Hyde MS, Christian Galvez-Padilla MD, Robert D. Fanelli MD, Eugene L Curletti MD, Berkshire Medical Surgery, Department of Surgery; University of Massachusetts Medical School.

This is a case report of Richter’s hernia through 5-mm port after laparoscopic-assisted hemicolecotomy. The patient is an 84-year-old woman with PMHx of HTN, CHF, Type 2 DM and COPD (on prednisone 5mg TID) who initially underwent screening colonoscopy and had multiple polyps removed. The patient underwent laparoscopic-assisted right hemicolecotomy to remove a sessile polyp in the cecum. Three 5-mm incisions were made in the umbilicus, suprapubic region and the left lower quadrant using bladed trocars. A fourth incision was made in the right lower quadrant through which the right colon and ileum were delivered and resected. At the end of the case, the three 5-mm incisions were closed with 4-0 Vicryl suture in a subcuticular fashion. The right lower quadrant incision was closed with #1 PDS sutures in two layers for the anterior and posterior sheath, and staples for the skin.

Postoperatively, the patient did not have any flatus or bowel movement. On POD #7, the patient became nauseous and vomited. A nasogastric tube was inserted for decompression. By POD #10, the patient remained without bowel function. It was decided to bring the patient back to the OR for exploratory laparotomy. The decision not to attempt a laparoscopic exploration was based on the amount of small bowel distention and concern regarding safe peritoneal access. After abdominal access was achieved through an infraumbilical midline incision, collapsed loops of small bowel were visualized. In addition, jejunal loops were dismembered. At approximately the midpoint of the jejunum, a portion of the antimesenteric border was herniated through a defect in the abdominal wall. This defect was identified and correlated with the left lower quadrant skin incision at the 5-mm port site. The fascial defect was closed with a running simple stitch using 2-0 Prolene.

Richter’s hernia is an infrequently encountered hernia that involves incomplete protrusion of bowel wall through a defect. Standard practice is to routinely close the fascia of port sites >10 mm in adults, and >5 mm in children, to prevent such herniation. Our case of a hernia through a 5-mm port site in an 84-year-old patient further evidence that other factors such as patient age, past medical history, pharmacotherapeutics (i.e. steroids) and other factors should be considered when deciding whether or not to close port sites <10 mm. Additionally, the use of non-bladed trocars may be of benefit in this subset of patients.

P235–Complications of Surgery

ENLARGED OR MASSIVE SPLENOMEGALY—SPLENIC AND HEMATOLOGIC DISORDERS—A RISK OF LAPAROSCOPIC SPLENECTOMY FOR THE TREATMENT OFSplenic and hematologic disorders. This study was performed to evaluate a risk of splenomegaly for perioperative complications (hemorrhage, operative time, and more) of LS.

86 consecutive patients who admitted our hospital from 1995 to May/2004 underwent LS (or hand-assisted laparoscopic splenectomy, HALS) for various indications. We reviewed the perioperative and various clinical factors in the patients. Patients were divided into three groups—normal spleen group (splenic weight <500g), enlarged spleen group (>1000g) and massive splenomegaly group (>1000g).

A weight of resected spleen was identified as a risk factor for prolongedoperative time and increased intraoperative hemorrhage. Estimated blood loss, operative time and conversion rate among three groups were compared. Patients with normal splenic weight <500g had a significantly shorter median operative time and smaller intra-operative hemorrhage. Between enlarged spleen group and massive splenomegaly group, there was no significant difference in clinical outcomes. Median estimated blood loss of enlarged and massive splenomegaly subgroup was 120 and 250ml, respectively. Median operative time of enlarged and massive subgroup was 235 and 245 min, respectively. There was no mortality in all subgroups.

Owing to difficulty in manipulating the spleen, LS procedures in enlarged and massive spleen subgroup are more difficult than that in normal spleen subgroup. But, in those patients, we could performed splenectomies in all cases without mortalty.

P236–Ergonomics/Instrumentation

SURGICAL ENDOSCOPY AT THE EDGE OF THE WORLD, Steven P. Bowers MD, Wilford Hall Medical Center.

There is a great need for-, but many obstacles to providing gastrointestinal endoscopy and minimally invasive surgery in austere environments, such as in forward deployed military hospitals and in humanitarian missions to the Third World. An equipment package for such operations must be light enough to be shipped via commercial airline baggage and transported by hand. Imaging equipment must enable endoscopy, laparoscopy and arthroscopy with a single image processor and camera, and should be compatible with a monitor of convenience. Capacity for a digital image output is optimal, because it allows a laptop computer to be used as a monitor, and enables real-time streaming of a video image for military telemedicine capability. All equipment must be reusable to minimize logistical strain, and all instruments and imaging equipment must be sterilized by autoclave. The author developed an equipment package with the above qualifications, and field-tested it during a humanitarian mission to one of the most remote locations on earth, the Patagonia region of Chile and the Tierra del Fuego. Over a ten-day period, 12 cholecystectomies and 26 endoscopy procedures were performed, in addition to 20 open inguinal herniorrhaphies. Due to the success of the equipment package in accomplishing the humanitarian mission, the equipment package was requisioned for use in Operation Iraqi Freedom.

P237–Ergonomics/Instrumentation

SOLO-SURGERY USING THE ENDFREEZE SYSTEM, F. Buess 1,2 PhD, Rahim Lang 3 MD, Toni Khater 1, Jens Burghardt 2 MD, 1. University of Tuebingen, Germany 2. Helios Klinik Muehlheim, Germany 3. Eduardus-Krankenhaus gGmbH, Koeln, Germany.

Introduction: The study is focusing upon the clinical application of a new holding system for solo-surgery. Methods and procedures: Electronically controlled guiding systems do normally prolong the operative procedure. Mechanical holders in the past had the problem of changing the position by the bi-manual action. We designed together with the company Tuebingen Scientific in Tuebingen, Germany and Aesculap in Tuttlingen, Germany, a new mechanical device for holding the camera and retracting instruments in laparoscopic surgery. A central innovative part is a baltrocar, which has two differ-
ent screws, to adjust the friction of the ball, giving the angle of the instrument and a second screw for defining the length of optical instruments inside the abdomen. The ball has to be in close contact with the abdominal wall. The ball is held by a metal clamp, which is attached to a mechanical retractor, which connects the system with the operating table.

After adjusting the friction to the needs of the operation and allowing a change of the position by using one hand without opening the screws the optic is focused upon the operative field. The operation is performed with the use of a curved grasper for the left hand, which allows that both instruments for the surgeons are located on the right side of the optic, e.g. in gallbladder surgery. Therefore, there is no conflict between operative instruments and retractor given. If the position of the optic or the retracting instrument has to be changed, it can be performed with the move of one hand in a very short time (no more than a second).

Results: We have operated with the use of solo-surgery 50 patients with chronic cholecystitis and gallbladder-stones and 5 patients with acute cholecystitis. It takes 0.9 minutes to establish the retracting technology, to break down the system 0.5 minutes in the average.

All procedures went smooth without any complications. We observed that less movements of the camera have been performed compared to the assisted procedure and that the position of the optic was clearly more stable than the assisted procedure. We perform today routinely solo-surgery for resection of the gallbladder in chronic cholecystolithiasis, excision in educational tasks. One ball trocar is routinely used for retraction of the liver in fundoplication, so that a third assistant is never necessary.

P238-Ergonomics/Instrumentation
OBJECTIVE ASSESSMENT OF KNOT QUALITY SCORE, Daniel L. Howell MD, Huang Ih-Ping MD, E.A Goldenberg MD, C.D Smith MD, Endosurgery Unit, Department of Surgery, Emory University

Surgical skills in laparoscopy are difficult to acquire and assess. Knot Quality Scores (KQS) have been used by some to assess the quality of laparoscopically tied knots as a measure of a difficult task of laparoscopic suturing and knot tying. KQS is calculated by the following formula,

\[
KQS = \frac{\text{maximum breaking force} \times \text{maximum force duration}}{\text{integrated force duration}}
\]

We have found that KQS has a large amount of variability for knots that slip. This study compared tensile strength of tied suture to that of untied suture utilizing a measure of elasticity known as Young’s modulus (YM). 100 four throw, slip square knots were tied laparoscopically in a box trainer using USS 2-0 silk suture. Knot quality was assessed using an In-Spec 2200 Benchtop tensiometer and the KQS was calculated using the previously described formula. Mean breaking force was determined for tied and untied suture along with the distraction of the suture in mm. Knots with a plateau of the curve extending beyond 6.5mm were designated as slipped. From the maximum breaking strain and distance of distraction in mm the YM was calculated in Pascals. Mean breaking force was 7.4 +/- 7.3 degrees in the F-needle group and 9.3 +/- 8.1 degrees in the R-needle group (p = 0.08), and the error in yaw angle in the F-needle group (4.7 +/- 5.1) was smaller than in the R-needle group (10.2 +/- 9.9 degrees) (p < 0.01). The product of time and the number of degrees of error in the pitch angle and the yaw angle with the F needle were significantly smaller than with the R needle in 20% and 60% of the surgeons, respectively. The product of time and the sum of the error in the pitch and yaw angles with the F needle was significantly smaller than with the R needle in 30% of the surgeons. The minimum number of multiple of overhand knot made with dry Reduced thread and dry Regular thread were 3 and 5, respectively, versus 2 and 5, respectively, with wet Reduced thread and wet Regular thread. <Conclusions> The results demonstrated that the new flat needle is grasped more conventionally and quickly than the regular needle, and that the thread with reduced surface coating is less likely to loosen. It was, therefore, concluded that the combination of the new flat needle and thread with reduced surface coating is useful for endoscopic suturing.

P239-Ergonomics/Instrumentation
DEVELOPMENT OF A NEW FLAT NEEDLE AND TIGHTER THREAD FOR ENDOSCOPIC SUTURING, Soji Ozawa MD, Yasuhide Morikawa MD, Toshiharu Furukawa MD, Junya Oguma MD, Hisanori Asada MD, Masaki Kitajima MD, Department of Surgery and Department of Obstetrics & Gynecology, School of Medicine, Keio University, Tokyo, Japan

As a means of facilitating intracorporeal suturing, we made 1/3 of the body of a curved needle flat to allow it to be grasped easily, and we reduced the surface coating of the thread as much as possible to prevent the knots from loosening. The new needle and the thread were evaluated in this study.

<Materials and Methods> Ten surgeons (Physician and an assistant grasper to grasp the new flat needle (70% oblateness, F needle; 25 mm, 1/2 circ., AZWELL, Japan) and a regular round needle (R needle) ten times each with a Lap Coach training system (Hakko, Japan). The time between needle insertion and grasping as correctly as possible was measured. The tip of the needle driver and the needle were photographed from two directions, and the error in angle between 90 degrees and the actually measured angle was analyzed. A multiple overhand knot was made on the sponge with 99.75% reduced silicone-coated thread (Reduced thread; 3-0, polyester, braided, AZWELL) and regular silicone-coated thread (Regular thread). The minimum number of multiple of overhand knot required to hold the knot when the surgeon’s hand was removed was counted. <Results> The time in F-needle group (12.6 +/- 4.3 sec) was shorter than in the R-needle group (18.1 +/- 9.2 sec) (p < 0.01). The error in pitch angle was 7.4 +/- 7.3 degrees in the F-needle group and 9.3 +/- 8.1 degrees in the R-needle group (p = 0.08), and the error in yaw angle in the F-needle group (4.7 +/- 5.1) was smaller than in the R-needle group (10.2 +/- 9.9 degrees) (p < 0.01). The product of time and the number of degrees of error in the pitch angle and the yaw angle with the F needle were significantly smaller than with the R needle in 20% and 60% of the surgeons, respectively. The product of time and the sum of the error in the pitch and yaw angles with the F needle was significantly smaller than with the R needle in 30% of the surgeons. The minimum number of multiple of overhand knot made with dry Reduced thread and dry Regular thread were 3 and 5, respectively, versus 2 and 5, respectively, with wet Reduced thread and wet Regular thread. <Conclusions> The results demonstrated that the new flat needle is grasped more conventionally and quickly than the regular needle, and that the thread with reduced surface coating is less likely to loosen. It was, therefore, concluded that the combination of the new flat needle and thread with reduced surface coating is useful for endoscopic suturing.

P240-Ergonomics/Instrumentation
FAILURE MODE AND EFFECTS ANALYSIS ON THE LAPAROSCOPIC CHOLECYSTECTOMY, Kazuhiro Shinohara MD, School of Bionics, Tokyo University of Technology

Failure Mode and Effects Analysis (FMEA) on the procedure of laparoscopic cholecystectomy was performed for the purpose of medical safety. The procedure of laparoscopic cholecystectomy was classified into 12 steps by the method of Industrial Engineering. Incidents and troubles were analysed in each step and their influences were classified into 4 classes in the manner of FMEA (1: catastrophic, 2: critical, 3: marginal, 4: negligible). 49 cases of the incidents and troubles were extracted and all of them were classified in 1 or 2. 76% of the incidents and troubles were caused by the factors of medical electric devices and surgical instruments. 55% were caused by both human and machine factors, 25% were caused by human factors. 43% of the incidents and troubles were peculiar to the laparoscopic surgery. One of the safety problems cleared from this study was that most of the incidents and troubles could be detected only by the surgeon and the lack of the integrated monitoring system for the total operational environments.

P241-Ergonomics/Instrumentation
ASSESSING ENDOSCOPIC CUTTING PERFORMANCE WITH AND WITHOUT THE TARGET BEING HELD WITH THE NON-PREFERRED HAND, Bin Zheng PhD, Stephen Obradovich, Alan
POSTER ABSTRACTS

P243–Esophageal/Gastric Surgery
THE INFLUENCE OF PSYCHOLOGICAL DISORDERS ON THE OUTCOMES OF LAPAROSCOPIC NISSEN FUNDOPICATION: PRELIMINARY RESULTS; Laurent Biertho MD, Sanjeev Dutta MD, Herawaty Sebajang MD, Martin Antony PhD, Mehran Anvari PhD, St. Joseph’s Healthcare, McMaster University, Hamilton, Ontario, Canada
Background: Psychological disorders have been associated with functional dysfunction of the digestive system. The aim of this study was to evaluate the influence of psychological factors on the outcomes of Laparoscopic Nissen Fundoplication (LNF) for documented GastroEsophageal Reflux Disease (GERD).
Methods: This is a prospective, single Institution, controlled trial. 17 patients (13 females and 4 males) with documented GERD underwent psychological testing before LNF, 3 months and 6 months after surgery (LNF Group). The results were compared with 10 patients (9 females and 1 male) who underwent a Laparoscopic Cholecystectomy (Control Group).
Psychological assessment was performed using the Symptom CheckList-90 (SCL-90), the Depression Anxiety Stress Scale, Anxiety screening test, Illness attitude testing and Beck Depression Inventory II. GERD symptoms were evaluated using a specific scoring system based on 5 major GERD symptoms (score 0 to 60).
Results: 7 patients in the LNF Group had ongoing reflux symptoms with GERD Symptom Score >12 at 6 months after surgery. In comparison to the remaining LNF patients with excellent outcome (minimal or no GERD symptoms) and the Laparoscopic Cholecystectomy patients, this group had significantly higher preoperative SCL-90 scores (p<0.05). The remaining psychological tests did not demonstrate any difference between groups.
Conclusion: SCL-90 may be a useful tool to evaluate the impact of psychological factors on patient satisfaction and symptom control after Laparoscopic Nissen Fundoplication.

P244–Esophageal/Gastric Surgery
NISSEN FUNDOPICATION WITH GASTROSTOMY TUBE IN LUNG TRANSPLANT PATIENTS WITH POOR ESOPHAGEAL MOTILITY; Ricardo M Bonnor MD, Aurora D Pryor MD, Duke University Medical Center, Department of Surgery, Durham, NC
Objective: Gastroesophageal disease (GERD) is prevalent in lung transplant patients, which may contribute to pulmonary injury and bronchiolitis obliterans. As a result, lung transplant patients with GERD are recommended a 360-degree fundoplication to protect lung function. There is also a high prevalence of esophageal dysmotility and delayed gastric emptying. We propose that gastrostomy tube with a complete fundoplication may be well tolerated in lung transplant patients with poor esophageal motility.
Methods: A retrospective chart review of 83 lung transplant patients with severe GERD was conducted from 1997 to 2004. Patients with poor esophageal motility were offered a Nissen fundoplication with a gastrostomy. Post-operatively patients were fed enterally via G-tubes and advanced to oral nutrition as tolerated. Results: Of the 83 patients post lung transplant, which required a Nissen fundoplication, 11 were offered a laparoscopic gastrostomy tube due to their poor esophageal motility (13%). All patients eventually tolerated oral nutrition. Patients were able to resume full and average calorie intake without g-tube removal an average of 91 days following fundoplication. Conclusion: Patients frequently have poor esophageal motility and GERD after lung transplant. Nissen fundoplication with placement of a gastrostomy tube is a feasible way to manage lung transplant patients with this gastrointestinal dysmotility. Patients were able to progress to oral nutrition after 360-degree fundoplication despite poor pre-operative esophageal motility.

J Lomax MD, Christine L MacKenzie PhD, Simon Fraser University, BC, Canada
In performing a complex endoscopic task, surgeons tend to work with the two hands, stabilizing the target with an instrument in the nonpreferred hand and manipulating the target using the preferred hand. The benefits of bimanual collaboration in the endoscopic cutting task were quantified using video analysis technology.
Twelve participants were required to perform three pseudo-endoscopic tasks in a counterbalanced order, reaching and cutting a 1 cm thread using endoscopic scissors in the preferred hand, with and without having the thread held by a grasper in the nonpreferred hand, and simply reaching and grasping the thread with an endoscopic grasper in the preferred hand. The image of the work plane was displayed vertically or superimposed over the workspace. In half the conditions, the camera was rotated 45 degrees, causing misalignment between the actual and displayed work plane. Movements were videotaped and decomposed into subtasks. Durations of subtasks performed by the preferred hand were analyzed using 3 (task) X 2 (display) X 2 (camera rotation) within subject MANOVA.
Cutting with the thread being held by the nonpreferred hand had shorter total time (6.8 s) than when the thread was not stabilized by the nonpreferred hand (7.6 s). However, due to the individual differences, the difference was not significant. Rather, reaching and grasping the thread with the preferred hand was performed in 5.4 s, significantly shorter than the two cutting tasks above. Rotation of the camera degraded task performance the most. The superimposed image display shortened the total execution time (5.8) compared to the vertical image display (7.3 s). This addressed the benefits of superimposing the display on the workspace to facilitate endoscopic task performance.

P242–Esophageal/Gastric Surgery
LAPAROSCOPIC RESECTION OF GASTRIC GISTS: NOT ALL TUMORS ARE CREATED EQUAL, Eric Bedard MD, Christopher M Schlachta MD, Joseph Mamazza MD, The Centre for Minimally Invasive Surgery, St. Michael’s Hospital, University of Toronto, Toronto, Ontario, Canada
INTRODUCTION: Laparoscopic resection has become an accepted approach to gastric GIST tumors with acceptable early results published in the literature. Long term recurrence rates, however, are still unclear and the management of tumors in challenging locations requires exploration.
METHODS: A retrospective analysis of all patients undergoing a laparoscopic resection of gastric GIST in our institution between November 1997 and July 2004 was performed.
RESULTS: A total of 12 patients (13 tumors) were evaluated: 5 tumors were located high on the lesser curve, 7 on the fundus/greater curve and 1 in the distal antrum. The mean patient age was 62 +/- 14 years. Symptoms at initial presentation, in order of frequency, were dyspepsia, upper GI hemorrhage and early satiety. All patients had an attempted laparoscopic approach with the following procedures performed: stapled wedge excision (8), excision and manual sewing technique (4) and distal gastrectomy (1). Overall, there was a 15% (2) conversion rate. As reported by others, lesions found in the fundus/greater curvature area were easily resected via simple stapled wedge excision. High lesser curve tumors, on the other hand, were more difficult to manage and required a combination of modalities for complete excision and preservation of the GE junction. These included: intra-operative resection margin localization via gastroscopy (4/5, 80%), excision and manual sewing technique (4/5, 80%) and reconstruction over an esophageal bougie (5/5, 100%). One patient with a high lesser curve GIST required conversion due to size and proximity to the GE junction, as did one patient with a lesion adjacent to the pylorus. Overall, the mean tumor diameter was 3.9 +/- 2.7 cm with 75% spindle and 17% epithelioid types. There were no post-operative complications and length of stay was 4.8 +/- 2.1 days. At median follow-up of 48 months (mean 37.1 +/- 25 months) one patient had suffered a recurrence (18 months post-op) with eventual disease-related death.
CONCLUSION: The laparoscopic approach to gastric GIST tumors is safe and associated with acceptable short and intermediate term results. High lesser curve GISTs can be safely approached laparoscopically by utilizing various techniques to ensure an adequate resection margin without compromising the GE junction.
P245–Esophageal/Gastric Surgery

LAPAROSCOPIC TREATMENT OF POST-DILATATION ESOPHAGIC ENDOSCOPIC PERFORATION IN A PATIENT WITH IDIOPATHIC ACHALASIA BY THAL ESOPHAGOGASTROPLASTY WITH DOR ANTIREFLUX VALVE, Gustavo L Carvalho PhD, Gildo O Passos with Frederico W Silva MD, Carlos H Ramos MD, Gilvan Loureiro MD, Carlos T Brandt PhD, Clínica Cirúrgica Videolaparoscópica Gustavo Carvalho, UPE - Universidade de Pernambuco, UFPE - Universidade Federal de Pernambuco, Recife 7 BRAZIL

BACKGROUND: The most serious complication of forced dilation of the esophagus is rupture of the thoracic esophagus with mediastinitis. This leads to a surgical emergency and usually requires a thoracotomy or laparotomy approach, or both, for it to be repaired and possibly to the need for a cerviotomy to re-route the esophageal passage. There has been a recent report of the repair of these lesions by laparoscopy through suture of the lesion. However, the repair of this severe injury using Thal’s esophagogastroplasty with Dor?ts anterior fundoplication (Thal-Dor) fully performed by laparoscopy has not previously been reported.

OBJECTIVE: To report the case of a female patient with idiopathic achalasia who suffered post-dilation endoscopic rupture of the esophagus and received treatment exclusively by laparoscopic means using Thal-Dor Procedure.

PATIENT: A 52 year-old female patient suffering from idiopathic achalasia, with strong symptoms, suffered an approximately 6cm rupture in the distal esophagus while undergoing endoscopic balloon dilation. The lesion was identified immediately and the patient referred for emergency surgical treatment by laparoscopy.

METHOD: After performing the pneumoperitoneum, a phrenotomy was undertaken on the anterior part of the diaphragmatic hiatus which allowed a better view of the mediastinum and complete identification of the esophageal injury. By using ultrasonic scissors 4 cm of the stomach adjacent to the lesion were sectioned longitudinally from the cardia.

Esophagogastroplasty was carried out using transverse suture to repair the injury. After testing with instillation of methylene blue, an antireflux Dor valve was made to cover up the gastro-esophageal suture.

RESULTS: An esophagram taken on the 1st POD showed no leakages and the esophageal passage without abnormalities, with the patient being fed in sequence. Three weeks after surgery, endoscopy showed the esophagogastric region without signs of esophagitis or stenosis; and from a rear view, the antireflux valve was well adjusted to the endoscope. The patient was satisfied with the procedure and to date has not mentioned any eating restrictions.

CONCLUSION: It is being increasingly demonstrated that the resources of minimally invasive surgery are safe and effective in conducting complex procedures, even in emergency situations, as long as patient clinical adequacy, level of technical skill of the surgical team and availability of instruments are respected.

P246–Esophageal/Gastric Surgery

LAPAROSCOPIC RE-FUNDOPICATION IN THE TREATMENT OF GERD - AN ANALYSIS OF 18 CASES, Gustavo L Carvalho PhD, Marco Antônio C Melo MD, Frederico P Santos, Gildo O Passos Jr, Gilvan Loureiro MD, Frederico W Silva MD, Roberto Pabst MD, Clínica Cirúrgica Videolaparoscópica Gustavo Carvalho, UPPE-Universidade Federal de Pernambuco, UPE - Universidade de Pernambuco, Recife - BRAZIL

BACKGROUND: Antireflux surgeries have a low rate of reoperations, varying from 2 to 10%. Nevertheless, when this is necessary, it is common to opt for open surgery under the belief that this will be safer. However, various centers have observed the efficiency of re-operations by laparoscopic means in antireflux surgeries, so demonstrating that the rate of complications is small, apart from the good long-term results.

OBJECTIVE: To assess the effectiveness and safety of laparoscopic re-fundoplication in a series of 18 patients.

PATIENTS: In the period from 1992 to 2004, a study was made of 18 patients (11 men and 7 women; whose average age was 46 years old) who underwent antireflux surgery by the Nissen procedure and who needed a second fundoplication. In all of those cases, laparoscopy was performed. From the 11 cases were shown to have esophagitis of varying degrees, 9 presented accessory gastric chamber due to migration of the valve, 8 presented other problems in the valve whether associated with migration or not (3 incomplete, 2 twisted, 2 tightened and 1 partially undone) and in 2 patients it was associated with Barrett’s esophagus. The main indications for the second operation were migration (9), undoing (4), tightening (3) and torsion (2) of the valve.

METHOD: In one patient, the surgery consisted of removing a stitch which was tightening the lower esophagus. In the other cases, fundoplication was again carried out and was associated with a new hiatoplastia in 13 of these. The patients were later assessed by endoscopy and biopsy.

RESULTS: There was no conversion to open surgery. The average hospital stay was 3.37 ±5,36 days. One female patient presented sudden thoracic pain on the 12th POD and needed another laparoscopic operation in which a perforation of the valve was diagnosed and treated. One male patient had post-operative discomfort for some time. There were no other complications from the operations and 15 patients have shown themselves to be asymptomatic since then. An endoscopy for control was carried out on the 30th and 60th post-operative days from which it was shown that 15 patients remained free of esophagitis and GERD.

CONCLUSION: Laparoscopic re-fundoplication are not only technically feasible but also clinically effective with low rates of complications and conversions.

P247–Esophageal/Gastric Surgery

LAPAROSCOPIC RESECTION OF A TUBULOVILLOUS ADENOMA ARISING IN THE DUODENAL BULB, Kuo-Hsin Chen MD, Shih-Horng Huang PhD, Department of Surgery, Far-Eastern Memorial Hospital, Taipei, Taiwan

LAPAROSCOPIC RESECTION OF A TUBULOVILLOUS ADENOMA ARISING IN THE DUODENAL BULB Kuo-Hsin Chen MD, Shih-Horng Huang PhD, Department of Surgery, Far-Eastern Memorial Hospital, Taipei, Taiwan

Tubulovillous adenoma arising in the duodenum is rare. Most of the lesions are found during endoscopic examination and removed by endoscopic cauteterization. We report a 74 y/o male patient with a tubulovillous adenoma of the duodenum bulb, which caused duodenal obstruction and intermittent bleeding. The patient had a history of previous polypectomy for The main indication for laparoscopic resection of the duodenal bulb polypectomy 6 years before this admission. Endoscopic polypectomy was attempted but failed to remove it completely due to the large size.

Laparoscopic duodenotomy is performed under CO2 pneumoperitoneum. The pedunculated lesion is exposed and lifted with an Endoloop. An EndoGIA is applied and the lesion is removed completely. The duodenotomy is closed by interrupted intracorporeal sutures. The postoperative course is uneventful. The patient remained asymptomatic free 22 months after the surgery. The laparoscopic resection of the duodenal bulb tubulovillous adenoma is feasible. To hold the lesion with an Endoloop helps to avoid tissue damage during surgery. Any bleeding from the base of the lesion could be checked and controlled through laparoscopic approach. The patient recovered faster when compared with traditional open resection.

P248–Esophageal/Gastric Surgery

LAPAROSCOPIC NISSEN FUNDOPICATION AFTER FAILED STRETTA PROCEDURE, S S Davis MD, M I Goldblatt MD, D J Mikami MD, W S Melvin MD, The Ohio State University Medical Center, Center for Minimally Invasive Surgery

OBJECTIVE: Radiofrequency energy delivery to the GE junction (the Stretta procedure) has been shown to be a safe and effective short-term treatment for GERD. Studies show improvements in GERD symptom scores, patient satisfaction and distal esophageal acid exposure. Laparoscopic Nissen Fundoplication may still be required for symptom control in patients who do not respond to Stretta. No literature exists describing the feasibility or efficacy of LF after failed Stretta.
METHODS: A database of 52 patients undergoing Stretta was retrospectively reviewed and four patients were identified who went on to required fundoplication. All had 24-hour pH studies, manometry and endoscopy to document the presence of reflux before the Stretta procedure. The decision to proceed with fundoplication was based on recurrence of reflux symptoms. Data for operative time, length of stay, and postoperative complications were collected from chart review, and compared to a cohort of patients undergoing routine fundoplication. Pre- and post-operative symptom surveys were completed by the patients to evaluate outcome.

RESULTS: Operative times were similar in both groups (98 vs. 97 minutes). The surgeon did not note a difficult dissection in any of the cases. There were no perioperative complications. Three of four patients were discharged home on postoperative day one. Most patients completed symptom surveys at the last postoperative visit and all reported excellent results.

CONCLUSIONS: Laparoscopic Nissen fundoplication after previous Stretta procedure is safe, and the outcomes are similar to those having fundoplication as an initial procedure. The use of Stretta as a first line procedure in patients with uncomplicated GERD does not preclude later performance of laparoscopic fundoplication in those with continued reflux symptoms.

P249—Esophageal/Gastric Surgery

EVALUATION OF THE ePTFE SOFT BELT NONINFLATABLE LAPAROSCOPY GASTRIC BANDING (SBNLB), MULTICENTERS 10 YEARS COMPARATIVE EVOLUTION STUDY, Moshe Dudai MD, Martin Fried MD, Gregorio Jermian MD, David Edelman MD, Jerusalem, Prague, Buenos-Aires, Miami

Aim: To examine the influence of the along time (10 years) changing in the surgical technique and the characters of the ePTFE Noninflatable bands, on the results of the SBNLB.

Methods: Four centers taking part in a prospective and retrospective study: Prague(P), Jerusalem(J), Buenos-Arias(B) and Miami(M). Six parameters were changed along the time; 3 for the surgical technique: size of the pouch, place of the retrogastric canulation and number of over-band placations; and 3 for the bands: type of the ePTFE, shape of the band and method of its fixation. The length of experience of each center was divided into tree main periods reflecting the changes in surgical technique and bands: Early experimental (EE P93-6, J97, B98-9, M00-1), Late experimental (LE P97-98, J98, B00-2, M01-2) and Stabilized Plato (SP P99-04, J99-04, B03-4) periods. At EE the pouch size was 25-50cc and reduced gradually to 10cc at SP. Lesser-sac canulation changed to very high perigastric or Pars-Placida at SP. Multiples over-band placations changed to minimal over-band placations at SP. The band material changed from vascular PTFE or simple ePTFE Noninflatable bands, on the results of the SBNLB.

Results: Were compares between the centers, for each period: Numbers of patients/Early PO complications/Bands Migration/De-Rebanding. For EE period: P-300/4/3/8 J-90/4/2/6 B27/4/1/4 M-30/2/1/2, for LE period: P-200/2/2/5 J-150/2/1/5 B-100/2/1/3 M-30/1/1/1, for SP period: P-400/0/0/3 J-360/0/0/3 B-43/0/0/0. There is similarity of the results between the centers, divided into tree main periods reflecting the changes in surgical technique and bands.

Conclusion: The results along the evolution of the surgical technique and bands. Sever PO complications were prevented at the SP period as well as band migration, will late Debanding were reduced from 7% at EE and 3% at LE to 0.75% at SP period (800 patients over 5 years of follow-up).

Conclusion: Experience of 4 centers over 10 years with evolution of the surgical technique and bands, lead the SBNLBG to achieved very low late band complications. Thus results create a doubt on the need for the inflatable mechanism, that its benefit never was evidence base proved.

P250—Esophageal/Gastric Surgery

LAPAROSCOPIC RESECTION OF GASTROINTESTINAL STROMAL TUMORS, Melanie A Edwards MD, Jonathan Critchlow MD, Benjamin Schneider MD, Beth Israel Deaconess Medical Center

Objective/Introduction: Laparoscopic wedge resection is suitable for gastrointestinal stromal tumors located in the stomach. We present our experience with gastrointestinal stromal tumors (GIST).

Methods and Procedures: We reviewed the charts of 30 patients operated on for GISTs between 1994 and 2004. All laparoscopic procedures were gastric resections, while open procedures included gastric, small bowel, and large bowel resections, as well as a partial hepatectomy for metastatic disease. Presenting symptoms, completeness of resection, tumor size and location, operating times and length of hospital stay are presented.

Results: There were 17 open, 11 laparoscopic and 2 hand-assisted resections performed for 35 tumors. In the laparoscopic and hand-assisted group, mean patient age was 63. Abdominal pain, gastrointestinal bleeding and anemia were the most common presenting symptoms. Other tumors were asymptomatic and discovered on evaluation for other conditions. 38% of lap resections were performed for anterior gastric tumors with size ranging from 0.7-5.5cm. Mean operating time was 186 minutes in the lap group and 191 mins for the open procedures. There was one liver laceration in the lap group, and no intraop complications for open procedures.

There were 3 conversions to an open procedure in the laparoscopic group, 2 because of inability to achieve clear margins due to tumor location, and 1 because of an adherent stomach. Hospital stay was shorter in the lap group, mean 4.4 vs. 7.1 days and there were fewer postop complications. There were no recurrences during the follow up period in the lap group and 5 in the open group.

Conclusions: Gastric GISTs that are small are well suited for laparoscopic resection. The low malignant potential associated with smaller tumors makes this a feasible alternative to open resection.
pathophysiology of this phenomenon remains unclear and it will require further research to establish it. Preoperative manometric evaluation for fundoplication is a controversial issue but it is also the gold standard to recognize esophageal motor disorders. It also helps identify esophageal motor disorders whether they were, or not present preoperatively for legal purpose.

**P252—Esophageal/Gastric Surgery**

**THE ROLE OF SELECTIVE VAGOTOMY DURING NISSEN FUNDOPLICATION**, S Disanaike MD, K O Shebani MD, E E Frezza MD, Texas Tech University Health Sciences Center

After Laparoscopic Nissen fundoplication, some patients continued to experience symptoms related to high acid output. To alleviate this problem, we decided to perform selective vagotomy on those patients who complained of epigastric pain, a pain consistent with peptic ulcer disease, or who have had a history of peptic ulcer disease.

**METHODS** We prospectively studied all patients who came to see us with gastroesophageal reflux disease GERD, a history of peptic ulcer disease or associated gastritis. The patients were assigned to two treatment groups: 1) Nissen fundoplication (NF) only and 2) NF with highly selective vagotomy (HSV). Patients were selected for HSV based on: 1) high acid output, 2) pre-prandial pain, 3) history of peptic ulcer, 4) high dose protein pump inhibitor therapy and 5) failure of anti-acid therapy after 6 months. Prior to the operation, an upper endoscopy was performed to rule out acute peptic ulcer or gastritis. A 24 hour pH study and manometry were also performed.

**RESULTS** Three patients in each group were considered in our initial series. The mean age was 41 +/- 8 in the first group and 44 +/- 9 in the second. Patients were on anti-acid therapy for an average of 12 +/- 4 months in the first group and 10 +/- 3 months in the second group. There were no active peptic ulcers or active gastritis in either group. Esophagitis was present in both groups. Manometry was normal. The DeMeester score was slightly higher in the second group. Operative time was 90 +/- 20 minutes for group 1 and 110 +/- 15 minutes for group 2. None of the patients complained of reflux. In group 1, 2 out of 3 patients were re-started on anti-acid therapy, with some relief of symptoms. In group 2, no patients complained of stomach pain or required anti-acid therapy.

**CONCLUSION** Adding HSV to the Nissen fundoplication decreased the symptomatology of high acid production. More studies are needed before a final conclusion can be drawn. From our preliminary data, we feel that performing HSV can be advantageous to the patient, adding only 15 to 20 minutes to the procedure.

**P253—Esophageal/Gastric Surgery**

**LAPAROSCOPIC GASTRIC BYPASS ? AN EFFECTIVE TREATMENT FOR COMPLICATED GERD. A CASE REPORT**, Piotr Gorecki MD, Kevin Cho MD, Katherine Martone MD, Leslie Wise MD, Department of Surgery, New York Methodist Hospital, Brooklyn, NY

Introduction: Surgical treatment of severe complicated gastroesophageal reflux disease (GERD) associated with a large hiatal hernia remains a challenging problem. High incidence of symptoms recurrence has been reported after laparoscopic repair.

Case report: A 29 year-old morbidly obese female suffering from severe heartburn, regurgitation and dysphagia presented for evaluation for weight reduction surgery. Her weight was 234 lbs and BMI was 40 kg/m2. Her quality of life was significantly impaired because of her symptoms. Her preoperative evaluation revealed esophagitis with a 6 cm hiatal hernia and stricture of the distal esophagus. 24-h pH testing revealed a significant acid exposure of the distal esophagus with DeMeester score of 177. Esophageal manometry revealed hypotensive low esophageal sphincter (LES) with LES pressure of 1 mm Hg. The patient underwent endoscopic balloon dilatation of the esophageal stricture followed by a course of aggressive treatment with proton pump inhibitors for three months. Her dysphagia improved. She underwent a laparoscopic reduction of a large hiatal hernia with high mediastinal dissection to establish intraabdominal segment of the short esophagus and a Roux-en Y gastric bypass. Her recovery was uneventful and she was discharged home the following day. A postoperative follow up visit she reported complete resolution of her reflux and dysphagia symptoms and no need for acid suppression medications. She enjoyed weight loss of 47 lbs and her quality of life improved from not acceptable to excellent. Radiograms and endoscopy photographs will be presented.

**Conclusions:** Aggressive treatment of esophagitis and preoperative balloon dilatation of peptic stricture followed by laparoscopic repair of hiatal hernia and Roux Y gastric bypass is feasible and may be considered as the most definitive surgical treatment of severe GERD complicated by esophageal stricture.
Mohammad K Jamal

POSTER ABSTRACTS

SIA, MYOTOMY WITH TOUPET FUNDOPLICATION FOR ACHALASIA
FUNCTIONAL EVALUATION OF LAPAROSCOPIC HELLER MYOTOMY WITH TOUPET FUNDOPLICATION FOR ACHALASIA AND MORBID OBESITY

P256–Esophageal/Gastric Surgery
THE USE OF ACELLULAR DERMAL MATRIX FOR MESH

The male:female ratio was 1.14:1 and mean age of 46 years. The mean duration of symptoms was 48 months and during this time 80% of patients failed non-operative treatments including botox (n=1), dilatation (n=12) or combined treatment (n=11). Three patients had sigmoid esophageal on contrast study. Only 6 patients did not receive any pre-operative treat-ments at the time of surgery. We excluded and used an overall form of pre-operative testing was carried out in all patients and included manometry (n=17), upper gastro-intestinal series (n=28) and upper endoscopy (n=29). Post-operative contrast studies were performed in all patients.

MHMDF was completed laparoscopically in 29/30 patients. There was one esophageal perforation necessitating an open conversion and no mortality in the group. All patients regardless of pre-operative therapy showed improvement in their post-operative dysphagia scores. The total SS decreased significantly from pre- to post-operatively in patients without previous treatment (3.3 ± 3.8 vs. 1.3 ± 1.2, p < 0.0001) and in patients with previous treatment (5.8 ± 2.2 vs. 2.7 ± 3.0, p < 0.0002). Despite the chronicity of symptoms and the failure of previous endoscopic treatments, one-third of patients were free of all symptoms at follow-up (5 months). For those with persistent symptoms, the mean dysphagia and regurgitation SS showed significant decline post-operatively (2.60 ± 0.50 vs. 0.37 ± 0.72, p < 0.0001 and 1.4 ± 1.19 vs. 0.4 ± 0.81, p < 0.002 respectively). MHMDF may cause postoperative reflux symptoms, heartburn and vomiting mean SS were not increased after MHMDF (1.13 vs. 0.80, p = NS and 0.67 vs. 0.27, p = NS respectively). MHMDF appears to be worthwhile in alleviating symptoms of achalasia in patients with pre-operative endoscopic treatment failure. The procedure has an acceptable safety profile and does not worsen symptoms of reflux disease.

P257–Esophageal/Gastric Surgery
FUNCTIONAL EVALUATION OF LAPAROSCOPIC HELLER MYOTOMY WITH TOUPET FUNDOPLICATION FOR ACHALASIA
THE ESOPHAGEAL ANASTOMOSIS–A PERSISTENT PROBLEM

Achalasia in the morbidly obese is an uncommon, but well described entity. We describe a morbidly obese patient with achalasia who underwent simultaneous laparoscopic Roux-en-Y gastric bypass (LRYGB) and Heller myotomy. A 35 year old, morbidly obese (BMI-47), African American female presented with progressive regurgitation, dysphagia, and a 50 lb weight loss. Her primary co-morbidity was hypertension. Manometry, EGD, and esophogram were consistent with achalasia. The patient underwent a combined LRYGB and Heller myotomy. The sequence of the procedure was: 1) establishment of pneumoperitoneum; 2) standard 5 trocar access; 2) side-side jejuno-jejunoanastomosis with a 60cm bili-pancreatic limb and 125cm Roux limb; 3) placement of a 6th left subcostal, midclavicular trocar; 4) extensive intrathoracic mobilization of the esophagus; 5) creation of a 30cc proximal gastric pouch, including division of the vagus nerve; 6) linear stapler (Gastro-Jejunostomy (antecolic) with 2.5cm anastomosis; 7) Heller myotomy of the distal 6cm of esophagus extending 2cm onto the gastric pouch; 8) posterior cruro-plasty. Operative time was 170 minutes. The patient had an uneventful recovery and was discharged home on postoperative day #3. At 3 month follow-up, the patient had lost 43 lbs (25% excess body weight) and had complete resolution of her dysphagia and regurgitation. Her hypertension resolved and she had discontinued her preoperative HCTZ and predvacid. Achalasia in the setting of morbid obesity presents a therapeutic dilemma. Obese patients with achalasia typically experience weight loss, however, they are at high risk for regaining weight.
their weight after effective treatment with Heller myotomy. Heller myotomy with simultaneous duodenal switch has been described as one treatment option. However, reflux and pathological malabsorption are potential complications that may limit the effectiveness of this procedure. Although it has never been reported, LRYGB with combined Heller myotomy is another feasible therapeutic option. However, the effect of a restrictive procedure (LRYGB) in the setting of esophageal dysmotility is unclear. Our short term results indicate that LRYGB can yield typical weight loss results of gastric bypass surgery with resolution of dysphagia. Creating a larger gastro-jejunos- tomy (2.5cm) may reduce the risk of postoperative dysphagia. Finally, because the gastric pouch has minimal acid produc- tion, the risk of pathological acid reflux is reduced.

**P259—Esophageal/Gastric Surgery**

**OUTCOMES OF LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR: 49 CONSECUTIVE CASES IN A RURAL CENTER.** Vittorio Lombardo MD, Carly Stell BS, Yaron Perry MD, Salman Malik MD, Craig Wood BS, Anthony T. Petrick MD, Geisinger Medical Center.

**INTRO:** Patient referrals for laparoscopic paraesophageal hernia repair (LPHR) have recently increased in our center. Recent series have advocated the laparoscopic approach. No large studies of LPHR have been reported in a rural population. Our objective is to analyze the outcomes of our initial experience with LPHR.

**METHODS:** Retrospective data was obtained through a GERD/dysphagia questionnaire, review of UGI and electronic medical records. Statistical significance was calculated using student's t-test.

**RESULTS:** The mean age of 49 consecutive patients was 67.1±14.8 with a 1:2.5 M:F ratio. Preop UGI and EGD demonstrated a PEH in 95% and 92% of patients respectively. Collis gastroplasty and Nissen were performed in 88% and only Nissen in 14%. Crural repair was performed in all patients. Median LOS was 3.5 days (range 2-9 days). 98% completed at least one postop questionnaire at a mean of 12.7 months and 80% had an UGI at least 3 mo postop (mean=12.2mo). UGI was normal 90% and 10% had recurrence of paraesophageal hernia. Major complications occurred in 12%. Mortality was 2.0%(n=1). Results were reported as excellent in 41%, good in 43%, fair in 10% and poor in 6%.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Preop</th>
<th>Postop</th>
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<tbody>
<tr>
<td>Heartburn</td>
<td>80%(n=39)</td>
<td>6.1%(n=21)*</td>
</tr>
<tr>
<td>Regurg/Emesis</td>
<td>73%(n=35)</td>
<td>6.1%(n=21)*</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>41%(n=20)</td>
<td>12%(n=4)*</td>
</tr>
<tr>
<td>Epigastric pain</td>
<td>33%(n=16)</td>
<td>2.0%(n=1)*</td>
</tr>
<tr>
<td>PPI dependency</td>
<td>76%(n=38)</td>
<td>18%(n=9)*</td>
</tr>
</tbody>
</table>

**CONCLUSION:** LPHR resulted in low morbidity and mortality in our rural population as has been reported by several urban centers. Laparoscopic repair offers low recurrence rates with excellent outcomes and compares favorably to open repair when done in “high-volume centers”.

**P260—Esophageal/Gastric Surgery**

**ANTI-REFLUX SURGERY: A SMALL AREA VARIATION ANALYSIS.** Steven R Lopushinsky MD, David R Urbach MD, University of Toronto.

No recent epidemiologic study of GERD or its therapy has been performed. The purpose of this study was to identify trends in anti-reflux surgical therapy and to compare rates of its use across the population.

All primary anti-reflux procedures performed in Ontario between 1991 and 2001 (N = 10,899) were identified from the Canadian Institute for Health Information and Ontario Health Insurance Plan databases. Using census data, we calculated regional anti-reflux surgery rates adjusted for age and sex.

Small area variation analysis was performed to assess disparities within the province.

The provincial crude rate of anti-reflux procedures was 11.6 per 100,000. Annual rates were relatively stable over the study period. Patients aged 45 to 64 had the highest rates of surgery. Women underwent surgery more frequently then men (13.6 vs. 9.4 / 100,000). Surgical rates by county ranged from 5.0 to 28.7 per 100,000 persons (See Figure). The extremal quotient and systematic component of variation were 5.7 and 175.8 respectively.

Significant regional variation exists for anti-reflux surgery across Ontario, suggesting that anti-reflux surgery is a highly discretionary procedure. Both patient and non-patient factors may influence rates of surgical intervention.

**P261—Esophageal/Gastric Surgery**

**PERCUTANEOUS ENDOSCOPIC GASTROGASTROSTOMY CORRECTS GASTRIC OUTLET OBSTRUCTION FOLLOWING VERTICAL-BANDED GASTROPLasty.** Roy Cobean MD, Peter Mazzaglia MD, Maine Medical Center.

**OBJECTIVE:** To develop and demonstrate feasibility of a percutaneous endoscopic technique to eliminate obstructive symp- toms following vertical-banded gastropasty.

**METHODS/PROCEDURES:** 20 patients were referred for revis- sional gastric surgery for obstructive symptoms or failure fol- lowing vertical-banded gastropasty performed as treatment for morbid obesity. Most patients had some combination of preoperative dysphagia, GERD, vomiting, and food impactions. The two interventions included: (1) Percutaneous transgastric endoscopically-guided stapled gastrogastrostomy (PEGG) for those patients unwilling or inappropriate to undergo Roux-en-Y gastric bypass (RYGBP), (2) Laparoscopic conversion to RNYGBP.

**RESULTS:** 12 patients underwent PEGG. Average operation was 50.6 minutes (range 25-140). Median length of stay was 0.75 nights (range 0-7), with 6 managed as outpatients. Eleven of 12 (92%) had complete or near complete symptom relief. One patient developed a port site hernia. Average weight increased by 8.4% of pre-op weight. One patient subsequently underwent laparoscopic conversion to RYGBP for weight control.

8 patients underwent laparoscopic conversion to RYGBP. Average operation was 301 minutes (range 225-390). Median length of stay was 3 nights (range 2-7). All had complete or near complete symptom relief. One patient developed atelectasis, another a port site infection. Average weight decreased by 23.5% of pre-op weight.

**CONCLUSIONS:** Obstructive sequelae of vertical-banded gas- troplasty can be safely and effectively corrected with a percu- taneous endoscopic gastrogastrostomy, often on an outpatient basis. Symptom relief is comparable to, and operative time and hospital stay shorter than, conversion to RYGBP; however, gastroplasty reversal alone enables weight gain by reducing the weight control properties of the gastropasty.

**P262—Esophageal/Gastric Surgery**

**PERCUTANEOUS ENDOSCOPIC GASTROGASTROSTOMY WITH T-BAR FIXATION IN CHILDREN AND INFANTS.** Patrick McGraw MD, Angela R Beck MD, William C Boswell MD, Christopher Rittmeyer MD, S. Alan Lord MD, Departments and Surgical Education, Memorial Health University Medical Center, Savannah, Georgia.

Since 1979, the standard for placing pediatric gastrostomy tubes has been percutaneous endoscopic gastrostomy (PEG) using the Ponsky ?pull? technique. This study evaluated the safety and efficacy of PEG placement using the ?push? tech- nique with T-bar fixation in pediatric patients at a children?s hospital in southeast Georgia from August 1997 through January 2003. This technique is usually limited to the adult population.

After performing endoscopy, we insufflated the stomach, tran-
silluminated the anterior abdominal wall, and secured the stomach to the anterior abdominal wall with T-bar fasteners. Using a modified Seldinger technique, we placed a gastrostomy tube through the center of the T-bars. Forty-seven children [mean age, 6.4 years], including 15 infants aged less than 1 year, underwent the procedure. Indications for long-term enteral access included failure to thrive (n=11), feeding disorder secondary to neurologic dysfunction (n=5), gastroparesis (n=1), and dysphagia (n=4). Forty procedures were performed in the operating room, three in the neonatal intensive care unit and four in the pediatric intensive care unit. Operative time averaged 23 minutes (range 12 to 45). One late complication occurred (gastrocolonic fistula). The one minor complication was early dislodgement of the gastrostomy tube in one infant. In this study, the technique was found to be safe and effective for placing gastrostomy tubes in infants and children.

P263–Esophageal/Gastric Surgery
DIVISION OF THE SHORT GASTRIC VESSELS DURING LAPAROSCOPIC NISSEN FUNDOPLICATION, S Mehta MD, A Hindmarsh MD, R Lowndes, M Rhodes MD, Department of Upper Gastrointestinal Surgery, Norfolk and Norwich University Hospital, Norwich, UK
Introduction
Division of the Short Gastric Vessels (SGV) during Laparoscopic Nissen Fundoplication may be an important step in reducing the prevalence of post-operative dysphagia. Clinical outcome measures have been used in the past to assess the relative importance of this technique. This study prospectively evaluates both clinical outcome and physiologic measures in patients with or without division of the SGV.
Methods
204 patients underwent Laparoscopic Nissen Fundoplication after 24 hr pH testing and manometry. Post-operatively they were invited to have repeat physiology measurements at 4 months and symptom assessment at 6 months.
Results
110 patients had division of the SGV (Group 1), whilst 94 did not (Group 2). Age and severity of reflux disease were similar in the 2 groups. Mean DeMeester score improved from 38 to 8 in Group 1 and from 45 to 7 in Group 2 (no significant difference between groups). Mean lower oesophageal sphincter pressure improved from 6.1 to 17.7 mmHg in Group 1 and from 5.4 to 17.3 mmHg in Group 2 (no significant difference between groups). Mean operating time was significantly longer in those having division of the SGV (65 vs. 54 mins, p<0.02), and there was a higher prevalence of operative morbidity (16.0% vs. 9.5%). There was no difference in clinical symptoms at 6 months.
Conclusion
Division of the SGV has no influence on changes in oesophageal physiology at 4 months, or on clinical symptoms at 6 months.

P264–Esophageal/Gastric Surgery
LAPAROSCOPIC MESH-AUGMENTED HIAToplasty AND ANTERIOR GASTROPEXY: A REMake OF AN OLD PRINCIPLE, Beat P Müller-Schich MD, Andreas Zerz MD, Georg Linke, Jochen Lange, Department of Surgery, Kantonsspital St. Gallen, Switzerland
Background: Laparoscopic fundoplication is still the operative standard procedure in the treatment of gastroesophageal reflux disease. It is also recommended in the treatment of hiatal hernias with paraesophageal involvement where it helps prevent postoperative reflux and helps with recurrence rates. But fundoplication also causes persisting side-effects in about every fifth patient. In the past, gastropexy procedures were considered to be an alternative with fewer side-effects. But high recurrence rates after good short-term results led to these techniques being abandoned. As a consequence, gastropexy procedures seemed to be long-lastingly successful if recurrences could be prevented by mesh-reinforcement. And this is what laparoscopic mesh-augmented hiatalplasty with anterior gastroplasty (LMAH) aims at.

Methods: In the period of 2001 to 2003, twenty consecutive patients (8 m, 12 f) underwent LMAH for gastroesophageal reflux disease and/or hiatal hernia. All data was prospectively collected. Perioperative work-up included gastrointestinal symptom rating scale questionnaire, esophagogastroduodenoscopy, upper Gi barium contrast series, esophageal manometry and 24-h pH monitoring. The same examinations apart from esophagogastroduodenoscopy were repeated three months postoperatively. Results: All patients revealed a hiatal hernia in the perioperative work-up; sixteen of them with paraesophageal involvement. Fourteen patients were operated on with gastroesophageal reflux. The median operation time was 120 minutes (70-216). There were two intra-operative minor complications and postoperative problems occurred in 7 patients. One 82 year old man died of a consecutive cardiac tamponade on the fourth postoperative day. After 3 months, all patients had improved with their initial complaints, all but one assessed the operation result as good up to excellent and would re-undergo the operation. One patient reported improved but still existing heartburn, one had mild dysphagia and another two described mild gas-bloating symptoms.

Conclusions: We believe that LMAH is an adequate alternative to laparoscopic fundoplication with fewer side-effects. It is a challenging procedure but seems to be successful in the treatment of both hiatal hernias and gastroesophageal reflux disease.

P265–Esophageal/Gastric Surgery
LAPAROSCOPY-ASSISTED DISTAL GASTRECTOMY WITH LYMPHNODE DISSECTION FOR EARLY GASTRIC CANCER, Yuugo Nagai MD, Katsunari Takagi MD, Nobutaka Tanaka MD, Department of Surgical Endoscopy, Izumi Ohtsu City Hospital(1), 2nd Department of Surgery, Wakayama Medical University(2), Department of Surgery, Asahi General Hospital(3)
Since 1993, we applied Laparoscopy Assisted Distal Gastrectomy (LADG) for early gastric cancer and 118 patients were treated in two hospitals. During 1993 and 2001, 52 patients were treated in Wakayama medical university and 66 patients were also treated in Asahi general hospital during 2002 and 2004, because of a surgeon’fs movement. In comparison with two periods, operation time became shorter (237 to 162 min.) even if more extended lymph nodes dissection could be performed. However major complications seemed to be increased. In early period, only one intra-abdominal abscess was conservatively treated and 4 anastomotic strictures successfully were treated by endoscopic balloon dilatation. In contrast, there are 4 ischemia of transverse colon caused by meso-colon injury, two intra-operative bleeding and each of one anastomotic leakage and stricture in later period. But its complication rate was not significantly higher than that of open gastrectomy. During 12 year follow-up period, only one recurrence by liver metastases was seen 30 months after LADG and cumulative 5 year survival rate was 93%. Thus our LADG can be a standard operation in early gastric cancer.

P266–Esophageal/Gastric Surgery
SENTINEL NODE NAVIGATION LAPAROSCOPIC SURGERY WITH THE INFRARED RAY LAPAROSCOPY SYSTEM FOR GASTRIC CANCER, Hiroshi Hirai MD, Norio Mitsuimori MD, Norichika Narimiya MD, Tomoki Koyama MD, Naoto Takahashi MD, Katsuhiro Yanaga MD, Departments of Surgery and Endoscopy, Jikei University School of Medicine
INTRODUCTION: We have reported the usefulness of infrared electronic endoscopic observation for sentinel node (SN) identification during laparotomy for gastric cancer (Br J Surg 2004; 91: 575-579). If this technique can be applied during laparoscopic surgery, cumbersome lymph node dissection may be omitted. METHODS AND PROCEDURES: This report examined the clinical use of an infrared laparoscopy system (IRLS) with indocyanine green (ICG) injection for SN detection in 32 patients with gastric cancer that dose not invade the subserosa (29 T1N0M0 and three T2N0M0 tumors, according to the Japanese TNM classification). RESULTS: ICG-positive lymph nodes that could not be observed under ordinary light were identified very clearly with the IRLS system. The identifi-
cification rate for SN was 100% (32/32), and the mean number of SN was 5.27±3.8 (1–13 SN). Five of the 32 patients had lymph node metastasis. The sensitivity of SN (5) and the specificity accuracy (32/32) were both 100%. CONCLUSION: By the use of IRLS observation in laparoscopic surgery, the same sensitivity was obtained in SN identification as with infrared ray electronic endoscopy; it was not necessary to darken the operating room, and the operation of the IRLS as well as observation with IRLS were easier than those in open surgery. The IRLS seems to be a useful tool for laparoscopic identification of SN for early gastric cancer.

P267--Esophageal/Gastric Surgery
LAPAROSCOPY-ASSISTED TOTAL GASTRECTOMY FOR GASTRIC CANCER, Kazuyuki Okada MD, Syuji Takiguchi MD, Mitsugu Sekimoto MD, Hiroshi Miyata MD, Yoshiyuki Fujiwara MD, Takashi Yasuda MD, Yuichiro Doki MD, Morito Monden MD, Department surgery and clinical oncology, Graduate school of medicine, Osaka university.

[Purpose] With the development of related instruments and techniques, laparoscopic gastrectomy which include partial gastrectomy and distal gastrectomy, has come to be applied to the treatment of gas cancer as a minimally invasive surgery. However, laparoscopic-assisted total and proximal gastrectomy are not so common, and they are also considered as the challenging procedures. It is the most major reasons that esophagojejunostomy and esophagogastrostomy under the laparoscopy have technical difficulties. So, we will report about our technique of laparoscopy-assisted total gastrectomy, especially about esophagojejunostomy by using semi automatic suturing device?Endostitch?.

[Method] From September 2001 to March 2004, laparoscopy-assisted total gastrectomy with lymph node dissection was performed on 14 patients in our hospital. They were also divided into two groups by the extent of lymph node dissection based on the preoperative clinical stage. One was laparoscopic D1+ beta lymph node dissection for 11 patients with T1N0, the other was hand-assisted laparoscopic D2 lymph node dissection for 3 patients with T1N1 or T2N0. Hand-assisted method was performed for splenectomy and the dissection of NO.10 and NO.11 lymph nodes. The way of laparoscopic anvil-head fixation on esophagojejunostomy is as follows. Firstly, the tip of the suture of Endostitch was brought outside the body using the Endoclose instrument. After about ten encircling purse-string sutures were performed by Endostitch, an anvil-head was placed laparoscopically with supporting the esophagus with three points. When the implanting Endostitch was performed, it was possible to get ligation with a sufficient degree of tension by pulling the suture placed through the abdominal wall extracorporeally.

[Result] The mean operating time and blood loss on the cases of laparoscopic D1+ beta lymph node dissection were 287 minutes and 583.3 ml respectively on the cases of hand-assisted laparoscopic D2 lymph node dissection for 3 patients with T1N1 or T2N0. Hand-assisted method was performed for splenectomy and the dissection of NO.10 and NO.11 lymph nodes. The way of laparoscopic anvil-head fixation on esophagojejunostomy is as follows. Firstly, the tip of the suture of Endostitch was brought outside the body using the Endoclose instrument. After about ten encircling purse-string sutures were performed by Endostitch, an anvil-head was placed laparoscopically with supporting the esophagus with three points. When the implanting Endostitch was performed, it was possible to get ligation with a sufficient degree of tension by pulling the suture placed through the abdominal wall extracorporeally.

[Result] The mean operating time and blood loss on the cases of laparoscopic D1+ beta lymph node dissection were 287 minutes and 583.3 ml respectively on the cases of hand-assisted laparoscopic D2 lymph node dissection. There was no major postoperative complication and no recurrent cases in both procedures. It was indicated that our technique of laparoscopy-assisted total gastrectomy was a feasable procedure for gastric cancer.

P268--Esophageal/Gastric Surgery
LAPAROSCOPIC WEDGE GASTRECTOMY ESOPHAGEAL LENGTHENING PROCEDURE: CLINICAL AND PHYSIOLOGICAL FOLLOW-UP, Allan Okrainec MD, Cliff Sample MD, Herawaty Sebajang MD, Mehran Anvari PhD, Centre for Minimal Access Surgery, McMaster University, Hamilton Ontario Canada.

Background: Various methods of Collis gastroplasty have been described to lengthen the esophagus. In this series of 8 patients, we describe early outcomes following a laparoscopic wedge gastrectomy (LWG) esophageal lengthening procedure.

Methods: Between January 2004 and August 2004, patients with PEH were assessed pre-operatively with symptom scores (GERTI), upper endoscopy, barium swallow, 24-h pH monitoring, and esophageal manometry. Intra-operatively, after reduction of the PEH and mobilization of the esophagus, patients with less than 2 cm of intraabdominal esophagus, underwent LWG. A 52 French bougie was advanced and the wedge gastrectomy was performed using a 45mm endo-GIA linear-cutting stapler.

Results: Eight patients (5M:3F) with a mean age of 66.9 ± 11.6 years underwent LWG. Six patients (75%) had GERD; seven patients (87.5%) had PEH (6 type III, 1 type IV); six (75%) had organoaxial volvulus of the stomach; two patients (25%) had previously failed fundoplications; three patients (37.5%) had Barrett’s esophagus. Mean O.R. time was 188.1 ± 51.9 min. Mean LOS was 3.9 ± 2.0 days. Mean time to start of oral diet was 1.25 ± 0.7 days. All patients had a gastrografin swallow on POD one. All were normal except one which showed a small stricture at the level of the diaphragm. The only minor complication was post-op dysphagia in this same patient. This resolved without dilatation. There were no major complications. Objective evaluation with upper endoscopy, 24-h pH recording and manometry is planned for our patients at 6 months.

Conclusion: LWG esophageal lengthening procedure is a safe technique for dealing with a shortened esophagus. Long term clinical and physiological follow-up are still needed. Our six month follow-up data will be available at the time of presentation.
POSTER ABSTRACTS

P272–Esophageal/Gastric Surgery

USE OF A LEFT HEMIDIAPHRAGM RELAXING INCISION FOR A TENSION FREE CRURAL CLOSURE IN THE REPAIR OF LARGE HIATAL HERNIAS, Patrick R Reardon MD, Wiljon Beltre MD,Ajay K Chopra MD,Michael J Reardon MD, Department of Surgery, University of Texas Health Sciences Center at Houston, The Methodist Hospital. Houston, Texas.

Introduction: Repair of a large hiatal or paraesophageal hernia with simple cruroplasty is associated with a high recurrence rate. The tension on the suture line renders it prone to disruption. To achieve a tension free repair, prosthetic materials have been utilized as bridging materials for the repair of the large hiatus. We report the use of a relaxing incision in the central tendon in the left hemidiaphragm to achieve a tension free crural closure.

Methods: From July 1995 to August 2004, a total of 123 patients underwent laparoscopic repair of a hiatal hernia with or without fundoplication in a single surgeon’s practice. Six of them presented with large symptomatic hernias (five type III/IV and one large type II hiatal hernia). There were 3 males and 3 females in this group. The average age was 65.3 years (range 42-84 years). The average BMI was 30.94 (range 27.4-38.4). The size of the hiatal defect ranged from 8 to 9 cm. Attempt at closure of such a large defect resulted in undue tension. Therefore, a vertical relaxing incision was made in the central tendon of the left hemidiaphragm. The hiatus was then closed with Teflon pledged Dacron sutures. The resulting defect in the left diaphragm was patched with Gore-Tex DualMesh using 0 braided Dacron sutures utilizing the Endo Stitch device. The mean duration for the procedure was 348 minutes (range 325-365 minutes). Patients have been followed up from 7 to 44 months (average 31.5 months). All patients are asymptomatic and recent contrast studies obtained in 3 of the patients are normal.

Conclusion: A relaxing incision in the left hemidiaphragm achieves an effective and tension free repair of a large hiatal hernia. There are no adverse effects noted with this technique. Longer follow-up is needed regarding recurrence rates.

P273–Esophageal/Gastric Surgery

MIDTERM FOLLOW UP AFTER LAPAROSCOPIC HELLER MYOTOMY ALONE VERSUS TOUPET, DOR AND MODIFIED DOR FUNDOPLICATION, William S Richardson MD, Colleen I Kennedy MD,John S Bolton MD, Ochsner Clinic Foundation, New Orleans, LA, USA

Our aim was to compare outcomes of Heller myotomy alone (H) and with different partial fundoplications. We retrospectively reviewed our experience of 69 laparoscopic Heller myotomies. 80% were performed with partial fundoplication (20 Toupet (T), 18 Dor (D), and 17 modified Dor (MD) where the fundoplication is sutured to both sides of the crura and not the myotomy).

Age was 69 (range 15-80) years. There were 4 mucosal perforations repaired intraoperatively. There was one small bowel fistula at an area of open hernia repair distant from the myotomy. There was one death from pneumonia in a patient with severe COPD. Phone follow-up was achieved in 68% (T-H, 12-T, 12-D, 13-MD) of cases at a mean of 37 (range 9-7) months.

Results are in %.

<table>
<thead>
<tr>
<th></th>
<th>No D</th>
<th>Monthly D</th>
<th>On PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>85.7</td>
<td>14.3</td>
<td>28.6</td>
</tr>
<tr>
<td>T</td>
<td>56.6</td>
<td>16.7</td>
<td>33.3</td>
</tr>
<tr>
<td>D</td>
<td>83.3</td>
<td>18.7</td>
<td>20.0</td>
</tr>
<tr>
<td>MD</td>
<td>84.6</td>
<td>15.4</td>
<td>15.3</td>
</tr>
</tbody>
</table>

In addition, there were two patients with reflux strictures requiring annual dilation (T, D), one redo Heller myotomy (D), and one esophageal replacement (T). Heller myotomy provides excellent relief of dysphagia with
and without fundoplication. Heartburn is a significant problem in a minority of patients. In our hands, T had the worst results and MD was more protective for heartburn.

**P274—Esophageal/Gastric Surgery**  
**BMI IMPACTS PRESENTING SYMPTOMS OF ACHALASIA AND OUTCOME AFTER HELLER MYOTOMY, Alexander S Rosemunny MD, Desiree V Villadolid BS,Candace M Kalipersad BS,Donald P Thometz BA,Steven S Rakita MD, Department of Surgery, University of South Florida College of Medicine, Tampa General Hospital**

Introduction: The impact of obesity on health is increasingly recognized. The impact of obesity on presenting symptoms of achalasia and on outcome after Heller myotomy is not established. This study was undertaken to determine the impact of Body Mass Index (BMI) on the presenting symptoms of achalasia and outcome after laparoscopic Heller myotomy.

Methods: Since 1992, 254 patients, 137 men and 117 women, of median age 47 years (49 years ± 17.9), and of median BMI 24 (25 ± 4.9), have undergone laparoscopic Heller myotomy and have been followed through a prospectively maintained registry. With median follow-up at 26 months (32 months ± 28.6), patients scored their symptoms after myotomy using a Likert scale (0=never/not bothersome to 5=every time I eat/very bothersome). Data are presented as median, mean ± SD, when appropriate.

Results: Patient scores improved with myotomy (p<0.001 for all, paired Student’s t-test) (Table). By regression analysis, increasing BMI tended to exacerbate the frequency/severity of all symptoms before and after myotomy.

- By regression analysis, before myotomy, increasing BMI significantly increased the frequency of choking, vomiting, and chest pain and, after myotomy, increasing BMI significantly increased the severity of regurgitation and frequency of heartburn (p<0.05). Conclusions: Laparoscopic Heller myotomy improves the frequency and severity of symptoms of achalasia. BMI impacts symptoms of achalasia before and after myotomy, some significantly. Increasing BMI exacerbated preoperative symptoms of esophageal obstruction and postoperative symptoms of gastroesophageal reflux/regurgitation. For patients with an elevated BMI, preoperative weight loss is encouraged and concomitant fundoplication with myotomy should be applied to optimize outcomes after Heller myotomy.

**P275—Esophageal/Gastric Surgery**  
**OUTCOMES PROMOTE REDO HELLER MYOTOMY FOR SYMPTOMS OF ACHALASIA, Alexander S Rosemunny MD, Desiree V Villadolid BS,Candace M Kalipersad BS, Donald P Thometz BA, Steven S Rakita MD, Department of Surgery, University of South Florida College of Medicine, Tampa General Hospital**

Methods: Of 253 laparoscopic Heller myotomies for achalasia undertaken since 1992, 9 patients (2 male, 7 female) had undergone previous Heller myotomies and suffered recurrence of symptoms: 4 patients had undergone 2 previous myotomies. For each, esophageal manometry studies, esophagoscopy, and timed barium study documented achalasia with a nonrelaxing lower esophageal sphincter without stricture. Concomitant fundoplication was undertaken if there was a notable hiatal hernia or a patulous hiatus. Patients scored symptoms before and after redo myotomy using a Likert scale, ranging from 0 (never/not bothersome) to 10 (every time I eat/very bothersome). Data are presented as median, mean ± SD.

Results: Initial myotomies had been undertaken via thoracotomy in 3, celiotomy in 3, and laparoscopy in 3. Median age at redo myotomy was 36 years (35 years ± 13.0). Before redo myotomy, 100% underwent dilation, 56% underwent Bototox injection, and 56% underwent both. All redo myotomies were undertaken and completed laparoscopically. 5 patients underwent concomitant anterior fundoplication. Median follow-up is 43.4 months (37.2 months ± 24.56).

Conclusions: Both the frequency and severity of recurrent symptoms of achalasia are significantly reduced with redo myotomy. With median follow-up beyond 3 years, outcomes promote the application of redo Heller myotomy for recurrent or persistent symptoms of achalasia following Heller myotomy.

**P276—Esophageal/Gastric Surgery**  
**LAPAROSCOPIC REPAIR OF A LARGE HIATAL HERNIA FIRST REPORT ON THE USE OF CRURASOFT® PATCH IN ITALY, Marco Casaccia MD, Paolo Torelli MD, Fabrizio Panaro MD, Alfredo Savelli MD, Luca Saltalamacchia MD, Bianca Maria Troilo MD, Umberto Valente MD, University of Genoa, Italy**

Prosthetic mesh reinforcement in laparoscopic repair of large hiatal hernias achieves excellent results reducing the recurrence rate when compared to cruroplasty alone. The use of a mesh goes from a reinforcement of a cruroplasty to a ?tension-free? repair. Till nowadays, mesh prostheses were cut in a shape to be adapted to the hiatal defect. In this report, we describe the first experience in Italy on the use of a new pre-cut composite Polytetrafluoroethylene (PTFE) prosthesis specially conceived for the hiatal region. A 78-year-old female patient presenting with a large paraesophageal hiatal hernia with migration of left transverse colon inside the hiatal defect (type IV hernia) received laparoscopic repairation by means of a composite ?V?-shaped mesh.

The procedure was completed laparoscopically and a partial fundoplication was associated. A favorable outcome was assessed by barium swallow radiograms performed on postoperative day 7. A complete resolution of the symptoms was noted at a monthly visit. This report confirms the feasibility and effectiveness of the pre-sized PTFE ?V?- shaped mesh in ?tension-free? repair of large hiatal hernias, adding some advantages when compared to the conventionally used prostheses.

Key Words: Hiatal Hernia, Hiatoplasty, Laparoscopy, Prosthesis, Polytetrafluoroethylene

**P277—Esophageal/Gastric Surgery**  
**OUTCOME OF 100 LAPAROSCOPIC NISSEN FUNDOPLICATIONS PERFORMED IN A RURAL HOSPITAL, Herawaty Sebajang MD, Laurent Biertho DO, Alex Omiccioli, Mehran Anvari PhD, Susan Hegge MD, Craig McKinley MD, Centre for Minimal Access Surgery, McMaster University Hamilton Ontario Canada; North Bay District Hospital, North Bay Ontario Canada**

**METHODS**: Between November 2000 and December 2003, 100 consecutive patients (60 women and 40 men, mean age 51 years) underwent LNF for gastroesophageal reflux disease at North Bay District Hospital, a 200 bed community hospital located 400 km away from the nearest tertiary care center. All cases were performed by two community surgeons with no formal laparoscopic training. Operating time, mortality, morbidity, length of stay, conversion rate and patient satisfaction
and GERD symptom score scales are presented. RESULTS: The table below presents the early surgical outcomes:

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>n=100</th>
<th>OR time (min)</th>
<th>104 (60-235)</th>
<th>30 d mortality</th>
<th>1%</th>
<th>Morbidity</th>
<th>7%</th>
<th>Mean LOS</th>
<th>1.87 days</th>
<th>Conversion rate</th>
<th>0%</th>
</tr>
</thead>
</table>

Outcomes n=100 OR time (min) 104 (60-235) 30 d mortality 1% Morbidity 7% Mean LOS 1.87 days Conversion rate 0%

Six patients presented with dysphagia following the surgery and were treated conservatively (two patients required dilatation). The median follow-up for this series is 22.6 months with a mean satisfaction score of 10 ± 2.98 on a visual scale of 0 to 10. Eighty five percent of patients would undergo the surgery again and 86% estimated that surgery had improved their quality of life.

CONCLUSION: Community surgeons can safely develop a laparoscopic Nissen fundoplication practice in their local hospital with outcomes similar to larger tertiary centers.

P278–Esophageal/Gastric Surgery
THE LEARNING CURVE OF LAPAROSCOPIC NISSEN FUNDOPLICATIONS PERFORMED BY A COMMUNITY SURGEON, Herawaty Sebajang MD, Laurent Biertho MD, Mehran Anvari PhD, Craig McKinley MD, Centre for Minimal Access Surgery, McMaster University Hamilton Ontario Canada; North Bay District Hospital, North Bay Ontario Canada.

PURPOSE: The learning curve of laparoscopic Nissen fundoplications performed by academic surgeons is reported to be 20 to 50 cases. The aim of this study was to assess a community surgeon’s learning curve with this procedure.

METHODS: Between January 2001 and June 2003, data was collected prospectively on the initial fifty laparoscopic Nissen fundoplications performed in a community hospital by a single surgeon with no fellowship training in advanced laparoscopic surgery.

RESULTS:

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Cases 1 to 20</th>
<th>Cases 21 to 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean OR time*</td>
<td>123 min</td>
<td>88 min</td>
</tr>
<tr>
<td>Intrep morbidity</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Postop morbidity</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Postop mortality</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Median LOS</td>
<td>2 days</td>
<td>1 day</td>
</tr>
<tr>
<td></td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

There was no symptom recurrence noted in all 50 patients at a mean follow-up of 25 months. At 6 weeks postoperative, four patients (8%) had dysphagia and were managed conservatively. The community surgeon involved in this series attended laparoscopic courses early in the learning curve and after the 17th case received mentoring, telementoring and telerobotic assistance. CONCLUSION: There is a significant drop in morbidity, mortality and operating time after the first 20 cases. A number of factors including mentoring, telementoring, telerobotic assistance and dedicated operating room nursing staff may have impacted on reducing this learning curve.

P279–Esophageal/Gastric Surgery

The existing classification system of hiatal and paraesophageal hernias has been described throughout the literature. Currently, there is no satisfactory comprehensive graphic representation of this system for the surgeon. Multiple modalities have been used to illustrate these hernias, most relying on artists’ renderings or 2-dimensional radiographic studies. The ambiguity of existing illustrations, along with a lack of a current standard, promotes miscommunication among clinicians.

Polygonal mesh surface modeling techniques were utilized to render dynamic 3-dimensional CT-based models of the four recognized types of paraesophageal hernias. The resulting images allow near-real time navigation by the surgeon in an intuitive and clinically relevant fashion. This model should clarify the existing classification system and will ultimately improve management of paraesophageal hernias.

P280–Esophageal/Gastric Surgery
LAPAROSCOPIC HAND-ASSISTED NISSEN FUNDOPLICATION, Kazuyuki Shimomura MD, Tatsuo Yamakawa MD, Dept. of Surgery, Mizonokuchi Hospital, Teikyo-University.

Although laparoscopic surgery is being widely accepted by surgeons, some drawbacks of this procedure, mainly from that laparoscopic procedures are 2-D remote surgery without tactile sensation, are being recognised. Hand-assisted laparoscopic surgery (HALS), which started in recent years to improve these situations, provides surgeon tactile sensation and good organ handling. Usually the indications of HALS are supposed to be associated with large resected specimen like colectomy, gastrectomy, and nephrectomy. However in selected cases like in complicated or high risk patients, HALS is also useful in functional diseases like GERD (gastro-esophageal reflux disease) even without surgical specimen. We would demonstrate the procedures and usefulness of Hand-assisted Laparoscopic Nissen Fundoplication (HALS Nissen) for GERD. The procedures of HALS Nissen is almost similar to pure laparoscopic access, but these procedures can be performed by the surgeon’s finger guide. The advantages of HALS Nissen are mainly in the phase of blunt dissection around lower esophagus with surrounded adhesion by severe esophagitis. And it also contributes for the better results in avoiding intraoperative injury in the area of esophago-gastric junction. As for the procedure of suture for fundoplication, HALS is useful to build the wrapping around fundus with appropriate pressure to fundus by finger knotting. We performed 3 cases of HALS Nissen so far, and the operation time is around 1 hour 30 min. All the patients discharged in 3 to 7 post operative days without complications or recurrence. HALS Nissen procedure is considered to be a safe and useful option to GERD to promote surgical safety.

P281–Esophageal/Gastric Surgery
HAND-ASSISTED LAPAROSCOPIC SURGERY FOR A HUGE GASTROINTESTINAL STROMAL TUMOR OF THE STOMACH:REPORT OF TWO CASES, Hitotoshi Takemoto MD, Hiroshi Yano MD, Takushi Monden MD, Department of Surgery, NTT West Osaka Hospital.

Gastrointestinal stromal tumor (GIST) of the stomach is difficult to diagnose preoperatively no matter whether it is malignant or benign. Although recent advances in imaging techniques, such as US, CT, and MRI have aided in the identification of space-occupying lesions of the stomach, these techniques do not permit preoperative diagnosis of these lesions. Therefore, the resection of the tumor is generally necessary from both diagnostic and also therapeutic aspects in patients with GIST of the stomach. There are variable operative approaches, and most surgeons expect that the laparoscopic procedure will be better than open surgery because it carries low complications, faster recovery, less pain and better cosmetics. We report two cases of a huge GIST of the stomach.
that were successfully treated by hand-assisted laparoscopic surgery (HALS). Two patients, a 56-year-old woman and a 60-year-old man, were admitted to our department for the treatment of a huge submucosal tumor of the stomach. After gastrointestinal endoscopy, US, CT, and MRI, we suspected that the masses measuring 7.0 cm and 8.0 cm in diameter, respectively, were GISTs in the stomach. However, we preoperatively could not rule out the possibility of a malignant neoplasm because they had been bleeding or gradually growing. Hand-assisted laparoscopic wedge resection was safely performed for the diagnosis and treatment of the submucosal tumor of the stomach. The duration of surgery was 85 minutes and 91 minutes, respectively. The intraoperative blood loss was insignificant. Intra- and postoperative course was uneventful. An immunohistochemical diagnosis was GIST with low-grade malignancy of the stomach. Two patients remain well with no sign of recurrence of GIST. HALS may be a good indication for huge GISTs of the stomach that are difficult to diagnose preoperatively whether they are malignant or benign.

**P282—Esophageal/Gastric Surgery**

**LAPAROSCOPIC GASTRIC RESECTION: THE RESULTS OF NINETEEN CONSECUTIVE CASES**, Laurent Layani MD, Craig Jackson MD, Taylor MD, Robert Winn MD, Michael ghusn MD, John Flynn Gold Coast Hospital, Queensland Australia

**INTRODUCTION.** Whilst the benefits of the laparoscopic surgery in the management many intra-abdominal pathologies such as cholelithiasis are well established, the benefit and feasibility of laparoscopic gastrectomy, particularly for gastric malignancy, remain uncertain. We sought to investigate this by reporting our experience with totally intracorporeal gastric resection (LGR).

**METHODS.** All lap gastric resections performed by a single surgeon were retrospectively analysed.

**RESULTS.** Between March 2000 and August 2004, 19 patients (median age 74 years) underwent LGR. Pathologies included 11 adenocarcinomas, 2 malignant GIST tumours, 4 benign GIST tumours, 1 incomplete dysplastic polyp, and 1 gastropaesisis. Seven of 13 patients with malignancy were treated with curative intent. Two total gastrectomies, 8 subtotal gastrectomies, and 5 wedge resections were performed. Median operative time was 154 minutes. There were no conversions to laparotomy and no postoperative deaths. A median of 25 lymph nodes were retrieved in curative malignant resections. Fluid and solid food intake was recommenced at a median of 16 hours and 3 days respectively. Median length of hospitalisation was 4.5 days. (range 3-15) The median return to normal preoperative activities was 17 days. One gastrointestinal anastomotic leak occurred and was successfully managed conservatively. There was no major morbidity. No port site recurrences occurred. Two patients (10%) underwent reoperation for laparoscopic re-anastomosis of microscopically involved margins. One patient with locally advanced adenocarcinoma died 17 months post resection. The remaining 12 patients with gastric malignancy were still alive at a median of 15 months.

**CONCLUSION.** Totally laparoscopic gastric resection is technically feasible and confers the established benefits of minimal access surgery, particularly low postoperative morbidity and short convalescence and is set to become the procedure of choice for benign and palliative gastric pathology. Whilst large randomised trials are needed to confirm its safety in potentially curative gastric malignancy, our results indicate that an oncologically sound resection can be achieved.

**P283—Esophageal/Gastric Surgery**

**IDENTIFICATION OF A LARGE SYMPATHETIC NERVE AT THE GASTROESOPHAGEAL JUNCTION DURING LAPAROSCOPIC NISSEN FUNDOPPLICATION,** Cyrus Vakili MD, Departments of Surgery, University of Massachusetts Affiliated Hospitals, Gardner MA, and Leominster MA

Functional symptoms such as gas bloat, flatulence, early satiety, inability to belch, epigastric fullness, and dysphagia frequently occur following Nissen fundoplication. The cause of these symptoms in the majority of cases has not been determined. This author has performed 449 laparoscopic Nissen fundoplications between January 1993 and June 2004. A relatively large sympathetic nerve supplying the gastroesophageal junction (GEJ) was observed during video laparoscopy. This nerve is a branch of the greater splanchnic nerve and exits through the left crus, and enters the most distal part of the esophagus, just above the angle of His. At first glance it looks as a fibrovascular structure. Upon biopsy on multiple occasions, its histology and identity was verified. The diameter of the nerve varies from 0.8 mm to 1.4 mm. There is no controlateral sympathetic innervation from the right crus to the GEJ. Interestingly, this sympathetic nerve to the GEJ has not been depicted or described in surgical literature. There are also a couple of smaller sympathetic nerves, parallel but more cephalad to the GEJ nerve, which exit through the tricus and enter the distal esophagus. Classically, the sympathetic innervation of the distal esophagus and the stomach has been described as fine nerve fibers traveling along large arteries such as the left gastric artery. Compared to the parasympathetic nerves, less information is available regarding the function of the sympathetic system on the lower esophageal sphincter and the fundus of the stomach. During Nissen procedure, these sympathetic nerves are often transected to facilitate mobilization of the distal esophagus, and to develop a window behind the esophagus for fundoplication. In my experience, preservation of these sympathetic nerves did not change the rate of gas bloat, or flatulence. However, its preservation seems to have shortened the period of post operative dysphagia. Considering the relative large size of the GEJ nerve, and its anatomical location, investigation into its function is warranted, particularly when the parasympathetic nerves are preserved.

**P284—Esophageal/Gastric Surgery**

**FEASIBILITY OF LAPAROSCOPIC FUNDOPICATION AFTER FAILED ENDOSCOPIC ANTIREFLUX THERAPY**, YKS Vyswanath RN, P Cann MD, P Davis MS, PP Vassallo, K Subramanian, Department of Surgery and Medicine, James Cook University Hospital

Background and aims: The intraoperative difficulties and postoperative outcome after failed endoscopic Enteryx polymer injection therapy (EEPIT) to improve the reflux symptoms is unclear. We assessed the feasibility and safety of undertaking the Laparoscopic Nissen-Rossetti fundoplication (LNRF) after failed EEPIT.

**METHODS.** Eleven among a total of 22 patients failed to respond to EEPIT. Hitherto 6 among 11 patients had undergone LNRF. All patients had Upper GI endoscopy, oesophageal manometry and pH profiles prior to EEPIT. At surgery care was taken to identify any distortion in the normal anatomy to identify any areas of fibrosis and abnormal foreign material. Results: All patients underwent successful LNRF. In five patients there were dense peri-esophageal adhesions and two of them had foreign body granuloma anterior to the gastrooesophageal junction obliterating the left sub hepatic space. The remaining 1 had no significant adhesions. Median hospital stay 1.5 days. The procedures were event free and all had excellent control of reflux symptoms in a median follow up of 5 months. Conclusion: Laparoscopic fundoplication following failed EEPIT injection is feasible and is not associated with increased postoperative morbidity.

**P285—Esophageal/Gastric Surgery**

**LAPAROSCOPIC IVOR LEWIS ESOPHAGECTOMY IN THREE PATIENTS WITH ABERRENT RIGHT SUBCLAVIAN ARTERIES,** Tracey L Weigel MD, Anna Ibele MD, Joseph Bobadilla MD, Loay F Kabbani MD, Niloo M Edwards MD, University of Wisconsin

**Introduction:** An aberrant right subclavian artery is a common anomaly often referred to as “dysphagia lusoria” if symptomatic. In patients with a resectable gastroesophageal junction carcinoma, an aberrant right subclavian that courses posterior to the esophagus, even if an incidental finding on chest CT, poses a challenge to safe resection and reconstruction.

**Methods:** Three patients with gastroesophageal junction carcinomas were found to have an aberrant right subclavian artery on preoperative chest CT and were approached with a laparoscopic Ivor Lewis esophagectomy. Diagnostic laparoscopy was
POSTER ABSTRACTS

PERFORATED PYLORODUODENAL ULCERS, A.A. Gulyaev, P.A. Yartsev, G.V. Pahomova, Gastroenterology department.

Methods: 346 patients were treated with perforated pyloroduodenal ulcers during the period of 1999 to 2004. Results: All patients had to take polyposis X-ray test of a belly cavity. In case of free gas absence (50%) in a belly cavity and a doubtful clinical picture of perforated ulcer, the X-ray test of a belly cavity after gastroscopy allowed to reveal free gas in 91% of the patients who had not have endoscopic indications of perforated ulcer (53%). Laparoscopy is the most effective diagnostic method in complicated cases. At Sklifosovsky hospital operation of a choice for patients with perforated pyloroduodenal ulcer, without accompanying complications of ulcer disease (the size of perforation less than 0.5cm, the size of free gas in a belly cavity less than 0.5cm) was used. Laparoscopic assisted gastric surgery. Conclusion: The MFG has exceptional opening strength and can be used as a port through insertion of a cannula here. The MFG was used in 30 cases of laparoscopic assisted gastric surgery March 1999 to August 2004. The length of the skin incision was 5-9 cm. ?yConclusion?z The MFG has exceptional opening strength and is an optimal instrument for laparoscopic assisted gastric surgery that allows re-insufflation. A favorable surgical field was ensured by this instrument and laparoscopic assisted gastric surgery can be performed; it was also useful for prevention of wound infection and cancer cell implantation.

**P286–Esophageal/Gastric Surgery**

**LAPAROSCOPIC NISSEN FUNDOPICATION IN INFANTS LESS THAN 10KG, Robert J Wilmot MD, Michael E Harned MD, David T Schindel MD, Konstantinos G Papadakis MD, East Tennessee Children's Hospital and The University of Tennessee Medical Center at Knoxville, Tennessee.**

Introduction: Laparoscopic Nissen fundoplication is an effective means for treating gastroesophageal reflux disease (GERD). As it gains popularity in the pediatric population, its widespread utility is still being defined. We present a group of patients in whom laparoscopic Nissen fundoplication was performed successfully in infants weighing less than 10 kg. Our purpose is to illustrate that laparoscopic Nissen fundoplication is a safe and effective means for treating GERD in this patient population.

Results: 22 laparoscopic Nissen fundoplications were performed in infant patients weighing less than 10kg. Most common indications included GERD (N=22), associated with failure to thrive (N=10) or respiratory symptoms (N=7). Gastrostomy was performed in 17 patients. Pyloromyotomy was performed concurrently for delayed gastric emptying in three patients. Mean patient weight was 6.3kg (range 3.0 to 9.5kg). Mean operating time was 50min. Mean length of the skin incision was 5-9 cm.

**P287–Esophageal/Gastric Surgery**

**EXPERIENCE WITH DEVELOPMENT AND CLINICAL USE OF A SMALL OPENER FOR LAPAROSCOPIC ASSISTED GASTRIC SURGERY, Hideo Yamada PhD, Juri Kondo MD, Eiji Kanehira PhD, Masahiko Sato PhD, Kouichi Nakajima PhD, Takahiro Kinoshita PhD, Shigetaka Suzuki MD, Endoscopic Surgery Center, Toho University Sakura Hospital.**

Conclusions: Laparoscopic Nissen fundoplication is an effective means for treating GERD in the infant population. Our data specifically illustrates its safety and efficacy in infants who weigh less than 10kg. As experience with this procedure continues to evolve, its role within other populations will further be defined.

**P288–Esophageal/Gastric Surgery**

**SMALL OPENER FOR LAPAROSCOPIC ASSISTED GASTRIC SURGERY, Michael E Harned MD, G.V. Pahomova, Gastroenterology department.**

Results: Three patients with esophageal carcinoma were approached with a laparoscopic Ivor Lewis esophagectomy. One patient had Barrett's with carcinoma in situ. One patient had neoadjuvant chemoradiation therapy. Median age was 63 yo and median LOS was 9 days. One patient had a barium obstruction treated successfull with emerais, there were no deaths. No patient had dysphagia postoperatively secondary to the aberrant posterior right subclavian that was left in its native position.

Conclusion: A laparoscopic Ivor Lewis esophagectomy is feasible with acceptable morbidity and LOS. In patients with gastrosophageal junction carcinomas and an incidental aberrant right subclavian artery posterior to the thoracic esophagus, a laparoscopic Ivor Lewis esophagectomy appears to be a safe approach that affords good postoperative swallowing function.

?yObjeiect?z Organ extraction and anastomosis in the event of laparoscopic assisted gastric surgery is performed in direct view from a small opening; an instrument is needed to re-insufflate the peritoneal cavity and perform laparoscopy again after anastomosis is complete. Various instruments are currently being developed, although the current situation is one in which there are no instruments with which a sufficient opening and laparoscopic manipulation afterwards can be smoothly performed. Thus, the authors devised a small opener for laparoscopically assisted surgery (Multi Flap Gate: MFG) intended for protection and effective opening of the peritoneal wound and simple re-insufflation in laparoscopic assisted gastric surgery.

?ySubjects and Methods?z The specifications of the MFG have been indicated. There are four aspects: a surface ring (approx. dimensions 70140 mm, height 13 mm, opening 70110 mm), an intraperitoneal ring (ext. dia. 70125 mm, int. dia. 70105 mm, thickness 5 mm), a draft protection sheet (length 100 mm), and a tension belt (width 35 mm, thickness 1.5 mm); the site is opened further by pulling the latter. Re-insufflation can be performed by attachment of a converter (approx. dimensions 70140 mm, 7070 mm) to the ring. In addition, there is a small hole in the center and it can be used as a port through insertion of a cannula here. The MFG was used in 60 cases of laparoscopic assisted gastric surgery March 1999 to August 2004. The length of the skin incision was 5-9 cm.

?yResults?z The MFG was easily attached in all cases and required strength was wapped shock. Damage to the MFG during surgical handling and trouble with regard to manipulation was not seen. The shape of the opening was almost square; extraction of organs and surgical manipulation in direct view were favorable. Gas leaks were also not noted during re-insufflation. In addition, no cases of postoperative wound infection or port-site recurrence were noted. We can do stomach resection, anastomosis and lymph node dissection easily using MFG.

?yConclusion?z The MFG has exceptional opening strength and is an optimal instrument for laparoscopic assisted gastric surgery that allows re-insufflation. A favorable surgical field was ensured by this instrument and laparoscopic assisted gastric surgery can be performed; it was also useful for prevention of wound infection and cancer cell implantation.
cumulative estimation of the remote results does not differ from well-known and makes 47 % of a ulcer relapses. However, after studying patients in view of their division into the groups it becomes obvious, that the most part of relapses directly connected to inadequacy of an ulcer disease treatment. In group “ A “ good and satisfactory results are marked in 81 %, bad results in 19 %. In group “ B “ good and satisfactory results are marked in 38 % of patients, bad in 62 %. Conclusion: We can state that treatment of patients with perforated ulcer must consist of combined surgical and therapy treatment. It allows in most cases to perform operation of simple closer of perforation, on the indications laparoscopy is preferred.

P289—Esophageal/Gastric Surgery
LAPAROSCOPIC REDO NISSEN FUNDOPLICATION, Constantine T Frantzides MD, TallaJ M Zeni MD, John G Zografakis MD, Mark A Carlson MD, Evanston Northwestern Hospital
Objective: To evaluate the mechanisms of failure after laparoscopic fundoplication, and the operative techniques necessary to reduce failure.
Methods and Procedure: A retrospective review of 42 patients with failed laparoscopic fundoplication was done. Pre- and postoperative symptoms and testing (endoscopic, radiologic and manometric) were analyzed. Operative techniques to correct the etiologies of failure were documented.
Results: Heartburn (69%) and dysphagia (12%) were the most common presenting symptoms; both symptoms were present in 10% of patients. Preoperative testing revealed the presence of reflux (76%), esophagitis (67%), hiatal hernia (45%), stenosis (14%), and dysmotility (5%). The most common intraoperative finding was a combination of ?slipped? fundoplication and hiatal hernia (24%). Other intraoperative findings included isolated slippage or malpositioning (17% each); combined malpositioning with hiatal hernia (12%); isolated hiatal hernia or tight fundoplication (10% each); loose fundoplication (7%); and tight cruroplasty (5%). Redo fundoplication alone was performed in 45% of patients, and another 45% underwent redo fundoplication with hiatal hernia repair; 68% of the hiatal hernia repairs were done with mesh reinforcement. Suture removal from a tight cruroplasty (5%) and additional suture placement on a loose fundoplication (5%) occasionally were employed. Complications included four gastric perforations, which were all recognized and repaired during the redo procedure. Open conversion occurred in one patient. Length of stay was 3.5 +/- 1.0 days. Long-term follow up occurred in 7/42 patients (17%). Four of these patients had a recurrent hiatal hernia, while three had a failed fundoplication.
Conclusion: Redo fundoplication can be successfully accomplished laparoscopically in nearly all patients. Hiatal hernia repair (with mesh reinforcement) and secure anchorage of the fundoplication appear to be essential components of long-term success. The recurrence rate following reoperation is higher than after primary fundoplication.

P290—Flexible Diagnostic & Therapeutic Endoscopy
ENDOSCOPE DIAGNOSIS AND TREATMENT OF SEVERAL PEDIATRIC GASTROINTESTINAL DISEASES: A SINGLE CENTER EXPERIENCE, Merab Budzide MD, Ramaz Kutubide MD, George M Ramashvili MD, Zaza Chagelishvili MD, Levan Labauri MD, Dept of Gastrointestinal Endoscopy Surgery of Pediatric Clinic, Tbilisi State Medical University,Georgia.
Introduction: Endoscopy is a common procedure for diagnosis and treatment of various gastrointestinal and colonic disorders in children.
Methods: We report our experience 1985 ? 2003 of 14911 (11504 diagnostic and 3407 therapeutic) endoscopies and lower gastrointestinal endoscopies in children from newborn to 16 years. There were used coniscious sedations with repeated doses of midazolam (0.025mg/kg) up to summary dose (0.4 mg/kg). The surgical endoscopies were performed under general anesthesia.
Results:
1. Peptic ulcer disease ? 685; Doudenal ulcer ? 598 (87%), Gastric ulcer ? 87 (13%). Study of specimens was done by
2. Endoscope treatment of gastroduodenal bleeding of ulcerous genesis 296 cases, among them DU ? 244 (82%), GU ? 52 (18%). Bleeding due to esophageal varices ? 27 cases, sclerosis therapy ? 12.
3. Endoscope polypectomy of single (84%) or multiple (16%) colon polyps 72250 cases. 91% of the polyps were juvenile.
5. Endoscope treatment of accidental chemical burns of esophagus with repeated endoscope control and dilation ? 180 cases.
6. Endoscopy diagnosis and successful dissolution of gastric phytobezoars using white turnip ? 87 cases.
7. Endoscopy investigations among the new-born such diseases as congenital hypertrophic pyloric stenosis, 239.
10. Endoscope diagnosis and treatment by colonoscopy of ileocolic intussusception in children under 2 years ? 73 cases. Endoscope treatment was done totally in 68 from 73 (93,1%) cases. The valve of Baugin and 10-15 cm in length terminal ileum were observed usually after endoscope pneumatic reduction.
Conclusion: Hence in some surgical diseases of intestinal tract in children the use of endoscope treatment is primary safe method. Also it decreases the number of laparatomies and complications.

P291—Flexible Diagnostic & Therapeutic Endoscopy
THE USEFULNESS OF INTRAOPERATIVE ENDOSCOPY, John M Cosgrove MD, George Denoto MD, Jeremy Govenor MD, North Shore University Hospital/North Shore-Long Island Jewish Health Care System.
The usefulness of intraoperative endoscopy as an adjunct to general surgery procedures cannot be overstated. The performance of upper endoscopy, colonoscopy and sigmoidoscopy can be accomplished with minimal setup and preparation, little difficulty and essentially no morbidity. Also, the procedure can be performed without adding much time to the operative case. The experience of one surgical endoscopist and a busy laparoscopic surgeon at a large academic medical center is chronicled. A two-year period (September 2002-September 2004) was chosen for review. All intraoperative endoscopies, colonoscopies and sigmoidoscopies were included. Those procedures performed outside the operating room(.,e., endoscopy suite and ICU) were excluded. There were 95 intraoperative endoscopies performed during the study period. There were 23 endoscopies to evaluate open gastric bypass (RYGBP), 14 colonoscopies for evaluation of colonic anastomoses, 16 colonoscopies for evaluation of rectal stumps or lower gastrointestinal hemorrhage, 5 endoscopies for upper gastrointestinal hemorrhage or small bowel obstruction, 9 trachoeotomies/PEGs, 13 sigmoidoscopies, 6 endoscopies for laparoscopic assisted myotomies, 4 colonoscopies for laparoscopic assisted colectomies, 3 endoscopies for laparoscopic assisted partial gastrectomies and 3 endoscopies for therapeutic reasons status post gastric bypass procedures. The endoscopies were therapeutic in 5 cases (3 RYGBP, 2 foreign bodies). Furthermore, our policy of intraoperative endoscopy picked up three anastomatic defects (1 RYGBP, 2 colocolonic anastomoses) that were easily corrected at the same setting. The endoscopic procedures have an excellent predictive value as there were no postoperative leaks. The average time for each endoscopy was less than two minutes. The performance of intraoperative endoscopy is an invaluable adjunct to the surgical armamentarium. It can be performed easily and safely and the information obtained is very useful and therapy will be altered in a subgroup of patients. The endoscopy allows the entire team to visualize the anastomosis on the monitor and photographs can be taken for inclusion in the medical record. We advocate the widespread application of

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ULTRASOUND GUIDED PRE-OPERATIVE LOCALIZATION OF THE THYROID GLAND AS A TOOL FOR ENDOSCOPIC AXILLARY THYROID AND PARATHYROIDECTOMY. Titus D Duncan, MD, FACS, Atlanta Medical Center and Morehouse School of Medicine

Minimally invasive surgical techniques have become common place in the treatment of surgical diseases processes once necessitating major incisions. Improved cosmesis, less pain and faster return to normal activity have been the driving force behind innovative surgical procedures now seen as common place. Improved surgical visualization with superior optics has also spawned claims of some procedures being safer than their open counterparts. Minimal access thyroid and parathyroid surgery has been shown to offer superior cosmetic results with improved patient satisfaction over its open counterpart. Furthermore, recent results have espoused superior visualization inferring improved safety for patients undergoing thyroid and parathyroid surgery. However, disadvantages of such techniques have prohibited them from enjoying much of the popularity as other minimally invasive techniques. Such disadvantages include added costs, prolonged surgical times and a steep learning curve. We recently reviewed our series of patients undergoing minimal access surgery to the thyroid and parathyroid gland. We compared our results of patients undergoing surgery with pre-operative ultrasound guided localization of the thyroid with patients who did not have pre-op ultrasound localization.

Our theory was that pre-operative ultrasound could reduce the operative time of the surgical procedure. We concluded that pre-operative ultrasound localization significantly reduced the overall operative time of the minimal access procedure as well as reduced the learning curve for surgeons learning the procedure. We present our data in support of the above conclusions.

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ENDOSCOPIC PARATHYROIDECTOMY AND THYROIDECTOMY USING AN AXILLARY APPROACH: A VIABLE ALTERNATIVE TO THE OPEN APPROACH. Titus D Duncan, MD, FACS, Ijeoma Acholonu Ejeh MD, Department of Minimally Invasive Surgery Morehouse School of Medicine and Atlanta Medical Center, Atlanta, Georgia

A permanent transverse scar in the neck is the usual endpoint for conventional surgical treatment for thyroid and parathyroid diseases despite that the majority of these procedures are performed for benign disease. The introduction of laparoscopic surgery in the 1980s ushered in an era of minimal access techniques for many surgical fields. Endoscopic surgery can be performed in anatomic regions with limited space unlike the thoracic and abdominal cavities. The global acceptance of minimal access surgery has been primarily due to the advantages the procedures hold for the patient. Some of these advantages include less pain, faster return to activity, shorter hospital stay and improved cosmesis. However, it is well known that there are similar advantages for the surgeon performing surgery through minimally invasive approach. Better view of the anatomy, perhaps leading to safer dissection, has been one of the main advantages to this particular approach. Unlike laparoscopic surgery where reports of less pain, faster return to activity and shorter hospital stays have prevailed, few reports espouse similar advantages using an endoscopic technique over the open approach in thyroid and parathyroid surgery. Therefore, advantages to such an approach appear to be one of cosmesis for the patient and improved visualization and safer dissection for the surgeon. We reviewed our series of endoscopic thyroid and parathyroidectomies in a single institution to assess whether such advantages outweigh the difficult learning curve. We examined the technical aspects of the procedure and the surgeons visualization of vital structures as well as subjective patient scar analysis and cosmetic satisfaction. Our results show that the axillary approach to the thyroid and parathyroid can be performed safely with minimal complications. It is expected as is seen in other series, that the operative time will diminish as the plateau of the learning curve is reached. Though the advantages commonly seen in most minimally invasive procedures (i.e., less pain, faster recovery, shorter hospital stay, etc.) are not evident using this technique, the superior cosmetic outcome and patient satisfaction from such an approach appear to outweigh the technical obstacles in hands of experienced minimally invasive surgeons. Improved visualization, that allows safer dissection for the surgeon, may make this a viable alternative to the open technique in select patients requiring these surgeries.

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THE CASE FOR PREOPERATIVE ESOPHAGOGASTRODUODENOSCOPY IN BARIATRIC PATIENTS. D Francis MD, N Fearing MD, M Bozuk MD, R Altieri MD, P Leggett MD, T Scarborough MD, E Wilson, Department of Surgery, University of Texas Medical School at Houston

Introduction: There currently is no standard preoperative work-up for the morbidly obese patient undergoing gastric bypass (GB) surgery. Once the stomach is divided it is difficult to evaluate for pathology that may have been present prior to bypass surgery. We reviewed the results of the preoperative work up for GB in our patients to determine whether esophagogastro-duodenoscopy (EGD) is warranted.

Methods: We reviewed a prospectively compiled database of findings in patients undergoing preoperative EGD in their workup for GB surgery. We have been performing routine EGD for over two years with routine biopsies on these patients. Data collected included, age, body mass index, clinical findings, pathological findings, and presence of H. pylori and treatment.

Results: Over a two-year period, 240 patients underwent preoperative EGD. Only 22 had normal findings and thus, no biopsy was performed. A total of 451 abnormal findings were noted on clinical exam. They included findings such as gastritis, esophagitis, and hiatal hernias. Pathology results in those that were biopsied showed abnormalities in 206 specimens. Gastritis was most often noted clinically in 189 patients (79% of all the EGDs). Pathological evaluation of biopsies revealed gastritis in 120 patients (63%). Reflux esophagitis was found on EGD in 107 patients (45%). However, on pathological evaluation, 74 of those 107 patients (69%) had some grade of esophagitis. Interestingly, 7 of the patients with esophagitis were thought to have Barrett’s metaplasia and pathologically it was found in 10 of 218 (4.5%) patients biopsied. These patients had previously undiagnosed disease. One patient had severe high-grade dysplasia. Hiatal hernias were seen in 31% of patients. Other findings included gastric polyps, duodenitis, ulcerations, Schatzki’s rings and gastroesophageal strictures. Most patients were tested for H. pylori, which was seen in 18% of those biopsied for the bacteria.

Discussion: The distal remnant created with GB surgery leaves a potential diagnostic challenge for the bariatric surgeon. Based on these results, EGD prior to surgical isolation of this remnant is warranted to rule out pathology that may become a source for problems in the future. In addition, our findings led to medical treatment in a significant number of patients and will help improve our surveillance of those patients with Barrett’s esophagus.

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BACKGROUND: The Adjustable Gastric Band (AGB) is one of the approved options in terms of bariatric surgery which is less invasive with lower mortality rates, but the reports inform more complications and re-operation rates that the so-called

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golden standard in bariatric surgery, the gastric bypass. Endoscopic evaluation and surveillance on the follow-up of AGB band is an important tool with its interface will be described. AIM: Evaluate upper endoscopies and endoscopic procedures in a series patients submitted to laparoscopic AGB in a 4 year period. CASUISTIC: Between December of 1999 and July of 2004, 1111 patients were submitted to AGB under NIH indications for bariatric surgery. Among those AGB patients, 356 were submitted to upper endoscopies and procedures by endoscopists of reffer centers with proper training in dealing with endoscopy in AGB. 217 were female (61%) with a follow-up between 45d e 4y (M=20months) and had their data retrospectively analyzed. METHODS: The endoscopic evaluation of the AGB consists in analyze the esophagus looking for dilata- tions and esophagitis. In the gastric pouch, the endoscopists had to look for its extension, mucosal damage, contents, cent- ralization and shape. The stoma was evaluated in terms of its axis and if it is easy to pass trough. In the stomach the band fundoplication was analyzed by its shape and integrity. The rest of the stomach and duodenum were analyzed on routine manner. RESULTS: From 356 (32% of 1111 AGB) patients sub- mitted to endoscopies in this AGB series, 259 (72,7%) were considered as normal (compatible with the endoscopic expecta- tions of AGB), with a gastric pouch in between 5cm (M = 2cm), stoma centered and easy to pass and a compatible fun- d Oplication on u-turn maneuver. 53 (14,8% of endoscopies) presents with any grade of erosive esophagitis. Esophageal dilatation - achalasia like occurred in 14 patients (4,0%), Food impacta- tion in 10 (2,8%). The main complications found on the AGB endoscopies were; slippage in 31 (8,7 ) and band migration in 10 (2,8%) patients. The patients with esophageal dilatation had their band deflated, the food impactation was removed, patients with slippage had their band repositioned by laparoscopy and 5 of the migrated bands were removed by endoscopy. CONCLUSION: By the numbers presented above it is clear that the interface between AGB and endoscopy plays an important role on the follow-up of AGB patients and suool be stimulated

P297–Flexible Diagnostic & Therapeutic Endoscopy
PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN THE COM- PLICATED OBSESE PATIENT CAN BE PERFORMED SAFELY.
James L Guzzo MD, Grant V Bochicchio MD,James Haan MD,Steven B Johnson MD,Adrian Park MD,Thomas Scalea MD, University of Maryland Medical Center and the R. Adams Cowley Shock Trauma Center
Introduction: Percutaneous endoscopic gastrostomy (PEG) has become a commonly performed procedure with an acceptable complication rate. There is an absence of data reporting the success and complication rates of PEG placement in the obese and morbidly obese (MO) patient.
Methods: Prospective data was collected from January 2001 to June 2004 evaluating the safety of our experience with PEG in obese and MO patients. In addition to BMI, patients were stratified by no previous abdominal surgery (NPAS) and previous abdominal surgery (PAS). Complication rates were evaluated by number of successful attempts, wound complications, bleeding, and tube dislodgement.
Results: 103 patients underwent attempted PEG placement over the 3 year study period. The mean body mass index of the study group was 55 ± 13 years, 73% were male, and 80% were trauma patients. The most common indication for PEG was dysphagia 2° to chronic respiratory failure following traumatic brain injury. The overall success rate of PEG was 94% with a complica- tion rate of 9.7%. There was no significant difference in the complication rates between NPAS and PAS patients.

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1000 COLONOScopies IN OCTOGENARIEANS. JP Guzallo DO, J E Efron MD,A M Vernava MD,D M Jones MD,M E Avalos MD,M A Liberman MD, Cleveland Clinic Florida-Naples
Objectives: To evaluate the endoscopic and pathologic findings in colonoscopy performed in 1000 patients greater than 80 years of age at a single institution.
Methods: We retrospectively queried the endoscopic database for patients greater than 80 years of age that underwent colonoscopy at the Cleveland Clinic Florida-Naples from May 24, 1999 to September 15, 2004. We analyzed the indications, findings, complications, and pathology of those patients.
Results: Indications for colonoscopy included screening (174), follow up of polyp (171), bright red bleeding (133), anemia (114), abdominal pain (73), diarrhea (57), follow-up cancer (54), surveillance (52), constipation (51), change in bowel habit (46), hemocult positive stools (41), family history of colon cancer (39), melenic bleeding (23), hematochezia (21), weight loss (21), and other diagnoses. Our endoscopic findings were polyps in 545 patients, diverticular disease in 716, mass in 26, AV malformations in 21, inadequate bowel prep or incomplete colonoscopy in 8, ulcer in 8, stricture in 6, and a normal colon was found in 94 patients. The pathology of biopsied lesions showed a total of 19 adenocarcinomas, 8 high-grade dysplastic lesions or carcinoma in-situ, 37 tubulovillous adenomas, 303 pts. with tubular adenoma, and 275 pts. with hyperplastic poly. The total number of complications in this patient group was 5, this included 1 perforation, and 1 bleeding episode after polypectomy.
Conclusion: Colonoscopy can be safely performed in octoge- narians. The bowel preparation is well tolerated and the proced- ure can be performed to completion in >99% of the patients. A majority of octogenarians will require therapeutic colono- scopies and therefore it is the procedure of choice in examin- ing the colon.

P298–Flexible Diagnostic & Therapeutic Endoscopy
IS THERE ALWAYS AN HIBUTONIC LOWER ESOPHAGEAL SPHINCTER IN ACHALASIA. Edgardo Suarez MD,Jose J Herrera MD,Jesus E Mora MD,Maria E Loredo MD, Hidalgo State de Mexico GI motility and endoscopy unit. Hospital General ?Dr. Manuel Geo Gonzalez?, GI motility unit and general surgery division.
Achalasia is an esophageal motor disorder characterized for the absence of primary progressive peristalsis in the esophagus; abnormalities in the lower esophageal sphincter (LES) have been described. This disease was first described by Sir Thomas Willis in 1674. It is the best known esophageal motility disorder. There are 0.03-1.1 cases every 100,000 persons per year. The name derivaives from Greek, meaning ?lack of relax- ation? and regards to the LES. The recent manometric studies have suggested that these LES abnormalities are not always present and the diagnostic criteria for achalasia have been changed. The absence of peristalsis is the mandatory manometric finding for achalasia diagnosis. Other manometric find- ings of the esophageal body, the LES and upper esophageal sphincter (UES) are not always present and are not required for diagnosis.
AIM: To know LES and esophageal body manometric findings in achalasia patients.
We reviewed clinical presentation and manometric findings of patients with achalasia diagnosis between April, 1998 and July, 2004. Manometric study was done with solid state Konigsberg-Castell We used stationary and pull through tech- nique according to Castell protocol.
RESULTS: One hundred thirty six patients were included. Average age was 42.5± SD 16.5 years. There were 54.4% female (n=74) and 45.6% male (n=62). Dysphagia was present in 88.1% of cases, regurgitation in 62.7%, and chest pain in 50.8%, weight lost in 45.7% and heartburn in 35.5%.
Esophageal aperistalsis and simultaneous contractions waves were observed in all cases. LES resting pressure was normal in 79.5% of patients, hypertonic in 16.8% and hypotonic in 3.6%. LES segment was from 3 to 5 cms. in 66.1%, and shorter in 33% of cases. We observed LES lack of relaxation in 2.5% of patients, relaxation was incomplete in 87.5% and total in only 10%.

Manometric criteria in achalasia diagnosis have changed. Despite Achalasia means lack of relaxation regarding the LES. And that historically it was considered that LES should be hypertonic in this disease. We found these criteria to be not constant. Nowadays there are mandatory manometric criteria for the diagnosis of achalasia (ESOPHAGEAL PRIMARY PERISTALSIS REPLACEMENT BY SIMULTANEOUS WAVES ?ESOPHAGEAL APERISTALSIS?) since it is found constantly. And there are non obligated manometric criteria for diagnosis of this disease as the LES findings.

**P299—Flexible Diagnostic & Therapeutic Endoscopy**

**ESOPHAGEAL DIFFUSE SPASM. A MOTOR PATTERN THAT PRECEDE ACHALASIA.** Jose J Herrera MD, Edgardo Suarez MD, Maria E Lopez MD, Hiosadhara E Fernandez MD, Jose A Palacios MD, Espol: gastroenterological Endoscopy unit. Hospital General Dr. Manuel Gea González?, gastrointestinal motility and general surgery division.

Esophageal diffuse spasm is a rare motor disorder characterized for chest pain, dysphagia and segmental wave contractions. Pathophysiology and natural history remains unclear and it has been suggested that it could precede achalasia. In both entities the proposed pathophysiology is a Nitric oxide neuromuscular defect. Manometric findings for diffuse esophageal spasm are simultaneous wave contractions over 30mmHg amplitude in more than 10% of swallows and for achalasia the absence of peristalsis is the mandatory manometric finding.

**Aim:** To present a patient whom has an initial diagnosis of diffuse esophageal spasm who in further evaluation had a vigorous esophageal achalasia.

**Case report:** We present a 41 years female who came in 2003 with last 3 months progressive dysphagia, heartburn, 5kgs weight lost, chest pain and hiccups. On first evaluation the barium esophagogastroduodenal evaluation showed esophageal dilatation with bird peak distal segment. EGD revealed dilated esophagus with remanent food in the esophagus. The manometric findings were compatible with diffuse esophageal spasm. Patient was discharged with medical treatment but 7 months after she came in again because of continuous vomiting, severe dysphagia, and 12 kgs weight lost. In this new evaluation the EGD revealed no organic obstruction, dilated esophagus, and remanent food in it. The manometric pattern in this new evaluation was compatible with esophageal vigorous achalasia. The patient went under Heller myotomy with partial fundoplication.

Manometric findings: First manometric study showed effective primary peristalsis replacement with simultaneous waves in 40% of swallows. Second manometric study showed effective primary peristalsis replacement with simultaneous waves in 100% of swallows, with amplitude waves greater than 30mmHg.

**Conclusion:** Pathophysiology and natural history of esophageal diffuse spasm remains unclear. Hypersensitivity to cholinergic stimulus as in achalasia has been observed. It has been suggested that progression from esophageal diffuse spasm could precede achalasia in 2 to 5% of cases.

**P300—Flexible Diagnostic & Therapeutic Endoscopy**

**EFFICACY OF ENDOLUMINAL GASTROPLICATION FOR GASTROESOPHAGEAL REFLUX DEVELOPED AFTER LYMPH NODES DISSECTION ALONG THE LESSER CURVATURE OF THE STOMACH.** Hitoshi Idani MD, Takashi Ishikawa MD, Takayuki Iwamoto MD, Masahiko Muro MD, Tatsuki Ishii MD, Masahiko Maruyama MD, Shinichiro Kubo MD, Hiroki Nojima MD, Shinichiro Watanabe MD, Hitoshi Kin MD, Fukuyama City Hospital, Department of Surgery

Introduction: Endoluminal gastroplacation (ELGP) is one of the newly developed endoscopic treatments for gastroesophageal reflux disease (GERD). However, its efficacy has been demonstrated only for primary GERD and there have been no reports on ELGP for post-surgical GERD. In this paper, we report a case of GERD developed after perigastric lymph nodes dissection successfully treated by ELGP.

Case report: 75 year-old man presented with heart burn, regurgitation and dysphagia which had appeared after dissection of involved lymph nodes along the lesser curvature of the stomach performed with lateral segmentectomy for liver metastases from rectal cancer. Esophagastrogastrofiberscopy showed grade B esophagitis and small hiatal hernia. Since the symptom had not been controlled by medical therapy and Nissen fundoplication was not possible due to anatomical changes, ELGP was performed. Using BARD endoscopic suturing system (EndoCinchTM), two plications were placed at the esophagogastric junction (EGJ). The procedure time was 55min. There were no adverse events without a slight chest pain which disappeared within few days. The symptoms associated with GER markedly reduced after the treatment. Acid exposure time and bile reflux time were improved after the procedure (pH<4: from 57.9 to 39.6%, bile reflux: from 69.0 to 42.0%).

**Conclusion:** This case report shows that ELGP is safe and effective for GERD developed after perigastric lymph nodes dissection and may be indicated for GERD after Billroth-2T distal gastrectomy or pylorus preserving gastrectomy with lymph nodes dissection for gastric cancer.

**P301—Flexible Diagnostic & Therapeutic Endoscopy**

**INTERVAL COMMON BILE DUCT STENTING FOR NON EXTRACTABLE CBD STONES.** Saed A Jaber MD, Nick Rangnekar MD, Steve W Eubanks MD, University of Missouri - Columbia

Common Bile Duct Stones are a common cause of morbidity and mortality. Since the evolution of laparoscopic Cholecystectomy, Surgeons started to face more challenges in managing CBD stones with different modalities. Despite widely available technology for the removal of CBD stones, there is 3% of patients with CBD stones that fail extraction. The Goal of this study is to facilitate extraction of CBD stones that failed extraction at the initial attempt during ERCP by using interval Stenting of the CBD.

Method: Eight patients were diagnosed with CBD stones ranging from 1.5 to 2.0 Cm in diameter. All patients underwent ERCP. Extraction of stones failed at the initial attempt during ERCP by using interval Stenting of the CBD. Most patients were started on Ursodeoxycholic acid empirically with view to help soften the stones. After three to six weeks patient underwent a second ERCP. Successfully all CBD stones were extracted.

Conclusion: Interval Stenting is useful technique to facilitate extraction of multiple CBD stones that cannot be extracted at the initial attempt.

**P302—Flexible Diagnostic & Therapeutic Endoscopy**

**FLEXIBLE ENDOSCOPIC SUTURING AT THE CARDIA: DETERMINATION OF DEPTH.** Markus Kleemann MD, Albrecht Mueldner MD, Cord Langner MD, Bernd C Manegold MD, Department of Surgery, University Hospital Schleswig-Holstein, Campus Lübeck, Lübeck, Germany

Introduction: After the description and development of the first flexible endoscopic sewing machine by Paul Swain, several indications are reported: the subcardial placement of sutures to prevent gastroesophageal reflux, closure of perforations and control of hemorrhage. The anatomical depth of endoscopically placed sutures remains still unknown. This present study was designed to increase the knowledge about the fundamental anatomical situation of endoscopic suturing in the cardia. The aim was the determination of the depth of endoscopic placed sutures in a complete exenterative cadaver
model. Material and Methods: Overall 58 sutures were placed in the cardia of 10 complete exenterative cadaver model at three different suction levels, 0.4-0.6-0.8 bar using the suturing machine EndoCinch® (BARD). After preparation of the cardia from its anatomical bed, all sutures were fixed in formalin and stained with HE for histological examination. Results: Absolute and relative distribution of suction pressure and suture depth is listed in the following table:

<table>
<thead>
<tr>
<th>Suture Depth</th>
<th>0.4 bar</th>
<th>0.6 bar</th>
<th>0.8 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucosa</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Submucosa</td>
<td>6 (10.3%)</td>
<td>6 (9.5%)</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td>Cr. M.propria</td>
<td>4 (6.9%)</td>
<td>2 (3.4%)</td>
<td>4 (6.9%)</td>
</tr>
<tr>
<td>Ion. M.propria</td>
<td>5 (8.6%)</td>
<td>6 (10.3%)</td>
<td>4 (6.9%)</td>
</tr>
<tr>
<td>Extramural</td>
<td>5 (8.6%)</td>
<td>6 (10.3%)</td>
<td>1 (1.7%)</td>
</tr>
</tbody>
</table>

Conclusions: Most of the sutures were placed in the longitudinal M.propria or were placed transmural. A submucosal placement may lead to bunked sutures.

**P303–Flexible Diagnostic & Therapeutic Endoscopy**

**SYMPTOMATIC MESOCOLIC STRICTURE AFTER RETROCOLIC LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: TREATMENT BY ENDOSCOPIC DILATATION,** Brian Lane MD, Samer Mattar MD, Amy Biedenkoch MS, Faisal Qureshi MD, Joy Collins MD, Paul Thodyil MD, Tomasz Rogula MD, Pandu Yenumula MD, Laura Velcu MD, Giselle Hamad MD, George Eid MD, Ramesh Ramanathan MD, Philip Schauer MD, Department of MIS Surgery, University of Pittsburgh Medical Center

INTRODUCTION: Internal hernias at the mesocolic defect after retrocolic laparoscopic roux-en-Y gastric bypass have been demonstrated to be a potential site for small bowel obstruction. Many have emphasized complete and secure closure of all potential internal hernia defects when performing LRNYGB. Conversely, isolated cases of obstruction at the mesocolic defect have been reported. We report two cases of stricture at the mesocolic opening in retrocolic, antegastric LRNYGB diagnosed at endoscopy and treated by balloon dilatation.

**METHODS AND RESULTS:** Two patients, ages 26 and 53, with BMI of 46 and 42 kgm2 respectively, underwent uncomplicated retrocolic antegastric LRNYGB. In both cases, the mesocolic and Petersen defects were closed with a running 2-0 silk endostitch on the medial and lateral aspects of the mesentery. Both patients had an uneventful postoperative course. One patient presented five weeks postop with complaints of vomiting to solid foods. The second patient presented ten weeks postop with complaints of progressive dysphagia to solid and soft foods. Both initial UGI studies were initially felt to be unrevealing. Both patients underwent esophagogastroscope. The gastrojejunal anastomoses were 9-10 mm in diameter, and the endoscope could pass easily. Further investigation revealed a tight narrowing of the jejunum at the location where the jejunal roux limb would pass through the retrocolic space. This narrowed area was dilated with a 16 mm balloon to 5 atm. Subsequently the endoscope was able to be passed easily through the jejunal stricture. Both patients had prompt resolution of symptoms which continued through six months follow up. Retrospective review of the pre-endoscopy UGI study showed a focal narrowing consistent with a partial obstruction at the mesocolic defect.

**CONCLUSION:** Stricture of the jejunum at the point where the roux limb passes through the mesocolic defect in retrocolic LRNYGB may be a cause for partial obstruction symptoms similar to those seen with gastrojejunal stricture. Gastrojejunal stenosis is the more commonly described finding with solid food dysphagia after LRNYGB. When this is not found, endoscopic exam more distally should be considered to assess and treat a jejunal stricture.

**P304–Flexible Diagnostic & Therapeutic Endoscopy**

**ACUTE CHOLECYSTITIS FOLLOWING COLONOSCOPY: TWO CASE REPORTS AND LITERATURE REVIEW,** Faizal Aziz MD, Perry Milman MD, John McNelis MD, Long Island Jewish Medical Center, New Hyde Park NY

**INTRODUCTION:** Sporadic reports of acute cholecystitis following colonoscopy have previously been described. Two cases are presented and the relatively sparse medical literature on this subject is reviewed.

**MATERIALS AND METHODS:** The medical and surgical records of two cases were reviewed retrospectively. Data acquired included demographic, medical, surgical, and outcomes. The available literature was then reviewed and all reported cases were summarized.

**RESULTS:** CASE 1: A 63-year-old female who presented to ER with severe epigastric pain 24 hours post colonoscopy with polyectomy. After a diagnosis of acute cholecystitis was made, the patient underwent uneventful laparoscopic cholecystectomy. The gall bladder was found to be distended, tense and gangrenous.

CASE 2: 60 year old male who 72 hours post colonoscopy and polyectomy, presented to the ER with acute cholecystitis. The patient underwent uneventful cholecystectomy. Pathology revealed acute and chronic cholecystitis with extensive hemorrhage and reactive epithelial atypia.

**P305–Flexible Diagnostic & Therapeutic Endoscopy**

**ENDOSCOPIC FINDINGS ON COMPLICATIONS AFTER GAS- TRIC BAND,** J A Palacios-Ruiz MD, J J Herrera-Esquível MD, G A López-Toledo MD, L E González-Monroy, General Hospital Dr. Manuel Gea Gonzalez

**INTRODUCTION:** Nowadays obesity represents a World Health concern, in Mexico 60% of population is overweight. Surgery is considered last frontier in treatment. There are several options described for surgical treatment, one of the most popular due to low mortality and morbidity is laparoscopically placed gastric band.

**Material and methods:** We performed endoscopies on postoperative patients after laparoscopically placed gastric band. The cause of reference was disfagia followed by epigastric pain.

**Results:** Most frequent findings were esophagitis, esophageal diverticulae, gastric band migration, pseudoachalasia within others.

**Summary:** Complications after gastric band placing are relatively unknown, being band migration the most frequent; however after times goes by and more experience is accumulated, there are other adverse events that are presenting.

**P306–Flexible Diagnostic & Therapeutic Endoscopy**

**ENDOSCOPIC IDENTIFICATION OF THE JEJUNUM FACILI- TATES MINIMALLY INVASIVE JEJUNOSTOMY TUBE INSERT- INATION IN SELECTED CASES,** NIAZY M SELIM MD, University of Arkansas for Medical Sciences

**Background:** Percutaneous endoscopic gastrostomy tube, Direct percutaneous endoscopic jejunostomy and laparoscopic feeding tube insertion are established techniques for feeding tube insertion. However, these techniques may be difficult or contraindicated after previous gastric or upper abdominal surgery. Methods: In one year, eight cases underwent minimally invasive jejunostomy tube insertion via endoscopic identification of the jejunum. Indications of the procedure were dysphagia, poor nutritional status and prolonged ICU admission.

Seven patients had previous upper abdominal surgeries and
were rejected for either percutaneous Endoscopic gastrostomy (PEG) or direct percutaneous jejunostomy. Under general anesthesia, EGD was performed. The jejunum was identified and intubated. A small abdominal incision (1 inch) was done. The proximal jejunum was identified easily by the light of the endoscope and the digital palpation of the endoscope. The jejunum was delivered in the wound and the Jejunosmotry tube was inserted using Witzel technique. The wound was closed. Results: All of the patients tolerated the procedure well. The mean time for the procedure was 20 minutes. There were no mortality related to the procedure. There were no complications. Feeding started in the next dayConclusions: The use of intraoperative endoscopy facilitated the identification of the Jejunum. It saved the patient a formal laparotomy and extensive manipulation. It is easy, safe and quick.

P307–Flexible Diagnostic & Therapeutic Endoscopy
ENDOSCOPIC APPEARANCE OF A SURVIVAL PORCINE MODEL OF THE POST GASTRIC BYPASS STATE, Matthew Sheppard MD, Steven P Bowers MD, Wilford Hall Medical Center

Background: The porcine foregut anatomy closely resembles the human, making it the ideal model for development of new surgical and endoscopic procedures. The author sought to develop a porcine gastric bypass model for training and development of endoscopic procedures in the post-gastric bypass state.

Methods: Eight healthy pigs (sus domestica) weighing 80 to 120 pounds were subjected to open Roux en Y gastric bypass with hand-sewn gastrojejunostomy of a 50 mL proximal gastric pouch to a 60 cm Roux limb. Animals were returned to soft gruel diet 24 hours after operation, were weighed weekly, and underwent endoscopy prior to euthanasia and necropsy. Gastrojejunostomy anastamotic circumference was measured at operation and at necropsy done between three and ninety days postoperatively.

Results: The endoscopic anatomy of the post-gastric bypass state closely resembled that of human patients. The inclusion of the gastric fundus in the proximal gastric pouch did not affect the endoscopic appearance of the model, and was associated with a trend towards improved complication free survival (p=0.1, Fisher’s exact test). Four animals were euthanized due to clinical deterioration on postoperative days 3, 11, 17 and 33. Two of these had perforated ulcers of the proximal gastric pouch. Another animal had anastamotic dehiscence and the fourth had anastamotic abscess without perforation. All animals had rapid spontaneous dilatation of the gastrojejunostomy anastamosis with an mean increase in anastamotic circumference of 4.8 cm, despite a limited diet that induced average weight loss of 3.4 pounds per week. Anastamotic dilatation was accelerated in animals with postoperative complication.

Conclusions: The porcine gastric bypass model closely approximates the endoscopic appearance of human anatomy in the post-gastric bypass state, but measures of weight loss and anastamotic size are not meaningful outcomes and long-term studies are prohibited by excess weight loss.

P308–Flexible Diagnostic & Therapeutic Endoscopy
THE ROLE OF EARLY ERCP IN BLUNT HEPATIC INJURY WITH BILIARY FISTULA: A CASE SERIES AND REVIEW OF THE LITERATURE, William R Silliman MD, Kimberly A Lieber MD,Nitin Ranganekar MD, Department of Surgery - University of Missouri-Columbia

Background: The liver is one of the most common organs injured from blunt abdominal trauma. Historically, treatment of severe liver injuries required an exploratory laparotomy. The objectives of the operation were: 1. control hemorrhage, 2. debride necrotic tissue and 3. drain the right upper quadrant. Today, nonoperative therapy for hepatic injuries is being utilized with increasing frequency. Instead of a laparotomy, patients will undergo angiography, which is often successful at controlling hemorrhage. However, biliary injury associated with blunt liver trauma, if left untreated may result in bile leak, abscess formation, or hemobilia. To the author’s knowledge, no studies have established a role for early endoscopic retrograde cholangiography (ERCP) in patients with severe liver injury after blunt abdominal trauma.

Methods: We report a case series of three patients who underwent ERCP to treat biliary injuries secondary to blunt abdominal trauma. All patients had biliary injury confirmed radiographically or clinically prior to the performance of the ERCP. The patients’ clinical course, morbidity and mortality will be reviewed.

Results: All three patients underwent successful ERCP with sphincterotomy. Two of the three had stent placement at the initial procedure. The patient who underwent ERCP with sphincterotomy alone had a recurrent biloma which required repeat ERCP with stent placement. There were no mortalities associated with the procedures.

Conclusion: ERCP allows both diagnostic and therapeutic goals to be achieved in a single intervention. It appears ERCP with sphincterotomy and stenting is safe and may be utilized to treat patients with biliary injury after blunt abdominal trauma. However, more studies are needed to establish a role for early ERCP in patients with severe liver injury after blunt abdominal trauma.

P309–Flexible Diagnostic & Therapeutic Endoscopy
POSTER: IS INTRAOPERATIVE ENDOSCOPY STILL IMPORTANT FOR THE MANAGEMENT OF OBSCURE INTESTINAL BLEEDING?, S Truong, J Nutzmann,O Schumacher,R Schwab,V Schumpelick, Chirurgische Klinik und Poliklinik der Rheinisch Westfalischen Technischen Hochschule Aachen

Background: In a retrospective study we tested the importance of intraoperative endoscopy in 19 patients, 4 patients with occult bleeding, 15 patients with a haemoglobin relevant massive haemorrhage. Method: All 19 patients underwent laparotomy under general anaesthetic. After solving adhesions we either used a gastroscope intubated over an enterostomy or a colonoscope intubated orally. Advancing the endoscope in the small intestine was done by the surgeon by slipping the small intestine slowly over the endoscope. Results: A complete evaluation of the small intestine was possible in all 19 patients. The cause for bleeding was found in 15 patients. 5 patients showed angiodysplasia, 3 patients ulcer, 2 patients had haemorrhage from a diverticulum, 1 patient had Peutz-Jeghers-Syndrome, 1 patient had Crohn’s disease, 1 patient suffered from radiation induced enteritis, 1 patient had variceal bleeding and 1 patient had bleeding from a carcinoma. 12 patients underwent a segmentresection of the small intestine, in 2 cases segmentresection and ulcer excision and in 1 case segmentresection and endoscopic treatment with clips and fibrin injection was done. In 4 patients only laparotomy was performed as no reason for haemorrhage was found. 3 patients had a recurrence bleeding, 1 had to undergo surgery a second time. In 14 of 15 cases of massive bleeding the diagnosis and location could be found correctly. Therefore the cause for massive bleeding can be correctly identified in 93% through intraoperative endoscopy, whereas in only 25% of cases of occult bleeding identification can be achieved. Conclusions: Correct diagnosis and location of a massive bleeding can be achieved in 78% by intraoperative endoscopy and is still a major advice to find the correct diagnosis and location of obscure intestinal bleeding. Keywords: intraoperative endoscopy, obscure intestinal bleeding, small intestine
P310–Flexible Diagnostic & Therapeutic Endoscopy
ENDOSCOPIC REMOVAL OF SIGMOID COLON FOREIGN BODY: WHAT TO DO WITH A TRAPPED BREAD BAG CLIP?, K J Wirsing MD, D E Scheeres, M.D., FACS, Grand Rapids General Surgery Residency Program, Grand Rapids, MI
Introduction: Ingestion of plastic bread bag clips is a rare but potentially life threatening cause of bowel obstruction or perforation. At least 25 cases of ingestion of this foreign body have been reported in the medical literature. We present a patient who presented with rectal pain and bleeding after she unknowingly swallowed a plastic bread bag clip, and review the literature on this topic as well as the relevant anatomy. Case: A 59 year-old female presented with intermittent hematochezia. Colonoscopy revealed a foreign body 35 cm from the anal verge, which was identified as a plastic bread bag clip. Its two teeth had encircled a hastral fold and eroded through its base, creating a colo-colonic fistula which trapped the clip in the colonic mucosa. Attempts to forcibly remove the bag clip using a polypectomy snare, endoscopic scissors, and toothed forceps failed.
Following a mechanical and antibiotic bowel prep, a flexible sigmoidoscopy was performed. An endoscopic sphincterotomy catheter was passed under the hastral fold through the fistula, and the opening was enlarged by cutting the hastral band with the wire directed towards the colonic lumen. After this, the tip of a snare device was used to incise the top of the hastrum in a longitudinal fashion to reduce the size of the fold trapping the bread bag clip. The clip was then grasped with rat-tooth forceps and manipulated until it disengaged from the hastrum. The foreign body was removed with no radiographic evidence of bowel perforation and an uneventful observation overnight in the hospital.
Conclusion: Bread bag clips that become entrapped on mucosal surfaces can be difficult to remove. Use of an endoscopic sphincterotomy catheter and a polypectomy snare to cut the mucosal fold has not been described in the literature, and is a safe method to remove this foreign body from the colon.

P311–Hernia Surgery
COMPARATIVE STUDY OF INCIDENCE OF WOUND INFECTION, PAIN AND QUALITY OF LIFE IN PATIENTS UNDERGOING INGUINAL HERNIA MESH REPAIR BY LAPAROSCOPY AND OPEN METHOD, Sandeep Aggarwal MD, Arvind Kumar MD, Madhusudan MD, Rajinder Parshad MD, Sandeep Guleria MD, Hemraj Pal MD, Department of Surgical Disciplines and Psychiatry* All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, India
ABSTRACT
TITLE: Comparative Study of incidence of wound infection, pain and quality of life in patients undergoing inguinal hernia mesh repair by laparoscopy and open method
BACKGROUND
Laparoscopic surgery for inguinal hernia is gaining increasing popularity, both among the patients as well as surgeons. The main reported benefits of the laparoscopic approach to unilateral inguinal hernia repair are decreased postoperative pain and decreased wound infection rate. In recent years, the outcomes of different health care interventions have been assessed in terms of quality of life. Therefore we did a prospective non-randomized study to compare the incidence of wound infection, pain and quality of life in patients undergoing inguinal hernia repair by laparoscopic and open methods.
Methods
Between January 2002 and November 2003, 90 patients above the age of 18 years of age with a clinical diagnosis of uncomplicated unilateral inguinal hernia were assigned to open method of hernia repair by Lichtenstein technique (Group A, n=60) and laparoscopic hernia repair (Group B, n=30).
RESULTS
There was no significant difference in wound infection rate between the two groups. The pain scores were higher in the open group in the early postoperative period. At the end of three months following surgery, the pain scores were similar in the two groups. However, there was no difference in the quality of life in the two groups at any time in the postoperative period (at the end of one week, 1 month and 3 months).
CONCLUSIONS
Laparoscopic repair of unilateral inguinal hernia offers no advantage over open repair in terms of improved quality of life. However the pain scores are lower in the early postoperative period in the laparoscopic group allowing early mobilisation and possible early return to work.

P312–Hernia Surgery
MINILAPAROSCOPIC INGUINAL HERNIA REPAIR, Ferdinando Agresta (1) MD, Emanuele Santoro (2) MD, Luigi Francesco Ciardo (1) MD, Giacco Mulieri (2) MD, Natalino Bedin (1) MD, M. Rizzi (1) MD, Department of General Surgery, Civil Hospital, Vittorio Veneto (TV); (2) Dept. of General Surgery ?Nuovo Regina Margherita? Hospital, Rome - Italy.
INTRODUCTION: Laparoscopy has recently been characterised by an increasing development of smaller laparoscopes, trocars and operative instruments, thus in order to minimise more nerve and muscle damage and to optimise aesthetic results. As a consequence minilaparoscopy has been gradually employed in the treatment of several pathologies.
Minilaparoscopic surgery has recently commenced in the treatment of inguinal hernias, similar to its ?major sister? laparoscopy. The indications for latter are well defined (bilateral or recurrent hernias or patients desiring or requiring a fast recovery to resume normal activities), however not completely clear for the feasibility of the minilaparoscopic technique.
The aim of this study is to evaluate retrospectively the last three years of patients who underwent minilaparoscopic transabdominal inguinal hernia repair (miniTAPP) at Our Institutions.
Materials and Methods: Between February 2000 and December 2003 a total of 303 patients (mean age 45 years) underwent a miniTAPP procedure. Amongst them, 213 (70.2%) were operated on for a bilateral diseases and 90 (28.7%) for a monolateral defect, with a total of 516 hernia defects repaired.
Results: No conversion to laparoscopy or anterior open approach was registered. Major complications were nil whilst minor occurrence ranged as high as 0.3%. Hospital stay was the same as a laparoscopic approach with a faster recovery to a normal activity and less analgesic requirement.
CONCLUSIONS: On the basis of our initial experience minilaparoscopic preperitoneal transabdominal hernioplasty is feasible, effective and easy to perform (without any increase in technique difficulties) in experienced hands. MiniTAPP provides positive and comparable results concerning the operative time, post op. morbidity and hospitalisation as the classical LAP. Spanning patients a wider skin incision in the trocars site might reduce postoperative pain, increase prompt recovery of gastrointestinal functions, shorten hospitalisation, help contain health-care costs and increases cosmesis. This approach appears to play a crucial role in the laparoscopic approach of all kind of hernias in patients not previously having had abdominal surgery.

P313–Hernia Surgery
LAPAROSCOPIC VS. OPEN INCISIONAL HERNIA REPAIR: A COMPARATIVE STUDY, C G Andrew MD, L S Feldman MD, W Hanna, S Bergman MD, M Vassiliou MD, S Demytenaere MD, D Shorebridge RN, G N Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.
Introduction: Laparoscopic incisional hernia repair (LIHR) has been shown to be safe and feasible. However, comparative studies have had conflicting results. Our goal was to compare short-term outcomes and recurrence rates after laparoscopic vs. open incisional hernia repair (OIHR). Methods: Charts were reviewed of all patients who had elective mesh repair of incisional hernia at a single institution over a two year period. Patients were contacted by telephone and subsequently examined in clinic. Using an intention-to-treat analysis, LIHR (n=42) and OIHR (n=97) data were compared using Student?es T, Chi Square, and rank sum tests. Results: Both groups were similar with respect to age, gender and ASA. There were more morbidity obese patients in the
LIHR group (27.5% vs. 10.3%, p=0.01) and more patients with previous incisional hernia repair (48.8% vs. 27.8%, p=0.01). Mean operation time was greater in the LIHR group (129+/− 19 minutes vs.105+/− 12 minutes, p=0.04); however, median hospital stay was shorter (1.0, range 0.5-24 days vs. 3.0, range 0.5-53 days, p<0.01). Fewer early postoperative complications occurred after LIHR (14.3% vs. 35.1%, p<0.01). Clinical follow-up was achieved in 93% of the LIHR group and 66% of the OIHR group. Mean length of follow-up was 18.9+/−10.6 vs. 22.9+/−10.3 months (p=NS). Hernia recurrence rates did not differ significantly between LIHR and OIHR (25.3% vs. 31.0%, respectively, p=0.20). The recurrence rate in the first 14 LIHR patients was 46.7%, as compared to 12.5% in the last 24 patients (p<0.03).

Conclusions: At our institution, LIHR was associated with shorter hospital stay and fewer early postoperative complications than OIHR. Unlike in other studies, no improvement was detected with respect to hernia recurrence rates. This may be accounted for by the learning curve phenomenon, the close follow-up in the LIHR group, and the intention-to-treat analysis.

P314–Hernia Surgery

LAPAROSCOPIC TREATMENT OF THE POSTOPERATIVE HERNIAS, Annibale Casati MD, Giovanni Perrucchini MD,Eugenio Guidotti MD, Luca Magni MD, Clinica Castelli (BG) Italy

Background: Thanks to the improvement made in the field of micro-invasive surgery and the growing necessity for the patient to be healed with less pain, in a more safe way and in less time, we can consider that the postoperative hernias can be cured by laparoscopy.

Methods: In the story of this possibility, we do not have to remember that the prostheses that, according to Reeve we could use to repair the postoperative hernia with the open technique, were polypropylene prostheses, that could not be kept in contact with the intestinal ansa, due to the risk of adhesion with retractions of the foreign body reaction, till intestinal perforations.

With the coming of polypropylene covered in a collagen film and of Goretex covered in bacteriostatic, the discussion about the reconstitution of the post operative hernia via laparoscopy has reopened.

From January 2002 to December 2003, we treated via laparoscopy 65 postoperative hernias, according to the following method we are going to explain.

The patients had to have a postoperative hernia no bigger than 8 cm of diameter, in order to overcome, with the prostheses currently available in the market, the hernial defect of about 5 cm.

The material used to repair the parietal defect was used in 40 Parietex cases and 25 Goretex cases. The Parietex prostheses were fixed to the walls with spiral metallic clips in the first 30 cases and subsequently with Parietex, while the Goretex prosthesis on the four cardinal points with prolene mesh and on the border with metallic spirals.

The lysis of adhesions was performed in every case, before the reduction of the hernial content and of the positioning of the prosthesis.

Results: The postoperative course was excellent with home visit the 2nd/3rd day, the postoperative pain minimum and the renewal working activity precocious. In the more severe post operative hernia cases, there has been the formation of pre-prosthesis seroma in 10,2%, where a part got reabsorbed. During the last two years 2 relapses (3%) have been solved using laparoscopy technique.

Conclusion: According to our experience we can say that, even if the follow-up is still brief, this method can represent a valid alternative to the traditional methods and bring to a total excellent outcome by improving the techniques and the materials used.

P315–Hernia Surgery

LAPAROSCOPIC MESH REPAIR OF AN INTERCOSTAL ABDOMINAL HERNIA, Ajay K Chopra MD, Wiljon Beltre MD, Patrick R Reardon MD, Department of Surgery, University of Texas Health Science Center at Houston, The Methodist Hospital, Houston, Texas.

Introduction: Intercostal abdominal hernias have been rarely reported in the literature. Most patients have an antecedent history of abdominotheracic trauma including rib fractures. We present a left sided intercostal abdominal hernia without any history of trauma which was managed successfully with a laparoscopic mesh repair.

Methods: A 70-year-old man presented with a 15X30 cm reducible swelling between eighth and ninth ribs on the left side, extending from an open costal margin anteriorly along the eighth intercostal space and posteriorly. The swelling completely disappeared when patient assumed a right lateral decubitus position resulting in a large depression. There was separation of ribs at the costal margin. History was significant for an episode of acute bronchitis resulting in violent coughing, following which he noticed bruising and ecchymosis on the left lower chest. A bulge appeared in that area six months later, which subsequently increased in size. A CT scan of the abdomen and pelvis showed a wide necked hernia with splenic flexure, omentum and a loop of small bowel as its contents. A diagnosis of left intercostal abdominal hernia was made and patient scheduled for a laparoscopic repair. The hernia was successfully repaired laparoscopically. The defect was 8X20 cm in size. The diaphragm was intact. A 20X30 cm Gore-Tex Dual Mesh was used for repair. The mesh overlapped the defect by at least 5 cm in all directions. Tacks were placed at one cm intervals all around the mesh and the portions overlying muscle were further secured with Gore-Tex #2 transmuscular sutures placed at 5 cm intervals. The patient was discharged on second postoperative day. In the first 24 hours and on one-month he had no complaints and the repair was sound.

Conclusion: Abdominal intercostal hernias can be successfully managed with slight modification of a standard laparoscopic prosthetic repair technique.
P317–Hernia Surgery
10 YEARS CONTROLLED STUDY COMPARING LAPAROSCOPIC TRANSABDOMINAL PREPERITONEAL TO LICHENSTEN INGUINAL HERNIA REPAIR, O. Avrutis MD, M Dudai, V. Michalevsky MD, O Sibisky MD, J. Meshoulam MD, A. Durst MD, Tikur Chaim Hospital, Jerusalem, Israel
Background: Lichtenstein tension free mesh repair (LTFMR) is a time-tested, simple, safe and well-understood procedure with a high success rate. Laparoscopic transabdominal preperitoneal inguinal hernia repair (TAPP) is the first established laparoscopic technique. Few studies have compared hernia mesh repair of TAPP with LTFMR.
Methods: To compare operative time, complications, postoperative pain, length of hospital stay, recurrence rate, and time until return to normal daily activity on long term between LTFMR and TAPP.
Results: The mean operative time of LTFMR for unilateral and for bilateral repair was significantly shorter than in the TAPP group: 43.3 min vs. 64.4 min and 77.6 min vs. 108 min, respectively (p = 0.006). There were 23 complications (5.5%) in LTFMR group and 21 complications (4.2%) in TAPP group (p = NS). The mean postoperative hospital stay after LTFMR and TAPP was similar: 1.36 day and 1.79 day. There were three recurrences in both groups (0.7%/0.6% respectively, for TAPP only at the first year). There were not significant differences in the mean postoperative pain scores, analgesic doses, and the time until return to the normal daily activity between compared groups.
Conclusion: This result suggests that TAPP inguinal hernia repair is comparable with Lichtenstein repair regarding postoperative pain, complications, recurrence, and time until return to normal daily activity. Operative time of LTFMR is significantly shorter than TAPP only at the early experience period.

P318–Hernia Surgery
OUTCOMES OF LAPAROSCOPIC VENTRAL HERNIA REPAIR IN A TEACHING INSTITUTION, Tamara L Ellis BA, Juliane Bingener MD, Wayne H Schwesinger MD, Melanie L Richards MD, Kenneth R Sirinek MD, Dept of Surgery, UTHSCSA.
Background and Clinical Significance: Ventral incisional hernia repairs constitute one of the most frequently performed surgical procedures in the United States. Recently laparoscopic VH repair as been added to the armamentarium of surgical techniques. Reports of follow up from several specialized centers are available, however few data about the patient outcome in the teaching environment. The primary aim of this study is to retrospectively evaluate the patient outcome after laparoscopic ventral incisional hernia repair in a teaching hospital.
Secondary aim is to identify potential risk factors for hernia recurrence.
Study design and methods: Data from patients who underwent a laparoscopic ventral incisional hernia repair since 1999 were prospectively collected in a data base and retrospectively reviewed. Additional data were corroborated through chart review. Data regarding demographics, comorbidities, procedures specific data and outcome variables were collected.
Results: From 1999 to 2004 104 patients underwent laparoscopic ventral incisional hernia repair; 19 men (18%) and 85 women (82%). The mean age was 51 years, (range 21-71).
Average mesh size was 310 cm². The majority of the patients were obese. The VH repair was assisted by a resident in PGY year 1 in 2 patients, in PGY year 2 in 13 patients, PGY 3 in 20 patients, PGY 4 in 1 patient and PGY 5 in 68 patients. There were 10 recurrences (10%). The recurrence rate for patients who underwent lap VH repair with the assistance of a junior resident was 11.5%, for a senior resident it was 8.6% (NS). The mean estimated blood loss was 33 cc (range 10-300 cc). 27 patients had complications (25%). 2 patients (2%) required reoperation. 24 (92%) of the complications were grade 1 (seroma, urinary retention). No mortality or disabling morbidity was noted. The complication rate for senior residents was 30%, for junior residents 17%. The mean follow-up ranged from 1-59 months.
Conclusion: Laparoscopic ventral incisional hernia repair in a teaching environment is feasible and safe. In selected patients this advanced laparoscopic procedure can be performed by junior residents with similar outcomes as their senior colleagues.

P319–Hernia Surgery
COMPOSIX SEPARATION: A REPORT OF THREE CASES, Andrew G Harrell MD, Kent W Kercher MD, William S Cobb MD, B. Todd Heniford MD, Carolinas Medical Center
Background: Standard laparoscopic ventral hernia repair requires the use of a composite mesh. Delamination of the components can occur with a subsequent intra-mesh fluid collection and infection, which requires surgical resection.
Methods: Patients with Composix mesh infections where the mesh separated, developed a fluid collection and became infected were reviewed.
Results: Three patients referred from outside institutions were identified. They included 1 male and 2 female patients age 52, 39, and 89. Each patient had a laparoscopic ventral hernia repaired with intraperitoneal placement of the Composix mesh. The patients presented with abdominal pain and redness of the abdominal wall at 3 months, 11 months, and 16 months after original implantation. CT imaging demonstrated the mesh components had separated and the intra-mesh space contained enhancing fluid collections. All patients required mesh removal with primary abdominal wall closure.
Staphylococcus aureus was grown from the infected fluid collection in each case. Subsequent hernia recurrence was noted in 2 of the 3 patients, and one of the patients has undergone successful laparoscopic repair.
Conclusion: Despite the improvement in mesh prosthetics, some complications will occur. This series of patients describes an unusual and rare event. Prior descriptions of mesh separation are limited. Successful management of this problem requires mesh removal, primary closure with possible recurrent hernia repair in the future.

P320–Hernia Surgery
LAPAROSCOPIC TOTALLY EXTRAPERITONEAL (TEP) REPAIR OF RECURRENT HERNIA WITH PREVIOUS MESH AND PLUG REPAIRS, Kyuna Y Kim MD, Koo Young Mann MD, Jae Young Jung MD, Sang Hwa Yu MD, Seung Han Kim MD, Yong Geul Joh MD, Seon Han Kim MD, Dong Keun Lee MD, Laparoscopic Surgery Center, Department of surgery, Hansol Hospital, Seoul, Korea
Introduction: We report our experiences of laparoscopic totally extraperitoneal (TEP) repair for recurrent hernia with previous mesh and plug repair. Laparoscopic hernioplasty is effective especially for the recurrent hernia that have previously been repaired using a conventional anterior technique. But in case of recurrent hernia with previous mesh and plug repair can be troublesome because of dense scar at the site of the plug with peritoneum and entire abdominal wall.
Methods: Between December 2000 and July 2004, 221 laparoscopic hernia repairs were performed. Among them, three cases of recurrent hernias with previous mesh and plug repair were managed by laparoscopic TEP repair. Balloon dissector was not used to avoid unexpected peritoneal tearing.
Results: The average period between the initial operation and the second operation was 10 months. Two cases were recurrent indirect hernia after repair for indirect hernia. The hernia defects were located between inferior epigastric vessels medially and plug laterally. Mesh prostheses were placed on the plug and abdominal wall to cover hernia defect and fixed with stapler. The lateral dissection was not possible due to dense...
adhesion between plug and peritoneum in these two cases. The third case was newly developed direct hernia after indirect hernia repair and the operative procedure was not unusual. The operative time averaged 56 min (range, 28-90) and all patients were discharged within 23 h. These patients were followed 3 to 32 months and no recurrences were observed. Conclusion: We have found that laparoscopic TEP repair of recurrent hernia with previous mesh and plug repair is feasible without removing plug. Comprehensive understanding of the anatomy of the hernia is critical. Further investigation with long term follow-up is needed to assess the safety and efficacy of this technique for recurrent hernia with previous mesh and plug repair.

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TEP INGUINAL HERNIA REPAIR: WHICH MESH AND HOW TO FIX IT?, Asim Shabbir BS, Shridhar Iyer BS, Wei Keat Cheah BS, Raj H Sidhu BS, Charles TK Tan BS, Davide Lomanto MD, Minimally Invasive Surgical Centre (MISC), National University Hospital, Singapore

Laparoscopic hernia surgery is gaining its role because of the benefits to patients that are evident from many published RCT when compared lap to open repair: less postop pain and analgesic consumption, earlier return to normal activities and work, less chronic pain and permanent paraesthesia. But technical factors are important to achieve satisfactory results. A review of our experience was undertaken involving 280 consecutive patients who underwent 350 extraperitoneal inguinal hernia repair (1998-2003) at the National University Hospital, Singapore. We performed 234 unilateral repair and 116 bilateral repair. The hernia repair was performed using three methods: in group 1: polypropylene mesh was anchored with spiral tacker (n=229); in group 2, polypropylene mesh without anchoring (n=51); and in group 3 a multifibre polyester anatomic mesh was utilized (n=70). The mean age was 49 years (range 20-81) and 85% were men. The overall mean operative time was 50 min (range 35-180 min); bilateral repairs took 27% longer than unilateral repairs. Complications rate was significantly lower in group 3 (2.8%) compared to group 2 (13.7%) and group 1 (5.6%). The recurrence rate was 11.3% when the mesh was not anchored, 16% when the mesh was anchored and no recurrence was recorded when anatomic mesh was utilized (mean follow-up 9 months). There was no recurrence detected in the last 112 cases (70: anatomic mesh; 42: polypropylene mesh and tacker). The overall mean inpatient hospital stay was 1.4 days, and of the last 30 cases, 70% were performed as outpatient. Laparoscopic inguinal hernia repair is a relatively new approach in the long history of groin Hernia repair. To achieve an acceptable recurrence and complication rate, surgical technique is very important. An adequate anatomical dissection together with a correct mesh placement, orientation and anchoring are the key factors. Data from our study showed that using anatomic mesh we can achieve the same recurrence and morbidity rate as using mesh plus fixation with tacker but with lesser cost. Laparoscopic approach remains an alternative and feasible method to open hernia surgery. In our 6 years experience, TEP hernia repair can be done with minimum morbidity and in the majority of cases can indeed be performed in the Day Surgery setting provided once the learn curve has overcome, and the repair can be accomplished with good clinical outcome.

P322–Hernia Surgery

LAPAROSCOPIC TOTAL EXTRAPERITONEAL (TEP) INGUINAL HERNIA REPAIR UNDER EPIDURAL ANAESTHESIA: A DETAILED EVALUATION, Pawanindra Lal MD, Nikhil Gupta, Prejesh Philip MD, Abhijit Basu MD, Venod K Ramteke MD, Department of Surgery, Maulana Azad Medical College & Lok Nayak Hospital, New Delhi, India

BACKGROUND: Laparoscopic total extraperitoneal (TEP) inguinal hernia repair is as efficacious as the open Lichtenstein's, can be learnt with proper training, incurs lesser post-operative costs and early return to work. The one major factor preventing the widespread acceptance of laparoscopic TEP is the requirement for general anaesthesia (GA) for its conduct. This study attempts to evaluate whether laparoscopic TEP can be performed under lesser invasive anaesthesia such as regional anaesthesia, its feasibility and limitations.

METHOD: A total of 22 patients were studied between Jan 2002 and March 2003 in a tertiary care referral hospital. Epidural anaesthesia was given using a lumbar epidural catheter and 2% Lignocaine with Adrenaline (Adr) achieving a sensory level of T6. Standard technique for laparoscopic TEP using three midline infraumbilical ports was used.

RESULTS: A total of 22 cases (20 unilateral, 2 bilateral) were operated. The mean operating time was 67.8 (range 40-110) mins. All 22 cases were started using epidural anaesthesia of which 15 (68.1%) were completed under epidural anaesthesia and 7 (31.9%) were converted to GA. No cases were converted to open. The only intraoperative complications were pneumoperitoneum and shoulder tip pain (9 cases each). There was no statistical difference between the cases conducted under epidural (67.6 mins) and those converted to GA (69.3 mins) or between the conversion rates of smaller versus larger hernias in this study (p value 0.22). Significant association of success of the procedure was seen with a sensory level of T6 (cases upto T6 and above :15 cases of which 2 were converted—conversion rate 13.3% and cases with sensory level was below T6: 7 cases of which 5 were converted: conversion rate 71.4%, p=0.014) and adequate epidural catheter length (P=0.015). Of the 9 cases with severe shoulder tip pain, 6 were converted to GA-67%; p=0.006, p<0.05). There were no significant postoperative complications and no recurrences were noted till a mean follow up period of 24 months (18-30 months).

Conclusions: From the present study it is clear that laparoscopic TEP is possible under epidural anaesthesia providing a minimal sensory level of T6 is achieved. Pneumoperitoneum, shoulder tip pain, intraoperative straining and inadequate preperitoneal space are factors whose interplay leads to conversion to GA. The size of the hernia is not related to pneumoperitoneum or conversion to GA.

P323–Hernia Surgery

LAPAROSCOPIC LOW ABDOMINAL HERNIA FIXATION TO COOPER’S LIGAMENT, Rober McKay MD, St. Vincent Medical Center

Laparoscopic repair of low abdominal wall hernias presents a challenge in fixation of mesh, especially in the obese patient. Few reports have suggested repair by tack fixation of mesh to Cooper’s ligament in patients; however, no case series have been reported to date.

Eight women, mean age 52.6 years, range 37 to 74 years, presented with nine low abdominal hernias. Body mass index averaged 52.6, range 21 to 50.6. Seven hernias were diagnosed clinically; seven were incisional, one primary midline and one recurrent Spigelian hernia. All hernias were repaired with mesh fixation to Cooper’s ligament using the ProTac®. Four large lower abdominal wall hernias were repaired with Bard Composite mesh; five smaller hernias, both midline and lateral, were repaired with polypropylene in the preperitoneal space using the TAPP approach. Follow-up averaged 8.4 months, (range 2 to 18 months) No recurrences were seen. Although controversy regarding suture versus tack fixation continues, tack fixation of the mesh to Cooper’s ligament in low ventral hernias has proven successful in repairing low abdominal wall hernias and is especially efficacious in the obese patient.

P324–Hernia Surgery

5MM PORT TECHNIQUE WITH ALTERNATIVE METHOD FOR MESH INSERTION DURING LAPAROSCOPIC INCISIONAL HERNIA REPAIR, Abdelrahman A Nimeri MD, Nasser A. Al-Nassar MD, Department of Surgery and Institute for Minimally Invasive Surgery, Washington University School of Medicine, St. Louis, MO

BACKGROUND: The standard approach to laparoscopic ventral hernia repair (LVHR) involves introduction of the mesh via a 10-12 mm or larger laparoscopic port site. This technique creates a fascial defect that must be suture closed and that can be the site of increased postoperative pain and of a new potential incisional hernia defect. We herein describe a new technique for LVHR that uses only 5 mm laparoscopic ports and an alternative method for insertion of the mesh.
METHODS: A closed insertion technique is used for peritoneal access and three 5mm ports are placed lateral to the hernia in a standard fashion. After adhesiolysis and reduction of the hernia contents, a 2.2-5 cm incision is made over the existing hernia defect and is extended through the hernia sac into the peritoneal cavity. The mesh is inserted through this incision into the abdomen through the existing fascial defect and is positioned and anchored using standard techniques. The mesh insertion site is closed in two layers with absorbable suture; no port sites require fascial closure. Data (given as mean ± S.D.) from patients undergoing LVHR utilizing this technique were collected prospectively and analyzed.

RESULTS: LVHR for incisional hernia repair using 5mm ports exclusively was carried out in 10 patients. Mean patient age was 60.7±10.8 years and the mean BMI was 35.1±7.0. Four patients were operated on for recurrent incisional hernias. Mean operative time was 118±45.4 minutes. Mean size of the defect repaired was 133.1±150.2 cm² and the mean mesh size used was 363.2±234.7 cm² (range 144-825 cm²). There were no conversions to open repair and the average length of stay postoperatively was 2.5 days. Three patients developed a seroma; one was aspirated once and the other two resolved spontaneously. One patient developed Candida sepsis from a urinary source that led to secondary Candida peritonitis that required mesh removal. Over a mean follow-up period of one year, there was one hernia recurrence (the patient who had mesh removed) and there were no port site recurrences or complaints of prolonged port site discomfort.

CONCLUSION: This approach appears to be safe and can be utilized for most patients undergoing laparoscopic inguinal hernia repair with acceptable morbidity and a short length of stay. The 5mm port technique eliminates the fascial defects associated with larger ports and should result in fewer port site hernias and possibly less postoperative pain as well.

P325–Hernia Surgery

USE OF PERI-OPERATIVE FLOMAX TO PREVENT POST-OPERATIVE URINARY RETENTION FOLLOWING LAPAROSCOPIC INGUINAL HERNIA REPAIR, Abdelrahman A Nimeri MD, L Michael Brunt MD, Department of Surgery and Institute for Minimally Invasive Surgery, Washington University School of Medicine, St. Louis, MO

Background: Postoperative urinary retention is one of the more common complications after laparoscopic inguinal hernia repair (LIHR). The development of urinary retention in this setting leads to increased patient discomfort, prolonged recovery room stays, and possible hospital readmission after discharge. Since alpha 1 receptor antagonists reduce urinary symptoms in patients with bladder outlet obstruction, it was hypothesized that the oral alpha 1 antagonist Flomax could be used to decrease the urinary retention rate in patients undergoing LIHR.

Methods: Data from all patients undergoing laparoscopic total extraperitoneal (TEP) inguinal hernia repair by a single surgeon from March 2003 through July 2004 were collected prospectively. Patients received Flomax 0.4 mg/day orally for a total of five days beginning two days prior to surgery. All TEP procedures were done under general anesthesia without a urinary catheter in place. Patients were discharged home after voiding in the recovery area. Data are expressed as mean ± SD.

Results: Flomax was administered to 24 of 26 consecutive patients undergoing outpatient TEP inguinal hernia repair. Mean patient age was 50.5 ± 10.9 years (28-72 yrs). Eight patients were operated on for recurrent inguinal hernias; 12 patients (50%) had bilateral hernias repaired and two patients had concomitant umbilical hernia repair. Mean operative time was 59.2 ± 21.5 minutes. The mean amount of intra-operative fluids given was 963 ± 230ml. None of the patients given Flomax preoperatively developed urinary retention and all were discharged home the same day of surgery. In contrast, the 2 patients undergoing TEP repairs who did not receive Flomax starting 2 days preoperatively developed urinary retention that required catheter placement.

Conclusion: Peri-operative administration of Flomax in the setting of laparoscopic inguinal hernia repair under general anesthetic was associated with no cases of post-operative urinary retention in this small pilot study. The use of peri-operative Flomax should be tested in larger numbers of patients and in a prospective, randomized trial to determine its impact on the postoperative urinary retention rate. If successful, this approach could result in shortened outpatient recovery room stays and potential savings in health care costs.

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HERNIAL RELAPSE IN LAPAROSCOPY: PERSONAL EXPERIENCE, Annibale Casati MD, Giovanni Perrucchini MD, Eugenio Guidotti MD, Luca Magni MD, Clinica Castelli (BG)

Background: Since 1998 we started our approach to the repair of the inguinal and crural hernias with a laparoscopic method, even for the primitive hernias.

Methods: From October 1998 to October 2003, we saw 1611 people suffering from inguinal hernial pathology. 1502 people were operated using the transperitoneal laparoscopy technique (TAPP) and 109 (6.9%) using the traditional technique (Linckenstein).

Patients that underwent the laparoscopy technique were divided M=1021 (66%), F=481 (32%) ranging from 25 to 82 years old, bilateral hernia was 7%.

Results: The accidents were 4 (0.26%); one due to the bleeding of a trocar wound, one due to the jejunal perforation an intestinal occlusion due to an ileal ansa incarcerated and one severe infection haematology due to the prosthesis infection. Conclusions: basing ourselves on our results and on our data, we can state that the laparoscopy technique represents a safe repair method for the inguinal hernia., with few accidents and a low chance to have the appearance of recurrences, but only if done by operators who have performed a good number of such an operation. The surgical timing overlaps the traditional technique, the functional recovery is faster and the aesthetic result is better. Regarding the costs, we need to say that the limited use in disposable material and the less expensive social cost for a more rapid renewal of the working activity, allow this technique to be done from the economic point of view.

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Introduction: Recent literature suggests that the laparoscopic repair of ventral hernias may have the lowest recurrence rates. Laparoscopy, however, may not be feasible in certain situations. For those situations in which laparoscopy cannot be performed, we describe an open technique that utilizes the tension-free principles of the laparoscopic repair without the need for subcutaneous flaps.

Methods: A midline incision is made over the hernia. The peritoneum is entered and the adhesions are taken down to at least 5cm from the fascial edge circumferentially. A piece of DualMesh (Gore, Inc.) is then measured to fit around the defect with a 5cm circumferential overlap. A vertical incision is then made in the mid-portion of the mesh and Gore-Tex Sutures (Gore, Inc.) are then sutured circumferentially around the mesh and the tails are left long to serve as anchoring sutures similar to a laparoscopic approach. The mesh is then placed into the peritoneal cavity over the bowel. Using a suture passer (Gore Inc.), the ties are brought out through the abdominal wall though 2mm skin incisions on the left side and tied down. The right side of the mesh is then raised in order to visualize its underside and it is tacked to the fascia with a spiral tacking device. The right sided sutures are then brought through the abdominal wall with a Suture-Passer and tied down. The right side of the mesh is then tacked to the overlying fascia by passing the spiral tacking device through the incision in the mesh. The incision in the mesh is then closed with suture. The overlying fascia may then be closed if feasible. Conclusion: For those situations in which laparoscopy cannot be performed, we describe an open technique for ventral hernia repair that utilizes the tension-free principles of the laparoscopic repair without the need for subcutaneous flaps.
**P328—Hernia Surgery**

**LAPAROSCOPIC VERSUS OPEN EPIGASTRIC HERNIA REPAIR,**

Kyle N Remick MD, Colin A Meghoo MD, John P Schriver MD, William Beaumont Army Medical Center

**INTRODUCTION:**

Epigastric hernias represent a subset of ventral abdominal wall hernias. They often arise from a midline, supraumbilical, fascial weakness and commonly present in an adult population. Laparoscopic repair of these hernias may reduce the incidence of wound complications and recurrence compared to the open approach. We aim to verify this and identify additional benefits of the laparoscopic approach.

**METHODS:**

We reviewed our recent experience with 30 patients with epigastric hernias repaired by either an open or laparoscopic approach. We compared the two groups based on demographics, intraoperative findings, short-term wound complications, and long-term recurrence.

**RESULTS:**

We reviewed our institution's experience with epigastric hernia repairs between May 2000 and July 2004 and discovered 30 eligible patients. Seventeen were repaired using an open technique and 13 were repaired laparoscopically. There was no significant difference in age, sex, or Body Mass Index (BMI) among the two groups. Additional fascial defects were identified intraoperatively in 46% of the laparoscopic group versus 38% in the open repair group (p=0.12). Concurrent procedures were performed in 39% of laparoscopic repairs versus 12% in the open repair group (p=0.19). There were two short-term complications in the laparoscopic group (one post-operative ileus and one incidental enterotomy) versus none in the open group. Thus far, there are no wound complications in either group and there is one recurrence in the open repair group with further follow-up pending.

**CONCLUSION:**

Benefits of a laparoscopic approach to the repair of epigastric hernias include a thorough evaluation of the ventral wall fascia, identification of additional fascial defects, and the simultaneous performance of additional laparoscopic procedures. It may be preferred in the initial repair of epigastric hernias in an adult population, and larger study groups are needed to determine statistical significance.

**P329—Hernia Surgery**

**THE USE OF PERICARD FOR LAPAROSCOPIC REPAIR OF VENTRAL HERNIAS,**

Danny Rosin MD, Moris Batumsky MD, Moshe Shabtai MD, Yaron Munz MD, Amram Avyln MD, Sheba Medical Center, Tel Hashomer and Sackler School of Medicine, Tel Aviv, Israel

**Objective:** Laparoscopic repair of ventral hernias is an accepted technique. The optimal material to reinforce the abdominal wall has not yet been defined, due to problems of cost, infection and adhesion formation. We have evaluated the effectiveness of bovine pericard as a biomaterial for laparoscopic ventral hernia repair.

**Methods:** 52 patients with incisional or primary ventral hernia were operated laparoscopically over an 18 months period. Pericardial patch (n=45) or perforated pericardial patch (n=7) was used to cover the fascial defect. Data regarding the surgery and the followup period was prospectively collected.

**Results:** Compared to a group of 55 consecutive patients operated laparoscopically over a period of 18 months, just preceding the study period, in whom Goretx patch was used to repair the hernia.

**Results:** Mean BMI was 31.5 in the pericard group and 30.3 in the Goretx group. Mean followup duration in the pericard group was 8.2 months, as opposed to 23.9 months in the Goretx group. 7 patients (13.5%) required removal of the pericard, due to infection, as opposed to 2 (3.6%) removals of infected Goretx. Non of the 7 perforated pericardial patches got infected. 2 recurrences of hernias were noted in the pericard group (9.6%), as opposed to 16 in the Goretx group (29%). Overall failure rate is therefore 23.1% in the pericard group, as opposed to 32.6% in the goretx group.

**Conclusions:** Overall failure rates were comparable in the both groups, with some advantage to the pericard group. Recurrence rate was lower in the pericard group. This may be related to the longer followup in the Goretx group. High infection rate was found in the pericard group, but not in the subgroup of perforated pericardial patch. The use of pericard is a viable alternative for laparoscopic ventral hernia repair. The use of perforated material, better selection of patients and refinement of surgical technique may improve the long term success.
showed that laparoscopic ventral hernia repair is safe, with shorter operative time, lesser pain, fewer complications, shorter hospital stays, less recurrence and more satisfied patients compared to open repair.

P332–Hernia Surgery
 LAPAROSCOPIC AND OPEN GROIN HERNIA REPAIR? A CHANGING PATTERN IN A BUDGET-CONSTRAINED PUBLIC HOSPITAL, D K Munz MD, B Bar Zakai MD, EL Shabtai MSC, D Rosin MD, Y Goldes MD, M Khaikin MD, A Ayalon MD, M Shabtai, Dept. of Surgery, Sheba medical Center and Statistical Service, Tel Aviv Sourasky Medical Center

Background: Recent reports have questioned the advantage of laparoscopic groin hernia repair (LHR) compared to the open method (OHR). However, wide availability coupled with readily accessible information on the internet, have made LHR a procedure very much in demand by patients and referring physicians alike. This study portrays the changes in the inter-relationships between LHR and OHR in a single, large, academic surgical service in a public government hospital.

Patients and Methods: Data regarding LHR and OHR were prospectively collected and retrospectively reviewed starting from date of the first LHR performed in 1997. The trend of the relative proportion of each method through the years and the absolute number of procedures performed by attending surgeons and residents were calculated. The overall burden on operating room time (OT) by each method was correlated to the operating surgeon’s experience. LHR costs were reduced by avoiding use of hernia balloons.

Results: Between 1997 and 2003, a total of 1474 groin hernia (LHR=886, OHR=606) repairs were performed. A steady increase in the relative fraction of LHR from 15.6% in 1997 to 98.7% in 2003 was clearly observed (p=0.0001). The majority of both LHR and OHR (>80%) were performed by residents. Overall mean OT for LHR and OHR were 71.24 and 66.29 minutes respectively (p=NS). OT was significantly shorter in the non-teaching (70.24) compared to teaching setting (79.5±25 minutes, p=0.001). Furthermore, OT correlated with point in time after 1997 and decreased significantly towards 2003 (p=0.0001). The interaction between OT, repair method and year (1997 and on) was statistically significant (p=0.001). Conclusions: The last decade has witnessed profound changes in the inter-relationships between LHR and OHR, mostly due to readily available information and more knowledgeable patients. Even in a public, budget-constrained institution, the majority of patients request and get LHR. It appears from our data that OT is similar in LHR and OHR albeit longer, as expected, in the teaching setting. We conclude that a proper balance must and can be kept so that patients’ request, safety and cost considerations are met. This, however, must be carried out while maintaining adequate residents training in academic institutions.

P333–Hernia Surgery
 CONSOLIDATED FIVE YEAR EXPERIENCE WITH LAPAROSCOPIC INGUINAL HERNIA REPAIR, Tarun Singhal MS, S Balakrishnan MS, S El-Hasani, Princess Royal University Hospital, Kent, U.K.

Introduction: After the introduction of Laparoscopic Hernia repair to the National Health Service (NHS), we studied the benefits and practicality of carrying out this specialised hernia repair technique in a District General NHS Hospital.

Methods: A total of 830 hernias were operated upon in 572 patients, aged between 16 and 89 years. 312 patients had the operation as a day case procedure and the remaining 260 were treated as inpatients.

Conclusion: Laparoscopic tension-free TAPP method of hernia repair, as we do it, is cost-effective and efficacious. Most patients can be treated as day cases. We discovered mesh-related complications in 19.1% patients, which were treated simultaneously. A low recurrence rate (0.12%) with low morbidity makes it an attractive method for routine treatment of groin hernias in the NHS. All patients were followed up by outpatient clinic visit and questionnaire.

P334–Hernia Surgery
 LAPAROSCOPIC TREATMENT OF PARAESOPHAGEAL HIATAL HERNIA WITH AN INCARCERATION OF PANCREAS AND JEJUNUM: A CASE REPORT, Masashi Tachibana MD, Nobumi Tagaya PhD, Hiroaki Kijima MD, Yasuhiro Kakihara MD, Kiyoshiro Hamada MD, Tokihiko Sawada PhD, Keiichi Kubota PhD, Second Department of Surgery, Dokkyo University School of Medicine, Tochigi, Japan

Hiatal hernia is generally divided into sliding and paraesophageal types. The latter with an incarceration of the pancreas is rare and has been provided with critical conditions. We present a successful laparoscopic treatment of paraesophageal hialtal hernia with an incarceration of the pancreas and jejenum. The patient was a 75-year-old woman who had complaints of epigastric pain and dysphasia. A chest x-ray revealed a mediastinal air-fluid level. Chest computed tomography showed intestinal contents, body and tail of the pancreas and the splenic artery within the mediastinum. An upper gastrointestinal series identified jejenum within the mediastinum without dislocations of esophago gastric junction and stomach. The patient underwent laparoscopic treatment for the diagnosis of paraesophageal hialtal hernia with an incarceration of pancreas and jejenum. At laparoscopy, jejenum was incarcerated into the mediastinal cavity through the internal hernia of transverse mesocolon. After resolving this incarceration, body and tail of the pancreas and the splenic artery were identified and also dislocated within the herna sac. After dividing and removing both of them from the mediastinal cavity, the crural defect was repaired with non-absorbable sutures. The operation time took 115 min and the estimated blood loss was minimal. The patient tolerated a regular diet on the first postoperative day and was discharged uneventfully. There were no recurrence or abdominal symptoms during the 11 months follow-up period. In the case of asymptomatic paraesophageal hialtal hernia with incarcerating pancreas on diagnostic imaging, elective surgical treatment is required to prevent a critical outcome.

P335–Hernia Surgery
 LONG TERM RESULTS OF LAPAROSCOPIC TOTALY EXTRAPERITONEAL INGUINAL MESH HERNIORRAPHY, Craig J Taylor MD, Tim Wilson MD, Peninsula Private Hospital, Sydney Australia

INTRODUCTION: The short term advantages of laparoscopic totally extraperitoneal mesh herniorrhaphy (TEP) are well documented, however the long term results remain unclear. We seek to clarify this issue with particular reference to the incidence of hernia recurrence and chronic groin pain.

METHODS: A retrospective case series of one hundred consecutive patients undergoing TEP 5 years previously by a single surgeon were followed up prospectively with a focused physical examination.

RESULTS: During the period between 1997 and 1999, 100 consecutive patients underwent 110 TEP hernia repairs. The mean age was 56 years. Median follow-up was 64 months. Follow-up was complete (interview and physical examination) in 88% and partial (telephone interview only) in a further 5%. There was no major morbidity or mortality. Hernia recurrence rate was 1%. Chronic pain occurred in 14 patients (14%), which was mild in 13 patients and moderate in one. Ninety eight percent of patients were satisfied with their repair and would or had recommended TEP to others.

CONCLUSION: Long term results of TEP demonstrate it to be an effective and safe procedure with a low recurrence and low prevalence of chronic pain which is generally of a mild, infrequent nature.

P336–Minimally Invasive Other
 A RELIABILITY ANALYSIS OF VIDEO-BASED RATING SCALES FOR TECHNICAL SKILLS ASSESSMENTS IN LAPAROSCOPIC SURGERY, R Aggarwal MD, T Grantcharov PhD, K Moorthy MD, P Papasavas MD, T Milland, S Barker MD, A Darzi MD, Department of Surgical Oncology & Technology, Imperial College London, United Kingdom; Department of Surgical Gastroenterology, Glostrup University Hospital, Glostrup, Denmark; Department of Surgery, Western Pennsylvania Hospital, Pittsburgh, PA, USA

Introduction: The assessment of surgical technical skill requires the development of valid, objective and reliable meas-
P337—Minimally Invasive Other

THE OPTIMAL METHOD OF TRAINING ON A VIRTUAL REALITY LAPAROSCOPIC SIMULATOR, R Aggarwal MD, G Dew, JW Hance MD, N Selvapatt, A Darzi MD, Department of Surgical Oncology & Technology, Imperial College London, UK.

Introduction: Virtual reality (VR) laparoscopic simulators have been shown to teach the skills required for laparoscopic surgery. However, with increased fidelity and on-screen feedback, the question should be asked whether it is necessary to have an expert tutor available during every training session? Is it the aim of this analysis to determine the optimal method of feedback to teach laparoscopic skills for the laparoscopic suturing module?

Methods: Forty laparoscopic novices trained on laparoscopic VR simulators in a stepwise approach, commencing with a previously validated basic skills curriculum on the MIST-VR simulator. Subjects then completed five half-hour sessions on the laparoscopic suturing module of the LapSim VR simulator. Prior to their first LapSim session, subjects were randomly allocated to one of four groups, each group receiving a different type of feedback during their training sessions. The groups received either expert tutor feedback, checklist feedback, VR simulator feedback, or no feedback. Assessments of laparoscopic suturing skill were carried out at the beginning and end of each session using a synthetic bowel model placed in a video trainer. Each subject’s performance was scored objectively using a validated motion analysis system, together with blinded checklist scoring of videos of each procedure. Data analysis used non-parametric tests, p<0.05 deemed significant.

Results: There were significant improvements in performance between the pre- and post-assessment for all subjects in terms of time taken (median 608 vs 523 seconds, p<0.001), total number of movements (426 vs. 368, p=0.003) and checklist scores (14 vs. 24, p<0.001). Subjects in tutor, checklist and simulator groups made significant improvements in terms of dexterity (p<0.05), though this was not the case for those in the no feedback group. Thracic improvements were also significant for all four groups on checklist scores (p<0.05), though subjects with tutor feedback achieved the narrowest range of scores. Conclusions: Training on a VR laparoscopic suturing module is beneficial, and feedback is crucial during training sessions to achieve improvements in dexterity and qualitative measures. The ideal method of training may be to ensure expert tuition is available at the beginning and end of each training session, with checklists or simulators providing feedback at other times.

P338—Minimally Invasive Other

LAPAROSCOPIC LIGASURE APPENDECTOMY IN EXPERIMENTAL ANIMALS, Abdallah Al Dohayan MD, King Khalid University Hospital.

Ligasure is a machine usually used to seal blood vessels. The same concept is used to seal the appendix and its feeding vessels. The procedure is carried in the animal laboratory of King Khalid University Hospital on rabbits. The rabbits are anaesthetized. Three trocars size 5mm are used. The appendix is identified. The mesoappendix and the appendix are controlled and cut using the ligature. The appendicular stump is buried using vicryl suture. The procedure was performed to 5 rabbits and traditional procedure was done to the other 5 rabbits as control group. Over a period of 3 months all rabbits are healthy and have normal life.

P339—Minimally Invasive Other

AEROSOLIZED BUPIVACAINE REDUCES POST-LAPAROSCOPIC PAIN: A RANDOMIZED CONTROLLED DOUBLE BLINDED CLINICAL TRIAL, Nawar A Alkhames MD, David Lomax MD, David H Peck PhD, Ara W Darzi MD, Department of Surgical Oncology and Technology, Imperial College London.

Objective: The introduction of laparoscopic strategies in the management of intra-abdominal pathologies has initiated a new philosophy in surgery centred on minimising the biological insult of surgical intervention. Laparoscopy has been shown to offer significant healthcare benefits over conventional approaches, including reduction of inflammatory and neuroendocrine responses and adhesion formation. Of particular interest are reports of decreased postoperative pain, resulting in shorter hospital stays and earlier return to normal activity; however, many patients still require analgesia during the first 24-48hrs postoperatively. The aetiology of this pain remains unclear, although the initiation of pneumoperitoneum has been implicated. Further reduction in postoperative pain would clearly be of advantage. In this study, we have analysed the use of intra-operatively delivered aerosolized intraperitoneal local anaesthetic and its ability to reduce postoperative pain.

Material and Method: The study is a prospective randomized controlled double blind trial. Eighty patients undergoing laparoscopic cholecystectomy will be recruited and divided randomly into 4 groups: control (n=20), aerosolized Bupivacaine (n=20), aerosolized normal saline (n=20) and local Bupivacaine into the bladder bed (n=20). All the patients will have standard preoperative, intraoperative and postoperative care including anaesthesia and analgesia. Pain score will be carried out by the nursing staff in recovery and 4hrs, 8hrs, 12hrs and 24hrs postoperatively using a standard 0-10 pain scoring scale.

Preliminary Results: Twenty patients have now been recruited. Aerosolized bupivacaine significantly reduced postoperative pain in comparison to all other treatments (p<0.05). Injection of bupivacaine into the gall bladder bed appears to reduce postoperative pain but with no statistical significant from control.

Conclusion: Aerosolized local anaesthetic is a very effective method to control postoperative pain and it significantly help to abolish opiate use leading to short hospitalization and less cost.

P340—Minimally Invasive Other

LAPAROSCOPIC ASSISTED PERITONEAL DIALYSIS CATHETER PLACEMENT, AN IMPROVEMENT ON THE SINGLE TROCAR TECHNIQUE, Walter D Blessing MD, J Ross MD, C Kennedy MD, W Richardson MD, Ochsner Clinic.

INTRODUCTION: Open peritoneal dialysis catheter (PDC) placement has largely been replaced by minimally invasive methods. One method uses a single trocar with a 2 mm peritoneal scope prior to introducing the PDC using the Seldinger Technique through the same trocar site (STPD). The other

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method uses traditional laparoscopy (LAPD). OBJECTIVE: To justify the increase in medical resources for laparoscopic-assisted peritoneal dialysis catheter placement. METHODS: This was a retrospective chart review of the LAPD group and the most recent consecutive STPD. The Chi-square test was used to compare the two groups. RESULTS: 25 patients had LAPD from 9/13/02 through 6/30/04. One patient was lost to follow-up and another patient's records were not available, making this group 23 patients. 25 patients from 2/21/01 through 2/21/03 had STPD. Three of these patients were lost to follow-up, and two of these patients' records could not be retrieved, making this group 20 patients. 16 of 23 (69.6%) and 9 of 20 (45%) patients in the LAPD and STPD groups respectively had had previous abdominal surgery. 5/23(21.7%) and 6/20(30%) of the LAPD and STPD respectively had PDC malfunction post placement. Other complications are listed in the table.

CONCLUSIONS: Although statistical significance was not obtained with this small sample size, STPD trended to an increased complication, malfunction, and PDC removal rate. More malfunctioning catheters in LAPD were able to be salvaged via a repeat laparoscopic procedure than in STPD. LAPD trended to a decreased rate of dialysate leak, but this was easily repaired, salvaging the PDC. LAPD can be used to place PDC in more patients with previous abdominal surgery. LAPD seems to be superior to STPD.

P341–Minimally Invasive Other

COSMETIC LAPAROSCOPIC CHOLECYSTECTOMY-A 7 YEAR REVIEW OF RESULTS. Michael Bozuk MD, Nicole Fearing MD, Phillip P Leggett MD, Department of Surgery, Houston Norwest Medical Center, University of TX-Houston

Abstract

Background: Today’s patients expect more attention to cosmesis in their surgical incisions. In 2001 we described a case report of a cosmetic laparoscopic cholecystectomy. Our goal was to improve the cosmetic results for patients while performing a safe cholecystectomy. We report here our results of 43 cosmetic laparoscopic cholecystectomies over the last 7 years.

Method: A retrospective review of all cosmetic laparoscopic cholecystectomies was performed. The procedure was accomplished with three, five millimeter ports. A port was placed in the umbilicus. Two additional ports were placed to the right and left of midline just above the pubic hairline.

Results: Forty-three cosmetic laparoscopic cholecystectomies were performed between June 1997 and July 2004. All patients were female with an average age of 3.1 years old (15-50yo). The average BMI was 23 (19-27). The indications for cholecystectomy were biliary dyskinesia in 22 patients, symptomatic cholelithiasis in 16 patients, gallbladder polyps in 2 patients and acute cholecystitis in 3 patients. Conversion to standard trocar placement or open cholecystectomy was necessary. Blood loss was minimal in all cases and no intraoperative complications were noted. Three patients had other procedures performed concurrently including appendectomy, lysis of adhesions, and tubal ligation. Two major complications were noted in our series. The first was a bile leak which was treated conservatively. The second was a partial bile duct occlusion secondary to a clip which was treated with ERCP. Gallbladder pathology was abnormal in all patients. Chronic inflammation was found in 23 patients, cholelithiasis in 16, smooth muscle hypertrophy in 10 and 3 had acute cholecystitis.

Conclusion: We propose that cosmetic laparoscopic cholecystectomy can be safely performed in a carefully selected patient population. It can be performed for a variety of diagnoses, with minimal morbidity. It adds to the laparoscopic armamentarium, especially in patients concerned with their cosmetic results.

P342–Minimally Invasive Other

SYMPTOMATIC ADRENALECTOMY FOUND DURING ELECTIVE ADRENALECTOMY. Jocelyn Carleton MD, Michael S Gold MD, Steven J Heneghan MD, Mary Imogene Bassett Hospital.

OBJECTIVE: The purpose of this study was to examine the relationship between preoperative pain and preoperative hemorrhage in patients with adrenal tumors. Although nontraumatic adrenal hemorrhage is rarely described, it is a relatively common finding in our series.

METHODS: Consecutive adenalecromies done by a single surgeon from 2000 to 2004 were reviewed prospectively for presenting symptoms, biochemical function, imaging, surgical indications, operative technique, pathology, complications and postoperative symptoms.

RESULTS: Twelve cases of adenalecromy were performed. Indications for surgery were biochemical function or size. Pathology confirmed four pheochromocytomas, five cortical adenomas, one cortical hyperplasia, one aneurysm, and one paraganglioma. Five patients undergoing adenalecromy gave a history of flank, back, or abdominal pain prior to resection.

Four out of the five patients presenting with pain were found to have pathologic evidence of previous hemorrhage within the adrenal gland. The specimens with hemorrhage included two adenomas, a pheochromocytoma, and an aneurysm. The only patient with preoperative pain who did not have evidence of preoperative hemorrhage was found to have an intrinsically painful paraganglioma. All patients had resolution of pain following adenalecromy.

Conclusion: Patients with pathologic evidence of previous hemorrhage were more likely to present with pain. Presentation with pain appeared independent of tumor characteristics or patient demographics. Laparoscopic adenalecromy was done safely in all cases and produced relief of the preoperative pain symptoms. Hemorrhage within an adrenal gland should be considered in patients found to have an adrenal mass on imaging and have a history of abdominal or flank pain. Based on our limited series, underlaying adrenal pathology should be considered likely in cases of nontraumatic bleeding.

P343–Minimally Invasive Other

LAPAROSCOPIC FUNCTION PRESERVING SURGERY FOR NON-PARASITIC SPLENIC CYST. Yoo Shin Choi MD, hyung ho Kim PhD, Department of Surgery, Seoul National University, College of Medicine.

INTRODUCTION: Concerns about overwhelming postsplenectomy sepsis have led to the development of splenic preservation procedures, so splenic preservation and conservative management is now accepted norms when dealing with pathologic benign splenic conditions and traumatic splenic injuries. Recently, we performed successfully laparoscopic function preserving procedures in two splenic pseudocysts. These procedures are rarely published in English literature in worldwide. A thorough understanding of splenic anatomy permits laparoscopic partial splenectomy or cyst unlooping hemisplenectomy with the resultant benefits including a decreased risk of postsplenectomy sepsis by preserving splenic function, short hospital stay, smooth convalescence, superior cosmesis and non-recurrence.

METHODS AND PROCEDURES: Case1. A 53-year-old man presented with left upper-quadrant abdominal pain. He had no history of trauma or tropical travel. MRI demonstrated a 2cm sized cyst at lower pole of spleen. Laparoscopic partial splenectomy underwent successfully. Case2. A 24-year-old woman presented with left upper-quadrant abdominal palpable mass. She had no history of trauma or tropical travel. CT demonstrated 20cm sized huge mass with wall calcification at upper pole of spleen. Laparoscopic cyst unlooping procedure with sagittal hemisplenectomy was performed without any events.

RESULTS: In all two cases, pathologic findings were splenic pseudocyst. Operative times were 120 minute in case 1 and 156minute in case 2. In case 1, he discharged at postoperative day 5th and in case 2, at postoperative day 3rd. On the CT checked 3 month after operation, we confirmed that cysts were completely excised without operation related complication and there were no evidence of recurrence in all two cases. Also splenic function is preserving completely normally.

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CONCLUSION: The success and relative ease of performing this laparoscopic function preserving procedure will pave the way for its future use in other selective cases involving splenic pathology.

P344—Minimally Invasive Other
LAPAROSCOPIC RESECTION OF LYMPH NODE POSITIVE COLON AND RECTAL CANCER: 24-MONTH FOLLOW-UP OF 90 PATIENTS, Gyu-Seong Choe MD, In-Taek Lee MD, Jong-Ho Lee MD, Soo-Han Jeon MD, Division of Colorectal Surgery, Department of Surgery, Kyungpook National University School of Medicine
Purpose: Despite laparoscopic colon resection for benign and early malignant lesions is quite acceptable because of fast recovery and minimal morbidity, laparoscopic curative surgery for advanced colorectal cancer remains controversial. The purpose of this study was to evaluate the postoperative outcomes, and short-term survival of laparoscopic resection for lymph node positive colorectal cancer. Methods: A single-institution retrospective trial was undertaken between June 1996 and April 2004, during which 266 patients had curative laparoscopic surgery for colorectal cancer by a single laparoscopic colorectal surgeon. Lymph node metastasis was confirmed at postoperative pathology in 90 patients. The surgical outcomes were evaluated in lymph node positive colorectal cancer patients, focusing on the results of the surgery, postoperative complications, oncologic clearance and recurrence rate. Results: In this study, 30 right hemicolecctomies(RHC), 1 left hemicolecctomy, 21 anterior resections(LAR), 35 low anterior resections(LAR, including 5 coloanal hand-sewn anastomosis), and 3 abdominoperineal resections(APR) were performed. The tumor site was the ascending colon in 30 cases, the descending colon in 23 cases, and the rectum in 37 cases, including 15 mid-low rectal cancers. Six laparoscopic procedures (6.7%) were converted to open surgery. There was no hospital mortality, and the hospital morbidity was 15.1%. The mean operation time were 202(125-340) minutes for RHC, 205(145-265) minutes for AR, 250(135-415) minutes for LAR, and 224(145-265) minutes for APR. The mean postoperative stay was 10.5(6-42) days. The mean number of lymph nodes retrieved and metastatic were 25.7(4-91) and 3.3(1-17), respectively. The mean distal margins were 6.8 (1.5-12.5) cm for AR, 2.7 (1-3.5) cm for LAR, and 0.7 (0.5-1) cm for coloanal hand-sewn anastomosis. Recurrence was identified in eleven patients(three local recurrences (3.5%) and eight distant metastases (9.3%)). There was no port site recurrence. One patient was died for distant metastasis. Conclusions: Laparoscopic resection for lymph node positive colorectal cancer is a safe procedure in terms of postoperative outcome, oncologic clearance, and short-term survival. However, further follow-up and multicenter, randomized trials will be required to determine whether the laparoscopic approach will play a significant role in the treatment of colorectal cancer in the future.

P345—Minimally Invasive Other
COMPARATIVE THERMAL SPREAD OF THREE RADIOFREQUENCY BIPOLAR VESSEL SEALING DEVICES, Tanuja Damani MD, Lawrence W Way MD, Arnold Advincula MD, University of California at San Francisco, San Francisco, CA; University of Michigan at Ann Arbor, Ann Arbor, MI
Radiofrequency (RF) bipolar vessel sealing devices facilitate laparoscopic dissection and surgical hemostasis, but can also cause undesirable collateral thermal damage. This in vitro study evaluated the thermal effects on adjacent tissue using real time infrared thermography during bipolar vessel sealing in pigs. The following RF vessel sealing devices were compared: Enseal, Ligasure Atlas V, and Ligasure Atlas V. A thermal imaging camera was used to record dynamic thermal images of the RF vessel sealing device in use. A 7.9 mm harvested porcine vessel was sealed on separate occasions using each of the three devices. Room temperature was 23.8 C and relative humidity, 50%. Protein denaturation was evaluated by subsequent collagen contraction and reformation into a seal, begins at 54C. Consequently, two thermal zones lateral to the jaws of the instrument were defined- a “hot” zone with temperatures greater than 54C immediately next to the jaws of the instrument, and a “cool” zone with temperatures equal to or less than 54C distant to the “hot” zone. Thermal spread was defined as the length of the “hot” zone. Thermal spread for Enseal, Ligasure Atlas V, and Ligasure LS1100 was 1.4 mm, 1.6 mm and 5.0 mm, respectively. Peak temperatures were 83.7C, 82.3C and 92.0C, respectively. Conclusion: The different thermal vessel sealing devices left different thermal imprints. In this in vitro study, the SurgRx Enseal 5 mm laparoscopic vessel sealing device produced the least thermal spread to surrounding tissues.

P346—Minimally Invasive Other
THE ROLE OF LAPAROSCOPY IN THE DIAGNOSIS AND MANAGEMENT OF CHRONIC SMALL BOWEL OBSTRUCTION: A CASE REPORT, Alexander J Ernest Jr. MD, M Chung MD, S Zagorski MD, Department of Surgery, Tripler Army Medical Center. Honolulu, HI
Abstract
Background: We present a case of laparoscopic exploration performed for a chronic small bowel obstruction, which was diagnostic and therapeutic.
Case Report: A 46-year-old woman with a 20-year history of chronic abdominal pain presented with frequent nausea, emesis, and diarrhea. Her past surgical history is significant for a leiomyoma of the jejunum excised as an infant. The patient is an avid martial artist so we planned to perform a laparoscopic resection of the likely stricture at the jejunum versus a limited incision laparotomy guided by laparoscopy. During the exploratory laparoscopy we encountered extensive adhesions and a massively dilated segment of jejunum. Thus, a limited laparotomy incision was placed in the midline for open exploration, entailing adhesiolysis and resection of the dilated small bowel with primary anastomosis. An area of mesenteric adenopathy was also identified and resected. The pathology and subsequent work-up revealed stage 1 low-grade follicular lymphoma for which observation has been recommended. The patient was discharged on post op day number 5 and has returned to her normal activities, including martial arts training, within 6 weeks of the operation.
Conclusion: This case illustrates the role of laparoscopy in the diagnosis and treatment of chronic small bowel obstruction. Its use can result in ?minimal laparotomy?, if needed, to facilitate rapid recovery.

P347—Minimally Invasive Other
THE ROLE OF ERYTHROPOIETIN IN SURGERY, Sameh A Fayek MD, Raymond L Horwood MD, Joseph Thomas RN, FAIRVIEW HOSPITAL, DEPARTMENT OF SURGERY, CLEVELAND CLINIC HEALTH SYSTEM
INTRODUCTION
In surgical patients anemia is a predictor of mortality and morbidity; its prevalence ranges from 5-75% and is often the only reason for blood transfusion. Pretreatment hemoglobin (Hb) is a predictive factor of transfusion (1). Transfusion is a common practice but blood is a limited resource and is associated with significant risks (2). Recombinant human erythropoietin (rHuEPO) stimulates erythropoiesis. Preoperative HuEPO is proposed to increase preoperative Hb to produce a higher early postoperative Hb. Also it is expected to accelerate postoperative erythropoietic recovery hence, preventing anemia and reducing the need for transfusion.
METHODS AND PROCEDURES
This is an observational study comparing data from two patient groups. Study group included eighteen patients undergoing major orthopedic surgery from October 2003 to May 2004, with Hb >10 and <13.4 gm% all having no contraindication or prior exposure to rHuEPO. All study patients received preoperative rHuEPO 40,000 U SQ, weekly x 2 or 3 weeks with supplemental iron. Control group included eighteen patients with similar demographics and preoperative HB range who underwent similar procedures by the same surgeon during the two-year period prior to October 2003 and received no treatment. Patient data was compared by their change in Hb; transfusion requirements, transfusion practice, length of hospital stay (LOS), morbidity, mortality and cost effectiveness. T-test and Chi-square test were used for statistical analysis with a significance level of 0.05.

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RESULTS
There was a smaller change in Hb levels from pretreatment to postoperative day 1 Hb in the study group (P=0.002). However, there was no statistically significant difference in the proportion of patients receiving a blood transfusion, number of units transfused/patient transfused, LOS, morbidity or mortality. The cost of rHuEPO course is equivalent to the cost of 3 units of homologous blood.

CONCLUSION
rHuEPO is safe with many advantages, however the overall clinical benefit should be further evaluated. Time lag and cost are considerable limitations for its use in surgery.

REFERENCES

P348–Minimally Invasive Other
DEFINING THE ROLE OF DIAGNOSTIC LAPAROSCOPY IN PATIENTS WITH ABDOMINAL PAIN, Jeannine Giovanni MD, Ibrahim M Daoud MD, Saint Francis Medical Center
The work up of patients with acute or chronic abdominal pain can be lengthy, costly, and sometimes unyielding of a diagnosis. Diagnostic laparoscopy is currently being used as an effective means to discern the etiology of various abdominal disorders. Its advantages over diagnostic laparotomy make it a better alternative in cases of diagnostic uncertainty. Laparoscopy can potentially avoid unnecessary laparotomies, provide diagnoses, and enable therapeutic interventions.

We describe our single institutional experience with diagnostic laparoscopy as a minimally invasive tool in the workup and treatment of patients with acute and chronic abdominal pain. We retrospectively reviewed patient demographics, type and frequency of preoperative diagnostic tests, operative findings, and therapeutic interventions. We propose that diagnostic laparoscopy is a valuable tool in cases of diagnostic uncertainty.

From 1991 to 1998, 78 patients underwent diagnostic laparoscopy following equivocal physical exam findings, laboratory tests, and noninvasive radiological procedures. The majority of patients were female (82.1%) ranging in age from 13-85 years old. Most patients (74%) presented with chronic pain defined as greater than 7 days duration. It was found that 32% of subjects had at least one X-ray, 44.9% had at least one computed tomography (CT) study, 16.7% had at least one ultrasound, and 44.9% had multiple tests including barium studies, cystoscopies, endoscopic retrograde cholangiopancreatograms (ERCP), magnetic resonance imaging (MRI), and endoscopic evaluations. None of these preoperative evaluations yielded diagnostic results. With diagnostic laparoscopy, we were able to establish a diagnosis in 76 patients (97.4%). The most common findings included hernias (27%), adhesions (18%), appendicitis (17%), gynecologic pathology (9%), malignancy (6.4%), and bowel obstruction (2.6%).

In our experience, diagnostic laparoscopy is a helpful tool to diagnose and treat patients with obscure causes of abdominal pain. It can potentially yield a diagnosis when conventional preoperative studies have failed to do so. It should be considered early on to avoid extensive workups and prolonged patient suffering.

P349–Minimally Invasive Other
THE EFFICACY OF LAPAROSCOPIC SURGERY FOR THE OBSTRUCTION BOWEL, Ken Hayashi MD, Yasuhiro Munakata MD, Takahide Yokoyama MD, Center of Endoscopic Surgery, Showa-Inan General Hospital
[Objectives] I compared results of laparoscopic surgery for obstruction bowel with open surgery and reviewed utility.

[Methods] We performed 85 cases of laparoscopic surgery and 30 cases of open surgery in the same period for the obstruction bowel during ten years. We diagnosed as an admission area by a dynamic ultrasonography, and digestive organs contrasting examination for all cases preoperatively, and made an adhesion map. We used scissors or an ultrasonic wave appliance for adhesion detachment. The art type of laparoscopic surgery was classed to three groups; laparoscopic group without window cases are classed as group A (n=39), laparoscopic assisted with small incision (4-8cm) are group B (n=22), and converted to open surgery are group C (n=4). In addition, I compared it with a group of initial open surgery.

[Results] The mean operation time was 102 minutes in group A, 172 minutes in group B, and 238 minutes in group C. Oral intake had a short in group A for 3.3 day, group B for 5.9 day, and 13.0 day for group C, and hospitalization was a short for 10.2 day in group A, 18.2 day in group B, and 35.0 days in group C. One case was needed open surgery postoperatively, because of a complication of peritonitis in group B, but there was not the surgical trouble else. In addition, 3 cases of group A, and 2 cases of a group B required readmission in obstruction bowel, but retrograded for a save. Readmission was required 7.7% of a laparoscopic group. The readmission rate of initial open group was 16.7% and 3 cases (7.8%) was needed for next surgical procedure.

[Concluding remarks] Laparoscopic surgery was feasible for obstruction bowel diseases with no-adhesion area. This procedure was safely completed with minimally invasiveness and a low recurrence rate.

P350–Minimally Invasive Other
LOCAL ANESTHESIA REDUCES POST-LAPAROSCOPY PAIN: A PROSPECTIVE, RANDOMIZED TRIAL, Dennis L Fowler MD, Nancy J Hogle RN, Edward Borrazzo MD, Andrew J Duffy MD, Columbia College of Physicians and Surgeons
Background: Local anesthesia at port sites during laparoscopic surgery has not been proven effective. We hypothesize that local anesthesia at port sites reduces postoperative pain and the need for narcotics.

Methods: Patients were prospectively randomized to receive local anesthesia at port sites prior to incision (Group 1), local anesthesia at port sites at the end of the procedure (Group 2), or no local anesthesia (Group 3). Patients were blinded to group assignment and were evaluated with a visual analog pain scale at 1, 2, 4, and 8 hrs postop. Below, pain scores at each time interval and mean number of narcotic doses (meds) are documented after analysis with ANOVA.

<table>
<thead>
<tr>
<th>Time Interval</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hr p=0.7700</td>
<td>2.1</td>
<td>2.7</td>
<td>3.1</td>
</tr>
<tr>
<td>2 hr p=0.004</td>
<td>1.2</td>
<td>2.6</td>
<td>4.6</td>
</tr>
<tr>
<td>4 hr p=0.015</td>
<td>1.2</td>
<td>1.3</td>
<td>3.7</td>
</tr>
<tr>
<td>8 hr p=0.001</td>
<td>0.7</td>
<td>0.5</td>
<td>2.5</td>
</tr>
<tr>
<td>meds p=0.0068</td>
<td>1.3</td>
<td>1.5</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Conclusions: Local anesthesia at port sites during laparoscopic cholecystectomy significantly reduces pain at 2, 4, and 8 hours after surgery, more so if infiltrated prior to incision than if infiltrated at the end of the operation. Patients who received local anesthesia required fewer narcotic doses, although not statistically significantly so. Nonetheless, this reduction in narcotic use may have clinical relevance.

P351–Minimally Invasive Other
LAPAROSCOPIC MANAGEMENT OF IATROGENIC COLONIC PERFORATION, J. Michael B, and S. Vaimakis MD, F. Silvestri MD, R B Wellner MD, Englewood Hospital and Medical Center
Background: Iatrogenic perforation (IP) of the colon is a relatively uncommon event [incidence 0.1-0.8 % of diagnostic and 0.15-3 % of therapeutic colonoscopies]. Laparotomy with or without diversion has been recommended conventionally for management. Few authors have advocated a laparoscopic approach to this problem.

Methods: Retrospective chart review of our 5-year community hospital experience with 13 IP of the colon referred to our service. Ages ranged from 37 to 82. Male/female ratio was 2:1. 12 perforations were discovered immediately post-endoscopy, which was attributed to impressive clinical presentations characterized by severe abdominal pain and marked abdominal distension/tympany. A single right-sided colon perforation was diagnosed 24 hours later. In all cases, patients underwent laparoscopic treatment.
Poster Abstracts

P352–Minimally Invasive Other
LAPAROSCOPIC BIOPSY OF PARA-AORTIC LYMPHNODE-COMPARISON BETWEEN TRANSPERITONEAL APPROACH AND EXTRAPERITONEAL APPROACH, Takashi Itwata MD, Nobunori Kurita MD, Masaki Nishioka MD, Tetsuya Ikemoto MD, Mitsu Shimada PhD, Department of Digestive Surgery, School of Medicine, Tokushima University.

INTRODUCTION: Improvements in instrumentation and video technology have allowed the surgeon to perform more complex and major operations through the laparoscope. The technique of laparoscopic para-aortic lymphadenectomy is usually performed via a transperitoneal approach (TP). In the gastrointestinal surgery, adhesions and complications using an extraperitoneal approach (EP) have been scarcely reported to be fewer than those in a TP. We experienced cases of laparoscopic lymph node biopsy, and evaluated effect of TP versus EP regarding the intraoperative blood loss, operation time and postoperative complications.

METHODS: A transperitoneal laparoscopic lymph-node biopsy was attempted with 3 ports on one patient of esophageal cancer (M, T2) with massive abdominal lymphadenopathy. Biopsy of the para-aortic lymph-nodes was difficult in the TP, therefore 1.5cm sized lymph node along the common hepatic artery was biopsied. With EP, the EP lymph-node biopsy, 5cm sized para-aortic lymph-node, was successfully performed with 4 ports on the other patient with malignant lymphoma.

RESULTS: Intraoperative blood loss was 270ml v.s. 100ml (TP v.s. EP, respectively) and operation time was 150 minutes v.s. 143 minutes. After operation oozing from lymphadenectomy continued for 5 days in TP case, EP case could walk 1st operative date.

CONCLUSIONS: The extraperitoneal laparoscopic biopsy of para-aortic lymph-nodes is useful method for para-aortic lymphadenectomy compared with transperitoneal approach.

P353–Minimally Invasive Other
CAN INTRAOPERATIVE LAPAROSCOPIC ULTRASOUND REPLACE INTRAOPERATIVE CHOLANGIOGRAPHY DURING LAPAROSCOPIC CHOLECTECTOMY?, Teresa L LaMasters MD, Nicole M Fearng MD, R Stephen Smith MD, Jonathan M Dort MD, University of Kansas School of Medicine - Wichita, and Via Christi Regional Medical Center - St. Francis Campus.

Background: Controversy surrounding the proper evaluation of the common bile duct during laparoscopic cholecystectomy has existed for several years. Recently, intraoperative laparoscopic ultrasound (ILUS) has been proposed as a safe alternative to intraoperative cholangiography (IOC). We hypothesized ILUS is a faster alternative to IOC with increased ability to determine anatomy.

Objectives: (1) To evaluate the ability of ILUS to evaluate biliary anatomy compared to IOC. (2) To evaluate the amount of time necessary to perform ILUS compared to IOC.

Methods: The use of ILUS vs. IOC in a university-affiliated tertiary-care center was prospectively evaluated. Seventy-five patients were included in the study. Each patient underwent ILUS followed by IOC. The ability to define biliary anatomy and the time required to complete each procedure was recorded.

Results: ILUS was performed more expeditiously than IOC (5.7 min vs. 11.2 min, p<0.05). ILUS was able to define the biliary anatomy in 94.6% of cases vs. 87.8% of cases for IOC (p=0.24). The biliary anatomy was able to be defined by at least one imaging modality in 100% of patients. Common bile duct explorations were performed in 4 cases (5%) with resolution of abnormality on cholangiogram. The negative predictive value was 97% and the positive predictive value was 100%. ILUS was also able to identify an aberrant right hepatic artery in three patients.

Conclusions: ILUS was more expedient than IOC and possessed the ability to define vascular anomalies. The ability of each modality to define biliary anatomy was similar between the studies; however, the combination of IOC and ILUS was superior to either study utilized alone. This technology has the potential to allow for prevention of complications during laparoscopic cholecystectomy as the biliary system is evaluated prior to ductotomy. ILUS represents a promising technology for intraoperative biliary evaluation and may replace IOC in the future.

P354–Minimally Invasive Other
BILATERAL LAPAROSCOPIC ADRENALECTOMY IN CHILDREN, Andreas Kiriakopoulos MD, Dimitrios Tsakayannis MD, Dimitrios Linos MD, Hygeia Hospital
Abstract

Objectives: Laparoscopic adrenalectomy is rarely performed in the pediatric population. This study focuses on the clinical presentation, the surgical technique and results of bilateral laparoscopic adrenalectomy in three consecutive children.

Method: This single institutional, retrospective study included three girls aged 6-14 years (median 13). Two of them had bilateral tumors (pheochromocytomas in one case, recurrent leiomyosarcomas in the other case). Micronodular hyperplasia causing Cushing’s syndrome was found in the last case. All patients underwent detailed endocrine assessment and extensive imaging studies including CT scan, MRI of the abdomen and MIBG scanning. The same surgical and anesthesiology group performed all operations that were successfully completed by the laparoscopic method.

Results: Six transperitoneal laparoscopic adrenalectomies were performed with no conversion. The average operating time was 137.3 minutes, the mean estimated blood loss was 75 mL, the mean size of the adrenal lesions was 8 cm, and the mean length of hospital stay was 3 days. Resolution of clinical and biochemical parameters of adrenal hyperfunction was accomplished in all patients with adrenocortical hyperplasia and pheochromocytoma.

Conclusion: Bilateral laparoscopic adrenalectomy can be performed safely and effectively with short hospital stay, minimal blood loss, and excellent functional outcome in the pediatric population.

P355–Minimally Invasive Other
COMBINED HAND-ASSISTED LAPAROSCOPIC RIGHT HEMICOLECTOMY AND DISTAL PANCREATECTOMY, Silviu Marica MD, Ali Ghellai MD, Guthrie Clinic/Robert Packer Hospital, Sayre PA, USA
Introduction

Minimally invasive surgery has achieved world-wide acceptance in various fields, including colon and pancreatic surgery. We present a patient who underwent a combined hand-assisted laparoscopic right hemicolectomy and distal pancreatectomy.

Methods

77 years old female was evaluated for symptomatic anemia. Work up included a CT scan of the abdomen and pelvis and a colonoscopy with biopsy. A hepatic flexure colonic adenocarcinoma was diagnosed. Concomitantly, a cystic mass was identified in the tail of the pancreas with features highly suggestive of mucinous cystadenoma. A recommendation was made for a hand-assisted laparoscopic approach of both lesions.
P357—Minimally Invasive Other

**LAPAROSCOPIC SPLENECTOMY IN SEVERE THROMBOCYTOPENIA**, Roger D Moccia MD, Tejinder P Singh MD, Albany Medical Center

**Introduction:** The purpose of this study was to determine if severe thrombocytopenia (platelets < 35,000) affects morbidity, mortality, or the need for transfusions in patients who have undergone laparoscopic splenectomy.

**Methods:** Retrospective case review of all patients who have undergone laparoscopic splenectomy (LS) by one surgeon in one institution between 1/1995 and 4/2004. Charts were reviewed to determine indication for procedure, pre-operative platelet count, post-operative transfusions, morbidity, mortality, length of hospital stay (LOS) and conversion to open operation.

**Results:** Thirty five laparoscopic splenectomies were performed by one surgeon at Albany Medical Center over a 9 year period. Twelve patients (34%) had preoperative platelet counts of less than 35,000. There were 6 men and 6 women with a mean age of 35 years (13 ? 62). Ten of the patients had a diagnosis of ITP, one had TTP and one had CLL. Mean operative time was 130 minutes (range 103 ? 166). Mean EBL was 61 ml (range 5 ? 300ml). Median post op LOS was 2 days (range 1 to 24). Three patients required post operative blood transfusions (1unit, 2units and 14 units). One patient (TTP) continued to have ongoing bleeding after operation requiring transfusion of 14 units of packed red blood cells. There were no post operative deaths and none of the patients required conversion to open operation.

**Conclusions:** Laparoscopic splenectomy can be performed safely in patients who have severe thrombocytopenia. Bleeding risk is not increased in this patient population and there does not appear to be a need for pre-operative transfusion of platelets in patients who are not actively bleeding.

P356—Minimally Invasive Other

**OUTCOME OF LAPAROSCOPIC SPLENECTOMY FOR THE TREATMENT OF HEMATOLOGICAL DISEASES**, Jacques Matone MD, Gaspar Lopes Filho PhD,Wagner Marcondes MD,Elesário Caetano MD,Ramiro Colleoni MD,Milton Scalabrini MD, Federal University of Sao Paulo - Brazil

**Objective:** The aim of this study was to review our experience with laparoscopic splenectomy, to determine its overall success and applicability.

**Introduction:** Splenectomy is considered to be the best available treatment for severe forms of hematological diseases, such as hereditary spherocytosis, idiopathic thrombocytopenic purpura (ITP) and other hematological conditions, refractory to conservative management. With the advancement of laparoscopic skills and technology, the minimally invasive approach was applied to many open procedures, including splenectomy. Over a short span of time laparoscopic splenectomy has largely replaced open splenectomy regardless of operative indication and has also resulted in an overall increase in the number of splenectomies performed. However, several aspects of this procedure remains as yet undefined and thus, several attempts have been made to modify the standard technique to try to optimize the procedure.

**Methods:** A retrospective analysis of 20 laparoscopic splenectomies performed due to hematological diseases at our institution, between February 2001 and January 2004, was carried out. Patients were followed in the surgical and hematology outpatient clinics and data was reviewed.

**Results:** The indications for the procedures were ITP (80%), non-Hodgkin lymphoma (10%), hereditary spherocytosis (5%) and hypersplenism due to erythematous lupus (5%). Mean age was 31-year old (range 19 to 55) and 80% were female. Mean operating time was 155 minutes. Concerning accesssory spleen, we performed routine search preoperatively. It was detected in the patients before surgical approach. Conversion rate was 10%, due to an injury during hilar dissection in one case and to multiple adhesions from previous surgery in another. Two patients required blood transfusion and post-surgical complications occurred in four patients (20%), including hematoma, diaphragm perforation, pulmonary embolism and infection of the port site. A small transverse incision in the lower abdomen was made for an intact removal of the spleen. In all cases, splenectomy improved patient’s hematological profiles.

**Conclusion:** The laparoscopic approach should be considered the first option in cases of hematological conditions that require splenectomy, whenever contraindications are absent. The procedure requires extensive laparoscopic experience and meticulous dissection of the spleen to lower the complication rate.
P361—Minimally Invasive Other
WHO GETS LAPAROSCOPY FOR APPENDICITIS, DO DISPARITIES EXIST?, R Ricciardi MD, R J Town PhD,T A Kellogg MD,S Ikramuddin MD,N N Baxter MD, Department of Surgery, University of Minnesota, Minneapolis, MN
INTRODUCTION: Laparoscopic approaches to appendectomy are feasible and are associated with reduced pain, shorter recovery, and fewer complications. Utilization of laparoscopic approaches for the treatment of appendicitis has increased steadily since its introduction. No previous research has evaluated the utilization of laparoscopic techniques or potential factors influencing access to laparoscopic appendectomy (LA). METHODS: We used data from the Nationwide Inpatient Sample (NIS), a 20% stratified random sample of US community hospitals in 33 states. Utilizing standard ICD-9-CM diagnostic and procedure codes, we identified patients who were admitted to the hospital with a diagnosis of uncomplicated appendicitis and subsequently underwent appendectomy from 2001 to 2002. Standard procedure codes were utilized to identify patients who underwent LA or open appendectomy (OA). We determined the influence of demographic factors, such as gender, race, payer information, and provider factors such as hospital size, rural or urban setting, geographic location, funding structure, teaching status, and hospital procedure volume on the utilization of LA. A multivariate model was constructed to determine the influence of demographic and provider factors on utilization of LA. RESULTS: A total of 77,909 patients were admitted with a diagnosis of uncomplicated appendicitis and underwent appendectomy during the two year time period, of these 33.9% underwent LA. In multivariate analysis women, older patients, and patients with private health insurance were more likely to undergo LA while African-Americans were less likely to undergo LA. Private for profit hospitals and hospital procedure volume were associated with increased utilization of LA, but teaching status, geographic location, and hospital size were not. CONCLUSIONS: Overall, despite known advantages, in 2001-2002 only one third of patients with appendicitis underwent LA in the US. Utilization of LA appears to be influenced by demographic and provider factors, a number of which (including race and hospital financial structure) are unlikely to be related to disease severity. These data indicate disparities in the application of laparoscopic techniques.

P362—Minimally Invasive Other
LAPAROSCOPIC SUTURING OF TENCKHOFF CATHETER TO PREVENT RE-OPERATION FOR DISPLACEMENT, Sam Rossi MD, Dai Nghiemi MD,Chris Haughn MD,Roberto Bergamaschi PhD, Minimally Invasive Surgery Center and Transplantation Service, Allegheny General Hospital, Pittsburgh, PA
Patients with end-stage renal disease (ESRD) may need to undergo placement of a Tenckoff catheter for peritoneal dialysis. The prevention of displacement of the catheter has been traditionally based on the length of the tunnel within the abdominal wall. However, re-operation rates due to displacement of the catheter have not been low. This study aims to evaluate prospectively the impact of laparoscopic suturing of Tenckhoff catheter on rates of re-operation for displacement. From 1998 to 2003, 216 patients underwent Tenckhoff catheter placement for ESRD at Allegheny General Hospital. Over these 18 years, there was a re-operative rate of 16.6% (32/216 patients) due to persistent abdominal pain with displacement of the catheter towards the upper abdominal quadrants. Laparoscopic suturing of Tenckhoff catheter was started in 2003. The surgical technique involves general or local anesthesia, CO2 pneumoperitoneum and three ports. A Hasson port is placed below the umbilicus to establish the pneumoperitoneum. Two 5-mm ports are placed in the upper quadrants.
Under direct visualization, the tip of the catheter is brought thru a tunnel within the abdominal wall deep to the pelvis and sutured to the parietal peritoneum using a 3-0 absorbable suture with intracorporeally tying a surgeon’s knot.

During 2003, five patients with a mean age of 61 (range 37-91) years underwent laparoscopic suturing of Tenckhoff catheter. A 91-year-old man underwent the procedure under local anesthesia. All five patients underwent immediate discharge and discharged without any complications. Mean operative time was 24.8 (range 15-45) minutes. All patients have been followed-up over the past year with no complaints of pain and with functioning Tenckhoff catheters.

Laparoscopic placement of Tenckhoff catheter with suturing its tip to the pelvis seems an effective way to prevent re-operations for displacement.

**P363—Minimally Invasive Other**

**FASCIAL AND PERITONEAL INJECTION OF LOCAL ANALGESIA AT TROCAR SITES PRIOR TO INCISION SIGNIFICANTLY DECREASES POST-OPERATIVE PAIN AFTER LAPAROSCOPIC SURGERY.** Beauvy Sarod MD, sanam ahmed MD, micheal castellano MD, sabido frederick MD, anthonay kopatais MD, gene f coppa MD, staten island university hospital

**ABSTRACT**

Background: since the introduction of laparoscopic cholecystectomy in 1986, a major benefit has been the reduction in Postoperative pain in patients undergoing this common procedure. This has been manifest by the reduction in use of pain medications particularly narcotics. standard pain medications in our institution for laparoscopic cholecystectomy is Oxycodone/APAP or Hydrocodone/APAP. There are however, a number of patients with complaints of pain in the region of trocar placement after laparoscopic procedure. A number of studies have evaluated the use of local injections of anesthetic medications into skin incision in order to further lower postoperative pain. This study evaluates the use of fascial and peritoneal injection as well as skin injection in the relief of postoperative pain.

METHODS: A retrospective analysis of two groups of patients was performed using a pain scale to quantify the variation in pain. Group A patients received local analgiesa. The skin, fascia and the peritoneum were injected under direct visualization with local anesthesia prior to incision and introduction of the laparoscopic trocars. Group B patients did not receive local analgesia and the records of 98 consecutive patients who underwent laparoscopic cholecystectomy in our ambulatory center during the period of 2003-2004 were examined retrospectively. There were 48 in group A and 50 in Group B. Patients in each group were selected consecutively. Pain postoperatively was evaluated by a telephone call made on the first postoperative morning. An incremental scale beginning with 0 as the lowest possible degree of pain, and ending with 10 as the most was used as the pain assessment tool.

RESULTS: Group A patients with the local anesthetic infiltration had significantly less complaints of postoperative pain as compared to the Group B (p < 0.5). In addition Group A returned to normal activities of daily living more quickly than Group B (p < 0.5).

**P364—Minimally Invasive Other**

**TIMING OF LAPAROSCOPIC APPENDECTOMY IN ACUTE APPENDICITIS IN CHILDREN - A COMMUNITY HOSPITAL EXPERIENCE.** Radhakrishnan Satheseen MD, Peter S Midulla MD, Edward Shlasko MD, Division of Pediatric Surgery, Department of Surgery, Maimonides Medical Center, Brooklyn, NY 11219

Appendicitis is the most common condition requiring surgery in the pediatric population. Most surgeons in the United States consider emergent or urgent appendectomy the standard of care. There is a significant body of evidence that demonstrates antibiotic therapy to be highly effective in reducing the risk of surgical intervention. Several factors affect the scheduling of surgical intervention, such as availability of Operating Rooms (OR), availability of surgeons, and staffing of the OR. Surgeons often justify timing and classification of surgery (as medically emergent) based on satisfying those exigencies. In our institution we schedule patients with acute appendicitis for laparoscopic appendectomy for the next available time during regular OR hours, even if this means waiting until the next day. We reviewed a series of 299 consecutive laparoscopic appendectomies during the period January 2000 to June 2004 to correlate the timing of surgery with perforation rate, the occurrence of complications, and influence on length of stay. No patient clinically diagnosed to have acute non-perforated appendicitis was found to have a perforation at operation. Our review did not reveal any increase in adverse outcome, nor was hospitalization significantly prolonged. A prospective study is underway to confirm these findings.

**P365—Minimally Invasive Other**

**100 LAPAROSCOPIC ADRENALECTOMIES - A CRITICAL APPRAISAL.** Stefan Schmidbauer MD, Felix Hohenbleicher MD, Sybille Lüderwald MD, Thomas Mussack MD, Klaus K Hallfeldt MD, Chirurgische Klinik Innenstadt, Ludwig-Maximilians-Universitaet, Munich, Germany

Objective: Laparoscopic adrenalectomy is today widely accepted as the gold standard for the resection of benign adrenal tumors. However questions remain open such as up to which size tumors should be resected laparoscopically. In the present study we also focus on the resection of solitary metastases, partial adrenalectomy, diagnostic problems regarding the treatment of large adrenal cysts and report on one patient who died following bilateral adrenalectomy for Cushing’s disease.

Methods and procedures: Between 1997 and 2004, 100 laparoscopic adrenalectomies using a lateral approach were carried out in 93 patients. Indications for surgery were benign adrenal tumors < 8 cm (30 adrenoleukodystrophy, 30 operations for Cushing’s syndrome, 21 pheochromocytomas, 13 incidentalomas, 2 cystic tumors) and in 4 cases solitary metastases of bronchial carcinoma. 7 patients underwent bilateral adrenalectomy. Two cystic tumors caused diagnostic problems, as it was impossible to determine preoperatively whether the lesions originated from the liver or the adrenal gland. Results: Mean tumor size was 3.7 cm with a maximum tumor size of 9 cm and 11 tumors > 6 cm. Mean operating time was 135 min with an average bloodloss of 250 ml. In 3 cases partial adrenalectomy was carried out, preserving the unaffected adrenal cortex. There were 3 conversions to open adrenalectomy due to diffuse bleeding, all in patients with Cushing’s disease. We observed 2 major complications (postoperative bleeding from the spleen necessitating a laparotomy and one patient with Cushing’s disease and severe COPD died 16 days after bilateral adrenalectomy due to pulmonary complications). All tumors >6cm were resected laparoscopically without complications. Resection of metastases included in all cases local lymphadenectomy. 3 of 4 patients are free of disease after a mean followup of 16 months.

Conclusions: Laparoscopic adrenalectomy is a safe and reliable procedure, displaying all the common advantages of minimal access surgery. However, special attention should be given to patients with Cushing’s disease and concomitant COPD. In these cases we refrain from bilateral adrenalectomy in one session. Benign tumors > 6 cm as well as large cystic lesions can be resected without technical problems. Partial adrenalectomy is indicated in selected cases. The resection of adrenal metastases may be beneficial in selected patients.

**P366—Minimally Invasive Other**


Minimally invasive approaches for placement ventriculoperitoneal (VP) shunts have been well described. Multiple case series have demonstrated excellent results for shunt placement, revisions and management of abdominal complications. We present our series and review pertinent literature. The reposition or revision of VP shunts. 100% of our patients had successful interventions with laparoscopic techniques.
**P367–Minimally Invasive Other**

**TOTALLY EXTRAPERITONEAL LAPAROSCOPIC LYMPH NODE BIOPSY FOR LYMPHOMA**, Robert J Wilmoth MD, Michael E Harnd MD,Craig S Swafford MD,Matthew L Mancini MD, Department of General Surgery, University of Tennessee Medical Center, Knoxville, TN.

**Objective:** The extraperitoneal space has become widely used for many surgical procedures. We present a case in which laparoscopy was used to obtain tissue diagnosis for pelvic lymphadenoapthy after CT guided biopsy failed adequate specimen for diagnosis.

**Case Report:** Patient is a 27-year-old male who initially presented with supraclavicular adenopathy in March, 2003. Subsequent lymph node biopsy and PET staging revealed Hodgkin's disease with no evidence of disease below the diaphragm. The patient underwent systemic treatment and follow up imaging out to two years revealed no evidence of recurrence. In November, 2003, the patient demonstrated left pelvic adenopathy on CT scan. CT guided biopsy was obtained on two separate occasions without tissue diagnosis. At this time there was no evidence of adenopathy at any other location.

**Results:** Balloon expandable trocar was utilized to gain access to the extraperitoneal space. Two additional 5mm ports were placed in the midline in a similar fashion as utilized in the TEP hernia approach. The left pelvis nodal chain was dissected and yielded tissue for histological confirmation. Pathology revealed recurrent Hodgkin's lymphoma.

**Conclusion:** Advanced laparoscopic skills continue to expand the clinical applications for the surgeon. We applied a facile technique used for the TEP hernia repair to obtain tissue from a deep location. We conclude that this is a safe and effective means of evaluating nodal pathology which would otherwise require a more extensive operation.

**P368–Minimally Invasive Other**

**OUTCOME OF ELECTIVE LAPAROSCOPIC SPLENECTOMY IN 89 CONSECUTIVE PATIENTS**, Takemasa MD, M Sekimoto MD,M Ikeda MD,T Shuji MD,M Yasu MD,T Hata MD,T Shingai MD,M Ikenaga MD,M Ohue MD,H Yamamoto MD,M Monden MD, Department of Surgery and Clinical Oncology, Graduate School of Medicine, Osaka University

**Background and purpose:** Laparoscopic splenectomy (LS) is the procedure of choice for elective splenectomy at our Institution. Technical feasibility and safety of elective LS in 89 consecutive patients were examined. Methods: We studied retrospectively reviewed a consecutive series of LS from November 1995 to March 2004. Patient demographics, operative indications, morbidity, mortality and clinical outcome were evaluated.

**Results:** A total of 89 LS splenectomy including 12 hand-assisted LS (HALS) were performed. Indications were splenic trauma, thrombocytopenic purpura (ITP), splenic cyst or cysts 4, hereditary spherocytosis 3, hyper-splenism 3, autoimmune hemolytic anemia 2, and others 9. There were no deaths. Two patients (2%) who underwent HALS required conversion to open splenectomy, one for dense intraabdominal adhesion, and the other for bleeding of splenic vein. Complication occurred in 7 patients (8%), 4 patients in HALS and 3 in LS. All complications were treated conservatively. Patients who underwent LS had significantly shorter operation time, decreased estimated blood loss, and small spleen than those underwent HALS (141 vs 267 min, 132 vs 1050g, and 196 vs 1381g, respectively).

**Conclusions:** LS is feasible, and the incidence of severe complications is rare.

**P369–Minimally Invasive Other**

**IS THE LAPAROSCOPIC SURGERY AFFECT THYROID FUNCTIONS?, Ali Uzunov MD, Harran University, School of Medicine, Department of Surgery, Sanliurfa, Turkey**

It is known that laparoscopic operations cause less tissue injury and systemic stress response. However, it has not been researched yet the response of thyroid functions, which is a stress organ, against trauma. Although there are a few studies to evaluate open surgery, there is not available report about the effect of laparoscopic surgery on thyroid function. The aim of this study was to evaluate the effects of surgery trauma on thyroid functions in subjects with laparoscopic cholecystectomy.

**Methods:** Forty subjects who underwent laparoscopic cholecystectomy were included in this study. Venous blood samples were taken before operation 30th min and 2nd and 24th hours afterwards for measurement of the levels of TSH, free T3, total T3, free T4, total T4, cortisole and albumin.

**Results:** Free T3 and total T3 levels were decreased significantly at postoperative 2nd and 24th hours than preoperative (p<0.05). However, serum cortisole levels were significantly higher at postoperative 2nd and 24th hours than preoperative (p<0.05). The levels of TSH were lower only at postoperatively 24th (p<0.05). The changes of free T4, total T4 and albumin values were not statistically significant (p>0.05).

**Conclusion:** Surgical stress, which depends on laparoscopic operations, could cause important changes on thyroid function. These changes may be relationship with sympathetic activity and increased cortisole levels that occur after operative injury.

**P370–Minimally Invasive Other**

**LAPAROSCOPIC APPENDECTOMY WITH LIGASURE, Nihat Yavuz MD, Fatih Aydogan MD,Sinan Carkman MD,Sahil Pekermezci MD,Melih Paksoy MD,Metin Kapan MD, Ilhan Karabicak MD,Ozan Kucuk MD,Feridun Sirin MD, Istanbul University,Cerrahpasa Medical Faculty, Emergency Department, Introduction:** Appendectomy is the most common operation performed in emergency departments.

**Nowadays, laparoscopic appendectomy (LA) is being performed with increasing frequency in acute appendicitis. Laparoscopic appendectomy has many advantages such as shorter hospital stay, less postoperative pain and earlier return to work.**

**LigaSure Vessel Sealing System (LVSS) (Valleylab, Boulder, CO, USA) is composed of an energy generator (figure 1) and hand instruments which are designed to be used either in conventional or laparoscopic surgery (figure 2). LVSS, seals vessels up to 7 mm in diameter constantly by using both bipolar pressure and thermal energy simultaneously.**

**The aim of the present study was to examine the value of LVSS in laparoscopic appendectomy.**

**Methods:** LA was performed in ninety-six patients presenting with acute appendicitis at Istanbul University, Cerrahpasa Medical Faculty, Emergency Department between May 2003 and June 2004. In 46 patients LigaSure and in 50 patients endoclip had been used to control the vascular supply of the appendix (figure 3). The operation time and length of postoperative course were considered as the main endpoints of the study. The results were statistically analyzed with unpaired Student’s t test.

**Results:**
24 of the patients were male and 22 were female in LigaSure group and 30 of the patients were male and 20 were female in endoclip group. The median age was 29 years (range 16-75) in LigaSure group and 26 years (range 15-58) in endoclip group. There was no difference in mean hospital stay, postoperative pain and return to work between the groups. The mean operative time was 41 minutes (range 23-93) in LigaSure group and 53 minutes (range 20-120) in endoclip group and the difference was found to be statistically significant (p<0.01).

Conclusions: LA is a safe and easily performed method, along with having the advantages of laparoscopic surgery. The use of ligasure in LA facilitates the dissection of mesoappendix and shortens the operative time.

P371—Minimally Invasive Other

LAPAROSCOPIC REPAIR OF MORGANHI HERNIA, Nihat Yavuz MD, Rafet Yigitbasi MD, Oguzhan Sunamak MD, Abdullah As MD, Ceyhun Oral MD, Sabri Erguney MD, Istanbul University, Cerrahpasa Medical School, General Surgery Department

Introduction: Morgagni hernia is a rare type of diaphragmatic hernia which represents less than 5% of all congenital diaphragmatic hernias. Patients are generally asymptomatic and are diagnosed incidentally. When symptomatic, it generates symptoms due to the compression of thoracic organs or compression of herniated intraabdominal organs. Once diagnosed, the condition requires prompt surgical correction. The defect is repaired either by primary suture or by the use of a prosthetic mesh. In adults, prosthetic mesh repair is preferred. Recently laparoscopic repair of Morgagni hernia has been introduced and gained wide acceptance.

Materials and Methods: Between Jan 2002 and May 2004, 5 patients with Morgagni hernia were treated laparoscopically at our department. Female/male ratio was 3/2. Mean age was 56 years (range 41 to 69 years). Diagnosis were made by chest x-ray and CT scan. Herniation was on the left in two patients, and on the right in three. The content of hernial sac was transverse colon and stomach. There were two separate defects in a patient with left sided hernia. All cases were laparoscopically treated using prosthetic material.

Results: All operations were completed laparoscopically. The postoperative hospital stay was 3 to 5 days with a mean of 4 days. None of the patients developed any complication in the early postoperative period. The mean follow-up period is 7 months (range 3 to 24 months). All patients are actually in good health and without recurrence. Conclusion: Laparoscopic repair of Morgagni hernia is a safe, simple and reliable procedure which presents all the advantages of the minimally invasive surgery.

P372—Minimally Invasive Other

LAPAROSCOPIC REPAIR OF VENTRAL AND INCISIONAL HERNIAS:OUR EXPERIENCE IN 150 PATIENTS, Nihat Yavuz MD, Turgut Ipek MD, Abdullah As MD, Metin Kapan MD, Erhun Elyuboglu MD, Sabri Erguney MD, Istanbul University, Cerrahpasa Medical School, General Surgery Department

Introduction: Incisional hernias develop in 2 to 20% of laparotomy incisions. Approximately 100,000 ventral hernias are operated each year in the United States. Recurrence rate of open repair is 25 to 52% for primary and 12.5 to 19% for mesh repair. Compared to open technique, laparoscopic repair has low complication and recurrence rates, greater patient acceptance and shorter hospital stay.

Materials and Methods: Between April 1999 and April 2004, 150 patients with ventral and incisional hernias were treated laparoscopically. Data concerning the age and sex of patients, the location, number and size of fascial defects, the type of hernias and their contents, the size and type of meshes used in repair, the operative time, the length of hospital stay, and postoperative complications were collected.

Results: Among 150 patients, 111 were female, 39 were male. 92 patients had incisional; 58 had umbilical hernias. In 85 cases, polypropylene, in 40 cases, Dacron, in 26 cases, Composix meshes were used. Mean age was 56.0 years (33 to 81 years). Mean operative time was 63 minutes (30 to 125 minutes). Mean postoperative hospital stay was 2.5 days (1 to 15 days). Postoperative complication rate was 8.6% (seroma, paralytic ileus, small bowel injury, and suture-site neuralgia). Mean follow-up period was 32 months (4 to 60 months). Recurrence rate was 3%. Three subileus cases detected during follow-up.

Conclusion: Laparoscopic approach to ventral and incisional hernias is safe, feasible and a good alternative to open approach. Our results are comparable with those of other reports in the literature.

P373—New Techniques

ARE ANTROPOMETRIC AND VOLUME MEASUREMENT PREOPERATIVE PREDICTORS OF OPERATIVE DIFFICULTY AND CONVERSION NEED DURING LAPAROSCOPIC APPROACH TO RECTAL DISEASES? PRESENTATION OF PROTOCOL AND PRELIMINAR RESULTS, Eduardo M Terargona PhD, Carmen Balague PhD, Juan Carlos Pernas PhD, Jose Monllor PhD, Carmen Martinez PhD, Jorge Garriga PhD, Manuel Trias PhD, Service of Digestive Surgery, *Service of Radiology, Hospital Sant Pau, Univ of Barcelona.

In rectal cancer, factors as the pelvic characteristics and tumor size can determine the degree of technical difficulty to perform the surgery by laparoscopic approach.

Objective: To identify the anthropometric and pathologic features that posses predictive value of operative difficulty or conversion need to open surgery in the laparoscopic approach to rectum cancer. To identify through volumetric measurements the relation between the pelvic and rectal or tumoral volume that could permit to predict the degree of technical difficulty, or the risk or need to convert to open surgery during laparoscopic approach to rectum cancer.

Design: Prospective study of all patients diagnosed of rectum cancer and submitted to laparoscopic approach in our Dep of Lap Dig Surgery of Hospital de Sant Pau, Univ of Barcelona. The radiological study is performed by Abdominal CT Scan with CT Siemens SOMATON plus 4. Axial scans since iliac crests to ischiatic tuberosities, 5 mm wide. Multplanar reconstrucion in a in SIEMENS Magic View 1000 workstation measuring in an axial and sagital and oblique planes the net axis: - promontorium-retropubic, -subsercal-retropubic, -lateral (axial oblique), -maximum and minimal lateral and ant-post pelvic diameter in tumoral location, cranial-caudal, lateral and ant-post tumor diameter, -maximum and prosthetic cranial caudal, lateral and ant-post diameter in men.

Volumetric analysis is performed by Volumetric analysis of minor pelvis, rectal ampulla, rectal tumour and prostate with an specific software (3D Doctor, Able Software Corp., 5 Appletree Lane, Lexington, MA 02420-2406, USA). 3D reconstruction is done from a DICOM file obtained during CT scan.

Statistics analysis: Univariate and Multivariate analysis. Factors evaluated as predictive variables: BMI, previous abdominal surgery, prosthetic and tumoral volume, tumoral location, the different pelvic axis (refered in design), neoadjuvant RT-QT. As dependent variables will be evaluated operative time, technical difficulty (4 degrees), peroperative blood loss, conversion rate, postop complications and hospital stay.

We present the basis of protocol and preliminar results. The protocol began on Jan/04 and 20 patients (6 w and 14 m) (mean age 74 & 61±7 y) have been included. First statistical study will be performed on Dec/04-Jan/05 in order to evaluate and present the results of the first year of the study.

We expect to obtain statistical differences on depending of volumetric parametres.

P374—New Techniques

ADVANTAGES OF A NEW MANUALLY SUTURING SYSTEM INCLUDING ADDITIONAL DEGREES OF FREEDOM, Gerhard F Braun 1,2 PhD, Jens Burchardt 1, Marc O Schurr 2 PhD, Marcus Braun 2, 1. Helios Klinik Muelheim, Germany 2. Tuebingen Scientific, Germany.

Description of the methods
In the past we focused on robotic systems development, with which we were the first to experiment internationally. We continued research towards the development of a simple mechanical suturing device, enabling angulation and rotation of the tip. The instrument was developed by the company Tuebingen Scientific in Tuebingen, Germany. The handle system is designed ergonomically and it is hold by the whole hand. Angulating the handle means fixation of the tip, stretching the handle means to put the tip in a straight position. Rotation of a knob at the tip of the handle allows rotation of the tip of the instrument. Following experimental evaluation which was highly successful, we started clinical application. Today we have performed the suturing of meshes on 10 patients in inguinal hernia. The technique is based on continuing suture of the mesh to the inguinal ligament. Also the fixation to the anterior abdominal wall together with the peritoneum is performed by the use of the suturing device. In 3 patients mesh was sutured to the anterior abdominal wall in patients with abdominal wall hernias. In 2 patients the mesocolon was closed following right colonic resection.

Conclusions
The new suturing device permits in an easy and ergonomic way sutures at the front of the tip of the instrument and sutures at the anterior abdominal wall. The principles of suturing can be compared to the robotic system DaVinci. Compared to this, the handling of the RADIUS surgical system is much more easy, does not need any time for installation of the technology and the price of the system is much less, compared to robotic systems. We are convinced that mechanical manipulators, as the RADIUS Surgical system, will allow better and more precise manual suturing, compared to conventional straight instruments.

P375–New Techniques
SIS MESH FOR LAPAROSCOPIC INGUINAL HERNIA REPAIR - 5 YEAR FOLLOW UP, David S Edelman MD, Laparoscopic Surgery Center, Baptist Hospital, Miami, Florida

Methods: Beginning August, 1999 a prospective study was begun using SIS mesh and laparoscopy in a pre-peritoneal approach to repair periremum hernias. A 7x10 cm mesh was placed, uncut, over the myopectinate orifice and secured with 5 tacks. Patients have followed at 2 weeks, 6 weeks, 6 months and yearly.

Results: The surgeon has an experience of over 800 laparoscopic inguinal hernia operations. There were 50 patients having 61 hernias studied. There were 16 direct, 42 indirect, 2 parastomal and 1 femoral hernia repaired. Operative time averaged 32 minutes. There were no major complications. Nine (9) patients developed seromas, 12 had pain lasting over 7 days requiring medication, 4 had swelling/orchitis and 5 patients (10%) developed a recurrent hernia.

Conclusions: The recurrences were technical complications due to the small mesh size. It is unclear if the pain, seroma and swelling is a host versus graft reaction to the mesh which led to the hernia recurrences. The subgroup of 10 Sport’s Hernia patients did not have the same problems. However, it is concluded that at 5 years, SIS mesh can be used for inguinal hernia repairs and further technical modifications along with a prospective randomized trial comparing SIS to other mesh is necessary.

P376–New Techniques
REPAIR OF A COMPLEX FOREGUT HERNIA AIDED BY NOVEL THREE-DIMENSIONAL SURGICAL RECONSTRUCTION, Stephen M Kavic MD, Ross D Segen MD, Patricia L Turner MD, Ivan M George, Adrian E Park MD, University of Maryland, Baltimore

Recent imaging technology has allowed sophisticated reconstructions based on high-resolution computerized tomography. Here, we present a case of complex foregut herniation in which image reconstruction was invaluable. An 84-year-old woman was referred with a diagnosis of incarcerated paraesophageal hernia. Her medical history was significant for a history of hiatal hernia and a remote motor vehicle collision. She described left-sided chest pain and nausea, and was found to have leukocytosis. Polygonal mesh surface modeling techniques with color enhancement were utilized to render dynamic three-dimensional (3-D) CT-based models of the patient’s hernia. Reconstruction revealed a large herniation of both the stomach and a portion of the liver through a defect in the diaphragm (see Figure).

Images obtained using this novel technique suggested a post-traumatic etiology. The accuracy of the predicted anatomic relationships by 3-D reconstruction was demonstrated at laparotomy, where the patient was noted to have a diaphragmatic hernia with incarcerated stomach and liver. After reduction of the hernial contents, gastroectomy with gastrotomy tube placement was performed in preparation for staged, definitive repair of the diaphragm. This case illustrates that 3-D anatomic reconstructions can be a powerful aid in preoperative planning.

P377–New Techniques
LAPAROSCOPIC VERTICAL SLEEVE GASTRECTOMY (VG) FOR MORBID OBESITY: A NEW RESTRICTIVE BARIATRIC OPERATION, Crystine M Lee BA, Janos Taller BA, John J Feng BA, Paul T Cirangle MD, Gregg H Jossart MD, Dept. of Surgery, California Pacific Medical Center

INTRO: The VG is the restrictive part of the technically difficult biliopancreatic diversion with duodenal switch operation (DS). The rationale of performing the VG as an independent operation was as the first stage of a two-stage DS that would reduce perioperative mortality and morbidity in high-risk super-obese patients through a shorter OR time and lack of anastomoses.

METHODS: Typically, 5-6 trocars are placed in the supine patient. Starting at a point 6cm proximal to the pylorus, a greater curvature gastroectomy is performed along a 32 Fr bougie, using 5-7 firings of 45-60mm linear 3.5mm GI staplers, thus creating a 60-80ml gastric tube. Bioabsorbable Seaguards® are used to buttress the staple-line from the third firing onwards. A methylene blue leak test is performed prior to removal of the bagged stomach from an enlarged trocar site.

RESULTS: Between Nov 2002 and Sep 2004, 68 patients underwent VG. The mean age was 46±11.2 years and 72% were female. The mean preop weight and BMI was 335±89 lbs and 53±2.11 kg/m2, respectively. Compared to 66 patients who underwent laparoscopic DS, the mean OR time was 102±29 vs 229±43 for DS; the mean EBL was 44±22 cc vs 94±48 for DS (P<0.05 for both). The mean lengths of stay were similar, 3.5±1.2 days after VG. Percentage excess weight loss (EWL) at 3, 6, and 12 months was 25%, 45%, and 50% after VG; and 34%, 57%, and 78% after DS (P<0.05 at 6, 12 months). Weight loss at 3, 6, and 12 months was 86±18, 102±32, and 130±48 lbs after VG; and 51±12, 86±13, and 117±21 lbs after DS (P<0.05 at 3 months). Three complications (4.4%) occurred after VG: vomiting due to poor gastric motility, superficial thrombophlebitis, and a moderately symptomatic pulmonary embolus. Of the 66
P378–New Techniques

PERCUTANEOUS TRANS-ESOPHAGEAL GASTROSTOMY TUBE: DECOMPRESSİON FOR MALIGNANT OBSTRUCTION, Richard A Mackey MD, Oishi Hitode MD, Chand Bipan MD, Kameoka Shingo MD, Ponsky Jeffrey MD, Cleveland Clinic Foundation

Percutaneous Trans-osophageal Gastrostomy Tube: Decompression for Malignant Obstruction

Materials and Methods: Seven patients with malignant gastrointestinal obstruction were evaluated for PTEG. Each patient was known to have an intra-abdominal malignancy and presented with gastrointestinal obstruction. Each had nasogastric tube decompression prior to PTEG. Examination revealed massive ascites and carcinomatosis in each patient. Ultrasound, fluoroscopy and a Rupture-Free Balloon (RFB) were utilized for the placement of the PTEG in an endoscopy suite. Ultrasound of the abdomen was performed first to confirm ascites. The RFB was inserted into the cervical esophagus trans-nasally and inflated with contrast media. Under ultrasound guidance percutaneous access was established followed by the placement of a guide wire into the RFB. This allowed percutaneous access into the cervical esophagus. An indwelling catheter was inserted over the guidewire into the stomach utilizing the Seldinger technique. Aspiration of the PTEG revealed gastric contents and the PTEG catheters were placed to gravity drainage.

Results: PTEG was successfully placed in all seven patients. The PTEG catheters provided effective drainage, relieving the obstructive symptoms in all seven patients. One minor post-operative complication occurred in the fourth patient; the development of subcutaneous emphysema on post-operative day 1, which was managed non-operatively. All patients were discharged to hospice within 4 days of the procedure.

Conclusion: PTEG is safe and effective technique for decompression in malignant gastrointestinal obstruction. PTEG can be utilized when the PEGs are contraindicated.

P379–New Techniques

A NEW ENDOSCOPIC TECHNIQUE FOR DIFFICULT CASES OF PERCUTANEOUS ENDOSCOPIC GASTROSTOMY, Hitode Oishi MD, Noriyasu Shiratori MD, Shingo Kameoka MD, Department of Surgery 2, Tokyo Women’s Medical University

We developed Percutaneous Trans-osophageal Gastro-tubing (PTEG) as a safe, simple and less invasive cervical esophagostomy alternative or supplementary to Percutaneous Endoscopic Gastrostomy (PEG). In our original method, PTEG is created using a rupture-free balloon (RFB) catheter under ultrasonographic and fluoroscopic control without endoscopic intervention. We performed in total of 156 conventional PTEG and more than 5000 PTEG were already done in Japan. To improve the technique, we started to use a flexible endoscope to create PTEG from 2003 and named it Endoscopic assist PTEG (EA-PTEG). For this purpose, we also developed an over tube type RFB catheter (OT-RFB) and 12 patients underwent this new procedure.

In this presentation, we would like to show our technique of new EA-PTEG and compare with conventional PTEG. We conclude that the endoscopic intervention made PTEG easier and safer with a fine direct vision control and consequently, reduced the irradiation time.

P380–New Techniques

COMPARISON OF HOLDING STRENGTH OF SUTURE ANCHORS FOR HEPATIC AND RENAL PARENCYMA, Juan M Perrone MD, Alison J Frisella, Jaime Landman MD, Caroline D Ames MD, Department of Surgery, Washington University School of Medicine

Introduction: Conventional laparoscopic suturing techniques are cumbersome, time consuming, and difficult to master. As such, we evaluated various clips to determine the most secure mechanism for tissue approximation with suture anchoring technique.

Material and Methods: A tensometer was used to measure the horizontal pull-off force of five different clips from two different substrates (fresh pig kidney and liver) with and without the addition of a pledget between tissue and clip. The clips investigated were: Lapra-Ty (Ethicon), Endoclip II (USSC), small Horizon Ligating Clips (Weck), Hem-o-lok Medium Polymer Clips (Weck) and a novel prototype Suture-clip (Applied Medical). ANOVA and Two-Sided Fisher’s Exact Test provided statistical analysis.

Results: The novel Suture-clip required the most horizontal stress compared to all other clips to dislodge it from the suture (p<0.01), followed by the Horizon and Lapra-Ty. Suture-clip, Horizon and Lapra-Ty clips as a group required significantly more force to dislodge them than Endoclip II and Hem-o-lock clips (p<0.05). There were no statistically significant differences in the horizontal stress required to dislodge each clip for kidney versus liver tissue or the presence or absence of a pledget. Conclusions: In our experimental model the Suture-clip, Lapra-Ty and Horizon clips required significantly greater horizontal force to dislodge them than the Hem-o-lock and Endoclip-II clips. The addition of a pledget did not improve tension resistance.
Materials and Methods: We retrospectively reviewed the charts of 10 consecutive patients undergoing hand-assisted bilateral nephrectomy between March 2002 and October 2004 using the following technique. With the patient in the supine position, a 5-7 cm periumbilical incision is made through which a hand assist device is positioned. Port sites are created at 5 cm (12mm) and 8 cm (5mm) lateral to the umbilicus on the side of the initial nephrectomy. After pneumoperitoneum is established, one hand is entered for blunt dissection while the other hand is used for instrumentation; the right hand is inserted for right nephrectomy and the left hand for left nephrectomy. A 5 mm laparoscope is used interchangeably between port sites. The renal hilum is dissected. The renal vessels are divided with a vascular stapler and the ureter is divided using plastic locking clips. The kidney is mobilized using the surgeon’s intra-abdominal hand. Finally, a 12 mm curette is inserted through the 12 mm port site. The suction curettage machine is used to aspirate cysts on the anterior and medial surface of the kidney providing a significant decrease in the overall size and allowing easy extraction through the 5-7 cm midline incision.

Results: All 10 patients underwent successful laparoscopic bilateral nephrectomy with a mean operative time of 193 minutes. The average size of the kidneys removed was 717 g and average length was 19 cm. No intraoperative complications or deaths occurred. All patients did well postoperatively with complete resolution of their presenting symptoms. Patients with renal allografts had stable function at the time of discharge.

Conclusion: In patients with symptomatic ADPKD, laparoscopic bilateral hand-assisted nephrectomy using suction curettage to minimize the size of the kidneys is fast, safe and effective.

P384–Robotics

TEACHING ROBOTIC SURGERY: A STEPWISE APPROACH, Mohamed R Ali MD, Bobby Bhasker-Rao MD, Bruce M Wolfe MD, University of California, Davis

Background: As robotic surgery becomes more established, strategies should be developed to integrate this technology into MIS education. After an initial institutional experience with 50 robotic-assisted laparoscopic Roux-en-Y gastric bypass procedures, a curriculum was developed for fellow training in robotic surgery. Methods: The MIS fellow was required to attend a structured training seminar and complete a laboratory training program in robotic suturing. Thirty consecutive robotic gastric bypass operations were reviewed. The learning curve was evaluated using cumulative order in 10-case increments. Results: The average task times for robotic gastric bypasses were then performed using the Zeus robotic surgical system to fashion a 2-layer gastrojejunostomy (GJ). Three robotic suturing tasks (posterior layer (A), inner layer (B), and anterior layer (C)) were assigned to the trainee in cumulative order in 10-case increments (cases 1-10=task A, cases 11-20=tasks A+B, cases 21-30=tasks A+B+C). The surgical staff performed tasks B+C in cases 1-10 and task C in cases 11-20. Results: Total robotic operative time did not vary significantly as the trainee gained more operative responsibility (cases 1-10=65min, 11-20=56min, 21-30=61min, NS by ANOVA). Similarly, mean robotic task time did not vary significantly over the fellow’s experience. There was no statistically significant difference between trainee and staff, respectively, in mean time for task B (18.3min vs. 19.1min, p=0.16) but a significant difference for task C (21.3min vs. 17.1min, p<0.05). There was no statistically significant difference in GJ leak rates among conventional laparoscopy (0), initial 50-case robotic experience of staff surgeon (1), and fellow training experience (0). Similarly, the GJ stricture rate was 0% in all categories. No adverse robotic events occurred throughout this series.

Conclusion: Robotic surgery training may be safely and effectively implemented in a minimally invasive surgery training program. A stepwise gradual introduction of increasingly demanding robotic tasks allows the trainee to acquire robotic surgical skill over a diminished learning curve. More importantly, risk to the patient is minimized by low complication rates and insignificant differences in robotic operative time. This approach appears to maximize the learning experience and minimize the potential for adverse outcomes.

P383–Robotics

IMPORTANCE OF HAPTICS IN MINIMALLY INVASIVE SURGICAL SIMULATION AND TRAINING, Suvaru De PhD, Yi-Je Lim MS, Daniel B Jones MD, Rensselaer Polytechnic Institute, Beth Israel Deconess Medical Center

BACKGROUND: Compared to open surgery, haptic cues are reduced in minimally invasive surgery (MIS). Although tissue color and texture convey important anatomical information visually, touch is still critical in identifying obscure tissue planes, blood vessels and abnormal tissues and for gauging optimal forces to be applied for tissue manipulation. AIM: The purpose of our study is to objectively compare interface devices, algorithms, and surgical training with and without haptics.

METHODS: We have developed novel hardware and software paradigms for effectively utilizing haptics for MIS surgical training.

RESULTS: The following techniques will be discussed: (1) Haptic feedback: we have integrated commercially available haptic devices into a training system that is designed to simulate minimally invasive procedures. (2) Physics-based haptic rendering: we have developed novel physics-based computational models of organs and devised algorithms for interaction of surgical instruments with soft biological tissues in real time. The advantage of these physics-based models is that well-formulated in vivo experiments extract requisite parameters for these models. (3) Haptic recording: We have used haptic devices to measure and record material properties of organs. (4) Haptic playback: We have developed user interaction techniques based on force feedback to guide a user during a training session.

CONCLUSIONS: With the current trend in developing objective quantifiable assessment techniques, the need for developing haptics-integrated systems based on solid fundamental research has become all the more essential. This calls for close collaboration between medical personnel and technologists. Successful integration of haptics into medical simulators will also help its integration into telediagnosis and telesurgery systems.
obstruction prompted a re-exploration but no abnormalities were found and his ileus resolved by post-op day 5. He was discharged on post-op day 6. He has since undergone bone marrow transplant and is still in therapy.

Conclusion: Robotic surgery is a safe and effective method for resecting malignancies in selected pediatric patients. Dissection can be facilitated by the ability to articulate the robotic instruments and the magnified 3-D image. Further study of this technology is warranted as it may increase the variety of procedures which can be safely performed using a minimally invasive approach.

**P387—Robotics**


Background: Laparoscopic Heller myotomy has become the standard treatment option for achalasia. The incidence of esophageal perforation reported is about 5 to 10%. Data about the safety and utility of the robotically assisted approach are scarce. The aim of this study is to assess the efficacy and safety of the robotically assisted Heller myotomy (RAHM) for treatment of esophageal achalasia.

Methods: Review of prospectively maintained database was performed. We analyzed demographic data, symptoms, esophagogram, esophageal manometry, intraoperative and postoperative data and all the RAHM performed at our institution between 9/02 and 2/04.

Results: 54 patients underwent RAHM for achalasia; 26 were men, mean age of 43 years (14-75). Dysphagia was present in 100% of patients.

Of the 26 patients (48%) who had previous treatment, 17 patients had pneumatic dilation, 4 patients had BOTOX injections, and 5 patients had both. The dissection was performed laparoscopically and the robotic surgical system was used for the myotomy. Operative time averaged 162 minutes (62-210), including robotic setup time. Blood loss averaged 24 mL (10-80). No mucosal perforations were observed. Average length of hospital stay was 1.5 days. There were no deaths. At the average follow-up of 17 months, 93% of patients had relief of their dysphagia.

Conclusions: This study proved RAHM to be a safe and effective alternative at our institution, since it decreases the incidence of esophageal perforation to 0% and provides relief of symptoms in 93% of the patients.

**P388—Robotics**

**LAPAROSCOPIC ROBOTIC ASSISTED SWENSON PULL-THROUGH FOR HIRSCHSPRUNG’S DISEASE IN INFANTS**, Andre Hebra MD, Claudia B Moore MPA,Beverly McGuire RN,Gail Kay MD,Richard Harmel MD, All Children’s Hospital, University of South Florida

Purpose: Infants with Hirschsprung’s disease can be treated with a one stage laparoscopic colo-anal pull-through without a colostomy. However, the feasibility and benefits of performing this operation using robotic technology has not yet been evaluated.

Methods: We reviewed our experience with 10 infants (age less than 7 months of age) treated with either laparoscopic pull-through (n=5, group 1) or robotic pull through (n=5, group 2). The average age was 16 weeks for patients in group 1 and 20 weeks for group 2.

Results: The average operative time was 190 minutes for group 1 and 260 minutes for group 2. Group 1 patients received a modification of the Swenson technique (partial proctectomy with mucosectomy) and group 2 received a modification of the Swenson operation (total proctectomy). Average length of stay was 3 days for patients in either group. No complications were recorded. All patients in group 1 required postoperative rectal dilations for management of rectal strictures.

Conclusions: Our experience indicates that robotic assisted pull-through can be safely performed in young infants. Operative time was longer in patients treated with robotic surgery and length of hospital stay was the same. An important observation was the fact that the robotic technology provided superior dexterity and visualization, essential in performing a complete rectal resection beyond the peritoneal reflection. Thus a complete proctectomy, as originally described by Swenson, could be accomplished. This may account for the fact that rectal strictures were less common in patients of group 2.

**P389—Robotics**

**LAPAROSCOPIC ULTRASOUND NAVIGATION IN LIVER SURGERY - TECHNICAL ASPECTS AND ACCURACY**, Markus Kleemann MD, Philipp Hildebrand MD,Hans-Peter Bruch MD,Matthias Birth MD, University Hospital of Schleswig-Holstein - Campus Lübeck, Germany

Introduction: Despite recent advances in laparoscopic techniques and instrumentation, laparoscopic liver surgery is still limited to selected patient population. One major reason may be the lack of orientation during dissection of liver parenchyma. After establishing an ultrasound navigated system for open liver surgery with online-navigation, we will use this technique also in laparoscopic surgery to navigate under laparoscopic ultrasound control e.g. interventional ablation procedures or liver resections.

Material and Methods: We used a six-degrees-of-freedom electromagnetic tracking system. First the adapter was placed at the head of the laparoscopic ultrasound probe to connect the electromagnetic tracker to the adapter. For calibration with an ultrasound phantom, the distance between adapter and ultrasound probe has to be determined and calibrated with the software of the navigation system. Then the other tracker was placed at a laparoscopic dissection instrument built for laser dissection and calibrated as mentioned above. In phantom testing and in a liver organ model the virtual resection line is then overlain to the laparoscopic ultrasound picture and offers the possibility of navigated ablation or resection. In a second step the system was integrated in a liver organ model to detect disturbances due to trocar and camera instruments.

Results: Laparoscopic navigation of the dissection instrument under ultrasound navigation is technically feasible. Even in cases of angulation of the tip of the ultrasound probe no disturbances of the navigation system were obvious, due to close approximation of the laparoscopic ultrasound head and electromagnetic sensor. Anatomic landmarks in liver tissue could be safely reached. No interaction of the electromagnetic tracking system and the laparoscopic equipment could be seen.

Conclusions: Laparoscopic navigation opens a new field in minimally invasive liver procedures.

**P390—Robotics**

**THE EFFECTS OF TRAINING ON THE PERFORMANCE OF ROBOTIC SURGERY: WHAT ARE THE OBJECTIVE VARIABLES TO QUANTIFY LEARNING?**, Kenji Narazaki BS, Dmitry Olenyovik MD,Jesse J Pandorf BS,Benjamin M Solomon BS,Nicholas Stergiou PhD, University of Nebraska Medical Center and University of Nebraska at Omaha

Computer assisted surgery promises ease of use and mechanical precision. However, little is known about the learning strategies for this new surgical technique. The aim of this study is to evaluate the effects of a training program on enhancing surgical performance using the da Vinci surgical system and to identify objective variables to quantify the extent of learning and dexterity.

Seven medical students, completely novice users of the system, were asked to participate in a designed training protocol. Each subject practiced three inanimate surgical tasks, bimanual carrying (BC), needle passing (NP) and suture tying (ST), with the robotic system for a total of six training sessions during a three weeks period. Kinematic data from the force transducers built within the system were collected with the help of a computerized user interface. Task completion time (T), correlation of variation between cyclic intervals in a task (CVI) and between maximum velocities in respective intervals (CVV),
total traveling distance of the tips of the surgical instruments (D), and mean absolute relative phase between both instrument tips (MARP) were measured and statistically analyzed. The results revealed significant reduction in T for all three tasks and in D for the NP and ST tasks (p<.05). MARP increased significantly for the BC task (p<.05). Additionally, while statistically significant results were not obtained, considerable changes in favorable directions were observed in CVI for NP (26.6%), and ST (47.0%), CVF for all tasks (22.6%, 24.2%, 45.9%), and MARP for NP (31.8%).

Subjects learned to perform the surgical tasks which could be measured objectively with the above parameters. The variables examined showed great promise as indicators of learning and dexterity for practical surgical tasks. Future studies will attempt to make further validation of these findings, as well as, to incorporate the variables identified to establish valid criteria for the development of integrated surgical systems and virtual training tools.

P394—Robotics

ANALYSIS OF THE RELATIONSHIP BETWEEN THE KNOT-tying FORCE DURING SUTURING AND WOUND HEALING IN THE GASTROINTESTINAL TRACT. Junya Osamura MD, Soji Ozawa PhD, Yuhiside Morikawa PhD, Toshiharu Furukawa PhD, Yoko Kitagawa PhD, Masakazu Ueda PhD, Masaki Kitajima PhD, Keio University, School of Medicine, Department of Surgery

Background: Objective data on the most suitable knot-tying force during suturing, that is, information regarding the most appropriate force to be used for a particular tissue, is essential for appropriate suturing during robotic surgery. It has been reported that wound healing in the gastrointestinal tract may be closely related to angiogenesis and the expression of growth factors. Purpose: We investigated the appropriate knot-tying force by determining the relationship between this force and wound healing in animal models. Material and methods: We cut and then sutured the stomach and jejunum of Beagle dogs, using a series of knot-tying forces (0.5-5.0 N). As a control experiment, under the same conditions and using the same knot-tying forces, ligation was also conducted without cutting. On the 4th, 7th, 11th and 14th postoperative day (POD), laparotomy was conducted once more to remove the stomach and the intestines. At each site of ligation in the removed organs, HE staining and immunohistochemical staining were conducted, and the relation between the knot-tying force and variations in the density of the microvessels and bFGF-positive cells was evaluated, to determine the most appropriate force for suturing the gastrointestinal tract. Result: On the 7th POD in the stomach (P<0.001), and 7th and 11th POD in the jejunum (P<0.05), the density of the microvessels in the submucosa at the sites of cutting and ligation was higher for the knot-tying force of 1.5 N than for any of the other forces used, whereas the density of the microvessels at the sites of ligation only showed no significant variation for any force on any of the postoperative days. On the 4th and 7th POD in the stomach (P<0.05) and 11th POD in the jejunum (P<0.05), the density of bFGF-positive cells in the mucosa at the sites of cutting and ligation was higher for the knot-tying force of 1.5 N than for any of the other forces used, whereas the density of bFGF-positive cells at the sites of ligation only showed no significant variation for any force on any of the postoperative days. Conclusions: In this study, by assessing wound healing in terms of the extent of angiogenesis and expression of growth factors at the wound site, it was determined that the knot-tying force of 1.5 N is the most appropriate for optimal wound healing in the gastrointestinal tract. We consider that these results would be useful for the development of robotic forceps imparting a sense of touch to the surgeon’s hand.

P395—Robotics

IN VIVO ROBOTIC CAMERAS CAN ENHANCE IMAGING CAPA-BILITY DURING LAPAROSCOPIC SURGERY. Stephen R Platt PhD, Mark E Rentschler MS, Jason Dumpert MS, Shane M Farritor PhD, Dmitry Olevnyikov MD, University of Nebraska - Lincoln, University of Nebraska Medical Center

Robot-assisted laparoscopy, which is generally considered an improvement to conventional laparoscopy, is still fundamentally constrained by the entry point. In vivo robotic surgical assistants are not confined by this point and offer distinct benefits compared to conventional robot-assisted laparoscopy. Robotic cameras inside the body can allow for better surgical planning and tool placement, as well as provide additional visual cues that can help surgeons to explore and more completely understand the surgical environment.

We have developed miniature, remotely controllable robotic camera systems that can be inserted into the abdominal cavity through a standard laparoscopic trocar or a small incision. These robots can be positioned anywhere inside the abdominal cavity and can change their orientation via remote commands and/or manual adjustments.

The efficacy of using these robotic cameras was studied in a series of tests carried out during laparoscopic surgical training sessions using swine. Following insertion of the robots into the abdominal cavity of the animals through small incisions, standard ISO and IEEE depth of field, resolution, contrast, and color tests were conducted. These tests were performed simultaneously for both the robotic imaging systems and standard laparoscopic endoscopes so that direct comparisons could be made. In addition, relative surgical performance was evaluated during cholecystectomy procedures conducted with and without the in vivo imaging systems.

The results of these tests show that in vivo robotic cameras can provide imaging capabilities comparable to current rigid, single-view laparoscopes, with the additional ability to be arbitrarily constrained by the entry point. In vivo robotic surgical cameras can be integrated into robotic imaging systems. Future work will be focused on optimizing image quality and transmission mechanisms, and improving the ability to accurately orient the cameras.

P393—Robotics

USING ROBOTIC NISSEN FUNDIPLICATION TO MANAGE GASTROESOPHAGEAL REFLUX DISEASE. Michael M Raso MD, Syed M Hussain MD, David L Crawford MD, Division of Minimally Invasive Surgery, Dept of Surgery, University of Illinois College of Medicine at Peoria

This study was conducted to assess the role of a robotic system to manage gastroesophageal reflux disease. Over a 2-year period, data were collected prospectively and analyzed retrospectively on 24 patients who had a Robotic Nissen Fundoplication. Preoperative workup included manometry (23), pH probe (18), EGD (21), UGI (7), HIDA (4), and ultrasound (3). Six patients did not have pH probes since five had esophagitis by endoscopy and one did not tolerate it well. All patients had a Nissen Fundoplication with a hiatal hernia repair. Concomitant procedures included; anterior gastrotomy (13), cholecystectomy (3), and gastric pacemaker (1). The mean, standard deviation, and ranges of the port setup time, robotic time, total operative time, BMI, and LOS were calculated. One MIS fellowship trained surgeon performed every case. The Da Vinci system facilitates completion of advanced laparoscopic procedures by providing a high resolution of three-dimensional image, motion scaling and tremor reduction, stable camera platform, comfortable ergonomics, and additional degrees of freedom (internal pitch and yaw) to the laparoscopic instruments. The Left Side First approach was utilized for each patient. Patients were weaned from antacids to avoid rebound gastritis. Patients were monitored subjectively for any symptoms of GERD in clinic. Significant GERD symptoms had objective testing performed. Twenty-four patients underwent a robotic Nissen Fundoplication between October 2002 to 2004. Twenty-three were successfully performed and one was aborted after patient had a suspected myocardial infarction intraoperatively. The mean BMI was 44.8 +/- 11.9 kg (range 19.5-37 kg). The mean total operative time was 184 +/- 67.4 min. (range 144-321 min.). The mean port setup time was 30.6 +/- http://www.sages.org/ 229
This study describes the experience, advantages, and disadvantages of using robotic assistance for a colectomy based on 23 consecutive cases by a MIS fellowship trained surgeon. Since the introduction of the DaVinci Robotic System, minimally invasive surgeons have explored the feasibility of its use for a variety of procedures. This study was based on information that was prospectively collected in an Access database from 9/2002 to the present. Data analyzed included indications for surgery, demographics, and operative times using range, mean, and standard deviations. There were 12 males and 11 females. Patient age: average 60.0 ± 13.7; range [32-81]. Operations included 12 sigmoid colectomies with splenic flexure mobilization and 11 right colectomies. Preop diagnosis: Cancer (4); Diverticulitis (8); Polyp (10); Carcinoid (1). Port setup time in minutes: ave 31.1 ± 7.9; [17-50]. Total robotic operating time in minutes: ave 147.7 ± 59.8; [69-306]. Total case time in minutes: ave 245.2 ± 45.7; [147-342]. Length of stay in days: ave 6.0 ± 7.0; [2-30]. One case was converted to open secondary to dense bladder/sigmoid colon adhesions. Six complications were encountered: 1) Patient slipped off OR table to floor after the robotic portion of the procedure; 2) Persistent left hip parasthesia; 3) Transverse colon injury from ultrasound shears; 4) Cecal injury from cautery; 5) Anastomotic leak; 6) Urinary retention beginning POD 5. Advantages of robotic assistance were: 1) Enhanced visualization of the operative field; 2) Wristed instrumentation facilitated dissection; 3) Camera controlled by operating surgeon; 4) Reduced surgeon's fatigue; 5) Increased marketability of surgeon as regional MIS expert. Disadvantages specific for this procedure included: 1) Inconvenience of altering port placement of camera/instruments during the case; 2) Difficulty working in far lateral extensions of the operative field; 3) Difficulty changing the port positions during procedure. Robotic assisted colon resections are feasible as demonstrated in this series with the above-mentioned advantages and disadvantages.

P395–Robotics


Inanimate simulation is a useful tool in overcoming the learning curve of minimal access surgery. Unique skills are required for mastery of robotically assisted minimal access surgery. We have developed inanimate exercises to simulate and assess the skills necessary for robotic surgery. Expert surgeons (n=4) (> 50 clinical robotic procedures and > 2 years of clinical robotic experience) were compared to novice surgeons (n=11) (< 5 clinical cases and limited laboratory experience) using the da Vinci Surgical System. Seven drills were designed to simulate clinical robotic surgical tasks. Time to completion, minor errors and major errors were recorded for the appropriate drill. Performance score was calculated by the equation Time to Completion + (minor error) x 5 + (major error) x 10. The Robotic Learning Curve (RLC) consists of a trend line of the performance scores corresponding to each repeated drill. Data was analyzed with the Friedman Test and Mann-Whitney U Test. Performance scores for experts were better than novices in all 7 drills (p<.05). The RLC for novices reflected an improvement in scores (p<.05). In contrast, experts demonstrated a flat RLC for 6 drills and an improvement in one drill (p=.027). This new drill set provides a framework for performance assessment during robotic surgery. The inclusion of particular drills and their role in training robotic surgeons of the future awaits larger validation studies.

P396–Robotics

150 ROBOTIC CASES - ONE SURGEON, Mark A Talamini MD, Samuel P Shih MD, Eric J Hanly MD, Joseph M Fuentes MD, Alexander R Aurora MD, Alberto Iglesias MD, Dept of Surgery, Johns Hopkins University, School of Medicine, Baltimore, Maryland

Introduction: It has been nearly four years since the FDA approval of the first robotic device for surgery, and the first robotic case performed at the Johns Hopkins Hospital. Since then many more cases have been performed and much valuable information has been gained.

Methods and Procedures: A review of prospectively collected data from 150 consecutive robotic cases conducted by a single general surgeon at a tertiary academic medical center between Aug 2000 and Nov 2003. These procedures were antireflux surgery (55), bowel resection (49), Heller myotomy (15), Splenectomy (12), Cholecystectomy (8), Gastric (4), Exp. Laparoscopy (4), Adrenalectomy (2) and Gastrojejunostomy (1)

Results: There is an equal sex distribution with the average age of 53 years and weight of 79kg. Average operating room time was 227 min (range 147-342), surgical time 156min (range 68-245) and robotic time 84min (range 30-217). There was a 10% conversion rate to an open procedure and the average length of stay was 5 days (range 2-7). There were 7 technical complications 4 minor (one hook cautery dislodgement and three slipped trocars) and 3 major (system malfunction) and 3 minor medical/surgical complications.

Conclusion: The results further confirm that robotic surgery is indeed safe and prospective in General Surgery. Results vary between the different procedures performed. Robotic surgery is still at an early stage, but results are promising. The optimal role for this technology requires further investigation.

P397–Robotics

ROBOTIC ILEOCOEKTOMY FOR CROHN'S DISEASE: COMPARABLE? Samuel P Shih MD, Alberto Iglesias MD, Eric J Hanly MD, Alexander R Aurora MD, Joseph M Fuentes MD, Anne O Lidor MD, Mark A Talamini MD, Dept of Surgery, Johns Hopkins University, School of Medicine, Baltimore, Maryland

Introduction - Conventional laparoscopic surgery has been shown to provide better outcomes than open approaches in the management of Crohn's disease. Since July 2000, when the first robotic system was approved by the FDA for general surgery, surgeons have been striving to utilize this new tool to create new possibilities and to improve upon conventional techniques. Crohn's disease procedures can take advantage of the excellent visualization to identify the important retroperitoneal structures and the ability to carefully dissect tissue.

Methods and Procedures - Data collected prospectively from 15 consecutive patients having robotic ileocecostomy (da Vinci Robotic System, Intuitive Surgical, CA) for Crohn's disease between 2000 and 2002 were compared to data from 39 crohn's patients having conventional laparoscopic ileocolostomy between 1995 and 1998. A single surgeon from a tertiary academic medical center performed all cases. The robotic procedure is described in detail.

Results - (robotic vs laparoscopic)
Patients in both groups had similar ages (33 vs 39 years) and sex distributions (60% vs 61.5% female). Operative time (200 vs 203min), complication rates (7 intra-operative (0 vs 0 cases) and post-operative (1 minor vs 3 minor) - and length of stay (6 vs 6 days) were comparative. There were more conversions to open surgery in the laparoscopic group (40%) than among the robotic group (20%).

Conclusion: Robotic ileocolonectomy is a safe and effective procedure. The robotic approach is at least comparable to conventional laparoscopic surgery and may allow more Crohn’s patients to receive surgery through a minimally invasive approach.

P398–Robotics
EFFICACY OF NOVEL ROBOTIC CAMERA VERSUS A STANDARD LAPAROSCOPIC CAMERA, Vivian E Strong MD, Nancy Hogle RN, Andrew Miller PhD, Marc Bessler MD, Barry Inabnet MD, Aku Ude MD, Prashant Sinha MD, Dennis L Fowler MD, New York Presbyterian Hospital - Columbia University
INTRODUCTION: To improve visualization during minimal access surgery, a novel robotic camera has been developed. The prototype camera is totally insertable, has 5 degrees of freedom, and is remotely controlled. The aim of this study is to compare the performance of laparoscopic surgeons on a validated assessment tool using both a laparoscope and the robotic camera.
METHODS AND PROCEDURES: Using the MISTELS (McGill Inanimate System for the Training and Evaluation of Laparoscopic Skills) tasks, six laparoscopic fellows and attending surgeons were tested using both a standard laparoscope and the new robotic camera. Half the surgeons used the laparascope first and half used the robotic camera first. Total scores from the MISTELS? sessions using the laparoscope were compared to the sessions using the robotic camera and then analyzed using a paired t-test (p<0.05 was significant).
RESULTS: Five of the six surgeons tested showed no significant difference in their MISTELS task performance on the robotic camera when compared to the standard laparoscopic camera. The mean MISTELS total score of 999 +/- 69 for all subjects using a laparoscope and camera was not significantly different than the mean score of 953 +/- 68 for the robotic camera. The mean MISTELS total score of 999 +/- 69 for all subjects using a laparoscope and camera was not significantly different than the mean score of 953 +/- 68 for the robotic camera. The mean MISTELS total score of 999 +/- 69 for all subjects using a laparoscope and camera was not significantly different than the mean score of 953 +/- 68 for the robotic camera.
CONCLUSIONS: A new robotic camera prototype allows for equivalent performance on a validated laparoscopic assessment tool when compared to performance using a standard laparoscopic camera.

P399–Robotics
ROBOT-ASSISTED SURGERY - A COMMUNITY HOSPITAL EXPERIENCE, Anusak Yiangprukawanan MD, Nino Carnevale MD, The Valley Hospital, Ridgewood, New Jersey
Due to prohibitive cost and limited clinical applications, the robotic surgical system (RSS) is currently available only in some major academic medical centers and a few community hospitals. This report, based on a community hospital perspective, analyzed the cost-benefit of robot-assisted surgery (RAS) and its impact on surgical practice limited to general abdominal surgery (laparoscopic surgery) and its role remains to be defined.

P400–Solid Organ Removal
LAPAROSCOPIC SPLENECTOMY, Abdullah Al Dohayen MD, King Khalid University Hospital
The operative technique for total splenectomy is well known, and until 9 years back the procedure hasn’t changed significantly since the first splencetomy was performed in 1826. Laparoscopic revolution has shown that laparoscopic splenectomy is viable. Laparoscopic operative techniques are variable. The lateral positioning of the patient is better. Usually the inferior Pole vessels are managed first and dissection is continuing cranially.
Laparoscopic splenectomy is done for 51 patients in King Khalid University Hospital. One patient converted to open. The average hospital stay is 2.6 days and no mortality. The procedure was done for spleen weight (200 g to 2.4 kg).
Hand assisted technique is good method to be used. All surgical spleen should be managed by laparoscopy as the first choice.

P401–Solid Organ Removal
EVALUATION OF VIRTUAL REALITY PATIENT RECONSTRUCTION IN THE ASSESSMENT OF VOLUME OF ADRENAL TUMORS: AN INITIAL EXPERIENCE OF 15 CASES, Maria Mara Arenas Sanchez, MD, George Boursa MD, Francesco Rubino, Harutaka Inoue MD, Antonello Forgione MD, Didier Mutter PhD, Luc Soler PhD, Jacques Marescaux MD, IRCAD/EITS, University Hospital of Strasbourg, France
Aim: Evaluation of size is important in the management of adrenal tumors for surgical decision making and follow-up, particularly for incidentalomas. Recently, volumetry has generated interest in the assessment of tumor evolution. The aim of this study was to validate the accuracy of virtual reality (VR) reconstruction (recon) in the assessment of maximal diameter and volume of adrenal tumors.
Methods: A prospective analysis of 15 consecutive patients with adrenal tumors requiring surgical resection was performed. All patients had pre-operative contrast-enhanced CT scan with 2mm slices. VR recon of adrenal tumors was performed by hand delineation followed by automatic reconstruction using a computer software system (Unix SGI octane 2 with R12000 processor) which automatically calculated tumor volume. Maximum diameter was measured by hand from both the conventional CT images and the VR recon. Following tumor resection, dimensions were measured directly and the true tumor volume was determined using volume displacement techniques. Linear regression analysis was used to evaluate the correlation between VR, CT and true measurements.
Results: Mean true maximal tumor diameter was 5 cm (range 2-10.5) and the mean VR diameter was also 4.9cm, regression analysis showing a good correlation (R2=0.81, slope=1, CI 0.81-1.20). Assessment of diameter by CT (4.2cm) also showed a good correlation with true diameter although not as strong as with VR diameter (R2=0.84, slope=1, 0.94-1.19). The true mean volume was 56.77ml (range 1-200) and the mean VR volume was 54.2ml (average error of 17% per lesion). Regressing the real volume on the VR volume yields a statistically significant correlation with an estimated slope of 0.99 (CI 95%; 0.80 -1.17) and a correlation coefficient (R2) of 0.95.
When considering small (<100ml) and large (>100ml) tumors separately, although the slope remains close to 1 for both, R2 was 0.98 for small tumors and 0.37 for large tumors (CI 95%; 1.052 - 1.30 and 0.31 - 1.64 respectively), indicating that VR recon was less accurate for large tumors.

Conclusion: Use of VR in the measurement of diameter and volume of adrenal tumors is promising. VR can estimate tumor volume with high accuracy for small lesions (<100ml). For large lesions, low accuracy may be due to poor definition of tumor margins and variability in tumor morphology. Further work is necessary to improve accuracy for large tumors prior to routine clinical use of this technology.

**P402—Solid Organ Removal**

**BILATERAL LAPAROSCOPIC ADRENALECTOMY - INDIAN EXPERIENCE**, Abbay N Dalvi MS, Pinky M Thapar MS, P S Menon MD, Nalini S Shah MD, Sameer A Rege MS, Seth G S Medical College & King Edward VII Memorial Hospital

Ten patients underwent bilateral laparoscopic adrenalectomy (BLA) from March 2003 to September 2004. The age group varied from 12 to 35 years. Five were males. The indications were Group A - ACTH dependant Cushing’s disease (n = 8), Group B - ectopic ACTH producing Cushing’s (n = 1) and Group C - congenital adrenal hyperplasia 11a hydroxylase deficiency (n = 1). In Group A, 7 had failed trans-sphenoal pituitary ablation. Patient in Group B had a history of thymectomy for carcinoid tumor two years prior to relapse. CECT thorax and MIBG scan failed to localize recurrence or new tumor. ACTH level was 260 pg/ml. The patient in Group C had uncontrolled hypertension. All the patients were evaluated for basal cortical, ACTH, urinary VMA, metanephrines, MIBG scan and other related investigations prior to referral. Sequential contrast enhanced CT scan was used to localize and gain adrenal related information. Sequential trans-abdominal LA was done in lateral decubitus position. Right gland was operated first. Four ports were used on the right side and five on the left side. The surgery was accomplished using only electrocautery. The approach was to reach the adrenal vein first followed by separation of the body from the adrenal gland. The operative time ranged from 180-300 minutes. The gland size ranged from 5 to 7.5 cm x 4 to 6cm. The mean weight was 8 gm. Only one patient (first patient) required conversion on right side. No patient required blood transfusion. Patients were discharged by day 4. Patients were maintained on prednisolone 5mg/day and fludrocortisone 0.05mg/day. All the patients had decreased post-operative S. cortisol levels, significant weight reduction; hypertension and blood sugar was controlled without medications. No menstrual irregularities got correlated with females. Longest follow up so far is of 18 months. There was significant improvement in quality of life. Overall patient satisfaction was achieved. To our knowledge, this is the first series of BLA from Asia.

**P403—Solid Organ Removal**

**LAPAROSCOPIC VERSUS OPEN SPLENECTOMY FOR SPLENOMEGALY**, Sebastian V Demytenaere MD, Liane S Feldman MD, Simon Bergman MD, Sudh Ghouloumd MD, Gerald M Fried MD, Steinberg-Bernstein Center for Minimally Invasive Surgery, McGill University Health Centre

Introduction: Whether laparoscopic splenectomy benefits patients with splenomegaly remains controversial due to a lack of comparative studies. The purpose of this study is to compare laparoscopic (LS) and open splenectomy (OS) for splenomegaly.

Methods: The medical records of concurrent patients undergoing splenectomy for splenomegaly (>500gm) from 2000 - 2004 were reviewed at two hospitals. OS was used exclusively while the other hospital used OS exclusively. Demographic, intraoperative and postoperative variables were compared. Data are expressed as medians and were analyzed using Mann Whitney U test (continuous data) and Yates corrected chi-square (proportions). p<0.05 was considered significant.

Results: There were 10 OS and 13 LS (8 hand-assisted). One LS was converted to open for bleeding. Patient age, gender and comorbidity were similar between groups. While blood loss was equivalent (500 vs 500cc p=0.9), LS took longer (135 vs 115min p=0.072) and OS spleen weight was greater (1420 vs 1055g p=0.15). After LS, time to oral intake (1 vs 3d, p=0.03) and length of stay (3 vs 6d, p=0.004) were decreased. Postoperative complications occurred in 40% of OS and 31% of LS patients (p=0.9).

Conclusion: In patients with splenomegaly, both OS and LS are associated with frequent postoperative complications. The benefits of LS included faster time to oral intake and shorter hospital stay, without compromising safety.

**P404—Solid Organ Removal**

**STAPLELESS LAPAROSCOPIC SPLENECTOMY: A PILOT STUDY**, Mohey El-Banna MD, Department of Gen Surg, Ain Shams University

Background: Both technical and technological advances over the past few years have made laparoscopic splenectomy more feasible and acceptable.

Most of the cases are performed for a normal sized spleen in haematological diseases. Division of the splenic vessels are carried out applying vascular staplers. In this study, we assess the use of the new LigaSure trade mark vessel sealing system to dissect and divide the splenic vessels.

Patients and Methods: Three patients with idiopathic thrombocytopenic purpura were admitted to Ain Shams University hospitals for laparoscopic splenectomy (LS). Instead of the usual LS technique that applies vascular staplers to control the splenic vessels, dissection was performed using LigaSure?

The dissection began at the tail of the spleen, and proceeded upward toward the splenic hilum. Dissection was conducted as close to the splenic hilum as possible, sealing and dividing branches of the splenic vessels. The short gastric vessels were the last divide. The spleen was thereafter extracted from the abdomen as usual.

The operative time, operative complications, hospital stay as well as the costs were evaluated and compared with the usual stapling technique.

Results: In the three cases, the operation was successfully performed laparoscopically. The patients were three females, their age ranging between 20-25 years. The operative time ranged from 45-90 min. excluding the time required to retrieve the spleen. There was no operative mortality, and the blood loss was minimal with no disturbance of the vital data of the patient.

Conclusion: Stapleless laparoscopic splenectomy with the use of LigaSure is a safe procedure. Results are comparable to the usual stapling technique. The direct costs are reduced with the disposal of the vascular staplers. Yet the costs of the LigaSure are not to be counted. In an advanced laparoscopic setting where LigaSure is available, stapleless laparoscopic splenectomy is an alternative successful approach.

**P405—Solid Organ Removal**

**A ROLE OF LAPAROSCOPIC ADRENALECTOMY FOR SOLITARY METACHRONOUS ADRENA MetASTASES FROM LUNG CANCER, TWO CASE REPORTS.**, Hideo Ino MD, Yoshihumi Sano MD, Minoru Naitou MD, Nobuyoshi Shimizu MD, Department of Cancer and Thoracic Surgery, Graduate School of medicine and Dentistry, Okayama University

(Objective) We report two cases of the laparoscopic adrenalectomy for a solitary adrenal metastasis after the operations of the non-small cell lung cancer (NSCLC). (Patients and Methods) The patients are 56y.o. female and 62y.o. male who had found left adrenal tumors by CT scan four and six months after the pulmonary resections due to NSCLC, respectively. (RESULTS) Both patients had laparoscopic adrenalectomy using an ultrasonically activated scalpel without any conversion or treatment-related death. The size of the tumors were 13mm and 27mm each in diameter. Pathological examination revealed NSCLC adrenal metastases in both cases. Patients recovered uneventfully and their conditions are now stable as of the past few years.

(Conclusion) We consider that roles of laparoscopic adrenalectomy may not only be an optional treatment for metastatic adrenal tumors but also more effective and less invasive diagnostic procedure, in case of the tumor is solitary, small in size, and well-localized.
LAPAROSCOPIC SPLENECTOMY FOR DELAYED SPLENIC RUPTURE FOLLOWING EMBOLIZATION, Edward A Pucci MD, Harry Zemon MD, Todd Ponsky MD, Fred Brody MD, Department of Surgery, The George Washington University Medical Center, Washington, DC.

Over the last several years, nonoperative management has become the standard of care for hemodynamically stable patients with splenic trauma. Successful nonoperative management is secondary to advances in intensive care monitoring, splenic embolization and radiologic techniques. When nonoperative management and embolization fail, surgery is required. A laparoscopic approach has been utilized in only a few cases. Furthermore, only one case of a totally laparoscopic splenectomy (LS) has been reported following splenic rupture. We report the first case of a totally laparoscopic splenectomy for a delayed splenic rupture following embolization. A 32-year-old male bicyclist was admitted to the hospital after a bus struck him. On presentation, he was hemodynamically stable with a GCS of 15 and no loss of consciousness. A CT scan of the abdomen and pelvis showed a significant hemoperitoneum with a splenic rupture. Celiac angiography revealed extravasation of contrast from a terminal segmental branch from the lower pole of the spleen. Three titanium coils were placed in order to embolize a splenic artery pseudoaneurysm. The patient remained stable until post procedure day 4 when he developed acute right lower quadrant pain with abdominal distension. Concurrently, his systolic blood pressure fell to 84 mmHg. He was then taken to the operating room emergently for a diagnostic laparoscopy and LS.

At surgery, 1.5 liters of blood was evacuated and a large laceration was apparent across the body of the spleen. A gauze pad was inserted and used to tamponade the laceration while the splenectomy was performed. The avascular attachments and small gastric vessels were divided with the ultrasonic scalpel and the hilum was divided with endovascular staplers. Ultimately, he was discharged to home post operative day six without complications. At three weeks after his surgery, he returned to work and his normal activities. This is the first case report of a LS for a ruptured spleen following embolization. Currently, the role of diagnostic and therapeutic laparoscopy has increased over the last decade for blunt and penetrating trauma. At this time, the exact role of LS for trauma is unclear. As the indications for laparoscopy expand with this trauma, LS should be considered for splenic rupture. Surgical expertise and patient selection are crucial for a successful LS.

LAPAROSCOPIC VS. OPEN DONOR NEPHRECTOMY: COMPARISON OF DONOR AND RECIPIENT OUTCOMES, Eugene Rubach MD, Andrew Isenberg MD, T. Paul Singh MD, Harry Zemon MD, Todd Ponsky MD, Fred Brody MD, Department of Surgery, University of Alabama at Birmingham, Birmingham, AL.

The use of live kidney donation has increased with the growth of Medicare. Laparoscopic nephrectomy was introduced to minimize postoperative donor morbidity while providing results equivalent to open operations. This study is a review of our institution's initial experience with laparoscopic donor nephrectomy. This is a case-control study comparing laparoscopic donors with matched open controls. There are 2 arms to the study: donor outcomes and recipient outcomes. **Objective** Renal transplantation is the only available cure for end-stage renal disease. To alleviate the need for cadaveric organs, live donation was developed. Laparoscopic donor nephrectomy was introduced to minimize postoperative donor morbidity while providing results equivalent to open operations. This study is a review of our institution's initial experience with laparoscopic donor nephrectomy. This is a case-control study comparing laparoscopic donors with matched open controls. There are 2 arms to the study: donor outcomes and recipient outcomes.

**Objective** Renal transplantation is the only available cure for end-stage renal disease. To alleviate the need for cadaveric organs, live donation was developed. Laparoscopic donor nephrectomy was introduced to minimize postoperative donor morbidity while providing results equivalent to open operations. This study is a review of our institution's initial experience with laparoscopic donor nephrectomy. This is a case-control study comparing laparoscopic donors with matched open controls. There are 2 arms to the study: donor outcomes and recipient outcomes. **Objective** Renal transplantation is the only available cure for end-stage renal disease. To alleviate the need for cadaveric organs, live donation was developed. Laparoscopic donor nephrectomy was introduced to minimize postoperative donor morbidity while providing results equivalent to open operations. This study is a review of our institution's initial experience with laparoscopic donor nephrectomy. This is a case-control study comparing laparoscopic donors with matched open controls. There are 2 arms to the study: donor outcomes and recipient outcomes.

**Study design** 11 donors underwent laparoscopic nephrectomy in 1999-2002. They were compared to 11 matched donors who underwent open nephrectomy during the same time period. Recipients of all 22 kidneys were followed for 18-60 months. **Conclusion** Outcomes of our first 11 laparoscopic donor nephrectomies were reviewed in a case-control study. Donors experienced longer operative time and earlier discharge to home. Both groups of recipients were similar at the beginning of the study. There were no differences in patient postoperative course between the groups. Renal graft function was similar between both groups with a trend for improved renal function in recipients of laparoscopically procured kidneys (p=0.39, NS) **Conclusions** Outcomes of our first 11 laparoscopic donor nephrectomies were reviewed in a case-control study. Donors experienced longer operative time and earlier discharge to home. Both groups of recipients were similar at the beginning of the study. There were no differences in patient postoperative course between the groups. Renal graft function was similar between both groups with a trend for improved renal function in recipients of laparoscopically procured kidneys. Laparoscopic donor nephrectomy is a valid alternative to open nephrectomy and provides similar outcomes with less donor disability.

LAPAROSCOPIC SPLENECTOMY FOR DELAYED SPLENIC RUPTURE FOLLOWING EMBOLIZATION, Eugene Rubach MD, Andrew Isenberg MD, T. Paul Singh MD, Harry Zemon MD, Todd Ponsky MD, Fred Brody MD, Department of Surgery, University of Alabama at Birmingham, Birmingham, AL.

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LAPAROSCOPIC RESECTION OF GIANT OVARIAN CYST, J R Salameh MD, Department of Surgery, University of Mississippi, Jackson, Mississippi.

INTRODUCTION: Giant intra-abdominal cysts are very rare and conventional treatment is full midline laparotomy. We present a case of complete laparoscopic extirpation of giant ovarian cyst.

CASE REPORT: 16 year-old female presented with progressive abdominal distension over one year along with early satiety, constipation and significant weight loss. She was cachectic with markedly distented, non-tender abdomen and dilated collateral veins on the chest wall and upper thighs. Laboratory work-up was normal. CT scan showed a giant multi-septated cystic mass in the abdomen measuring 22.5 x 30 x 40.5 cm with significant mass effect causing intra-hepatic ductal dilatation and right hydropneumothorax. Operative Technique: A 3-cm umbilical incision was made and carried down to the cyst wall. The cyst was entered at the center of a purse-string suture and decompessed; 15 liters of murky brown fluid were aspirated. The cyst wall opening was closed, the midline fascia partially closed and a Hasson cannula introduced. Additional trocars were inserted. The cyst was arising from the left ovary; the right ovary was normal. A laparoscopic left salpingo-oophorectomy was performed. The remaining attachments of the cystic mass to the omentum were taken down. A residual loculation required drainage using the laparoscopic sucker and an endoloop was used to close the cyst wall opening. The cyst was delivered through the midline wound. Operative time was 67 minutes. Estimated blood loss was minimal.

Postoperative course was uneventful and the patient was discharged home on post-operative day one with minimal pain and tolerating regular diet. Pathology revealed a mature cystic teratoma. CONCLUSION: Giant ovarian cysts can be managed laparoscopically when a normal tumor marker profile and benign imaging appearance excludes the possibility of malignancy.

LAPAROSCOPIC BILATERAL ADRENALECTOMY FOR ECTOPIC ACTH-DEPENDENT CUSHING’S SYNDROME, J R Salameh MD, K R Bormann MD, Department of Surgery, University of Mississippi, Jackson, Mississippi.

INTRODUCTION: Ectopic ACTH secretion, primarily from small cell lung cancers and bronchial carcinoids, causes 15% of ACTH-dependent hypercortisolism. When the primary tumor cannot be localized or is unresetable, adrenalectomy is an option for control of Cushing’s syndrome symptoms. Laparoscopic adrenalectomy offers a definitive but low morbidity approach for these often frail patients.

METHODS: Two patients with ectopic ACTH-dependent Cushing’s syndrome confirmed by petrosal sinus sampling, undetectable primary tumors, and drug-resistant Cushing’s symptoms, underwent bilateral laparoscopic adrenalectomies.
Adrenalectomies were transperitoneal and were performed using sequential, full lateral decubitus positioning.

RESULTS: Both patients were 61 year old females. Operative times including repositioning were 240 and 245 minutes. Right lobe wedge liver biopsy was added in one case. Estimated blood losses were minimal and the operations were uncomplicated. Regular diets were resumed on the first postoperative day. Hospital stays were three days, mainly for intravenous medications. Pathology confirmed diffuse cortical hyperplasia. Both patients noted rapid improvement in their Cushing's syndrome, including fatigue, emotional lability, supraclavicular fat, and hyperglycemia. Both are maintained on hydrocortisone and fludrocortisone, carry injectable dexamethasone and wear medical alert bracelets. Neither has experienced an Addisonian crisis at 12 and 2 months follow-up.

CONCLUSIONS: Bilateral total adrenalectomy for ectopic ACTH-dependent Cushing's syndrome can be performed laparoscopically with minimal morbidity, is followed by rapid clinical improvement, and is a viable alternative to medical management.

**P410—Solid Organ Removal**

**SURGICAL AUDIT OF FIRST 48 LAPAROSCOPIC SPLENECTOMIES.** Mohammad m Talebpour PhD, gorfat m toogeh PhD,ali m yagobi PhD, Department of Surgery, Sina Hospital, Tehran, Iran

**Aim: To assess the safety and clinical outcome of laparoscopic splenectomy.**

Methods: A consecutive patients referred for laparoscopic splenectomy to a tertiary centre were included in the audit. Open splenectomy was carried out on those with huge spleen. Patients were positioned at 60 degrees semi-supine. Exploration of upper abdomen was carried out routinely for presence of accessory spleen. Homeostasis of vessels performed by intracorporeal suturing routinely and in some conditions by clips. Spleen put in a bag after emptying of its blood by cutting hilar vein and removed from bag by splitting.

Results: During 30 months 48 laparoscopic splenectomies were performed; 39 ITP, 3 spherocytosis with gallstone and 6 cases of treated polycythemia vera. Mean splenic size was 9.5*4.5*3.5cm, with the biggest spleen measured at 30 x 12 x 9 cm. Splenic vessels were tied using intra-corporeal suturing (41 cases) or clips (7 cases). There was one case of complications or death. In our subset analysis, there were 16 patients discharged from hospital with any morbidity or mortality.

Conclusion: Laparoscopic splenectomy including moderate splenomegaly is safe, with good patient outcome.

**P411—Solid Organ Removal**

**EARLY IN-HOSPITAL SPLENECTOMY MAY IMPROVE OUTCOMES IN IDIOPATHIC THROMBOCYTOPENIA PURPURA (ITP).** D. Tseng MD, T. Deloughery MD, B. Sheppard MD, J. Hunter MD Oregon Health and Sciences University

**Objective: For patients who require hospital admission for exacerbation of ITP, early splenectomy is effective in providing long lasting remission.**

Methods: A retrospective review of patients charts between 1994-2004 at a single tertiary referral center was performed, identifying 32 patients who underwent splenectomy for ITP.

Results: Long lasting medication free remission was accomplished in 87% of splenectomized patients up to 9 years. Incidence of minor complications was 10% with no major complications or death. In our subset analysis, there were 16 patients who required hospitalization for ITP exacerbation prior to splenectomy at which time 5 had immediate in-hospital splenectomy, whereas the other 11 returned for later splenectomy. Of the 11 who returned for a separate admission, 3 had no platelet improvement after splenectomy, and 3 had delayed platelet improvement. However, the 5 patients with immediate in-hospital splenectomy all went on to have expected platelet response and were medicated free.

Conclusions: Immediate in-hospital splenectomy is a reasonable alternative to chronic steroid use and may be associated with a higher chance of success compared to later splenectomy.
stay period was 1.5 days (range 1-3 days). Wound infection developed in two patients with Cushing’s syndrome. There was no mortality. Histopathological exam of specimens revealed a cystic adenoma in 16 cases (10 of which was non-functional), a pheochromocytoma in 4, a bilateral cortical hyperplasia and a lymphoma in case each.

Conclusion:
Laparoscopic adrenalectomy is an established method in the treatment of adrenal masses. The performance of laparoscopic adrenalectomy as well as of other laparoscopic procedures has become easier with the introduction new energy system, LigaSure. In fact, vascular control and dissection of the gland by LigaSure reduces the blood loss almost to nil and shortens significantly the operation period. Laparoscopic adrenalectomy by the use of LigaSure is an easy, safe and reproducible procedure.

P414—Solid Organ Removal

RADIOFREQUENCY ABLATION FOR PARTIAL LAP SPLENECTOMY. AN EXPERIMENTAL STUDY. Dimitrios Zacharouis MD, Konstantinos Tepetes MD, George Tzovaras MD, Antonioun Polytisidis MD, Konstantinos HatziTheophilos, Department of Surgery, University Hospital, University of Thessaly, Larissa, Greece.

Introduction
Partial Splenectomy is performed infrequently by either the laparoscopic or the open approach. The most common indications include trauma, hamartomas, diagnosis and treatment of non-parasitic cyst and staging of Hodgkin disease. In this experimental study the radiofrequency ablation (RFA) probe (Radiomics / Tyco Hellas) has been used laparoscopically for division of the splenic parenchyma.

Material and Methods
In the surgical experimental lab, 5 pigs underwent lap partial splenectomy (LPS) under general anesthesia. The three trocar technique, as in laparoscopic splenectomy were used. Two applications of the RFA probe were enough to create a zone of desiccation approximately 1cm from the splenic hilum. The division of the splenic parenchyma was carried out using scissors. The specimen was removed using an endobag. The animals then underwent exploratory laparotomy.

Results
No blood loss was recorded during the splenic parenchyma division. The medium operating time was 30min. (range 25-35). There were no obvious thermal injuries to the adjacent tissues.

Conclusions
The RFA probe can be used successfully for LPS in pigs. There was no blood loss and no thermal injury. The RFA looks promising as another tool for hemostasis and bloodless splenic resection.

P415—Thoracoscopy

FIFTY-TWO CONSECUTIVE THORACOSCOPIC SYMPATHECTOMIES FOR PALMARIS HYPERHIDROSIS OR COMPLEX REGIONAL PAIN SYNDROME. Justin M Burns MD, B Todd Heniford MD, Nicholas H Tinkham BA, Michael A Cowan MD, Craig A Van Der Veer MD, Kent W Kercher MD, Brent D Matthews MD, Carolinas Medical Center.

Introduction: The purpose of this study is to evaluate the efficacy and outcomes of consecutive thoracoscopic sympathectomies. The indication for the procedure was either palmaris hyperhidrosis (PH) or complex regional pain syndrome (CRPS). Methods: Patients undergoing thoracoscopic sympathectomy between July 1998 and June 2004 were identified. Medical records were reviewed and standard descriptive statistics were performed.

Results: There were a total of 50 patients that received 52 operations (two patients had a contra lateral sympathectomy performed as a second procedure). Patients had a mean age of 29 years (M:F 20:30). Forty-eight procedures were performed for PH while 4 were for CRPS. The mean operating time was 78 minutes; mean blood loss, 50cc; and mean postoperative stay, 1.1 days. Forty-five procedures were performed for bilateral disease (87%). Nine patients developed a unilateral pneumothorax. Eight required tube thoracostomy (removed after 1.25 days) while 1 patient received percutaneous evacuation.

One patient developed a chest wall hematoma at a trocar site that resolved spontaneously and one patient developed a transient Horner’s syndrome. After a mean follow-up of 5.3 months, 59% (27/46) of patients treated for hyperhidrosis reported compensatory sweating. Forty-six (92%) patients (both PH and CRPS) were satisfied with their outcome. Four patients were dissatisfied due to excessive compensatory sweating. Three patients (75%) treated for CRPS were asymptomatic although all four patients reported satisfaction from the procedure.

Conclusion: Thoracoscopic sympathectomy is a safe and effective alternative treatment for PH and CRPS. Compensatory sweating occurred in >50% of patients although the majority of patients were satisfied with their short-term outcome.

P416—Thoracoscopy

CASE REPORT: MEDIASTINITIS AND EMPYEMA ARISING FROM INFECTED PANCREATIC PSEUDOCYST SUCCESSFULLY TREATED BY VATS. Yi-Chen Chang MD, Department of Surgery, Far Eastern Memorial Hospital, Far Eastern Memory Hospital, Taipei, Taiwan.

Objective: Mediastinitis is a life threatening disease. Treatments include antibiotics, treatment and adequate drainage. Traditionally, thoracotomy is necessary for drainage of mediastinitis extending below carina. As the advance of VATS, thoracoscopic surgery can achieve adequate drainage of mediastinum.

Methods: Common causes of acute mediastinitis include surgical infection, esophagus rupture, descending infection from oral pharynx. Ascending infection from pancreas to mediastinum is rare. Anatomically, the retroperitoneum space can communicate to the posterior mediastinum. However, the most common thoracic complications of acute pancreatitis are pleural effusion or empyema, and frank mediastinitis is very rare. We reported a case of 41 year-old male who was sent to our hospital because of chest pain, dyspnea and fever. Chest X ray showed widening of mediastinum and bilateral pleural effusion. Pleural tapping showed purulent pleural effusion and high level of amylase. Chest CT was done and showed enlarged paraesophagus tissue. Besides, a cyst at pancreatic tail with cephal extension was noted. Esophagogram did not showed perforation of esophagus. Surgical intervention was arranged under the impression of acute mediastinitis and empyema. The operation was approached by VATS from right side. We clear the pleural cavity and then open the mediastinal pleura. Pus and necrotic tissue at paraesophagus area were debrided. Chest tubes at pleural cavity were placed after operation. NPO for one week was prescribed after operation. Antibiotics treatment continued for 2 weeks. Postoperative course was uneventful and follow-up chest CT one month later showed complete resolution of mediastinitis. However, the pancreatic pseudocyst did not resolve.

Conclusion: VATS can achieve adequate drainage of mediastinum.

P417—Thoracoscopy

ENDOSCOPIC TRANSTHORACIC SYMPATHECTOMY FOR PALMAR HYPERHIDROSIS. David S Edelman MD, Mariner’s Hospital, Tavenier, Florida.

Intro: Endoscopic Transthoracic Sympathectomy (ETS) has been shown to be an effective treatment for palmar hyperhidrosis. Compensatory Sweating (CS), although usually mild, is a side effect that occurs in 100% of patients. CS is the reason for regretting having the operation in 2% of patients operated on. Horner’s syndrome is another common side effect if operating at the T2 ganglion level of the sympathetic chain. Methods: Beginning March, 2002 I began offering a T3 clamping of the sympathetic chain as an alternative to a T3 cutting sympathectomy for palmar hyperhidrosis. Some patients had an additional T4 sympathectomy for axillary sweating. The surgeon had an experience of over 700 ETS operations. Single
Poster Abstracts

P419–Thoracoscopy
VIDEO-ASSISTED SEGMENTAL RESECTION FOR LUNG TUMORS WITH COMPUTED TOMOGRAPHY GUIDED LOCALIZATION. Masahide Murasugi PhD, Toyohide Ikeda PhD, Takuma Kikkawa MD, Naoko Wachi MD, Yoshihide Shimizu PhD, Kunihiro Oyama PhD, Masahiro Mae PhD, Takamasa Onuki PhD, First Department of Surgery, Tokyo Women's Medical University, Tokyo, Japan

BACKGROUND: Although video-assisted thoracic surgery (VATS) is now widely accepted. However, VATS procedure is seldom used for pulmonary segmental resection.

METHODS: Between 1987 and 2003, 455 patients underwent video-assisted thoracic surgery for primary lung cancers or metastatic lung tumors at the Tokyo Women’s Medical University. Among then, 27 patients underwent VATS segmental resection because of tumor location, there population consisted of 18 males and 9 females with a mean age of 66.2 (range, 27 to 82).

RESULTS: VATS was carried out with three surgical ports and small thoracotomy. Simultaneous segmental resection was performed with basic operation, and anatomical segmental resection was performed in 4 cases. Median operation time was 272 minutes and average blood loss was 219 mL. We performed preoperative computed tomography-guided localization of lung tumors with use of a hook wire needle. Two cases were performed two point CT guided hook wire marking for excision line. Resected segment was S6 (n=18), S8 (n=3), S7 (n=2), S2 (n=1), S4 (n=1), S5 (n=1), S7 (n=1) and S9 (n=1).

There was no surgical mortality.

CONCLUSIONS: This report demonstrates that preoperative CT-guided localization can facilitate safe VATS segmental resection of a small deep pulmonary nodule. VATS segmental resection is safe and may be an acceptable for lung tumors.

P420–Thoracoscopy
THORACOSCOPIC LINGULECTOMY IN AN IMMUNOCOMPROMISED PATIENT WITH PULMONARY ASPERGILLOSIS. Bryan A Whitson MD, Michael A Maddaus MD, Rafael S Andrade MD, Division of General Thoracic Surgery, University of Minnesota Department of Surgery

INTRODUCTION: Invasive Pulmonary Aspergillosis (IPA) has a very high mortality in the immunocompromised patient. The mainstay of treatment is medical therapy, however, surgical resection has a therapeutic role in selected cases. When resection is performed, lung preservation is attempted, usually resulting in simple wedge resection. Occasionally, larger lesions, or those deeper within the parenchyma, may require anatomic resection such as lobectomy or segmentectomy. Although thoracoscopic lobectomy is described, thoracoscopic anatomic segmentectomy for localized IPA has not been reported. We present a case of thoracoscopic lingulectomy for localized IPA in an immunocompromised patient resistant to medical treatment.

METHODS AND PROCEDURES: A 66 year old male with acute myeloid leukemia presented with progression of symptoms from localized IPA that was resistant to optimal medical therapy. Computerized tomography showed a 4.7 cm x 5.2 cm centrally located lingular mass. Three ports and a 6 cm access incision were used similar to that of thoracoscopic lobectomy. Sequential dissection and transection of the lingular vein, bronchus, and arteries was performed. The lung parenchyma was then transected with endoscopic staplers along the lines of inflation demarcation. Blood loss was 100cc. Pathology showed a 4.5 cm mass with IPA and clear margins. The patient had an uneventful recovery and was discharged on the 5th post-operative day.

CONCLUSION: Video assisted thoracoscopic segmentectomy, although technically challenging, can be safely performed, allowing the benefits of a less invasive approach with lung sparing.

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ET001
OPTIONS FOR VENTILATORY ASSIST IN AMYOTROPHIC LATERAL SCLEROSIS/ALS: THE POSSIBILITY OF DIAPHRAGM PACING VIA LAPAROSCOPICALLY PLACED INTRAMUSCULAR ELECTRODES, Raymond P. Onders MD, Anthony R. Ignagni MS, Robert Schitz DO, Bashar Katirji MD, Mary Jo Elmo RN, University Hospitals of Cleveland
Background: ALS (Lou Gehrig’s Disease) is a progressive neurodegenerative disease that affects around 1.4/100,000 individuals annually. The cause of death for most patients is respiratory failure unless the only available option of long-term positive pressure ventilation is used. Therapeutic electrical stimulation has been shown to maintain the strength of other peripheral muscles in ALS by maintaining physiologic activity, contractile properties and calcium levels. Motor units can be compensated for by collateral axon sprouting and the rate of sprouting increases with electrical stimulation. We have shown in spinal cord injured patients that the laparoscopic diaphragm pacing system is a low-risk, cost-effective outpatient system that will support the respiratory needs of patients. The objective of the present study is to assess the use of this system to slow or temporarily arrest the rate of respiratory decline of patients with ALS.
Method: With FDA and IRB approval a phase one study of ten patients with ALS and FVC greater than 50% has begun. Each patient will be followed for three months pre-implantation with a series of tests including: pulmonary function tests, ultrasound analysis of diaphragm thickness and phrenic nerve conduction tests. Patients will undergo outpatient laparoscopic mapping of their diaphragm to locate the phrenic nerve motor points and two electrodes will be implanted in each hemidiaphragm. Two weeks after surgery, stimulus/output characteristics of each electrode will be determined. The patients will then condition the diaphragm with three to five 30 minute sessions of therapeutic electrical stimulation per day. Success will be measured by stopping or reversing the rate of progression of the decreasing pulmonary reserve.
Conclusions: Therapeutic electrical stimulation has been used for patients with ALS in the past but it could never help the end result of the respiratory decline. We now have an easy laparoscopic way to stimulate the diaphragm and this study will show whether this will help the quality of patients’ respiration with ALS.

ET002
IMAGE FUSION-INTRA-OP CT WITH MINIMALLY INVASIVE SURGERY, Jay A Redan MD, Gary Onik MD, Florida Hospital-Celebration Health
1. OBJECTIVE OF THE TECHNOLOGY OR DEVICE: The purpose of this evaluation is to determine the use of intraoperative CT scanning to aid in the localization and treatment of intra-abdominal and intra-thoracic tumors that were otherwise difficult or unable to be localized by conventional methods.
2. DESCRIPTION OF THE TECHNOLOGY AND METHOD OF ITS USE OR APPLICATION: Intraoperative CT scanning is used as an adjunct to minimally invasive surgery to aid in the localization of otherwise non-visualized tumors that have required conventional open surgery for removal. The device uses a laser guidance system incorporated into a 16 slice CT scanner in a completely anesthetized and paralyzed patient. This technology aids for exact real time localization of a lesion and avoids the localizing methodology used in the radiology department from disruption during transport to the operating room. Additionally, the patient is under a general anesthetic, therefore, suffers no pain and makes the procedure safer and easier.
3. PRELIMINARY RESULTS: 16 patients have undergone a combined intra-op CT/minimally invasive surgical procedure. The tumors are listed:
   I. Recurrent ovarian carcinoma/Fallopian tube carcinoma. 2 patients
   II. Retroperitoneal tumor. 2 patients
   III. Lung cancer. 2 patients
   IV. Recurrent colon cancer. 1 patient
   V. Renal cell carcinoma. 3 patients
   VI. Painful bony metastasis from prostate cancer. 1 patient
   VII. Liver Metastasis. 4 patients
   VIII. Mediastinal tumor 1 patient
In all 16 procedures, the tumors were perfectly localized followed by a minimally invasive surgical resection and/or ablation in conjunction with radiologists and minimally invasive surgeons. There were no mortalities and zero morbidity in our series.
4. CONCLUSION/FUTURE DIRECTION: The use of this technology is clearly an advance in the field of minimally invasive surgery. The ability to localize these tumors through otherwise undetectable or extremely difficult localization means have aided the minimally invasive surgeons’ capabilities to expand into areas that otherwise would have required either an open operation or a very prolonged and difficult minimally invasive surgical procedure. This technology is still investigational and further studies will be reported when concluded.

ET003
FLUORESCENT CHOLANGIOGRAPHY: A NEW METHOD FOR IMPROVED IDENTIFICATION OF THE BILARY TRACT DURING LAPAROSCOPIC CHOLECYSTECTOMY, Brendon M Stiles MD, Prasad S Adusumilli MD, Amit Bhargava, Yuman Fong, Memorial Sloan-Kettering Cancer Center
Introduction: Correctly identifying biliary anatomy remains an obstacle to safe, timely completion of laparoscopic cholecystectomy (LC). We sought to use autofluorescence of bile (fluorescent cholangiography) to facilitate in vivo identification in mice. This technique requires no extraneous dye or radiography.
Methods: Fluorimetry was performed on samples of mouse bile to determine excitation and emission spectra. In mice (n=7), midline laparotomy was performed, followed by liver retraction to expose the porta hepatitis. Using stereomicroscopy, photographs were taken in brightfield and fluorescent modes, without changing depth or focus. Surgical residents (n=6) evaluated the pictures and identified the gallbladder, cystic duct, common bile duct, and whether the cystic duct joined the right hepatic duct or the common bile duct.
Results: Fluorimetry demonstrated autofluorescence of bile at an excitation wavelength of 475nm. Intense emission was observed at 480nm. Using fluorescent stereomicroscopy at these settings, the gallbladder and biliary tree were easily identified in mice.
This technique decreased diagnostic errors of biliary anatomy by 11-fold (2% v/s 22%, p<.01) compared to brightfield visualization. Fluorescent stereomicroscopy was also used to diagnose bile leak, obstruction, and complex anatomy. Using a prototype 5mm Olympus laparoscope equipped with fluorescent filters, results were reproduced.Conclusions: By incorporating fluorescent filters into standard laparoscopes, fluorescent cholangiography, based solely upon the autofluorescence of bile, may facilitate real-time identification of biliary anatomy during LC, without the need for extraneous dye administration or the use of radiography.

ET004
A NEW LAPAROSCOPIC IMPLANT FOR THE TREATMENT OF GORD, Todd A Berg, Torax Medical, Inc
Research has shown that GERD is a disease with a complex pathology. Numerous factors including lower esophageal sphincter (LES) tone, transient relaxations, and the hiatal diaphragm, have all been discussed as physiologic barriers to reflux. Multiple attempts have been made to address defects of these physiologic barriers however, no device or treatment to date can completely restore the physiologic function of the LES. Surgery is anatomically invasive, presents morbidities,
and has limited precision of efficacy. Drugs only inhibit acid production; they do not address the physiologic dysfunction of the LES. Opportunity remains for a comprehensive treatment which is minimally invasive, safe and restores the LES to normal function. Our approach is to correct the LES by providing an implant to directly augment its function. It is our objective that this implant provides a precise pressure barrier in the LES. It is our further objective that the implant can actuate to allow normal swallow functions.

The technology is an active implant which is attached to the distal esophagus. The implant provides a barrier to gastric pressures, yet yields to normal swallow pressures.

At rest the implant provides a compressive resistance to opening of the esophagus with a magnitude of 10-20mm Hg.

When swallowing, the implant’s resting tone barrier decreases. This allows the implant to distend to the maximum diameter of the esophagus and immediately return to the minimum diameter of the esophagus after the food bolus passes.

The device has been extensively tested in animal studies both acutely and chronically. All animals have undergone pre- and post-implant manometry testing which consistently yields an average 15 mm-Hg pressure increase over baseline. Fluoroscopically viewed barium swallows were also performed to verify normal swallow function and device actuation; all have been normal. Additionally, histopathology assessment has demonstrated a stable healing process and incorporation of the implant.

Pre-clinical testing of the device is being completed. The implant provides a definitive and physiologic increase in pressure resistance to gastric reflux. To date, data suggests the implant is safely incorporated to the esophagus and maintains its position. Additionally, the implant’s function of providing a gastric pressure barrier and allowing full distention for normal swallow function appears permanent.

**ET005**

**MULTISPECTRAL THERAPEUTIC ENDOscopy—IMAGING AND INTERVENTION.** John L Bala BS, Ronald Franzino MD, Micro Invasive Technology, Inc.

OBJECTIVES: This paper’s objective is to redefine conventional endoscopes so that they can efficiently transmit Visible (VIS), Ultra Violet (UV) and Infrared (IR) images from within the body, and can guide laser energy into it.

DESCRIPTION: Current endoscopes cannot combine visual imaging and therapeutic intervention because their light source is static; their fiber optic bandwidth is limited; and their optics are inefficient, responding only to light between 400-700nm. The multispectral endoscope uses Pulsed Xenon Flashtubes which offer a broad optical spectrum (190-1200nm), and which generate high-powered micro-second light pulses that convert non-visible light into visual images. These images can become visible with the use of photodynamic dyes or IR Sensors. Multiplexing technology can also direct lasers for ablation/coagulation by sharing the fiber optic illumination pathway into the body between intervention and imaging. Pulsed Xenon’s UV output can directly kill some infectious bacteria in seconds and also activate diagnostic dyes in situ. During laser surgery, this technology can also identify thermal variations in solid tissue temperature; the IR spectrum may be able to delineate solid tissue from blood vessels as well.

The multispectral endoscope uses optical concepts that replace up to 22 optical elements with a single component to increase the transfer efficiency and resolution of visual and IR images. It can be equipped with different, interchangeable, low-cost, disposable illuminators which can be optimized for a given surgical procedure.

RESULTS: Working prototypes of the “Pulsed Xenon Imaging and Intervention System” demonstrate the efficacy of multiplexing. Laboratory tests utilized pulsed UV light to kill Staphylococcus. In vivo tests demonstrated multiplexing of lasers with visual imaging. Image-guided intestinal biopsies using a disposable illuminator multispectral endoscope integrated with a snare were performed.

CONCLUSIONS/FUTURE DIRECTION: Current results represent “proof of concept” rather than FDA clinical test requirements. These results demonstrate the multispectral endoscope’s potential as a therapeutic surgical imaging device. Integrating laser targeting with visual imaging will further increase the capability of both technologies. Multispectral imaging and intervention, combined with application-based optics, is the enabling technology for the future of endoscopy.
actions at the home location which are communicated back to the remote station over the Internet. The RP6 system allows the remote party (physician, etc.) to control the movements of the robot itself, see and hear at the home location (hospital), and be seen and heard at the home location (hospital) while not physically being there.

Results: Deployment of the system at the hospital was accomplished in less than a day. The wireless network at the institution was already in place. Control station setup ranged from 1 to 4 hours and was mostly dependent on the quality of the Internet connection (bandwidth) at the remote locations. Patients visited with the RP6 on their discharge day were able to be discharged >4 hours earlier than with conventional visits, thereby freeing up hospital beds on a busy med-surg floor. Patient visits during off hours (nights and weekends) were 3 times more efficient than conventional visits during these times, (20 minutes/visit vs. 40 minutes round trip travel + 20 minute visit). Patients and nursing personnel both expressed tremendous satisfaction with the remote presence interaction.

Conclusions: Our early experience suggests a significant benefit to patients, hospitals, and physicians. The implications for future development are enormous.

**ET008**

ULTRASOUND-GUIDED LAPAROSCOPIC SURGERY SYSTEM, Philip Bao MD, Robert Galloway PhD, Alan Herline MD, Vanderbilt University Hospital

Objective: Metastatic and primary liver tumors pose a significant clinical problem for patients and cancer surgeons. Only approximately 20% of these lesions are resectable with standard open surgery, and this has motivated interest in less invasive alternative procedures such as laparoscopic radiofrequency ablation (RFA). Intra-operative imaging with ultrasound is critical to successful positioning of the RFA probe especially during laparoscopic surgery, as the surgeon cannot rely easily upon tactile cues. Also, needle placement is important for tumors larger than 3cm because they are often more irregular in shape and require multiple overlapping ablations. To augment tumor visualization and targeting, we have developed a tracked laparoscopic ultrasound targeting system for liver RFA.

Description of technology and application: A laparoscopic ultrasound probe has been modified to permit tracking by an infrared camera. By tracking the standard two-dimensional images output from the ultrasound machine, we are able to reconstruct three-dimensional ultrasound volumes that can be examined from multiple views much like computer tomography reconstructions of the spine or blood vessels. Moreover, this volume is spatially related to the physical space of the patient and can be used to guide a tracked RFA probe. After the tumor is identified in the volume and an insertion point for the RFA needle is selected, a targeting system is activated which displays the proposed trajectory to the tumor and its distance from insertion. The user may then inspect the path to ensure that no critical structures intervene. A new insertion point and needle path may be chosen, or if satisfactory, the probe is advanced until the distance between target and probe reaches zero. Preliminary results using this system on an experimental model show that we can target the center of a tumor within 10mm.

Conclusions: Image-guided technology has a future role in assisting surgeons particularly during complex laparoscopic procedures which already depend to some degree on intraoperative imaging. This technology is a powerful and cost-effective tool that has the potential to allow surgeons to perform procedures more efficiently and safely. In the future, we hope to apply this tracked ultrasound system to laparoscopic liver resections as well.

**ET009**

REFUX (ACID OR NON-ACID) DETECTED BY MULTICHANNEL INTRALUMINAL IMPEDANCE-PH TESTING PREDICTS GOOD SYMPTOM RESPONSE FROM FUNDOPICATION, Inder Mainie MD, Radu Tutuian MD, Amit Agrawal MD, Amine Hila MD, Janice Freeman RN, Donald O Castell MD, Medical University of South Carolina

Background: Combined Multichannel Intraluminal Impedance (MII) detects gastroesophageal reflux (GER), of all types and is used in the diagnosis of typical and atypical symptoms persisting despite PPI therapy. Laproscopic Nissen fundoplication (LNF) is a recognized treatment for patients with a diagnosis of GER.

Aim: To determine the outcome of LNF as a treatment for patients with persistent symptoms identified as due to reflux by MII-pH on PPI Bid.

Method: 14 patients (Female 12; mean age 40; range 8 months ? 78 years) evaluated using MII-pH were followed after LNF. All patients except one had a positive symptom index (SI) for acid (AR) or non-acid (NAR) reflux during pre-operative testing. Chart review or contact by phone was used to document patient response to surgery.

Results: Mean period of follow-up was 6.5 months (1 month ? 15 months). Eleven patients after LNF were asymptomatic and off anti-reflux medication. Of the 11 asymptomatic patients 6 were diagnosed with a positive SI for cough with NAR, 3 with a positive SI for heartburn with acid reflux, 1 with a positive SI for nausea with acid reflux and 1 with a positive SI for regurgitation with NAR. Patient did improve after surgery but at 10 months was taking a proton pump inhibitor on a required basis and 1 patient had a recurrence of her symptoms (hoarseness) 8 months after surgery. One patient had a recurrence of symptoms (heartburn) at 8 months but was noted to have a negative symptom index on MII-pH evaluation.

Conclusion: A positive SI for non-acid or acid reflux using MII-pH predicts successful response to laproscopic Nissen fundoplication.

**ET010**

LAPAROSCOPIC TREATMENT OF EARLY STAGE COLORECTAL TUMORS CHASED BY MAGNETIC CLIP DETECTING AND CHASING SYSTEM (MCDCS): USEFULNESS OF A MAGNETIC FORCE CHANGEABLE FORCEPS, Takeshi Ohdaira MD, Hideo Nagai MD, Jichi Medical School Hospital

Aim: In laparoscopic surgical treatment of early stage colorectal carcinomas, intraoperative tumor site identification is often difficult. We have developed a novel detecting and grasping device of laparoscopic usage. We used a magnetic clip for the marking and the staying point of the lesion. Methods: We applied a 300 mT magnetic marking clip near the oral edge of the tumor during preoperative colonoscopy and identified the clip by using a magnetic clip detecting and chasing system (MCDCS) with magnetic force changeable ability. At first, during operation, we identified the lesions under a condition of a weak magnetic force of MCDCS. Then the magnetic force level of MCDCS was increased to obtain efficient holding power, and the colon was resected under simultaneous chasing and grasping of the marking site. Results: In a basic ex vivo study, 100 mT magnetic force was easily detected with 100% of detection ratio and 600 mT magnetic force was necessary to constantly chase and grasp the lesion. In a clinical study, the marking site was detected in all the 13 patients. The mean length between the detected site and the clip along the longitudinal bowel axis was 10.8 mm (S. D., 4.6). The mean detection time was 8.4 seconds (S. D., 2.5). Even the marking clip on the retroperitoneal and mesenteric side, MCDCS can readily detect the site through the anti-mesenteric bowel wall.

Conclusion: MCDCS accurately identifies a tumor site and easily treats the colon and rectum with chasing and grasping of the tumor site. This device may be useful to easily resect the tumor in laparoscopic surgery.
TP001
HAPTIC FEEDBACK SYSTEM FOR ROBOTIC SURGERY, Erik P Dutson MD, Roy Hwang, Ali Douraghy, John Zhang, Arthi Vijayaraghavan, Carlos Gracia MD, Warren Grundfest MD, 1UCLA Interdepartmental Biomedical Engineering Department1, UCLA Section of Minimally Invasive and Bariatric Surgery, 3UCLA Center for Advanced Surgical and Interventional Technology (CASIT)

OBJECTIVE
Currently available surgical robotic systems do not provide the surgeon with classic tissue-level haptic feedback. This presentation will outline a plan for introduction of the tactile component in a force sensing robotic grasper based on technologies developed in our Institute.

DESCRIPTION OF THE TECHNOLOGY
The proposed instrument design will relate forces sensed by a surgical grasper directly to the surgeon. The actuation of measured forces is done through a unique finger glove design which related forces using micro-actuating balloons. The actuation balloons comprise a non-linear surface array which will allow feedback information directly to the surgeon’s hands. The design incorporates finger glove actuation controls onto a Da Vinci surgical robotic system. The device transmits force information from the surgical field to the surgeon using MEMS actuation, via micro-balloons originally used for the delta wing aircraft. Balloon actuation is the deformed shape of the silicone rubber, activated by pressurizing and decompressing via a miniature solenoid valve. The balloon actuators can deflect up to 2-mm, with a step response under 50 Hz for a force of greater than 100 mN, and have a pressure range from 0 to 20 psi. The balloons do experience deformation at high pressure and the pressure deflection relationship can be easily characterized. The final concept is a force sensor on the instrumentation that transmits information to a processing circuit and the micro-balloon actuator, which will then provide tactile feedback information to the operating surgeon.

CONCLUSIONS/FUTURE DIRECTIONS
There is an overwhelming body of evidence suggesting minimally invasive surgery is a superior method of surgery with proper patient selection based on cost, complications, short term quality of life, and return to normal functioning. The profound alteration in tactile feedback has contributed to the long learning curves of laparoscopic procedures. Robotic surgery offers some potential benefits in the transition to minimally invasive techniques for the learner, however, lack of tactile feedback is a major drawback that currently undermines its true potential. Reintroduction of tactile feedback may reduce the training time needed, and may also allow for more precise control during delicate laparoscopic and robotic surgical procedures.

TP002
ENDOSCOPIC INTRALUMINAL SUTURING IN POSTOPERATIVE ROUX-EN-Y GASTRIC BYPASS PATIENTS, Michael A Schweitzer MD, The Johns Hopkins University School of Medicine.

Objective: Endoscopic intraluminal suturing devices are currently being used to treat gastroesophageal reflux disease. These suture devices now afford us the opportunity to operate on the stomach pouch of postoperative gastric bypass patients.

Methods: Five postoperative gastric bypass patients underwent endoscopic intraluminal surgery from November 2002 to October 2003 using a flexible endoscopic suturing device with a standard 11mm endoscope. Four patients with a dilated gastrojejunal anastomosis and weight regain had their stoma’s reduced in size. One patient had a leak after undergoing a conversion from a vertical banded gastroplasty to a gastric bypass. A gastric pouch false diverticulum remained after the drain had finally been removed. The false diverticulum was closed with 3 sutures after injection of fibrin glue.

Results: Successful stoma plication was performed on all four patients to narrow their dilated stomas that were measured at over 2cm preoperatively too less than 15mm postoperatively. Two patients had their gastric pouch plicated near the stoma. The one patient who had a gastric pouch false diverticulum closed with fibrin glue into the tract and suture closure of the opening has been asymptomatic.

Conclusion: Upper endoscopic intraluminal suturing is an exciting new field of emerging technology that will, in time, find its role in gastric surgery. The gastric pouch and stoma of postoperative gastric bypass patients is within reach for endoscopic intraluminal therapy. The current devices available were designed for gastroesophageal reflux disease. They will need further refinement to allow more flexibility so as to gain easier access to the rest of the stomach and not just the gastroesophageal junction.

TP003
ENDONSENSE: THE FUTURE OF FORCE FEEDBACK, Kathryn Done’ MS, Timothy N Judkins MS, Allison DiMartino MS, Dmitry Oleynikov MD, Human Centered Designs, University of Nebraska Medical Center

OBJECTIVE: The EndoSense, patent-pending, was designed primarily to provide the laparoscopic surgeon with ever more information about the surgical area. This is a laparoscopic grasper tool which provides force feedback from the grasper tip to the fingertips controlling the force. The EndoSense is also a more comfortable and functional tool, using ergonomic concepts to design a tool which better fits the user.

DESCRIPTION: The EndoSense is specifically designed to provide the user with an intuitive, comfortable, and functional surgical tool. The force feedback felt at the fingertips, which provides the user with information about the magnitude of force being exerted on what he/she is grasping, is one of the major functional advantages of this tool. \(1\) The design incorporates the following:

- Force feedback of grasping tissue via a novel spring-motor system.

- Ergonomic handle that decreases discomfort during lengthy use.

- Two finger paddles that have an intuitive movement mimicking the movement of the graspers.

- Use of the thumb and index finger to reduce fatigue on the hand.

As the graspers receive resistance from the tissues within the patient, a force sensor within the tool transmits that force into the two finger paddles. This transmission of force mimics what the surgeon would feel if he/she were working with traditional open surgical tools.

CONCLUSIONS: Endoscopic surgery is one of the fastest growing surgical fields, and in need of continued improvement and innovation. Sensing the forces being exerted on tissue is one more way to equate endoscopic surgery to open surgery and thus decrease training time before surgery and errors during surgery.

TP004
ROBOT-ASSISTED 3D STRAIN IMAGING FOR MONITORING THERMAL ABLATION OF LIVER, Emad M Boctor MSc, Michelle DeOliveira MD, Gabor Fichtinger PhD, Russell H Taylor PhD, Michael Awad MD, Michael A Chot MD, Johns Hopkins University

Objective: Primary and metastatic liver cancer represents a significant source of mortality worldwide. An increasing interest has been focused on thermal ablative approaches, in which monitoring the ablation process in order to document adequacy of margins during treatment is a significant problem. Ultrasound is the most commonly used modality for target imaging and ablation monitoring. However, the appearance of ablated tumors in conventional ultrasound only reveals hyper-echoic areas from microbubble and outgasing, but cannot sufficiently visualize the margin of tissue coagulation.
Materials and Methods: We capitalize on the changes of tissue elastic properties occurring during heating and protein denaturation, based on prior work of Ophir et al. They also measured elastic properties indirectly by creating mechanical disturbance such as compression and evaluating the resulting displacement in ultrasound. In contemporary practice, however, lack of controlled compression often results in compromised or false reading. Our approach to this problem is to apply precise mechanical control of deformation by mechanical arm. We acquire radiofrequency ultrasound (RFUS) data from the tissue in both rested and stressed states and then estimate the induced strain distribution by tracking speckle motion. The experimental system consists of a Siemens Antares ultrasound scanner to generate RFUS measurement, a robotic arm to provide accurate compression and controlled 3D sonography, and Radionics and RITA ablators.

Experiments and Results: We performed proof-of-concept in vitro experiments on fresh bovine liver. The samples were degassed and placed in a gel-based phantom. The ablation protocol was repeated for different ablation durations (2, 3, 5, and 7 minutes) and temperature ranges (50, 75, and 100 degree Celsius). We compared the strain images, pathological examination, and conventional B-mode images of the thermally treated liver samples. The strain images were found to be consistent with the pathological margins, while the B-mode images were inconclusive.

Future Directions: Currently, we are in the process of repeating the in vitro studies with a refined experimental protocol, in a more controlled manner, and on a larger number of samples, before progressing onto in vivo animal studies. We also investigate the integration of strain based and thermal imaging. Preliminary results promise the ability of deriving accurate temperature maps based on speckle motion.

TP005
PLUG-AND-PLAY INTEROPERABILITY OF MEDICAL DEVICES IN THE OR OF THE FUTURE. Julian M Goldman MD, Susan F Whitehead BA, David W Rattner MD, Massachusetts General Hospital and CIMIT, Boston, MA, USA

INTRODUCTION: The OR is a complex and potentially dangerous environment, where clinicians rely on teamwork and a patchwork of systems to mitigate hazards instead of using automated safety systems (interlocks). Clinicians can’t easily achieve situational awareness or control devices in the OR environment. There is an absence of smart alarms and automated clinical decision support, and no technological infrastructure exists to implement the required solutions.

Proposed Future State: Widespread implementation of open-standards-based Plug-and-Play (PNP) medical device interoperability in the OR of the Future (ORF) will facilitate comprehensive data COMMUNICATION and medical device CONTROL. Adoption of ORF PnP standards will lower the barrier to the deployment of innovative networked medical device technologies.

- Benefits of COMMUNICATION interoperability: Comprehensive population of the EMR, enhanced clinical situational awareness and decision support tools, information for QA and process improvement.
- Benefits of CONTROL interoperability: Device-device control with implementation of safety interlocks, remote user activation of devices, distributed? medical devices such as distributed sensor networks, etc.

METHODS and RESULTS: The MGH/CIMIT[1] ORF PnP program was established to produce a framework for the development of safe and effective consensus medical device interoperability standards. The program was initiated by MGH and CIMIT with a DoD-supported meeting in May 2004. Meeting goals were to identify stakeholders, define the project scope, and form working groups. Over 80 attendees included clinicians, IHDNs, >20 manufacturers, FDA, and DoD[2]. We formed multidisciplinary working groups and agreed to concentrate initial efforts on identifying high-level clinical user requirements for the proposed system. At the 2nd meeting of this peripheral anatomy, the goal was to identify the minimum number of biofeedback sensors to surgical instruments. The primary goal of the technology described is to minimize unnecessary damage to the organ of interest by creating an electromagnetic field that can be used to track the position of the surgical instruments. The technology is designed to work with a standard setup of surgical instruments, which are calibrated and positioned using the electromagnetic field. The surgical instruments are then tracked in real-time, allowing the surgeon to visualize the position of the instruments in relation to the surrounding anatomy. This can help to prevent damage to the organ of interest, as well as improve the overall accuracy of the surgical procedure. The technology could be particularly useful in cases where the organ of interest is difficult to access or visualize, or where there is a risk of damaging nearby structures. In addition, the technology could be used to improve the efficiency of the surgical procedure by reducing the need for repeated calibration and positioning of the surgical instruments. Overall, the technology has the potential to provide significant benefits for both patients and surgeons. However, further research is needed to confirm its effectiveness and safety in clinical settings.
We have created “Ischemia Sensing Surgical Instruments” by adapting and incorporating real-time pulse oximetry techniques into the working surfaces of operative instruments. These instruments provide real-time tissue oxygenation data.

In preliminary experiments, we monitored porcine hepatic oxygenation during retraction while performing the Pringle maneuver. Results demonstrated a correlation between our measurements and the manipulation of the porta hepatis.

Future endeavors aim to develop a system for alerting the operative team to impending tissue damage through sensory substitution. In addition, we envision the system to extend directly into robotically controlled instruments in order to enhance the human - machine interface.

**TP008**

The Value of Video Intubation Techniques for Surgical Residents, (S.R.)

Marshall Kaplan, MD, Denham Ward, MD, George Berci, MD * Cedars Sinai Medical Center, Los Angeles/University of Rochester, New York

In many institutions, S.R.s must contend with emergency airway situations where, unfortunately, an anesthesiologist is not immediately available. This can be a challenge to a successful intubation because of a lack of experience and technical difficulties.

Traditionally, a Macintosh blade on a laryngoscope handle with a tiny battery powered globe is used to attempt intubation. The authors have developed a standard Macintosh blade and handle modified by the insertion of a TV camera into the handle from which a miniature, (3mm) image-light bundle is fitted in to the blade. An enlarged video display is monitored by the assistant to follow the movements on the screen. This system has been successfully used on several hundred patients by anesthesiologists. It is our hypothesis that if the S.R.s are using a vastly improved visual technique with appropriate education, employing this mobile unit in the ICU's or ER's a greater safety margin with fewer attempts can be expected.

It is definitely the method of choice in teaching. (A 7-minute video strip will be included in the 10-minute presentation).

**TP009**

SMART TUTOR: A NOVEL ADAPTIVE SIMULATION ENVIRONMENT FOR TEACHING LAPAROSCOPIC MOTOR SKILLS.

Pham MD, Lincoln Roland MD, Kenneth A Benson BA, Roger W Webster PhD, Anthony G Gallagher PhD, Randy S Haluck MD, Penn State College of Medicine, Hershey, PA; Soundshore Medical Center, NYC, NY; Verefi Technologies, Hershey, PA; Emory University, Atlanta, GA

Introduction: Optimal learning is best achieved in moderate stress situations and without frustration. The Smart Tutor Computing Algorithm (Verefi Technologies, Inc., Hershey, PA) was developed and integrated into the RapidFire PC based laparoscopic skills trainer (Verefi) to create real-time adjustments in difficulty settings based on the users' performance. The Smart Tutor algorithms aim to keep users of any level in their optimal “zone” of learning by minimizing frustration and stress. The goal of this pilot study was to compare our first generation RapidFire/Smart Tutor (RF/ST) to the Mentic pace.

Results: Three tasks from RapidFire were modified with two different Smart Tutor algorithms (emphasizing speed or accuracy) to create six tasks. For MIST VR, only the Acquire, Transfer, and Traversal tasks were used. Expert performance criteria (EPC) were established for RF/ST and MIST VR systems. Ten medical students were randomized to train on each system. For RF/ST, training was completed when subjects achieved EPC in four of the six tasks in two consecutive trials. For MIST VR, subjects were advanced from medium to master level and then to completion of training when EPC were achieved in two of the three MIST tasks for two consecutive trials. Users were assessed by a standard pre- and post-training laparoscopic paper cutting task. All subjects answered a questionnaire regarding levels of frustration based on a five point Likert scale. Data were compared using standard t-test. Results: Data show that novice users had significant improvements in their laparoscopic motorskill on both the RF/ST and MIST VR. The average number of training trials required to achieve EPC on RF/ST and MIST VR environments were 10±3 and 15±4 respectively (p<0.05). A difference in subjective frustration ratings was noted between RF/ST 2.0±0.8 and MIST VR 3.2±1.1 (p<0.05).

Conclusion: Novices acquired laparoscopic skill as assessed on their pre- and post-training cutting scores after training on RF/ST. Although not statistically significant, novice users were achieving EPC with less number of trials with RF/ST. Of importance is that RapidFire with Smart Tutor adaptive environment is providing a less frustrating learning environment, which may enhance laparoscopic skills acquisition.

**TP010**

VACUUM ASSISTED ABDOMINAL WALL LIFT FOR MINIMAL ACCESS SURGERY (M.A.S.) A PRELIMINARY PORCINE STUDY TO EVALUATE SAFETY, EFFICACY AND FEASIBILITY.

Tehemton E Udwadia MD, Biten K Kathrani MS, Ulhas S Gadgil PhD, William Bernie MD, V M Charan MD, Dept. of M.A.S. P. D. Hinduja National Hospital, Regional R & D, Johnson & Johnson Medical, Ethicon Endo Surgery Inc.

Objective: In a porcine model, to design a vacuum assisted device for abdominal wall lift for Minimal Access Surgery (MAS) with the intent to make MAS cost effective in developing countries. Technology A transparent dome shaped device was placed on the pigs abdomen and negative pressure was applied between the device and the abdomen, which lifted the abdominal wall firmly against the undersurface of the device. The device was configured on mould casts made of the pig abdomen insufflated to 14mmHg with CO2. The device had a foam gasket in contact with the abdominal wall to maintain vacuum and appropriately sited ports for trocar entry. It is mandatory in this method to ENSURE free communication of air from outside the device to the peritoneal space through a sub-umbilical trocar placed by open entry passing through the device. The device enters the peritoneal cavity pari passu with vacuum creation and thereby preventing the viscer a being lifted, creating intra peritoneal space at ambient air pressure. Due to the inherent condition of CO2 is not a problem.

Method The study was divided into three groups; 1)in 12 animals to assess the safety and feasibility of the method, 2)in 11 animals, in addition to 1 above, performance of MAS procedures like lap. chole., lap. salpingectomy, lap. assisted bowel resection and 3) in 4 animals long term survival monitoring studies as in group 1 for 2-18 days, after extreme and prolonged vacuum application. Results a) Safe limits of vacuum to create and maintain operative space were 50-150 mmHg for 2 hours. b) Continuous monitoring of vital signs (ECG, HR, SAP2, ETCO2, resp rate, rectal temp), biochemistry and histopathology- post procedure confirmed device safety. c) Intraperitoneal work space by actual measurement was comparable to CO2 insufflation.

Conclusion This study confirms the safety and efficacy of the device. The operating room has a suction machine which can easily be adapted to create a vacuum for this lift, whereas CO2 is not readily available in the developing world. This continuous communication of air between the peritoneal cavity.
and ambient atmosphere provides several cost benefits like valve less simple trocars, suction aspiration without loss of work space, simplified hand instruments. It obviates deleterious effects of CO₂ by maintaining a work space at ambient pressure, temperature and humidity. If feasible in clinical practice this device could help spread the benefits of MAS to all people in all places.

**TP011**

**THE USE OF ACCELEROMETER DATA TO TRACK AND QUANTIFY LEARNING DURING TRAINING ON VIRTUAL LAPAROSCOPIC SKILL MODULES**, Michael J Dancisak PhD, James Korndorffer MD, Michelle J Pinette BS, Department of Exercise and Sport Sciences, 2Department of Surgery, 3Department of Biomedical Engineering, Tulane University, New Orleans, LA

Objective of the Technology

Accelerometer data have been successfully utilized to track and quantify reaching and grasping movements in infants and adult populations. Previous studies have used temporal measures such as time to peak acceleration and time to peak deceleration. Those measures represent single point data on a discrete reaching task. The present study examined the efficacy of acceleration data for determining skill levels of performers during several sessions on a virtual laparoscopic training device. It was hypothesized that the number of acceleration reversals (e.g., acceleration/deceleration) could be obtained from a single tri-axial accelerometer during virtual laparoscopic training sessions.

Technology and Method

The present study used a Biopac MP100 system with a triaxial accelerometer to assess acceleration reversals during a standardized laparoscopic training module. Acceleration reversals were defined as persistent 0-point crossings. Three levels of participants were assessed to determine if expert and novice performers could be determined from the number of reversal done by each performer. Novice performers were non-medical students from a private university. Intermediate performers were individuals trained on the virtual training modules but not practicing surgeons, and expert performers were practicing surgeons familiar with both the training modules and high-ear skill level performers. The results from this study are consistent with reversal data seen in novice and expert reaching tasks.

Conclusions/Future Directions

The results from the present study indicate that the use of acceleration reversal data may provide a metric to assess skill level in individuals training on virtual skills modules. The reversal data may also provide feedback for current practitioners when developing skills on new equipment. The use of acceleration reversals may also provide information about practice schedules for medical students and others learning new surgical skills.

**TP012**

**GASLESS HAND ASSISTED LAPAROSCOPY**, Daniel T Farkas MD, Scott Laker MD, Vincent Iannace MD, Annette Wasielewski RN, Patrick F Leahy MD, Garth H Ballantyne MD, Hackensack University Medical Center

Objective: The objective of this technology is to provide surgeons the ability to perform hand assisted laparoscopic, without the need for a carbon dioxide pneumoperitoneum.

Description: A new hand access device (Freedom) was designed by Galileo Corporation (Dublin, Ireland). This device is essentially a sleeve, with multiple balloons around the outside of it. The device is inserted into the abdomen, and the balloons insufflated through a single tube. This has the effect of lifting the abdominal wall, and provides room within the abdominal cavity to work, without the need for a pneumoperitoneum.

Preliminary Results: Using a prototype of concept? design, we performed a hand assisted laparoscopic left hemicolectomy in a cadaver. With the use of the Freedom device, and no pneumoperitoneum, we were able to obtain excellent intra-abdominal views. We were able to mobilize the left colon and splenic flexure, as well as dissect out the rectosigmoid. The pelvic views were equally good using this hand access device.

Conclusion: The Freedom hand access device allows the use of gasless hand assisted laparoscopy. Carbon dioxide pneumoperitoneum is not necessary when using this device, and this can eliminate some of the adverse effects and complications associated with laparoscopy.

**TP013**

**COMPUTER MEDIATED, PER-ORAL CIRCULAR STAPLER (EEA TYPE) FOR CREATION OF THE GASTRO-JEJUNOSTOMY DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS**

Alex Nagle MD, Eric Hungrness MD, Jay B Prystowsky MD, Nathaniel J Soper MD, Northwestern University, Feinberg School of Medicine, Department of Surgery, Chicago, IL

Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) is technically challenging and has a long learning curve. Morbidity and mortality are often associated with complications related to the gastro-jejunostomy (GJ), particularly early in the learning curve. Although stapling devices have simplified performance of the GJ, complications have not been eliminated. An FDA-approved computer mediated stapler (SurgASSIST; Power Medical Interventions, USA) has been introduced. This technology eliminates potential stapling errors and provides a precise, reproducible staple line by digitally establishing a staple height determined by the tissue thickness. SurgASSIST consists of a computer console, remote control, flexible shaft, and circular stapler. To facilitate passage through the esophagus, the length of the stapler has been shortened and a soft, conical shaped introducer tip has been added to the distal end. A hydrophilic coated sheath covers the stapler to provide a smooth trans-oral passage. Once passed through the esophagus, the introducer tip is unlocked and the sheath is retracted to expose the stapler head. A flexible wire trocar, centrally located within the stapler then penetrates the gastric wall. This long, thin trocar creates a small gastric defect compared to other EEA devices and allows easy and quick connection to the anvil. The anvil and stapler are then united and a computer mediated, circular 21-mm GJ is created.

This technology has been evaluated in a human cadaver model. Trans-oral passage of the stapler was performed with no difficulties and several inherent advantages were confirmed. A trans-oral approach simplified performance of the GJ and provided a consistent, reliable anastomosis in a timely fashion. Based on this preliminary experience, we believe this device will shorten the learning curve associated with LRYGB and potentially decrease morbidity and mortality. Further prospective clinical evaluation will be conducted to validate these claims.

**TP014**

**IMAGE OVERLAY FOR CT-GUIDED HEPATIC NEEDLE INSERTIONS — CADAVER STUDIES**, Michelle L deOliveira MD, Anton Deguet MS, Gregory Fischer MS, Emese Balogh MS, Ian M Fayad MD, S. James Zinreich MD, Gabor Fichtinger PhD, Johns Hopkins University

OBJECTIVE: We present a two-dimensional image overlay device to assist hepatic needle placement on CT scanners.

MATERIALS AND METHODS: The image overlay system consists of a flat display and a semitransparent mirror mounted on the gantry. When the physician looks at the patient through the mirror, the CT image appears to be floating inside the body with correct size and position, as if the physician had...
ANTI-FOGGING EFFECTS OF TITANIUM DIOXIDE (TiO2) COATING LAPAROSCOPE WITH SUPER-HYDROPHILIC EFFECT: AN APPLICATION OF PHOTOCATALYSIS TECHNOLOGY TO LAPAROSCOPY, Takeshi Ohdaira MD, Hideo Nagai MD,Kazuhide Hashimoto PhD, Jichi Medical School

Aim: Maintaining a clear view of laparoscope is a prerequisite for safe and accurate laparoscopic surgery. Conventional products used to prevent fogging of laparoscopic lenses include surfactant solutions to prevent water vapor condensation, lens-cleaning systems using a water jet, and systems to heat the tip of scopes. However, the effects of surfactants are only short-lived, and both water-jet and heater systems were proved to be totally ineffective for oily membrane. We developed a new anti-fogging device using titanium dioxide-coated glass, which has long-lasting anti-fogging properties against condensation, tissue debris, and blood, as well as oily membrane. Principles: The device is a cylindrical socket with titanium oxide-coated glass placed at its tip. Water, supplied through the socket device, produces a thin water barrier on the glass coated titanium dioxide that protects the lens surface against oil, blood and tissue. Method of evaluation: Laparoscopic surgeries using conventional laparoscope and sockets with or without titanium dioxide coating glass were performed and video recorded. The time from laparoscope insertion to the first withdrawal and wash due to fogging was measured and compared among the three type sockets. The double-blind study included 20 patients, respectively, undergoing axillary dissection at our institution.

RESULTS: The geometrical accuracy of needle placement was 1.5 mm on mechanical phantoms. The average needle placement accuracy, compared to the conventional free-hand unassisted technique. FUTURE WORK: We will perform controlled studies with the CT image overlay system on human and fresh ventilated animal cadavers, focusing on hepatic needle placement under tilted gantry. An MRI compatible version of the image overlay system has also been constructed and currently being tested on phantoms. FUNDING: Siemens Corporate Research, National Science Foundation #EEC-9731478, Brazilian Ministry of Education #CAPES-BEX1572/03

EVALUATION OF THE EFFICACY OF LIGASURE(TM) DEVICES IN SEALING OF PORCINE LYMPHATIC VESSELS, Yuri W Novitsky MD, Andrew G Harrell MD,Michael J Rosen MD,William S Cobb MD,Ronald F Sing DO,Kent W Kercher MD,B. Todd Henfod MD, Carolinas Medical Center

Introduction: Lymphatic leaks following dissection with standard electrosurgical sources may cause significant morbidity after pelvic, abdominal, axillary, and vascular surgeries. Prior to this study, there was no FDA approval for lymphatic ligation with any energy source. LigaSure (LS), a computer-controlled bipolar diathermy system, has been shown to reliably seal blood vessels up to 7 mm in diameter. The objective of this study was to evaluate the efficacy of LS devices to seal large lymphatic vessels.

Methods: Thoracic ducts from 4 adult pigs were explanted and sealed at multiple levels using 3 different LS devices: Atlas, V and XTD. Fifteen seals (5 per group) were analyzed for sealing time, visual quality, and burst strength. A qualitative seal assessment for the amount of sticking, charring, and desiccation was performed using a standard 0 (minimum) to 3 (maximum) scale. Seal burst strength was measured using a graduated pressure saline injection system. Twelve intact seals (4 per instrument) underwent a histological analysis. The data was expressed as mean±standard deviation. ANOVA was used for statistical comparison of the instruments.

Results: The overall range time to achieve a seal was 5.5±2.2s (range, 3-10s). There was no difference in sealing time between the Atlas, V, and XTD instruments (6.3±2.3s, 4.1±0.6s, 6.4±2.6s, respectively). Qualitative seal assessment revealed an overall minimal sticking and charring (1.0±0.7 and 0.9±0.8, respectively) and a favorable degree of seal tissue desiccation (2.2±0.6). There was no statistical difference between the 3 groups. The mean overall burst strength of the seals was 271±78 mmHg (range, 127-360 mmHg). The burst pressures in the Atlas, V, and XTD groups were not statistically different (285±72 mmHg, 216±86 mmHg, 316±40 mmHg).

Histological analysis demonstrated a fusion of a lymphovascular channel with a complete obliteration of the lumen, thus confirming the thermal fusion of all thoracic ducts.

Conclusion: LS vessel sealing systems produced a fast and effective sealing of porcine lymph vessels with minimal sticking and charring. Regardless of the type of device employed, seal failures occurred at markedly supraphysiologic lymphatic pressures. This study resulted in the recent and first ever FDA approval for lymphatic sealing by a surgical energy source. In addition, clinical efficacy of LS devices to prevent/ minimize lymphatic leaks is currently being investigated in patients undergoing axillary dissection at our institution.

SHAPELOCK COBRA, Lee J Swanson BA, Pankaj J Panichha BA, Richard A Kozarek BA, Paul Swain MD, Legacy Health System, University of Texas Medical Branch, Virginia Mason Medical Center, Lahey Clinic

Technology Objective: The ShapeLock? Cobra (USGI Medical, San Clemente, CA) was developed to create the essential endoluminal platform from which advanced endoluminal and transluminal endoscopic procedures can be performed.

Description of Technology/Method of Application: The ShapeLock Cobra utilizes the flexible, locking, nested metal links of the ShapeLock technology, but incorporates additional features that allow therapeutic procedures. The Cobra is sized to be introduced per-oryally, but can also be used for procedures in the lower GI tract. The Cobra has 4-way tip articulation as well as insufflation, suction and irrigation similar to standard endoscopes and can be actively steered to reach all areas of the stomach, including retroflexion to the GE junction. Once the desired position is achieved, ShapeLock technology enables the device to be locked in place. After insertion and positioning, the distal end of the visualization lumen can be extended above the body of the endoscope to provide off-axis visualization and thus enable effective triangulation of instruments to permit complex, two-handed tissue manipulations.

Results: The ShapeLock Cobra has been tested in both canine and porcine models. The potential to perform both intragastric and transgastric surgery has been demonstrated.
Conclusions/Future Directions: A mechanical device has been developed that retains the desirable attributes of an endoscope, but incorporates features that overcome its inherent limitations. The ShapeLock Cobra is flexible like an endoscope, but can be locked to facilitate force transmission at the desired target in the desired plane. Future directions include using a CCD chip and LED light source for visualization. Using a CCD, wire can be routed through the dead space between the circular instrument lumens, thereby freeing space within the lumen for operating instruments. The Cobra is expected to facilitate advanced endoluminal procedures such as extended mucosal resection, full-thickness resection of gastric and colonic lesions, and gastric remodeling. Moreover, the Cobra may become an enabling technology in transluminal interventions to perform organ resection, anastomosis, bypass or other surgical indications within the peritoneal cavity.

TP018

CLINICAL, RESEARCH AND EDUCATIONAL APPLICATIONS FOR AUTOSTEREOSCOPIC DISPLAY AND PRINTING IN MINIMALLY INVASIVE SURGERY, Michael J Mastrangelo, Jr, MD, Andrew H Joel, St. Charles Medical Center, Bend, OR and Volumgraphics, Inc., Atlanta, GA

Objective of the technology or device: A new technique is available that produces affordable, high-resolution, photographic-quality micro-lenticular transparencies and prints. Autostereoscopic printing of volumetric data and animated hardcopies (VolugramsTM) of cine, video and animation are applicable to clinical, research and educational content.

Description of the technology: The Stereoscope was developed in 1838 and first applied to radiographic tomograms in 1895. The ability to visualize and communicate volumetric medical data in stereo is becoming more important as the three-dimensional (3D) information produced by CT, MRI, PET and 4D ultrasound grows exponentially in complexity. Advancing technologies allow for routine stereo viewing and printing of the data. Previous display options have included active and passive stereo projection and display systems that require specialized polarized or shuttered glasses that control which image is seen by each eye. Autostereoscopic displays accomplish stereoscopic visualization without the use of glasses and instead use a lenticular lens system or a raster masking technique to achieve the same effect. The result is a visual sense of depth perception in the projected or printed image similar to what we naturally see with our binocular vision.

Preliminary Results: Stereoscopic display technologies have been successfully used for clinical, research and educational applications including preoperative planning and surgical simulation. Autostereoscopic hardcopies of volumetric medical data are currently being utilized in scientific presentations/posters.

Conclusions/Future direction: The micro-lenticular system is a method for producing prints and transparencies of animations, 3D data and stereopairs that provides stereoscopic cues without the use of glasses or special viewing devices. This technique is applicable to volumetric medical imaging and holds promise for minimally invasive surgical planning, research, education and scientific presentation.

TP019

PROCEDURAL ALGORITHM FOR LCBE USING MULTI-CHANNEL INSTRUMENT GUIDE, Donald E Wenner MD, James H Rossier, Jr, MD, Paul R Whitwam MD, David M Turner MD, Eastern New Mexico Medical Center

Introduction: Laparoscopic Common Bile Duct Exploration (LCBDE) methods have evolved rapidly since the introduction of laparoscopic cholecystectomy. No unified approach or standardized LCBDE procedure has developed. Additional hurdles include damage to expensive fragile equipment and the organization of a complex operating room environment. These challenges have slowed the successful introduction of LCBDE into general surgical practice.

Objective: The Multi-channel Instrument Guide (MIG) was designed to protect the cholecloscope from damage when guiding the choledochoscope into either the cystic duct or common bile duct (CBD). The MIG enhances control of the choledochoscope and lends itself to a systematic procedural algorithm and a standardization of the tool kit required for LCBDE.

Description and use of the MIG: The MIG is a J shaped three lumen guide tool. The largest lumen is 3.4mm diameter to accommodate a 2.8 mm flexible choledochoscope. The two smaller lumens are 1.9mm diameter. The flexible guide is pulled into an introducer sheath and straightened for insertion through a standard 10 mm laparoscopic port placed in the epigastric location. The surgeon guides the flexible choledochoscope into the cystic duct or into the CBD. The standardized tool kit needed for LCBDE includes the MIG, a flexible choledochoscope, balloon catheter, irrigation catheter, nitinol stone basket, and lithotripter or Holmium laser fiber. A video system that can accommodate two video inputs with picture in a picture feature is also needed. A procedural algorithm is followed based on patient anatomy, stone size and stone location. The algorithm progresses from simple to complex in a logical sequence.

Results: A total of 54 LCBDE cases were completed using the MIG. A 96% rate of bile duct clearance was achieved. Damage to the flexible choledochoscope was reduced ten fold. The procedural algorithm was validated in cases with various stone sizes, numbers, and locations. Lithotripsy was effectively employed in cases with impacted or large stones.

Conclusion: The MIG has achieved the goal of improved introduction, control, and protection of the choledochoscope. A standardized approach guided by a procedural algorithm has been achieved. For the future, this new approach to LCBDE needs to be validated in a teaching institution with general surgical residents so that LCBDE may be successfully integrated into general surgical practice.

TP020

DEVELOPMENT OF A PROTOTYPE ARTICULATING LAPAROSCOPIC GRASPER, Dmitry Olevnikov MD, Tim Juddkin MS, Katherine Donn MS, Susan Halibey PhD, University of Nebraska

A prototype articulating laparoscopic grasper tool which includes an articulating end effector, an ergonomic handle, and an intuitive hand/tool interface (Figure 1) has been developed. This study investigated the evaluation of the prototype tool by surgeons and comparison with existing tools. A questionnaire was developed to ask surgeons about problems they experience associated with use of conventional tools and then query their opinions of the prototype tool. Eighteen laparoscopic surgeons volunteered to complete the questionnaire.

Generalized results were obtained through use of a Wilcoxon Signed Rank Test utilizing ranking with zeros for each hypothesis. The level of significance for all statistical tests was 0.05.

Tests on problems such as hand/wrist pain, shoulder pain, finger tingling/numbness, etc. produced significant results for the number of surgeons experiencing each of the queried problems. A significant number of surgeons (p=0.045) identified the prototype handle as either comfortable or extremely comfortable. A significant number of surgeons (p=0.015) preferred the prototype tool over conventional tools, based on general impression.

Articulation of the tip has been successfully designed in the prototype and 90% of the respondents believed the articulation to be a useful addition to laparoscopic graspers. The new shape of the handle is considered comfortable by a significant number of respondents. Most respondents believe the new design will relieve at least one problem currently experienced during surgery. Fifteen of the 18 surgeons queried said they would try a commercially available version of the prototype tool.
TP021
INTRA-OPERATIVE TELECONSULTATION IN LAPAROSCOPIC SURGERY: A COST EFFECTIVE ALTERNATIVE FOR THE DEVELOPING NATIONS, 
Alay P Singh MS, Ravinder P Singh MS,Harinder Kaur MD,Subash Batta MS, Punjab Health Systems Corporation Civil Hospital, Ludhiana

Objective
The objective of the current presentation is to highlight how the newer technologies of telementoring, live streaming and audio video modes of connection can influence the patient outcome by instant re-sourcing of expert opinion regardless of time and space. Broadband Internet which forms the platform for telemicine in the developed nations is either not easily available or is very expensive in most parts of the third world and the required hardware may not be within the reach of many small centers. Hence we developed a device, which can communicate using the already existing telecommunication modes requiring minimum hardware and respecting the financial constraints.

Method
The basis of this technology is development of an image-synchronizing device constructed from the available videophones. This videophone was modified to improve its resolution and enhance its connectivity, which enabled it to receive and transmit real time images without compromising the quality, using the existing cellular and regular telephone networks. Broadband Internet although worked well was never used. This device consisted of a camera, a high-resolution screen and an audio channel. The size of this device is smaller than that of a Laptop computer. A group of 15 experts in the field of laparoscopic surgery was constituted and given one such device each and were requested to carry it at all possible times. One such device was kept in the operating room connected to the monitor of the laparoscope. In the time of need the device was switched on and the expert was contacted as per the preference order in the roster and was asked to connect the device to the telephone or the cellular channel used initially to contact him. He then gave his expert opinion after seeing the images being transmitted to his device.

Results
We have been using this system for more than six months and have sought help in 42 cases and received instant response in 36 cases. In 4 cases the expert was unable to comment because of poor image quality. In the remaining 32 cases the operating surgeon was benefited by the expert advice.

Conclusion:
This technique is inexpensive and appropriate in procuring instant intra-operative consultation without having a setup for a formal video conferencing. It is very useful in the early phase of learning curve and still has a great potential for its upgradation.

TP022
A DUAL-CHANNEL CO2 INSUFFLATOR: A MULTIFUNCTIONAL DEVICE FOR WIDER CO2 APPLICATIONS, 
Kiyokazu Nakajima MD, Keigo Yasumasa MD,Shunjii Endo MD,Tsuyoshi Takahashi MD,Akiko Nishitani MD,Ricchio Nezu MD,Toshirou Nishida MD, Department of Surgery, Osaka University Graduate School of Medicine - Osaka Rosai Hospital, Osaka, Japan

Background: Carbon dioxide (CO2), with its rapid absorptive nature, has been more widely used in various clinical settings. The authors first proposed simultaneous (i.e. intraoperative) use of CO2 insufflation for both laparoscopy and colonoscopy and presented the preliminary data at SAGES 2004 meeting. CO2 insufflated colonoscopy during laparoscopy is feasible, safe and is of practical value to minimize persistent bowel distention without impeding subsequent laparoscopic visualization and procedure (Nakajima K et al, Surg Endosc 2005, in press). In that study we used a CO2 feeding system (for colonoscopy) in addition to a conventional automatic insufflator (for laparoscopy), since conventional insufflators have been designed solely for creation and maintenance of CO2 pneumoperitoneum and were not suitable for other purposes. In collaboration with Olympus R&D department, we therefore are developing a more flexible device, a dual-channel CO2 insufflator, which provides one channel for standard pneumoperitoneum and the other for various applications (e.g. CO2-insufflated colonoscopy, CO2-leak test for rectal anastomosis). The prototype: The device prototype, sized 295mm (W) x 340mm (D) x 150mm (H), provides one CO2 inlet connected to a regular CO2 gas cylinder, and two CO2 outlets positioned on the front and back of the device, respectively. The CO2 gas fed from the cylinder, is pressure-regulated and divided into two independent conduits inside the device. The front outlet feeds CO2 gas for pneumoperitoneum at electronically-controlled pressure and flow rate. The back channel supplies CO2 gas at fixed flow rate (1.8 L/min), allowing manual control of insufflation for various purposes.

Preliminary results: CO2-insufflated colonoscopy was attempted during laparoscopy on 4 canine models using the above prototype. Pneumoperitoneum was established and maintained successfully by utilizing the front channel of the device. Colonoscopy was performed simultaneously with CO2 gas fed from the back channel. There was neither device malfunctions nor device-related complications. The overall performance of the prototype was satisfactory.

Summary and future directions: The device enables two different modes of CO2 insufflation at the same time from a single CO2 cylinder. Although the current prototype provides only a single mode of CO2 insufflation from the back channel, the authors are now improving its function to allow wider use of CO2 in the operating room.

TP023
TISSUE PRE-COAGULATION WITH THE NEW RADIO FREQUENCY INLINE® DEVICE IMPROVES SURGICAL HEMOSTASIS, 
Steven A Daniel BS, Koroush S Haghighi MD,Taras Kussyk MD,David L Morris MD, UNSW Department of Surgery, St George Hospital, Sydney

Introduction
Achieving adequate hemostasis during liver resections is particularly difficult due to the vascular nature and complicating factors including cirrhosis, post chemotherapy fibrosis, and fatty liver disease. High blood loss during liver resections is known to result in increased rates of both operative and post operative morbidity and mortality. The cost of poor hemostatic control can be significant. This paper presents clinical results for the InLine®, a new pre-coagulation Radio Frequency (RF) device that reduces both transection blood loss and transection time.

Method
45 patients with primary or metastatic liver tumours underwent open surgical resection with pre-coagulation of the resection plane using the InLine® RF device (Resect Medical, Inc., Fremont, CA) prior to transection. Standard surgical procedures were used for all other aspects of the surgeries. These patients included livers with normal function, cirrhotic livers (Childs A & B), Fatty livers, and post chemotherapy fibrosis. Both anatomical and non-anatomical liver resections were performed. The amount of blood loss during the transection, transection time, resection method, and the total resected surface area were noted. Blood loss and transection time were then calculated based on a per unit of resected surface area.

Results
In all cases a pre-coagulated resection plane was achieved using the InLine® and without significant patient complications. Published blood loss during liver transection averaged 20.4 (+/-8.7) mls/cm2 compared to 3.4 (+/-3.8) mls/cm2 for transections performed after pre-coagulation with the InLine® device. Similarly, transection time reduced from 50.0 (+/-28.3) sec/cm2 compared to 33.2 (+/-24.7) sec/cm2 for transections performed after pre-coagulation with the InLine® device. In both cases the results were statistically significant.

Conclusion
A variety of tools and techniques have been created to help reduce blood loss during liver surgery, however blood loss remains a significant complication. This is particularly true for non-anatomical resections and for those suffering from liver cirrhosis, post chemotherapy fibrosis, or fatty liver disease. This study has shown that pre-coagulation of normal, cirrhotic, fibrotic, or fatty liver tissue with the InLine® device is a safe and effective technique that helps to reduce blood loss, transection times, and procedural costs for liver resections. Additional InLine® work with kidneys & spleens is ongoing.
TP024
A RETROSPECTIVE STUDY COMPARING STOMAL STENOSIS RATES OF THE GASTROJEJUNOSTOMY IN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS WITH AND WITHOUT THE USE OF NITINOL SUTURES (U-CLIP)
Jame M Kane MD, James M Kane, Jr MD, Mark C. Weiner MD, Paul J Guske MD, Stuart R Verseman MD, Jonathan W Wallace MD, Alexian Brothers Medical Center

Laparoscopic gastric bypass is becoming the most common bariatric procedure performed in the United States. Certain complications, such as stomal stenosis, have been reported at a higher prevalence. We have noted an increase in our patients. In an attempt to reduce our stomal stenosis rate, we started performing an interrupted reinforcement of the stapled GJ anastomosis using nitinol clip sutures (U-CLIP).

Method - A retrospective review of 364 patients undergoing laparoscopic gastric bypass. Two methods of performing a GJ anastomosis were compared in order to determine a difference in stomal stenosis rates. The initial GJ anastomosis were reinforced with interrupted running 2-0 Polysorb sutures (Auto Suture) and the later group with interrupted 3.00 mm U-CLIPs.

Results - Three hundred and sixty four patients underwent laparoscopic gastric bypass during the study period. There were 213 patients in the initial group and 151 patients in the U-CLIP group. The two groups were comparable with respect to age, sex and BMI. There were 21 stomal stenosis in the non U-CLIP group and 4 in the U-CLIP group with a rate of 9.85% and 2.6 respectively (p=0.00067). The operative times were not statistically different.

Conclusions - The interrupted U-CLIP suture reinforcement of the circular stapled GJ resulted in a significant reduction in the stomal stenosis rate. The U-CLIP provided an easy and fast method of interrupted suturing laparoscopically that better replicated our open gastric bypass method without increasing the length of the operation.

TP025
INTERACTIVE BIOMATERIALS, M C Hiles PhD, J P Hodde MS, Cook Biotech Incorporated

Natural scaffold biomaterials hold the promise of recapitulating strong and functional patient tissues without the need for a long-term foreign body. The SIS Technology uses the extracellular matrix from mammalian intestinal tissues to provide a tissue repair scaffold into which the patient’s own cells can grow and actively restore natural tissue structure and function. The potential surgical applications of this natural mesh material are endless and current usage is already quite broad. The healing of chronic wounds, multi-year relief from incontinence, and successful hernia repairs in grossly contaminated fields all attest to the potential of this technology. Future applications ranging from vascular valves and conduits to plastic and reconstructive tissue bulking can all benefit from the potential of these devices to grow with pediatric patients.

The wide range of surgical applications of this biomaterial technology will be explored with examples of current uses and futuristic endeavors that hold great potential for advancing human medicine.

TP026
NEEDS BASED, “INTELLIGENT” SURGICAL SKILLS TRAINING SYSTEM
David Earle MD, David Hananel BS, Neal Seymour MD, Baystate Medical Center

OBJECTIVE Technologic advances have made it possible to enhance surgical training within the current framework of mainstream residency programs. Missing from curriculum design is a strategy to tailor training among residents, and for an individual resident over time. We will use an automated system based on individual performance to guide the surgeon educator inside the operating room, and the trainee utilizing simulation lab outside the operating room.

DESCRIPTION Surgical residents are required to perform a series of tasks using a virtual reality, surgical education platform (SEP) in a simulation lab. The SEP includes didactic content and manual skills exercises. The assessment information from the lab will interface automatically with our online assessment form present in each operating room. Immediately before an operation, the surgeon educator will review this data, and during the operation, focus on areas identified as not being mastered. Immediately after the operation, the surgeon can give the trainee feedback on performance using the online assessment. The clinical performance data will then automatically interface with the SEP to guide the trainee to areas of need at the next self-guided lab session.

CONCLUSION A feedback loop between the clinical setting and simulation lab will enhance both efficiency and safety of patient care taking place in teaching hospitals. It will help objectively quantify what surgeons deem competent behavior – something that is easily recognized, but difficult to define. It will help foster an environment where honest feedback from educators is constructively used by trainees.

FUTURE DIRECTIONS Incorporation of emergency resuscitation, and procedures such as central venous access, airway management, and wound management. Access to an online surgical video library and additional didactic material will also be incorporated to enhance the educational experience. Additionally, data could be used to promote or re-direct trainees.

TP027
WWW.LAPSEARCH.NET, A SEARCH ENGINE FOR LAPAROSCOPIC EQUIPMENT AVAILABLE IN THE UNITED STATES, M J Weiner MD, S A Laker MD, New York University, New York, NY, Hackensack University Medical Center, Hackensack, NJ

Objection: To create an objective source for surgeons, nurses and OR purchasers to obtain information on all laparoscopic devices for use in the United States.

Description: LapSearch (www.lapsearch.net) is a laparoscopic device search engine that was created to make the process of obtaining information about laparoscopic instruments more manageable. Surgeons can use LapSearch to find devices based on their physical dimensions, function or characteristics (i.e. all ligature devices 5mm in diameter with that use ultrasonic cutting). Currently there are over 1000 devices in the database, with plans to expand if there is interest. Lapsearch is continuing to add new features including the ability to store lists of devices, the option to view the most popular devices of the day, week or month and an upcoming option that will allow surgeons to share their experiences with one another and discuss the strengths and weaknesses of particular devices. Lapsearch intends to work together with the device companies allowing them to continually update the database, ensuring its currency. Lapsearch was designed by physicians for physicians and is and always will be free to all health care practitioners.

Preliminary Results: The website serves as the only search engine available that uses ultra-sound cutting. Currently there are over 1000 devices in the database, with plans to expand if there is interest. Lapsearch is continuing to add new features including the ability to store lists of devices, the option to view the most popular devices of the day, week or month and an upcoming option that will allow surgeons to share their experiences with one another and discuss the strengths and weaknesses of particular devices. Lapsearch intends to work together with the device companies allowing them to continually update the database, ensuring its currency. Lapsearch was designed by physicians for physicians and is always free to all health care practitioners.

Conclusion: The website, www.lapsearch.net, aids the surgeon, nurse and hospital purchaser in making an informed decision on the products they choose to purchase and use. In addition, the site acts as a platform for the introduction of new devices and technologies by the manufacturers. Lapsearch ultimately hopes to serve as a platform for educating surgeons and providing timely, critical product information.
TP028
A BREAKTHROUGH IN SURGICAL VIDEOSCOPE TECHNOLOGY, Matthew Fahy MS, Gina M Baldo BA, Joseph R Williams MS, Olympus America, Inc.
The new Olympus LTF-VP 5mm Surgical Videoscope is a technological breakthrough in imaging engineering. It utilizes Olympus’ unique EndoEYE technology, placing the CCD (charged coupled device) at the distal end of the scope. The resulting image is brighter with better color reproduction and resolution than any conventional laparoscope. This is due to the fact that the rod lens system of conventional laparoscopes is thereby eliminated, along with all its inherent limitations. Since fewer lenses are required, reflected noise that occurs at lens surfaces is reduced. Light absorption that typically occurs inside the rod lens system is reduced, permitting bright, natural-color imaging and a deep, focus-free depth of field. A wider field of view presents more reliable orientation. Illumination lenses are placed at the distal tip, facilitating the most appropriate light distribution and contributing to a wider field of view.

The distal tip is also deflectable (flexible) and provides unlimited degrees of visual freedom - up to 108°x80° in any direction. This advanced deflectable design allows comprehensive observation of regions such as lateral, luminal and en face parenchyma. The deflectable tip design also allows areas to be viewed more expansively than ever before, even providing the capability of visualizing anatomical structures that were previously inaccessible with conventional laparoscopes. The LTF-VP Videoscope can be utilized through any access port 5mm or greater, enhancing the surgeon’s ability to view the anatomy from any desired perspective. Ergonomic progression includes a newly designed control body and deflector mechanism. The one-piece integrated design requires no manual focusing, no assembly and rapid reprocessing, improving product durability and reliability.

TP029
REAL-TIME 3-D MEASUREMENTS IN ENDOSCOPIC VIDEO IMAGES: A NOVEL ALGORITHM AND POTENTIAL FOR FUTURE DEVELOPMENTS, Amir Szold MD, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel
Aim: the use of a single stereoscopic sensor for video imaging enables to appoint three dimensional coordinates to each pixel. In order to develop machine understanding of anatomical landmarks an algorithm capable of measuring 3-dimensional relative distances between key points is necessary. Methods: An algorithm has been developed that is capable of accurate 3-dimensional measurements during endoscopic procedures. Results: The algorithm was incorporated into a stereoscopic camera picture-processing unit. The resolution of the device is scalable according to application needs and is the result of the sensor resolution, distance and anatomical features. Currently the measurements are done in real time, while the image is frozen to increase accuracy. Future developments: 3D measurements enable 3-dimensional, real time picture analysis. This, in turn, is the theoretical basis for registering the streaming video to archived data, such as anatomical landmarks from anatomy pictures or even archived patient data such as CT or MRI.

TP030
THE SHAPELOCK: A UNIQUE AND VERSATILE TOOL FOR THE NEXT GENERATION OF DIAGNOSTIC AND THERAPEUTIC COLONOSCOPY, Pankaj J Pasricha MD, Gregory B Haber MD, Douglas K Rex MD, Gottumukkala S Raju MD, University of Texas Medical Branch, Lenox Hill Hospital, Indiana University Technology Objective: The ShapeLock? Endoscopic Guide (USGI Medical, San Clemente, CA) is a tool that facilitates intubation and provides a platform for next generation therapeutic procedures. Description of Technology: The ShapeLock? Endoscopic Guide consists of two components. The first component is a reusable, multi-link, flexible overtube with a squeeze-activated handle. The second component is a disposable, sterile sheath with a smooth external skin, a hydrophilic coated inner liner and an atrumatic tip that is loaded onto the reusable component prior to each use. Method of Application: The endoscope is inserted into the lumen of the ShapeLock and then inserted into the anatomy. Once inserted, the ShapeLock can be converted from a flexible to a rigid configuration without changing shape to stabilize the colon and prevent painful and potentially dangerous looping. Preliminary Experience:
1. Preliminary studies from multiple centers involving over 200 cases have shown that the ShapeLock device is safe and facilitates colonoscopy. Typical shortening and straightening maneuvers of the colon are not only feasible but appear to be abetted with the flexible ShapeLock in place.
2. Pilot data has shown that the ShapeLock is useful in facilitating colonoscopy on the distal colon in patients with redundant colon in which previous colonoscopy was unsuccessful.
3. The device serves as conduit for rapid deployment of the colonoscope to facilitate removal of multiple large polyps located in the proximal colon and also serves as a decompression tube during prolonged procedures, thereby improving patient comfort.
4. The ShapeLock provides a large and flexible conduit for evacuation and removal of semi-solid material or blood. The role of ShapeLock to enable conversion of an incomplete prep to a ?clean colon? is being investigated. The ShapeLock may also be useful to quickly prepare the colon in cases of colonic bleeds in which immediate colonoscopy is indicated. Conclusions/Future Directions: The ability of the ShapeLock to be converted from a flexible configuration to a rigid one that resists pushing forces represents a technological advancement in colonoscopy. The safe application of forces much greater than currently possible may enable the ShapeLock to assist in the development of next generation therapeutic procedures. Finally, a narrow-bore, longer length ShapeLock has the potential to enable the use of smaller colonoscopes.

TP031
LAPAROSCOPIC ASSISTED ENDOSCOPIC RETROGRADE CHOLANGIPANCREATOGRAPHY: A NOVEL TECHNIQUE TO TREAT CHOLEDOCHOLITHIASIS DIAGNOSED AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC, William R Silliman MD, Roger A dela Torre MD, Steven Scott MD, Nitin Rangnekar MD, Steven Eubanks MD, University of Missouri-Columbia
Abstract:
1. Objective of the Technology or Device: Morbid obesity has become a significant health problem in the United States. Many patients are undergoing surgical treatment for their obesity and, there has been a significant increase in the number of laparoscopic roux en y gastric bypass operations performed. Symptomatic cholelithiasis is a common problem in the morbidly obese population. Cholelithiasis may present either prior to or after the obese patient has had significant weight loss. Cholelithiasis, a complication of cholelithiasis, is frequently treated with ERCP. Unfortunately, patients who have had a previous roux-en-y gastric bypass are not candidates for endoscopic removal of the common duct stones with ERCP. We describe a novel technique used to treat choledocholithiasis in a patient who had undergone a roux-en-y gastric bypass 6 weeks prior.
2. Description of the technology and method of its use or application: Laparoscopic assisted gastroscopy was performed in the bypassed stomach allowing access to the stomach and duodenum with introduction of the endoscope through the abdominal wall and into the anterior mid-body of the stomach near...
the greater curvature. The ERCP was then performed performed and the gastrostomy was closed.

3. Preliminary Results: This technology is normally associated with movie industry or the creation of Augmented Reality training materials. This system uses non contact sensing, real-time measurement system is achieved.

4. Conclusions: In the ProMIS™ system Augmented Reality has been shown to improve the training content and efficacy. A number of locations and regions are associated with surgical skills. The construct validity of the ProMIS™ system has been demonstrated through VR-OR studies to validate the transfer of the training content into reality. The main performance metrics are time taken, total path length swept by each instrument tip and the smoothness/efficiency of the surgeon’s movement. Additionally, task-specific metrics are calculated to measure performance associated with different regions on and above the task plate. This is achieved because ProMIS has an accurate 3D model of the standard task and regions in space. A software tool called ProMIS LessonMaker allows a non-technical user to create these regions and their associated metrics as part of creating customised instructional materials.

Augmented Reality in Training Tasks

In addition to the capability to provide measurement ProMIS Lesson Maker uses advanced multi-media technology to allow the creation of Augmented Reality training materials. This is the combination of 3D interactive graphics with live video. This technology is normally associated with movie industry or fighter pilot displays is used to add additional instruction, interactive psychomotor challenges or proximal feedback on errors during the completion of a “standard box trainer task”.

Figure 1 Superimposed graphics interacting with instruments during live video trainer task.

Results

The construct validity of the ProMIS™ system has been demonstrated in 3 studies in Emory, Imperial College, London, UK and AMNCH, Dublin, Ireland [3, 4]. Interactive augmented reality content has been merged with the live video to improve the training content and efficacy. A number of centres are conducting such called “VR-OR” studies to validate the transfer of skills developed in ProMIS transfer to the OR.

Conclusions

In the ProMIS™ system Augmented Reality has been shown to provide a clinically validated, flexible and engaging platform for training and objectively assessing the skills of laparoscopic surgery. Because the system uses non contact sensing, real surgical instruments and runs on a standard PC it is a very robust and cost effective method of surgical training.

References


Motion Analysis, Surg Endosc. 2002 Apr;16(4):840-5


TP034

PRELIMINARY EXPERIENCE WITH A NEW MECHANICAL MANIPULATOR: THE RADIUS SURGICAL SYSTEM

Nicola Di Lorenzo MD, Giorgio Coscarella MD, Luca Faraci MD, Iwona Gacek MD, Fabrizio S Altorio MD, Achille L Gaspari, UNIVERSITA’ DI ROMA TOR VERGATA ITALY

Objective of the device:

Improvement of the four degrees of freedom (DOF) that limit conventional instruments in their range of movement: till now, only electronic robotic effectors have mimicked the human...
Laparoscopy is associated with a stressing position, with high elbows and contracted back muscles. With ergonomic handles, the hands and arms of the surgeon are relaxed, avoiding discomfort and fatigue.

Description of the technology:
Manual manipulators represent a new class of endoscopic devices, positioned between conventional instruments and robotic systems.

Radius Surgical System is a mechanical bi-manual instrument system (produced by Tuebingen Scientific, it received the CE mark in October 2003) with 6 DOF (such as in robotic surgery) and an ergonomic hand-arm movement and position, that can be used as simple as a conventional endoscopic instrument. The tip of the instrument can be deflected and rotated, a variety of interchangeable effectors can be used for the specific surgical tasks. All functions can be operated via a multi-functional ergonomic handle.

Preliminary available results:
The device is currently under surgical investigation in partnership with some leading groups worldwide. We report the results of an experimental study evaluating the learning curve of the instrument, with three groups of participants, demonstrating that the learning curve is not highly complex, and improvement is achieved in all groups. Our preliminary clinical applications in bariatric surgery and abdominal hernia repair.

Conclusions/Future directions.
Advantages of Radius are:
Six DOF, with ergonomic hand-arm movements.
Alignment of the instrument tip in difficult access angles.
Versatility by simple change of endo effectors and compatibility to normal laparoscopic OR setting, with no additional set-up time required;
Cost effectiveness: Radius is a surgical manipulator system that will be priced as a hand-guided instrument system, at a hundredth of the price of electronic robots.

Current problems are:
Precise and controlled needle guidance still to be improved;
Limited number of tips: new effectors soon available
More efficient when suturing in a small space, on the perpendicular axis.

Ergonomic advantages can be better appreciated after an intuitive learning curve to control the instrument most effectively.

Procedures that benefit of the Radius are those with maneuvers and suturing in recesses, like: Fundoplication; Prosthetic fixation; Bariatrics; Radical prostatectomy; IMA – take down.

Key words: ergonomy – manipulators – laparoscopy – DOF