# TABLE OF CONTENTS

5 General Information  
5 Registration Schedule  
5 Corporate Supporters  
6 Conference Leaders  
6 Program Committee  
6 SAGES Meeting Accreditation  
7 Past Presidents  
7 Shuttle Schedule  
9 Schedule at a Glance  

## WEDNESDAY SESSIONS - HILTON FLOOR PLAN  
13 Appropriateness Conference  
14 Surgeons-in-Training Scientific Session  
15 Opening Ceremonies & Reception  

## THURSDAY SESSIONS - HILTON FLOOR PLAN  
18 SAGES/EAES Postgraduate Course I  
19 SAGES/JSES Postgraduate Course II  
20 Minimally Edited Video Session  
21 SAGES/ALACE/FELAC Postgraduate Course III  
22 Basic Science Forum with ICEL  
22 Basic Science Forum Abstracts – Thursday  
24 Nurses/Allied Health Professionals Postgraduate Course  
25 Industry Education Night  

## FRIDAY SESSIONS - HILTON FLOOR PLAN  
28 Scientific Session  
31 Karl Storz Lecture in New Technology  
31 SAGES Presidential Address  
33 Forum for Industry  
81 Oral Abstracts – Friday  

## SATURDAY SESSIONS - HILTON FLOOR PLAN  
39 Scientific Session  
39 Gerald Marks Lecture  
40 Awards Ceremony  
103 Oral Abstracts – Saturday  

50 Sunday - International Conference of Experimental Laparoscopic Research  
54 SAGES Meeting Faculty  
65 Commercial Disclosures  
67 SAGES Lunches  

## SAGES Poster Program  
123 Poster Award Winners  
135 Poster Abstracts – Friday  
192 Poster Abstracts – Saturday  

71 SAGES Learning Center  
72 SAGES Social Programs & Special Events  
73 Tours - For Guests  

## EXHIBIT FLOOR PLANS  
257 Exhibitor Profiles  
269 Index of Faculty and Presenters

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Your family, office and fellow colleagues can leave you a message one of three ways:

**Phone:** 212-333-6354  
**Fax:** 212-333-6356  
**Global access through the Internet:**  
SAGES2002.postmessage.com

When you receive a message, your name will automatically appear on one of the scrolling monitors at one of the message center kiosks. In addition to the main Message Center in the registration area, there will be two other message center kiosks where messages can be sent and received; one directly adjacent to the main Message Center outside the main session room (3rd floor of the Hilton), and one near registration (2nd floor of the Hilton).

To retrieve your messages, simply key in your badge number on one of the computer workstations. You will be personally welcomed and told how many messages you have. A user-friendly menu allows you to read, reply and print your messages. To leave message for another attendee, select their name and type your message.

The Message Center will be staffed from 8:00 - 5:00 daily CST. The Video Paging systems are operational 24 hours a day.

For your convenience, SAGES will also provide one Cyber-café station at which you may check your home/office E-mail. This will be directly adjacent to the Main Message Center outside the main session room.

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**WORLD CONGRESS HOTEL INFORMATION**

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| **NEW YORK HILTON & TOWERS**  
*(Meeting Site & Headquarters Hotel)*  
1335 Avenue of the Americas (53rd - 54th Street)  
New York, NY 10019 · 212.586.7000 (tel) · 212.315.1374 (fax) |  
| **SHERATON NEW YORK HOTEL & TOWERS**  
811 Seventh Avenue @ 52nd Street  
New York, NY 10019 · 212.581.1000 (tel) · 212.262.4410 (fax) |  
| **THE WARWICK HOTEL**  
65 West 54th Street @ Avenue of the Americas  
New York, NY 10019 · 212.247.2700 (tel) · 212.247.2725 (fax) |  
| **WELLINGTON HOTEL**  
Seventh Avenue @ 55th Street  
New York, NY 10019 · 212.247.3900 (tel) · 212.581.1719 (fax) |  

1 block from the NY Hilton.

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http://www.8thworldcongress.org/
GENERAL INFORMATION

Meeting Location:
New York Hilton
1335 Avenue of the Americas, New York, NY 10019-6078
The World Congress fully complies with the legal requirements of the ADA and the rules and regulations thereof. If any participant of the program offered by the World Congress is in need of special accommodation, please do not hesitate to call and/or submit in writing to the Meeting Registrar in order to receive service.

Sponsor:
SAGES
Society of American Gastrointestinal Endoscopic Surgeons
2716 Ocean Park Blvd., Suite 3000, Santa Monica, CA 90405 U. S. A.
Phone: (310) 314-2404  Fax: (310) 314-2585
E-mail: SAGESweb@sages.org
Website: www.sages.org

Dates:
March 13 - 16, 2002
See the Schedule-at-a-Glance on page 9.

Registration Materials:
Included in registration for delegates:
› Program and course materials
› Continental breakfast every morning
› Coffee Breaks
› Opening Reception
Included in registration for Accompanying Persons
› Opening Reception
› Special Tour: “New York New York – Big Apple Overview”
   (select one of two dates)

Registration Hours:
Tuesday:  1:00 PM - 5:00 PM
Wednesday:  7:00 AM - 7:00 PM
Thursday:  7:00 AM - 5:00 PM
Friday:  7:00 AM - 5:00 PM
Saturday:  7:00 AM - 5:00 PM

Location:
2nd Floor Promenade, New York Hilton.

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IFSES Societies:
IFSES, the International Federation of Societies of Endoscopic Surgeons, is responsible for overseeing site selection for bi-annual World Congresses of Endoscopic Surgery. IFSES societies include:
› CAGS Canadian Association of General Surgeons
› EAES European Association for Endoscopic Surgery
› ELSA Endoscopic & Laparoscopic Surgeons of Asia
› FELAC + ALACE Federacion Latino America de Cirurgia Asociacion Latino Americana de Cirurgia Endoscopia
› JSES Japan Society for Endoscopic Surgery
› GSA General Surgeons Australia
› SAGES Society of American Gastrointestinal Endoscopic Surgeons

VISIT THE SAGES MEMBERSHIP SERVICES BOOTH
Directly opposite the Entrance of the Main Ballroom
› Information and applications to join SAGES
› Printed guidelines for privileging, training and standards of practice
› SAGES Members Services - pay dues, application status, etc.
› Future Postgraduate Course information
› Patient Information Brochures
› Resident Ed Course information

Buy fabulous SAGES logo products including Ergonomic Playing Cards, SAGES Baseball Caps, SAGES Fishing Hats, Children’s Stuffed Pig, Kid’s Scrubs, “Einstein” T-shirt, Silk SAGES Logo Ties, Travel Handbags, Stress Reliever Toys, Laparoscopic Trouble Shooting Charts, SAGES Postgraduate Video Courses

Since we’re going to be in Hollywood (Los Angeles) next year, stop by to take a picture with your favorite star! Open During Regular Meeting Hours

http://www.8thworldcongress.org/
GENERAL INFORMATION

World Congress Leaders:

PROGRAM CHAIRMAN:
Lee Swanstrom, MD

INTERNATIONAL PROGRAM
CO-CHAIR: Antonio Lacy, MD

CONGRESS PRESIDENT:
Kenneth Forde, MD

IFSES PRESIDENT:
Jacques Perissat, MD

HONORARY CO-PRESIDENTS:

ALACE: Manolo Cortez, MD
CAGS: Michel Talbot, MD
EAES: Wolfgang Wayand, MD
ELSA: Serafin Hilvano, MD

Local Arrangements Coordinator: Barry Salky, MD

Postgraduate Course Directors:

SAGES/EAES: Nathaniel Soper, MD and Joel LeRoy, MD
SAGES/ALACE/FELAC: Stephen Eubanks, MD, Luis Burbano, MD, and Jorge Cervantes, MD
SAGES/JSES: Frederick Greene, MD and Masao Tanaka, MD
Nurses Course: Ellie Dougherty, RN & Donna Stanbridge, RN

Unit Coordinators:

Consensus Forum Co-Chairs: John Hunter, MD and Abe Fingerhut, MD
Basic Science Forum Chair: R. Lawrence Whelan, MD
Poster Chair: Peter Crookes, MD
Poster Co-Chair: Manabu Yamamoto, MD
Video Chair: Michel Gagner, MD
Video Co-Chair: Guy Bernard Cadiere, MD
Learning Center Chairs: Steven Wexner, MD and Joseph Mamazza, MD
Educator's Lunch Coordinators: C. Daniel Smith, MD and Tehemton Udwadia, MD
Resident's Day Coordinators: Thomas Biehl, MD and Leena Khaitan, MD

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W. Stephen Eubanks, MD, Co-Chairman

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H. Jaap Bonjer, MD
L. Michael Brunot, MD
Luis E. Burbano, MD
Jo Buyske, MD
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Jorge Cervantes, MD
Ricardo V. Cohen, MD
Manolo Cortez, MD
Peter F. Crookes, MD

Jorge Cueto-Garcia, MD
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C. Daniel Smith, MD
Nathaniel J. Soper, MD
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Mark A. Talamini, MD
L. William Traverso, MD
Tehemton E. Udwadia, MD
R. Lawrence Whelan, MD
Sherry M. Wren, MD
Manabu Yamamoto, MD

Accreditation:
The Society of American Gastrointestinal Endoscopic Surgeons (SAGES) is accredited by the Accreditation Council for Continuing Medical Education (A.C.C.M.E.) to sponsor Continuing Medical Education for physicians. SAGES designates this Continuing Medical Education activity for:

- 3.5 credit hours for the Appropriateness Conference
- 3.50 credit hours for the Resident & Fellow Scientific Session
- 6.00 credit hours for the PG Course 1 (SAGES/EAES) on Complications
- 3.50 credit hours for the PG Course 2 (SAGES/JSES) on Hepatic Disease
- 4.00 credit hours for the Minimally Edited Video Session
- 3.00 credit hours for the PG Course 3 (SAGES/FELAC) on Emergency Laparoscopy
- 4.00 credit hours for the Basic Science Forum with ICEL
- 3.75 credit hours for the Nurses/Allied Health Professionals PG Course
- 14.00 credit hours for the Scientific Session
- 1.50 credit hours for the Educators’ Lunch
- 1.50 credit hours for the Pediatric Surgery Lunch
- 1.50 credit hours for the Appropriateness Conference Lunch
- 1.50 credit hours for the Ethics Lunch
- 1.50 credit hours for the Ergonomics Lunch
- 1.50 credit hours for the International Lunch 1
- 1.50 credit hours for the International Lunch 2
- 1.50 credit hours for the International Lunch 3

in Category 1 of the Physicians Recognition Award for the American Medical Association. Note: Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

http://www.8thworldcongress.org/
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Desmond H. Birkett, MD 1997-1998
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Jeffrey H. Peters, MD 1999-2000
Nathaniel J. Soper, MD 2000-2001

THE EXHIBIT

Exhibit Dates and Hours

Wednesday, March 13  Opening Reception  5:30 PM - 7:00 PM
Thursday, March 14  10:00 AM - 2:30 PM
Friday, March 15  10:00 AM - 2:30 PM
Saturday, March 16  10:00 AM - 1:00 PM

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SHUTTLE SCHEDULE

Due to the close proximity of the 8th World Congress hotels, shuttles will not be necessary for the Wednesday through Saturday programming. Please consult tickets or program listings for the shuttle times of the following events:

- Tours
- Off-Site Courses
- Evening Events

All shuttles will depart from the NY Hilton and Towers only. Please use 54th Street exit.
## SCHEDULE AT A GLANCE

<table>
<thead>
<tr>
<th>DATE</th>
<th>MORNING</th>
<th>AFTERNOON</th>
<th>EVENING</th>
</tr>
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<tbody>
<tr>
<td>Tuesday,</td>
<td>SAGES Committee Meetings</td>
<td>SAGES Committee Meetings</td>
<td>Opening Ceremonies</td>
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<tr>
<td>March 12,</td>
<td>Off-site Hands-on Courses</td>
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<td>2002</td>
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<td>Wednesday,</td>
<td>Off-site Hands-on Courses</td>
<td>Appropriate venue Conference</td>
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<td>March 13,</td>
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<td>Surgeons-in-training Scientific Session</td>
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<td>SAGES/EAES Postgraduate Course I</td>
<td>SAGES/EAES Postgraduate Course I</td>
<td>Industry Ed. Night</td>
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<td>SAGES/JSES Postgraduate Course II</td>
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<tr>
<td>Friday,</td>
<td>Science Session Panel I · Science Session</td>
<td>Educators/Pediatric Lunches</td>
<td>Gala on Pier &amp; Int'l. SAGES Sing-Off</td>
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<td>March 15,</td>
<td>Panel II</td>
<td>Physically Active and Video Presentations</td>
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<td>2002</td>
<td>Karl Storz Lecture in New Technology</td>
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<td>Forum for Industry</td>
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<td>Saturday,</td>
<td>Annual Business Meeting</td>
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<td>Broadway Tickets Available!</td>
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<td>March 16,</td>
<td>Science Session Panel IV · Science Session</td>
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<td>SAGES Awards Ceremony</td>
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<td><strong>Exhibit Dates and Hours</strong></td>
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**IMPORTANT WORLD CONGRESS MEETING PHONE NUMBERS:**

- Main Registration: 212-333-6351
- SAGES Booth: 212-333-6353
- Message Center: 212-333-6354
- Message Center Fax: 212-333-6356
- World Congress/SAGES Office: 212-333-6357
- Speaker Prep Room: 212-333-6364

**REGISTRATION LOCATION:**

- 2nd Floor Promenade, New York Hilton.
A GENTLE REMINDER!

We have taken every precaution to assure the safety and security of our guests and their possessions. However, we urge you to be aware and take simple steps to guard your possessions.

- Do not leave your purse or briefcase unattended.
- Do not leave your laptop, phone or PDA on the floor or out of your sight in a darkened room.
- Be aware of your surroundings.

Have a safe and secure meeting!

http://www.8thworldcongress.org/
When is Open Surgery Most Appropriate?

TIME: 1:00 - 5:00 PM, LOCATION: Trianon Ballroom
Conference Co-Coordinators: John Hunter, MD and Abe Fingerhut, MD

Description:
Less formal than the traditional Consensus Forum, an Appropriateness Conference is evidence based and still results in an expert opinion-based recommendation on a given topic. Appropriateness in health care services and especially on one specific given topic like laparoscopic surgery has not often been the subject of meetings and workshops, since it is often just assumed that services delivered are "appropriate" until proven otherwise. In view of recent discussions on cost-effectiveness, quality of care and rationing, however, the “appropriateness” of the health care delivered has become a key issue.

The World Congress Appropriateness Conference will consist of 2.5 hours of presentation, followed by 1.5 hours of discussion with presenters, an expert panel and audience interaction. The topics which have been selected are appendectomy, hernia, colectomy and GERD. Each topic will have three lectures, including a dispassionate review of existing literature, a lecture on when it is appropriate to use the open approach, and a talk on when it is appropriate to convert.

Our goal is to encourage the exchange of national and international information and knowledge on the meaning of appropriateness, the methods of identifying appropriate and inappropriate treatments in the domain of laparoscopic surgery, and to determine when a specific laparoscopic or open procedure is appropriate, and when conversion to an open procedure is appropriate.

The results of the Appropriateness Conference will be presented during a lunch on Saturday, March 16. The lunch program will include a brief history of consensus panels in laparoscopic surgery; a review of the World Congress appropriateness conference, how it came to be and why we picked the topics, and the conclusion of the panel/audience discussion following the presentations. This luncheon is free of charge to Appropriateness Conference registrants.

Objectives:
To determine the appropriate indications for:
- Open appendectomy
- Open repair of hiatal hernia
- Open colectomy
- Open GERD, and
To determine the appropriate times for conversion of a laparoscopic procedure to an open procedure

Topics and Faculty:

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Faculty</th>
</tr>
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<tbody>
<tr>
<td>1:00 - 1:15 PM</td>
<td>INTRODUCTION AND GLOBAL STATEMENT</td>
<td>John Hunter, MD</td>
</tr>
<tr>
<td>1:15 - 1:45 PM</td>
<td>LAPAROSCOPIC APPENDECTOMY</td>
<td>Lukas Kraehenbuehl, MD</td>
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<td></td>
<td>Review</td>
<td>David Rattner, MD</td>
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<td></td>
<td>Open</td>
<td>H. Jaap Bonjer, MD</td>
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<tr>
<td></td>
<td>Lap. Approach</td>
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<tr>
<td>1:45 - 2:15 PM</td>
<td>LAPAROSCOPIC INGUINAL HERNIA REPAIR</td>
<td>Guy Maddern, MD</td>
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<td></td>
<td>Review</td>
<td>Jorge Cervantes, MD</td>
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<td></td>
<td>Open</td>
<td>Robert Fitzgibbons, MD</td>
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<td></td>
<td>Lap. Approach</td>
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<tr>
<td>2:15 - 2:45 PM</td>
<td>LAPAROSCOPIC COLECTOMY</td>
<td>Steven Wexner, MD</td>
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<td>Review</td>
<td>Douglas Wong, MD</td>
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<td>Open</td>
<td>Antonio Lacy, MD</td>
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<td>Lap. Approach</td>
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<tr>
<td>2:45 - 3:15 PM</td>
<td>LAPAROSCOPIC GERD REPAIR</td>
<td>David Watson, MD</td>
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<td>Review</td>
<td>Donald Low, MD</td>
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<td>Open</td>
<td>Bernard Dallemagne, MD</td>
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<td>Lap. Approach</td>
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<td>3:15 PM</td>
<td>BREAK</td>
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<tr>
<td>3:30 - 4:30 PM</td>
<td>Panel/Audience Discussion &amp; Response</td>
<td></td>
</tr>
</tbody>
</table>

Panelists:
Abe Fingerhut, MD
Ruth Fischbach, PhD
Annetine Gelijns, PhD
Charles Lightdale, MD
Thom Lobe, MD
Bertrand Millat, MD
Alan Moskowitz, MD

On behalf of the World Congress, SAGES acknowledges a generous educational grant in support of this program from Aesculap/BBraun.
OUTSTANDING abstract submissions from residents and fellows around the globe will be presented at the Surgeons-in-Training Scientific Session. Each abstract will be critiqued by a distinguished member of the World Congress faculty, who will offer guidance for young surgeons on their specific research projects and the surgical topic in general. Each presentation will then be opened to the audience for further questions and suggestions. Experienced surgeons as well as surgeons in training are encouraged to attend to offer their comments.

**Program:**

**Time:** 12:30 PM - 4:00 PM, **Location:** Mercury Ballroom

**Co-Coordinators:** Tom Biehl, MD and Leena Khaitan, MD

Outstanding abstract submissions from residents and fellows around the globe will be presented at the Surgeons-in-Training Scientific Session. Each abstract will be critiqued by a distinguished member of the World Congress faculty, who will offer guidance for young surgeons on their specific research projects and the surgical topic in general. Each presentation will then be opened to the audience for further questions and suggestions. Experienced surgeons as well as surgeons in training are encouraged to attend to offer their comments.

**Expert Faculty:**
- Luis Burbano, MD
- Frederick Greene, MD
- Seigo Kitano, MD
- Thomas Dent, MD
- Jack Jakimowicz, MD
- Jeffrey Ponsky, MD

**Objectives:**

At the conclusion of this session, participants will:

- Increase their knowledge of the latest research being performed by surgeons-in-training
- Be able to identify methods that will improve or modify research studies
- Recognize typical problems in research areas that might cause them to lose scientific merit
- Recognize possible solutions to avoid these pitfalls

**TIME:**
- **12:30 PM** Presenter: Emily Winslow  “Influence Of Spastic Esophageal Manometric Features On Outcomes Of Laparoscopic Antireflux Surgery,” Emily Winslow, M.D., Ketan Desai, M.D., Peggy Frisella, R.N., Tanya Gunsberger, B.A., Ray Clouse, M.D., Nathaniel Soper, M.D., Mary Klingensmith, M.D., Department Of Surgery, Washington University, St. Louis, MO (see poster #P020 for abstract)
- **12:56 PM** Presenter: Joseph Carter  “Reduction of Lung Metastases after Cecectomy with Laparoscopy and Perioperative Vaccination,” J. Carter, M.D.; I. Kirman, M.D., Ph.D; P. Wildbrett, Bsc; D. Feingold, M.D.; Z. Asi, Bsc; R. Fowler, Bsc; E. Huang, Md; R. Whelan, Md, Columbia-Presbyterian Medical Center, NY, NY (see poster #PS097 for abstract)
- **1:09 PM** Presenter: Teodor Grantcharov  “Teaching and Testing Surgical Skills on a Virtual Reality Laparoscopy Simulator - Definition of Factors Affecting Performance,” Teodor P. Grantcharov, M.D.; Linda Bardsram, M.D.; Peter Funch-jensen, M.D.; Jacob Rosenberg, M.D., Dept of Surgical Gastroenterology, Copenhagen Univ, Hvidvode Hospital, Copenhagen, Denmark & Dept of Surgical Gastroenterology L, Aarhus University, Kommunehospitalet, Aarhus, Denmark (see poster #P015 for abstract)
- **1:22 PM** Presenter: Zun-gon Kim  “Impact of Improved Hepatic Blood Flow on Liver Metastases During Laparoscopic Surgery in the Rat. A Preliminary Study,” Zun-Gon Kimi, M.D., Thomas Moscht, Matthias Lorenzi, M.D., Claus-georg Schmedt2, M.D., Carsten N. Guttt2, M.D., t Department Of General And Vascular Surgery, Johann Wolfgang Goethe-university, Frankfurt/Main, Germany 2 Department Of General Surgery, Ruprecht-karls-university, Heidelberg, Germany (see poster #P022 for abstract)
- **1:35 PM** Presenter: Paul Ziprin  “Laparoscopy Reduces Adhesion Formation by Enhancing Mesothelial Cell Fibrinolytic Activity via a Down Regulation of Plasminogen Activator Inhibitor-1 (PA-I1) Levels,” Paul Ziprin Md, Paul F Ridgway Md, David H Peck Phd, Ara W Darzi Md, Department Of Surgical Oncology And Technology, Faculty Of Medicine, Imperial College Of Science, Technology And Medicine, London, U.K. (see poster #PA011 for abstract)
- **2:29 PM** Presenter: Thomas Robinson  “Routine Pre-Operative Labs Are Unnecessary Prior To Elective Laparoscopic Cholecystectomy,” Thomas N. Robinson, M.D., Walter L Birli, M.D., Julie K. Heimbach, M.D., Casey M. Calkins, M.D., Patrick J. Offner, M.D., Ernest E. Moore, M.D., Jon Burch, M.D., Dept Of Surgery, Denver Health Medical Center & Un. Of Colorado, Denver, CO (see #RS09 for abstract)
- **2:42 PM** Presenter: Erik Wilson  “Combined Laparoscopic Nissen Fundoplication and Cholecystectomy: Increased Association Between Gastroesophageal Reflux and Biliary Disease,” Erik B. Wilson, Md, Philip L. Leggett, Md, The University Of Texas-houston Health Science Center, Houston Northwest Medical Center, Houston, TX (see poster #PA029 for abstract)
- **2:55 PM** Presenter: Paul Ridgway  “Laparoscopic Staging of Pancreatic Tumours Induces Increased Invasive Capacity Which May Be Blocked by a Specific Gelatinase Inhibitor,” Paul F Ridgway Md, Paul Ziprin Md, David H Peck Phd, Ara W Darzi Md, Academic Surgical Unit, Imperial College Faculty Of Medicine, St. Mary's Hospital, London, UK (see poster #PS12 for abstract)
- **3:08 PM** Presenter: Chandrakanth Are  "The Properties of Pneumo-peritoneum Modify Perfusion Response Induced by Bacterial Lipopolysaccharide," Chandrakanth Are Md, Yorge Karolat Phd, Mark A Talamini Md, Antonio Demaio Phd, Department Of Surgery And Department Of Paediatric Surgery, The Johns Hopkins Medical Institutions,Baltimore, MD (see poster #PS095 for abstract)
- **3:21 PM** Presenter: Marietta Bertleff  “Laparoscopic Correction Versus Open Surgery of Perforated Peptic Ulcer: First Results of the Loma Trial," Mj Bertleff, M.D., Wb Bemelman, Ph.D, Ih Oei, M.D., Jf Smulders, M.D., Ac Vanderham, Ph.D., Hj Bonjer, Ph.D., Jf Lange, Ph.D., Department Of Surgery, Mcz Location Clara, Rotterdam, The Netherlands (see poster #PS095 for abstract)
- **3:47 PM** Presenter: Khaled Madbouly  “Symptom Directed Laparoscopic Repair of Rectal Prolapse: A Comparison of the Wells Procedure and Rectopexy," Khaled Madbouly; Md, Anthony J. Senagore, Md, Connor P. Delaney, Md, Ph.D, Department Of Colorectal Surgery And Minimal Invasive Surgery, Cleveland Clinic Foundation, Cleveland, OH (see poster #PA023 for abstract)

On behalf of the World Congress, SAGES acknowledges a generous educational grant in partial support of this program from Ethicon Endo-Surgery, Inc.

http://www.8thworldcongress.org/
WEDNESDAY March 13, 2002
World Congress Opening Ceremonies: 5:00 - 5:30 PM

LOCATION: Grand Ballroom
WELCOME TO NEW YORK AND...

Join us as SAGES welcomes you to New York, the United States of America and the 8th World Congress of Endoscopic Surgery. Music and words will remind us that we are one world and one world of surgery. Meet those whose efforts are responsible for organizing and presenting the Congress. Pay tribute to this week of international solidarity in surgery and become Honorary New Yorkers for one week.

Exhibit Opening Reception: 5:30 - 7:00 PM
The 8th World Congress Opening Reception
Immediately following the close of the Opening Ceremonies
LOCATION: America’s Halls 182, Rhinelander Gallery

Exhibitor’s Special Promotions

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>BOOTH</th>
<th>PROMOTION</th>
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</thead>
<tbody>
<tr>
<td>Aesculap/B Braun</td>
<td>229</td>
<td>Enjoy the hospitality of Aesculap/B Braun with a coffee or cappuccino.</td>
</tr>
<tr>
<td>Applied Medical</td>
<td>357</td>
<td>Win a Canon “Elph 2 Advanced Photo System.” One camera given away each day!</td>
</tr>
<tr>
<td>BioEnterics Corporation</td>
<td>245</td>
<td>Win round trip airfare to ABS 2002 or SAGES 2003. During the Opening</td>
</tr>
<tr>
<td>Braintree Laboratories</td>
<td>247</td>
<td>reception a caricaturist will be on hand to bring out the best in you.</td>
</tr>
<tr>
<td>C.B. Fleet Co., Inc.</td>
<td>147</td>
<td>Come by and pick up a product sample.</td>
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<tr>
<td>LSI Solutions</td>
<td>351</td>
<td>Drop by for your chance to win a digital camera.</td>
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<tr>
<td>Olympus America</td>
<td>220</td>
<td>Enter a drawing to win an Olympus Digital Camera and P-400 color printer.</td>
</tr>
<tr>
<td>Resource Anesthesiology</td>
<td>102</td>
<td>Munch on fresh, hot popcorn and enter to win a gift certificate to a top NY</td>
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<td>Associates</td>
<td></td>
<td>restaurant - daily.</td>
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<tr>
<td>Richard Wolf</td>
<td>306</td>
<td>Take a cuddly stuffed wolf home to the kids and listen to a brief educational presentation.</td>
</tr>
<tr>
<td>Taut, Inc.</td>
<td>239</td>
<td>Show me the money! Enter to win $1000 cash.</td>
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<tr>
<td>Tissuelink</td>
<td>318/317</td>
<td>Play the game “operation” to win a prize.</td>
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</tbody>
</table>

Portions of World Congress Meeting to be Available On-line After Meeting

Missed a talk? Couldn’t get to an early session? Left early?
'Don’t worry... you can see it on the internet!

The Friday and Saturday portions of the Scientific Session which take place in the plenary room will be broadcast on the Internet approximately one month following the meeting. This will include the Storz Lecture in New Technology, the SAGES Presidential Address, the Gerald Marks Lecture, as well as four panels featuring invited faculty lectures and six sessions of oral presentations.

Please watch www.8thworldcongress.org and www.sages.org for details.

The Broadcast will be free to World Congress registrants.

Complete your Evaluation and CME Forms!
Drop the completed forms in boxes outside the meeting rooms.
A GENTLE REMINDER!

We have taken every precaution to assure the safety and security of our guests and their possessions. However, we urge you to be aware and take simple steps to guard your possessions.

- Do not leave your purse or briefcase unattended.
- Do not leave your laptop, phone or PDA on the floor or out of your sight in a darkened room.
- Be aware of your surroundings.

Have a safe and secure meeting!
THURSDAY March 14, 2002

SAGES/EAES Postgraduate Course I

“When Bad Things Happen to Good Surgeons:
Avoiding & Treating Complications of Laparoscopic Surgery”

TIME: 8:00 - 11:00 AM and 2:00 - 5:00 PM, LOCATION: Grand Ballroom
Course Co-Chairs: Nathaniel Soper, MD and Joel LeRoy, MD

Course Description:
This didactic, interactive course will address the issue of complications occurring as a result of laparoscopic surgery. Leading authorities from the U.S.A. and Europe will discuss general problems, such as access and pneumoperitoneum complications, as well as operation-specific complications due to the most commonly performed laparoscopic procedures. Emphasis will be placed on means by which these complications can be reduced or eliminated from one’s practice. Adequate time will be programmed into the course to allow questions from the audience to be addressed by the faculty.

Objectives:
◗ To understand the causes, mechanisms and means of prevention of the general complications of laparoscopic surgery.
◗ To recognize the common pitfalls of the most frequent laparoscopic procedures.
◗ To be exposed to various pharmaceutical agents which may help minimize perioperative problems.
◗ To experience the rapidly-developing field of surgical simulation as an aid to perioperative planning.
◗ To realize the importance of determining outcomes in one’s own surgical practice, and to be exposed to the tools for facilitation of this process.

I. General Complications:

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 - 8:15</td>
<td>Access and Trocar Complications</td>
<td>J. Leroy, MD</td>
</tr>
<tr>
<td>8:15 - 8:30</td>
<td>Pneumoperitoneum-Related Problems</td>
<td>M. Talamini, MD</td>
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<tr>
<td>8:30 - 8:45</td>
<td>Thermal Device Use &amp; Abuse</td>
<td>J. Amaral, MD</td>
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<tr>
<td>8:45 - 9:00</td>
<td>Conversion: When, How and Why?</td>
<td>W. Wayand, MD</td>
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<tr>
<td>9:00 - 9:30</td>
<td>Discussion</td>
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</table>

II. Operation-Specific Complications

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>9:30 - 9:45</td>
<td>Inguinal Herniorrhaphy</td>
<td>C. D. Smith, MD</td>
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<tr>
<td>9:45 - 10:00</td>
<td>Ventral Herniorrhaphy</td>
<td>B. Todd Heniford, MD</td>
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<tr>
<td>10:00 - 10:15</td>
<td>Appendectomy</td>
<td>A. Fingerhut, MD</td>
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<td>10:15 - 10:30</td>
<td>Colectomy</td>
<td>A. Lacy, MD</td>
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<td>10:30 - 11:00</td>
<td>Discussion</td>
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<tr>
<td>11am-2pm</td>
<td>Exhibits, Posters, and Lunch</td>
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III. Operation-Specific Complications II

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>2:00 - 2:15</td>
<td>Antireflux Surgery-Intraoperative</td>
<td>B. Dallemagne, MD</td>
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<tr>
<td>2:15 - 2:30</td>
<td>Antireflux Surgery-Late/Redo Problems</td>
<td>J. Hunter, MD</td>
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<tr>
<td>2:30 - 2:45</td>
<td>Gastric Bypass</td>
<td>J. Mouiel, MD</td>
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<td>2:45 - 3:00</td>
<td>Splenectomy</td>
<td>A. Park, MD</td>
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<td>3:00 - 3:15</td>
<td>Cholecystectomy/Bile Duct Injury</td>
<td>N. Soper, MD</td>
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<td>3:15 - 3:40</td>
<td>Discussion</td>
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IV. Miscellaneous Considerations

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>3:40 - 3:55</td>
<td>Anesthetic Complications &amp; Their Prevention</td>
<td>S. Jones, MD</td>
</tr>
<tr>
<td>3:55 - 4:10</td>
<td>Pharmaceutical Therapy to Minimize Perioperative Problems</td>
<td>S. Schwartzberg, MD</td>
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<tr>
<td>4:10 - 4:25</td>
<td>Preoperative Simulation Strategies</td>
<td>J. Marescaux, MD</td>
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<td>4:25 - 4:40</td>
<td>Training &amp; Determination of Outcomes &amp; Competency</td>
<td>G. Fried, MD</td>
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<td>4:40 - 5:00</td>
<td>Discussion</td>
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On behalf of the World Congress, SAGES acknowledges a generous educational grant in support of this program from Karl Storz Endoscopy America.

http://www.8thworldcongress.org/
THURSDAY March 14, 2002
SAGES/JSES Postgraduate Course II

“Minimally Invasive Surgical Management of Hepatic Disease”

TIME: 7:00 - 11:00 AM, LOCATION: Mercury Ballroom
Course Co-Chairs: Frederick L. Greene, MD and Masao Tanaka, MD

Course Description:
The course will review the anatomy and discuss imaging studies appropriate for planning minimal access procedures for benign and malignant liver disease. Technical approaches and the instrumentation for management of solid and cystic lesions will be discussed. New methods of ablation of malignant liver lesions will be presented and outcome studies and pertinent literature will be reviewed.

Objectives:
- To present the indications and contraindications for the laparoscopic management of benign and malignant hepatic disease.
- To discuss technical issues relating to resection of benign and malignant lesions utilizing laparoscopic techniques.
- To discuss minimal access ablative techniques used in the management of hepatic malignancy.
- To identify appropriate imaging techniques for the preoperative and intraoperative planning of minimal access hepatic resection.

Minimal Access Liver Course Session I

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>7:00 - 7:20 AM</td>
<td>Review of Hepatic Anatomy and Imaging As a Primer for Minimally Invasive Approaches</td>
<td>F. Greene, MD</td>
</tr>
<tr>
<td>7:20 - 7:40 AM</td>
<td>Diagnosis and Tissue Sampling - Tools of the Trade</td>
<td>D. Easter, MD</td>
</tr>
<tr>
<td>7:40 - 8:00 AM</td>
<td>Intraoperative Ultrasound Guidance in the Management of Hepatic Lesions</td>
<td>D. Birkett, MD</td>
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<tr>
<td>8:00 - 8:20 AM</td>
<td>Preoperative and Intraoperative Physiologic Assessment</td>
<td>P. Hansen, MD</td>
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<tr>
<td>8:20 - 8:50 AM</td>
<td>Discussion</td>
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<tr>
<td>8:50 - 9:10 AM</td>
<td>Break</td>
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Minimal Access Liver Course Session II

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:10 - 9:30 AM</td>
<td>Management of Cystic Lesions of the Liver</td>
<td>N. Katkhouda, MD</td>
</tr>
<tr>
<td>9:30 - 9:50 AM</td>
<td>Laparoscopic Liver Resection: Technical Aspects of Left Lateral Segmentectomy</td>
<td>H. Kaneko, MD</td>
</tr>
<tr>
<td>9:50 - 10:10 AM</td>
<td>Minimally Invasive Surgery for Hepatic Malignancy - Laparoscopic Liver Resection and Endoscopic Thermal Ablation</td>
<td>G. Wakabayashi, MD</td>
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<tr>
<td>10:10 - 10:30 AM</td>
<td>Comparison of Resection vs. Ablative Techniques - Outcomes and Results</td>
<td>A. Lefor, MD</td>
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<tr>
<td>10:30 - 11:00 AM</td>
<td>Discussion</td>
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</table>

On behalf of the World Congress, SAGES acknowledges a generous educational grant in support of this program from Valleylab

Visit the Exhibits, Posters and Learning Center

Exhibit Dates and Hours
WEDNESDAY, MARCH 13
Opening Reception 5:30 PM - 7:00 PM
THURSDAY, MARCH 14 10:00 AM - 2:30 PM
FRIDAY, MARCH 15 10:00 AM - 2:30 PM
SATURDAY, MARCH 16 10:00 AM - 1:00 PM

Interested in purchasing a copy of the videos shown at this meeting or previous meetings? If so, please visit SAGES official video distributor, Ciné-Med, at booth #108 in the SAGES Exhibit Hall.

Complete your Evaluation and CME Forms!
Drop the completed forms in boxes outside the meeting rooms.

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http://www.8thworldcongress.org/
Minimally Edited Video Session

TIME: 7:00 - 11:00 AM, LOCATION: Trianon Ballroom
Program Chairs: Michel Gagner, MD and Guy Bernard Cadiere, MD

Course Description:
This four-hour session will consist of a series of minimally edited videos of surgeries performed by the world's leading laparoscopic surgeons. Each author will be present to narrate the video live, and to address questions from the audience and an expert panel as it is shown. A 30-minute discussion period will occur at the end of the session. The purpose of this session is to provide an in-depth visual presentation of common laparoscopic procedures showing both the operative details as well as real-life problems that are encountered and overcome by the expert surgeon.

Objectives
At the conclusion of this session, participants will be able to:
- Describe the steps recommended by experts in the performance of the different laparoscopic surgery procedures.
- Identify potential complications and recommended solutions for each procedure.
- Differentiate between the skills needed to perform each procedure.

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Procedure</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>7:00</td>
<td>Introduction</td>
<td>Michel Gagner, MD &amp; Guy Bernard Cadiere, MD</td>
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<tr>
<td>7:10</td>
<td>Gastric Bypass</td>
<td>Michel Gagner, MD</td>
</tr>
<tr>
<td>7:35</td>
<td>Anti-Reflux Surgery</td>
<td>Guy Bernard Cadiere, MD</td>
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<tr>
<td>8:00</td>
<td>Oesophagectomy</td>
<td>Aureo DePaula, MD</td>
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<tr>
<td>8:25</td>
<td>Hepatectomy</td>
<td>Go Wakabayashi, MD</td>
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<tr>
<td>8:50</td>
<td>Splenectomy</td>
<td>Eric Poulin, MD</td>
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<tr>
<td>9:15</td>
<td>Hernia Repair</td>
<td>Edward Felix, MD</td>
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<tr>
<td>9:40</td>
<td>Gastrectomy</td>
<td>Cristiano Huscher, MD</td>
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<tr>
<td>10:05</td>
<td>Left Colectomy</td>
<td>Joel Leroy, MD</td>
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<tr>
<td>10:30</td>
<td>Discussion</td>
<td>All</td>
</tr>
</tbody>
</table>

On behalf of the World Congress, SAGES acknowledges a generous educational grant from Stryker Endoscopy in support of this venue.

11:00 AM - 2:00 PM: Visit the Exhibits, Posters and Learning Center!
Laparoscopy in Acute and Emergency Situations

TIME: 2:00 - 5:00 PM, LOCATION: Trianon Ballroom
Course Co-Chairs: W. Stephen Eubanks, MD, Jorge Cervantes, MD & Luis Burbano, MD

Course Description:
This postgraduate course is designed for the practicing laparoscopic surgeon and for the surgeon in training. The focus of the course is the appropriate application of minimally invasive surgical techniques in the patient presenting with a surgical emergency. The emergency conditions discussed will include trauma, intestinal perforations, inflammatory diseases, obstruction, and ischemia. The faculty will be comprised of SAGES members and international representatives of ALACE and FELAC.

Objectives:
At the conclusion of this course, participants will be able to:
◗ Describe appropriate use of laparoscopic techniques in the emergency setting, including indications, contraindications, techniques, potential complications, and published results.
◗ Describe the necessary and appropriate instrumentation and equipment for laparoscopic surgery in the emergency setting.
◗ Participants will acquire knowledge regarding the current role of laparoscopic surgery at the bedside in settings such as the intensive care unit.
◗ Evaluate whether or not minimally invasive techniques is reasonable for the management of the patient in the trauma and emergency setting.

Program:

2:00 - 2:15 Diagnostic Laparoscopy for Acute Abdominal Pain  
G. Ferzli, MD

2:15 - 2:30 Laparoscopy for Abdominal Trauma (Blunt and Penetrating)  
E. Fahel, MD

2:30 - 2:45 Laparoscopic Management of Intestinal Obstruction  
R. Cohen, MD

2:45 - 3:00 Laparoscopic Management of Diverticulitis  
A. Garcia-Ruiz, MD

3:00 - 3:15 Laparoscopy for Acute Appendicitis  
L. Burbano, MD

3:15 - 3:40 Discussion

3:40 - 3:55 Bedside Laparoscopy in the ICU  
L. Khaitan, MD

3:55 - 4:10 Laparoscopic Management of Perforated Ulcer  
M. Antozzi, MD

4:10 - 4:25 Laparoscopy for Intestinal Ischemia  
J. Cueto-Garcia, MD

4:25 - 4:40 Laparoscopic Re-operations for Postoperative Complications  
D. Easter, MD

4:40 - 5:00 Discussion

Note: No syllabus for this course.

Save These Dates! http://www.sages.org/sag-cal.html

SAGES Scientific Session & Postgraduate Course
March 12-15, 2003, Los Angeles, California
March 31-April 3, 2004, Denver, Colorado

Related Meetings
SAGES/SSAT joint symposium, During ACS Clinical Congress, Wednesday evening, October 9, 2002, San Francisco, CA, Topic TBA

IPEG: 11TH CONGRESS FOR ENDOSURGERY IN CHILDREN: May 2-4, 2002, Genoa, Italy

IPEG: 12th CONGRESS FOR ENDOSURGERY IN CHILDREN: March 11-13, 2003, Los Angeles, CA

THE 15TH SCIENTIFIC MEETING OF THE JAPAN SOCIETY FOR ENDOSCOPIC SURGERY (JSES)
WITH THE CONGRESS OF THE SOCIETY OF ENDOSCOPIC AND LAPAROSCOPIC SURGEONS OF ASIA (ELSA), Tokyo, Japan
JSES: September 19-20, 2002
ELSA: September 19-21, 2002

10th EAES INTERNATIONAL CONGRESS: June 2-5, 2002, Lisbon, Portugal

18th WORLD CONGRESS OF ISDS: December 8-11, 2002, Hong Kong

11th EAES ANNUAL CONGRESS, 1ST ENDOSCOPIC SURGICAL WEEK: June, 2003, Edinburgh, Scotland, UK

9th WORLD CONGRESS OF ENDOSCOPIC SURGERY: February 2-7, 2004, Cancun, Mexico - Hosted by ALACE/FELAC

http://www.8thworldcongress.org/
THURSDAY March 14, 2002

Basic Science Forum with ICEL (International Conference on Experimental Laparoscopy)

TIME: 1:00 - 5:00 PM, LOCATION: Mercury Ballroom
Forum Coordinator: R. Lawrence Whelan, MD

Description:
ICEL, the International Conference of Experimental Laparoscopy, is an international society of basic science researchers devoted to the elucidation of the physiologic, oncologic, and immunologic consequences of minimally invasive surgery. The principal goals of the group are to provide a forum for the rapid dissemination of the results of basic science studies and to foster the performance of new and innovative collaborative studies in this field. ICEL members have generated much of the existing basic science literature regarding laparoscopy. This group has met annually for the last 5 years. ICEL's 2002 annual meeting is to be incorporated into the 2002 World Congress. During this joint basic science session, all of the basic science papers of the World Congress will be presented. This session will be moderated by both ICEL and SAGES members. The second day of the ICEL meeting will take place on the Sunday following the World Congress. On this day, other basic science studies and works in progress will be presented. It is hoped that this joint meeting will encourage interested surgical researchers to join the ICEL group and that it will also lead to future combined meetings with both SAGES and EAES.

Objectives:
At the conclusion of this event, the participants will have knowledge of:
- Reviews of the physiologic, immunologic, and oncologic impact of laparoscopy
- Cardiovascular, pulmonary, and renal effects of CO2 pneumoperitoneum
- Local and systemic immunologic consequences of minimally invasive surgery.
- Port site tumors; the appropriateness of laparoscopic methods for curative cancer resection.
- Systemic (non-port site or intra-abdominal recurrence related) oncologic implications of minimally invasive techniques.

Program:

Moderator: Lukas Kraehenbuehl, MD
Brief Introduction: R. Larry Whelan

Faculty Lectures (15 minutes each)
1:00 PM Immunological impact of surgical approach  Jaap Bonjer, MD
1:15 PM Peritoneal and “local” repercussions of CO2 pneumoperitoneum Carsten Gutt, MD
1:30 PM Port site tumors Cristoph Jacobi, MD
1:45 PM Oncologic impact of surgical approach Paul Redmond, MD

Note: See Page 50 for more details on the Sunday, March 17 ICEL Meeting.

Oral Presentation of Abstracts
2:00 - 5:00 PM

BS01 “EXCISION OF LAPAROSCOPIC PORT SITES INCREASES THE LIKELIHOOD OF WOUND METASTASES IN AN EXPERIMENTAL MODEL” David I. Watson MD FRACS, Tanya Ellis Bsc (Hons), Paul Leeder MD FRCS, Susan J Neuhaus PhD, Thomas Dodd FRACP, Glynn G Jamieson MS FACS, FRACS, The University of Adelaide Department Of Surgery, Royal Adelaide Hospital, Adelaide, South Australia, Australia

* BS02 “INCREASED TUMOR SPREAD AFTER CONVERSION FROM LAPAROSCOPIC TO OPEN SURGERY” Lars Brinkmann MD, Beate Richter MD, Tobias Weberschock MD, Claus-Georg Schmidt MD, Carsten N Gutt MD, Department Of General Surgery, J-W Goethe University Frankfurt, Germany

* BS03 “RAPID FLOW CO2 LAPAROSCOPY AEROSOLISES CANCER CELLS INTO PERITONEAL CAVITY BUT NOT PORT SITES IN A NEW RAT MODEL” I KS Zayyan FRCS, J S Christie-Brown MRC PATH, I S Van Noorden, 2 CY Yiu FRCE, I D Pelli FRCS, I RT Mathie PhD, I Division Of Surgery, Anaesthetics And Intensive Care, Imperial College School Of Medicine, Hammersmith Hospital, London, UK; 2 Whittington Hospital, London, UK

BS04 “EFFECT OF SURGICAL TRAUMA ON EPCAM VACCINE INDUCED TUMOR SPECIFIC CELL CYTOTOXICITY AND ANTIBODY PRODUCTION” Irene Kirman, MD, Ph.D., Alexandra Maydelman, Zisan Asi, B.A., Daniel Feingold, MD, Marc Bessler, MD, Richard L. Whelan, Department Of Surgery, Columbia University, New York, NY

* BS05 “THE HYPOXIC PNEUMOPERITONEUM INDUCES AUGMENTED MALIGNANT POTENTIAL VIA NF-KB MEDIATED METALLOPROTEASE UPREGULATION” P SG Siddiqui MD, P Ziprin MD, Pa Paraskeva MD, Dh Peck Phd, Aw Darzi MD, Academic Surgical Unit, Imperial College Faculty Of Medicine, St. Mary’s Hospital, London, UK


BS07 “ALTERATIONS OF T LYMPHOCYTE SUBSETS AND TH1/TH2 BALANCE FOLLOWING LAPAROSCOPY-ASSISTED DISTAL GASTRECTOMY” Kyuzo Fujii, MD, Kazuhiro Yasuda, MD, Masafumi Inomata, MD, Norio Shiraishi, MD, Yoshue Adachi, MD, Seigo Kitano, MD, Department Of Surgery I, Oita Medical University, Oita, Japan

Underline denotes presenter. * denotes resident paper.

Complete your Evaluation and CME Forms!

Drop the completed forms in boxes outside the meeting rooms.

http://www.8thworldcongress.org/
BS08 “COMPARISON OF OPEN V.S. LAPAROSCOPIC, INTRACORPO-
REALY HAND-SEWN SMALL BOWEL ANASTOMOSIS ASSESS-
MENT OF LOCAL LEUKOCYTE INFLAMMATORY REACTION USING
CONFOCAL LASER-SCANNING MICROSCOPY IN THE PORCINE
MODEL” Istvan Gal, MD, PhD, Geza Telek, MD, Balazs Borsitsky, MD,
Laszlo Simon, MD, Zoltan Szabo, PhD, Department Of Surgery,
School Of Pecs, National Stroke Center Budapest, Hungary,
M.O.E.T. Institute, San Francisco, CA

BS09 “EFFECT OF HEATED HUMIDIFIED GAS DURING PNEUMOPERI-
TONEUM.” Minoru Matsuda, MD, Ph.D.*, Y. Oikawa, M.E. **, K.
Onodera, MD, PhD *, S. Kasai, MD, PhD.*, Second Department Of
Surgery, Asahikawa Medical College, Asahikawa, Japan*. Kiyota
Hospital, Sapporo, Japan**

* BS10 “ISCHEMIA/REPERFUSION WITH CO2 PNEUMOPERITONEUM
IN A PORCINE MODEL” Gamal Mostafa, MD, Brent Matthews, MD,
Didier Dreau, Phd, Catherine Austin, Mareva Foster, Cathy
Culberson, B Todd Heniford, MD, Carolinas Medical Center,
Charlotte, North Carolina

BS11 “THE PERCENTAGE OF CD31+ T CELLS DECREASES AFTER OPEN
BUT NOT LAPAROSCOPIC SURGERY IN HUMANS” Irena Kirman,
MD, Ph.D., Vesna Cekic, R.N., Natalia Poltaratskaia, M.S., Zishan
Asi, B.A., Daniel Finegold, MD, Richard L. Whelan MD, Department
Of Surgery, Columbia University, New York, NY

* BS12 “LAPAROSCOPIC STAGING OF PANCREATIC TUMOURS
INDUCES INCREASED INVASIVE CAPACITY WHICH MAY BE
BLOCKED BY A SPECIFIC GELATINASE INHIBITOR” Paul F
Ridgway MD, Paul Ziprin MD, David H Peck Phd, Ara W Darzi MD,
Academic Surgical Unit, Imperial College Faculty Of Medicine, St.
Mary’s Hospital, London, UK

BS13 “COMPARISON OF THE ONCOLOGICAL EFFECTS AMONG DIF-
FERENT INSUFFLATION GASES IN RATS” Takeshi Okita MD,
Hideyuki Ishida, MD, Nobuo Murata MD, Daijo Hashimoto MD,
Department Of Surgery, Saitama Medical Center, Saitama Medical
School, Saitama, Japan

BS14 “COMPARISON OF THE ONCOLOGICAL EFFECTS BETWEEN GAS-
LESS PROCEDURE AND CARBON DIOXIDE PNEUMOPERITONEUM
IN RATS” Masaru Yokoyama MD, Hideyuki Ishida, MD, Nobuo
Murata MD, Daio Hashimoto MD, Department Of Surgery,
Saitama Medical Center, Saitama Medical School, Saitama, Japan

Underline denotes presenter. * denotes resident paper.
Fundamentals of Advanced Minimally Invasive Surgical Procedures

Objective:
At the conclusion of the program the RN/Allied Health Professional will be able to:

- List the key elements of a training program for OR staff assigned to advanced/robotic MIS procedures.
- Identify and describe mechanisms to address new issues in MIS patient and staff safety arising from advanced procedures.
- Perform accurate and clear pre-operative teaching for patients scheduled for advanced MIS procedures.
- Describe the role of advanced MIS procedures in surgical oncology.

Program:

**Session I:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:05</td>
<td>Ergonomic Issues in Advanced MIS Procedures</td>
<td>T. Kenyon, R.N.</td>
</tr>
<tr>
<td>2:25</td>
<td>Your Hospital is Purchasing a Surgical Robot... How To Plan</td>
<td>A. Wasliewski, R.N.</td>
</tr>
<tr>
<td>2:45</td>
<td>Role of Advanced MIS in Surgical Oncology</td>
<td>K. Conlon, MD</td>
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<tr>
<td>3:05</td>
<td>Panel Discussion</td>
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<tr>
<td>3:25</td>
<td>Break</td>
<td></td>
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</tbody>
</table>

**Session II:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:40</td>
<td>Development of an RN Training Program for Advanced MIS</td>
<td>D. Stanbridge, R.N.</td>
</tr>
<tr>
<td>4:00</td>
<td>Teaching Patients About Advanced MIS Procedures</td>
<td>J. Cranfill, R.N.</td>
</tr>
<tr>
<td>4:20</td>
<td>OR Technique: Are We Meeting the Standards in Advanced MIS Procedures?</td>
<td>C. Spry, R.N.</td>
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<tr>
<td>4:40</td>
<td>MIS Safety Update - Additional Hazards of Advanced Procedures</td>
<td>A. Huisman, R.N.</td>
</tr>
<tr>
<td>5:00</td>
<td>Managing Crises and Avoiding Open Procedures Safely</td>
<td>L. Swanstrom, MD</td>
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<tr>
<td>5:20</td>
<td>Panel Discussion</td>
<td></td>
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<tr>
<td>5:40</td>
<td>Closing Remarks</td>
<td>E. Dougherty, R.N. and D. Stanbridge, R.N.</td>
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</tbody>
</table>

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from Legacy Health Systems.
BioEnterics Division of
Inamed Corporation

invites you to join them for a reception and seminar beginning at 5:00 pm. The title of the event is “A Review of the LAP-BAND® System and BioEnterics.” A panel discussion on the Lap-Band® Adjustable Gastric Banding System will feature Prof. Paul O’Brien, Drs. Brian Quebbemann and Hadar Spivac. Dr. Barry Fisher will moderate the discussion which will be proceeded by four presentations. Refreshments will be served.

Reception begins at 5:00 pm. Location: Trianon Ballroom

Ethicon Endo-Surgery, Inc.

An opportunity to interact with thought leaders on Hand Assisted Laparoscopic Surgery (HALS). Featuring live telesurgery and peer presentations complemented by educational opportunities. Procedure and product displays will be available showcasing innovative approaches to HALS from Ethicon Endo-Surgery. At last high tech meets high touch.

The program begins at 5:00 in the Grand Ballroom with a reception, to be followed at 6:00 with a telesurgery, and will end with three presentations from 7:00 - 7:45. Refreshments will be served.

Fleet Pharmaceuticals

RECEPTION & SYMPOSIUM will begin at 5:30 PM in the Mercury Ballroom. Sponsored by THE JOHNS HOPKINS SCHOOL OF MEDICINE. Featured Presenter: RICHARD D. SCHULICK, M.D., F.A.C.S., Assistant Professor of Surgery & Oncology, Johns Hopkins University School of Medicine. Topic: Bowel Prep for Surgery. One Hour of CME Credit in Category 1 in AMA/PRA. The Johns Hopkins School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (A.C.C.M.E.) to sponsor Continuing Medical Education for physicians. The Johns Hopkins School of Medicine designates this Continuing Medical Education activity for 1 credit hour in Category 1 of the Physicians Recognition Award for the America Medical Association. Note Each physician should claim only those hours of credit activity that he/she actually spent in the educational activity.

Unrestricted Educational Grant from FLEET PHARMACEUTICALS.

W.L. Gore & Associates, Inc.

are pleased to present a panel discussion on “The Technical Challenges and Approaches to the Laparoscopic Repair of Complex Abdominal Wall Hernias.” Moderated by Dr. Robert Fitzgibbons, the panel will discuss minimally invasive techniques to repair stomal, lumbar, and supra-pubic/sub coastal hernias. Panelists include Drs. Todd Heniford, Adrian Park and Roy Smoot. The panelists’ combined experience with Laparoscopic Incisional Hernia Repair is more than several hundred clinical cases.

Refreshments and appetizers will be served beginning at 5:30 in the Rendezvous Trianon Ballroom.

These events are not planned by SAGES and therefore are not accredited by SAGES.
A GENTLE REMINDER!

We have taken every precaution to assure the safety and security of our guests and their possessions. However, we urge you to be aware and take simple steps to guard your possessions.

- Do not leave your purse or briefcase unattended.
- Do not leave your laptop, phone or PDA on the floor or out of your sight in a darkened room.
- Be aware of your surroundings.

Have a safe and secure meeting!

http://www.8thworldcongress.org/
Description:
This section of the World Congress includes panels with invited faculty who will speak on specific topics and sessions of oral & video presentations of abstracts selected by the Program Committee. Panel information is listed below; information about the abstract & video presentation sessions will be available in the final program.

Who Should Attend:
- Practicing surgeons who wish to expand their knowledge of laparoscopic surgery and flexible endoscopy
- General Surgery Residents with an interest in endoscopic surgery
- Fellows in GI surgery or advanced laparoscopic general surgery
- Nurse and GI Assistants with an interest in minimally invasive surgery and endoscopy

Included in Registration for the Scientific Session:
Program materials will be available at the Registration desk beginning at 1:00 PM on Tuesday, March 12, 2002. Fee includes all program materials, Wednesday evening Exhibit Reception, continental breakfasts, and breaks.

Concurrent Sessions

**PLENARY ROOM (GRAND BALLROOM)**

**Scientific Session Panel I: Introducing New Procedures/Technology into Surgical Practice**

**TIME:** 7:30 - 8:30 AM

Panel Chairs: Karl Zucker, MD & Gerhard Buess, MD
Moderator: Lee Swanstrom, MD

**Objectives:**
At the conclusion of this panel, participants should be able to:
- Discuss the problems associated with the development of a new procedure or surgical device, including financial aspects, clinical trials and government approvals
- Distinguish between the different roles a practicing clinical surgeon may have in the development of new devices and/or procedures
- Discuss new instruments, devices or procedures may be available in the near and distant future.

7:30 Teaching Principles for a New Procedure TEM
Gerhard Buess, MD
7:40 Development and First Clinical Use of a Totally Implantable Artificial Heart
Desmond Birkett, MD
7:50 Development, Clinical Trials and FDA Approval of Robotic Surgical Devices
Yulan Wang, Ph.D.
8:10 Discussion Panel

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from General Surgery News.

**IN MEMORIAM—KARL ZUCKER, MD, FACS**

Karl Zucker died of recurrent esophageal cancer on September 18, 2001. The Laparoscopic World has lost one of its best.

He was an active SAGES member and a pioneer in minimal access surgery. He was founding editor of *Surgical Laparoscopy and Endoscopy* which became known to all of us as “The Zucker journal.” Karl took an active and forward thinking interest in surgical technology until the very end of his life. He worked with Drs. Lee Swanstrom and Gerhard Bues to structure the New Technology panel of the World Congress and was to be its co-chair. We acknowledge the enormous contribution he made to surgery. We will miss him.

**CONCURRENT I (TRIANON BALLROOM)**

**Scientific Session Panel II: Measuring Surgical Outcomes: Patients, Providers, and Populations**

**TIME:** 7:30 - 8:30 AM

Panel Chairs: Ara Darzi, MD & William Laycock, MD

**Objectives:**
At the conclusion of this panel the participant should be able to:
- Understand what measurement tools are available with discussion of advantages/disadvantages of the instruments.
- Understand how to use prospective data registries as a quality improvement tool for the physician.
- Discuss several examples of population-based registries involving laparoscopic procedures and how these registries can have health policy implication.

7:30 Review of SAGES Outcomes Committee Efforts
Keith Apelgren, MD
7:40 Measuring Patient-Centered Outcomes: Understanding & Choosing the Right Measures
David Urbach, MD
7:55 Using Prospective Registries to Measure & Improve Surgical Quality: Lessons Learned From the VA NSQIP
Jennifer Daley, MD, MPH
8:10 Population-Based Assessment of Laparoscopic Surgery: Variation in Utilization & Outcomes in the Real World
Sam Finlayson, MD, MPH
8:25 Discussion Panel

Rules for Discussants During Scientific Sessions

1. You may question the presenter by either submitting your question in writing to an usher or proceeding to the microphone to ask the questions from the floor. If you choose to write the question, please use the forms available on the table.
2. When recognized by the moderator, give your name, hospital or university affiliation, city and country before asking your question.
3. Please ask your question in a clear, concise manner and indicate the name of the presenter to whom your question is directed.
4. Please do not give comments or information about results of a similar study, except as part of your question.
5. Each discussant is limited to one question; not a discussion.

http://www.8thworldcongress.org/
The 2002 Karl Storz Lecture in New Technology

TIME: 8:30 AM, LOCATION: Plenary Room (Grand Ballroom)

Innovations in Diagnostic and Therapeutic Endoscopy

Christopher Paul Swain, MD
Professor and Consultant Gastroenterologist, Royal London Hospital, ENGLAND

Dr. Paul Swain has participated in the invention of more than 25 endoscopic or gastrointestinal devices. His accomplishments as a gastroenterologist defy belief because his work has been both clinical and technological. Currently Senior Lecturer and Consultant in Gastroenterology at the Royal London Hospital, he has earned the following academic letters in addition to his MD degrees: Bsc, MRCS LRC, MB BS, MRCP. He oversees a strong academic group which studies aspects of gastroenterology with special interests on motility, inflammatory bowel disease and therapeutic endoscopy. He has developed or participated in the development of dozens of devices, some of which have changed the future of endoscopic diagnosis and therapy. We are honored to have him as the Karl Storz Lecturer this year.

Some of Dr Swain’s innovations include:
- Sewing Machine(s) which sew with thread
- Devices of delivering single plastic sutures to GI tissue & strong alloy clips to GI tissue
- Stapler: A device for delivering a double row of staggered staples to GI tissue
- Rubber Band Ligator
- Compression buttons for forming anastomosis magnetic compression
- Hemostatic “Ulcer Clamp”
- “Hot Squeeze” Bipolar Forceps
- Electrically conductive plastic composites for non-stick endoscopic electrodes
- Coaptive laser endcap to enhance photo coagulation of large bleeding arteries
- Suction Snare Device
- Devices for indicating orientation at endoscopy
- Netted polypectomy snare
- Device to exert retrograde traction on bowel as colonoscope advances
- Microwave generator and delivery system for endoscopic use
- Microwave aerials for treatment of gastrointestinal cancer
- Endoscopic knot pusher
- Endoscopic thread locking device
- New slip knot and externally releasable knot for use at endoscopy
- Thread cutting devices for use at flexible endoscopy
- Theoretical studies of cordless and robot endoscopes
- Development of multiple biopsy device for Barrett’s oesophagus
- Water-jet propelled colonoscopy device
- Suction contraction/expansion device for moving a colonoscope
- Prototype wireless endoscopes (the capsule)

This Lecture is permanently endowed by a generous educational grant from Karl Storz Endoscopy, GmbH.

Previous Storz Lecturers
2001 Professor Jacques Marescaux, MD, FRCS, France: “Information Age and Surgery: A Cultural Revolution”
2000 Professor Tehmenton Udwadia, MD, India: “One World - One People - One Surgery”
1999 Erich Muhe, MD, Germany: “The First Laparoscopic Cholecystectomy: Overcoming the Roadblocks on the Road to the Future”
1997 Jack Jakimowicz, PhD, Netherlands: “Laparoscopic Ultrasonography in the Staging of GI Malignancy”

SAGES Presidential Address
TIME: 9:00 - 9:30 AM, LOCATION: Plenary Room (Grand Ballroom)

Why Organized Surgery? Why SAGES?

L. William Traverso, MD

http://www.8thworldcongress.org/
Session SS01: Foregut
Moderators: Jeffrey H. Peters & Steven Stain
Friday, 9:30 - 11:00 AM
So01 “NATIONAL TRENDS IN UTILIZATION AND OUTCOMES OF ANTI-REFLUX SURGERY” Samuel R. G. Finlayson MD, MPH; John D. Birkmeyer, MD; William S. Laycock, MD, Department Of Surgery, Dartmouth-Hitchcock Medical Center, Lebanon, NH; Va Outcomes Group, White River Jct., VT; Dartmouth Medical School, Hanover, NH

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from Medtronic.

Session SS02: Colorectal
Moderators: Kenneth A. Forde & Antonio M. Lacy
Friday, 9:30 - 11:00 AM
So07 “LONG TERM RESULTS OF LAPAROSCOPIC VERSUS OPEN RESECTIONS FOR RECTAL CANCER ON ITS UNSELECTED PATIENTS” Francesco Felicotti, MD, Roberto Campagnacci, MD, Alessandro M. Paganini, MD, Mario Guerrieri, MD, Angelo De Santis, MD, Emanuele Lezoche, MD, Istituto De Scienze Chirurgiche, University Of Ancona, Ancona, Italy, Il Clinica Chirurgica, Universita La Sapienza, Roma, Italy.
So08 “TRANSANAL ENDOSCOPIC MICROSURGICAL RESECTION (TEM) AND RADICAL SURGERY FOR EARLY RECTAL CANCER, RETROSPECTIVE CASE-MATCHING STUDY” Wooyong Lee, MD, Doosook Lee, MD, S I Choi, MD, Hokyung Chun, MD, Department Of Surgery, Samsung Medical Center, Sungkyunkwan University, School Of Medicine, Seoul, Korea.
So09 “TRANSANAL ENDOSCOPIC EXCISION FOR RECTAL ADENOMAS” Costanza Cociolo, MD, Lee E. Smith, MD, Thomas StaHL, MD, Jennifer Douglas, MD, Department Of Colon And Rectal Surgery, Washington Hospital Center, Washington, DC.
Soo “ENDOCOSIC MUCOSAL RESECTION FOR ADVANCED NON-POLYPI COLORECTAL ADENOMA AND EARLY STAGE CARCINOMA” U. Bergmann MD, A. Stanescu MD, H.G. Beger MD, Department Of General Surgery, University Clinic Ulm, Ulm, Germany.
* So04 “FIRST YEAR EXPERIENCE OF PATIENTS UNDERGOING THE STRETTA PROCEDURE” Hugh Houston, MD, Leena Khaitan, MD, Stefan Scholz, MD, Michael Holzman, MD, Kenneth Sharp, MD, William Richards, MD, Department Of Surgery, Vanderbilt University Medical Center, Nashville, TN

Session SS03: Outcomes & Endocrine Surgery
Moderators: Daniel Deziel & Alberto Montori
Friday, 9:30 - 11:00 AM
So16 “SAGES OUTCOMES DATA REVEAL SOME SURPRISES” Leena Khaitan, Keith Apelgren, John Hunter, L. William Traverso, Vanderbilt University Medical Center, Nashville, TN, Michigan State University, Lansing, MI, Oregon Health Sciences, Portland, OR, Virginia Mason Medical Center, Seattle, WA

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from Valleylab.
FRIDAY 11:00 - 11:30 AM
March 15, 2002: Scientific Sessions & Panel Presentations

Forum for Industry  
Location: Grand Ballroom  
Moderator: Steve Schwatzberg, MD

On Friday, March 15, from 11:00 to 11:30, our industry colleagues will have an opportunity to present educational information in the main session room. A limited number of companies will make brief presentations highlighting pertinent updates about their products or company. This type of forum is a first for the World Congress and will provide attendees a focused communication about evolving developments in the corporate sector. Afterwards, registrants are encouraged to visit the exhibit floor before it closes at 2:00 p.m. This forum is not accredited for CME credits.

Company participants are: Bard Endoscopic Devices, Braintree Laboratories, Inc., Karl Storz Endoscopy America, Inc., Olympus America, Inc.

Portions of World Congress Meeting to be Available On-line After Meeting

Missed a talk? Couldn’t get to an early session? Left early? Don’t worry...you can see it on the internet!

The Friday and Saturday portions of the Scientific Session which take place in the plenary room will be broadcast on the Internet approximately one month following the meeting. This will include the Storz Lecture in New Technology, the SAGES Presidential Address, the Gerald Marks Lecture, as well as four panels featuring invited faculty lectures and six sessions of oral presentations.

Please watch www.8thworldcongress.org and www.sages.org for details.

The Broadcast will be free to World Congress registrants.

11:00 AM - 2:00 PM: Visit the Exhibits, Posters and Learning Center!

Rita Medical 1/2 Page Advertisement

Page 33
### Concurrent Sessions

#### Panel III: Minimally Invasive Treatment of Aortoiliac Disease

**Objectives:**
- Learn the various techniques to perform aortoiliac occlusive and aneurysmal disease.
- Learn about the specific instrumentation available to perform these techniques.
- Learn about the advantages and disadvantages related to each technique.
- Learn means of acquiring the skills necessary to perform these surgical procedures.

**Panel III: Minimally Invasive Treatment of Aortoiliac Disease**

**March 15, 2002: FRIDAY**

**Time:** 2:00 - 3:00 PM

**FRIDAY**

**Time: 2:00 - 3:00 PM**

**Video Session Vo1: Hepatobiliary**

**Moderators:** David Edelman & Michael McMahon

**TIME: 2:00 - 3:00 PM**

**Vo22 “LAPAROSCOPIC HAND-ASSISTED RESECTION OF A SEGMENT 4B LIVER TUMOR” Theresa Quinn, MD, John Ko, MD, Myron Schwartz, MD, Alfons Pomp, MD, Mount Sinai School of Medicine, New York, NY**

**Vo22 “LAPAROSCOPIC COMMON BILE DUCT EXPLORATION - LESSONS LEARNED FROM 10 YEARS EXPERIENCE” Joseph B. Petelin, MD, Department Of Surgery, University Of Kansas School Of Medicine, Kansas City, KS**

**Vo25 “LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION WITH ROUX EN-Y HEPATICOJEJUNOSTOMY” Celeste Hollands, MD, Department Of Surgery, Louisiana State University Health Sciences Center, Shreveport, LA**

**Concurrent Session SS04: Education & Measuring Results of Surgery**

**Moderator:** Alfred Cucchiari

**TIME: 2:00 - 3:00 PM**

**SS02 “OVERVIEW OF THE METRICS FOR OBJECTIVE ASSESSMENT OF SURGICAL SKILLS WORKSHOP: SETTING STANDARDS FOR TRAINING AND EVALUATION OF SURGICAL TECHNICAL SKILLS” Richard Satava, MD, Yves-Marie Dion, MD, Jack Jakimowicz, MD, Bari Gehrad, Anthony Gallagher, Stephen Deane, Jefry, Hendorf, Gerald Fried, Glenn Regher, Adrian Park, Randy Baluck, David Nahrwold, Leroy Heinrichs, Harrith Hasson, Thomas Krummel, Yale University, Ninewells Hospital And Medical School, Catharina Hospital, St, Mary’s Imperial College, University Of Tuebingen, Queens University Belfast, University Of New South Wales, University Of Perthen, McGill University, University Of Toronto**

**SS02 “PROSPECTIVE RANDOMIZED EVALUATION OF SURGICAL RESIDENT PROFICIENCY WITH LAPAROSCOPIC SUTURING FOLLOWING COURSE INSTRUCTION” Kristi L. Harold, MD, Brent D. Matthews, MD, Charles L. Backus, D.O., Broc Pratt, MD, Ronald F. Sing, D.O., B. Todd Hendiford, MD, Department Of Surgery, Carolinas Medical Center, Charlotte, NC**

**SS02 “DETERMINANTS OF COMPETENCE IN LAPAROSCOPIC SURGERY: A MULTICENTER STUDY” John Brogger, MD, Rimantas Rukas, MD, Bjorn Karlsen, MD, Roberto Bergamaschi, MD, Ph.D., Dept Of Clinical Neurophysiology, Haukeland University Hospital, Bergen, Norway And Dept Of Research And Development, Ssfs Teaching Hospital, Forde, Norway**

**SS02 “EVALUATING MINIMALLY INVASIVE SURGERY (MIS) TRAINING USING LOW COST MECHANICAL SIMULATIONS: RELIABILITY AMONG SURGEON RATINGS” Uyen B. Chu, MD, Gina L. Adrales, MD, Jim D. Hoskins, B.S., Donald B. Witzke, Ph.D., Michael B. Donnelly, Ph.D., Michael J. Mastrangelo, Jr., MD, Alejandro Gandias, MD, and Adrian E. Park, MD, Center For Minimally Invasive Surgery, University Of Kentucky, Lexington, KY**

**SS01 “ANALYSIS OF ERRORS IN LAPAROSCOPIC SURGICAL PROCEDURES: A NEW METHODOLOGY” Neal E. Seymour, MD, Anthony G. Gallagher, Ph.D., Sanziana A. Roman, MD, Michael K. O’Brien, MD, Dana K. Andersen, MD, Richard M. Satava, MD, Dept Of Surgery, Yale University School Of Medicine, New Haven, CT**

**Concurrent Session SS05: New Approaches**

**Moderator:** Praddeep Chowhey

**TIME: 2:00 - 3:00 PM**

**SS02 “A PROSPECTIVE ANALYSIS OF 211 ROBOTIC ASSISTED SURGICAL PROCEDURES” The Academic Robotics Group, Consisting Of Mark A. Talaman MD, William Chapman MD, W. Scott Melvin MD, Santiago Horgan MD, Johns Hopkins Univ Sch Of Med Dept Of Surgery, Baltimore MD; Dept Of Surgery East Carolina Univ, Charlotte, NC; Dept Of Surgery Ohio State Univ, Columbus OH; Dept Of Surgery Univ Of Illinois Sch Of Med, Chicago, IL**

**SS03 “LAPAROSCOPIC GASTRECTOMY WITH RADICAL D1A NODE DISSECTION WITH INTRAOPERATIVE NAVIGATION USING 3D ANGIO CT IMAGES RECONSTRUCTED AS LAPAROSCOPIC VIEW” Shuji Takiguchi, MD, Mitsugu Sekimoto, MD, Yasuhiro Miyake, MD, Yoshiyuki Fujiwara, MD, Takuishi Yasuda, MD, Shigeyuki Tabura, MD, Masahiko Yano, MD, Seishi Kumano, MD, Tison Kim, MD, Morito Munden, MD, Dept Of Surgery And Clinical Oncology, Dept Of Radiology, Graduate Sch Of Medicine, Osaka University, Osaka, Japan**

**SS04 “LAPAROSCOPIC APPROACH IN ABDOMINAL EMERGENCIES: A DECENNIAL EXPERIENCE” Ferdinando Agresta, MD, Ivan Michele, MD, Natalino Bedin, MD, Dept Of Surgery, Ospedale Civile, Vittorio Veneto (Tv), Italy**

**SS05 “MINIMALLY INVASIVE MANAGEMENT OF PENETRATING THORACIC TRAUMA” John R. Romanelli, MD, Joseph L. Pfeifer III, MD, Brian W. Nolan, MD, John J. Kelly, MD, Demetrius E. Litwin, MD, University Of Mass. Medical Center, Worcester, MA**

**SS06 “LAPAROSCOPIC LATERAL ADRENALECTOMY VS OPEN POSTERIOR ADRENALECTOMY FOR THE TREATMENT OF BENIGN ADRENAL TUMORS” Klaus J.J. Halffeldt, MD, Stefan Schmidbauer, MD, Felix Hohenbleicher, MD, Arnold Trupka, MD, Chirurgische Klinik Innsbruck, Ludwig-maximilians Universitaet, Munich, Germany**

**SS17 “LAPAROSCOPIC MANAGEMENT OF SYMPTOMATIC ACHALASIA WITH EPINEPHRINE DIVERTICULUM” E Fronj Jr, MD, M Banasiak, M Bloomston MD, L Carey MD, E Zervos MD, S Goldin MD; Wallace Lpr, As Rosemurgy MD, Univ Of South Florida Tampa, FL**
SAGES acknowledges a change on behalf of the 8th World Congress, SAGES welcomes a generous educational grant in support of this session from Genzyme Biosurgery.
Session SS09: Bariatric Surgery
Moderator: Strel M. Herron
TIME: 4:30 - 6:00 PM

Vo03 GERD/Achalasia/Gastric
Moders: Bruce Schimer & Margaret Oddsdottir
TIME: 4:30 - 6:00 PM

Vo07 "VALUE OF INTRAOPERATIVE ENDOSCOPY DURING ROUTINE LAPAROSCOPIC FUNDOPLICATION" Reginald C.Bell, MD, Swedish Medical Center, Englewood, CO
Vo07 "LAPAROSCOPIC WEDGE FUNDECTOMY TO ACHIEVE ESOPHAGEAL LENGTHENING" Mary E.Klingsiegel, MD, Nathaniel J. Soper, MD, Department of Surgery, Washington University, St Louis, MO
Vo07 "REOPERATIVE SURGERY FOR ACHALASIA" Sergey Lyasov, MD, David Thoman, MD, Edward H. Phillips, MD, Cedars-Sinai Medical Center, Los Angeles, CA
Vo08 "COLLAR SLING RECONSTRUCTION FOLLOWING LAPAROSCOPIC MYOTOMY FOR ACHALASIA" Ralph W. Aye, MD, Blair A. Joue, Lynne A. Skaryak, MD, Swedish Medical Center, Seattle, WA - Portland VA Medical Center, Portland, OR
Vo01 "LAPAROSCOPIC STAGING IN GASTRIC CANCER" Juan Eduardo Contreras M.D, Carlos Carvajal M.D.Marcos Bustamante M.D.Juan Carlos Justiano M.D.Juan Lombardi, MD, Department Of Surgery, Hospital For Infants And Children At P'Si Denver, CO
Vo01 "PEDIATRIC LAPAROSCOPIC APPENDECTOMY FOR ACUTE APPENDICITIS: A COST ANALYSIS" Ashley H. Vernon, MD, Keith E. Georgeson, MD, Carroll M. Harmon, MD, Ph.D, Div. Of Pediatric Surgery, Department Of Surgery, University Of Arizona Affiliated Hospitals, Tucson, AZ

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from BioEnterics Division of Inamed Corporation.
A GENTLE REMINDER!

We have taken every precaution to assure the safety and security of our guests and their possessions. However, we urge you to be aware and take simple steps to guard your possessions.

- Do not leave your purse or briefcase unattended.
- Do not leave your laptop, phone or PDA on the floor or out of your sight in a darkened room.
- Be aware of your surroundings.

Have a safe and secure meeting!
### SAGES Annual Business Meeting, Location: Grand Ballroom

Each year during the annual meeting, SAGES convenes its annual business meeting for the general membership. All SAGES members are welcome and encouraged to attend and participate in this meeting. Breakfast will be provided. The meeting will include an introduction by the current President, Dr. William Traverso, the official election of new Officers and Board members, official vote on by-laws changes, reports from the Chairs of SAGES major committees, and the introduction of and remarks by Incoming President, Dr. Bruce Schirmer.

If you are a SAGES member, or are considering membership, please join us Saturday morning!

### Scientific Session Panel IV: Endoluminal GI Surgery: New Approaches for Benign & Malignant Diseases

**Time:** 7:30 - 8:30 AM  
**Panel Chairs:** Morris Franklin, MD & Shuichi Ohashi, MD

**Objectives:**

At the conclusion of this panel, participants will be exposed to:

- Cutting edges of endoluminal GI surgery for benign and malignant diseases, discussing techniques, pitfalls, and outcomes.

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>7:30</td>
<td>Endoluminal Gastric Procedures for Tumors &amp; Pancreatic Pseudo-Cysts</td>
<td>Shuichi Ohashi, MD</td>
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<td>7:45</td>
<td>Endoluminal Colon Surgery</td>
<td>Morris Franklin, MD</td>
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<tr>
<td>8:00</td>
<td>Transanal Endoscopic Microsurgery &amp; Endoluminal Stapling Devices</td>
<td>Gerhard Buess, MD</td>
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<tr>
<td>8:15</td>
<td>Discussion</td>
<td>Panel</td>
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### Scientific Session Panel V: The Current Status of Laparoscopic Bariatric Surgery

**Time:** 7:30 - 8:30 AM  
**Panel Chairs:** Paul O’Brien, MD & Emma Patterson, MD

**Objectives:**

At the conclusion of this panel, participant should be able to:

- Discuss patient selection for laparoscopic bariatric surgery
- Restate the issues relating to patient outcomes
- Describe the pros and cons of various surgical treatment options for morbid obesity.

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<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
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<tr>
<td>7:30</td>
<td>The Problem of Morbid Obesity &amp; the Role of Laparoscopic Surgery</td>
<td>Emma Patterson, MD</td>
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<td>7:40</td>
<td>Laparoscopic Roux-en-Y Gastric Bypass</td>
<td>Philip Schauer, MD</td>
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<td>7:50</td>
<td>Laparoscopic Adjustable Gastric Banding</td>
<td>Paul O’Brien, MD</td>
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<td>8:00</td>
<td>Laparoscopic Biliopancreatic Diversion (+/- Duodenal Switch)</td>
<td>George Fielding, MD</td>
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<td>8:10</td>
<td>Laparoscopic Gastric Pacing and Vagal Nerve Stimulation</td>
<td>Kenneth Champion, MD</td>
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<tr>
<td>8:20</td>
<td>Discussion</td>
<td>Panel</td>
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### The 2002 Gerald Marks Lecture

**Progress in GI Tract Surgery: The Impact of Gastrointestinal Endoscopy**

**Prof. Dr. Med. Prof. h. c. Hans G. Beger**  
Chairman and Head of the Department of General Surgery, University of Ulm, Germany

Hans Beger’s name has become synonymous with pancreas surgery for the past three decades. His two volume book on the subject is the definitive work in its field.

A graduate of the School of Medicine, University of Bonn (1962), he undertook three research fellowships in liver transplantation at Massachusetts General Hospital (Prof. McDermott), Kentucky University Hospital at Lexington (Prof. B. Eiseman) and the University of Colorado at Denver (Prof. Th. Starzl) from 1962-68. Following these, he served as Research Fellow of the German Research Council.

His previous academic appointments include: Dean of the Medical School Berlin-Charlottenburg, Free University of Berlin, Dean of the Clinical School and Chairman and Head of the Department for General Surgery, University of Ulm.

He is a member of more than 30 professional societies and has been honoured by organizations in 10 countries. He currently serves as Secretary General of the German Society of Visceral Surgery and as an Editorial Member in 28 international surgical journals.

He has served as editor of 21 books and author in 675 original papers. His international lectures number more than 250.

### The Marks Lecture A History

<table>
<thead>
<tr>
<th>Year</th>
<th>Lecturer</th>
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<tr>
<td>1987</td>
<td>Professor William Wolfe (not named)</td>
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<td>1988</td>
<td>Professor Worth Boyce</td>
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<td>1989</td>
<td>Professor Peter Cotton</td>
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<td>1990</td>
<td>Professor Alfred Cuschieri</td>
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<td>1991</td>
<td>Professor George Berci</td>
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<td>1992</td>
<td>Professor Theodore Schrock</td>
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<td>1993</td>
<td>Professor John Terblanche</td>
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<td>1994</td>
<td>Professor Alex Walt</td>
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<td>1995</td>
<td>Professor Kenneth Forde</td>
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<td>1996</td>
<td>Professor John Wickham</td>
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<td>1997</td>
<td>Professor Thomas Dent</td>
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<td>1998</td>
<td>Professor Jacques J. Perissat</td>
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<td>1999</td>
<td>Professor Michael Trede</td>
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<td>2000</td>
<td>Professor Tom R. DeMeester</td>
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<td>2001</td>
<td>Professor Layton F. Rikkers</td>
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http://www.8thworldcongress.org/
2002 Research Grant Winners

**Primary Investigator:** Mohamed R. Ali, MD
**Project Title:** Intracellular Cytokine Expression By Peripheral Monocytes And Lymphocytes During Laparoscopic Surgery
**Institution:** Medical College Of Virginia, Virginia Commonwealth University
**Grant Support:** United States Surgical

**Primary Investigator:** H. Jaap Bonjer, PhD, MD
**Project Title:** Laparoscopic Versus Open Live Donor Nephrectomy: A Prospective Randomized Trial Regarding Quality Of Life And Costs
**Institution:** University Hospital Rotterdam
**Grant Support:** United States Surgical

**Primary Investigator:** Jason B. Fleming, MD
**Project Title:** Evaluation Of Vascular Endothelial Growth Factor (VEGF) In Peritoneal Washing Specimens Obtained At Staging Laparoscopy In Patients With Upper Gastrointestinal Malignancies
**Institution:** University Of Texas - Southwestern Medical Center At Dallas
**Grant Support:** United States Surgical

**Primary Investigator:** Edward Lin, DO
**Project Title:** Laparoscopic Living Donor Hepatectomy and Graft Preservation
**Institution:** Emory University School Of Medicine
**Grant Support:** United States Surgical

**Primary Investigator:** Brian J. Dunkin, MD
**Project Title:** The Impact Of A Virtual Reality Simulator Curriculum On Mastery Of Colonoscopy During Fellowship Training.
**Institution:** University Of Miami School Of Medicine
**Grant Support:** CB Fleet

**Primary Investigator:** James Fleshman, MD
**Project Title:** Does Antisense To Beta-Catenin Reduce Port Site Implantation In Colon Cancer?
**Institution:** Department Of Surgery Washington University School Of Medicine
**Grant Support:** Karl Storz Endoscopy America

**Primary Investigator:** Kristi L. Harold, MD
**Project Title:** The Effects Of Prolonged, High-pressure (15mmHg) Carbon Dioxide Pneumoperitoneum In A Porcine Sepsis Model
**Institution:** Carolinas Medical Center
**Grant Support:** Ethicon Endosurgery

**Primary Investigator:** Hugh L. Houston, MD
**Project Title:** Prevalence Of Non-Acid Reflux Following Medical And Surgical Treatment Of Barrett’s Esophagus
**Institution:** Vanderbilt University Medical Center
**Grant Support:** Ethicon Endosurgery

**Primary Investigator:** Harrison S. Pollinger, MD
**Project Title:** The Effect Of CO2 Pneumoperitoneum And Wound Closure Technique On Tumor Implantation
**Institution:** Carolinas Medical Center
**Grant Support:** Ethicon Endosurgery

**Primary Investigator:** Blair A. Jobe, MD
**Project Title:** The Effect Of Neoesophagus Vascular Augmentation And Delay Phenomenon On Esophagogastrectomy Sticture Formation.
**Institution:** Oregon Health Sciences University And PVAMC
**Grant Support:** W.L. Gore

**Primary Investigator:** Tonia M. Young-Fadok, MD
**Project Title:** Patterns of Hormone Flux and Fluid Mobilization Associated with Laparoscopic Colorectal Resection
**Institution:** Mayo Clinic, Rochester
**Grant Support:** Stryker Endoscopy
SATUREDAY 9:00 - 9:30 AM
March 16, 2002: Awards Ceremony

LOCATION: Grand Ballroom

2002 Distinguished Service Award Winner

John Coller, MD, FACS served as SAGES president from 1986 to 1987. He was a founding member of SAGES as well as its secretary. Always ahead of the thinking curve, during his tenure he organized one of the first corporate/association partnerships known as the “SAGES Corporate Council.” Responding to the need for an ethical relationship between industry and SAGES, he worked with the leadership of SAGES and industry to forge a union that would tie the intellectual, business and problem solving resources while maintaining scientific integrity and independence for both sectors. The Corporate Council is still thriving.

John Coller was one of a few visionaries that pointed us to the world of electronic communications and education when they were just emerging. He was a laptop buff before most surgeons knew that laptops existed. He told us we needed a website in the mid-nineties and designed our first prototype. He encouraged SAGES to lead not only in surgical technology but in administrative communications and legislative issues. One of his major contributions to the Society is that he urged us to learn about and participate in legislative education though we, as a group, are more likely to be immersed in clinical, educational and research activities. He was the spearhead when SAGES applied for and earned a seat on the AMA House of Delegates, giving us a voice in the national health dialogue. He still serves as our representative on that august body.

Previous Distinguished Service Award Winners:
Dr. Gerald Marks, Dr. William L. Wolff, Dr. George Berci, Dr. Jeffrey Ponsky, Dr. Kenneth Forde

2002 Young Researcher Award Winner

Dr. Ninh Nguyen was nominated for the 2002 Young Researcher Award by not one, but four SAGES members! He has been a member of SAGES since 1994, upgrading to Active status in 1997. He currently serves on the SAGES Educational Resources Committee, won the Best Resident Paper Award at the 1997 SAGES Annual Meeting, and was a recipient of SAGES research grants in 1995 and 2001. He is currently Assistant Professor of Surgery and Director of the Minimally Invasive Surgery Program at UC Davis in Sacramento, CA. He attended medical school at the University of Texas Health Science Center and completed his general surgery residency at Mt. Sinai Medical Center in Miami Beach, FL. He completed a surgical oncology fellowship from 1995-1997 and a minimally invasive surgery fellowship from 1997-1998 at the University of Pittsburgh. Dr. Nguyen has authored or co-authored 44 publications and given 33 scientific presentations at a remarkably early stage in his surgical career.

SAGES acknowledges a generous educational grant in support of the Young Researcher Award from ACMI.

Portions of World Congress Meeting to be Available On-line After Meeting

Missed a talk? Couldn’t get to an early session? Left early?
Don’t worry...you can see it on the internet!

The Friday and Saturday portions of the Scientific Session which take place in the plenary room will be broadcast on the Internet approximately one month following the meeting. This will include the Storz Lecture in New Technology, the SAGES Presidential Address, the Gerald Marks Lecture, as well as four panels featuring invited faculty lectures and six sessions of oral presentations.

Please watch www.8thworldcongress.org and www.sages.org for details.

The Broadcast will be free to World Congress registrants.

http://www.8thworldcongress.org/
This award is designated for a person in industry or a physician/surgeon. The award is granted for a significant, long-term scientific or technological contribution to the field of surgical endoscopy.

In the OB-GYN world, Professor Kurt Semm is known as “the father of operative laparoscopy.” He is the consummate innovator in minimally invasive GYN procedures. So, when he moved from Germany to Phoenix, Arizona several years ago, Europe’s loss was America’s gain. Until his move to the U.S. he was Professor and Chairman of the Clinic of Gynecology and Obstetrics and Director of the Michaelis Midwifery School of the Christian Albrechts University in Kiel, Germany.

His contributions to the field are an encyclopedia of achievement and surgical revolution. He was an instrument maker whose pioneering work met with stiff resistance from the surgical establishment. In 1980, Dr. Semm was the first person to carry out a laparoscopic appendectomy but his attempts to publish were not encouraged. More than one procedure bears his name, among them the classic intra fascial Semm Hysterectomy (CISH). The most prestigious award in GYN laparoscopy also bears his name. It is the Kurt Semm Award for Excellence in Pelviscopy of the American Association of Gynecologic Laparoscopists.

Professor Semm graduated Ludwig Maximillians University School of Medicine, Munich, Germany and in 1957 founded the German Society on Fertility and Sterility. He has served as President of the III World Congress of Human Reproduction in Berlin in 1981 and President of the International Federation of Fertility Societies (IFFS) 1986-1989. He has been awarded honorary membership in more than two dozen international medical organizations. Among his most prestigious honors are: the Order of Merit First Class of the Federal Republic of Germany-West, Fellowship of the Royal College of Obstetricians and Gynecologists ad eundem, and Medical Doctor of the Year in Germany (Jatros prize) 1991.

He has authored more than 600 scientific papers, 27 books, 35 films and videos in Neonatology, Endocrinology, and Pelviscopic Surgery.

In Memoriam

Ed Standen, Past President, SAGES Corporate Council

Ed Standen was a welcome fixture at SAGES meetings and educational events for almost a decade. As Ethicon’s Director, Professional Education, then as Executive Director, Professional Education/ Healthcare Integrity, he was committed to the idea that the education of residents and surgeons was a serious task to be shared by surgeons and industry. He gave full measure to that mission.

Married for 29 years to Sandra and father of two grown children, he began his career in 1982 with Ethicon, Inc. in the Sales Division. He joined Ethicon Endo-Surgery, Inc. in 1994 and held many posts until his death last August.

As President of SAGES Corporate Council and as a member of its Steering Committee for many years, he helped forge a bridge between industry and SAGES that was, at once, comfortable, ethical and effective. We will miss his warm smile, his dedication and his sense of humor.

The Best Resident Presentation Awards, which will be announced following the World Congress, are being given in the name of Ed Standen, supported by the Corporate Council.

Complete your Evaluation and CME Forms!
Drop the completed forms in boxes outside the meeting rooms.

Interested in purchasing a copy of the videos shown at this meeting or previous meetings? If so, please visit SAGES official video distributor, Ciné-Med, at booth #108 in the SAGES Exhibit Hall.
Session SS12: Colorectal Techniques & Outcomes
Moderators: R. Lawrence Whelan & Minhua Zheng

Time: 9:30 - 11:00 AM

S101 "NINE-YEAR AUDIT OF LONG-TERM OUTCOME OF LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER" Masahiko Watanabe, MD; Hiroshi Hasagawa, MD; Hideo Baba, MD; Seiichiro Yamamoto, MD; Masaki Kitajima, MD, Department Of Surgery, Keio University School Of Medicine, Tokyo, Japan
S102 "ONCOLOGICAL QUALITY AND LONG-TERM RESULTS IN LAPAROSCOPIC COLORECTAL SURGERY" Hubert Scheidbach, MD; Claus Schneider, MD; Ferdinand Kockerling, MD; Hanover Hospital (Slloah), Dept. Of Surgery And Center For Minimally Invasive Surgery, Hannover, Germany
S103 "LAPAROSCOPIC TOTAL MESORECTAL EXCISION FOR RECTAL CANCER" Joel Leroy, MD; Michelle K Smith, MD; Faek Jamali, MD; Lael Forbes, MD; Francesco Rubinio, MD; Jacques Marescaux, MD, Hopitaux Universitaires De Strasbourg, Eils/Ircad, Strasbourg, France
S104 "TRANSANAL ENDOSCOPIC MICRO-SURGERY IN THE TREATMENT OF SELECT RECTAL CANCERS OR SUSPICIOUS RECTAL TUMORS" John H Marks, MD, Gerald J Marks, MD, Christine Marchionni, B.A., Lankenau Hospital, 3600 Foulks Road, Wynnewood, PA
S105 "IS LAPAROSCOPIC SURGERY ACTUALLY LESS INVASIVE THAN CLASSICAL OPEN SURGERY? QUANTITATING PHYSICAL ACTIVITY USING AN ACCELEROMETER AS THE CONDITION OF CONVALESCENCE" Y. Inoue MD, T. Kimura MD, S. Fujita MD, H. Noro MD, FUCHIKOHI MD, T. Itoh MD, E. Taniguchi MD, S. Ohashi MD, H. Matsuura MD, Department Of Surgery, Osaka University Graduate School Of Medicine, And Department Of Surgery, Osaka Central Hospital, Japan
S106 "LOCAL EXCISION OF RECTAL CANCER BY TRANSANAL ENDOCOLIC MICROSCISURGIE" (TEM) Mario Guerrieri, MD, M Francesco Feliciotti MD, Alessandro M. Paganini, MD, Pamela Zenobi, MD, Francesca Crosta, MD, Emanuele Lezcheo, MD, Istituto De Scienze Chirurgiche, University Of Ancona, Ancona, Italy, II Clinica Chirurgica, Universita La Sapienza, Roma, Italy

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from Fleet Pharmaceuticals.

9:30 - 11:00 AM: Visit the Exhibits, Posters and Learning Center!
Panel VI: Advanced Topics in Antireflux Surgery

**Objectives:**

- Discuss the reasons for failure and difficult aspects of antireflux surgery
- Make therapeutic decisions regarding partial versus complete fundoplication
- Select the appropriate antireflux procedure in the morbidly obese patient
- Discuss the benefits both real and theoretical of robotic esophageal surgery

**Rules for Discussants During Scientific Sessions**

1. You may question the presenter by either submitting your question in writing to an usher or proceeding to the microphone to ask the questions from the floor. If you choose to write the question, please use the forms available on the table.
2. When recognized by the moderator, give your name, hospital or university affiliation, city and country before asking your question.
3. Please ask your question in a clear, concise manner and indicate the name of the presenter to whom your question is directed.
4. Please do not give comments or information about results of a similar study, except as part of your question.
5. Each discussant is limited to one question; not a discussion.

**Video Session Vo4: Hernia**

Moderators: Afons Pomp & Joseph Mamazza

**TIME:** 2:00 - 3:00 PM

- VI23 "LAPAROSCOPIC VENTRAL HERNIA REPAIR" Kristi L. Harold, MD, Cynthia D. Nelms, MD, Harrison S. Pollinger, DO, Ronald F. Singh, DO, B. Todd Heniford, MD, Carolinas Medical Center, Charlotte, NC
- VI24 "LAPAROSCOPIC PRIMARY REPAIR OF A HERNIA OF THE FOREARM OF MORGAGNI" Ginal L. Adrales, MD, Carl A. Weiss, MD, PhD, Uyen B. Chu, MD, Adrian E. Park, MD, Center For Minimally Invasive Surgery, University Of Kentucky, Lexington, KY

**Panel SS15: Solid Organ**

Moderator: Emanuele Lezoche

**TIME:** 2:00 - 3:00 PM

- SS27 "WARM ISCHEMIA TIME DOES NOT CORRELATE WITH RECIPIENT GRAFT FUNCTION IN LAPAROSCOPIC DONOR NEPHRECTOMY" Molly M. Buxton, MD, Eugene Cho, MD, Stephen C. Jacobs, MD, John L. Flowers, MD, Univ. Of Maryland Sch. Of Medicine, Baltimore, MD
- SS28 "IMPACT OF RENAL ANATOMIC VARIATION ON LAPAROSCOPIC DONOR NEPHRECTOMY" John Mecenas, MD, Michael Edey, MD, Devon John, MD, Christine Ren, MD, Mary Ann Hopkins, MD, Thomas Diffo, MD, Dept Of Surgery, New York University School Of Medicine. New York, NY

**Panel SS16: Adv. Foregut Surgery**

Moderator: Reginald Bell

**TIME:** 2:00 - 3:00 PM

- SS33 "SYMPTOMATIC OUTCOMES OF LAPAROSCOPIC ANTIREFLUX SURGERY (LARS) IN PATIENTS ELIGIBLE FOR ENDOLUMINAL THERAPIES (ET)" Keter M. Desai, MD, Mary E. Klingensmith, MD, Emily Winslow, MD, Peggy Fisella, RN, Nathaniel J. Soper, MD, Dept Of Surgery, Washington Univ. Sch Of Medicine, St. Louis, MO
- SS34 "A PREVIOUS ENDOSCOPIC TREATMENT (WITH PNEUMATIC DILATIONS OR BOTULINUM TOXIN INJECTIONS) DOES NOT AFFECT THE OUTCOME OF LAPAROSCOPIC HELLER-DOR OPERATION FOR ESOPHAGEAL ACHALASIA." Mario Costantini, MD, Giovanni Zaninotto, MD, Giuseppe Portale, MD, Daniela Molena, MD, Michela Costantino, PhD, Loredana Nicoletti, BS, Christian Rizetto, BS, Ermanno Ancona, MD, University Of Padua, Department Of Medical And Surgical Sciences (Clinica Chirurgica Iv), Padua, Italy

**Panel SS17: ESOPHAGEAL CANCER: LAPAROSCOPIC STAGING TO IMPROVE OPTIMAL TREATMENT**

- Giandomenico Mucisani, MD; Enrico Ruggeri MD; Maurizio Onorato, MD; Jessica Montori MD; Luigi Masoni MD, 3rd Dept. Of Surgery - La Sapienza University Of Rome - Italy
- SS17 "LAPAROSCOPIC REPAIR OF PERFORATED PEPTIC ULCER" WT. Siu, C.H. Chau, C.N.Tang, M.K.W. Li, Department Of Surgery, Pamela Youde Nethersole Eastern Hospital, Hong Kong, China
- SS18 "SHORT-TERM RESULT OF LAPAROSCOPIC DISATL GASTRECTOMY (LDG) FOR EARLY GASTRIC CANCER" Kawai J. MD, Fujiwara M. MD, Kasai Y. MD, Nakao A. MD, Surgeryii, School Of Medicine, Nagoya University, Nagoya, Japan
Session SS20: The World of Laparoscopy
Moderator: Dennis Fowler
TIME: 4:30 - 5:30 PM
S171 “THE ABSENT ROLE OF PROSPECTIVE COMPARISON OF THE BALLOON ASSISTED ENDO-ONE HUNDRED CASES EXPERIENCE OF VIDEO-ASSISTED LAPAROSCOPIC SURGERY”

TIME: 4:30 - 5:30 PM
Moderator: Barry Salky
TIME: 4:30 - 5:30 PM
S179 “LAPAROSCOPICALLY-ASSISTED PROCOLECTOMY WITH ILEAL J POUCH ANAL ANASTOMOSIS”
Kazuhiro Shibuya MD, Akiko Hashimoto MD, Yuji Funayama MD, Hiroo Naito MD, Kohei Fukushima MD, Chikashi Shibata MD, Taku Kitayama MD, Seiki Matsuno MD, Iwao Sasaki MD, First Department Of Surgery, Tohoku University, Sendai, Japan
S180 “COMPLICATED CROHN’S DISEASE IS NOT A CONTRAINDICATION TO LAPAROSCOPIC SURGERY”
BARRY SALLY MD, Division Of Laparoscopic Surgery, Department Of Surgery, Mount Sinai Hospital, New York, NY
S181 “LAPAROSCOPIC MESH RECTOPSY FOR RECTAL PROLAPSE: EXPERIENCE WITH 174 CASES”
Ji-Dulucq MD, P-Wintringer MD, IIS-Institute Of Laparoscopic Surgery Bagatelle Hospital - Talence (France)
S182 “RECURRENCE RATES AFTER SURGERY FOR UNCOMPPLICATED DIVERTICULITIS: LAPAROSCOPIC VERSUS CONVENTIONAL SIGMOID RESECTION”
Klaus Thaler MD, Eric Weiss MD, Steven Wexner MD, *Jp Arnaud MD, Juan Nogueras MD, *Roberto Bergamaschi MD, Cleveland Clinic Florida, Weston, FL and Angers University, France
S183 “WOUND COMPLICATION OF LAPAROSCOPIC VS. OPEN COLECTOMY”
Emily R. Winslow MD, James W. Flesham MD, Elisa H. Birnbaum MD, L. Michael Brunst MD, Department Of Surgery And Institute For Minimally Invasive Surgery, Washington University School Of Medicine, St. Louis, MO
S184 “ENDOSCOPIC TREATMENT OF SURGICAL COLO-RECTAL ANASTOMOSIS STENOSIS”
Schuster KL MD, Manegold B.C., MD, Department Of Surgical Endoscopy, University Hospital, University Of Heidelberg, Mannheim, Germany

Session SS22: Bariatric
Moderator: Philip R. Schauer
TIME: 4:30 - 5:30 PM
S185 “THE LEARNING CURVE FOR LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS IS 100 CASES”
Sayeed Kramidzi MD, Giselle Hamad MD, William Gourash CNP, The Minival Invasive Surgery Center, Univ Of Pittsburgh, Pittsburgh, PA
S186 “LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS DEMANDS A LONG LEARNING CURVE”
D. Oikol MD, H. Schmidt MD, P. Weber MD, A. Wasilewski R.N., P. Fan MD, GH Ballantyne, MD, Hackensack University Medical Center, Hackensack NJ
S187 “EFFECT OF STANDARD VERSUS EXTENDED ROUX LIMB LENGTH ON WEIGHT LOSS AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS”
John J. Fung MD, Michel Gagner MD, Nihiles M Korgaonkar BS MBA, Brian P Jacob MD, Christine A Chu MD, David C Voellinger MD, Theresa Quinn MD, William B Inabnet MD, Daniel M Herron MD, Alfons Pom PDM, Mount Sinai Minimally Invasive Surgery Center, Mt Sinai School Of Medicine, New York, NY
S188 “ROLE OF ROUTINE INTRA-OPERATIVE ENDOSCOPY IN LAPAROSCOPIC BARIATRIC SURGERY”
J.K. Champion MD, Department Of Surgery, Emory Dunwoody Medical Center, Atlanta, GA
S189 “COMPARISON OF OBJECTIVE OUTCOMES FOLLOWING LAPAROSCOPIC NISSEN FUNDOPERATION VERSUS LAPAROSCOPIC GASTRIC BYPASS IN THE MORBIDLY OBSESE WITH GERD”
Daniel G. Davis, DO, Yashodhan Khajanchee MBBS, Lee L. Swanstrom MD, Emma J. Patterson MD, Legacy Health System, Portland, OR
$190 “LAPBAND: ITALIAN EXPERIENCE ON 2602 PATIENTS OPERATED IN 6 YEARS”
Angriani, Furbolda, Dold, Basso, Lucchese, Giacomelli, Zappa, Lattuada, Dicosio, Veneziani, Turcichia, Favretti, Alkilani, Forestieri, Lesti, Puglisi, Toppino, Campanile, Capizzi, D’atri, Scipioni, Giardeliet, Dilorrenzo, LaCitrignola, Belvederesi, Marzano, Bernante, Ipp t Lorenzo, Italian Group For Lap Band: Glib, Naples - Italy

On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this session from United States Surgical.
TIME: 8:00 AM - 3:30 PM

International Conference of Experimental Laparoscopic Research (ICEL)
Neurological Institute at Columbia Presbyterian Medical Center
1st floor conference room, 710 West 168th Street, New York, NY

The International Conference of Experimental Laparoscopic Research will hold its final session on March 17, 2002 at the Columbia Presbyterian Hospital Campus in uptown Manhattan. There will be 2 sessions. The first starts at 8:00 AM and will end at 12:00 Noon. The second session will start at 1:00 PM and will end by 3:30 PM. ICEL members and researchers that have submitted abstracts will present recently finished basic science and clinical studies. Studies in progress and preliminary reports are also welcome at this informal and stimulating meeting. Comprehensive discussions about study design, models, and results are the rule during this meeting. One of the goals of the group is to stimulate and encourage young potential researchers to carry out studies and to get involved. World Congress attendees who are interested in basic science research regarding minimally invasive surgery as well as immunology or oncology are welcome to attend free of charge. ICEL counts among its members some of the most prolific and innovative researchers in the world. The sessions are very lively and often very entertaining as well.

Note: See Pages 22-23 for more information on the Basic Science Forum with ICEL.
This event was not planned by SAGES and therefore is not accredited by SAGES.
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March 12-15, 2003, Los Angeles, California
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Related Meetings
SAGES/SSAT joint symposium, During ACS Clinical Congress, Wednesday evening, October 9, 2002, San Francisco, CA, Topic TBA
IPEG: 11th CONGRESS FOR ENDO SURGERY IN CHILDREN: May 2-4, 2002, Genoa, Italy
IPEG: 12th CONGRESS FOR ENDO SURGERY IN CHILDREN: March 11-13, 2003, Los Angeles, CA
THE 15th SCIENTIFIC MEETING OF THE JAPAN SOCIETY FOR ENDO SCOPI C SURGERY (JSES)
WITH THE CONGRESS OF THE SOCIETY OF ENDO SCOPI C AND L A P A RO SCOPI C SURGEONS OF ASIA (ELSA), Tokyo, Japan
JSES: September 19-20, 2002
ELSA: September 19-21, 2002
10th EAES INTERNATIONAL CONGRESS: June 2-5, 2002, Lisbon, Portugal
18th WORLD CONGRESS OF ISDS: December 8-11, 2002, Hong Kong
11th EAES ANNUAL CONGRESS, 1ST ENDO SCOPI C SURGICAL WEEK: June, 2003, Edinburgh, Scotland, UK
9th WORLD CONGRESS OF ENDO SCOPI C SURGERY: February 2-7, 2004, Cancun, Mexico - Hosted by ALACE/FELAC

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Page 60
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**LUNCHES**

**Thursday & Friday, March 14 & 15, 2002**

The World Congress Program Committee has set aside a three-hour block of time from 11:00 AM - 2:00 PM to visit the exhibits, posters and Learning Center at your leisure. A lunch café is available in the New York Hilton with light lunches at modest prices. The exhibit halls are an integral part of the technical education available at the meeting. In these halls you will find the latest products, publications and services for endoscopic surgery, ultrasound and minimally invasive techniques.

**Friday, March 15, 2002**

**TIME: 11:00 AM - 2:00 PM  **

*Exhibits, posters and lunch*

**About Lunch!** Several lunches are available for World Congress attendees on Friday and Saturday for CME credit. Your ticket is included in your registration packet, if you registered in advance for one or more lunches. Tickets to the following lunches may still be available for purchase.

**Educators’ Lunch:**

*Surgical Endoscopy Fellowships: Do We Need Them?*

**TIME: 12:30 - 2:00 PM**  **LOCATION: See Lunch Ticket**

Registration is limited.

**Lunch Coordinators:**

C. Daniel Smith, MD and Tehemton Udwadia, MD

**Lunch Description:**

Panel format during lunch. At the beginning of each panelist’s presentation, a series of questions will be posed to the audience (two questions for each panelist topic) and the results reviewed prior to the presentation. The same questions will again be asked at the end of the session to see how opinions of the audience changed based on the panelists presentations. Each panelist’s session will be 15 minutes (including two audience questions and review). The last 30 minutes will be for discussion from the audience and final audience responses.

**Objectives:**

- To be familiar with the role Endoscopic Fellowships play in training surgeons in advanced endoscopic surgery
- To be aware of the current status of Endoscopic Fellowships world wide.
- To have an up-to-date perspective on the controversy surrounding the role of Endoscopic Fellowships in surgical training and participate in discussions regarding some possible future directions such fellowship training may take.
- To update those active in training general surgeons as to the current and future impact Endoscopic Fellowships have in basic general surgery training.

**Who Should Attend:**

This luncheon is designed for attendees who are involved in training surgical residents, medical students and practicing surgeons.

12:30 Surgical Endoscopy Fellowships are Inevitable and Should Become Formalized and Accredited  
John Hunter, MD

12:45 Surgical Endoscopy Training is Integral to General Surgery Residency and Should Be Integrated into Residency and Fellowships Abandoned  
Michael Nussbaum, MD

1:00 Are Surgical Endoscopy Fellowships the Only Hope for Bringing Surgical Endoscopy to Developing Countries?  
Tehemton E. Udwadia, MD

1:15 Why All The Discussion? Surgical Endoscopy Fellowships are already a Recognized Specialty in Developed Countries Outside of The US.  
Jean Louis Dulucq, MD

**Pediatric Lunch:**

*Innovations in Neonatal Surgery*

**TIME: 12:30 - 2:00 PM**  **LOCATION: See Lunch Ticket**

Registration is limited.

**Lunch Coordinators:**

Steven Rothenberg, MD and Thomas Lobe, MD

**Lunch Description:**

This luncheon is intended for pediatric surgeons. It will give the participants an overview of the current thinking on the endoscopic treatment of common neonatal disorders. Registration is limited.

**Objectives:**

- To present the participants with a better understanding of the role of endoscopic surgery in neonates with Hirschsprung’s disease.
- To present the participants with a better understanding of the role of endoscopic surgery in the management of infants with imperforate anus.
- To present the participants with an overview of the role of endosurgery in the treatment of infants with esophageal atresia with and without tracheoesophageal fistula.
- To discuss the role of endosurgery in the treatment of intestinal atresia in the newborn.
- To give the participants ample time for discussion, including questions, on the use of endosurgery in surgical neonates.

*On behalf of the 8th World Congress, SAGES acknowledges a generous educational grant in support of this event from Starion Instruments Corp.*

Complete your Evaluation and CME Forms!

Drop the completed forms in boxes outside the meeting rooms.
LUNCHES Saturday, March 16, 2002

TIME: 11:00 AM - 1:00 PM  Your last chance to visit the exhibits, posters and learning center.

Appropriateness Forum Results Presentation Lunch
TIME: 12:30 - 2:00 PM  LOCATION: See Lunch Ticket
No fee for Appropriateness Conference registrants. See description on page 13.

On behalf of the World Congress, SAGES acknowledges a generous educational grant in support of this program from Aesculap/BBraun.

Ethics Lunch:
Strange Bedfellows:
The Ethics of How Industry Works with Surgeons
TIME: 12:30 - 2:00 PM  LOCATION: See Lunch Ticket
Lunch Coordinators:
Peter Crookes, MD and Prof. Sir Alfred Cuschieri, MD

Objectives:
At the conclusion of this seminar, the participants will:
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Appreciate the forces that have led to the increasing dependence of surgical research on industrial sponsorship.
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Appreciate the potential ways in which corporate sponsorship may influence the outcome or publication of clinical and scientific studies.
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Be aware of strategies to ensure the integrity of clinical and scientific research.

Program:
The Innovative Surgeon:
Making Links with Industry Joseph Amaral, MD
The Entrepreneurial Viewpoint:
Why Industry Needs Practicing Surgeons Fred Moll, MD
Legal Safeguards: What the Law Allows and Why Thom Lobe, MD
Placing a buffer between the clinician/researcher and the industry:
The Role of the SAGES Foundation Greg Stiegmann, MD

Luncheon on Ergonomics:
A Twist of the Wrist - Ergonomics and the Laparoscopic Surgeon
TIME: 12:30 - 2:00 PM  LOCATION: See Lunch Ticket
Lunch Coordinator: Ramon Berguer, MD

Objectives:
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To understand the definition of ergonomics
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To understand the type of ergonomic problems facing surgeons and OR personnel
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To learn 3 easy ways to improve the ergonomics of laparoscopic surgery

Description:
The luncheon program will moderated by Dr. Christine MacKenzie, a leading ergonomist conducting research in the field of Medicine and Surgery, and Dr. Ramon Berguer, a surgeon with expertise in ergonomics. The session will use video presentation, live demonstration, and invited commentary to highlight the ergonomic problems with laparoscopic technology and surgical robotics. The moderators will discuss the impact of these ergonomic issues on surgeon's musculoskeletal disorders, operating room efficiency, technology development and patient safety. Practical solutions for surgeons and directions for future investigation will be proposed. Commentary will be sought from selected individuals and luncheon attendees, and will reflect practicing surgeons' international points of view. The following individuals will be invited formally to respond to the session and will be provided in advance with presentation materials.
_shipping
Dr. Steven Schwartzberg (representing technology oriented surgeon)
Dr. Manabu Yamamoto (representing Japan)

Pencil Us In For Next Year!
SAGES Scientific Session & Postgraduate Course
March 12 - 15, 2003, Los Angeles, California

http://www.8thworldcongress.org/
International Lunch I:

**DOING MORE WITH LESS:**
Practice Tips for Surgeons in Rural Areas, Small Towns and Developing Nations

**TIME:** 12:30 - 2:00 PM
**LOCATION:** See Lunch Ticket

**Lunch Coordinators:** Nicholas Morris, MD and Alberto Chousleb, MD

**Lunch Description:**
This panel will outline several common challenges and evaluate possible solutions for the surgeon practicing outside the urban/university setting.

**Objectives:**
- To present the participants with more options for solving endoscopic problems in the office or small practice setting
- To present the participants with a better understanding of equipment resources, costs and alternatives
- To present the participants with various perspectives on practitioner preceptorships
- To discuss the role information exchange and educational alternatives for non-urban surgeons and those in developing countries.

**Who Should Attend:**
Surgeons and nurses from rural America, small towns world-wide and developing nations.

**Program:**
Doing more with less equipment resources.
Cost and alternatives. More options for small practice settings.

- How to improve information exchange and education at the home base for the surgeon not in the urban milieu.
  - Tehemton Udwadia

- Improving education away from your home base for the rural or developing nation surgeon. A review of options: preceptorship, mini fellowships, courses, coverage and innovative ways to handle cost.
  - Serafin Hilvano

- Rural surgery in Canada: lessons and methods
  - Michel Talbot

- How to triage patients in a small practice.
  - Nick Morris

- When to send patients out. How to develop a triage referral list.

International Lunch II:

**AN INTERNATIONAL BRAINSTORMING SESSION:**
The “Guys in the Trenches” Tackle Four MIS Problems

**TIME:** 12:30 - 2:00 PM  **LOCATION:** See Lunch Ticket

**Lunch Coordinators:** Barry Salky, MD and Wolfgang Wayand, MD

**Lunch Description:**
The lunch coordinator has identified four controversial questions and will open the floor up for no-holds-barred brainstorming. They will work with the international lunch chairman to develop a set of rules for the brainstorming.

One goal of this lunch is to encourage exchange of good ideas from non faculty members and to hear potential solutions which have not already “made the circuit.” It also gives a feeling of inclusion. The controversies will be listed in the advance program to allow those who want to participate to choose this lunch. The panel members will each give a 2-3 minute summary of the conventional way(s) to handle the controversy. This will set the scene for the dialogue.

**Objectives:**
1. To present the participants with options and techniques for retrieving lost stones and evaluating when and if to retrieve them.
2. To present the participants with information on tools and techniques on laparoscopic suturing
3. To present the participants with information and scientific perspectives on port site closures
4. To discuss the role of pre-operative breast ultrasound as a tool for the general surgeon
5. To provide participants with an opportunity to participate in problem solving in these topics

**Who Should Attend:**
All surgeons interested in participating in problem solving.

**Program:**
- The Lost Stone - common bile duct stones left in the duct
  - Wolfgang Wayand

- What does safe entry into the abdomen really mean?
  - Manolo Cortez

- Laparoscopic suturing - What’s the real story?
  - Joseph Sandor

- Extraperitoneal access in inguinal hernia - Is there a better way?
  - Pradeep Chowbey

- Breast Ultrasound - What should the surgeon know?
  - Frederick Greene
2002 LEARNING CENTER

Directors: Steven Wexner, MD and Joseph Mamazza, MD
LOCATION: Murray Hill (2nd Floor of NY Hilton)

Thursday, March 14, 2002: 10:00AM - 2:30PM
Friday, March 15, 2002: 10:00AM - 2:30PM
Saturday, March 16, 2002: 10:00AM - 1:00PM

Hands-on Stations:

Anti-reflux Surgery
Robert Glasgow, MD
The anti-reflux station will consist of three components: 1) A slide presentation on the pathogenesis of reflux disease, indications for surgery, pre-operative evaluation, techniques of anti-reflux surgery, and post-operative care, 2) A video presentation demonstrating a laparoscopic Nissen fundoplication and Toupet fundoplication, and 3) An inanimate station where the attendee will have the opportunity to practice a fundoplication.

Bariatric Surgery
Raul Rosenthal, MD
The latest tools for performing bariatric surgery will be available and discussed, including peri strips, the lap band and the gastric simulator kit. This station will also present numerous videos showing different techniques of performing this procedure.

Laparoscopic Common Bile Duct Exploration
Daniel Herron, MD
Participants gain familiarity with the use of a cholecchooscope on an inanimate model and learn to retrieve common bile duct stones by maneuvering the cholecchooscope through the cystic duct into the common bile duct. Several different types of wire baskets are available.

Communication Technology in Surgery: Digital Editing to PDA
Robert Cravero, MD & Steven Schwartzberg, MD
Attendees will learn about image capture, basic editing techniques, and image storage. They will also learn about the different compression schemes available for output, whether it is to tape, disc or as a streaming video format for the World Wide Web. The imaging chain will be demonstrated from a laparoscopic camera through recording devices to the computer with a variety of outputs from tape, file or the PDA.

Endoscopic Stenting
Colon/Bowel Prep, Tracy Arnell, MD
Esophageal/Upper, Jeffrey Ponsky, MD
This station will include colonic & esophageal stenting using endoscopic guidance. A detailed explanation of the equipment required and its operation will be covered. This will be accomplished by stent deployment demonstrations as well as graphically in the form of videos & posters.

Ergonomics
Ramon Berguer, MD
This station will use state of the art electronics and wireless communications to measure the performance and physical and mental workload of surgeons performing knot-tying tasks with both standard and robotic laparoscopic systems. Participants will be trained in knot-tying and the use of robotic manipulators.

Flexible Endoscopy
Jeffrey Marks, MD
This learning center station will include simulator models of colonoscopy, EGD and ERCP. Both diagnostic and therapeutic models will be available for all modalities. In addition, participants will be encouraged to enroll in a simulator validating study.

Rectal Techniques
PPH, Eric Weiss, MD, TEM, Lee Smith, MD
This station will consist of numerous videos showing different techniques of performing these procedures. Patient selection, instruments and techniques will be discussed. Additionally, several devices and instruments will be available for attendees to view and use.

Suturaing
Zoltan Szabo, PhD & Wanda Toy, Surgical Educator
Intense hands-on suturing including intra- and extra-corporeal techniques demonstrated with instantaneous feedback. Laparoscopic tissue handling and complex suturing maneuvers are also demonstrated.

Top Gun
James “Butch” Rosser, MD
The Top Gun Laparoscopic Skill Shootout Station brings thrills, excitement and competition to the quest of mastering minimally invasive surgery. This station features the Yale based curriculum practiced by hundreds of institutions around the world.

Ultrasound
EndoRectal, Juan Nogueras, MD · Upper, Maurice Arregui, MD
This station provides hands on exposure to ultrasound equipment available in the clinic and operating rooms. Ultrasound guidance, aspiration, drainage and biopsy techniques are highlighted.

On behalf of the World Congress, SAGES acknowledges generous educational grants from Karl Storz Endoscopy America and Aloka in partial support of this program.

POSTER PROGRAM

The poster session is where you are likely to glimpse ideas of the future, experience and techniques from countries around the globe. Most posters will only be displayed for one day, either Friday or Saturday, depending on the topic. The Award Winning Posters will be on display at the entrance of the Sutton Complex on Thursday, Friday and Saturday. Poster presenters will be available for discussion at their posters on the day of their presentation, Friday or Saturday, from 11:30AM - 12:30PM.

Chair: Peter Crookes, MD, Co-Chair: Manabu Yamamoto, MD
http://www.8thworldcongress.org/
Opening Ceremonies
Date: Wednesday, March 13, 2002
Time: 5:00 PM
Place: Grand Ballroom, New York Hilton
Fee: No Fee for Registrants & registered guests
Dress: Business or casual
Welcome to New York! Welcome to the U.S.A! SAGES welcomes you to the 8th World Congress of Endoscopic Surgery. In true American style, the opening ceremonies will be fast, furious and fun! Don't miss them.

Welcome Reception
Date: Wednesday, March 13, 2002
Time: 5:30 - 7:00 PM
IMMEDIATELY FOLLOWING OPENING CEREMONIES
Place: All Exhibit Halls - Americas 1 & 2, Rhinelander
Fee: No Fee for Registrants & registered guests
Dress: Business or casual
Three Fabulous Floors of Exhibits!
Three incredible locations for special promotions, presentations and entertainment. Great food! Open bar!
Note: Children under the age of 14 will not be permitted in the Exhibit Hall due to safety considerations.

The Gala on the Pier
Including The Fifth Annual SAGES International Sing-Off
Date: Friday, March 15, 2002
Time: 7:15 PM (Shuttles begin at 7:00 PM)
Place: Pier Sixty at Chelsea Piers
Dress: Black Tie Optional
Fee: $75.00 per person
Cocktails on the terrace of the fabulous Chelsea Piers with a gorgeous view of Manhattan. An elegant gourmet sit down dinner followed by a fabulous Broadway troop of singers and dancers bringing you the best of Broadway with an international flavor.
And, as if that weren't an evening to remember, we will have an abbreviated version of the Fifth International SAGES Sing Off. Truly a New York Evening! Coach transportation included.

On behalf of the World Congress, SAGES acknowledges Platinum and Gold Level Donors in support of the Gala on the Pier & 5th annual Sing-Off:

Smith & Nephew 1/2 Page Advertisement

Page 72
TOURS for Accompanying Persons

NEW YORK! NEW YORK!
Big Apple Overview
Date: Wed. - SOLD OUT, Thurs. - Tickets still available
March 13 and 14
Time: 1:30 - 4:30 PM
Includes: Deluxe Coach, Tour Guides
Description: NEW YORK! THERE’S NOTHING LIKE IT! Too much to see. Too much to do. This 3 hour tour is just a glimpse of the most famous landmarks, history, sights, cultural attractions and ethnic diversity. The East Side, West Side, Little Italy, SOHO, Chelsea, Chinatown, Battery Park, Greenwich Village, Fifth Avenue and Ground Zero. Photo opportunity stops.
Fee: Free for registered guests

Not Like Any Other Tour of Harlem!
Date: Wednesday, March 13
Time: 9:45 AM - 2:30 PM (Shuttles depart at 9:15 AM)
Includes: Celebrity Guide, Lunch, private tour
Description: Barry Lewis, who has done all the PBS tours of New York Neighborhoods, will be our Harlem guide. From Sugar Hill to Hamilton Heights; from 125th Street to Striver's row; He will help us appreciate this unique heritage.
Fee: $90 per person (limited to 30 persons)

Behind the Scenes on Broadway/ Lunch with a New York Drama Critic
Date: Thursday, March 14
Time: 9:30 AM - 1:30 PM
Includes: Tour of Broadway Theater, Lunch, Meeting with Drama Critic
Description: The “Great White Way” beckons as we walk through the magical stage door of a Broadway theater. Our special guide will give us an insider’s view of the New York Theater scene most theater goers never see. We will discuss the Broadway theater in an historical perspective. Following this we will proceed to a Broadway landmark eatery for lunch with Howard Kissel, famous Drama Critic of the New York Post who has power to make or break a new show. He will share some colorful insider gossip and discuss many fascinating theater subjects. A rare opportunity for theater lovers.
Fee: $90 per person (limited to 50 persons)

Woodbury Commons Designer Outlet: Shop Till You Drop!
Date/Time: Thursday, March 14, 9:00 AM - 3:30 PM (Shuttles depart at 9:00 and 11:15 AM)
Includes: Deluxe Motor coach round trip, discount booklets
Description: Join us for a day at the world’s largest and most prestigious outlet center. Discounts on fabulous name brands. We’ll take you by deluxe coach to the center, drop you off and let you shop till you drop. There are 220 designer outlets with discounts from 30-65%.
Fee: $30.00 per person

An Extraordinary Private Fashion and Jewelry Experience
Date/Time: Friday, March 15, 9:00 AM - 1:00 PM
Includes: Private showing at St. John, Private Jewelry showings, lunch, fashion consultant
Description: A private showing at the Fifth Avenue flagship boutique of St. John, one of America’s premier women’s designers. The store will remain closed to the public during our visit, while we enjoy designer talk, informal modeling by some of our own guests, and a chance to shop and an elegantly-served light buffet lunch in the store. Following this, we will visit a showroom of fine jewelry from the Victorian era through Art Deco periods featuring estate jewelry from the original molds. Then we visit the showroom of a dealer who designs for fine specialty jewelry shops where jewelry is an art form. You may purchase jewelry treasures at deep discounts behind doors not open to the public.
Fee: $90 per person (limited to 35 persons)

A Few Tickets Still Available to Amazing Broadway Shows
Numerous potential registrants have inquired about getting tickets to Broadway shows while in New York. We have obtained a limited block of tickets for evenings when the World Congress has no official events. Each ticket includes an agent’s fee. Transportation is not included. Most theaters are walking distance or a short taxi ride from the hotel.

Wednesday Evening, March 13, 2002
42nd Street
Award winning review of the best of Broadway. Vintage New York singing, dancing, comedy. Rave reviews!
Fee: $90 per ticket

Oklahoma
The revival of this Rogers & Hammerstein classic won’t even hit Broadway until a month before the Congress. Tickets are expected to be hard to get. Every melody is a familiar one. The choreography will be sensational.
Fee: $88 per ticket

Saturday Evening, March 16, 2002
The Full Monty
If you saw the movie, you are still laughing. This Broadway adaption of the movie is a musical with rave reviews. A group of working men take to the stage with very little to cover their embarrassment. Tickets are at a premium.
Fee: $106 per ticket

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BS01

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

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

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

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

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

BS02

INCREASED TUMOR SPREAD AFTER CONVERSION FROM LAPAROSCOPIC TO OPEN SURGERY

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

Methods:
60 male WAG/Rij rats were randomised into four groups: laparotomy (Open, n = 15), laparoscopy (CO2, n = 14), and after 60 minutes (CV 60, n = 15) and after 60 minutes (CV 60, n = 15). Metastases were induced by intrasplenic tumor cell (50,000 cells, C531) inoculation during procedure. Total operating time was 90 minutes. Regarding CV 60 total operating time was 120 minutes. 28 days following surgery tumor growth was evaluated regarding number, diameter and cancer index of tumor nodes. Data were analysed by Kruskal-Wallis Test.

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

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

BS03

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

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

Methods:
A novel rat model of desufflation without trocar was developed and 55 Fischer rats were randomised into three groups: A (rapid flow of CO2 at 0.67L/min, n=20), B (slow flow at 0.44L/ml, n=20) and C (gasless laparoscopy, n=15). CO2 was vented into the peritoneum and pelvis using an established laparoscopic cancer model. Rats were randomized into three groups: A (rapid flow of CO2 at 0.67L/min, n=20), B (slow flow at 0.44L/ml, n=20) and C (gasless laparoscopy, n=15). CO2 was vented into the peritoneum and pelvis using an established laparoscopic cancer model.

Results:
In group A (rapid flow), 5/20 rats developed portless valves with tumour involvement, compared with 1/20 in group B (slow flow) and 0/20 in group C (gasless laparoscopy). The difference between groups was statistically significant (p<0.05).

Conclusions:
This study suggests that excision of laparoscopy port site wounds following laparoscopic surgery increases the likelihood of wound metastases. Further studies are needed to confirm these findings and to investigate the role of CO2 in the development of portless valves.

BS04

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

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Background:
Surgical trauma induces immune modulation. Our goal was to study the effect of surgical intervention on the development of a specific immune response to EpCAM, a tumor associated protein. Methods: EpCAM protein and the adjuvant MPLA were incorporated in alginate beads. Control beads contained alginate only. The beads were implanted 3 weeks before surgery in all mice. The following experimental groups (n=5) were included: anesthesia control + control beads (AC-contr), anesthesia control + vaccine beads (AC-vac), open surgery + control beads (OS-contr), open surgery + vaccine beads (OS-vac), CO2 pneumoperitoneum (pneumo) + control beads (CO2-contr) and CO2 pneumoperitoneum + vaccine beads (CO2-vac). Tumors were allowed to grow 5 weeks. Subsequently, blood was obtained, mice sacrificed, their splenocytes isolated and frozen. The concentration of anti-EpCAM IgG in plasma was determined by ELISA. EpCAM specific killing was assayed by flow cytometry using PI staining and fluorescein-labeled C26EpCAM cells. Student's t-test was used for statistical analysis. Results: All immunized mice developed greater cytokotoxic response to C26EpCAM than their respective controls: AC-vac, vs AC-contr, (p<0.02), OS-vac, vs OS-contr, (p<0.01) and CO2-vac, vs CO2-contr, (p<0.02). However, anti-EpCAM IgG increased significantly in AC-vac, 3.12±0.78 ug/ml vs AC-contr, 0.02±0.04 ug/ml (p<0.01) and in CO2-vac, 1.22±0.73 ug/ml vs CO2-contr, 0.02±0.04 ug/ml (p<0.01), but not in OS-vac, 0.64±1.6 ug/ml vs OS-contr, 0.002±0.64. (Tumor growth is subject of a separate abstract.) Conclusions: Perioperatively administered encapsulated EpCAM-MPLA vaccine induces specific cell mediated and antibody mediated immune response in the setting of anesthesia alone or CO2 pneumoperitoneum. Although vaccination in the open surgery mice also induced a cell-mediated response, a diminished antibody response was observed after laparotomy.

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

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

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

**Results:** Both tumour lines demonstrated augmented invasion over 72 hours (p<0.01 all groups), Concomitant significant increase in MMP 2 and 9 activity was observed in the SW1222 cells, MMP 9 and 103kDa gelatinase in MDA-MB231 cells (p<0.01). TIMP-1 expression was significantly lower in the hypoxic group (p<0.05). NF-kB demonstrated a band shift in response to hypoxia, with levels of Ik-B significantly decreased on western blotting (p<0.001). The increased MMP activity and invasion of cells was attenuated by the addition of SN50 (p<0.001 and p<0.05 respectively).

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


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

**Methods:** We defined CIM as the presence of intestinal metaplasia within cardiac mucosa on biopsy from an endoscopically normal appearing gastroesophageal junction. Thirty patients with CIM who had multiple biopsies taken from the esophagus, gastroesophageal junction, and stomach were identified. Tissue blocks from biopsies taken at the gastroesophageal junction were sectioned and immunostained for cytokeratins 7 and 20. The cytokeratin 7/20 staining of the CIM in each patient was determined to be either a Barrett’s or non-Barrett’s pattern. H. pylori infection was assessed by Giemsa staining of entral biopsies. Results: H. pylori infection was present in 16 patients. A Barrett’s cytokeratin 7/20 staining pattern in the CIM was present in only 46% of the H. pylori positive patients, compared to 86% in the 14 patients with CIM and no H. pylori (p=0.02). Augmented evidence of reflux disease was present in 71% of patients with CIM and no H. pylori compared to 31% of patients with H. pylori.

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

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Introduction: Recently, several animal studies showed that the core body temperature falls during pneumoperitoneum. However, the relationship among the body temperature, intraabdominal temperature and humidity is not well evaluated. The purpose of this study is to investigate the effects of heated humidified gas for hypothermia prevention.

Materials and methods: Seven pigs weighing 30kg were generally anesthetized and divided in two groups. The first group had cold CO2 gas insufflation (24deg., 1% relative humidity) while another group had heated humidified gas (37deg., 100%) insufflation. Moreover, these 2 groups were divided to with and without gas leak-age group (10 min). The intraabdominal humidity was measured by a humidity probe through 15-mm trocar. Esophageal and intraabdominal temperature were also measured with 5 minutes interval by thermometer. The study was continued for more than 2 hours. The statistical analyses were performed by ANOVA and Fisher’s test.

Results: 1. Cold gas group (C group): Intraabdominal temperature and humidity were stabilized after 10 minutes (36.0deg., 98.0%) and the core temperature at 2 hours of insufflation was 36.0deg. 2. Cold gas with leakage group (CL group): Intraabdominal temperature and humidity were significantly lower than C group (30.1deg., 88.9%, p<0.05). Core temperature was dropped to 0.2deg (n.s.). 3. Heated Humidified gas group (H group): Intraabdominal temperature, humidity and core temperature were 36.0deg., 98.6%, and 36.0deg. 4. Heated Humidified with gas leakage group (HL group): Intraabdominal temperature and humidity were significantly higher than CL group (36.1deg., 100%, p<0.05). There were no significant differences in core temperature between H group and HL group (36.1deg.). Conclusion: Cold CO2 insufflation with gas leakage caused the decreasing of intraabdominal temperature and humidity. These unexpected phenomena could be prevented by using heated humidified gas insufflation.

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

Under general anesthesia, CO2 pneumoperitoneum (15 mmHg) was maintained for 4 hours in domestic pigs (CO2 group). After the pneumoperitoneum (ischemic) period, the animals (n=8) were reperfused for 2 hours. Sham animals (n=8) underwent general anesthesia without pneumoperitoneum. Intraabdominal temperature, humidity, and core temperature were 36.0deg., 98.6%, and 36.0deg. at the end of the reperfusion period. There were no significant differences in core temperature between H group and HL group (36.1deg.). Conclusion: Cold CO2 insufflation with gas leakage caused the decreasing of intraabdominal temperature and humidity. These unexpected phenomena could be prevented by using heated humidified gas insufflation.

LAPAROSCOPIC STAGING OFPancreatic Tumours Induces Increased Invasive Capacity Which May Be Blocked by a Specific Gelatinase Inhibitor

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

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

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

Conclusions: These results indicate the invasive capacity of pancreatic tumour cells is augmented by laparoscopic pneumoperitoneum. This is in part be mediated by increased gelatinase activity and may be attenuated by the addition of specific inhibitors.
COMPARISON OF THE ONCOLOGICAL EFFECTS AMONG DIFFERENT INSUFFLATION GASES IN RATS

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(Purpose) There have been few data comparing oncological effects among different insufflation gases even though some investigators demonstrated that the use of carbon dioxide gas may be hazardous for laparoscopic tumor surgery. This study compared the survival of tumor-bearing rats, proliferating activity of peritoneal macrophages among 3 different insufflation gases. (Materials and Methods) (Ex-1, n=24) Immediately after intraperitoneal inoculation of 5X10^6 AH 130 cells, male Donryu rats (200-220g) were randomized to receive pneumoperitoneum with CO2, He, or air at 10 mmHg for 60 min or to serve as a control without pneumoperitoneum. The mean number of beads phagocytosed by each macrophage per rat was determined. (Ex-2, n=24) Immediately after intraperitoneal inoculation of AH 130 cells, pneumoperitoneum with one of the 3 different gases or no insufflation was performed. Seven days after the procedures, peritoneal fluid was collected and the S-phase faction of AH 130 cells was determined using a flowcytometry. (Ex-3, n=24) A total of 6X10^9 latex beads (1.1 um) were injected intraperitoneally 24 hr after pneumoperitoneum with 3 different gases or no insufflation. At the end of the procedures, peritoneal macrophages were harvested to determine the mean number of beads phagocytosed by each macrophage per rats. (Results) (Ex-1) The survival time was shorter in rats with insufflation gases (He,CO2,and air), compared with that in control rats (P<0.01). (Ex-2) The S-phase factions of groups HE and air were significantly lower than those of the other two groups (P<0.05). (Ex-3) There were no significant differences in the number of phagocytosed beads among the groups. (Conclusions) These results suggest that:(1) the choice of gas may affect the proliferation of tumor cells,(2) insufflation itself may promote tumor spread.

COMPARISON OF THE ONCOLGICAL EFFECTS BETWEEN GASLESS PROCEDURE AND CARBON DIOXIDE PNEUMOPERITONEUM IN RATS

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(Purpose) There are few data comparing oncological benefits between a gasless procedure (GP) and pneumoperitoneum (PP). This study compared the survival of tumor-bearing rats, intraperitoneal, phagocytotic activity of peritoneal macrophages, and proliferating activity of intraabdominal tumor cells between GP and PP. (Materials and Methods) Male Donryu rats (160-200g) and ascites hepatoma AH 130 cells were used. (Ex-1, n=45) Immediately after intraperitoneal inoculation of AH 130 cells (5X10^6 cells), rats were randomized to receive either abdominal wall lifting (gasless group) for 60 min, carbon dioxide pneumoperitoneum at 10 mmHg for 60 min (pneumoperitoneum group), or anesthesia only (control group). Rats were followed until death. (Ex-2, n=33) Rats received the 3 different procedures immediately after intraperitoneal injection of a total of 6X10^9 latex beads (diameter:1.1 um). At the end of the procedures, peritoneal macrophages were harvested to determine the mean number of beads phagocytosed by each macrophage per rats. (Ex-3, n=28) Immediately after intraperitoneal inoculation of AH 130 cells, the 3 different procedures were performed. Seven days after the procedures, peritoneal fluid was collected and the S-phase faction of AH 130 cells was determined using flowcytometry. (Results) (Ex-1) The PP group demonstrated significantly shorter survival, compared with the other 2 groups (P<0.05). (Ex-2) The number of beads phagocytosed by each macrophage per rat tended to be greater in the GS group (P=0.05). (Ex-3) The S-phase faction was 30.5±3.7 in the GS group, 44.8±1.6 in the PP group, and 39.3±12.3 in the control group (P<0.05). (Conclusions) Compared with the gasless procedure, pneumoperitoneum promoted the proliferative activity of intraperitoneal tumor cells and tended to deteriorate the phagocytic activity of intraperitoneal macrophages. These mechanisms may have caused the shorter survival of rats undergoing pneumoperitoneum in this animal model.
NATIONAL TRENDS IN UTILIZATION AND OUTCOMES OF ANTI-REFLUX SURGERY

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

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

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

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

LAPAROSCOPIC REPAIR OF LARGE HIATAL HERNIA. MID-TERM FOLLOW UP.

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

Foregut–S003

FIRST YEAR EXPERIENCE OF PATIENTS UNDERGOING THE STRETTA PROCEDURE.

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The Stretta procedure is a new, totally endoscopic treatment for GERD, where radiofrequency energy is delivered to the smooth muscle of the LES. Forty-one patients undergoing the Stretta procedure between August 2000 and August 2001 were prospectively evaluated. Under an IRB approved protocol, patients were studied preoperatively and postoperatively using esophageal manometry, 24-hour pH testing, SF12 surveys, and GERD specific questionnaires (OQLQ, RAV). Results are reported as means±SEM. All procedures were performed on an outpatient basis, 33 were under conscious sedation and 8 were under general anesthesia. Prior to treatment, patients had a mean LES pressure of 24.3±8.6 mmHg, Johnson-Demeester score of 33.6±4.6 mmHg, and % time reflux 6.2±0.9. QOL RAD scores were significantly improved at 3 months (3.7±0.3 to 5.1±0.5, p<0.04) and 6 months (5.0±0.4, p<0.01). Physical SF12 scores were also significantly improved at 6 months (26.3±3.2 to 32.7±4.2, p<0.01). Mental SF12 scores were improved at 3 months (43.4±2.4 to 52.2±4.0, p<0.03) but not at 6 months. Eight patients returned for esophageal manometry and 24-hour pH testing at a mean of 7.4 months. There was a trend towards decreased esophageal acid exposure (6.2% to 4.8%), but this was not statistically significant. There was no significant change in mean LES pressure (24.3±2.9 to 23.8±4.2, p=0.84). Eighteen of 29 patients (62%) available for 3 months follow-up and 10 of 17 patients (59%) available for 6 months follow-up were completely off proton pump inhibitors. The only complication related to Stretta was a case of gastroesophageal reflux 10 days post-op which resolved completely.

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

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Surgical therapy for Zener’s diverticula (ZD) has been substantially modified, since the introduction of trans-oral diverticulotomy (TOD) with the endoscopist. However, there is no evidence that TOD offers better long-term results than open surgery (upper esophageal sphincter myotomy and diverticulotomy or diverticulopexy - UESMD). Since 1993, 58 patients (43 males, 15 females, median age 70.5, range 38-95, years) presented with ZD. Symptoms (dysphagia and regurgitation) were prospectively collected and scored from 0 (absence of symptoms) to 8 (severe daily symptoms). UES pressure, relaxations and intrabolus pressures were recorded by esophageal manometry in 49 patients. Twenty-four patients, median age 76 years (range 38-95), were assigned to TOD on the basis of operative risk, size of ZD ( > 3 cm), and in 6 cases - the patient’s preference. UESMD was performed in 34 patients (median age 69, range 41-94). No mortality was observed in either group, but 5 patients in the UESMD group had postoperative complications (p<0.05). In conclusion, TOD is a safe, quick and effective solution for similar in both groups. During follow-up (41 months, range 1-101), 3 patients in the TOD group had postoperative complications (p<0.05) (2 leakages from diverticulectomy, both healing with conservative treatment). The hospital stay was shorter in the TOD group than after UESMD, i.e. 5 (2-19) vs 9 (4-16) days, p<0.001. Post-operative esophageal manometry was performed in 8 TOD patients and 18 UESMD patients, and showed a statistically significant reduction in UES pressure (p<0.05), improved UES relaxation and lower intrabolus pressure in both groups. During follow-up (41 months, range 1-101), 3 patients died of other causes and 2 were lost; regurgitation improved similarly in both groups, but 3/20 patients in the TOD group still complained of severe dysphagia as opposed to 0/33 in the UESMD group (p<0.05). In conclusion, TOD is a safe, quick and effective solution for most patients with ZD, but upper esophageal sphincter myotomy with diverticulotomy or diverticulopexy better long-term results, especially for dysphagia, and should be recommended for younger, fit patients and in case of small size diverticula.

LAPAROSCOPIC ESOPHAGOGRASTIC DEVASCULARIZATION IN BLEEDING VARICES

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Background: Bleeding from esophageal varices is the major cause of death in patients, with portal hypertension. The ideal surgical procedure should effectively control bleeding, and maintain liver function with low rates of encephalopathy. Based on this objective, laparoscopic devascularization of the esophagus and upper stomach is technically feasible and promising. Rapid recovery and complications are low, compared with portal hypertension surgery in high risk patients without exposing the patient to hazards of open surgery.

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

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

Conclusion: Laparoscopic devascularization of the lower esophagus and the upper stomach is technically feasible and promising. Rapid recovery, and complications are low, compared with portal hypertension surgery in high risk patients without exposing the patient to hazards of open surgery.

LONG TERM RESULTS OF LAPAROSCOPIC VERSUS OPEN RESECTIONS FORRECTAL CANCER ON 115 UNSELECTED PATIENTS

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Aim: To compare the results of laparoscopic and open surgical resections in a consecutive cohort of 115 patients with rectal cancer. Methods: Between 1998 and 2000, 115 vertebral patients were treated by laparoscopic (28) or open (87) rectal resection procedures. Results: Laparoscopic surgery was performed by 2 different surgeons. Laparoscopic surgery was less invasive (mean operative time 149 vs 176 min, respectively) and had a shorter hospitalization (mean 3.3 vs 6.4 days). No significant difference was observed in the incidence of complications. 3/21 (14%) and 1/84 (1.2%) complications were reported in laparoscopic and open surgery respectively. Postoperative radiotherapy was necessary in 10/28 (36%) and 23/87 (26.3%) patients. There was no cardiopulmonary or vascular complication in both groups. Conclusion: In this study there is no significant difference between laparoscopic and open rectal resection. However, laparoscopic resection has potential advantage as regards to reduced hospitalization period and lower postoperative complications. Randomized trials with larger patient population is mandatory to confirm the above results.

TRANSANAL ENDOscopic MICROsurgery (TEM) AND Radical Surgery FOR Early Rectal Cancer, Retrospective Case-Matching Study.

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

Between Oct 1994 and Dec 2000, 74 patients had TEM and 100 patients had radical surgery for rectal cancers, which were lymph node metastasis. The mean size of tumor was 23.5mm for TEM group and 37.8mm for radical group (p<0.05). In the TEM group, 52cases (70.3%) were T1 lesion and 22cases (29.7%) were T2 lesion and in radical groups, 17cases (17%) were T1 lesion and 83 (83%) cases were T2 lesion. Five year disease free survival rate for stage T1 cancer was 90.9% for TEM group and 100% for radical group(p=0.925) and for stage T2 cancers, it was 76.9% for TEM group and 91.0% for radical group(p=0.017). There was no statistical significance for 5-year disease free survival rate for both T1 and T2 tumors between two groups (p=0.07, p=0.47). There is significantly increased risk of local recurrence after TEM for stage T2 tumors. Therefore careful selection of the patients required for TEM and when proper muscle layer is resected from pathology, conversion to radical surgery should be considered during the operation.
Endoscopic mucosal resection for advanced non-polypoid colorectal adenoma and early stage carcinoma

**Purpose:** Endoluminal treatment of gastrointestinal neoplastic lesions has become a capable alternative to surgical procedures. Endoscopic mucosal resection (EMR) techniques were evaluated in the usefulness of the treatment of flat and sessile colorectal adenomas and early stage carcinoma. Patients and Methods: Fifty-seven patients (32 female, 25 male) with non-polypoid colorectal lesions were treated with re-excision. Results: Lesion size ranged from 10 to 50 mm. Carcinoma in situ was seen in 7 lesions, and the remaining lesions were benign. Morbidity was minimal, with one conversion to an open procedure for an intra-peritoneal perforation which required a low anterior resection. No patient required transfusion and there was no mortality. The hospital stay was short, with half of the patients being discharged the same day. The average cost from July 1996 to December 1999 was $7,775 for a TEM versus $34,018 for a LAR. Subsequent follow-up averaged 36.8 months (range 1–100 months), during which time 2 patients had recurrence of their adenomas. These were successfully treated with re-excision. In conclusion, TEM is an accurate, safe and relatively inexpensive technique when compared to low anterior resection.

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

**Purpose:** Predicting conversion in laparoscopic colorectal surgery: fellowship training is an advantage

**Methods:** To prospectively validate a previously developed model for predicting conversion in laparoscopic colorectal surgery. To evaluate the impact of fellowship training. Methods: A simple, clinical model for predicting conversion in laparoscopic colorectal surgery was previously developed based on a multivariable logistic regression analysis of 367 procedures performed prior to 1998. This model awarded one point each for risk factors: malignancy, weight ≥50 kg, age ≥75 years and 38 patients less than 75 years of age that underwent LC for colorectal cancer between 1991 and 1999 was performed. LC patients were matched with an open control group for procedure, age, gender, year of procedure, and surgeon. Procedures included right colectomy, anterior resection of rectosigmoid, and abdominoperineal resection. Anasthesia time, operative time, postoperative narcotic usage (NU), return of bowel function (RBF), length of stay (LOS), and independence at discharge were compared in the entire group of 154 patients. Results: Mean ages were 81.4 and 81.8 for LC and OC for age >75 and 62.9 and 62.7 for LC and OC for age <75. Morbidity was similar between LC and OC for either age group. Mean anasthesia time and operative time were significantly longer (p < 0.05) for LC compared to OC (46.5 vs. 39.3, 159.3 vs. 111.7) for age >75 and for age <75 (47.1 vs. 40.3, 182.8 vs. 135.5). LC achieved faster recovery in both groups: RBF (3.9 vs. 4.9, age >75; 4.2 vs. 5.0, age <75) and more likely to have malignancy (59% vs. 44%, p=0.007) and obesity (median 71.0 kg vs. 66.0 kg, p=0.001). The rate of conversion in the follow-up group was unchanged (9.8% vs. 9.0%, p=0.05). While the expected trends toward increasing risk of conversion with weight level and malignancy were observed, the model did not distinguish well between groups at risk for conversion. Contrary to the model, however, the fellowship trained surgeon had a conversion rate that was not higher than the other more experienced surgeons (7.3% vs. 9.3%, p=0.05) despite being in his early experience, and operating on patients that were more obese (median 75.0 kg vs. 70 kg, p=0.02) and more likely to have malignancy (59% vs. 55%, p=0.05). Recalculated conversion scores excluding the inexperience penalty for the fellowship trained surgeon demonstrated a good fit of the model with conversion rates for scores 0, 1, 2, and 3+ of points of 6.5%, 7.9%, 9.6% and 15.0%. Conclusions: Fellowship training appears to eliminate the learning curve for laparoscopic colorectal surgery. This model continues to be a valid predictor of conversion to open surgery if the inexperience penalty is excluded for a fellowship trained surgeon. This model now requires validation by other centres.

**Purpose:** Age and type of procedure influence the choice of patients for laparoscopic colectomy

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

**Results:** Mean ages were 81.4 and 81.8 for LC and OC for age >75 and 62.9 and 62.7 for LC and OC for age <75. Morbidity was similar between LC and OC for either age group. Mean anasthesia time and operative time were significantly longer (p < 0.05) for LC compared to OC (46.5 vs. 39.3, 159.3 vs. 111.7) for age >75 and for age <75 (47.1 vs. 40.3, 182.8 vs. 135.5). LC achieved faster recovery in both age groups: RBF (3.9 vs. 4.9, age >75; 4.2 vs. 5.0, age <75) and LOS (6.1 vs. 7.8, age >75; 6.1 vs. 7.7, age <75) (p < 0.05). Fewer patients required assistance at discharge in the LC age <75 group (p <0.05). Left LC in age >75 and right LC for age <75 provided faster recovery (p <0.05).

**Conclusions:** The advantages of LC over OC are the same for the elderly and the young. There may be a selective benefit of laparoscopic right colectomy in the young and laparoscopic left colectomy in the elderly.
THE USE OF ENTERAL STENTS IN MALIGNANT COLONIC AND GASTRIC OUTLET OBSTRUCTION
Christine A. Ely, M.D., Maurice E. Arregui, M.D., Department of Surgery, St. Vincent’s Hospital, Indianapolis, IN

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

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

RESULTS: Six stents were placed in 5 patients with malignant gastric outlet obstruction. Technical success was achieved in 100%, and 5/5 (100%) patients were clinically improved. One stent was replaced due to obstruction from tumor ingrowth. Follow up to hospice (one patient 30 days after stenting) or death (3 patients in 30-66 days) showed all stents to be patent. The fifth patient did well for 2 weeks and then was lost to follow up. Four stents were placed in 3 patients with colonic obstruction. One was for palliation of obstructing rectal cancer and diverticulitis. Technical success was achieved in 100%, and 3/3 obstructions were relieved. One stent stenosed and required replacement. This stent was patent until the patient’s death 29 days later. One perforation occurred, requiring colostomy. One patient who received a preoperative stent had a successful one stage resection.

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

OUTCOMES & ENDOCRINE SURGERY–S016

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

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

Results: 3319 cases were entered by 72 surgeons between May, 1999 and August, 2001. 873 LC and OC were entered. 25% of these cases were first-assisted by a nonphysician. 11% did not have documented gallstones. 3% of LC’s were converted to OC. 49% had intraoperative cholangiogram, of which 18% revealed significant findings. 7 major CBD injuries (0.6%) and 116 complications were reported. Follow up in 571 patients (62%), revealed symptomatic improvement in 96%. In the GERD report, 1019 procedures were entered, 26% of whom had undergone previous fundoplication, 43% had esophageal amplitude <20mmHg and 24% had >70% peristalsis. LF was completed in 95% of patients with <1% complication rate. Mean operative time was 137 minutes. Of 632 patients (62%) with follow up, 98% reported symptomatic improvement.

Conclusion: The SAGES outcomes initiative allows surgeons to be involved in data collection about their practice. It provides surprising average data on the practice of surgery which are more useful for setting benchmarks than published data from the surgical elite. Improvements in the tool will include better methodology for complete data capture, and periodic auditing to insure data completeness and accuracy.
**LAPAROSCOPIC ADRENALECTOMY: A PROSPECTIVE EVALUATION OF 151 PROCEDURES.** Colm J O’Boyle, Peter C Sedman, #C Raj Kapadia, *William A Brough, Christopher MS Royston., Departments of Upper Gastrointestinal and minimally invasive surgery, # Airedale General Hospital, Keighley, *Stepping Hill Hospital, Stockport and Hull Royal Infirmary, Hull, UK.

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

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

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

**MINIMALLY INVASIVE VIDEO-ASSISTED PARATHYROIDECTOMY**

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

Patients with primary hyperparathyroidism (pHPT) and one unequivocally enlarged parathyroid gland in the preoperative ultrasound and 99mTc-SestaMIBI scintigraphy underwent minimally invasive video-assisted parathyroidectomy by an anterior approach. Intraoperatively, a rapid chemiluminescence immunomassay was used to measure iPTH levels shortly before and 5, 10 and 15 minutes after excision of the adenoma. The operation was considered successful, when a greater than 60% decrease in pre-excision iPTH levels was observed after 15 minutes. Between November 1999 and August 2001, 28 out of 70 patients with pHPT were eligible for a minimally invasive approach. In all but 3 cases the adenoma was removed successfully applying the new technique. However, in 4 patients intraoperative iPTH monitoring showed no sufficient decrease in iPTH values. Here, subsequent cervical exploration revealed 1 double adenoma and 3 hyperplasias respectively.

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

**COMPARATIVE STUDY OF THYROIDECTOMIES: ENDOSCOPIC SURGERY VERSUS CONVENTIONAL OPEN SURGERY.** Yoshiyumi Ikeda

Hiroshi Takami, M.D., Masanori Niimi, M.D., Ph.D., Shigehiko Kan, M.D., and Susumu Kodaira, M.D., Department of surgery, Teko University School of Medicine, Tokyo, Japan

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

**Patients and Methods:** Endoscopic thyroidectomies using either an anterior chest approach or an axillary approach or conventional open surgery were performed. Each procedure was performed in 15 patients matched for age, gender and tumor size. We compared the operating time, intraoperative blood loss and the degree of pain on the first post-operative day to assess the surgical invasiveness of each procedure.

Three months after surgery, the presence of hypesthesia and paresthesia in the neck, discomfort in swallowing, and the cosmetic results were investigated to assess the nature of the patients’ complaints.

**Results:** The mean operating time and intraoperative blood loss was 145 minutes and 25 ml for the anterior chest approach, 175 and 30 for the axillary approach and 11 patients (73%; p<0.01) underwent open surgery, 10 patients (67%; p<0.01) complained discomfort in the neck or anterior chest pain in the first post-operative day. Three months after surgery, none of the patients received an endoscopic thyroidectomy complained of hypesthesia or paresthesia in the neck, discomfort in swallowing, and the cosmetic results were matched for age, gender and tumor size. We compared the operating time, intraoperative blood loss and the degree of pain on the first post-operative day to assess the surgical invasiveness of each procedure.

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

**Comparative outcomes:**

- **Results:**
  - Operating time: 145 minutes (anterior chest), 175 minutes (axillary), 25 minutes (open)
  - Intraoperative blood loss: 25 ml (anterior chest), 30 ml (axillary), 25 ml (open)

- **Conclusion:**
  - Laparoscopic surgery is significantly lower than that after open surgery.
PROSPECTIVE RANDOMIZED EVALUATION OF SURGICAL RESIDENT PROFICIENCY WITH LAPAROSCOPIC SUTURING FOLLOWING COURSE INSTRUCTION. Kristi L. Harold, M.D., Brent D. Matthews, M.D., Charles L. Backus, D.O., Broc Pratt, M.D., Ronald F. Sing, D.O., B. Todd Heniford, M.D., Department of Surgery, University of Kentucky, Lexington, Kentucky.

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

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

Despite randomization IG was slower than CG (732.4sec vs. 500.2sec, p=0.10). The IG decreased suture time from the 1st to 2nd stitch (727.6sec to 257.6sec, p=0.001) and decreased from 500.2sec to 421.8sec. Time to perform the 2nd stitch was not significant between groups (257.6sec vs. 421.8sec, p=0.46), but time reduced between the 1st and 2nd suture was highly significant (IG=478.8sec vs.CG=78.4sec, p=0.001). Use of the SAD and the CG increased their times when compared to both the first and second suture. The difference in time reduction from 1st to 3rd sutures was significant (599.9sec vs. 323.9sec, p=0.02). The CG was able to perform almost as quickly as the IG with the suturing device (173.6sec vs. 133.4sec, p=0.11). The IG improved the accuracy between the 1st and 2nd stitch (4.7mm to 2.6mm, p=0.02); the CG accuracy did not change. Knot strength was not different in any test. Surgery residents can improve laparoscopic suturing skill with a short didactic course and minimal individual proctoring. A SAD can decrease the time to perform an intracorporeal tie by inexperienced surgeons without compromise of knot strength.

Determinants of Competency Judgments by Experienced Laparoscopic Surgeons. Gina I., Ass. M.D., Uyen B. Chu, M.D., Michael B. Donnelly, Ph.D., Donald B. Witze, Ph.D., Jim D. Hoskins, B.S., Michael J. Mastrangelo, Jr., M.D., Alejandro Gandas, M.D., and Adrian E. Park, M.D., Center for Minimally Invasive Surgery, University of Kentucky, Lexington, Kentucky.

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

We assessed the laparoscopic skills and competence of 27 subjects with varying levels of experience using an inanimate model of a laparoscopic appendectomy. The subjects were observed and videotaped while performing a laparoscopic appendectomy. Two independent expert raters then assessed the recorded videos.

The test videotapes were rated by five laparoscopic faculty in four categories, including clinical judgment and respect for tissue, dexterity and the economy of movement, serial/simultaneous complexity (flow of the operation), and spatial orientation. The raters then worked together with the class to assign each video to one of four categories.

The correlation between the raters was 0.85, indicating that there was general agreement among the raters in judging competence. Each of the four components scored in the study are important in determining competence, although the degree of importance varied with each component. Competence in the basic category is a complex entity but one that can be reliably judged by experienced raters.
FRIDAY

March 15, 2002: Scientific Session Abstracts

Education & Measuring Results-S029

OPERATIVE END PRODUCT, PROCEDURE EFFECTIVENESS AND SURGEONS’ FORARM WORK LOAD COMPARING INLINE TO PISTOLGRIP HANDLES DURING SUTURING IN A LAPAROSCOPIC PHYSICAL SIMULATION MODEL. Miro Uc大厅, M.D., Jan Brogger, M.D., Rimantas Rukas, M.D., Bjorn Ketchem, M.D., Roberto Bergamaschi, M.D., Robert Cucchi, M.D., Tore Velte, M.D., and Per Erik Jorgensen, Ph.D.

Objective: The aim was to compare inline (ILH) with pistol-grip (PGH) with regard to product quality, procedure effectiveness, and surgeon forearm workload while suturing in a laparoscopic simulator. METHODS: A 90% power crossover design at alpha 0.05 required a sample of 46. Block randomisation generated ILH-PGH or PGH-ILH sequence allocation, Population consisted of voluntary laparoscopic surgeons pretested with MIST-VR. Assignment generator was separated from executor. Tasks were suturing of perforated ulcer on foam stomach placed in a simulator. Olympus tm ILH and Wisap tm PGH needleholders were compared. Product quality was measured by tissue damage, accuracy error, water leak, procedure effectiveness by OR time and time motion analysis including goal (GDA) and non goal directed actions (NGDA); surgeon workload by electromyogram (EMG) of six forearm and thumb muscles. Assessor and statistician were blind to surgeon identity and handle type. Nonparametric, McNemar and t-tests were used for binary, ordinal and continuous variables, respectively. RESULTS: 46 surgeons with a median of 38 MIST-VR score performed tasks as allocated. All variables but one were significantly different comparing 1st to 2nd task ignoring handle type. There was no evidence of significantly unequal carryover effect when comparison was stratified by ILH-PGH or PGH-ILH sequence. When comparing ILH to PGH regardless of task order there were significant differences in leak rates (24 vs 40 percent p=0.02) and tissue damage (mean 0.1 vs 0.2 mm p=0.06). Accuracy error (median 1 vs 2 mm p=0.2), OR time (median 186 vs 176 sec p=0.7), GDA (median 25 vs 29 p=0.3), NGDA (median 1 vs 1 p=0.09) and EMG (median 1.6 vs 1.7 root mean square p=0.4) were not significantly different comparing ILH to PGH. CONCLUSION: The use of PGH when compared to ILH for suturing in a laparoscopic simulator resulted in poorer quality of operative end product as witnessed by increased leak rates and tissue damage. There were no differences in procedure effectiveness and surgeons forearm workload between handle types.

New Approaches-S032

ANALYSIS OF ERRORS IN LAPAROSCOPIC SURGICAL PROCEDURES: A NEW METHODOLOGY. Neal E. Seymour, M.D., Anthony G. Gallagher, Ph.D., Sanziana A. Roman, M.D., Michael K. O’Brien, M.D., Dana K. Andersen, M.D., Richard M. Satava, M.D., Department of Surgery, Yale University School of Medicine, New Haven, CT.
The determination of laparoscopic surgeon ability is essential to training error avoidance. A standardized method of procedure analysis is described which measures error and addresses potential problems of bias and complexity.

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

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

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

Education & Measuring Results-S030

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

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

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

Results: We obtained ICC values of 0.81, 0.84, and 0.74 for COM ratings on LA, LC, and LH respectively. We also obtained ICC values for the same three models for CJ 0.89, 0.83 0.75; DEX 0.89, 0.86, 0.88; SSC 0.82, 0.82, 0.82; and SO 0.97, 0.96, 0.86, respectively.

Conclusions: We were encouraged that we obtained very high reliability of performance ratings for competence and surgical skills in a mechanical simulator. Typically, faculty evaluations of residents in the operating room are much less reliable. In contrast, when faculty observe residents in a controlled, standardized environment their ratings are very reliable.
LAPAROSCOPIC GASTRECTOMY WITH RADICAL LYMPH NODE DISSECTION WITH INTRAOPERATIVE NAVIGATION USING 3D ANGIO CT IMAGES RECONSTRUCTED AS LAPAROSCOPIC VIEW. Shuji Takiguchi, M.D., Mitsugu Sekimoto, M.D., Yasuhiro Miyake, M.D., Yoshitaka Fujiwara, M.D., Yukitaka Yasuda, M.D., Shigeuki Tamura, M.D., Masahiko Yano, M.D., *Seishi Kumanu, M.D., *Toson Kim, M.D., Morito Monden, M.D., *Department of Surgery and Clinical Oncology, *Department of Radiology, Graduate School of Medicine, Osaka University, Osaka, Japan

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

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

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

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

Between January 1992 and July 2001 a total of 790 patients (mean age 52.2) underwent emergent and/or urgent surgery. Among them, 473 (59.87%) were operated on laparoscopically (acute small bowel obstruction: 25 cases; gastro-duodenal ulcer disease: 22 cases; biliary system disease: 112 cases; pelvic disease: 302 cases; colonic perforations - iatrogenic or not: 12 cases), according to the presence of a well-trained surgical team. We decided not to treat patients with LAPS who had a history of previous abdominal approaches to malignant disease, a history of more than two major abdominal surgeries or massive bowel distension. We did not consider perforitis to be a contraindication to LAPS. The laparoscopic group conversion rate was 6.5% and was mainly due to the presence of dense intraabdominal adhesions. Major complications ranged as high as 2.7% with a postoperative mortality of 0.8%. A definitive diagnosis was provided in 96.9% cases, with the possibility to treat 93.4% of them by laparoscopy.

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

LAPAROSCOPIC MANAGEMENT OF SYMPTOMATIC ACHALASIA WITH EPHERINIC DIVICLTUM. F.Craite Jr, MD, M.Bloomston MD; L Carey MD; E Zervos MD; S Goldin MD; M Wallace LPN; AS Rosemurgy MD, University of South Florida, Tampa, Florida

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

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

Results: Dor fundoplication was undertaken in five patients while Toupet fundoplication was undertaken in one patient. There was one intraoperative complication- an esophageal perforation that was laparoscopically repaired and buttressed with a Dor fundoplication. There was no evidence of leak on postoperative contrast studies. One patient developed postoperative pneumonia that progressed to empyema requiring decorticatation. Patient reported dysphagia decreased from 4.3 ± 0.7 to 3.4 ± 0.8 (mean ± SD) to 1.8 ± 1.7 (P<.05 by Mann-Whitney U test) while heartburn decreased from 4.3 ± 0.8 to 1.3 ± 1.3 (P<.05). All patients reported improvement in symptoms after operation.

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

Underline denotes presenter. * denotes resident paper.
### Education & Training–S038*

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

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

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

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

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### Education & Training–S039*

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

Although much resource has been devoted to laparoscopic training for young surgeons, the fruits of such labor has not been analyzed. In this study we delineated the laparoscopic capability of the current surgical graduates, traced its growth over the past 7 years, and made short term projections based on growth rates. **Method:** The residents' operational logs collected by the Residency Review Committee and American Board of Surgery was the sole source of data. From 1994 through 2000, laparoscopic operations/resident were tabulated and subjected to regression analysis, and the growth rate (slope or change/year) for each calculated. **Results:** mean laparoscopic operations/resident over entire training period was 94/00. **Conclusion:** residents were competent to perform a variety of laparoscopic procedures.

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### Education & Training–S040*

**Title:** TRAINING THE NOVICE IN LAPAROSCOPY: MORE CHALLENGE IS BETTER.  
**Authors:** Mohamed A. Ali, MD, Yvonne Mowery, Brian Kaplan, MD, Eric J. DeMara, MD.  
**Institution:** Department of Surgery, Medical College of Virginia, Richmond, Virginia.  

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

#### Mean scores for each task are tabulated with a lower score signifying a better result.  
#### Both groups were statistically similar at baseline. All scores improved significantly (p<0.01, except TP (p=0.054). The variances within each group also decreased with time, implying that the students gained similar levels of proficiency. Scores reached plateau after an average of 4 trials in Group B compared to only 2 trials in Group A (ANOVA, p<0.05). Subjects in Group B also improved more from baseline to final scores than Group A in all tasks, statistically significant in MD, TP, and T (p<0.05).

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

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The presentation includes data from both abstracts above.
**THE BLUE DRAGON - A SYSTEM FOR OBJECTIVE LAPAROSCOPIC SKILL ASSESSMENT**

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

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

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

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**COMPARISON OF ECONOMIC AND ECOLOGIC IMPACTS OF DISPOSABLE VERSUS REUSABLE INSTRUMENTS FOR LAPAROSCOPIC CHOLECYSTECTOMY**

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

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

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

**Conclusions:** In view of the upward pressure of costs in hospitals, disposable instruments should only be used in laparoscopic cholecystectomy if they offer clear advantages over reusable instruments.
ESOPHAGEAL CANCER: A LAPAROSCOPIC APPROACH TO STAGING AND RESECTION, David E. Pace, M.D., Patrick M. Chiasson, M.D., Christopher M. Schlachta, M.D., The Centre for Minimally Invasive Surgery, St. Michael’s Hospital, University of Toronto, Toronto, Ontario

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

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

Thirteen patients (40.6%) had incurable disease based on staging laparoscopy. Six had tumour invading local structures, 6 had bulky tumour involvement of celiac nodes, and 1 had diffuse peritoneal carcinomatosis. Laparoscopic esophagectomy was attempted in 19 patients (12 males and 7 females). Median operative time was 280 minutes (range of 230 to 445) and median operative blood loss was 400 cc (range of 100 to 1000). Two cases were converted. Median hospital stay was 12 days (range of 7 to 40) and median ICU stay was 2 days (range of 1 to 39). Four patients (21.5%) suffered major postoperative complications and twelve patients (63.2%) suffered minor complications that did not affect length of stay. There was one in-hospital mortality (5.3%). Delayed complications occurred in 7 patients (35.8%). Proximal and distal resection margins were tumour free in all cases. Average number of lymph nodes excised was 10 (range of 2 to 30). There was one stage 0, three stage 1, six stage 2A, three stage 2B, and six stage 3 tumours. Four year survival with a median follow-up of 12.2 months was 44.0%.

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

QUALITY OF LIFE, SYMPTOMATIC OUTCOME AND PATIENTS SATISFACTION AFTER LAPAROSCOPIC REFUNDOPLICATION IN GASTROESOPHAGEAL REFLUX DISEASE PATIENTS WITH FAILED PRIMARY ANTIREFLUX SURGERY: A 3 TO 5 YEARS FOLLOW-UP
Frank Alexander Granderath MD, Thomas Kamolz PhD, Ursula Maria Schweiger MD, Heinz Wykypiel jr. MD, Rudolph Pointner MD
Institutions: Department of General Surgery, Hospital Zell am See, Zell am See, Austria; Department of General Surgery, University of Innsbruck, Innsbruck, Austria

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

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

Results: Three to five years after laparoscopic refundoplication, patients quoted their quality of life (GIQLI) in an overall score of 113.4 points, which is comparable to that of patients who underwent primary laparoscopic antireflux surgery. 25 (92.6%) patients estimated their satisfaction with the redo-procedure as very good and would undergo surgery again if necessary. Two (7.4%) patients reported about rare episodes of heartburn, which could be treated successfully with proton pump inhibitors. Four (14.3%) patients reported about episodes of regurgitation, but did not have a decreased quality of life because of it. Seven (25.9%) patients suffer from mild to moderate dysphagia 5 years postoperatively, the other patients (74.1%) do not have any dysphagia at follow-up.

Conclusion: Laparoscopic refundoplication after primary failed antireflux surgery results in a high patients satisfaction and significant improvement of patients quality of life with good to excellent symptomatic outcome for a follow-up period of 3 to 5 years after surgery.
Esophageal Surgery–S054* 

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

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

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

Results: 16 patients underwent a completely laparoscopic procedure and 3 were converted to open due to intraoperative complications. Adhesions were found to be the cause of the pain in 19 patients. Endoscopic examination revealed that 21 patients had adhesions involving the small intestine, 7 had adhesions involving the colon, 5 had adhesions involving the stomach, 1 patient had adhesions involving the liver, and 1 patient had adhesions involving the bowel.

Conclusion: Esophageal Surgery–S056* 

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

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

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

A non randomised comparison of 636 patients operated on by the author with 100 months follow up showed documented recurrent reflux in 1.1% with reimplantation (352) vs 3.3% in those without (284), (p<0.01 Cox regression). Long term stricture, severe dysphagia, paraesophageal herniation occurred in 0.9% with reimplantation vs 2.5 % without (P<0.01).

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

Esophageal Surgery–S057* 

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

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

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

The endoscopic and the laparoscopic GEJ corresponded in 65% of the observations, and were within 1 cm in 28% of cases. The endoscopic GEJ was more than 1 cm proximal to the laparoscopic one in 9% of patients (mean difference=1.2cm+/-0.9cm). The wrap was judged redundant or too tight in 2 cases and asymmetric in 3 instances. 93.5% of patients had grade 2 or greater flap valve, and all had grade 1 valve after fundoplication. In 3 cases the fundoplication was modified solely on the endoscopic appearance. In one case, IOE identified an unrecognized esophageal diverticulum changing our plan from a redo Nissen fundoplication to a transhiatal esophagectomy.

Conclusion: Esophageal Surgery–S058* 

LAPAROSCOPIC APPROACH IS SUPERIOR TO THORACOSCOPIC APPROACH FOR THE TREATMENT OF ESOPHAGEAL ACALASIA. Giovanni Ramacciato MD, Paolo Mercantini MD, Pietro Maria Amadio MD, Francesco Sipia MD and Vincenzo Ziparo MD Department of Surgery “Pietro Valdoni”, University of Rome “La Sapienza”, Rome,Italy

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

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

Results: Mean operating room time were 222 min. (range 120-288) for THM group and 160 min. (range 80-192) for LHM group (p<0.0001). The mean blood loss was 100 ml in both THM and LHM. There were two mucosal injury during THM (12.5%) and two in the LHM group (11.7%). Conversion to an open procedure took place in 2 THM operations (12.5%). Average hospital-stay was 5.1+-2.2 days for THM group and 2+-1 days for LHM group (p<0.0001). Followup data for LHM (median 35.5 months, range 12-84) and THM (median 18.5 months, range 4-45) showed a significantly longer survival in LHM group. The recurrence of dysphagia was significantly lower in the LHM group (284), (p<0.01 Cox regression). Long term stricture, severe dysphagia, severe reflux in 1.1% with reimplantation (352) vs 3.9% in those without (284), (p<0.01 Cox regression).

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

Brent Matthews, MD, Hong Boi, Kristi Harold, MD, Kent Kercher, MD, Gina Adrades, MD, Adrian Park, MD, Ronald Sing, DO, B. Todd Heniford, MD, Carolinas Medical Center, Charlotte, North Carolina

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

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

Eleven traumatic diaphragmatic hernias were completed laparoscopically and 3 required conversion. For the laparoscopically repaired diaphragmatic injuries, 3 defects were repaired using ePTFE. The mean operative time was 145 minutes (range, 55-200), mean estimated blood loss was 110 cc (range, 30-500), and postoperative length of stay was 5 days (range, 2-12). There were no intraoperative complications, but 3 patients developed pulmonary complications (atelectasis/pneumonia). Follow-up was available for 9 patients. There were no documented failures. Full recovery was presented in all patients. The chronic diaphragmatic hernias presented with abdominal pain (9/9), or vomiting (3/9).

Follow-up was available in 9 patients. There have been no documented failures. Full recovery was presented in all patients. The chronic diaphragmatic hernias presented with abdominal pain (9/9), or vomiting (3/9).

Conversion to laparotomy was required in 3 patients. For laparoscopic repair of diaphragmatic injuries, conversion was required in 1 patient (2%). There were no mortality or morbidity related to the procedure. Laparoscopic repair was performed in 3 patients and 2 patients required conversion. Conversion was required in 1 patient due to difficulty in repairing the diaphragmatic hernia. The conversion was successful and the patient was discharged without complications.

CONCLUSIONS:

- Laparoscopic repair of traumatic diaphragmatic hernias is feasible and can be performed with good outcomes.
- Conversion may be necessary in some cases due to difficulty in repairing the diaphragmatic hernia.
- Laparoscopic repair is associated with a low incidence of complications and a short hospital stay.

LAPAROSCOPIC ULTRASOUND IS CAPABLE OF REPLACING OPERATIVE CHOLANGIOGRAPHY

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

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

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

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

CONCLUSIONS: LUS had a higher success rate of bile duct visualisation than IOC & was a more accurate & sensitive method of detecting CBDS. LUS is comparable to IOC in detecting the size/number of the ductal stones. LUS is therefore a satisfactory alternative to cholangiography in the detection of bile duct stones.
INCIDENCE AND SURGICAL MANAGEMENT OF MIRIZZI SYNDROME DURING LAPAROSCOPIC CHOLECYSTECTOMY

Markus Schäfer1,2, M.D., Roger Schneider1, Lukas Krähenbühl1, M.D., SALTS Group1 and Dep. of Visceral and Transplantation Surgery, University of Zürich, Zürich, Switzerland.

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

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

Among 13,023 laparoscopic cholecystectomies in 39 cases (14 males, 25 females, mean age 61 years) a MS has been found (incidence 0.3%). Whereas 35 patients revealed a type 1 (85%), the rarer type 2 had a type 2 (15%). A gallbladder carcinoma was detected in 4 patients only in type 1 (incidence 10.3%). No significant difference was observed in age, sex preoperative symptoms and laboratory findings between patients with type 1 or type 2. Eleven patients underwent laparoscopic cholecystectomy only, 27 cases were converted to an open approach (71%), mostly including intraoperative cholangiography and open bile duct exploration. One patient had a primary open approach. In 3 patients with a type 2 a hepatico-jejunoscopy was performed, while the remaining 3 patients received simple closure and drainage (T-tube) of the biliary fistula. The overall complication rate (intra- and postoperative complications) was 20.5%. There was no death.

Although the Mirizzi syndrome represents an uncommon entity, it must be recognized intraoperatively by laparoscopic surgeons.

Conversion to an open approach was needed in 71% of all cases for patient’s safety. In contrast to series in the literature, the coincidence of gallbladder cancer was low.

THE DEGREE OF BILIARY REFLUX IN PATIENTS WITH COMMON BILE DUCT STONES AND AFTER ENDOSCOPIC SPHINCTOROTOMY

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

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

METHODS: 0.5 mls of bile aspirate obtained during cystic duct cannulation of 56 patients undergoing laparoscopic cholecystectomy +/- ductal exploration were analysed to determine the degree of reflux in each sample reflected by the activity levels of chymotrypsin,lipase & amylose. The enzymatic content of the bile was determined & comparisons made between the following 5 patient groups: a) existing evidence of previous/current CBDS(n=14); b)jaundice/colic + previous CBDS(n=7); c)pancreatitis + previous CBDS(n=7); d)current ductal stones(n=23) & e)patients who had undergone a previous ES(n=5).

RESULTS: Patients with no previous history of CBD & those with a history of previous CBDS presenting with jaundice/colic had negligible amounts of all three enzymes.Patients with current CBDS had a mild elevation of amylose & trypsin levels(4.1 & 2.2 activity units),whereas the levels of amylose and trypsin in those who had undergone ES were moderately elevated(8.5 & 10.4 activity units: p<0.05).In contrast, patients who had a history of pancreatitis and previous ductal stones had a significant elevation of amylose, trypsin and chymotrypsin levels(136.6,156.8 &66 activity units:p<0.001).

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

LAPAROSCOPIC RADIOFREQUENCY OF HEPATOCELLULAR CARCINOMA WITH CIRRHOSIS

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The laparoscopic approach to radiofrequency interstitial thermal ablation (RITA) of hepatocellular carcinoma (HCC) with intraoperative ultrasound guidance was proposed with the aim of obtaining additional information for a neoplastic staging and effective treatment of the HCC in patients with a difficult percutaneous approach. Between December 1997 and June 2001, we enrolled 79 patients with HCC. Sixty patients had cirrhosis due to hepatitis C, 9 due to hepatitis B and the remaining 10 had an alcoholic cirrhosis. The Child-Pugh class was A in 47 cases, B in 23 and C in only 1. Forty-six patients had a solitary lesion, 26 had two lesions and 7 had three lesions. The mean diameter of the tumours was 29+-11 (range: 10-50 mm). Diagnostic work-up with extracorporeal US and spiral CT was used. A power-color-doppler system (Aloka SSD 1700, Aloka Co. Ltd., Tokyo, Japan) with a flexible LUS probe was used for ultrasound examination. The device for RITA consisted of a 100-W, 500 kHz monopolar RITA generator (CC-1, Radiomics, Burlington, Mass). Twenty-five per cent of the cases revealed new malignant HCC. A total of 109 lesions were treated by RITA: the mean operative time was 78.5+-22 min. There was no operative mortality. Operative morbidity was: a) hemoperitoneum from a trocar access in a hematoma at the trocar sites in 13 cases, 2 transient episodes of acute encephalopathy, and, in 3 other cases, a mild ascites well-controlled by diuretics. The mean hospital stay was 3.4+-1.8 days. The mean follow-up was 14+-12 months. At spiral CT, a complete response with a 100% necrosis was achieved in 64 out of 75 patients examined (85%). The 3-years actuarial survival curve was 70%. Laparoscopic RITA may be proposed in selected cases as those with lesions adjacent to important structures or difficult to access percutaneously. In patients with multiple tumours where additional malignant nodules are more prone to be detected by intraoperative ultrasound and treated in the same session.

Hepatobiliary Surgery–S065

HAND-ASSISTED LAPAROSCOPIC SEGMENTECTOMY IN RECURRENT PYOGENIC CHOLANGITIS

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

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

Seven patients had the hand-assisted laparoscopic segmentectomy attempted. There were 6 female and 1 male of mean age 54.7 (26-69). Six patients (85.7%) could have the operation successfully performed. There was 1 open conversion due to bledng ductal stones located in the left lateral segment selected for hand-assisted laparoscopic segmentectomy. The remaining 5 patients recovered uneventfully and had no cholangitis attack upon a mean follow-up of 8.3 months.

This study demonstrates that preliminary results did confirm the feasibility and the potential advantage of hand-assisted laparoscopic segmentectomy in patients with RPC. Skill refinement and improvement of ancillary technology might further improve the results and this hand-assisting laparoscopic technique could be part of the armamentarium of a liver surgeon.
Hepatobiliary Surgery–S066

LAPAROSCOPIC CHOLECYSTECTOMY IN CIRRHOTIC PATIENTS

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

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

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

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

Hepatobiliary Surgery–S067*

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

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

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

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

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

Bariatric Surgery–S068

LAPAROSCOPIC GASTRIC BANDING FOR MASSIVE SUPER OBESITY

George Fielding Dr, George Hopkins Dr., Royal Brisbane and Wesley Hospitals, Brisbane, Australia

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

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

Five patients had an awake intubation and 6 patients were monitored overnight in ICU. There was no hospital mortality; 30 day mortality was 0. No pulmonary emboli or cardiac abnormalities. Five of the 6 bands removed had a previous gastric stapling. All were removed after 2 years. These 6 patients were converted to a BPDDS. Two patients were lost to follow-up after one year.

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

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

Bariatric Surgery–S069*

TWO-STAGE LAPAROSCOPIC BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH: AN ALTERNATIVE APPROACH TO SUPER-SUPER MORBID OBESITY

Christine A. Chu, M.D., Michel Gagner, M.D., Theresa Quinn, M.D., David C. Voellerling, M.D., John J. Feng, M.D., William B. Inabnet, M.D., Daniel Herron, M.D., Alfons Pomp, M.D., Department of Surgery, Minimally Invasive Surgery Center, Mount Sinai School of Medicine, New York, NY

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

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

Results: Four women and three men with an average age of 43 (30-64) were included in this cohort. At time of initial laparoscopic sleeve gastrectomy, the average weight was 406.9 lbs. with a BMI of 62.5. The average excess weight was 268.1 lbs. This operation resulted in an average (+-SD) 32.4+-5% excess weight loss. The average time interval between the two procedures was 202 days. The average BMI at time of the second procedure, laparoscopic duodeno-ileostomy, ileo-ileostomy, was 48.0. At 3 weeks follow-up, 5 out of 7 patients had an average weight of 289.2 lbs. and a BMI of 44.6. The total excess weight loss was 41.5+-9%. Three patients had a 3 months follow-up. Their average BMI was 40.5 with a total excess weight loss of 52.1+-11%. The average time for the two procedures was, respectively, 109 and 161 minutes. The total length of hospital stay was a mean of 6 days. There was minimal blood loss using the laparoscopic technique. There was no morbidity or mortality in this cohort.

Conclusion: Laparoscopic sleeve gastrectomy with interval laparoscopic duodeno-ileostomy, ileo-ileostomy is a safe and effective procedure. There is a drastic reduction in the morbidity and mortality using this approach compared with our historical cohort. A two-stage laparoscopic BPDDS is an alternative to the traditional one-stage approach for selected patients with super-super morbid obesity.
Bariatric Surgery-S070*

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

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We reviewed our experience with complications following LRYGB that were managed laparoscopically. A total of 246 morbidly obese patients (mean BMI: 50.9 kg/m²) underwent LRYGB by three surgeons in two institutions. Mortality was 1.3%, 26 patients (10.6%) developed 28 complications that required surgical exploration. Two patients underwent a negative laparoscopy to rule out anastomotic leak.

<table>
<thead>
<tr>
<th>Total</th>
<th>Open</th>
<th>Lap</th>
<th>Endo*</th>
<th>Non-operative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel obstruction</td>
<td>18 (7.3%)</td>
<td>1</td>
<td>14</td>
<td>N/A</td>
</tr>
<tr>
<td>Gastrojejunoanostomy stricture</td>
<td>8 (3.2%)</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Bleeding ( staple line/ulcer)</td>
<td>10 (4%)</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Acute cholecystitis</td>
<td>5 (2%)</td>
<td>0</td>
<td>5</td>
<td>N/A</td>
</tr>
<tr>
<td>Gastric remnant perforation</td>
<td>2 (0.8%)</td>
<td>1</td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>Iatrogenic perforation</td>
<td>1 (0.4%)</td>
<td>0</td>
<td>1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Laparoscopic management: Endoscopic management**

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

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

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Bariatric Surgery-S072

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

N Shepard, M.D., Mike Cronan, R.T., Scott Bradley, M.D., Bruce M. Wolfe, M.D., Dept of Surgery, University of California, Davis, Medical Center, Sacramento, California.

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

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

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

PP and RT are independent factors for reduction of femoral venous flow. The combination of PP/RT further reduces femoral venous flow. In morbidly obese patients, SCD increased femoral venous flow during PP by 30% and during PP/RT by 40% in the laparoscopic group and during RT by 20% in the open group, but did not return flow to baseline levels.

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Bariatric Surgery-S071*

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

Elizabeth C. Hamilton, M.D., Thomas L. Sims, B.S., Daniel B. Jones, M.D., David A. Provost, M.D. Southwestern Center for Minimally Invasive Surgery, UT Southwestern Medical Center, Dallas, Texas.

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

Methods. We prospectively analyzed 56 patients undergoing LRYGB between June and August of 2001. Clinical data from this cohort were compared to data collected from 115 patients with documented anastomotic leaks among 234 LRYGB performed at this institution. Clinical indicators were analyzed to determine the sensitivity, specificity, accuracy, and positive and negative predictive values of each in identifying leaks.

Results. Mean patient age was 41 (25-65) years old and mean body mass index was 48 kg/m² (38-62).

<table>
<thead>
<tr>
<th>Clinical Indicator</th>
<th>Sens.</th>
<th>Spec.</th>
<th>Acc.</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory distress</td>
<td>67%</td>
<td>84%</td>
<td>83%</td>
<td>14%</td>
<td>98%</td>
</tr>
<tr>
<td>SBP &lt; 100 mm Hg</td>
<td>22%</td>
<td>80%</td>
<td>78%</td>
<td>4%</td>
<td>97%</td>
</tr>
<tr>
<td>HR &gt; 120 BPM</td>
<td>89%</td>
<td>89%</td>
<td>89%</td>
<td>25%</td>
<td>99%</td>
</tr>
<tr>
<td>Pos. Contrast Study</td>
<td>22%</td>
<td>100%</td>
<td>97%</td>
<td>90%</td>
<td>97%</td>
</tr>
<tr>
<td>Temp &gt; 38.5 °C</td>
<td>0%</td>
<td>82%</td>
<td>79%</td>
<td>0%</td>
<td>95%</td>
</tr>
</tbody>
</table>

Of the 56 prospectively evaluated patients without leaks, 11% were tachycardic (HR > 120) and 16% were febrile (temperature ≥ 38.5°C). None of the patients with leaks were febrile, and hypotension was infrequent.

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

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Bariatric Surgery-S073*

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

Daniel J. Scott, MD, Leonardo Villagrasa, MD, Thomas L. Sims, BS, Elizabeth C. Hamilton, MD, David A. Provost, MD, Daniel B. Jones, MD, Southwestern Center for Minimally Invasive Surgery, University of Texas Southwestern Medical Center, Dallas, Texas.

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

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

<table>
<thead>
<tr>
<th>Stones (n=14)</th>
<th>No Stones (n=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preop BMI (kg/m²)</td>
<td>48.2 ± 3.7</td>
</tr>
<tr>
<td>Follow-up Interval (months)</td>
<td>9.0 ± 0.9</td>
</tr>
<tr>
<td>Excess Weight Loss (%)</td>
<td>70.1 ± 23.1</td>
</tr>
<tr>
<td>Ursodiol Compliance (%)</td>
<td>63.2 ± 41.4</td>
</tr>
</tbody>
</table>

Of 52 patients found to be gallstone-free at the time of LRYGB, 14 (27%) patients developed gallstones; 4 of these 14 patients (29%) were symptomatic and required cholecystectomy. Ursodiol compliance in patients with symptomatic stones was 31% compared to 76% with asymptomatic stones (p = 0.03). Ursodiol side-effects were reported in 25% of patients. We conclude that ursodiol compliance is poor after LRYGB, and consequently may not prevent gallstone formation. However, ursodiol may decrease the incidence of symptoms in patients who develop gallstones.
CAN THE EFFECT OF GASTRIC BANDING BE PREDICTED BY AN INTRAGASTRIC BALLOON? Suzan van der Meij MD 1, Robert GJM Piek RPhD 1, M.P. Stutropen PBD 1, Lisbeth M of a small Vliegen MDPD 3, 1 Department of Surgery, Isala klinieken, locatie Weezenlanden, Zwolle, 2 Department of Gastro-enterology, Isala klinieken, locatie Weezenlanden, Zwolle, 3 Department of Gastro-enterology, Academic Medical Centre, Amsterdam

Objective: The most effective treatment for morbid adipositas with long term result is bariatric surgery. The clinical dilemma is the selection of patients, due to the fact that individual results cannot be predicted. To some extent the result of an intragastric balloon can predict the result of gastric banding a prospective study was started in 1999.

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

Results: In 38 patients (33 female, 5 male; age 37 (26-45)) an intragastric balloon was placed endoscopically. In 4 patients the balloon had to be removed prematurely due to complications. The average BMI of the 34 remaining patients decreased in 6 months from 46.7 to 40.5 (77% success).

Until now 26 patients have been operated for laparoscopic banding. Average hospital stay was 5 (3-8) days. During the average follow up of 8 (3-19) months 2 patients developed a pouch dilatation for which 1 had to be removed prematurely due to complications. The average BMI in the lapband group decreased from 40.5 to 35.7 (42 % success). None of the patients who did not lose sufficient weight with an intragastric balloon were successful in losing weight after bariatric surgery.

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

Bariatric Surgery–S076

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

OBJECTIVE: To review the technique and results of endoscopic dilatation for patients that developed gastroesophageal stricture after gastric bypass. METHODS AND PROCEDURES: A retrospective review of all dilations performed for patients developing anastomotic stricture after gastric bypass was done. All dilations were performed by the same physician. The dilations were standardized after the first few procedures. We found the scope balloon dilators (CRE, Boston Scientific/Miroinvasive) to be the best. If the stricture impedes a standard 9 mm gastroscope, a CRE 8,9,10 mm is initially used. Fluoroscopic Guidance is required if the balloon does not traverse the stricture freely. Occasionally, tight eccentric strictures require the use of a wire guided through the scope balloon system. The demographics of patients, the type of surgery, time when stricture appear and number of dilations were recorded. RESULTS: We reviewed 24 patients that required dilation (10% of total procedures) over 24 months period. Fourteen patients had an open surgery, 9 laparoscopic and 1 was a reoperation. Females were 83%; mean age was 38.6 and mean BMI was 51. Twenty-one strictures (86%) occurred within 3 months of the surgery and attempts to dilate them were done at 1, 3 and 6 month. All dilations were successful, with 65% patients requiring one dilatation and the rest between 2 to 3 procedures. No stricture was seen after 8 months of surgery. A dilatation up to 12 mm was done in patients requiring multiple procedures. CONCLUSIONS: Anastomotic strictures after gastric bypass is not unusual. Proper technique to dilate these strictures has not been reported. We had a 100% success using the scope balloon dilators technique. Most strictures appear during the first three months of surgery. The need for multiple procedures is minimized using our approach. Weight loss is maintained in patients presenting this problem.

Bariatric Surgery–S074*

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

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

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

RESULTS: Mean pouch volume for laparoscopic procedures was 14.9cc vs. 27.3cc for open bypass patients. This was statistically significant. The mean gastro-jejunal anastomotic area of the laparoscopic Roux-en-Y bypass patients was 28.27cm3 compared to 40.84cm3 for the open group. This was also statistically significant.

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

GERD/Achalasia/Gastric–S081

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

In Chile gastric cancer (G.C.) is the first cause of death in male sex. The present incidence of mortality in Chile is 18.7 per 100,000 people in the 65-74 year age group. It is the most frequent of the neoplasms. G.C. It was introduced. A complete visual and surgical exploration of the tissue diagnosis. Patients discharged from the study were, patients with T1 and T2 or carcinomatosis or multiple hepatic metastasis. Submitted by laparoscopic staging, patients with T3, T4 and patients with less than 4 hepatic metastasis.

RESULTS: From year 1993 through 2000 we have incorporated to this protocol a total of 91 patients of a total of 579 treated patients with G.C. The laparoscopic staging for the primary tumor (T) showed T3 a sensitivity of 73.04 % whereas with TAC / U.S. it was of a 28.21%. For T4 the sensitivity of the laparoscopy was of 68.75 % and with TAC/US of a 21,88%. The hepatic metastasis detected by laparoscopy gave sensitivity of a 99.47% whereas with TAC/US was of 11.58%. Finally the sensitivity of the laparoscopy for peritoneal carcinomatosis was of 81.82% and 22.73% with TAC/US. All this I determine a 48% of less exploratory laparotomy, helped on changing the surgery strategy on 30% of the cases and changed TNM on 92%. DISCUSSION: Laparoscopic staging is an excellent diagnostic tool for the preoperative evaluation in patients with G.C. sensitivity is superior to the TAC/US and help to reduce hospital costs and outcome for patients.

Underline denotes presenter. * denotes resident paper.

http://www.8thworldcongress.org/
Lap. Surgery in Adults & Children–S084

POSTNATAL OUTCOME FOLLOWING MATERNAL SURGERY DURING PREGNANCY

Sebastian G. de la Fuente, M.D., J. Greenfeld, M.D., C. Cosentino, M.D., Department of Surgery, University of Arizona Affiliated Hospitals, Tucson, Arizona.

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

Methods: Time-dated pregnant guinea pigs (bred in-house) were randomly assigned to one of three treatment groups: CO2 pneumoperitoneum (P); laparotomy (L); or control (C). Surgeries were performed under isoflurane anesthesia on gestational day 45 (term 68 days). In group P, the abdomen was insufflated with CO2 for 45 min at 7 mm Hg pressure. For group L, a 5 cm midline abdominal incision was made and kept open for 45 min. Entry points were then closed in layers and animals recovered from anesthesia. Each guinea pig was allowed to deliver without further intervention. On postnatal day 10, behavior was assessed by monitoring locomotor and exploratory activity of each offspring in a 1 x 1 m chamber demarcated into 100 squares. Animals were videotaped in the chamber for 80 min and then each recording was scored for number of squares traveled. In addition, vocalization and exploratory activity level were scored on a three-point scale (low, moderate, high). All scoring was completed by observers unaware of the treatment group.

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

Lap. Surgery in Adults & Children–S085

MINIMALLY INVASIVE SURGERY IN NEONATES: THE FIRST DECADE’S EXPERIENCE

Steven S Rothenberg, M.D., The Hospital For Infants and Children, Denver, Colorado.

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

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

Operative time ranged from 8 minutes (pyloromyotomy) to 210 minutes (colon pull-through). Time for the laparoscopic procedure was .85. The Operative complication rate was 2.1%.

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

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

INTRA-ABDOMINAL ABSCESS FOLLOWING LAPAROSCOPIC SPARING DISTAL GASTRECTOMY, G-TUBE PLACEMENT AND OPEN APPENDICETOMY IN THE PEDIATRIC POPULATION

R. McKinlay, M.D., S. Neelam, M.D., K. Stevens, M.D., D. Coulter, B.S., M. Ghyory, M.D., J. Greenfeld, M.D., C. Cosentino, M.D., Department of Surgery, University of Arizona Affiliated Hospitals, Tucson, Arizona.

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

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

Results: Of the 350 patients undergoing appendectomy, 204 were completed laparoscopically (58.6%) and 146 were performed open (41.4%). Only one laparoscopic appendectomy was converted to an open procedure (0.2%). Thirty-five patients were lost to follow-up and were excluded from review regarding abscess formation. There were 16 intra-abdominal abscesses, 10 in the open group and 6 in the laparoscopic group. The incidence of IAA for LA overall was 3.2% (6/197), and the incidence for OA overall was 7.9% (10/127) (p<0.07). The incidence of IAA following LA for perforated appendicitis was 6.5% (3/46), and the incidence of IAA following OA for perforated appendicitis was 7.1% (4/52) (p<0.02). For acute appendicitis, the incidence of IAA in the laparoscopic group was 2.5% (3/130) and in the open group was 7.1% (4/56) (p<0.02). The incidence of IAA in the laparoscopic group was 2.5% (3/130) and in the open group was 7.1% (4/56) (p<0.02).

Conclusions: This study demonstrates in a large pediatric population no statistically significant difference in the rate of intra-abdominal abscess formation following laparoscopic and open appendectomy. Laparoscopic appendectomy can be performed for perforated appendicitis without increasing the risk of infra-abdominal abscesses.
**Lap. Surgery in Adults & Children-S088**

**PEDIATRIC LAPAROSCOPIC APPENDECTOMY FOR ACUTE APPEN- DICITIS: A COST ANALYSIS**

*Ashley H. Vernon, MD, Keith E. Georgeson, MD, Carroll M. Harmon, MD, PhD Division of Pediatric Surgery, Department of Surgery, University of Alabama at Birmingham, Birmingham, Alabama*

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

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

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

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

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**Lap. Surgery in Adults & Children-S089**

**MANAGEMENT OF PERIAPPENDICEAL ABSCESS: THE ROLE OF LAPAROSCOPIC INTERVAL APPENDECTOMY**

*Michael Clar, MD, Tom Paluch, MD, Department of Surgery, Kaiser Foundation Medication Center, San Diego, California*

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

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**Lap. Surgery in Adults & Children-S090**

**LAPAROSCOPIC VERSUS OPEN APPENDECTOMY: PROSPECTIVE RANDOMIZED STUDY OF 227 PATIENTS**

*Mohamed Mostafa Marzouk M.D., Ayman A. Abdrabuh, A.F. Abadeer, Department of Surgery, Saudi German Hospital Group - Jeddah, Saudi Arabia*

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

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

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

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

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**Lap. Surgery in Adults & Children-S091**

**THERAPEUTIC LAPAROSCOPY IN ABDOMINAL TRAUMA.**

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

Laparoscopy was applied for 48 hemodynamically stable patients with suspicious abdominal injuries between February 1998 and January 2001. The age ranged from 15 to 79(mean 40) years. 30 were male and 18 were female. Preoperative evaluation with enhanced abdominal CT revealed some significant injuries in all cases. The laparoscopic procedures were done in the operating room under general anesthesia. Mechanism of injury was blunt trauma(36) and stab wound(12). On the basis of laparoscopic finding, therapeutic laparoscopy(totally laparoscopic, laparoscopic-assisted or hand-assisted ) was done in all cases(100%) for gastric wall repair(8), small bowel repair and resection(17), colon repair and resection(11), Hartmann's procedure and colostomy(6), distal pancreatectomy(3), splenectomy(2) and etc(3). For bowel resection and distal pancreatectomy, laparoscopic-assisted(6) and hand-assisted(3) procedures were applied.

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

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

Michael J McMahon, PhD, George Delibaltadakis, Nikolaos Georgopoulos
Academic Unit of Surgery, University of Leeds, United Kingdom

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

Methods: The PRS was administered prospectively to patients undergoing contemporaneous lap and open radical nephrectomy (with organ-conserving resection) from January 2006 to September 2008. ADL was assessed using the SF-36 questionnaire and designed to assess pain, ADL, and HRQOL in post-operative patients.

Results: Seventeen open (12 donor nephrectomy, 5 radical nephrectomy) and 25 lap (22 donor nephrectomy, 3 radical nephrectomy) patients had 3-month follow-up data. Patients were comparable in age (36.9 vs. 40.1), gender (8 vs. 14 females), BMI (27.9 vs. 26.5), and extraction incision size (7.2 vs. 7.4 cm). Operative time was longer in the lap (231 vs. 160 minutes, p<0.001), but hospital stay was shorter (median 3 days vs. 5 days, p=0.010). HRQOL scores were consistently higher for lap patients from post-op day 3 to 90 (ANOVA F(7,26)=2.734, p=0.10). Lap patients recovered faster than open patients; median time to return to 75% of pre-op score was 90 vs. 42 days for open and lap patients (log rank, p=0.0245).

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

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

Donor Nephrectomy-S094*

LAPAROSCOPIC VERSUS OPEN DONOR NEPHRECTOMY: A COST-UTILITY ANALYSIS

Kenneth T. Pace, MD, MSc, Sarah J. Dyer, MSc, Veronique Phan, MD, MSc, Robert Stewart, MD, R. John Honey, MD, Eric C. Poulin, MD, MSc, Christopher M. Schlachta, MD, and Joseph Mamazza, MD, Divisions of Minimally Invasive Surgery and Urology, St. Michael's Hospital, University of Toronto, Toronto, Canada

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

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

Results: LapDN costs are higher ($10,317.40 vs. $9,853.70), while quality of life (QOL) is superior (0.7883 vs. 0.7062). ICER was $7,471.11/QALY, ranging from LapDN dominant (lower cost and greater QOL) in best-case scenarios ($34,177.70/DQALY) (worse-case). The model was sensitive to in-patient costs, probability of not returning to work post-operatively, and model length. For these variables, the ICER varied from LapDN dominant to $34,765.03/QALY.

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

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

Donor Nephrectomy-S095*

A STUDY TO COMPARE STANDARD OPEN NEPHRECTOMY, LAPAROSCOPIC NEPHRECTOMY AND HAND-ASSISTED LAPAROSCOPIC LIVE-DONOR NEPHRECTOMY


Introduction: Minimally invasive live-donor nephrectomy is reported to promote donor organ donation through an accelerated recovery with reduced pain and length of hospital stay (LOS) compared to the open operation. However, the risks are not fully established. The hand-assist technique (HA) may hold advantages over the standard laparoscopic technique (LAP) including a greater margin of safety, reduction of operative time and costs. We compared the outcome of donor and graft in live donor nephrectomies for standard open (ODN), LAP or HA. Methods: Records of 125 live donor nephrectomies were examined: ODN in 50 patients, LAP in 40, HA in 35. Conversion from ODN to LAP or HA was required in 3 LAP and 1 HA cases. Outcome measurements included donor operative time (OT), donor LOS, cost of donor hospitalization, recipient urine output (UO) on day 1 and 2, recipient creatinine (CR) and recipient complications. Results: For all groups, donor and recipient age was similar. Donor weight was less in ODN (156.5 lbs) than in LAP and HA (167.1 and 168.3 lbs). Early graft function with LAP and HA, measured by UO and CR, were equivalent to ODN. By 6 weeks, graft function was excellent in all groups. OT was shorter in ODN compared with either LAP or HA (p<0.001). LAP and HA was associated with reduced hospital LOS (p<0.001) but both were associated with a trend toward greater hospital LOS compared with ODN. Surgical complications for ODN included ARF, wound infection, thrombosis, urine leak (n=2); for LAP graft thrombosis, splenic laceration, hydrenephrosis; for HA urine leak, lymphocele. Conclusions: Minimally invasive live donor nephrectomy using LAP or HA results in excellent early renal function with a favorable safety profile. Occurrence of urine leak post transplant was not increased using either LAP or HA. Hospital LOS was significantly reduced in both LAP and HA compared with ODN. We conclude that LAP and HA offer effective and safe minimally invasive alternatives to ODN.

Source of funding: Departmental and Biomedical Research Grant from the Kidney Foundation of Canada.
**Donor Nephrectomy–S096**

**IS HAND ASSISTED LAPAROSCOPIC DONOR NEPHRECTOMY A PROHIBITIVE EXPENSE OR A USEFUL TOOL?** Joseph F. Buell MD, Michael D. Feuerstein, MD, Wolfgang Erhardt, MD, Georg Bischof, MD, Rudolf Steiniger, MD, Jörg R. Siewert, MD  
Institut für Experimentelle Onkologie und Therapieforschung, Klinikum rechts der Isar, TU München, Munich, Germany; Universitätssklinik für Chirurgie, University of Vienna, Vienna, Austria

**Background:** Laparoscopic donor-nephrectomy decreases disincentives to donation frequently associated with the disadvantages of open surgery. However, concerns have been raised regarding graft quality, since the incidence of delayed graft function is higher when compared with the results of open harvested kidneys. This may be caused by amelioration of kidney perfusion due to the elevated intraabdominal pressure and due to a mechanically induced renal angiospasm during donation. This study was adressed to reveal if the renal periarterial application of papaverine may enable enhanced renal blood flow during laparoscopic nephrectomy.

**Materials and methods:** Twelve male piglets underwent left laparoscopic donor-nephrectomy after laparoscopic clipping of the right renal vessels and ureter. Urine output and creatinine-clearance were determined as indirect indicators of renal blood flow. In the treatment group (n=8) papaverine-hydrochloride was administered to the tissue surrounding the renal artery prior to the preparation of the vessels and results were compared with controls (n=6). Free sodium-excretion was measured to preclude prerenal failure.

**Results:** The group control mean urine output per minute was 0.35 ± 0.2 ml and mean creatinine-clearance was 0.95 ± 0.1 ml/min/kg. In pigs treated with papaverine mean urine output per minute was 2.35 ± 0.2 ml and mean creatinine-clearance was 2.22 ± 0.5 ml/min/kg. The differences were significant (p=0.011, urine output; p=0.038, creatinine clearance).

**Conclusions:** Papaverine improves renal function during laparoscopic kidney harvest when applied at the vicinity of the renal artery prior to vascular preparation. Obviously, this technique increases renal blood flow, which is impaired by capnoperitoneum, and protects against mechanically induced angiospasm. Further studies are needed to show, if melioration of kidney function during donation is followed by improved early postoperative graft function.

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**Donor Nephrectomy–S097**

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

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

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

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

**RESULTS:** Data reported as mean ± standard error.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>LAPAROSCOPIC (n=117)</th>
<th>HAND-ASSISTED (n=81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating time (min)</td>
<td>257 ± 8</td>
<td>211 ± 7</td>
</tr>
<tr>
<td>Blood loss (ml)</td>
<td>288 ± 33</td>
<td>122 ± 17</td>
</tr>
<tr>
<td>Marked renal vascular bleed</td>
<td>5.1%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Conversion to open</td>
<td>3.4%</td>
<td>0%</td>
</tr>
<tr>
<td>Warm ischemia time (sec)</td>
<td>257 ± 8</td>
<td>106 ± 6</td>
</tr>
<tr>
<td>Hospital stay (days)</td>
<td>2.4 ± 0.1</td>
<td>3.0 ± 0.1</td>
</tr>
<tr>
<td>30-day graft survival</td>
<td>94%</td>
<td>95%</td>
</tr>
<tr>
<td>Median 30-day creatinine (mg/dl)</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Lymphocele</td>
<td>13.4%</td>
<td>0%</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>6.6%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Acute tubular necrosis</td>
<td>6.6%</td>
<td>7.3%</td>
</tr>
</tbody>
</table>

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

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Underline denotes presenter. * denotes resident paper. http://www.8thworldcongress.org/
Colorectal Techniques & Outcomes–S099

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

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

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

[Results] Sites of tumour was distributed in the caecum: 50 (12%), ascending: 73 (18%), transverse: 67 (16%), descending: 22 (5%), sigmoid: 135 (32%) and the rectum: 70 (17%). As for the local invasion, there were 122 (29%) pTis, 135 (32%) pT2, 87 (21%) pT3 and 3 (1%) pT4 tumours. Dukes’ staging identified 298 patients (71%) for Dukes’ A, 84 (13%) for B, 57 (14%) for C and 7 (2%) for Dukes’ C. Postoperative complications included wound sepsis in 19 patients (4.6%), anastomotic leakage in 15 (3.6%) and bowel obstruction in 10 (2.4%). Twelve patients developed recurrences (liver: 5, peritoneum: 3, local: 4). The 5-year survival rate was 98.5% for Dukes’ A, 100% for Dukes’ B and 85.3% for Dukes’ C.

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

Colorectal Techniques & Outcomes–S100

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

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

PATIENTS & METHODS: The data were collected within the framework of a prospective multicentre observational study that has been ongoing since Aug 1, 1995 including 42 hospitals. Out of a total of 2383 patients, 863 (25%) underwent a curative resection for colorectal carcinoma.

RESULTS: The patients’ average age was 67.9 years, the sex distribution almost 1:1. UICC staging of tumours (stages I, II and III) revealed the following figures: 243/37.3%, 203/30.6% and 213/32.1%. In the majority of the cases, an oncologically radical resection was performed. The mean distance of the tumor from the anal verge was 9.5 cm (range: 1 cm to 21 cm). Eleven patients had perforation of the tumour. A mean of 1.2 lymph nodes were resected in the specimen. 10.8 lymph nodes were resected in the specimen.

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

Colorectal Techniques & Outcomes–S101

LAPAROSCOPIC TOTAL MESORECTAL EXCISION FOR RECTAL CANCER. Joel Leroy, MD; Michelle K Smith, MD; Faek Jamali, MD; Lael Fonken, MD; Francesco Rispoli, MD; Jacques Fleurescu; Hubert Huber, MD. Hospitals Universitaires de Strasbourg, EITS/IRCAD, Strasbourg, France

Objective: Total mesorectal excision (TME) for the treatment of rectal cancer has been reported by multi-center studies to improve local control and survival rates. Despite these concerns, laparoscopic procedures are increasingly being performed for colorectal cancer. We present our series of laparoscopic TME performed for rectal cancer.

Methods: Between November, 1991, until September, 2001, prospective data was accrued on 112 consecutive patients undergoing laparoscopic TME for rectal cancer performed for cure or palliation. The operations were all performed by the same surgeon. The mean age was 67 years (range 28 – 84). All tumor stages were included in the study (T0 – T4) although the majority of the patients were TNM stage II or higher (81%). 48 patients received preoperative radiotherapy.

RESULTS: The mean distance of the tumor from the anal verge was 9 cm. Results: TME was successfully performed laparoscopically in 97% of the patients. Mean operative time was 202 minutes. An average of 8 lymph nodes were resected per case. Margin of resection (proximal or distal) was 3.4 cm. Postoperative anastomotic leaks occurred in 16.7% of cases; 6% requiring intervention. There were 2 (1.9%) peri-operative deaths. Mean follow-up was 3 years (0.1 – 8.5 years). Local recurrence rate was 7%. Cancer-specific survival and overall survival rates at five years were 75% and 65% respectively for patients resected with curative attempt. Conclusion: Laparoscopic total mesorectal excision for rectal cancer performed by an experienced laparoscopic surgeon is a safe and technically feasible operation. Overall complication and survival rates compare favorably to those of conventional open TME procedures. Based on our study, we propose that the laparoscopic approach for TME dissection may actually improve and aid in standardization of the technique by allowing the surgeon to perform a more precise dissection of the pelvic planes under the direct visualization and magnification of the endoscope.

Colorectal Techniques & Outcomes–S102

TRANSANAL ENDOSCOPIC MICROSURGERY IN THE TREATMENT OF SELECT RECTAL CANCERS OR SUSPICIOUS RECTAL TUMORS. John H Marks, M.D., Gerald J. Marks, M.D., Christine Marchioni, B.A.; Lankenau Institute for Medical Research, Wynnewood, Pennsylvania.

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

RESULTS: 43 patients with rectal cancer or tumors with a high likelihood of malignancy are the subject of this study. Of the 24 men and 19 women there were 2 groups: known cancer: n=16; patients with suspicious lesions: n=27. The operations were performed by the same surgeon. The mean age of the patients was 62.2 years (range: 21 – 91). The mean distance of the tumor from the anal verge was 3.5 cm (range: 1 cm to 21 cm). Eleven known rectal cancer patients were treated with preoperative radiation or preoperative chemoradiation. Twenty-two patients would have received an abdominal perineal resection (APR) by ordinary standards; 14 patients would have qualified for abdominal sphincter-preserving operations; and 7 patients were indeterminate. Full thickness excisions were done; disk: n=2; hemi-circumferential: n=19; and sleeve resection: n=1. Ages ranged from 30 to 91 years (avg. 66.7). RESULTS: 90% avoided a major abdominal operation (39/43). 90% avoided an APR (20/22). Mortality: n=0; morbidity 9/43: minor wound separation: n=6; major wound separation: n=3; 2 of which were rectovaginal fistulas (91 year old patient presented with fistula and a 77 year old patient presented with a previously irradiated and incompletely excised cancer). A single instance of locally recurrent cancer required an APR. There were no other recurrences. Overall 3 patients required a stoma.

CONCLUSION: TEM promises to offer a safe and effective option in the selective treatment of patients with known or suspected rectal cancer with or without preoperative radiation or chemoradiation by reducing the need for major abdomin surgery and colostomy.
**Colorectal Techniques & Outcomes–S103**

**IS LAPAROSCOPIC SURGERY ACTUALLY LESS INVASIVE THAN CLASSICAL OPEN SURGERY? -QUANTITATING PHYSICAL ACTIVITY USING AN ACCELEROMETER AS THE CONDITION OF CONVALESCENCE**

Y. Inoue MD, T. Kimura MD, S. Fujita MD, H. Noro MD, F. Uchikoshi MD, T. Itoh MD, E. Taniguchi MD, S. Ohashi MD, H. Matsuda MD Department of surgery, Osaka University Graduate School of Medicine, and department of surgery, Osaka Central Hospital

**PURPOSE**

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

**MATERIALS AND METHODS**

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

**RESULTS**

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

**CONCLUSION**

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

**Colorectal Techniques & Outcomes–S104**

**LOCAL EXCISION OF RECTAL CANCER BY TRANSDURAL ENDOSCOPIC MICROSURGERY (TEM): 10 YEARS EXPERIENCE.**

Mario Guerini, M.D., Francesco Feliciotti, M.D., Alessandro M. Paganini, M.D., Pamela Zerboni M.D., Francesco Crista, M.D., Emanuele Laccone, M.D., Istituto di Scienze Chirurgiche, University of Ancona, Ancona, Italy; *II Clinica Chirurgica, Università La Sapienza, Roma, Italy.

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

A group of 114 patients with extraperitoneal rectal carcinoma underwent preoperative radiotherapy (5,040 cGy) after transdural resection. The indications were: >75 years old, high risk patients and patients who refused abdomino perineal resections. The histological findings were: 26 T1 lesions (22.8%), 55 T2 lesions (49.1%) and 17 T3 lesions (14.9%). In the 13.2% of the patients, the pathologist did not find cancer cells in the resected specimen (15 T0). No operative complications were observed and no perioperative mortality was reported. Postoperative pain was mild and oral intake began after two-three days.

The results were as follow: major complications (1.7%), recto-vaginal fistula that required reoperation and 1 recto-urethral fistula treated by conservative therapy, 11 minor complications (5.6%) consisting of 7 leaking suture, 3 cases of stenosis incontinence and 1 rectal haemorrhage that resolved by medical therapy. Mean hospital stay was 5 days (range 3-10). Long follow-up was 48 months (range 6-114 months). Local recurrences were observed in 7 (6.5%) patients: 5 patients were successfully reoperated by TEM (one), anterior resection (2) and abdomino perineal resection (2), the other two patients were high risk for major surgery and underwent radiotherapy. The cancer-related survival in T0 and T1 patients was 100%.

The cancer-related survival of T2 and T3 patients was 81% and 62.1% respectively. Transdural endoscopic microsurgery (TEM), combined with full-dose preoperative radiotherapy allows to perform minimally invasive full-thickness exrectal resection of rectal cancer with full-thickness perirectal fat dissection. This approach is feasible and safe and current follow-up appears to be effective. Randomized clinical trials will be necessary to confirm our preliminary results.

**Foregut–S105**

**DOES LAPAROSCOPIC ANTI-REFLUX SURGERY PREVENT OCCURRENCE OF TRANSIENT LOWER ESOPHAGEAL SPHINCTER RELAXATION?**

F. Bahmeriz MD, M. Mirza MD, M. Anvari MB BS PhD, C. J. Allen MB Ch, C. Gill Potter BSC, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

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

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

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

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

<table>
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<tr>
<th>Group</th>
<th>Acid Reflux pH &lt;4</th>
<th>Basal LES Pressure (mm Hg)</th>
<th>Nadir LES Pressure (mmHg)</th>
<th># TLESR with nadir&lt;2 mm/patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7.53 ± 0.186</td>
<td>10.77 ± 0.62</td>
<td>0.85 ± 0.14</td>
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<tr>
<td>B</td>
<td>1.08 ± 0.259 *</td>
<td>19.18 ± 1.10</td>
<td>6.23 ± 0.49 *</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Data shown as mean ± se, *p<0.05

**Conclusion:** The number of TLESRs is reduced significantly by anti-reflux surgery. Even accounting for increased basal and nadir pressures, the incidence of transient relaxation of the LES is reduced suggesting that there may be additional mechanisms involved in this process.
SATURDAY  
March 16, 2002: Scientific Session Abstracts

**Foregut–S107***

REDUCING THE IMPACT OF POST-FUNDOPLICATION SYMPTOMS - LAPAROSCOPIC 90 DEGREE ANTERIOR FUNDOPLICATION

David J. Watson MD FRACS, Glyn G Jamieson MS FACS,FRACS, Richard Krysztopik MD FRCS, Peter G Devitt MD FRCS, FRACS, University of Adelaide Department of Surgery, Royal Adelaide Hospital, Adelaide, South Australia, AUSTRALIA

Introduction: Laparoscopic Nissen fundoplication is now the procedure of choice for the surgical treatment of gastro-esophageal reflux. However, it can be followed by an adverse outcome, including dysphagia and wind-related problems. To reduce the likelihood of this, we have progressively modified this procedure to an anterior 90-degree partial fundoplication.

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

Results: From February 1999 to June 2001, 97 patients underwent 90-degree anterior fundoplication. In 20 the procedure was chosen because of poor oesophageal peristalsis, including dysphagia and wind-related problems. To reduce the likelihood of this, we have progressively modified this procedure to an anterior 90-degree partial fundoplication.

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

**Foregut–S109***

COMPARISON OF PATIENT SATISFACTION WITH REDO VERSUS PRIMARY FUNDOPLICATION

Leena Khattan, M.D., Parul Bhatt, William Richards, M.D., Hugh Houston, M.D., Kenneth Sharp, M.D., Michael Holzman, M.D., Vanderbilt University Medical Center, Nashville, TN

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

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

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

**Foregut–S110***

REDEFINING GASTROESOPHAGEAL REFLUX: DETECTION USING MULTICHANNEL INTRALUMINAL IMPEDANCE TECHNOLOGY

Nagamangalam S. Balaji FRCS, Denis Biron MD, Tien R DeMaetser MD, Jeffrey H. Peters MD, University of Southern California, Los Angeles, CA

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

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

RESULTS: A total of 185 reflux events were characterized. Forty five percent (82) of these were non-acid detected by impedance changes only, 45% (86) of these were by both pH and impedance. 13% (25) of the total were associated acid events were detected by pH changes only. Pure liquid reflux was seen in 44% and a mixed liquid and gas in 51%. Reflux was classified as distal esophageal reflux in 28%, proximal esophageal reflux in 55% and the proximal esophageal reflux in 16%. An additional 43% gas reflux events were detected by impedance changes only and were predominantly non-acid.

CONCLUSION: Nearly one half (45%) of reflux events are undetected by pH studies. Furthermore, the majority (71%), are observed to reach the mid and proximal esophagus by impedance changes. The additional information provided by detection of reflux via ambulatory impedance studies is likely to have a major impact on the clinical management of patients with gastroesophageal reflux disease.
LAPAROSCOPIC ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFLUX DISEASE: EXPERIENCE WITH 668 CONSECUTIVE LAPAROSCOPIC ANTIREFLUX PROCEDURES

Frank Alexander Granderath MD, Ursula Maria Schweiger MD, Thomas Kamolz PhD, Heinz Wykypiel Jr. MD, Rudolph Pointner MD, Department of General Surgery, Hospital Zell am See, 5700 Zell am See, Austria; Department of General Surgery, University of Innsbruck, A-6020 Innsbruck, Austria

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

Patients and methods: Between September 1993 and July 2001, 668 laparoscopic antireflux procedures have been performed at the Department of General Surgery of the Hospital Zell am See. In 505 (75.6%) patients a laparoscopic 360° floppy Nissen fundoplication and in 163 (24.4%) patients with poor esophageal motility (<30 mmHg in the lower esophageal segments in response to wet swallows) or severely disordered peristalsis (>40% simultaneous contractions in wet swallows), a laparoscopic Toupet fundoplication has been performed.

Results: Overall morbidity was 7.5%. Conversion to open surgery was necessary in 32 patients (4.8%). In 39 of our own patients, a laparoscopic redo-procedure was necessary due to failed primary intervention. There was no mortality. For a mean follow-up period of 4.8 years (range 3 months to 94 months) 24-hour pH monitoring and esophageal manometry, quality of life (GIQLI) and analysis of failure were prospectively reviewed.

Results of 310 consecutive laparoscopic Nissen Fundoplications performed in a true outpatient setting follow-up.

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

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

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

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

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

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

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

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

Previous studies have shown that surgical repair of paraesophageal hernias is associated with a high recurrence rate. The recurrence rate has also been reported higher with a laparoscopic approach. We determined and reported our own recurrence rate of 10.6% in primary repairs with suture cruroplasty in 144 patients with a mean follow-up of 5 years.

Recently, it has been suggested that the use of a prosthetic material in laparoscopic paraesophageal hernia repair may result in a decreased recurrence rate. The purpose of this study was to review the results of our own experience with a mesh cruroplasty for large paraesophageal hernias, performed in 144 patients with a mean follow-up of 5 years.

Conclusion: The use of mesh reinforcement for large paraesophageal hernias can achieve good to excellent results at short- and mid-term follow-up. However, further follow-up and evaluation of the long-term results are necessary.

http://www.8thworldcongress.org/
The World of GI Surgery–S115*

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

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

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

Sixteen patients met these criteria. Mean age of the patients was 56 years (range 35-78). Operating time averaged 240 minutes (range 165-350), while mean blood loss was 576cc (range 100-1800). There were no conversions to an open procedure. Mean weight of extracted spleens was 2008g (range 843-4950). Histologic diagnoses included lymphoma(9), leukemia(3), primary hypersplenism(2), Gaucher’s disease(1) and Felty’s syndrome(1). Postoperatively, length of stay averaged 3.3 days (range 2-7). One patient (6.25%) had a complication; there was no mortality. That patient initially required removal of a small segment of the tail of the pancreas with the spleen, and then developed a small pancreatic leak and a subphrenic abscess.

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

The World of GI Surgery–S116

THREE YEARS EXPERIENCE IN LAPAROSCOPIC LIVER RESECTION. Cristiano G. S. Hutcher MD, Eldo Ermengildo Frazza MD, Carmine Napolitano MD, Francesco Crafa MD, Marco Luci e Achille Recher MD, Department of Surgery, Ospedale S. Giovanni, Roma, Italy and Loyola University Chicago, IL USA.

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

Between February 1998 and August 2000, 54 patients with liver tumor underwent laparoscopic liver resection. The indications for the operation were: hepatic carcinoma (HCC) 22, cholangiocarcinoma 1, colon metastasis 22, angiomia 2, hamartoma 1, cholangio adenoma 1, FNH 1, Caroli Disease 2, hydatid cyst, 2. Among the patients with HCC there were 8 Child A patients, with mild cirrhosis. The type of resection performed was segmentectomy 16, bisectionectomy 6, left hepatectomy 16, extended left hepatectomy 1, right hepatectomy 5, extended right hepatectomy 2. In two cases (4%), one segmentectomy and one bisectionectomy, the procedure was converted to open surgery. Pringle maneuver was performed in 21 patients with an average time of 44 min (range 20-80 min). There was no intra-operative mortality, but one patient died on the first postoperative day because of liver failure and coagulopathy. Postoperative morbidity rate in the malignancy group was 43 % including 9 pleural effusions and/or chest infections, 4 bile collection, and 4 hematomas of the trocar sites. Mean hospital stay was 10 days (range 2 to 25 days). The follow-up ranged 12-29 months (median follow-up 32 months). Of the 45 patients with malignancy, 22 patients are alive and disease-free, 9 are alive with recurrent disease, 8 died from recurrences of the primary, 5 died of other causes.

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

The World of GI Surgery–S117

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

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

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

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

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

The World of GI Surgery–S122*


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

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

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

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

LRFA+ LHAIP LRFA LHAIP P

<table>
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<td>Perioperative Complications</td>
<td>2(19%)</td>
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</table>

Solid Organ–S127*

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

Laparoscopic donor nephrectomy (LDN) has been shown to be a safe and effective option for renal procurement. Studies comparing open nephrectomy and hand-assisted LDN have emphasized decreased warm ischemia time (WIT) when compared with "pure" laparoscopic retrieval, however no data exist that define what constitutes a prolonged WIT in terms of recipient graft function. The aim of this paper was to use a large, single institution experience with LDN to determine if WIT correlates with recipient serum creatinine levels.

640 LDN's were performed from 3/96 to 9/01. WIT's were prospectively collected and were defined as the time from renal artery occlusion to immersion in iced saline. Serial recipient creatinine levels were measured at one week, one, three, six and twelve months from the transplant. Data were analyzed using Pearson correlation at a confidence interval of 95%. Mean WIT(seconds) was 151 with a standard error of 3.4 and ranged from 35 to 720. Recipient creatinine (mg/dl) mean at 1 week was 1.94 and ranged from 0.5 to 10.5. Recipient creatinine mean at 1 month was 1.68 and ranged from 0.6 to 8.5. Recipient creatinine mean at 3 months was 1.60 and ranged from 0.6 to 8.8.

Recipient creatinine mean at 6 months was 1.63 and ranged from 0.7 to 13.5. Recipient creatinine mean at 12 months was 1.70 and ranged from 0.7 to 22.4. No correlation was found between WIT and recipient creatinine levels at one week(p=0.4737),one month(p=0.9180), three months (p=0.6227), six months (p=0.8349) or twelve months (p=0.2835). WIT does not correlate with recipient graft function in LDN within the range of times studied. Shorter warm ischemia time associated with open donor nephrectomy and hand-assisted LDN does not necessarily offer a measurable advantage in recipient graft function. During extraction of the kidney, expedience to minimize WIT does not necessarily offer a measurable advantage in recipient graft function. During extraction of the kidney, expediency to minimize WIT does not necessarily offer a measurable advantage in recipient graft function. During extraction of the kidney, expediency to minimize WIT does not necessarily offer a measurable advantage in recipient graft function.
IMPACT OF REINAL ANATOMIC VARIATION ON LAPAROSCOPIC DONOR NEPHRECTOMY, John Macenas, M.D., Michael Edye, M.B.B.S., Devon John, M.D., Christine Ren, M.D., Mary Ann Hopkins, M.D., Thomas Diffo, M.D., Department of Surgery, Mount Sinai-NYU Health, New York University Medical Center, New York, NY.

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

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

Results: Thirty-one right and 129 left LDNs were performed. Five were converted (3.1%). 72% had normal anatomy at operation. Other operative findings included renal arterial variants in 19% of patients. 11% had polar arteries, 6.9% had double renal arteries, and 0.6% had three right renal arteries (RRA). A left renal artery aneurysm was also found (0.6%). Renal venous anomalies were seen in 8.1%. These included duplicated right renal veins (4.3% vs. 3.1%) and 1.9% had retroaortic left renal veins (LRV) and 1.3% had circumaortic LRVs. Other findings were a small accessory vein on the right, a short RRV, and triple RRVs. Left lumbar veins were present in 8 of 129 patients (68%), 19% of these were multiple or abnormal. 1.9% had duplicate ureters, all noted preoperatively. Preoperative studies did not identify 68% of polar arteries, triple RRVs, or 77% of renal vein anomalies. Right donor selection criteria included favorable renal vein length (13%), multiple left arteries (58%), anomalous LRV (6.5%), RRA stenosis (6.5%), size discrepancy (19%), duplicate ureter (6.5%), other (3.2%), and 9.7% of these patients met multiple criteria.

Conclusions: Preoperative imaging gives useful information for donor side selection but is no substitute for careful dissection. In this series, significant vessels were missed in 14% of patients. Technical considerations include keeping a wide margin during mobilization of the kidney, judicious use of sharp dissection, and anticipation of anatomic variants.

LAPAROSCOPIC SPLENECTOMY FOR IDIOPATHIC THROMBOCYTOPENIC PURPURA IN ADULTS, Martin Lajous M.D., Lopez-Karpovich Xavier M.D., Paulina Beazury M.D., Miguel F. Herrera M.D., Department of Surgery, Hematology and Oncology, Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran, Mexico City, Mexico.

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

Patients and Methods. From a total of 87 LS performed at our Institution in a 7 year period, 60 patients underwent surgery for ITP. Clinical and surgical characteristics, complications, and long term results are analysed. Results. Mean age of the patients was 38±16 years; 43 were females and 17 males. The lower edge of the spleen was palpable in 8% of the patients and ultrasound revealed splenomegaly (>12 cm) in 1/40 patients. The mean preoperative platelet nadir was 15±34 X 1000/mm3. Eighty-two percent of patients received preoperative antinflammatory vaccination. There were 3 conversions to open surgery (5%). The mean operative time was 169±63 minutes. Twenty-one percent of the patients presented minor complications, 10% developed major complications (2 incisional hernias, 1 intraabdominal bleeding, 1 bleeding from the trocar site including a 30-day mortality of 2 patients (1 stroke and 1 abdominal sepsis). Mean postoperative hospital stay was 4.2±1.8 days. In a mean follow-up of 23±22 months, complete response (platelet count >150,000/mm3 for at least 2 months) was observed in 59% of the total group. Partial response (platelet count >150,000/mm3 with treatment, or >50,000/mm3 without treatment or relapse after complete response) was documented in 21%. There was no response in 19%. Two of these patients underwent reoperation for an accessory spleen.

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

LAPAROSCOPIC SPLENECTOMY FOR IDIOPATHIC THROMBOCYTOPENIC PURPURA IN ADULTS, Alicia Fanning MD, Fred Brody MD, Michael Rosen MD, Frank Duprierer, MD, Jeffrey Ponsky MD, Department of General Surgery, Minimally Invasive Surgery Center, The Cleveland Clinic Foundation, Cleveland OH.

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

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

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

To our knowledge, this is the first time quantitative time analysis has been used to study LS. Interestingly, the time consuming aspect of this operation is patient preparation and positioning which is critical to the overall surgical approach. Clearly a learning curve to achieve proficiency in advanced laparoscopy exists. This study shows that once that curve has been achieved, phases of the operation become efficient and routine with very little time variance.
**Solid Organ–S132**

**FEASIBILITY OF LAPAROSCOPIC ADRENALECTOMY FOR LARGE ADRENAL MASSES**

Yuri W. Novitsky, M.D., Kent W. Kercher, M.D., Donald R. Czerniach, M.D., Richard A. Perugini, M.D., John J. Kelly, M.D., Demetrius E.M. Litwin, M.D., Department of Surgery, University of Massachusetts Medical School, Worcester, MA

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

**Patients and Methods:** Retrospective review of 27 consecutive patients who underwent LA for large adrenal masses at a University hospital. All LA (14 right and 13 left) were performed via lateral decubitus transperitoneal approach. Average size of the mass was 6.8 ± 1.5 cm. Preoperative indications included: pheochromocytoma (8), Conn’s adenoma (7), nonfunctioning adenoma (4), cyst/pseudocyst (3), myolipoma (2), cortical hyperplasia (2), and Cushing’s syndrome (1). Statistical analysis was performed using a two-sample t-test.

**Results:** Average operating time was 183 ± 65 (range 120-375) min, average blood loss was 105 ± 102.7 (range 20-500) ml. The average operative time and blood loss were non-significantly greater in right than in left LA groups (166.3 vs 203.5 min, p = 0.89 and 76.7 vs 123.8 ml, p = 0.14, respectively). Average NPO time was 0.7 (range 0-4) days and average time of return to a regular diet was 1.74 ± 0.9 (range 1-5) days. Average length of stay was 2.6 ± 1.8 (range 1-10) days. One patient had transient episode of pseudomembranous colitis. There were no conversions to open adrenalectomy and no major morbidities.

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

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**Adv. Foregut Surgery–S134**

**A PREVIOUS ENDOSCOPIC TREATMENT (WITH PNEUMATIC DILATIONS OR BOTULINUM TOXIN INJECTIONS) DOES NOT AFFECT THE OUTCOME OF LAPAROSCOPIC HELLER-DOR OPERATION FOR ESOPHAGEAL ACHALASIA**

Mario Costantini, MD, Giovanni Zaninotto, MD, Giuseppe Portale, MD, Daniela Molena, MD, Michela Costantino, PhD, Loredana Nicoletti, BS, Christian Rizzetto, BS, Ermanno Ancona, MD, University of Padua, Department of Medical and Surgical Sciences (Clinica Chirurgica IV), Padua, Italy

Laparoscopic Heller myotomy is the treatment of choice in esophageal achalasia (EA). However, some patients are referred for surgery only after an unsuccessful endoscopic treatment with dilations (D) or Bototox injections (B), when the operation may be more difficult and the risk of mucosal perforation higher. In this study we evaluated the effects of a previous endoscopic treatment on the outcome of laparoscopic myotomy. From 1992 to June 2001, 150 patients underwent Heller-Dor operation for EA: they were 85 male, 65 female; their median age was 42 years (range 11-80). The majority of our patients (124) underwent surgery without any previous treatment (Group A), 15 had one to 8 D (Group B) and 11 had Bo treatment (alone in 7, associated to D in 4) (Group C). No differences in the intraoperative mucosal lesions were detected among the 3 groups (6/124 mucosal lesions in group A, 0/15 in Group B and 1/11 in group C, p = n.s.) nor in the median duration of the operation (152 ± 77 min in Group A, 150 ± 123 min in Group B and 163 in Group C, respectively, p = n.s.). The diagnostic yield of Laparoscopy was 23.3 ± 15%. The diagnostic sensitivity and specificity of the Laparoscopy were respectively 45% and 97% in the pts undergoing surgery, while it reached 97% and 100%, respectively, on autopsy studies of the patients. The diagnostic sensitivity and specificity of the Laparoscopy was respectively 45% and 97% in the pts undergoing surgery, while it reached 97% and 100%, respectively, on autopsy studies of the patients.

**RESULTS:**

- **Background:** In the last years it has been witnessed a change in the prevalence and in the ilarotic pattern of esophageal cancer. The aim of this study was to evaluate the stage distribution, the clinic presentation and the management algorithms for this disease by using surgical laparoscopy.
- **Study Design:** Forty-four patients with esophageal cancer consecutively accessed from '95 to 2000 where evaluated for diagnostic tests, laparoscopic study and treatment modalities.
- **Results:** The diagnostic yield of Laparoscopy was 23.3 ± 15%, compared to preliminary US-CT studies; in fact 10 pts had been understaged by imaging diagnostic techniques: 4 stage I pts were stage III, 2 stage II pts were stage IV and 4 stage II pts were stage IV. The impact upon the treatment modalities for these 10 patients is evident. The diagnostic sensitivity and specificity of the Laparoscopy was respectively 45% and 97% in the pts undergoing surgery, while it reached 97% and 100%, respectively, on autopsy studies of the non-operated group (40%). No complications were observed following Laparoscopy.

**Conclusion:** Laparoscopy should be performed in patients with esophageal cancer who are candidates for resective surgery. Intra-abdominal metastases and advanced stage of disease can be missed in some cases by current imaging tools, in order to avoid unnecessary surgery.
Adv. Foregut Surgery–S137

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

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

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

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

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

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


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

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

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

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

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

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

Thoracoscopy–S139

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

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

Patients and Methods: This study includes 124 patients of clinical Stage I lung cancer operated with VATS lobectomy from January 1995 to August 2001 in our institution. We performed VATS lobectomy with ND2a lymph nodal dissection in 121 patients (97.8%), and with ND1 in 3 patients (2.4%). Postoperative pathological examination revealed that 112 patients (90.3%) were pathological Stage IA, three (2.4%) in Stage IB, one (0.9%) in Stage IIA, and eight (6.4%) in Stage IIIA. Parameters analyzed were as follows: (1) time required for operation; (2) amount of intraoperative bleeding; (3) time required for pleural drainage; (4) complications; (5) survival rates; (6) recurrences.

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

Conclusions: We believe that VATS lobectomy for clinical Stage I patients is a safe and effective approach with excellent long-term results.
Thoracoscopy-S140*

VIDEO ASSISTED THORACIC SURGERY (VATS) IN OCTOGENARIANS
James P. Koren M.D., Robert J. Caccavale M.D., Jean-Philippe Bocage M.D., W. Peter Geis M.D., Department of Surgery and Minimally Invasive Learning Center, St. Peter's University Hospital, New Brunswick, New Jersey.

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

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

One hundred and sixty two (162) consecutive VATS procedures were performed in one hundred and fifty seven (157) patients. Co-morbid conditions consistent with their advanced age included chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, and diabetes. The VATS procedures included 96 lung resections (53 lobectomies, and 42 wedge/segment resections), 46 pleuropneumotomies, 8 decortications, 8 mediastinal biopsies, 3 pericardial windows, and 1 drainage of hemothorax. The pathology included 76 primary lung cancers, 35 metastatic diseases, 37 benign conditions, 9 mesotheliomas, and 3 carcinoid tumors. The average operative time and rate in the elderly patient population. Appropriate management of thoracic diseases is often avoided because of the inherent risks associated with the access thoracotomy. The purpose of this study is to evaluate the perioperative outcomes of octogenarians who underwent VATS for a variety of thoracic conditions.

One hundred and sixty two (162) consecutive VATS procedures were performed in one hundred and fifty seven (157) patients. Co-morbid conditions consistent with their advanced age included chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, and diabetes. The VATS procedures included 96 lung resections (53 lobectomies, and 42 wedge/segment resections), 46 pleuropneumotomies, 8 decortications, 8 mediastinal biopsies, 3 pericardial windows, and 1 drainage of hemothorax. The pathology included 76 primary lung cancers, 35 metastatic diseases, 37 benign conditions, 9 mesotheliomas, and 3 carcinoid tumors. The average operative time and length of hospital stay after surgery was 51 minutes and 2.8 days respectively. There were 31(19%) mortalities, two from cardiac complications, and one from pneumonia. 21(12.1%) patients required re-exporation for bleeding. 4(2.5%) cases were converted to open thoracotomy. 13(8.0%) cases had an air leak of which 11 were managed as an outpatient with a Heimlich valve. They were discharged from the hospital on average of 3.3 days post-operatively.

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

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

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

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

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

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

Thoracoscopy-S143

SONOGRAPHIC EVALUATION FOR PERIPHERAL PULMONARY NODULES DURING VIDEO-ASSISTED THORACOSCOPIC SURGERY
Mitsuo Yamamoto, M.D., Masahiko Takeo, M.D., Fumio Meguro, M.D., Toshiaki Ishikawa, M.D., Department of surgery, Kobe west city hospital, Kobe, Japan.

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

Subjects and methods: Between June 2000 and March 2001, 26 patients underwent VATS at our institution. Our study group included 15 women and 11 men who were 47-79 years old. There were primary lung cancer (n=15), pulmonary metastasis (n=6), and various benign tumors (n=5). The tumors ranged from 8 to 40 mm in size with a mean of 17.9±8.5 mm. The subjects were classified into 2 groups (ALOKA instruments, Japan) with a dedicated 7.5 Mhz flexible sonographic probe were used in this study.

Results: Sonographic guidance visualized peripheral intrapulmonary tumors easily in 21 (81%) out of the 26 patients. In the remaining 5 patients it was failed to visualize because of retained air in the collapsed lung that have severe emphysema in 1 case and lesion in too deep portion from the lung surface in 4 cases, respectively. In the 21 cases with successful sonographic guidance, rich intratumoral blood flow signal was identified in 8 out of 15 primary lung cancers by using Color Doppler method. The peak velocity was 26±12.5 cm/s in primary lung cancer and 9.4±7.2 cm/s in pulmonary metastases, respectively. Significant difference was appreciated between them. (p<0.01)

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

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

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

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

Results: No significant difference was observed in age, gender, location of the tumor, and there was also no significant difference in the depth of tumor invasion, degree of lymph node metastasis. There was also no significant difference in the average number of total dissected lymph node between 2 groups (6.8±2.2 in T group, 8.1±2.6 in C group). On the other hand, duration of thoracic procedure of T group was significantly longer than that of C group, while there was no significant difference in the duration of total procedure between 2 groups. The amount of blood loss was significantly less in T group. The rate of postoperative complications was not significantly different in 11 cases in T group and 66 cases in C group had recurrent disease. There was no significant difference in survival rate at 4 years after surgery between 2 groups. The survival rate in the patients with lymph node metastasis was not significantly different between 2 groups.

Conclusion: The thoracoscopic esophagectomy is as equally curative as conventional open surgery for advanced thoracic esophageal cancer.
LAPAROSCOPIC VS OPEN COLONIC RESECTION FOR CANCER: LONG-TERM RESULTS ON 266 UNSELECTED PATIENTS. Felicetti F., M.D., Guerrieri M., M.D., Pedrini M., M.D., Facs, A., M.D., Campagnacci R., M.D., Rosco E., M.D., Facs, 1 Department of General Surgery, University of Ancona, “Umberto I” Hospital, Ancona, Italy. 2 Department of Surgery “Paride Stoppin”, II Clinica Chirurgica, University “La Sapienza”, Rome, Italy.

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

LR was technically feasible in 96.2% of cases. No statistically significant difference (p) was observed in the major complications' rate (5.3% after LR and 4.5% after OR) (p = 0.952) and in perioperative mortality (2% after LR and 1.8% after OR) (p = 0.798). Mean follow-up was 44.6 months (range 1-9 years) during which time we observed 2 cases of abdominal wall metasteses in the laparoscopic group (0.9%) in pts with advanced disease. The local recurrence rate was lower after LR as compared to OR: 4.1% vs 8.1% (p = 0.560, respectively) (ns). Distant site metasteses occurred in 8.2% after LR and 9.3% after OR (p = 0.916) (ns). At 60 months of follow-up cumulative survival probability in LR completed malignant cases was 0.897 as compared to 0.861 after OR (p = 0.763) (ns). Eighty-five pts in the laparoscopic group (87.5%) and 71 in the open group (82.5%) are disease free. Based on our data, a better treatment in terms of survival rate is detected in the laparoscopic group. The main limit of the preliminary long term oncological outcomes is the low number of patients enrolled. In order to be able to draw conclusive scientific statements, we should wait the completion of the ongoing international randomized controlled trials.

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

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

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

Results: While the cost of the initial laparoscopic procedure was higher than the open repair (mean $7124 vs $9150). In the base case analysis EM was both the least effective (11.08 QALYs) for LR, $697 ($7480, 15.64 QALYs) for OM, and $1711 ($10620, 14.89 QALYs) for ONM. In sensitivity analysis cost effectiveness was influenced only by the recurrence rate.

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

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

Between January 2000 and June 2001, three hundred and thirty-seven patients underwent 495 TEP laparoscopic inguinal hernia repairs using polyester mesh. There were 396 males and 28 females with an average age of 45 years (range 17-80). The average operative time for each patient was 54.3 minutes (range 18-157 minutes). There were no conversions to open repair and no mortality.

Comparing the outcomes of the patients with chronic pain, two patients with urinary retention and one incidence of each of the following: epididimitis, prostatitis, hydrocele, port site cellulitis, and a patient who had CO2 in the Foley bag at the end of the surgery but a normal cystogram (no identified bladder injury). There has been one recurrence (0.2%). It occurred at four months post-op and was repaired with a trans-abdominal laparoscopic approach. The mean time of follow-up is 11 months (range 2-20 months). There have been no documented infections of the mesh and no mesh has been removed.

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

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

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

Starting with endoscopic extraperitoneal hernia repair in 1994, till now we performed endoscopic extraperitoneal hernia repair in more than 4500 cases. To specify our own results we prospectively investigated the three-year follow-up of 1329 patients operated on in the years 1997 and 1998. 177 of these patients had hernia recurrences and were operated on in the totally extraperitoneal mesh repair technique (163 males, 14 females). 96 patients had recurrent hernias on the right or left side, 32 had bilateral recidives and 49 had recidives on the left or right side and a primarily contralateral hernia. Altogether 258 hernias were found in this group, 209 of which were recidives (85 lateral, 65 medial, 5 femoral and 103 combined hernias). Long-term follow-up was performed by questionnaire and examination. Median follow-up time was 28 months and documentation was complete in 149 patients (84.2%). Our intraoperative complication rate was 2.3% (bleeding, bladder injury etc.), the postoperative complication rate 3.9% (hematoma etc.). The re-recidive-rate in the patient-group with recidive hernias was 0%; there was 1 hernia recurrence in a patient with a primarily contralateral hernia.

The totally extraperitoneal endoscopic recidive hernia repair produces very low re-recidive-rates. The method is safe and effective with acceptable intraoperative and postoperative complication rates. In our opinion it is the method of choice in the experienced hand.
LONG-TERM RESULTS OF LAPAROSCOPIC RECURRENT INGUINAL HERNIA REPAIR
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Background and objective: Laparoscopic repair of recurrent inguinal hernia is becoming a popular alternative because it combines the potential low recurrence rate of open preperitoneal repair with fast recovery.

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

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

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

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

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

A PROSPECTIVE STUDY OF COMPLICATION RATES AFTER LAPAROSCOPIC AND OPEN VENTRAL HERNIA REPAIR
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Introduction: Although ventral hernia repair is increasingly performed laparoscopically, complication rates with this procedure are not well characterized. For this reason, we performed a prospective study comparing early outcomes after laparoscopic and open ventral hernia repair. Methods and Procedures: We identified all patients undergoing ventral hernia repair at a single tertiary care center between August 1, 1999 and July 1, 2001 (overall n=257). To increase the homogeneity, we excluded umbilical hernia repairs, non-elective procedures, procedures not involving mesh, and repairs performed concurrently with another surgical procedure. Postoperative complications (in-hospital or within 30-days) were assessed prospectively according to standardized definitions by trained nurse clinicians. Results: 136 patients met the study criteria, 68 (50%) underwent open repair and 68 (50%) received laparoscopic repair (including 3 conversions to open). Patients in the laparoscopic group were more likely to have undergone a prior failed ventral hernia repair (40% versus 21%, p=0.01), but other patient characteristics were similar. Overall, patients undergoing laparoscopic repair had fewer postoperative complications (4% versus 15% with open, p=0.04). Of the 3 complications in the laparoscopic group, 1 was minor (ileus) and two were major (enterotomy, infected mesh). Of the 10 complications in the open group, 9 were minor (wound infection, ileus) and one major (dehiscence). The laparoscopic group had longer OR times (2.8 hrs versus 2.3 hrs with open, p=0.001), but shorter average hospital stays (1.2 versus 2.3 days with open, p=0.001). Although more likely to have undergone prior ventral hernia repair, patients undergoing laparoscopic repair had fewer postoperative complications than those receiving open repair. Long-term studies assessing hernia recurrence rates will be required to help determine the optimal approach to ventral hernia repair.
Hernia Repair–s158

OUR EXPERIENCE WITH LAPAROSCOPIC VENTRAL HERNIA REPAIR WITHOUT SUTURES: DOUBLE CROWN TECHNIQUE

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Introduction: The laparoscopic approach for ventral hernias is performed in a mesh: avoiding sutures to fix the mesh to avoid recurrences. We have developed our Double Crown technique for laparoscopic ventral hernia repair with similar results, avoiding the need of those sutures.

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

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

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

Cryoanalgesic ablation for the treatment of post-herniorrhaphy neuropathic pain

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

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

Results: Nine males, 1 female ages 20 to 54 (mean 42.6) were treated during 58 months with 8.2 month mean follow-up for ileoinguinal (4), genitofemoral (1), and combined (5) neuralgia. Patients reported 1 to 5 prior herniorrhaphies (mean 1.8), experienced neuropathic pain 0 to 14 years (mean 6.3), and underwent up to 3 (mean 1.3) ablative pain procedures prior to referral. Patients reported overall pain reduction of 0 to 100% (mean 75.75%, median 100%); 80% reported decreased analgesic use, and 90% reported increased physical capacity following cryotheraphy. Two underwent additional cryotherapy, one for incomplete relief and one for recurrent pain, both with 100% efficacy. Wound infection (1) was the only complication.

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

New Technology/Robotics–s161

ERGONOMIC DIFFERENCES BETWEEN MINIMALLY INVASIVE SURGICAL SUITES AND STANDARD OPERATING ROOMS

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

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

In the OR, the mean SF for the main cart was 10.4 lb(0.6 SD) and for the slave cart 7.3 (1.1) for a maximum distance of 600 ft. In the MIS suite, the mean SF for the columns ranged from 2.1 to 5.3 (0.3) for a maximum distance of 6 ft (p<0.05 by anova). The work (w=fxd) in the standard OR was 7,199 Joules Vs. 81 Joules in the MIS suite (p<0.005).

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<tr>
<th>Task</th>
<th>Force</th>
<th>OR</th>
<th>MIS column</th>
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<tr>
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<td>7.3</td>
<td>N/A</td>
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<td>Slave</td>
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Conclusion: Both study groups were within federal guidelines for acceptable push forces for manual handling. The MIS suite is ergonomically preferred with a 65% overall reduction in push-pull force. The physical workload was improved by 98.9%. This contributes to an improved OR environment for MIS staff which impacts OR efficiency and safety.
AN ATTEMPT TO EXPAND THE VIEW UNDER SCOPE WITH FINGER-ATTACHABLE CAMERA (FINGER CAMERA) Yukio Fujino, M.D., Kazuyuki Shimomura, M.D., Kazuhiko shinohara, M.D.,Naoki Ishizuka, M.D.,Hirobumi Yamada,M.D., Akio Odaka,M.D., Takanobu Hoshino,M.D.,Daijo Hashimoto,M.D.,Yasu Idezuki,M.D.Department of Surgery,Saitama Medical Center,Saitama Medical School,Saitama,Japan

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

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

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

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

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

Results: 149 patients completed the SRI (60 L, 89 O). Cronbach’s alphas were 0.91 for pain questions and 0.97 for activity resumption questions. Pain level with time (L vs O, 1-10 score) at week 1 (4.42 vs 6.06, p=0.03), week 2 (3.08 vs 4.38, p<0.04), week 3 (2.03 vs 3.16, p=0.02), and week 4 (1.18 vs 2.28, p=0.00) all favored laparoscopy. Pain level with activity (L vs O, 1-3 scale) for getting out of bed (1.62 vs 1.85, p=0.04), hygiene (1.18 vs 2.28, p=0.00) all favored laparoscopy. Days until return to activity (L vs O, 1-4 scale) were significant for 3 activities. Subscales (L vs O, standardized on 1-100 scale) for getting out of bed (1.62 vs 1.85, p=0.04), hygiene (1.18 vs 2.28, p=0.00) all favored laparoscopy. Pain level with time (L vs O, 1-10 score) at week 1 (4.42 vs 6.06, p=0.03), week 2 (3.08 vs 4.38, p<0.04), week 3 (2.03 vs 3.16, p=0.02), and week 4 (1.18 vs 2.28, p=0.00) all favored laparoscopy. Pain level with activity (L vs O, 1-3 scale) for getting out of bed (1.62 vs 1.85, p=0.04), hygiene (1.18 vs 2.28, p=0.00) all favored laparoscopy.

Comparison of laparoscopic skills performance between standard instruments and two surgical robotic systems. Gregory F. Dakin, M.D., Michel Gagner, M.D., Peter S. Midulla, M.D., Edward Shlasko, M.D., John N. Cunningham, M.D., Division of Laparoscopic Surgery, Department of Surgery, The Mount Sinai School of Medicine, New York, NY. Division of Pediatric Surgery, Department of Surgery, Maimonides Medical Center, Brooklyn, NY

Our aim was to compare the performance of laparoscopic tasks by surgeons using standard laparoscopic instruments and two surgical robotic systems. 18 surgeons performed tasks in a training box using three different instrument systems: standard laparoscopic instruments, the Zeus(tm) Robotic Surgical System (Zeus), and the da Vinci(tm) Surgical System (da Vinci). Basic tasks included running a 60-cm rope, placing beads onto pins, and dropping cotton peanuts into cylinders; fine tasks included intracorporeal knot tying and running stitches with 4-0, 8-0, and 7-0 sutures. Time (in seconds) required and precision in performing each task were recorded. The paired t-test and Wilcoxon signed rank tests were used for statistical analysis.

Time to complete the rope, beads, and peanut tasks was 38, 83, and 54 for the standard instruments; 54, 146, and 61 for da Vinci; and 106, 196, and 128 for Zeus. In all basic tasks, standard instruments performed significantly faster than either robotic system (p<0.04) while da Vinci performed significantly faster than Zeus (p<0.04). No significant difference in precision was found between standard instruments and Zeus. Da Vinci was more precise than standard instruments (p<0.04) and Zeus (p<0.03) in the peanut task. 6-0 and 7-0 knot tying time was similar between standard instruments and da Vinci (113 and 110) and were significantly faster than Zeus (237, p<0.005) in the 8-0 task time. Both da Vinci and Zeus were significantly more precise in knot tying (Zeus and da Vinci) and running sutures (da Vinci) than standard instruments (p<0.03).

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

A NO-ENDOSCOPIC TECHNIQUE FOR DIFFICULT CASES TO CREATE A PERCUTANEOUS ESOPHAGEAL GASTRO-TUBING (PEG) Hideto Oishi, M.D., Hironori Shindou, M.D., Noriyasu Shirotani, M.D.,* Shingo Kameoka, M.D.,* Department of Surgery, Aoyama Hospital, Tokyo Women's Medical University, School of Medicine Department of Surgery II, Tokyo Women's Medical University, School of Medicine, Tokyo, Japan

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

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

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

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

CONCLUSIONS: When it is difficult to create a PEG, PTEG with RFB is safe, simple, less invasive and just as effective.
USE OF NAVIGATOR FOR INTRAOPERATIVE DETECTION OF LYMPH NODE METASTASES FOR COLORECTAL CARCINOMA DURING LAPAROSCOPIC SURGERY Nobuyoshi Miyajima, M.D., Tatsuos Yamakawa, M.D., Department of Surgery, Teikyo University Hospital, Mizonokuchi, Kawasaki, Japan.

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

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

Results: Preliminary Study A total of 157 lymph nodes were resected. Histopathological examination revealed that 137 of them were metastasis-negative and the remaining 20 were positive. The L/B ratio of metastasis-positive lymph nodes was 3.81±1.81. On the other hand, the L/B ratio of metastasis-negative lymph nodes was 1.41*0.468. L/B ratio of metastasis-positive lymph nodes was significantly larger than that of metastasis-negative lymph nodes (P<0.01). The cut-off value of the L/B ratio was determined as 2.0 to include all metastasis-positive nodes.

Clinical study. Dukes’ classification of 40 cases was A in 8, B in 21 and C in 11. Metastasis to the lymph nodes could be predicted in every case. However, 5 cases out of 29 cases without lymph node metastases were judged to be metastasis-positive with Navigator. Sensitivity of this clinical study was 100%, specificity was 82.8% and accuracy was 87.5%.

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


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

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

Analysis of variance was performed, and where appropriate, a Tukey’s test.

The EBVS’s mean burst pressure was statistically higher than the UCS at 4-5mm (600 vs. 206) and 6-7mm (442 vs. 174). The EBVS had higher burst pressures for the 4-5mm group (601 vs. 128), and 6-7mm group (519 vs. 174). The thermal spread was not statistically different between EBVS and UCS at any size (EBVS mean 2.57mm vs. UCS mean 2.18mm).

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

DIGITAL STEREOTACTIC BREAST MICROBIOSIS FOR NON PALPABLE BREAST LESIONS: STUDY OF 276 CASES Carlo Mariotti M.D., Francesco Felicetti M.D., Maddalena Baldarelli M.D., Andrea Tamburini M.D., Jenifer N. Marini M.D. and Emmanuel A. Choukas-Bradley M.D., FACS, Clinica Adepthia, Rome, Italy.

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

From June 1999 to July 2001 276 BP were performed using VACB in 198 (72.7%) cases and ABBI in 78 (29.3%). All patients (pts) had dubious mammography lesions not confirmed by US. Mean age of the pts was 53 years, (range 39-79). Indications were: 194 (70.3%) microcalcifications, 50 (18.1%) nodular opacities and 32 (11.6%) parenchymal distortions.

All the BP were performed with a digital stereotactic table with a vacuum suction aspiration system for VACB and with a cutting cannula for ABBI. The digital imaging system calculates the exact three dimensional position of the lesion and transmits it to the operator work-station. Mean operative time was 10 min for VACB and 20 min for ABBI. One (1.3%) intraoperative complication was observed with ABBI for the technical defect of the cannula and 5 (1.9%) pts developed postoperative hematomas. Cosmetic outcome was good for ABBI and excellent for VACB. Thirteen (18.7%) lesions removed by ABBI and 37 (16.7%) by VACB resulted malignant whereas 55 (63.3%) lesion treated by ABBI and 161 (81.5%) by VACB resulted benign.

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

30 YEARS OF DIAGNOSTIC LAPAROSCOPY – AN OVERVIEW Tathemion F. Udawadia, M.S.

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We commenced Diagnostic Laparoscopy (D.L.) in a developing country in 1972, with the objective of hastening diagnosis, reducing patient distress, improving management and bed utilization in an overcrowded Teaching Hospital, where simple investigations like x-rays took weeks to materialize. Over 18 years upto 1990 we had performed 3157 diagnostic laparoscopies, with all adults being done under L.A. We had no mortality and an acceptable complication rate of 0.06%. We achieved an 84% diagnosis rate, 74% being on histological targeted biopsy, covering a wide spectrum of pathology. The equipment cost when spread out over 3000 patients works out to Rs. 30 ($0.75). With availability of non-invasive diagnostic aids like US, CT, MRI and under control target biopsy with these modalities the role of diagnostic laparoscopy has altered in many parts of the world. Over the last ten years we use D.L. for the evaluation of peritoneal pathology, abdominal tuberculosis, malignancy and in the acute abdomen and abdominal trauma, where the 3 mm instruments offer safety. We use it in the management of lower abdominal pain in females in the childbearing age and children with intractable lower abdominal pain. D.L. is often a prelude to laparoscopic treatment of the underlying pathology.

We have found that D.L. has its optimal application in developing countries, as it is exceedingly cost-effective in an environment where there is a heavy patient load and sophisticated, non-invasive diagnostic aids are not available. D.L. is the ideal teaching aid for laparoscopic surgery in developing countries.
New Technology/Robotics-s170

LAPAROSCOPIC SURGERY FOR PERITONITIS Hiroshi OMORI, M.D., Hiroshi ASAHI, M.D., Yoshihiro INOUE, M.D., Takashi IRINODA, M.D., Shigetsu ENDO, M.D., Kazuyo SAITO, M.D. Critical Care Medicine, Iwate Medical University, School of Medicine, Morioka, Japan

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

New Technology/Robotics-s171

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

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

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

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

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

New Technology/Robotics-s172

COMPARISON OF THE ACUSTIMULATION RELIEFBAND® DEVICE TO ONDANSETRON FOR TREATMENT OF POSTOPERATIVE NAUSEA AND VOMITING (PONV) AFTER ABLUMINAR LAPAROSCOPY Stephanie B. Jones, MD; Margarita Coloma, MD; Paul F. White, PhD, MD; Daniel B. Jones, MD. Department of Anesthesiology and Pain Management* and The Southwestem Center for Minimally Invasive Surgery. University of Texas Southwestem Medical Center, Dallas, TX

PONV is a potential obstacle to outpatient laparoscopy. This study compares transcutaneous acupoint electrical stimulation using the ReliefBand® device to ondansetron for the treatment of PONV after laparoscopy. 285 patients undergoing ambulatory laparoscopic procedures with a standardized general anesthetic were enrolled in this randomized, double-blind, placebo- and sham-controlled study. All patients received anesthetic and analgesic protocols. For primary endpoint analysis, patients were randomized to one of three treatment groups: (1) Control (CTL): inactive (sham) ReliefBand® and ondansetron. 4 mg IV. (2) ReliefBand® (RB): active ReliefBand® and ondansetron, 2 ml IV, and (3) Combination (COM): active ReliefBand®, ondansetron 4 mg IV and saline, 2 ml IV. A blinded observer recorded the response to nausea and vomiting and time to achieve discharge criteria. Postdischarge side effects, patient satisfaction and quality of recovery (QoR) scores were assessed at 24 and 72 h via a follow-up phone call. Data were analyzed using ANOVA or Chi-square tests. p < 0.05 was considered statistically significant.

The complete response rate was significantly higher in the COM group (73%) compared to the RB group (40%) and comparable to the CTL group (67%). Patients in the RB and COM group reported higher QoR scores than the CTL group (8.4, 8.2±0.7 vs 7.2±0.6). Combination antiemetic therapy with the ReliefBand® device and ondansetron resulted in improved complete response rates and QoR scores when used to treat established PONV after laparoscopy and general anesthesia.

New Technology/Robotics-s173

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

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

Conclusion: BERG/ALIF is a viable alternative to the conventional open procedure and permits the use of most open orthopedic instruments and any implant. From a spinal surgeon’s viewpoint, the anterior approach is a less destructive operation. The posterior bony elements are spared. Post-surgical scarring in and around the spinal canal and nerve roots is avoided and average blood loss is less than 100 cc per level.
LAPAROSCOPICALLY-ASSISTED PROCTOCOLECTOMY WITH ILEAL J POUCH ANAL ANASTOMOSIS. Katsuhiko Shibuya M.D., Akihiko Hashimoto M.D., Yui Funuguma M.D., Hiroo Naito M.D., Kohei Fukushima M.D., Chikashi Shibata M.D., Taku Kitayama M.D., Seiki Matsuno M.D., Iwao Sasaki M.D First Department of Surgery, Tohoku University, Sendai, Japan.

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

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

Results: Median operative time of the LAC group was 8 hours and 15 minutes, which was 73 minutes longer than that of the standard colectomy (SC) group. The number of days during which eating was prohibited for this report. The mean age was 37 years, and there were 58% females. Immunosuppressive medications were seen in 40%. There were 73 patients considered to have complicated disease, and they form the basis of this report. The mean age was 37 years, and there were 58% females. Immunosuppressive medications were seen in 40%. The mean OR time was 155 minutes (range 90-240). Length of stay was 4.2 days. All patients had laparoscopic assisted surgery. In summary, compare Crohn’s disease requiring surgery is feasible and safe utilizing laparoscopic technology. While more time consuming than non-complicated disease, the benefits of laparoscopic surgery were seen in this difficult group of patients.

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

The aim of this study was to review 174 patients having a laparoscopic rectopexy between January 1992 and March 1999. There were 158 females and 16 men, of mean age 56 years (range 18 to 89 years). Operative indications were complete rectal prolapse, or rectocele associated with severe dyschezia. 24% of the patients had undergone proctological surgery, and 48% female patients gynaecological surgery. 48% patients had had previous laparotomy. Laparoscopic technique needed 4 cannula. A modified French-type Orr-Loygue mesh rectopexy was performed. The rectum is being entirely freed, then stapled to the sacral promontory using two mersilene meshes. Fourteen patients had a combined procedure. There was no mortality, and morbidity was low (7 minor complications). Five of 174 procedures were converted to open (3%) because of too tense adhesions. Functional results were excellent in 94% of the cases. Anatomical results were excellent in 85% of the cases. Two patients kept mild rectocele, and 2 patients a mucosal prolapse. Rectal prolapse is a complex disorder, and surgical treatment is difficult. Our laparoscopic technique is standardized, with excellent functional results after a follow-up of up to 9 years.
Colorectal Surgery for Benign Disease–s182

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

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

Between 1/92 and 2/96, 79 patients had LSR for uncomplicated diverticulitis at two tertiary referral centers compared to 79 matched controls who had OSR. Resection length and inflammation at proximal resection margins were determined at the formalin-fixed specimen as was level of anastomosis. Recurrence was defined as left quadrant pain, fever and leukocytosis with consistent CT on admission and enema findings at 8 weeks.

The groups were matched for age, gender, body mass index, length of symptoms and ASA classification. Mean resected specimen length was 16.1 cm in LSR and 18.3 cm in the OSR group (p=0.068). 19 (24%) LSR vs 41 (52%) OSR patients had splenic flexure mobilization (p=0.001). Follow up was longer in the OSR vs LSR group (96.9±14 vs 91.9±16 months, respectively; p=0.048). 3 LSR (4%) vs 7 OSR patients (10%) had recurrence (p=0.198). There were no differences between recurring and nonrecurring patients in splenic flexure mobilization (40 vs 38%, p=0.93) and resected specimens with inflamed proximal margins (0 vs 18%, p=0.95). Patients undergoing LSR had similar recurrence rates as OSR if the anastomosis is performed to the proximal rectum and not the distal sigmoid colon.

Colorectal Surgery for Benign Disease–s183*

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

Aims: The purpose of this study was to determine if laparoscopic surgery has impacted on the incidence of wound complications after colon resection. Methods: Eighty-three patients with colon cancer were prospectively randomized to undergo either laparoscopic colon resection (LCR) or open colon resection (OCR) at our institution as a part of a multi-center clinical trial. Wound complications were tabulated from a prospectively collected database and physician records at a mean follow-up of 27.4 ± 17.9 months postoperatively (range 4-68 months). Results are expressed as mean ± SD. Statistical analysis was performed using Fisher’s exact and student’s t-test. Results: Thirty-seven patients were randomized to LCR and 46 to OCR. Seven patients in the LCR group (15.9%) were converted to open colectomy and were included in the OCR group for analysis. LCR was carried out using an open incision for anastomosis and specimen extraction. No differences in patient age, incidence of prior abdominal surgery, steroid use, or medical comorbidities were seen between groups. Incision length was significantly greater (p<0.001) in the OCR group (19.4 ± 5.6cm) compared to the LCR extraction site (6.3 ± 4.4cm). Wound infections were seen in 13.5% of patients after LCR (2.7% trocar sites, 10.8% extraction sites) and in 10.6% after OCR (NS). The rate of incisional hernia was 18.9% after LCR and 17.4% after OCR (p=NS). Only 1 incisional hernia (2.7%) in the LCR group occurred at a trocar site. In the LCR group, extraction sites accounted for 10 of 12 (83.3%) total complications while there were only 2 (16.7%) trocar site complications.

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

Colorectal Surgery for Benign Disease–s184*

ENDOSCOPIC TREATMENT OF SURGICAL COLO-RECTAL ANASTOMOSIS STENOSIS
Schuster K.L., M.D., Manejold B.C., M.D.
Department of Surgical Endoscopy, University Hospital, University of Heidelberg, Mannheim, Germany

INTRODUCTION: Stenosis of the surgical anastomosis remains a frequent and unsolved problem. Numerous patients present postoperatively with defecation problems or an ileus.

PATIENTS AND METHODS: From 1996-2001, we analyzed 88 patients with symptomatic anastomosis stenosis to elucidate factors regarding i.e. initial diagnosis, type of operation, anastomosis technique and postoperative care (anastomotic insufficiency, etc.).

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

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

Bariatric–s185

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

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

Methods: From 7/97 to 9/2001, 750 patients underwent LRYGBP for the treatment of morbid obesity. The same 2 surgeons performed all operations. The operation consisted of creation of an isolated gastric pouch (15ml) with a Roux-en-Y gastrojejunostomy. We evaluated perioperative outcomes of the first 150 consecutive patients to determine if a learning curve effect could be demonstrated

Groups were divided into 3 groups (I, II, III) of 50 consecutive patients, and outcomes for each group were compared

<table>
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<th>Group</th>
<th>%BMI &gt;55</th>
<th>Mean ASA</th>
<th>Mean OR Time(min)</th>
<th>Convent ratio</th>
<th>Intrap comp</th>
<th>Tech Comp % (lap-comp)</th>
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<td>I (1-50)</td>
<td>18%</td>
<td>2.55</td>
<td>311</td>
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<tr>
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<td>0</td>
<td>15</td>
</tr>
<tr>
<td>III (101-150)</td>
<td>24%</td>
<td>3.17</td>
<td>227</td>
<td>0</td>
<td>0</td>
<td>11*</td>
</tr>
</tbody>
</table>

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

Conclusion. Our data suggests that operative time and technically related complications decreased with operative experience even though heavier patients and higher risk patients were more predominant in the latter part of our experience. LRYGBP is a technically challenging operation with a long learning curve. Strategies for developing training programs must address these training challenges in order to minimize morbidity related to the learning curve.
Bariatric-s186*

EFFECT OF STANDARD VERSUS EXTENDED ROUX LIMB LENGTH ON WEIGHT LOSS AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS. John J Feng MD, Michel Gagner MD, Brian P Jacob MD, Christine A Chu MD, David C Voellinger MD, Theresa Quinn MD, William B Inabnet MD, Alfons Pomp MD

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

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

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

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

Bariatric-s187*

ROLE OF ROUTINE INTRA-OPERATIVE ENDOSCOPY IN LAPAROSCOPIC BARIATRIC SURGERY. J.K. Champion M.D.

Department of Surgery, Emory Dunwoody Medical Center, Atlanta, Georgia

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

From April 1995-September 2001, we performed 825 laparoscopic bariatric procedures. There were 743 roux gastric bypass, 55 vertical banded gastroplasties, 18 lap-bands and 9 gastric pacemakers. All patients underwent flexible endoscopy at the primary surgeon at completion of the case to assess for technical errors. There were 34 technical errors (4.1%) identified. There were 29 sutures/steapline leaks, 2 bougie perforations, 2 inadvertent stoma closures secondary to the suture line, and 1 mucosal perforation in a gastric pacemaker. All errors were successfully repaired laparoscopically at the time of the procedure. Post-op there were 3 anastomotic leaks. One in the 34 repaired errors (2.9%) and two in the remaining 791 patients (0.25%).

Routine intra-operative endoscopy identified 34 technical errors in a series of 825 laparoscopic bariatric procedures, with successful repair of 33 (97%).
Bariatric-s190

LAPBANDR.: ITALIAN EXPERIENCE ON 2602 PATIENTS OPERATED IN 6 YEARS. Angrisani, Furbetta, Doldi, Basso, Lucchese, Giacomelli, Zappa, Lattuada, DiCosmo, Veneziani, Turicchia, Favretti, Alkilani, Forestieri, Lesti, Puglisi, Toppino, Capizzi, DiLorenzo, Giardiello, DiLorenzo, Lacitignola, Belvederesi, Marzano, Bernante, Iuppa, Lorenzo, Italian Group for Lap Band – GILB, Naples - Italy

LapBand System procedure is the most common bariatric surgical procedure worldwide. This is an interim report of the experience of the 28 Italian Centres participating to the national Collaborative study group for LapBand (GILB). Methods. An electronic database was specifically created. It was e-mailed to all the surgeons performing Laparoscopic Gastric Banding System operation in Italy. Statistical analysis was performed by means of Fisher exact test. Results. From October 1994, 2602 patients (1883F/719M; mean BMI: 44.3±4.2, range 30.4-83.6 Kg/m2, mean age: 38.0±11, range:15-74 yr.) have been recruited. Mortality rate has been 0.38% (10/2602), mainly due to cardiovascular complications (myocardial infarction, pulmonary embolism). Laparotomic conversion rate has been 2.3% (59/2602) and was more frequent in super-obese (BMI>50) patients in respect to morbid (BMI>50) obese patients (p<0.05). Postoperative complications in 289/2602 (11.1%) patients were: tube-port failure (n=116;40.1%), gastric pouch dilation (n=138;47.7%), gastric erosion (n=35;12.1%). Most of Gastric pouch dilation (67.3%) presented during the first 50 operated patients/centre. The incidence of gastric pouch dilation decrease with growing surgeon's experience. Surgery for complications was often performed by laparoscopy, rarely via laparotomy. No death was recorded as consequence of surgery to treat complications. Weight loss has been evaluated at the following intervals: 6,12,24,36,48 and 60 months, with BMI 39.9,36.4,32.2,33.1,32.7 and 31.1 Kg/m2, and was significantly different between super-obese and morbid-obese group. Preoperative comorbidities (hypertension, diabetes, respiratory symptoms, degenerative arthritis) in superobese patients were improved and/or completely disappeared 12 months following Lap Band.

Conclusions: LapBand system is a surgical procedure with very low mortality, low morbidity rate and satisfactory weight loss. Surgery for complications can be safely performed by laparoscopy.
Poster Program

Chair: Peter Crookes, MD, Co-Chair: Manabu Yamamoto, MD

Location: Sutton Complex, 2nd Floor of the New York Hilton

The poster session is where you are likely to glimpse ideas of the future, experience and techniques from countries around the globe. Most posters will only be displayed for one day, either Friday or Saturday, depending on the topic. The Award Winning Posters will be on display at the entrance of the Sutton Complex on Thursday, Friday and Saturday. Poster presenters will be available for discussion at their posters on the day of their presentation, Friday or Saturday, from 11:30AM - 12:30PM.

Poster Award Winners, Thursday - Saturday

BARIATRIC SURGERY

PA001 Fielding, George "RESULTS IN CHANGE IN TECHNIQUE WITH LAPAROSCOPIC GASTRIC BANDING"

PA002 Papasavas, Pavlos "OUTCOME ANALYSIS OF LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY: THE FIRST 116 CASES"

PA003 Ren, Christine "IMPACT OF DEDICATED TRAINING IN LAPAROSCOPIC BARIATRIC SURGERY ON OUTCOME"

PA004 Rutledge, Robert "WEIGHT LOSS AFTER OPEN, LAPAROSCOPIC ROUX-EN-Y AND MINI GASTRIC BYPASS FOR MORBID OBESITY"

PA005 Suter, Michel "LAPAROSCOPIC GASTRIC BANDING BEYOND THE LEARNING CURVE"

PA006 Tarnoff, Michael "ENDOSCOPIC INJECTION OF FIBRIN GLUE: AN ADJUNCT TO NONOPERATIVE MANAGEMENT OF POST-GASTRIC BYPASS ANASTOMOTIC LEAK AND GASTROGASTRIC FISTULA"

BASIC SCIENCE

PA007 Are, Chandrakanth "REDUCED GUT BLOOD FLOW DURING LAPAROSCOPIC NISSEN FUNDOPPLICATION-SIMILAR TO PERICARDIAL TAMponade?"

PA008 Kim, Zun-gon "IMPACT OF DOPAMINE AND ENDOTHELIN-1-ANTAGONISM ON LIVER FUNCTION DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY."

PA009 Kirman, Irena "EPCAM VACCINE INHIBITS TUMOR GROWTH IN ANESTHESIA CONTROL BUT NOT LAPAROTOMIZED OR CO2 INSULATED MICE BEARING EPCAM EXPRESSING ADENOCARCINOMA"

PA010 Kirman, Irena "NATURALLY OCCURRING IGG ANTIBODIES TO EPCAM IN COLON CANCER AND CONTROL PATIENTS"

PA011 Ziprin, Paul "LAPAROSCOPY REDuces ADHESION FORMATION BY ENHANCING MESOTHELIAL CELL FIBRINOLYTIC ACTIVITY VIA A DOWN REGULATION OF PLASMINOGEN ACTIVATOR INHIBITOR-I (PAI-I) LEVELS"

COLORECTAL/INTESTINAL SURGERY

PA012 Konstantinidis, Konstantinos "LAPAROSCOPIC APPROACH IN SMALL BOWEL SURGERY"

PA013 Madbouly, Khaled "SYMPTOM DIRECTED LAPAROSCOPIC REPAIR OF RECTAL PROLAPSE: A COMPARISON OF THE WELLS PROCEDURE AND RESECTION RECTOPEXY"

PA014 Mascio, Christopher "OUTCOME ANALYSIS OF ROUTINE LAPAROSCOPIC APPENDECTOMY, SELECTIVE LAPAROSCOPIC APPENDECTOMY AND OPEN APPENDECTOMY"

PA015 Targarona, Eduardo "LEFT COLECTOMY: A COMPARISON BETWEEN LAPAROSCOPIC AND HAND ASSISTED TECHNIQUE."

EDUCATION/OUTCOMES

PA016 Grantcharov, Teodor "TEACHING AND TESTING SURGICAL SKILLS ON A VIRTUAL REALITY LAPAROSCOPY SIMULATOR - DEFINITION OF FACTORS AFFECTING PERFORMANCE."

PA017 Mcbride, Corrigan "SLEEP DEPRIVATION DOES NOT IMPAIR LEARNING OF LAPAROSCOPIC SKILLS"

PA018 Nutt, Mike "EFFECTS OF VARIOUS ENVIRONMENTAL STIMULI ON THE LEARNING OF BASIC VIRTUAL REALITY LAPAROSCOPIC SKILLS"

ESOPHAGEAL/GASTRIC SURGERY

PA019 Lucktong, Tananchai "CIRCUMFERENTIAL ESOPHAGEAL MUCOSECTOMY WITH PROSTHETIC REPLACEMENT"

PA020 Winslow, Emily "INFLUENCE OF SPASTIC ESOPHAGEAL MANOMETRIC FEATURES ON OUTCOMES OF LAPAROSCOPIC ANTIREFLUX SURGERY"

PA021 Zornig, Carsten "LAPAROSCOPIC FUNDOPPLICATION NISSEN VS. TOUPET: A PROSPECTIVE RANDOMIZED STUDY OF 200 PATIENTS REGARDING PREOPERATIVE ESOPHAGEAL MOTILITY."

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY

PA022 Hunerbein, Michael "ON DEMAND ENDOSONOGRAPHY OF UPPER GI TRACT CANCER USING MINIPROBES OR ENDOSCOPIC ULTRASONOGRAPHY"

HEPATOBILIARY/PANCREATIC SURGERY

PA023 Schmandra, Thomas "RISK OF GAS EMBOLISM IN CONVENTIONAL VERSUS MODIFIED HAND-ASSISTED LAPAROSCOPIC HEPATIC RESECTION"

PA024 Tranter, Sheena "LAPAROSCOPIC BILE DUCT EXPLORATION CAUSES MORE MORBIDITY THAN CHOLECYSTECTOMY ALONE: A MATCHED CONTROLLED STUDY"

MINIMALLY INVASIVE OTHER

PA025 Ainslie, William "MICROPUuncture CHOLECYSTECTOMY: A RANDOMISED CONTROLLED TRIAL."

PA026 Martin, Iain "WARMING AND HUMIDIFICATION OF CARBON DIOXIDE INSUFFLATION GAS SHORTENS THE TIME TAKEN TO RETURN TO NORMAL ACTIVITY AFTER LAPAROSCOPY."

PA027 Raoc Venkat "A NOVEL TECHNIQUE OF LAPAROSCOPIC MANAGEMENT OF SUPERFICIAL HYDATIDOMAS OF THE LIVER."

PA028 Rosin, Danny "EFFECTS OF ACUTE BOWEL OBSTRUCTION ON INTRACRANIAL PRESSURE: OBSERVATIONS IN A LARGE ANIMAL MODEL"

PA029 Wilson, Erik "COMBINED LAPAROSCOPIC NISSEN FUNDOPPLICATION AND CHOLECYSTECTOMY: INCREASED ASSOCIATION BETWEEN GASTROESOPHAGEAL REFUX AND BILIARY DISEASE"

NEW TECHNIQUES/TECHNOLOGY

PA030 Kim, Won Woo "LAPAROSCOPICALLY HARVESTING OF SMALL BOWEL GRAFT FOR SMALL BOWEL TRANSPLANTATION"

http://www.8thworldcongress.org/
**BARIATRIC SURGERY**

<table>
<thead>
<tr>
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<td>Elariny, Hazem</td>
<td>&quot;EARLY RESULTS OF LAPAROSCOPIC NON-BANDED VERTICAL GASTROPLASTY WITH SLEEVE GASTRECTOMY (WITHOUT DUODENAL SWITCH) IN THE TREATMENT OF MORBID OBESITY&quot;</td>
</tr>
<tr>
<td>PF006</td>
<td>Gould, Jon</td>
<td>&quot;TRANS-GASTRIC INSERTION OF THE CIRCULAR STAPLER ANVIL IN LAPAROSCOPIC GASTRIC BYPASS&quot;</td>
</tr>
<tr>
<td>PF007</td>
<td>Hamad, Giselle</td>
<td>&quot;ELECTIVE CHOLECYSTECTOMY DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: IS IT WORTH THE WAIT?&quot;</td>
</tr>
<tr>
<td>PF008</td>
<td>Johnson, Beverly</td>
<td>&quot;THE OR TEAM CONCEPT IN LAPAROSCOPIC GASTRIC BYPASS SURGERY&quot;</td>
</tr>
<tr>
<td>PF009</td>
<td>Madan, Atul</td>
<td>&quot;LAPAROSCOPIC OBESITY SURGERY ON THE INTERNET&quot;</td>
</tr>
<tr>
<td>PF010</td>
<td>Maresca, Michele</td>
<td>&quot;SINGLE CENTRE EXPERIENCE WITH LAP BAND SYSTEM, OPEN AND LAPAROSCOPIC GASTRIC BYPASS FOR THE TREATMENT OF MORBID OBESITY.&quot;</td>
</tr>
<tr>
<td>PF011</td>
<td>Masoni, Luigi</td>
<td>&quot;LAPAROSCOPIC BILIO INTESTINAL BY-PASS FOR MORBID OBESITY: PRELIMINARY REPORT ON FIVE CASES.&quot;</td>
</tr>
<tr>
<td>PF012</td>
<td>Mattar, Samer</td>
<td>&quot;SHOULD CHOLECYSTECTOMY BE A ROUTINE PART OF LAPAROSCOPIC GASTRIC BYPASS FOR OBESITY: A COST ANALYSIS&quot;</td>
</tr>
<tr>
<td>PF013</td>
<td>McCormick, James</td>
<td>&quot;LAPAROSCOPIC REVISION OF FAILED OPEN BARIATRIC PROCEDURES&quot;</td>
</tr>
<tr>
<td>PF014</td>
<td>Mehta, Vishal</td>
<td>&quot;LAPAROSCOPIC BARIATRIC SURGERY FOR THE TREATMENT OF SUPER-OBESITY: BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH AND ROUX EN Y GASTRIC BYPASS WITH LONG LIMB: 24 MONTH FOLLOW-UP&quot;</td>
</tr>
<tr>
<td>PF015</td>
<td>Ritchie, James</td>
<td>&quot;THE IMPORTANCE OF THE PARS FLACCIDA POSITION IN LAPAROSCOPIC GASTRIC BANDING: A COMPARISON OF COMPLICATION RATES IN 151 CASES OF LAP BANDING AND 174 CASES OF THE SWEDISH ADJUSTABLE GASTRIC BAND&quot;</td>
</tr>
<tr>
<td>PF016</td>
<td>Schmoeller, Friedrich</td>
<td>&quot;LAPAROSCOPIC REOPERATIONS FOR COMPLICATIONS OF LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING.&quot;</td>
</tr>
<tr>
<td>PF017</td>
<td>Sims, Thomas</td>
<td>&quot;ROUTINE UPPER GASTROINTESTINAL GASTROGRAFIN SWALLOW AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS&quot;</td>
</tr>
<tr>
<td>PF018</td>
<td>Spivak, Hadar</td>
<td>&quot;PROSPECTIVE STUDY OF 298 PATIENTS UNDERGOING LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING USING THE TWO-STEP TECHNIQUE. A TECHNIQUE TO PREVENT POSTOPERATIVE SLIPPAGE&quot;</td>
</tr>
<tr>
<td>PF019</td>
<td>Szomstein, Samuel</td>
<td>&quot;ANALYSIS OF DIFFERENT LAPAROSCOPIC TECHNIQUES FOR ROUX-EN-Y GASTRIC BYPASS&quot;</td>
</tr>
<tr>
<td>PF020</td>
<td>Voellinger, David</td>
<td>&quot;LAPAROSCOPIC SLEEVE GASTRECTOMY IS A SAFE AND EFFECTIVE PRIMARY PROCEDURE FOR BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH&quot;</td>
</tr>
</tbody>
</table>

**COLORECTAL/INTESTINAL SURGERY**

<table>
<thead>
<tr>
<th>Poster</th>
<th>Author(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF021</td>
<td>Yeaney, Woodrow</td>
<td>&quot;CASE REPORT: GASTRIC PERFORATION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY&quot;</td>
</tr>
<tr>
<td>PF022</td>
<td>Are, Chandrakanth</td>
<td>&quot;THE PROPERTIES OF PNEUMOPERITONEUM MODIFIES ACUTE PHASE RESPONSE INDUCED BY BACTERIAL LIPOPOLYSACCHARIDE&quot;</td>
</tr>
<tr>
<td>PF023</td>
<td>Gutt, Carsten</td>
<td>&quot;BODY POSITION AND DESUffLATION INFLUENCES PORTAL VENOUS FLOW DURING PNEUMOPERITONEUM&quot;</td>
</tr>
<tr>
<td>PF024</td>
<td>Jobe, Blair</td>
<td>&quot;THE EFFECT OF TOPICAL ANESTHETIC ON ESOPHAGEAL MOTILITY TEST RESULTS&quot;</td>
</tr>
<tr>
<td>PF025</td>
<td>Kim, Zun-gon</td>
<td>&quot;IMPACT OF IMPROVED HEPATIC BLOOD FLOW ON LIVER METASTASES DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY.&quot;</td>
</tr>
<tr>
<td>PF026</td>
<td>Veldkamp, Ruben</td>
<td>&quot;CHANGES IN THE MORPHOLOGY OF THE PERITONEUM AFTER LAPAROSCOPIC SURGERY: GAS OR STRETCHING?&quot;</td>
</tr>
<tr>
<td>PF027</td>
<td>Ardhanari, Ramesh</td>
<td>&quot;LAPAROSCOPIC SINGLE LAYER HAND SUTURED GASTRO JEJUNOSTOMY&quot;</td>
</tr>
<tr>
<td>PF028</td>
<td>Ardhanari, Ramesh</td>
<td>&quot;LAPAROSCOPIC HAND SUTURED RECONSTRUCTION AFTER HARTMAN'S PROCEDURE&quot;</td>
</tr>
<tr>
<td>PF029</td>
<td>Billy, Helmut</td>
<td>&quot;TOTAL LAPAROSCOPIC PROCTECTOMY WITH SPHINCTER PRESERVATION FOR DISTAL VILLOUS ADENOMA OF THE RECTUM&quot;</td>
</tr>
<tr>
<td>PF030</td>
<td>Chen, William</td>
<td>&quot;INTRACORPOREAL ANASTOMOSIS VS. DIRECT VISUALIZED ANASTOMOSIS IN LAPAROSCOPIC-ASSISTED ANTERIOR RESECTION&quot;</td>
</tr>
<tr>
<td>PF031</td>
<td>Chinnusami, Palanivelu</td>
<td>&quot;LAPAROSCOPIC REPAIR OF COLO-VESICAL FISTULA&quot;</td>
</tr>
<tr>
<td>PF032</td>
<td>Chock, Alana</td>
<td>&quot;NEEDLESCOPIC APPENDECTOMY: ANOTHER OPTION&quot;</td>
</tr>
<tr>
<td>PF033</td>
<td>Chock, Alana</td>
<td>&quot;LAPAROSCOPIC SMALL BOWEL RESECTION: LAPAROSCOPIC ASSISTED AND TOTALLY LAPAROSCOPIC APPROACH&quot;</td>
</tr>
<tr>
<td>PF034</td>
<td>Chowdhury, Humayun</td>
<td>&quot;UNCOMMON GALL BLADDER ANATOMY ENCOUNTERED DURING LAPAROSCOPIC CHOLECYSTECTOMY.&quot;</td>
</tr>
<tr>
<td>PF035</td>
<td>Chowdhury, Humayun</td>
<td>&quot;LAPAROSCOPIC APPENDICECTOMY: DESERVES MORE ATTENTION IN THE DEVELOPING COUNTRIES&quot;</td>
</tr>
<tr>
<td>PF036</td>
<td>Costi, Renato</td>
<td>&quot;LAPAROASSISTED SUBTOTAL COLECTOMY WITH ANTEROSTATLTIC CAECOPROCTOSTOMY FOR CSTRUCTION&quot;</td>
</tr>
<tr>
<td>PF037</td>
<td>Diamond, Ivan</td>
<td>&quot;LAPAROCTOMY IN THE MANAGEMENT OF COLONIC DUPLICATION&quot;</td>
</tr>
<tr>
<td>PF038</td>
<td>Dubsky, Peter</td>
<td>&quot;LAPAROSCOPICALLY ASSISTED SURGERY IN CROHN'S DISEASE&quot;</td>
</tr>
<tr>
<td>PF039</td>
<td>Fujii, Shoichi</td>
<td>&quot;LAPAROSCOPICALLY ASSISTED COLECTOMY WITH COLON-LIFTING METHOD BY THREAD FOR COLON AND RECTAL CANCER&quot;</td>
</tr>
<tr>
<td>PF040</td>
<td>Fujiwara, Senko</td>
<td>&quot;ILEUS FOLLOWING COLONOSCOPY REPORT OF A CASE...&quot;</td>
</tr>
<tr>
<td>PF041</td>
<td>Gibelis, George</td>
<td>&quot;LATE PRESENTING COMPLICATED APPENDICITIS;A NOVEL APPROACH TO A COMPLICATED PROBLEM&quot;</td>
</tr>
<tr>
<td>PF042</td>
<td>Grubnik, Volodymyr</td>
<td>&quot;LAPAROSCOPIC TREATMENT OF COMPLICATED DUODENAL ULCERS&quot;</td>
</tr>
<tr>
<td>PF043</td>
<td>Hamad, Mostafa</td>
<td>&quot;LAPAROSCOPIC SUTURED ANASTOMOSIS OF THE BOWEL. TECHNIQUE AND LEARNING CURVE.&quot;</td>
</tr>
<tr>
<td>PF044</td>
<td>Hasegawa, Hirotoshi</td>
<td>&quot;LAPAROSCOPIC RESTORATIVE PROCTOCOLECTOMY FOR PATIENTS WITH ULCERTATIVE COLITIS&quot;</td>
</tr>
</tbody>
</table>
PF045 Hsiao, Koung-hung “LAPAROSCOPIC TOTAL ABDOMINAL COLECTOMY FOR SLOW TRANSIT COLON”
PF046 Inge, Thomas “COST ANALYSIS OF STAPLED AND LIGATED TECHNIQUES OF LAPAROSCOPIC APPENDECTOMY IN CHILDREN”
PF047 Inokuchi, Mikito “LAPAROSCOPIC COLECTOMY WITH INTRACORPOREAL FUNCTIONAL END-TO-END ANASTOMOSIS”
PF048 Inufusa, Haruhiko “LAPAROSCOPIC LYMPHADENECTOMY OF COLORECTAL CANCER BY 3 PORTS METHOD.”
PF049 Kamei, Shusaku “EVALUATION OF CONVERTED CASES IN LAPAROSCOPIC TREATMENTS FOR SMALL BOWEL OBSTRUCTION”
PF050 Kasai, Yasushi “LAPAROSCOPIC TOTAL COLECTOMY FOR ULCERATIVE COLITIS”
PF051 Kim, Seon Han “ONE HUNDRED AND FIFTEEN CONSECUTIVE LAPAROSCOPIC COLECTOMIES WITHOUT OPERATIVE MORTALITY”
PF052 Koyabashi, Michiya “LAPAROSCOPIC ASSISTED COLECTOMY FOR COLON CANCER - EVALUATION OF OUR 5 CONVERTED CASES”
PF053 Korolija, Dragan “BLOOD LOSS IN LAPAROSCOPIC VS OPEN COLORECTAL SURGERY. META-ANALYSIS”
PF054 Lau, Stanley “COMBINED LAPAROSCOPIC ASSISTED RIGHT HEMICOLECTOMY AND LOW ANTERIOR RESECTION FOR SYNCHRONOUS COLORECTAL CARCINOMAS”
PF055 Lirici, Marco “COMBINING ULTRASONIC DISSECTION AND THE STORZ OPERATION RECTOSCOPE: AN EFFECTIVE NEW APPROACH TO TRANSANAL ENDOSCOPIC MICROSURGERY”
PF056 Marcello, Peter “LAPAROSCOPIC PROCTECTOMY WITH ILEOANAL POUCH AFTER LAPAROSCOPIC TOTAL COLECTOMY: A COMPARATIVE STUDY”
PF057 Michelet, Ivan “LAPAROSCOPIC MANAGEMENT OF PERFORATED PEPTIC ULCER”
PF058 Okuda, Junji “LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER - MILLENNIUM STRATEGY”
PF059 Paluch, Tom “THE LEARNING CURVE IN LAPAROSCOPIC COLECTOMY: MAKING A MOLLIEHILL OUT OF THE MOUNTAIN”
PF060 Ravo, Biagio “COMBINED LAPAROSCOPIC-COLONOSCOPE COLON RESECTION AND ANASTOMOSIS BY INTUSSUSCEPTION”
PF061 Ray, Subir “SINGLE SURGEONS EXPERIENCE OF 121 CONSECUTIVE LAPAROSCOPIC APPENDECTOMIES AT A COMMUNITY HOSPITAL.”
PF062 Recio, Patrick “LAPAROSCOPIC TREATMENT OF SMALL INTESTINAL DISORDERS: A TEN YEAR EXPERIENCE”
PF063 Rivas, Homero “LAPAROSCOPIC MANAGEMENT OF MECKEL’S DIVERTICULUM IN ADULTS.”
PF064 Shirota, Yoshinori “LAPAROSCOPIC ASSISTED ANTERIOR RESECTION WITH AUTONOMIC NERVE PRESERVATION FOR RECTAL CANCER.”
PF065 Suga, Hiroyasu “ENDOSCOPIC HEMOSTASIS WITH FIBRIN GLUE TO HEMORRAGE OF UPPER DIGESTIVE CANAL.”
PF066 Suzuki, Kenji “RESULT OF ELECTIVE LAPAROSCOPY FOR PATIENTS WITH SMALL BOWEL OBSTRUCTION”
PF067 Takenaka, Satoru “IDENTIFICATION AND SPARING TECHNIQUE OF VAGUS NERVE IN LAPAROSCOPIC GASTRECTOMY”
PF068 Tanaka, Keitaro “LAPAROSCOPIC TOTAL COLECTOMY IN A PATIENT WITH FAMILIAL ADENOMATOUS POLYPOSIS : CASE REPORT”
PF069 Tanaka, Jun-ichi “LAPAROSCOPIC SURGERY FOR ADVANCED COLORECTAL CANCER”
PF070 Targarona, Eduardo “RIGHT COLECTOMY: A COMPARISON BETWEEN LAPAROSCOPIC AND HAND ASSISTED TECHNIQUE.”
PF071 Taylor, Michelle “PNEUMOBILIA AND PNEUMATOSIS ASSOCIATED WITH SMALL BOWEL OBSTRUCTION”
PF072 Taylor, Michelle “ANEMIA AND BLOOD TRANSFUSION IN GENERAL SURGERY: RISK FACTORS FOR ADVERSE OUTCOME”
PF073 Vaimakis, Stefanie Cravio “LAPAROSCOPIC SIGMOID RESECTION FOR LOCALIZED AMYLOIDOSIS OF THE COLON”
PF074 Yamada, Hideo “LAPAROSCOPIC MANAGEMENT OF COLORECTAL CANCER. - RETROPERITONEAL APPROACH TECHNIQUE AND RESULTS”
PF075 Yamaguchi, Shigeki “LAPAROSCOPIC LYMPH NODE DISSECTION FOR RIGHT COLON CANCER.”
PF076 Yamamura, Takuya “LAPAROSCOPIC-ASSISTED SIGMOIDECTOMY WITH LYMPH NODE DISSECTION VIA MINILAPAROTOMY”
PF077 Yasui, Ouki “VIDEO-ASSISTED TOTAL COLECTOMY FOR THE FAMILIAL ADENOMATOUS POLYPOSIS”
PF078 Yoon, Jin Seok “IS ROUTINE PLACEMENT OF A NASOGASTRIC TUBE NECESSARY FOR LAPAROSCOPIC COLON SURGERY AS A PREOPERATIVE PREPARATION?”
PF079 Zameerpasha, A “ACUTE APPENDECTISIS WITH MASS OR ABSCESS - LAPAROSCOPY IS GOLD STANDARD”

COMPILATION OF SURGERY

PF080 Anselmino, Marco “LAPAROSCOPIC FUNDOPLICATION WITH WIDE MOBILIZATION OF THE GASTRIC FUNDUS IS ASSOCIATED WITH AN HIGH INCIDENCE OF POST-OPERATIVE GASTRIC MIGRATION INTO THE CHEST”
PF081 Bose, S. “PERICHOLCYSTIC ADHESIONS IN SINGLE VERSUS MULTIPLE GALLSTONES:DO THEY MAKE A DIFFERENCE IN LAPAROSCOPIC CHOLECYSTECTOMY?”
PF082 Costi, Renato “LAPAROSCOPY IN THE LAST DECADE OF THE MILLENNIUM: INNOVATIONS AND COMPLICATIONS.”
PF083 Faife, Barbara “MORBILIDITY AND MORTALITY AFTER LAPAROSCOPIC SURGERY. OUR EXPERIENCE IN 3869 CASES.”
PF084 Gupta, S.P. “COMMONER INJURY DURING LAP-CHOLECYSTECTOMY DUCTAL OR DUODENAL”
PF085 Hochstadter, Hrvoje “FUNCTIONAL LIVER INJURY CAUSED BY MONPOLAR CAUTERISATION DURING LAPAROSCOPIC CHOLECYSTECTOMY AS THE PREDICTOR OF POSSIBLE LATE STRICUTURE OF THE COMMON BILE DUCT.”
PF086 Kanda, Kulip Singh “BILE DUCT INJURIES DURING LAPAROSCOPIC CHOLECYSTECTOMY - SINGLE SURGEON'S EXPERIENCE IN 4800 CASES.”
PF087 Kimura, Taizo “BILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY..”
PF088 Kurumiya, Takashi “ASSESSMENT OF LAPAROSCOPIC CHOLECYSTECTOMY FOR SEVERE ACUTE CHOLECYSTITIS REQUIRING TREATMENT BY PTGBD”
PF089 Kusano, Toshiomi “DUCT-TO-DUCT ANASTOMOSIS AFTER TRANSECTION OF THE RIGHT HEPATIC DUCT DURING LAPAROSCOPIC CHOLECYSTECTOMY – SIX YEARS FOLLOW-UP [–].”

Underline denotes presenter  * denotes resident paper.
Friday March 15, 2002: poster abstracts

PF090 Milic, Dragan “COAGULATION DISORDERS IN THE PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY”

PF091 Okada, Kazuyuki “RECURRENCE OF GALLBLADDER CARCINOMA DEVELOPED AT THE PORT-SITE BUT NOT IN THE LAPAROTOMY WOUND AFTER LAPAROSCOPY WAS CONVERTED TO OPEN SURGERY: A CASE REPORT”

PF092 Olson, Michelle “PORTAL VEIN THROMBOSIS: A CATASTROPHIC COMPLICATION OF LAPAROSCOPIC SPLENECTOMY”

PF093 Ortiz-Oshiro, Elena “IMPACT OF GASLESS AND CO2 PNEUMOPERITONEUM ON HEMODYNAMICS DURING LAPAROSCOPIC SURGERY: EXPERIMENTAL STUDY”

PF094 Ortiz-Oshiro, Elena “DOES CO2 PNEUMOPERITONEUM AFFECT MESENTERIC VASCULARIZATION DURING LAPAROSCOPIC SURGERY?”

PF095 Verma, Ganga Ram “INJURY TO THE POSTERIOR SECTORS DUCT, A RAREST BILIARY DUCTAL ANOMALY, DURING LAPAROSCOPIC CHOLECYSTECTOMY?”

PF096 Vokurka, Jiri “CAN BLEEDING FROM AN UMBILICAL PORT BE PREVENTED?”

PF097 Yano, Hiroshi “PERCUTANEOUS TRANSHEPATIC BALLOON DILATION IS AN EFFECTIVE TREATMENT OF COMMON BILE DUCT STRicture FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY: REPORT OF A CASE”

EDUCATION/OUTCOMES

PF098 Al Ageely, Mohd “COMPARISON BETWEEN LAPAROSCOPIC SPLENECTOMY AND HAND ASSISTED SPLENECTOMY.”

PF099 Alotibi, Ahmed “X-RAY SCREENING TO IDENTIFY THE RIB & SYMPATHETIC CHAIN”

PF100 Ben-meir, Aviv “A 6-YEAR MULTI-INSTITUTIONAL REVIEW OF SURGERY IN PREGNANCY: LAPAROSCOPY HAS NOT BECOME THE STANDARD OF CARE FOR APPENDICITIS.”

PF101 Berberoglu, Metin “BIPOLAR OR QUADRIPOLAR ELECTROSURGERY? COMPARISON OF THERMAL SIDE EFFECTS”

PF102 Cervini, Patrick “THE SURGEON ON CALL IS A STRONG DETERMINANT OF USING A LAPAROSCOPIC APPROACH FOR APPENDECTOMY”

PF103 Chekan, Edward “LAPAROSCOPIC INGUINAL AND BILIARY ANATOMY TRAINING INSTRUMENT”

PF104 Donnelly, Michael “THE INVOLVEMENT OF PERCEPTUAL MOTOR FACTORS IN THE PERFORMANCE OF MINIMALLY INVASIVE SURGICAL (MIS) SKILLS.”

PF105 El-banna, Mohey-edin “THE IMPACT OF MINIMALLY INVASIVE SURGERY COURSES ON SURGEONS’ PRACTICE”

PF106 Foster, Allen “GASTROINTESTINAL SYMPTOMS ARE MORE INTENSE IN MORBIDLY OBESE PATIENTS”

PF107 Gandsas, Alex “LIVE STREAMING VIDEO FOR SURGICAL EDUCATION: A LABORATORY MODEL”

PF108 Hamilton, Elizabeth “IMPACT OF A MINIMALLY INVASIVE SURGERY CENTER OF EXCELLENCE ON RESIDENT LAPAROSCOPIC EXPERIENCE”

PF109 Kanda, Kulip Singh “LAPAROSCOPIC CHOLECYSTECTOMY - A COMPARISON OF RESULTS IN DEVELOPING AND DEVELOPED COUNTRIES.”

PF110 Khaitan, Leena “ANALYSIS OF PATIENT SATISFACTION WITH LAPAROSCOPIC FUNDOPLICATION”

PF111 Maccabee, David “TRANSITION TO LAPAROSCOPIC ADRENALECTOMY & THE NEED FOR ADVANCED TRAINING”

PF112 Mackay, Sean “THE VIRTUAL CHAPERONE: ACCEPTABILITY TO PATIENTS”

PF113 Odom, Steve “EMERGENCY DEPARTMENT VISITS BY DEMENTED PATIENTS WITH MALFUNCTIONING FEEDING TUBES”

PF114 Reynolds, Frederick “A RURAL, COMMUNITY-BASED PROGRAM CAN TRAIN SURGICAL RESIDENTS IN ADVANCED LAPAROSCOPY”

PF115 Rosin, Danny “LAPAROSCOPY IN THE EARLY POST-LAPAROTOMY PERIOD”

PF116 Wojtasik, Lynn “IMPAIRED TRAINING IN OPEN BILIARY SURGERY IN THE LAPAROSCOPIC ERA”

ERGONOMICS/INSTRUMENTATION

PF117 Adrales, Gina “THE EFFECT OF USING LAPAROSCOPIC INSTRUMENTS ON MUSCLE ACTIVATION PATTERNS DURING MINIMALLY INVASIVE SURGICAL TRAINING PROCEDURES”

PF118 Adusumilli, Prasad “COMPLICATIONS FROM THE USE OF THE HARMONIC SCALPEL: A REVIEW”

PF119 Bann, Simon “THE USE OF AN ERGONOMICALLY DESIGNED HANDLE DOES NOT ENHANCE PERFORMANCE IN A CLOSED BOX LAPAROSCOPIC TASK”

PF120 Berguer, Ramon “THE RELATIONSHIP BETWEEN SURGICAL GLOVE SIZE AND DIFFICULTY USING LAPAROSCOPIC INSTRUMENTS: A SURVEY OF 726 LAPAROSCOPIC SURGEONS.”

PF121 Brackman, Matthew “BARE BONES LAPAROSCOPY: A RANDOMIZED PROSPECTIVE TRIAL ON COST REDUCTION IN LAPAROSCOPIC CHOLECYSTECTOMY”

PF122 Czerniach, Donald “EFFECTS OF IMAGE VARIABLES ON VISUOSCOPY TASK PERFORMANCE”

PF123 Ebner, Winfried “EVALUATION OF A METHOD FOR CONTROL OF CLEANING PERFORMANCE IN REUSABLE HOLLOW INSTRUMENTS FOR MINIMALLY INVASIVE SURGERY”

PF124 Faist, Michael “THE EFFECT OF DIFFERENT ELBOW ANGLES ON MUSCLE ACTIVITY OF THE FOREARM DURING LAPAROSCOPIC SURGERY”

PF125 Hernandez, Juan “OBJECTIVE ASSESSMENT OF HAND ASSIST VERSUS CONVENTIONAL LAPAROSCOPIC SURGERY”

PF126 Kehl, Katharina “MUSCLE-STRAIN AND TASK PERFORMANCE IN RELATION TO MONITOR-POSITION IN LAPAROSCOPIC SURGERY”

PF127 Kenyon, Trudy “LAPAROSCOPIC VIDEO MONITORS: MINIMALLY INVASIVE SURGICAL SUITES OFFER IMPROVED ERGONOMICS.”

PF128 Matern, Ulrich “FRICITION BETWEEN LAPAROSCOPIC INSTRUMENT’S SHAFT AND TROCAR”

PF129 Matern, Ulrich “A COMPARISON OF THE ERGONOMICS OF DIFFERENT HANDLES FOR MINIMALLY INVASIVE SURGERY - AN EMG BASED STUDY”

PF130 Matsuda, Minoru “DEVELOPMENT OF NEW MEMBRANE-TYPE HEATED FUMIDIFIER FOR LAPAROSCOPIC SURGERY”

PF131 Miscusi, Giandomenico “HAND ASSISTED LAPAROSCOPIC SURGERY: HAS IT ANY ROLE IN COLORECTAL SURGERY?”

PF132 Reynolds, Frederick “A RURAL, COMMUNITY-BASED PROGRAM CAN TRAIN SURGICAL RESIDENTS IN ADVANCED LAPAROSCOPY”

PF133 Shinohara, Kazuhiko “COMPARISON OF MULTIMODAL INTERFACE FOR MINIMALLY INVASIVE SURGERY”

Underline denotes presenter. * denotes resident paper.
FRIDAY March 15, 2002: Poster Abstracts

PF134 Zheng, Bin “ENDOSCOPIC TASK PERFORMANCE UNDER SPATIAL MISALIGNMENT CONDITIONS”

ESOPHAGEAL/GASTRIC SURGERY

PF135 Ahlberg, Gunnar “ABDOMINAL ESOPHAGO-GASTRIC RESECTION BY LAPAROSCOPY CAN BE FACILITATED BY A DOUBLETAPED ANASTOMOSIS.”

PF136 Akaishi, Takashi “LAPAROSCOPIC NISSEN FUNDOPPLICATION APPLIED TO PARENTERAL NUTRITION”

PF137 Al Dohayan, Abdullah “TRANSSEGASTRIC MUCOMUSCULAR GASTROPLASTY IN DOGS”

PF138 Anvari, Mehran “EFFECTIVENESS OF LAPAROSCOPIC ANTI-REFLUX SURGERY IN PATIENTS WITH ACID INDUCED CHEST PAIN.”

PF139 Anvari, Mehran “OUTCOME OF LAPAROSCOPIC ANTI-REFLUX SURGERY IN PATIENTS WITH FUNCTIONAL HEARTBURN.”

PF140 Bahmeriz, Fahad “INCIDENCE OF SYMPTOMATIC GASTROESOPHAGEAL REFLUX DISEASE AFTER LAPAROSCOPIC HELLER’S MYOTOMY WITHOUT ANTI-REFLUX PROCEDURE”

PF141 Bell, Reginald “VARIATION BETWEEN ENDOSCOPIC AND EXTERNAL LANDMARKS OF THE GASTROESOPHAGEAL JUNTION DURING LAPAROSCOPIC NISSEN FUNDUPLICATION”

PF142 Bhatti, T.T. “HOW EFFECTIVE ARE PRESENT STAGING MODALITIES FOR OESOPHAGEAL CANCER?”

PF143 Billy, Helmuth “MICROLAPAROSCOPIC FUNDUPLICATION USING THE LEFT SIDED FIRST APPROACH”

PF144 Billy, Helmuth “LAPAROSCOPIC NISSEN FUNDUPLICATION IN PATIENTS WITH A REPLACED LEFT HEPATIC ARTERY. USING THE LEFT SIDED APPROACH TO PRESERVE THE REPLACED LEFT HEPATIC ARTERY.”

PF145 Bischof, Georg “RESULTS OF TRANSORAL MINIMALLY INVASIVE SURGERY FOR ZENKER DIVERTICULUM”

PF146 Bowers, Steven “LAPAROSCOPIC ESOPHAGEAL MUCOSAL STRIPPING: EVALUATION OF A MINIMALLY INVASIVE METHOD OF RESECTION OF DYSPLASTIC BARRETT’S ESOPHAGUS IN A PORCINE MODEL”

PF147 Cantor, Brian “PROGRESS TOWARD LAPAROSCOPIC TOTAL GASTRECTOMY FOR MALIGNANT DISEASE.”

PF148 Chan, Angus “HAND-PORT ASSISTED GASTRIC MOBILIZATION AND TRANSHIATAL DISSECTION UNDER DIRECT VISION IN PHARYNGO-LARYNGO-ESOPHAGECTOMY”

PF149 Chang, Lily “DEFINING THE NORMAL LARYNGO-PHARYNGEAL ENVIRONMENT: ITS RELATION TO THE DIAGNOSIS OF GASTROESOPHAGEAL-LARYNGEAL ACID REFLUX”

PF150 Chinnusami, Palanivelu “ROLE OF LAPAROSCOPIC TENSION FREE CRUROPLASTY IN THE MANAGEMENT OF LARGE HIATUS”

PF151 Chinnusami, Palanivelu “LAPAROSCOPIC APPROACH TO SUPRA-DIAPHRAGMATIC ESOPHAGEAL BENIGN TUMOR”

PF152 Cuesta, Miguel “LAPAROSCOPIC HAND ASSISTED TRANSHALTAL ESOPHAGUS RESECTION WITH CERVICAL ESOPHAGOAGASTROSTOMY FOR ESOPHAGEAL Cancer”

PF153 De La Fuente, Sebastian “EFFICACY OF SURGISIS ES (NOVEL SOFTTissue GRAFT) FOR CLOSURE OF FULL-THICKNESS GASTRIC PERFORATION IN RATS.”

PF154 Demeester, Steven “LAPAROSCOPIC MEDIASTINAL ESOPHAGEAL MOBILIZATION: DO YOU GAIN ANY LENGTH?”

PF155 Demeester, Steven “POTENTIAL ROLE FOR EXCESSIVELY TIGHT CRURAL CLOSURE IN POST LAPAROSCOPIC FUNDOPICATION DYSPHAGIA”

PF156 Fernandez, Arnulfo “SIX YEARS OF EXPERIENCE IN LAPAROSCOPIC SURGERY OF THE ESOPHAGEAL ACHALASIA.”

PF157 Fischella, Piero “EFFECT OF LAPAROSCOPIC FUNDOPICATION ON ESOPHAGEAL MOTOR FUNCTION”

PF158 Fujiwara, Michitaka “LAPAROSCOPIC DIATAL GASTRECTOMY FOR SEVERE CORROSIVE GASTRITIS: A CASE REPORT”

PF159 Fukunaga, Tetsu “A NEW TECHNIQUE FOR LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH LYMPHADENECTOMY”

PF160 Gecelter, Gary “HELLER MYOTOMY WITH ANGLE OF HIS REPAIR - A FOUR-YEAR COMPARATIVE FOLLOW-UP STUDY”

PF161 Haithcock, Benjamin “COMPARISON OF ANTI-REFLUX PROCEDURES AMONG ETHNICITY”

PF162 Halpin, Valerie “LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR USING PROSTHEITIES IN A CANINE MODEL”

PF163 Hayashi, Ken “THE PROCEDURE OF LAPAROSCOPE ASSISTED PROXIMAL GASTRECTOMY FOR EARLY GASTRIC CANCER OR SUBMUCOSAL TUMOR - COMPARED WITH OPEN PROXIMAL GASTRECTOMY”

PF164 Hayashi, Hideki “CLINICAL OUTCOMES OF LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH EXTRA-PEIRGASTRIC REGIONAL LYMPH NODE DISSECTION FOR GASTRIC CANCER”

PF165 Hoshino, Takanobu “LAPAROSCOPIC-ASSISTED GASTRECTOMY WITH SYSTEMATIC LYMPHADENECTOMY : CAN SUCH A COMPLICATED PROEDURE BE PERFORMED LAPAROSCOPICALLY ALONE?”

PF166 Idani, Hitoshi “SAFETY AND EFFICACY OF LAPAROSCOPIC ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFUX DISEASE IN ELDERLY PATIENTS OVER 80 YEARS OF AGE”

PF167 Ida, Atsushi “CURTAIN RETRACTION TECHNIQUE FOR BIG HIALT HERNIA”

PF168 Ilada, Patrick “BOUGIE OR NO BOUGIE. DOES IT AFFECT THE POST OPERATIVE DYSPHAGIA RATE: A RETROSPECTIVE ANALYSIS”

PF169 Johnson, Alfred “POST-OPERATIVE TRENDS IN PULMONARY FUNCTION FOLLOWING LAPAROSCOPIC ANTI-REFLUX SURGERY IN ASTHMATICS”

PF170 Kanthan, Rani “PATHOLOGICAL VALIDITY OF ESOPHAGEAL ENDOSCOPY: HOW REAL IS WHAT WE SEE? MYTH OR REALITY?”

PF171 Kawano, Tatsuyuki “HAND-ASSISTED THORACOSCOPIC RADICAL ESOPHAGECTOMY USING AN ANTERIOR PHRENO-MEDIASTINAL APPROACH”

PF172 Kimura, Masayuki “SAFETY AND COMFORT OF LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY IN PATIENTS WITH MARIE-FISCHER’S SYNDROME”

PF173 Kondo, Hisao “LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH SYSTEMATIC AORTO-PEIRGASTRIC MASTECTOMY”

PF174 Kondo, Hisao “LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH SYSTEMATIC LYMPHADENECTOMY”

PF175 Lyass, Sergey “CURRENT STATUS OF ANTIREFLUX PROCEDURE IN LAPAROSCOPIC HELLER MYOTOMY: META-ANALYSIS.”
FRIDAY March 15, 2002: Poster Abstracts

PF176 Madan, Atul “THE MYTH OF THE SHORT ESOPHAGUS”
PF177 Mochizuki, Yoshinari “A CLINICAL PATHWAY FOR LAPAROSCOPIC DIATIAL GASTRECTOMY”
PF178 Morales-Conde, Salvador “INDICATIONS AND MANAGEMENT OF PROTHESES TO CLOSE THE CRURA DURING LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL HERNIAS”
PF179 Nelms, Cynthia “MINIMALLY INVASIVE MANAGEMENT OF ESOPHAGEAL DIVERTICULI”
PF180 O’Rourke, Robert “SHORT ESOPHAGUS AND ITS IMPACT ON FAILURE AFTER NISSEN FUNDOLICATION”
PF181 Ozawa, Soji “VIDEO-ASSISTED THORACIC SURGERY AND LAPAROSCOPIC SURGERY FOR CANCER OF THE THORACIC ESOPHAGUS.”
PF182 Pereira, Natasha “DO FUNDIC GLAND POLYPS SECONDARY TO PPI THERAPY REGRESS AFTER LAPAROSCOPIC FUNDOPLICATION?”
PF183 Pinheiro, Jose “ASSESSMENT OF THE FAILED FUNDOPLICATION BY COMPUTERIZED AXIAL MANOMETRY (CAM)”
PF184 Puhalla, Harald “LAPAROSCOPIC NISSEN VERSUS TOUPET FUNDOPLICATION IN PATIENTS WITH GASTROESOPHAGEAL REFLUX DISEASE AND IMPAIRED DISTAL OESOPHAGEAL MOTILITY.”
PF185 Richardson, William “EVALUATION OF FIBROSIS FORMATION AFTER BOTULINUM TOXIN OR FORCED BALLOON DILATION TO THE LOWER ESOPHAGEAL SPHINCTER”
PF186 Saxena, Deepak “LAPAROSCOPIC OMENTOPLASTY OF DUODENAL ULCER PERFORATION IN 25 PATIENTS: A RETROSPECTIVE STUDY”
PF187 Szold, Amir “COMPLETE FUNDOPLICATION HAS EQUAL LONG-TERM RESULTS IN PATIENTS WITH AND WITHOUT ESOPHAGEAL BODY MOTILITY DYSFUNCTION”
PF188 Tanimura, Shinya “LAPAROSCOPIC DISTAL GASTRECTOMY WITH REGIONAL LYMPH NODE DISSECTION FOR GASTRIC CANCER”
PF189 Tomonaga, Tetsuya “TWO CASES OF FIBROMUSCULAR THICKENING TYPE OF CONGENITAL ESOPHAGEAL STENOSIS DIAGNOSED BY ENDOSCOPIC ULTRASOUND SONOGRAPHY.”
PF190 Uchida, Kazunori “EXPERIENCE WITH SELECTIVE PROXIMAL VAGOTOMY USING LAPAROSCOPIC COAGULATING SHEARS IN THE TREATMENT OF INTRACTABLE DUODENAL ULCER”
PF191 Urushihara, Takashi “GASTRIC MOTILITY AFTER LAPAROSCOPIC ASSISTED DISTAL GASTRECTOMY, WITH/WITHOUT PRESERVATION OF THE PYLORUS FOR EARLY GASTRIC CANCER AS ASSESSED BY DYNAMIC X-RAY IMAGING”
PF192 Velanovich, Vic “LAPAROSCOPIC NISSEN FUNDOPLICATION AFTER FAILED ENDOSCOPIC GASTROPLICATION”
PF193 Velanovich, Vic “PYLOROPLASTY WITH LAPAROSCOPIC FUNDOPPLICATION IN THE TREATMENT OF GASTROESOPHAGEAL REFLUX DISEASE ASSOCIATED WITH PREOPERATIVE BLOATING”
PF194 Villegas, Leonardo “LAPAROSCOPIC Heller MYOTOMY WITH BOLSTERING PARTIAL FUNDOPPLICATION FOR ACHALASIA.”
PF195 Weber, Kaarle “COMPARISON OF LAPAROSCOPIC AND OPEN GASTRECTOMY FOR MALIGNANT DISEASE”
PF196 Wilson, Erik “ESOPHAGOGASTRIC FISTULA AS A RARE CAUSE OF FAILURE OF LAPAROSCOPIC NISSEN FUNDOPLICATION”
PF197 Yamashita, Toshiki “LAPAROSCOPIC ASSISTED PROXIMAL GASTRECTOMY FOR EARLY GASTRIC CANCER”
PF198 Y_Sel, Nedim “RESULTS OF LAPAROSCOPIC GASTRIC BANDING FOR OBESITY CONSIDERING THE PORT FUNCTION”

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY
PF199 Gersin, Keith “THE STRETTA PROCEDURE: REVIEW OF CATHETER AND TECHNIQUE EVOLUTION, EFFICACY, AND COMPLICATIONS TWO YEARS AFTER INTRODUCTION.”
PF200 Hagiike, Masanobu “USEFULLNESS OF TOTAL COLONOSCOPY AND ENDOSCOPIC POLYPECTOMY IN HEMODIALYSIS PATIENTS.”
PF201 Hazzan, David “ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY AND PAPILLOTOMY FOR BILE DUCT STONES IN PATIENTS 80 YEARS OLD AND OLDER A SAFE PROCEDURE”
PF202 Kelessis, Nickos “IS GASTROSCOPY A VALID DIAGNOSTIC TOOL IN DETECTING GASTRIC MALT LYMPHOMAS? A DILEMMA BEYOND THE EYE”
PF203 Lagares-Garcia, Jorge “COLONOSCOPY IN OCTOGENARIANS”
PF204 Low, Donald “THE ROLE OF FLEXIBLE THERAPEUTIC NEEDLESCOPIC BILATERAL THORACIC THORACOSCOPY”
PF205 McGuire, Tim “THE TREATMENT OF UNRESECTABLE ESOPHAGEAL CANCER WITH SELF-EXPANDING STENTS.”
PF206 Murcia, Mario “IS GASTROSCOPY A VALID DIAGNOSTIC TOOL IN DETECTING GASTRIC MALT LYMPHOMAS? A DILEMMA BEYOND THE EYE”
PF207 Newlin, Matthew “INTRAOPERATIVE ENTEROSCOPY IN THE EVALUATION OF SMALL BOWEL DISEASE: INDICATIONS AND TREATMENT ALGORITHM FOR THE SURGEON”
PF208 Sekac, Jaroslav “THE TREATMENT OF UNRESECTABLE ESOPHAGEAL CANCER WITH SELF-EXPANDING STENTS.”
PF209 Yamagawa, Kentaro “THE ROLE OF FLEXIBLE THERAPEUTIC ENDOSCOPY (FTE) AND INTERVENTIONAL RADIOLOGY (IVR) FOR THE HEPATO-BILIARY-PANCREATIC (HBP) SURGICAL DISEASE”
PF210 Ziegler, Daniel “THE TREATMENT OF UNRESECTABLE ESOPHAGEAL CANCER WITH SELF-EXPANDING STENTS.”

HEPATOBILIARY/PANCREATIC SURGERY
PF211 Takagi, Sumito “STRATEGY OF LAPAROSCOPIC HEPATECTOMY FOR EXTRAHEPATIC GROWING TUMOR”

THORACOSCOPY
PF212 Abdulkarim, Amal “HIGHLY SELECTIVE SYMPATHOTOMY”
PF213 Akashi, Akinori “THE USE OF NON-CONTACTED AND WIDE SPREAD ND-YAG LASER TIP WITH Y-SHAPED STOPPER IN THORACOSCOPIC LUNG VOLUME REDUCTION SURGERY FOR DIFFUSE CHRONIC EMPHYSEMA”
PF214 Al Dohayan, Abdullah “THORACOSCOPIC MANAGEMENT OF HYPERHYDROSIS (SYMпатетомия, SYMPATHETIC CLIPPING)”
PF215 Al Otiaby, Ahmed “LAPAROSCOPIC PERCAUTANEOUS REPAIR OF INCISIONAL HERNIA”
PF216 Al-otiaby, Ahmed “COMPARISON BETWEEN THORACOSCOPIC SYMPATHECTOMY AND SYMPATHETIC CLIPPING.”
PF217 Aoe, Motoi “THORACOSCOPIC THYMECTOMY FOR PATIENTS WITH MYASTHENIA GRAVIS. (EXTENDED THYMECTOMY THROUGH COLLAR INCISION WITH VIDEO-ASSISTED THORACIC SURGERY)”
PF218 Burpee, Stephen “NEEDLESCOPIC BILATERAL THORACIC SYMPATHECTOMY”
FRIDAY  March 15, 2002:  Poster Abstracts

PF219  Hamada, Yoshiro  "VIDEO-ASSISTED SURGERY FOR PERSISTENT THORACIC FLUID COLLECTION"
PF220  Ishibashi, Hiroki  "INTRALOBAR AND EXTRALOBAR PULMONARY SEQUESTRATION TREATED BY VIDEO-ASSISTED THORACOSCOPIC RESECTION IN CHILDREN"
PF221  Kurihara, Masatoshi  "THE APPLICATION OF ULTRASONICALLY ACTIVATED TROCAR SYSTEM TO THE INSERTION OF THORACOSCOPIC TROCARS"
PF222  Mori, Takahiro  "THORACOSCOPIC ESOPHAGECTOMY FOR A CASE OF LOCAL RECURRENT AFTER RADIATION THERAPY"
PF223  Morikawa, Toshiaki  "TECHNICAL FEASIBILITY OF THORACOSCOPIC SEGMENTECTOMY OF LUNG"
PF224  Nishimura, Mtsuyo  "HAND-ASSISTED THORACOSCOPIC ESOPHAGECTOMY"
PF225  Ramakrishnan, Parthasarathi  "THORACOSCOPIC EXTRACTION OF IMPACTED FOREIGN BODY ESOPHAGUS"
PF226  Saxena, Deepak  "ROLE OF LAPROSCOPIC SURGERY IN ACUTE ABDOMEN (247 CASES) - A RETROSPECTIVE STUDY"

SATURDAY, March 16
HEPATOBLIARY/PANCREATIC SURGERY
PS001  Ainslie, William  "FURTHER EXPERIENCE WITH LAPAROSCOPIC DRAINAGE OF PANCREATIC PSEUDOCYSTS."
PS002  Alexakis, Nikolaos  "LATENT COLON ADENOCARCINOMA DISCOVERED DURING OR AFTER LAPAROSCOPIC CHOLECYSTECTOMY"
PS003  Alexander, Kelly  "FLEXIBLE STAGING LAPAROSCOPY FOR UPPER GASTROINTESTINAL MALIGNANCIES - IMPROVING YIELD THROUGH FAILURE ANALYSIS"
PS004  Alexander, Kelly  "LAPAROSCOPIC CHOLECYSTECTOMY IN ELDERLY PATIENTS"
PS005  Andoh, Hideaki  "LAPAROSCOPIC CHOLECYSTECTOMY FOR SUSPECTED EARLY GALLBLADDER CANCER"
PS006  Barczynski, Marcin  "ROUTINE LOW-VERSUS STANDARD-PRESSURE PNEUMOPERITONEUM DURING LAPAROSCOPIC CHOLECYSTECTOMY - INITIAL RESULTS OF PROSPECTIVE RANDOMIZED CLINICAL TRIAL"
PS007  Berber, Eren  "LAPAROSCOPIC RADIOFREQUENCY ABLATION OF LIVER TUMORS COMBINED WITH OTHER SURGICAL PROCEDURES"
PS008  Brasasco, Oscar  "ACUTE CHOLECYSTITIS DUE TO GALLBLADDER CROHN’S DISEASE"
PS009  Choudhury, Manoj  "LAPAROSCOPIC COMMON BILE DUCT EXPLORATION AND CHOLEDOCHOLITHOTOMY."
PS010  Chowdhury, Humayun  "MODIFIED NEEDLESCOPIC SURGERY FOR CHOLECYSTECTOMY"
PS011  Ewing, Douglas  "CHILAIDITIS SYNDROME MAY BE A CONTRAINDICATION TO LAPAROSCOPIC CHOLECYSTECTOMY IN PATIENTS WITH ACUTE CHOLECYSTITIS"
PS012  Fielding, George  "LAPAROSCOPIC HEPATECTOMY - MAJOR RESECTIONS ARE POSSIBLE"
PS013  Finley, David  "LAPAROSCOPIC MANAGEMENT OF GANGRENOUS CHOLECYSTITIS"
PS014  Furuta, Kazunori  "CASE OF LAPAROSCOPIC Pancreatic CYSTGASTOROSTOMY."
PS015  Gentileschi, Paolo  "LAPAROSCOPIC PORTOCALV SHUNT IN THE PORCINE MODEL: A FEASIBILITY STUDY"
PS016  Grubnik, Volodymyr  "LAPAROSCOPIC TREATMENT OF HEPATIC ECHINOCOCOSIS"
PS017  Hamad, Mostafa  "LAPAROSCOPIC CYSTOJUENOSTOMY FOR A GIANT PANCREATIC PSEUDOCYST"
PS018  Hamad, Mostafa  "LAPAROSCOPIC CHOLECYSTECTOMY UNDER SPINAL ANAESTHESIA. IS IT POSSIBLE?"
PS019  Hourmont, Katherine  "TELEROBOTIC LAPAROSCOPIC CHOLECYSTECTOMY ACHIEVES THE SAME RESULTS AS STANDARD ROBOTIC LAPAROSCOPIC CHOLECYSTECTOMY"
PS020  Inagaki, Hitoshi  "HAND ASSISTED LAPAROSCOPIC LEFT LOBECTOMY OF THE LIVER."
PS021  Karuppusami, Sendhil Kumar  "CHOLEDOCHAL CYST: LAPAROSCOPIC EXCISION AND HEPATICOJUENOSTOMY- PERSONAL EXPERIENCE"
PS022  Kawano, Katsunori  "LAPAROSCOPIC AND THORACOSCOPIC MANAGEMENT OF BENIGN LIVER CYSTS"
PS024  Lee, Sang Kuon  "LAPAROSCOPIC CHOLEDOCHOLITHOTOMY IN PATIENTS WHO PREVIOUSLY UNDERWENT CHOLECYSTECTOMY"
PS025  Lee, Sang Kuon  "SUCCESSFUL LAPAROSCOPIC TREATMENT OF MCHERRY TYPE I MIRIZZI’S SYNDROME"
PS026  Maeda, Dai  "TREATMENT OF BILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY"
PS027  Matsuda, Masamichi  "TRANSVAGINAL REMOVAL OF THE GALLBLADDER AFTER NEEDLESCOPIC CHOLECYSTECTOMY"
PS028  Meredith, Kenneth  "ROBOTIC ASSISTED RADIOFREQUENCY TUMOR ABLATION: AN EX VIVO BOVINE LIVER MODEL"
PS029  Mylonaki, Despoina  "INTRAOPERATIVE FINDINGS AND POSTOPERATIVE COMPLICATIONS IN LAPAROSCOPIC CHOLECYSTECTOMY. TEN YEARS OF EXPERIENCE."
PS030  Mylonaki, Despoina  "INCIDENTAL FINDING OF GALLBLADDER CARCINOMA DETECTED DURING OR AFTER LC"
PS031  Mylonaki, Despoina  "MANAGEMENT OF CONGENITAL POLYCYSTIC LIVER DISEASE"
PS032  Nathanson, Leslie  "RANDOMISED TRIAL OF LAPAROSCOPIC CHOLEDOCHITOMY VS POST-OPERATIVE ERCP FOR COMMON BILE DUCT STONES"
PS033  Neff, Marc  "DOME-DOWN LAPAROSCOPIC CHOLECYSTECTOMY: A MULTI-INSTITUTIONAL REVIEW."
PS034  Nyamkhuu, Davaadorj  "LAPAROSCOPIC CHOLECYSTECTOMY WITHOUT INTRAOPERATIVE CHOLANGIOGRAPHY: IS IT SAFE?"
PS035  O’Rourke, Nicholas  "LAPAROSCOPIC STAPLED DISTAL PANCREATECTOMIES CAN LEAK"
PS036  Odo, Masaharu  "ENDOSCOPIC HEAT ABLATION THERAPY FOR HEPATOCELLULAR CARCINOMA"
PS037  Onders, Raymond  "THE ERA OF ULTRASONOGRAPHY DURING LAPAROSCOPIC CHOLECYSTECTOMY: IS CHOLANGIOGRAPHY EVER NEEDED"
PS038  O’Hara, Hirotugu  "LAPALOSCOPIC CHOLECYSTECTOMY WITH TWO ORIGINAL LIFTING BARS"
PS039  Paganini, Alessandro  "LAPAROSCOPIC CRYOABLATION OF HEPATIC TUMORS: MID-TERM FOLLOW-UP RESULTS"
PS040  Paganini, Alessandro  "TEN YEARS EXPERIENCE WITH LAPAROSCOPIC SINGLE STAGE COMMON BILE DUCT STONES MANAGEMENT"

Underline denotes presenter  * denotes resident paper.

http://www.8thworldcongress.org/
PS041 Pidigu, Rajan “LAPAROSCOPIC MANAGEMENT OF COMPLICATED HYDATID CYST WITH INTRABILARY RUPTURE.”

PS042 Ray, Subir “CAN LAPAROSCOPIC CHOLECYSTECTOMY BE DONE IN A TRUE OUTPATIENT SETTING FOR ACUTE, CHRONIC AND GANGRENOUS CHOLECYSTITIS? THE EXPERIENCE OF 588 CONSECUTIVE LAPAROSCOPIC CHOLECYSTECTOMIES BY A SINGLE SURGEON.”

PS043 Reddy, Prasanna “LAPAROSCOPIC STUMP CHOLECYSTECTOMY: HOW SAFE IS IT?”

PS044 Reissman, Petachia “LAPAROSCOPIC ENucleATION OF PANCREATIC ISLET CELL Tumors”

PS045 Rosen, Michael “PREDICTIVE FACTORS FOR CONVERSION OF LAPAROSCOPIC CHOLECYSTECTOMY”

PS046 Sandu, Triuk “THREE PORT VERSUS STANDARD LAPAROSCOPIC CHOLECYSTECTOMY, A PROSPECTIVE, RANDOMIZED TRIAL”

PS047 Shibuya, Kazuhiro “LAPAROSCOPIC CYSTOEJUNOSTOMY FOR PANCREATIC PSEUDOCYST. -INFRACOSTAL APPROACH”

PS048 Shimomura, Kazuyuki “EXPERIMENTAL AND CLINICAL EVALUATION OF COMMON BILE DUCT REPAIR BY TITANIUM CLIP”

PS049 Spira, Ram “LAPAROSCOPIC CHOLECYSTECTOMY IN OCTOGENARIANS”

PS050 Tagaya, Nobumi “EXPERIENCE WITH LAPAROSCOPIC RESECTION OF THE PANCREAS”

PS051 Tanaka, Jun-ichi “CHOLECYSTECTOMY WITH LAPAROSCOPIC MINI-INSTRUMENTS”

PS052 Yeung, CK “LAPAROSCOPIC EXCISION OF CHOLEDOCHAL CYST IN CHILDREN”

HERNIA SURGERY

PS053 Al Dohayan, Abdullah “LAPAROSCOPIC PERCUTANEOUS CLOSURE OF DEEP INGUINAL RING IN INDIRECT INGUINAL HERNIA”

PS054 Bingener, Juliane “ADHESION FORMATION AFTER LAPAROSCOPIC VENTRAL INCISIONAL HERNIA REPAIR WITH POLYPROPYLENE MESH:A STUDY USING ABDOMINAL ULTRASOUND”

PS055 Bingener, Juliane “RECURRANCE RATE AFTER LAPAROSCOPIC REPAIR OF RECURRENT INGUINAL HERNIAS: HAVE WE IMPROVED?”

PS056 Boogert, Jolanda Van De “THE SPORTSMAN’S HERNIA: A CAUSE OF CHRONIC GROIN PAIN”

PS057 Bossard, Kerrie “LAPAROSCOPIC VENTRAL HERNIA REPAIR”

PS058 Chowdhury, Humayun “SURGICAL TECHNIQUE IN DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY”

PS059 Duluq, Jean-louis “2514 TOTALLY EXTRAPERITONEAL LAPAROSCOPIC HERNIA REPAIR (TEPA) IN A SINGLE INSTITUTION”

PS060 Edelman, David “LAPAROSCOPIC HERNIORRHAPY USING PORCINE SMALL INTESTINAL SUBMUCOSA (SIS) MESH - 2 YEAR FOLLOW UP.”

PS061 Ghitulescu, Gabriela “INCISIONAL HERNIA REPAIR: COMPARISON OF 3 TYPES OF MESH IN A RABBIT MODEL”

PS062 Ghoghesaei, Manouchehr “LICHENSTEIN VERSUS ENDOSCOPIC INGUINAL HERNIA REPAIR: DIFFERENCES IN QUALITY OF LIFE.”

PS063 Ghoghesaei, Manouchehr “LAPAROSCOPIC VERSUS OPEN TENSION FREE REPAIR OF INCISIONAL HERNIAS: POSTOPERATIVE QUALITY OF LIFE.”

PS064 Glascock, Matthew “LAPAROSCOPIC EXPLORATION FOR ATHLETIC PUBALGIA”

PS065 Habib, Elias “BOCHDALEK HERNIA IN ADULTHOOD: PITFALLS AND MISDIAGNOSIS”

PS066 Habib, Elias “LAPAROSCOPIC TENSION-FREE REPAIR OF INCISIONAL UMBILICAL OR EPIGASTRIC HERNIA WITH GORETEX MESH”

PS067 Habib, Elias “RETORETROPERITONEAL TENSION-FREE REPAIR OF THE LUMBAR HERNIA”

PS068 Ikeda, Masahito “LAPAROSCOPIC INGUINAL HERNIA REPAIR BYEXTRAPERITONEAL APPROACH:USEFULNESS OF PERITONEAL EDGE ORIENTED METHOD”

PS069 Juergens, Christopher “LAPAROSCOPIC VENTRAL HERNIA REPAIR IN THE OBESE PATIENT: A CASE SERIES.”

PS070 Khajanchee, Yashodhan “ARE LAPAROSCOPIC HERNIA REPAIRS TRULY MORE EXPENSIVE THAN OPEN?”

PS071 Konstantinidis, Konstantinos “LAPAROSCOPIC INGUINAL HERNIA REPAIR”

PS072 Lau, Hung “LEARNING CURVE FOR UNILATERAL ENDOSCOPIC TOTALLY EXTRAPERITONEAL INGUINAL HERNIOLAPLASTY”

PS073 Lau, Hung “ENDOSCOPIC EXTRAPERITONEAL INGUINAL HERNIOLAPLASTY OF INDIRECT INGUINAL HERNIA:REDUCTION VS LIGATION”

PS074 Lau, Hung “MANAGEMENT OF PERITONEAL TEAR DURING ENDOSCOPIC EXTRAPERITONEAL INGUINAL HERNIOLAPLASTY”

PS075 Lemos, Silvio “USE OF STITCHES FOR MESH FIXATION IN LAPAROSCOPIC INGUINAL HERNIA REPAIR.”

PS076 Milic, Dragan “PHS: A NEW APPROACH IN THE TREATMENT OF GROIN HERNIAS”

PS077 Morales-Conde, Salvador “IS THERE INDICATIONS TO PLACE A MESH INTRAPERITONEALLY WITH CONTAMINATION OF THE ABDOMINAL CAVITY DURING LAPAROSCOPIC VENTRAL HERNIA REPAIR?”

PS078 Shimomura, Kazuyuki “LAPAROSCOPIC INTRAPERITONEAL ONLAY MESH (IPOM) REPAIR FOR INGUINAL HERNIA BY COMPOSITE MESH”

PS079 Sundaram, Balasasikumar “EVALUATION OF PREPERITONEAL INGUINAL HERNIOLAPLASTY BY DIFFERENT APPROACHES: TAPP VS TEP VS OPEN”

PS080 Takehara, Hiroo “AN ADVANCED DEVICE FOR LAPAROSCOPIC REPAIR FOR GROIN HERNIA OF PEDIATRIC PATIENTS.”

PS081 Tarnoff, Michael “PLANNED TOTALLY EXTRAPERITONEAL LAPAROSCOPIC SPIGELIAN HERNIA REPAIR”

PS082 Tarnoff, Michael “LAPAROSCOPIC INGUINAL HERNIA UTILIZING LOCAL ANESTHESIA AND A LARYNGEAL MASK AIRWAY.”

PS083 Tatum, Roger “IDENTIFYING THE OPTIMAL APPROACH IN REMEDIAL SURGERY FOR RECURRENT REFLUX AND SYMPTOMATIC HIATUS HERNIA - ABDOMINAL OR THORACIC?”

PS084 Tiruchelvam, Vasudevan “LAPAROSCOPIC PRE-PERITONEAL INGUINAL HERNIA REPAIR WITHOUT THE USE OF BALLOON INSUFFLATOR OR TACKERS: A MORE COST-EFFECTIVE APPROACH”

PS085 Topart, Philippe “LAPAROSCOPIC VENTRAL HERNIA REPAIR WITH THE GORETEX DUALMESH: THE FIRST 100 CASES”

PS086 Topart, Philippe “REOPERATIONS AFTER LAPAROSCOPIC VENTRAL HERNIA REPAIR WITH THE GORETEX DUALMESH”

PS087 Van’t Riet, Martijne “TENSILE STRENGTH EVALUATION OF MESH FIXATION METHODS IN LAPAROSCOPIC INCISIONAL HERNIA REPAIR.”
**MINIMALLY INVASIVE OTHER**

PS088 Whitaker, John "COMPARISON OF ADHESION FORMATION ASSOCIATED WITH TACKER (US SURGICAL) VERSUS A NEW MESH FIXATION DEVICE, SALUTE (ONUX MEDICAL)"

PS089 Alexakis, Nikolaos "IMMEDIATE OR DELAYED DIAGNOSIS OF PERFORATED GASTRODUODENAL ULCER DURING LAPAROSCOPIC CHOLECYSTECTOMY."

PS090 Allen, Jeff "TOTTALLY LAPAROSCOPIC MANAGEMENT OF GALLSTONE ILEUS".

PS091 Arcovedo, Rodolfo "ULTRASOUND GUIDED THERAPY OF CECAL CECECTOMY WITH LAPAROSCOPY AND PERIOPERATIVE FIXATION DEVICE, SALUTE (ONUX MEDICAL)"

PS111 Honma, Kaneatsu "A NEW TECHNIQUE OF THE LAPAROSCOPICALLY-ASSISTED INTRAGASTRIC SURGERY. A NEW INSERTION METHOD OF TROCARS THROUGH GASTRIC WALL USING THE SMALL OPEN LAPAROTOMY."

PS112 Ise, Norihito "LAPAROSCOPIC SURGERY TO THE PATIENTS WITH LIVER CIRRHOSIS - AS FOR THE SAFETY POSITION ON ABDOMEN FOR INSERTION OF TROCAR."

PS113 Jacone, Tomas "ADVANCED LAPAROSCOPY IN CHILDREN WITH CYANOTIC CONGENITAL HEART DISEASE".

PS114 Kagaya, Tadashi "LAPAROSCOPIC CHOLECYSTECTOMY VIA TWO PORTS, USING THE TWIN-PORT."

PS115 Kamolz, Thomas "LAPAROSCOPIC ANTIREFLUX SURGERY IN GERD PATIENTS WITH CONCOMITANT MAJOR DEPRESSION."

PS116 Kamolz, Thomas "AN ANALYSIS OF QUALITY OF LIFE DATA BEFORE AND AFTER LAPAROSCOPIC FLOPPY NISSEN FUNDOPLICATION IN PATIENTS WITH AND WITHOUT BARRET'S ESOPHAGUS."

PS117 Khoury, Ghattas "LAPAROSCOPIC TREATMENT FOR SPLENIC HYDATIDIOSIS."

PS118 Kondraske, George "LAPAROSCOPIC SKILLS: DO GOOD HANDS BEGUS LAPAROSCOPIC ABILITY?"

PS119 Krasnolutsky, Nikolay A. "LAPAROSCOPIC OPERATIONS FOR ABDOMINAL TRAUMA AFENDULOV S.A., MD, KRASNOLUTSKY N.A., MD HEALTH CENTRE OF LIPETSK IRON AND STEEL CORPORATION, RUSSIA."

PS120 Krasnolutsky, Nikolay A. "INDIVIDUAL TREATMENT OF ULCERATIVE DISEASE AFTER LAPAROSCOPIC REPAIR OF PERFORATED DUODENAL ULCER AFENDULOV S.A., MD, KRASNOLUTSKY N.A., MD"

PS121 Krasnolutsky, Nikolay A. "RELAPAROSCOPIC OPERATIONS IN TREATMENT OF COMPLICATIONS AFTER CONVENTIONAL AND LAPAROSCOPIC PROCEDURES."

PS122 Kubota, Hiroshi "THORACOSCOPIC PULMONARY VEIN ISOLATION TO TREAT ATRIAL FIBRILLATION."

PS123 Ludwig, Kaja "LAPAROSCOPIC-ENDOSCOPIC COMBINED RESECTION OF GaSTRIC TUMORS."

PS124 Marzouk, Mohamed "LAPAROSCOPIC TOUTET FUNDOPLICATION IN PATIENTS WITH CONCOMITANT MAJOR DEPRESSION."

PS125 Marzouk, Mohamed "LAPAROSCOPICALLY ASSISTED ORCHIOPEXY EXTENDED MOBILIZATION OF INTRA-ABDOMINAL TESTIS."

PS126 Matsuzawa, Ichiro "EXPERIENCE OF LAPAROSCOPIC RADICAL PROSTATECTOMY."

PS127 Miller, Harry "ROBOTIC SURGERY IN MEXICO. OUR EXPERIENCE SINCE 1996."

PS128 Mylonaki, Despoina "COST ANALYSIS OF LAPAROSCOPIC CHOLECYSTECTOMY VS OPEN CHOLECYSTECTOMY IN A UNIVERSITY TEACHING HOSPITAL IN GREECE."

PS129 Nagy, Alex "INTRA-SURGEON VARIABILITY IN MOTOR TASK PERFORMANCE IN LAPAROSCOPIC SURGERY."

PS130 Nels, Cynthia "OPTIMAL CLOSURE METHOD OF FIVE MILLIMETER TROCAR SITES."

PS131 Nishikawa, Tomofumi "TREATMENT OF INTRAVENTRICULAR HEMATOMA WITH FLEXIBLE ENDOCOPY: A CASE REPORT."

Underline denotes presenter, * denotes resident paper.
FRIDAY March 15, 2002: Poster Abstracts

PS132 Nishizawa, Haruki “A CASE OF ECTOPIC OVARY WITH PARTIAL ABSENCE OF BILATERAL FALLOPIAN TUBES THAT WAS DETECTED DURING LAPAROSCOPIC SURGERY”

PS133 Novitsky, Yuri “PROSPECTIVE RANDOMIZED BLINDED TRIAL OF MINI-PORT VS CONVENTIONAL CHOLECYSTECTOMY”

PS134 Oberwalder, Michael “ANAL ULTRASOUND AND ENDO-SONOGRAPHIC MEASUREMENT OF PERINEAL BODY THICKNESS: A NEW EVALUATION FOR FECAL INCONTINENCE IN FEMALE”

PS135 Ohara, Satoshi “EVALUATION OF GYNECOLOGICAL LAPAROSCOPIC SURGERY BASED ON ANALYSIS OF SURGICAL STRESS”

PS136 Ohtsuka, Yoshiya “VIDEOSCOPY-CONTROLLED CORONARY ARTERY BYPASS GRAFTS”

PS137 Palesty, J. Alexander “LAPAROSCOPIC IN PATIENTS WITH APPENDICITIS: A RETROSPECTIVE REVIEW OF 33 CONSECUTIVE CASES”

PS138 Papia, Guiseppe “LAPAROSCOPIC REPAIR OF MORGAGNI DIAPHRAGMATIC HERNIA IN CHILDREN: TECHNICAL CHALLENGES AND RESULTS”

PS139 Pierre, Andrew “MINIMALLY INVASIVE SURGERY FOR ESOPHAGEAL DIVERTICULA”

PS140 Pinheiro, Jose “CAUSES OF CONVERSION TO OPEN DURING LAPAROSCOPIC ADRENALECTOMY”

PS141 Rahman, Motiar “REMOVAL OF DROPPED STONE DURING LAPAROSCOPIC CHOLECYSTECTOMY.”

PS142 Rahman, Motiar “A NEW METHOD OF FIRST CANNULATION IN LAPAROSCOPIC SURGERY.”

PS143 Reisman, Petachia “LAPAROSCOPIC CRYOABLATION OF RENAL TUMORS - PRELIMINARY RESULTS”

PS144 Rosin, Danny “LAPAROSCOPIC TOTAL GASTRECTOMY: INITIAL RESULTS IN 3 PATIENTS”

PS145 Rubino, Francesco “ENDOSCOPIC APPROACH FOR CAROTID ARTERY BYPASS GRAFTS”

PS146 Saxena, Shobhna “LEARNING CURVE - TOTAL LAPAROSCOPIC HYSTERECTOMY - AN EXPERIENCE OF 142 CASES A RETROSPECTIVE STUDY.”

PS147 Schmandra, Thomas “ROBOT-ASSISTED LAPAROSCOPIC RESECTION OF AN ANEURYSM OF THE INFERIOR VENA CAVA IMITATING A RETROPERITONEAL NEOPLASM”

PS148 Shimizu, Shuji “MEDIASTINOSCOPIC THYMECTOMY IN MYASTHENIA GRAVIS.”

PS149 Tajima, Gengo “LAPAROSCOPIC SPLENECTOMY FOR RECURRENT METASTASIS OF OVARIAN CANCER”

PS150 Takeuchi, Ikuya “NATURAL KILLER ACTIVITY IS BETTER PRESERVED AFTER A GASLESS PROCEDURE THAN AFTER PNEUMOPERITONEUM OR LAPAROSCOPY IN RATS”

PS151 Ulkanov, Alexander “USE OF VIDEOPELVISCOPY IN THE DIAGNOSIS AND TREATMENT OF GYNECOLOGICAL DISEASES”

PS152 Ussia, Giovanni “TECHNIQUE AND LONG TERM RESULTS OF LAPAROSCOPIC CHOLECYSTECTOMY USING LIGATION OF THE CYSTIC DUCT AND ARTERY”

PS153 Van Den Broek, Wim “INDICATIONS FOR DIAGNOSTIC LAPAROSCOPY IN CASE OF SUSPECTED APPENDICITIS”

PS154 Varma, Mannoharan “ROLE OF INTRAOPERATIVE ULTRASONOGRAPHY IN SINGLE HOLE CHOLECYSTECTOMY: AN EXPERIENCE OF OVER 10,000 CASES.”

PS155 Veldkamp, Ruben “DOES VENTILATION WITH PEEP PRESERVE CARDIOPULMONARY FUNCTION DURING LAPAROSCOPIC SURGERY IN PULMONARY DISEASE?”

PS156 Villegas, Leonardo “LAPAROSCOPIC INTRAPERITONEAL HYPERTHERMIC CHEMOTHERAPY FOR MALIGNANT ASCITES IN PERITONEAL CARCINOMATOSIS.”

PS157 Williams, Michael “LAPAROSCOPIC MANAGEMENT OF LOCALIZED INTRA-ABDOMINAL CASTLEMAN’S DISEASE”

PS158 Woo, Jonggook “LAPAROSCOPIC ASSISTED COLECTOMY (LAC) VERSUS OPEN SURGERY, RETROSPECTIVE CASE-MATCHING STUDY”

PS159 Yasuda, Akira “THE LAPAROSCOPIC RESECTION OF THE DUODENAL CARCINOID TUMOR”

PS160 Yeung, CK “RETROPERITONEOSCOPIC URETEROURETEROSTOMY FOR THE TREATMENT OF OBSTRUCTIVE RETROILIAC URETER IN A 4-YEAR-OLD BOY”

PS161 Yeung, CK “LAPAROSCOPIC VARIOCOCELECTOMY IN YOUNG PATIENTS: TO LIGATE THE TESTICULAR ARTERY OR NOT”

PS162 Yokoyama, Tadashi “LAPAROSCOPIC SPLENECTOMY UNDER BALLOON OCCLUSION OF THE SPLENIC ARTERY: FOR REDUCTION OF BLOOD LOSS AND OPERATOR’S STRESS”

PS163 You, Seong Yeop “EFFECTS OF CLOSED LOOP INTESTINAL OBSTRUCTION ON MESENTERIC BLOOD FLOW: LARGE ANIMAL MODEL OBSERVATIONS”

PS164 Zacharoulis, Dimitris “LONG TERM OUTCOME FOLLOWING LAPAROSCOPIC NISSEN FUNDOPICATION”

PS165 Zameerpasha, A “ECTOPIC PREGNANCIES WITH HAEMOPERITONEUM - TACKLING OF 42 CASES OF EMERGENCIES IN PELVIS”

PS166 Zameerpasha, A “ECTOPIC TESTES IN RT. ILLIAC FOSSA - LAPAROSCOPIC EXPLORATION, ECTOMY OR PEXY - A SERIES OF 21 CASES”

NEW TECHNIQUES/TECHNOLOGY

PS167 Al Dohayan, Abdullah “CLOSURE OF TROCAR SITE WOUND”

PS168 Alexander, Kelly “FLEXIBLE LAPAROSCOPY - EXPERIENCE WITH 1036 CASES”

PS169 Angelini, Licinio “ROBOTIC SOLUTION FOR RELIABLE BIOPTIC SAMPLES DURING LAPAROSCOPIC SURGERY”

PS170 Arcovedo, Rodolfo “COMPARISON BETWEEN THE GEA UPPER EXTRACORPOREAL KNOT AND THE ROEDER EXTRACORPOREAL KNOT: MORE SECURE, EASIER, QUICKER TISSUE APPROXIMATION.”

PS171 Aziz, Asad “LAPAROSCOPIC GASTROPEXY IN CONJUNCTION WITH PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN HIGH RISK PATIENTS”

PS172 Bailey, Brian “MINIMALLY INVASIVE REPLACEMENT OF THE ABDOMINAL AORTA: A NEW ROBOTIC TECHNIQUE”

PS173 Barnett, Sean “LAPAROSCOPIC SUBTOTAL COLECTOMY FOR COLONIC INERTIA”

PS174 Berger, Robert “INITIAL ONE YEAR EXPERIENCE WITH ROBOTIC ADVANCED LAPAROSCOPIC FOREGUT SURGERY”

PS175 Boni, Luigi “A NEW DEVICE FOR BLEEDING CONTROL IN ENDOSCOPIC SURGERY”

PS176 Campagnacci, Roberto “VIDEO SURGERY AND FIBEROPTIC HIGH SPEED CONNECTIONS”

PS177 Carbon, Roman “TISSUE MANAGEMENT IN MIS BY SEALING: ADHESIVE STRENGTH AND TREATMENT OF SPLENIC TRAUMA”

Underline denotes presenter. * denotes resident paper.

http://www.8thworldcongress.org/
FRIDAY March 15, 2002: Poster Abstracts

PS178 Catton, James "LAPAROSCOPIC SPLENECTOMY WITHOUT CLIPS, STAPLES OR LIGATURES."
PS179 Conquest, Anne "COMPUTER ENHANCED ROBOTICALLY ASSISTED GENERAL SURGERY: INITIAL EXPERIENCE WITH 62 PATIENTS"
PS180 Cosgriff, Ned "COMPARISON OF HEALING PROCESS FOLLOWING LIGATION WITH SUTURES AND BIPOLAR VESSEL SEALING"
PS181 Donias, Harry "ROBOTICS IN PEDIATRIC SURGERY TRAINING"
PS182 Dumon, Kristoffel "THE EVALUATION OF THE FUNCTIONAL PERFORMANCE OF A NEW COMPUTER MEDIATED CIRCULAR CUTTING STAPLER IN A PRECLINICAL SETTING"
PS183 Ebrahimi, Dariush "A STATISTICAL ANALYSIS OF SURGICAL IMAGES: IMPLICATIONS FOR VISUAL DISCRIMINATION OF TISSUE"
PS184 Evans, William "A NEW, GRADED PRESSURE LAPAROSCOPIC FUNDOPPLICATION FOR THE TREATMENT OF 'GERD' IN THE DYSMOTILE ESOPHAGUS."
PS185 Gandsas, Alex "FIRST WIRELESS BROADCAST OF LAPAROSCOPIC SURGERY TO A HAND HELD COMPUTER"
PS186 Gandsas, Alex "TRANSCERVICAL MINIMALLY INVASIVE APPROACH FOR ZENKER'S DIVERTICULUM"
PS187 Garcia-oria, Miguel "ARE VISITORS OF A MEDICAL WEB SITE SUFFERING FROM THE ILLNESS THE WEB SITE IS ABOUT?"
PS188 Hamstra, Stanley "A NOVEL METHOD FOR THE ASSESSMENT OF DEPTH PERCEPTION IN SURGERY FROM TWO-DIMENSIONAL DISPLAYS"
PS189 Hayakawa, Tetsushi "DUAL VISION SURGERY FOR LAPAROSCOPIC DISTAL GASTRECTOMY"
PS190 Kokuba, Yukihito "LAPAROSCOPIC COLECTOMY PROCEDURE IN A DIFFICULT COLON CANCER PATIENT- INTRA-ABDOMINAL ADHESION"
PS191 Kurauchi, Nobuaki "A NEW TECHNIQUE OF ENDOSCOPY: GUIDED TRANSHEPATIC BILIARY DRAINAGE AFTER LAPAROSCOPIC CHOLEDOCHOLITHOTOMY"
PS192 Kurian, Marina "CAN A NITINOL CLIP REPLACE SUTURE FOR ADVANCED LAPAROSCOPIC SURGERY?"
PS193 MacDonald, Jeannie "A LAY PERSON VERSUS A TRAINED ENDOSCOPIST: CAN THE PREOP ENDOSCOPY SIMULATOR DETECT A DIFFERENCE?"
PS194 Mallen, Antonio "USES OF BIPOLAR SEALANT SYSTEM (LIGASURE®) IN LAPAROSCOPIC SURGERY"
PS195 Mallen, Antonio "USE OF BIPOLAR VESSEL SEALING SYSTEM (LIGASURE®) IN LAPAROSCOPIC SURGERY."
PS196 Matsumoto, Sumio "ULTRASONIC TROCAR, SCISSORS AND ASPIRATOR WITH AN ELECTRIC CAUTERY CONNECTOR ACCOMPLISHED SAFE LAPAROSCOPIC OPERATION."
PS197 Matsuura, Yoshifumi "THE ULTIMATE LAPAROSCOPIC CHOLECYSTECTOMY - CLIPLESS NEEDLE PROCEDURE"
PS198 Maude, Karen "INITIAL EXPERIENCE WITH LAPAROSCOPIC ADHESIOLYSIS AND INSERTION OF SEPIFILM II."
PS199 Miserez, Marc "ENDOSCOPIC TOTALLY PREPERITONEAL VENTRAL HERNIA REPAIR: FEASIBILITY STUDY"
PS200 Nagata, Naoki "LAPAROSCOPIC SPLENECTOMY: SURGERY TECHNIQUE AND OUTCOMES OF 23 PATIENTS"
PS201 Park, Adrian "NOVEL GASTROINTESTINAL ANASTOMOTIC DEVICE DEVELOPED FOR LAPAROSCOPIC OR ENDOLUMINAL DEPLOYMENT-A PILOT STUDY"
PS202 Park, Adrian "APPLICATIONS OF DIGITAL IMAGING PROCESSING TO LAPAROSCOPIC SURGERY"
PS203 Perez, Alexander "WHAT IS THE VALUE OF TELEROBOTIC TECHNOLOGY IN GASTROINTESTINAL SURGERY?"
PS204 Reynolds, James "VALIDATION AND APPLICATION OF A METHOD TO CONTINUALLY-MEASURE IN UTERO FETAL SHEEP CEREBRAL OXYGENATION DURING MATERNAL GENERAL ANESTHEISA"
PS205 Rubino, Francesco "NEW APPROACH OF A 3D VIRTUAL SCLEROPTIC: AUTOMATIC TREATMENT FROM THE MRI DATA"
PS206 Rubino, Francesco "TRI-DIMENSIONAL (3D) VIRTUAL CHOLANGIOGRAPHY: EVALUATION OF A NEW COMPUTERIZED TECHNIQUE"
PS207 Ruurda, Jelle "INITIAL EXPERIENCES WITH ROBOT-ASSISTED LAPAROSCOPIC SURGERY; A REPORT OF 30 LAPAROSCOPIC CHOLECYSTECTOMIES WITH THE USE OF THE DA VINCI SYSTEM."
PS208 Ruurda, Jelle "EVALUATION OF TIME-LOSS RELATED TO THE USE OF ROBOTICS IN LAPAROSCOPIC SURGERY."
PS209 Sano, Yoshifumi "NEW METHOD OF VIDEOXADIOLOGY USING SUBCU-DISSECTOR"
PS210 Santos, Jose Eduardo "DUAL HOLDER TELESCOPE/LIVER RETRACTOR IN LAPAROSCOPIC HIATUS HERNIA SURGERY - A NEW INEXPENSIVE AND PRACTICAL DEVELOPMENT"
PS211 Schauer, Philip "LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR USING A NEW BIOMATERIAL MESH."
PS212 Schlachta, Christopher "POINT OF CARE DATA COLLECTION FOR MINIMALLY INVASIVE SURGERY: THE DOMINIC PROJECT"
PS213 Shen, Perry "LAPAROSCOPIC RADIOFREQUENCY ABLATION OF THE LIVER IN PROXIMITY TO MAJOR VASCULATURE: EFFECT OF THE PRINGLE MANEUVER"
PS214 Sims, Carrie "HISTOLOGICAL CHARACTERISTICS OF LAPAROSCOPIC COAGULATION WITH THE TISSUELINK (TM) FLOATING BALL(TM)"
PS215 Srimurthy, K.R. "ANORECTAL MALFORMATIONS: IS LAPAROSCOPIC PULLTHROUGH JUSTIFIED?"
PS216 Tamura, Isao "LAPAROSCOPIC SURGERY USING A NEWLY DESIGNED SUCTION-LIFTER"
PS217 Treat, Michael "A NEW THERMAL DEVICE FOR TISSUE WELDING"
PS218 Van Koesveld, Jacomar "USE OF HEAD-MOUNTED DISPLAY IN TRANSANAL ENDOSCOPIC MICROSURGERY."
PS219 Vanuno, Daniel "ROBOTIC VERSUS LAPAROSCOPIC HELLER MYOTOMY: REVIEW OF THE INITIAL EXPERIENCE"
PS220 Watanabe, Masazumi "LESS INVASIVE VIDEO-ASSISTED SURGERY FOR THYMIC DISEASES THROUGH MINI-STERNOTOMY - ESPECIALLY EXTENDED THYMECTOMY FOR MYASTHENIA GRAVIS."
PS221 Wenger, Urs "ISOBARIC LAPAROSCOPY MADE EASY BY THE LAPAROTENER."
PS222 Yamakawa, Tatsuo "LIGA-SUTURING DEVICE FOR ENDOSCOPIC SURGERY"
PS223 Yeung, CK "INTRAVESICAL ENDOSCOPICURETERIC REIMPLANTATION FOR OBSTRUCTIVE MAGAURETERS UNDER CARBON DIOXIDE PNEUMOVESICUM"

Underline denotes presenter * denotes resident paper.

http://www.8thworldcongress.org/
FRIDAY March 15, 2002: Poster Abstracts

**SOLID ORGAN REMOVAL**

PS224 Yokoyama, Masayoshi “ENDOSCOPIC INTRATHORACIC SURGERY UNDER NEGATIVE PRESSURE AND SPONTANEOUS RESPIRATION”

PS225 Al Dohayan, Abdullah “LAPAROSCOPIC SPLENECTOMY”

PS226 Bell, Robert “LAPAROSCOPIC DONOR NEPHRECTOMY DOES NOT ADVERSELY AFFECT LONG-TERM QUALITY OF LIFE…”

PS227 Billy, Helmuth “LAPAROSCOPIC MANAGEMENT OF GRADE III AND IV SPLENIC INJURIES IN THE HEMODYNAMICALLY STABLE TOURIST”

PS228 Buell, Joseph “LAPAROSCOPIC DONOR NEPHRECTOMY IN THE SUPER MORBIDLY OBESE”

PS229 Duperier, Terive “FACTORS PREDICTING RESPONSE OF LAPAROSCOPIC SPLENECTOMY IN PATIENTS WITH IMMUNE THROMBOCYTOPENIC PURPURA (ITP)”

PS230 Duperier, Terive “LAPAROSCOPIC SPLENECTOMY FOR PATIENTS WITH EVANS SYNDROME”

PS231 Elli, Enrique “LIVING RELATED ROBOTIC DONOR NEPHRECTOMY”

PS232 Feldman, Liane “LAPAROSCOPIC VERSUS OPEN SPLENECTOMY FOR ITP: A CASE-MATCHED COMPARISON”

PS233 Feliciotti, Francesco “TREATMENT OF ADRENAL METASTASES BY LAPAROSCOPIC TRANSPERITONEAL ANTERIOR APPROACH”

PS234 Hashimoto, Masaji “RIGHT HEPATIC DUCT EMPTYING INTO CYSTIC DUCT: REPORT OF A CASE”

PS235 Jackson, Patrick “LAPAROSCOPIC MANAGEMENT OF SPLENIC TRAUMA: CASE REPORT AND REVIEW OF THE LITERATURE”

PS236 Jensen, Aaron “LAPAROSCOPIC SPLENECTOMY: THE EARLY EXPERIENCE”

PS237 Katori, Remi “LAPAROSCOPIC ADRENECTOMY (RETROPERITONEAL APPROACH)”

PS238 Kercher, Kent “IMPACT OF THE INTRODUCTION OF LAPAROSCOPIC NEPHRECTOMY WITHIN A COMMUNITY-BASED TEACHING HOSPITAL”

PS239 Kuranishi, Fumito “PROS AND CONS OF VIDEO-ASSISTED-NECK-SURGERY”

PS240 Lauter, David “DEVELOPING A PROGRAM FOR LAPAROSCOPIC NEPHRECTOMY IN A MEDICAL STAFF MODEL HMO”

PS241 Mecenas, John “A TECHNIQUE FOR SAFE DIVISION OF THE RENAL VESSELS DURING LAPAROSCOPIC KIDNEY HARVEST”

PS242 Noraldin, Osman “LAPAROSCOPIC ENDOCYSTECTOMY OF HYDATID CYST OF THE LIVER”

PS243 Regan, Joseph “SMALL BOWEL OBSTRUCTION AFTER LAPAROSCOPIC DONOR NEPHRECTOMY”

PS244 Rosen, Michael “HAND ASSISTED LAPAROSCOPIC SPLENECTOMY FOR MASSIVE SPLENOMEGALY”

PS245 Sekimoto, Mitsugu “RESULTS OF 62 UNSELECTED CONSECUTIVE LAPAROSCOPIC SPLENECTOMIES”

PS246 Takahashi, Hidenori “HAND-ASSISTED LAPAROSCOPIC SPLENECTOMY FOR SPLENIC TUMOR: TWO CASES REPORT”

PS247 Wintringer, Pascal “LAPAROSCOPIC LEFT PANCREATECTOMIES WITH SPLEEN PRESERVATION”

PS248 Wu, F.P.K. “HEMATOLOGICAL LONG-TERM RESULTS OF LAPAROSCOPIC SPLENECTOMY FOR PATIENTS WITH IDIOPATHIC THROMBOCYTOPENIC PURPURA”

PS249 Yamada, Hideo “RETROPERITONEOSCOPIC LIVE DONOR NEPHRECTOMY”

PS250 Zacharoulis, Dimitris “LAPAROSCOPIC SPLENECTOMY: BEYOND THE LEARNING CURVE”

Underline denotes presenter. * denotes resident paper.
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PATHOLOGICAL FINDINGS AND HELICOBACTER PYLORI INFEC-TION IN ASYMPTOMATIC PATIENTS UNDERGOING BARIATRIC SURGERY

Prasad S. Adusumilli*, M.D., Michael Leitman*, M.D., Mitchell Roslin*, M.D., Moutsaam Abaza*, M.D., Mathew Ostrowitz+, Valavanur Subramanian*, M.D.* Department of Surgery, Lenox Hill Hospital, New York, NY,* State University of New York School, Brooklyn, New York, NY.

Introduction: Studies suggest that the incidence of Helicobacter pylori (H.pylori) infection and gastritis in obese patients, including those undergoing gastric reduction surgery, may be increased.

Methods: Histological findings at the time of surgery in a series of patients who were undergoing Roux-en-Y gastric bypass (RYGBP) for morbid obesity were analyzed. Pathological material obtained from the bypass anastomosis was reviewed for the presence of gastritis and H. pylori. The presence of H. pylori was demonstrated using a hematoxylin- and eosin- stained biopsies.

Results: 341 morbidly obese patients underwent bariatric surgery between January 1999 and August 2001 by two surgeons at a single institution. Of 290 patients undergoing RYGBP, material for histological examination was available in 212 patients (73%). Gastritis was present in 85 patients (40%), active chronic gastritis in 28 (13%) and chronic gastritis in 57 (27%). H. pylori were present in 20 patients (9.4%). One in four patients with gastritis was positive for H. pylori. H. pylori were present in 15 patients with active chronic gastritis (56%) and in 5 patients with chronic gastritis (9%). The absence of H. pylori in gastritis positive patients was confirmed by further testing the biopsies with giemsa stain and modified Diff-quick method.

Conclusions: Our case series contradicts the recently published reports that the incidence of Helicobacter pylori in asymptomatic patients undergoing bariatric surgery is higher. In fact the incidence is lower than that found in age-matched controls.

FEASIBILITY OF Colecystectomy AT TIME OF ROux-EN-Y GASTRIC BYPASS. Aviv Ben Meir, M.D., Anna Miller, R.N., Courtney Holbrook, Ph.D., and Bruce D. Schirmer, M.D. Department of Surgery, University of Virginia, Charlottesville, Virginia.

Introduction: We performed a retrospective review of our database to determine if there was any added morbidity from performing cholecystectomy at the time of roux-en-y gastric bypass and to assess the increase in our operative times for the remaining 94 patients were reviewed and compared. We performed 29 open gastric bypasses with a mean operative time of 198 minutes. During this time period, we also performed 28 open gastric bypasses with cholecystectomy with a mean operative time of 211 minutes. We performed 16 laparoscopic gastric bypasses with a mean operative time of 256 minutes. We added cholecystectomy to laparoscopic gastric bypass in 21 patients with a mean operative time of 300 minutes. One patient that underwent cholecystectomy at the time of laparoscopic gastric bypass presented to the emergency room on postoperative day 5 with gallstone pancreatitis secondary to retained common duct stone. This was treated via a percutaneous transhepatic route.

Conclusion: Cholecystectomy can be performed safely in the setting of gastric bypass regardless of open or laparoscopic approach adding 13 minutes to our mean open operative times and 44 minutes to our mean laparoscopic operative times.


From 06/07/96 to 06/02/01 (30 months) 120 patients were operated for morbid obesity by one single surgeon. This study included 108 women (90%) and 12 men (10%). Average BMI was 46.6 (36-77), average weight 126 kg (93-225), 118 Lap-Bands (Bioenterics®) and 2 Swedish bands (Obtech®) were implanted. At 12 months, 65 patients could be evaluated, with an average weight decrease from 126 to 96 kg.

Port complications: 4 reversals due to suture failure (prolene 00), and 2 catheter disconnections (retrieved by laparoscopy).

Band complications: one porous band that was impossible to inflate at month 4 was recorded. It was changed under laparoscopy using the “small train” technique. Two gastric penetrations were also recorded: weight loss stopped at month 9, and the barium x-ray showed the band inside the stomach. Yellow discharge was also observed in the port. Removed laparoscopically at month 24.

Abscess at the port site at month 5 after the removal of a bezouard by fibroscopy two months before. Ablation by a conversion laparotomy (a paralytic ileus made laparoscopy impossible). Four per-operative complications led to 2 conversions due to the position of the trocar(s) and to a gastric perforation. Two patients haematomas necessitated re-intervention at H2 and D3. The ambition of the stomach with aphasia (8.3%) resulting from the anterior large tuberosity sliding over the band, after an average period of 9.1 month (3-20), required laparoscopic ablations (end of the weight loss) laparoscopic repositionings (one secondary failure) and 7 laparoscopic implantations of new bands. Patient related problems were linked to difficult follow-up, as 8 patients did not re-consult, 1 stopped follow-up at M4, and 50% consulted every one or two months. However, compliance is not a factor of success, and it is probable that women, aged >40, unemployed and depressive, represent a bad indication.

USE OF AN EEA STAPLER SIMPLIFIES THE JEUNO-JEUNOSTOMY OF LARPOROSCOPIC ROUX-EN-Y GASTRIC BYPASS. James F. de Caestecker, M.D., Andreas Castellanos, M.D., Barry D. Mann, M.D., William N. Wang, M.D., Medical College of Pennsylvania Department of Surgery, Philadelphia, Pennsylvania, Hahnemann University Hospital, Department of Surgery, Philadelphia, Pennsylvania.

Objective: Laparoscopic Roux Y gastric bypass has revolutionized the field of bariatric surgery. One of the most difficult steps is the jejuno-jejunostomy, one of the most popular techniques requires 2 applications of the endo-GIA stapler. Closure of the common channel formed by the first application of the device is often difficult to perform particularly when it has become enlarged by manipulation and threatens to narrow the caliber of the Roux limb. We describe a method of introducing the anvil of a EEA to the desired point in the Roux limb.

Procedure: After transecting the jejunal 40cm distal from the ligament of treitz the Roux limb is measured 75-150cm distally and marked with an endoclip. The anvil of a 21mm EEA is placed through the open end of a 16Fr red rubber catheter and the other end is cut. A 4Fr EET exchanger catheter is then placed as a stiffer through the catheter into the open end of the anvil. The anvil and attached catheters are then pushed into the peritoneal cavity. The tip of the device is exteriorized through the right side 12mm cannula. The anvil is placed inside the Roux limb and telescoped onto the catheter system until the anvil reaches the endoclip. The anvil is grasped and the catheter system detached by gentle traction. The post of the anvil is torqued against the antimesenteric border and a small enterotomy is made to allow the stem of the anvil to penetrate through the bowel wall. The EEA is passed into the bilary-pancreatic limb about 3cm and its stem brought out through the anti-mesenteric border. The anvil is married with the stem of the EEA and fired. The bilary-pancreatic limb is closed using the Endo GIA stapler, completing the jejuno-jejunostomy. Results: Operative time for performance of the jejuno-jejunostomy has been lessened by an estimated 25%. Conclusions: Performance of the jejunoojejunostomy can be simplified by using an EEA stapler. Benefits include decreased operative time and decreased concern for narrowing of the Roux limb.
Bariatric Surgery–PF005

EARLY RESULTS OF LAPAROSCOPIC NON-BANDED VERTICAL GASTROPLASTY WITH SLEEVE GASTRECTOMY (WITHOUT DUODE-NAL SWITCH) IN THE TREATMENT OF MORBID OBESITY Hazem A. Elariny, M.D., Ph.D. Advanced Laparoscopic and General Surgery Associates, PLLC

Background: In performing laparoscopic BPD with duodenal switch procedure in super morbidly obese, the difficulty and risk, encouraged the performance of the procedure in two stages. We began performing the laparoscopic vertical gastroplasty/sleeve gastrectomy alone, with intent to return for the duodenal switch after a significant weight loss. Many lower BMI (35-40) patients requested this procedure to reduce short and long term risks. Highly motivated non-sweet addicted, compliant patients were selected. Methods: During one year, 30 laparoscopic vertical gastroplasty / sleeve gastrectomy procedures were performed. Two 5 mm working ports and two 10/12 mm ports are placed. The Greater curvature of the stomach is devascularized using the harmonic scalpel. Application of the endo-GIA stapler is used to create a lesser curve gastric tube over a 60 french bougie. The antral staples are 4.8mm thick; body and fundic staples are 3.5 mm thick. No nasogastric suction is used. The patients are fed a liquid diet in the recovery room.

Results: Operative time ranged from 55 minutes to 210 minutes and averaged 90 minutes. 28/30 patients were discharged within a 23-hour observation period. Weight loss averaged 20 lbs during the first month post-operatively, then tapers to 1/4 to 1/2 pound per day for the next two months. Longer term weight loss results will require further follow-up. We experienced no staple line leaks, no hernias, no wound infections, no DVT’s, no other major complications. Patients report a high level of satisfaction. Conclusions: Laparoscopic non-banded vertical gastroplasty with sleeve gastrectomy, can be safely performed for these cases. The operating room time cost (ORTC) was calculated based on TORT. The procedures were performed by one surgeon(VEA) and the OR team which was consistently the same for all our cases(RNA,OR tech,and RN circulator).

Bariatric Surgery–PF007

ELECTIVE CHOLECYSTECTOMY DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: IS IT WORTH THE WAIT? Giselle G. Hamad MD, Sayeed Ikramuddin MD, William F. Gourash CRNP, Philip R. Schauer MD, University of Pittsburgh Medical Center Department of Surgery, Pittsburgh, Pennsylvania

We wish to demonstrate the safety of concomitant laparoscopic Roux-en-Y gastric bypass (lap GBP) and cholecystectomy (LC) in patients with gallstones diagnosed preoperatively.

Methods: Eighty-four out of 549 (15%) consecutive morbidly obese patients who underwent lap GBP had simultaneous elective LC. Six ports were used for the lap GBP; the same port placement was used for the LC. The gallbladder was retracted using the right subcostal port and dissection was carried out using the left upper quadrant port. Intraoperative cholangiography was approached selectively.

Results: Out of 549 patients, 105 had prior cholecystectomy. Forty-two percent of all patients had a concomitant secondary procedure; the most common was cholecystectomy (16.7%). Preoperative BMI was 48.4 ± 7.09 kg/m2 for patients having the combined procedure and 48.8 ± 7.3 kg/m2 (p=0.64) for patients having only lap GBP. Five patients had preoperative symptoms of biliary colic. Postoperatively, at one week follow-up of 7.8 ± 6.73 months, the percent excess weight loss was 46.5 ± 0.25% for the group having combined lap GBP and LC versus 50.15 ± 62.72% (p=0.59) for lap GBP alone. There were no conversions to an open procedure in order to perform the LC. None of the postoperative complications required endoscopic retrograde cholangiopancreatography. OR time for the combined procedure was 293.2 ± 7.98 minutes versus 245.0 ± 77.0 minutes for lap GBP alone (p < 0.0001). Length of stay for the combined procedure was 4.41 ± 1.12 days versus 2.69 ± 0.77 days for the lap GBP alone (p=0.001). There were no postoperative bile leaks or bile duct injuries. None of the patients had retained stones nor required endoscopic retrograde cholangiopancreatography.

Conclusions: Concomitant laparoscopic cholecystectomy and Roux-en-Y gastric bypass is safe and feasible using the same port placement for lap GBP. Combining LC with lap GBP does significantly increase operative time and nearly doubles the hospital stay.

Bariatric Surgery–PF006

TRANSGASTRIC INSERTION OF THE CIRCULAR STAPLER ANVIL IN LAPAROSCOPIC GASTRIC BYPASS

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Objective: Creation of the gastrojejunoanastomosis remains one of the most difficult steps in laparoscopic gastric bypass. Hand-sewn, side-to-side stapled, and circular stapled anastomoses have been described. We have adopted and refined a technique using a 25-mm circular stapler. The results of our last 100 patients using this approach are reviewed.

Methods/Technique: We insert the anvil transgastrically rather than the alternative transoral route. A gastrostomy is made along the greater curve of the stomach with an ultrasonic shears. This gastrostomy is in a direct line with our most inferior lateral left sided port and the proposed gastrojejunoanastomotic site on the proximal lesser curve. The anvil has a looped suture tied to its end. It is dropped into the abdomen via a right-sided port site after removing the port. A disposable curved dissectors with a tip capable of 90-degree rotation and full rotation is then used to grasp the suture. This instrument is then passed through the gastrostomy and the tip placed intraabdominally in the location selected for the gastrojejunoanastomosis. By retoculating the tip of the dissectors, the gastric wall is tented and thinned in this location. The ultrasonic shears are used to open the stomach on the tip of the anvil. The suture is grasped and pulled along with the spiked end of the anvil through the gastric wall. The greater curve gastrostomy site is closed with a linear endostapler. The pouch is then constructed with multiple firings of a rotocutting linear stapler.

Results: Deaths: 4 (0.4%). Weight Loss: 241 lbs; BMD: 0.6% OR: 0.6% Gastroscopy: 0.6%

Conclusions: Laparoscopic roux-en-Y gastric bypass is a procedure that has undergone parallel evolution at many centers and different techniques have been developed. Our technique is relatively simple and is associated with a low leak and stricture rate.

Bariatric Surgery–PF008

THE OR TEAM CONCEPT IN LAPAROSCOPIC GASTRIC BYPASS SURGERY Valeriu E. Andrei, MD; Beverly A. Johnson, RNFA, CNOR; Corazon Ramos, RNFA, CNOR; Wendy Hancock, RNFA, CNOR; Jacqueline W. Carey, RN, CCRN Department of Surgery and Operating Room Nursing Staff, Saint Peter's University Hospital, New Brunswick, NJ

PURPOSE: This study evaluated the efficiency and cost-effectiveness of using a designated team for laparoscopic gastric bypass surgery.

METHODS: An early postoperative outcome based on a retrospective review of increasing the number of cases performed in the same day was analyzed in three groups. Group 1 is constituted by the first two patients done on a rate of two LGB cases per day. Group 2 included the first two patients done on a rate of two LGB cases per day, and Group 3 included the first three patients done on the rate of three LGB cases per day. Total operating room time (TORT) which includes procedure time (PT), anesthesia time (AT) and nursing time (NT), American Society of Anesthesia physical status classification (ASA), body mass index (BMI), patient weight and length of hospital stay (LHS) were reviewed for these cases. The operating room time cost (ORTC) was calculated based on TORT. The procedures were performed by one surgeon (VEA) and the OR team which was consistently the same for all our cases (RNFA, OR tech, and RN circulator).

RESULTS: The results for Group 1 (cases 1,2), Group 2 (cases 8,9) and Group 3 (cases 236,237,238) are as follow: #1:Weight 219lbs, BMI 40, TORT 370min, PT 300min, AT & NT 70min, ORTC $5141. #2: Weight 246lbs, BMI 44, TORT 335min, PT 290min, AT & NT 45 min, ORTC $4760. #3:Weight 240lbs, BMI 43, TORT 365min, PT 300min, AT & NT 65 min, ORTC $4760. #5:Weight 262lbs, BMI 43, TORT 295min, PT 200min, AT & NT 95 min, ORTC $4380. #236:Weight 327lbs, BMI 50, TORT 145min, PT 100min, AT & NT 45 min, ORTC $2248. #237:Weight 299lbs, BMI 47, TORT 155min, PT 100min, AT & NT 55 min, ORTC $2640. #238:Weight 222lbs, BMI 39, TORT 155min, PT 100min, AT & NT 55 min, ORTC $2640. ASA and LHS were the same for all these patients. TORT, AT & NT decreased significantly from the first cases and were not related to lower weight or BMI.

CONCLUSIONS: Experience and the development of a team concept significantly decreased the cost for OR time without affecting the early postoperative discharge from the hospital.
LAPAROSCOPIC OBESITY SURGERY ON THE INTERNET

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While the easy access to the Internet can provide much information for many patients, the quality and accuracy of information are uncertain. Patients interested in laparoscopic obesity surgery have often attempted to educate themselves via the Internet. This investigation explores the information available over the Internet.

Four terms (laparoscopic obesity surgery, laparoscopic gastric bypass, laparoscopic bariatric surgery, and laparoscopic Roux-en-y bypass) were arbitrarily chosen to search on the six most popular search engines and two metasearch engines. The first twenty hits (bypass) were arbitrarily chosen to search on the six most popular search engines and two metasearch engines. From the original 602 hits, only 119 unique web sites were found. Only 67/119 (56%) unique web sites had some type of education information concerning laparoscopic obesity surgery. While 63/119 (53%) sites discussed a procedure related to obesity surgery, 18/63 (29%) had biased or misleading information. Only 30/63 (48%) did not discuss the details of the procedure, 37/63 (59%) did not discuss other procedures, 30/63 (48%) did not discuss complications of the procedure, 37/63 (59%) did not discuss death as a risk to any procedure, and 7/63 (11%) did not discuss laparoscopic obesity surgery. Only 89 (15%) of the original 602 hits led to web sites that discussed laparoscopic obesity surgery, details of the procedure, and complications in an unbiased manner.

A large amount of information (biased and unbiased) is available over the Internet. However, it is difficult for the patient to ascertain the unbiased information while wading through a vast amount of unrelated, biased, and incomplete information. Bariatric surgeons may only have to spend time not only to educate but also to re-educate their patients. The Internet is not a dependable source of accurate information for patients.

Bariatric Surgery-PF010

SINGLE CENTRE EXPERIENCE WITH LAP BAND SYSTEM.- OPEN AND LAPAROSCOPIC GASTRIC BYPASS FOR THE TREATMENT OF MORBID OBESITY

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BACKGROUND: Aim of this study is the retrospective comparative analysis of the early results obtained with Lap Band. (LAGB) and initial experience with Roux-En-Y Gastric Bypass performed via laparotomy (RYGBP) and laparoscopy (LRGYBP) in a single centre.

METHODS: From January 2000 to July 2001, 74 patients were referred for surgery and selected according to the following criteria: LAGB in highly motivated patients with BMI < 50, LRGYBP in those without comorbidity for LAGB and BMI ≥ 50, RYGBP in pts with BMI >50. Open and Laparoscopic Gastric Bypass were performed with mechanical stapling using Gagner technique (anvil positioning in the proximal pouch via NG tube passed transorally).

RESULTS: LAGB: 27 pts (27/74=36.4%) 23F/4M; mean age 32.8, range:21-52 yrs; pre-operative mean BMI 43.8,range 35-51; 1 pts (3.7%) was converted to laparotomy. Post-operative complications were:1 recurrent port infection and 1 non fatal pulmonary embolism. Mean post operative BMI at 6 and 12 months were 35.3 and 32.7. LRGYBP: 24 pts 22F/2M; mean age 35.2,range 19-50 yrs; pre-operative mean BMI 45.7, range 39-50; 1 pts (4.2%) was converted to laparotomy, 3 concomitant cholecystectomy were performed. Two pts (8.4%) suffered wound infection. Mean post operative BMI at 6 and 12 months were 33.6 and 27.3. RYGBP: 23 pts 14F/9M mean age 38.4,range 21-56 yrs; pre-operative mean BMI 52.7, range 39-64; concomitant cholecystectomy was performed in 4 patients. One (4.3%) leakage required a reoperation. Eleven pts (47.8%) had wound infections. Mean post operative BMI at 6 and 12 months were 41.8 and 32.3. Mean post operative hospital stay for LAGB, LRGYBP and RYGBP were 3+-1,5+-3 and 8+-5 days, respectively in pts without post operative complication. No mortality was observed.

CONCLUSION: Gastric Banding and Gastric Bypass are presently available in obesity surgery mainly laparoscopically (5/174; 68.9%). Experience with laparoscopic gastric bypass is required before starting the laparoscopic approach.

LAPAROSCOPIC BILIO INTESTINAL BY-PASS FOR MORBID OBESIY:

PRELIMINARY REPORT ON FIVE CASES.

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BACKGROUND: Malabsorptive surgery still plays an important role in the management of morbid obesity (MO). In our experience we have been giving our preference to the bilio-intestinal by-pass (BIBY) according to the technique described by Eriksson in the early ’80s. Besides the jejunoo-ileal by-pass, a cholecysto-jejunal anastomosis represents the distinguishing feature of this operation, which restores the entero-hepatic bile circulation so reducing risks of hepat-failure and of choleretic diarrhea; moreover the continuous lavage of the diverted stump prevents the occurrence of the sump syndrome, with no compromise of the results on weight loss.

STUDY DESIGN: Since May of 1996 we have been having a total of over 120 patients affected by MO. Of these, 51 underwent BIBY based on strict clinical and psychological pre-operative criteria. They were 33 females and 18 males, median age 33 yrs (range 19-48), median BMI 46.9 (range 40.1-64.7), mean BMI 48. Two cases (the first one in December of 2000) have been treated by laparoscopic approach by an original 6-port technique and they represent the basis of this report.

RESULTS: Operative time was 215’, compared to a mean 90’ of the open technique. No intraoperative complications were observed. Both patients were able to leave the bed and pass flatus on the first and second post-op day, but restoration of oral intake and discharge were on the fourth and seventh post-op day, respectively, as with open BIBY.

CONCLUSION: Our preliminary results show that lap BIBY is feasible and safe. It allows an earlier patient mobilisation with reduced risks of DVT. Moreover no incisional hernias are expected, compared to over 30% risk with open surgery. With experience we believe that it will be possible to reduce operative time.

Bariatric Surgery-PF012

SHOULD CHOLECYSTECTOMY BE A ROUTINE PART OF LAPAROSCOPIC GASTRIC BYPASS FOR OBESITY. A COST ANALYSIS

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Background: Many surgeons routinely perform cholecystectomy during open bariatric procedures, to prevent another laparotomy should gallstones develop. Because laparoscopic cholecystectomy (LC) can be easily performed after laparoscopic Roux-en-Y gastric bypass (LGB), deferring management of the gall bladder is considered by many to be accepted practice.

Objective: To determine, based on a cost analysis, the optimal management of the gall bladder in patients undergoing LGB.

Methods: A literature survey was performed from which the following assumptions were derived: a prevalence of gallstones of 30% (17.5% of whom will have complicated disease). The incidence of bile duct injury in elective and acute cholecystectomy was assumed to be a 30% incidence of postoperative symptomatic cholelithiasis (15.7% of whom will have complicated disease). The incidence of bile duct injury in elective and acute cholecystectomy was assumed to be 0.5% and 2.7%, respectively. A decision analysis was performed using three broad management strategies: LGB and deferred gallbladder management (LGB + deflected LC), concomitant LC only for those patients with known stones, as determined by preoperative ultrasound (LGB + selective LC), and concomitant LC in all patients (LGB + LC). Mean hospital charges from patients managed at Emory University Hospitals under each strategy were calculated and applied as a relative indicator of cost of care.

Results: Concomitant LGB with LC resulted in decreased cost when compared to both selective and deferred management of the gall bladder. The additional cost incurred in selective management was $217 and in deferred management was $580 per patient.

Conclusion: The common practice of deferring management of the gall bladder during LGB cannot be recommended from a health care cost standpoint.
**Bariatric Surgery–PF013**

**LAPAROSCOPIC REVISION OF FAILED OPEN BARIATRIC PROCEDURES.** JT. McCormick, DO, PK. Papavassalis, MD, PF. Caushaj, MD, F Hoyetan, MD, DJ. Gagne, MD. Minimally Invasive Surgery Program, West Penn Allegheny Health System.

Roux-en-Y Gastric Bypass (RYGB) is considered the surgical procedure of choice for morbid obesity. Procedures such as vertical banded gastroplasty (VBG) have also been performed to facilitate weight loss, however, results following VBG have been less dramatic and less durable. Patients who fail to meet weight loss goals after restrictive or malabsorptive surgery can be offered revision. Technically challenging, an open approach has been adopted by many bariatric surgeons for corrective surgery, particularly when the initial operation had been performed open. We present five cases in which prior open bariatric procedures were revised laparoscopically.

Five patients presented having regained weight after initial success with prior bariatric surgery.

Three patients had prior open VBGs, which were converted laparoscopically to RYGB. Two patients had prior RYGB, one was revised to a banded RYGB and the other converted to a long limb RYGB. Preoperative BMI averaged 46 kg/m². Average operative time was 344 minutes (range 240-450). This was significantly longer than our experience with 56 primary RYGB during the same 4 month time period (average 208 minutes (range 90-350)). Average postoperative stay was 3.2 days (range 2-5). One patient developed a stricture at the gastrojejunostomy requiring endoscopic dilation. There were no other complications and no deaths. The follow-up period is too short to determine effect on weight loss or quality of life.

Laparoscopic revision of failed open bariatric procedures can be performed safely in the hands of an experienced minimally invasive surgeon. Laparoscopic revision of prior open bariatric procedures requires longer operative times than primary RYGB.

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**Bariatric Surgery–PF014**

**LAPAROSCOPIC BARIATRIC SURGERY FOR THE TREATMENT OF SUPER-OBESITY: BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH AND ROUX EN Y GASTRIC BYPASS WITH LONG LIMB: 24 MONTH FOLLOW-UP.** Andrei VE, MD; Kortbawi P, RN,NPC; Mehta V, MD; Johnson BA, RNFA; Villapaz A, RNFA; Ramos C, RNFA; Hancox W, RNFA; Carey JC, RN,CCRN; Brolin RE, MD.

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Abstract: With its incidence on rise, obesity is the second most preventable cause of death after tobacco. Conservative treatment often cannot achieve a sustained weight loss greater than 10 kg especially if the treatment is not continued indefinitely. Surgical treatment for morbid obesity achieves significant long-term weight loss and is becoming more accepted in the medical and lay communities. In the United States, the most common procedure performed has been the Roux-en-Y gastric bypass. Recently, however, other procedures, such as biliopancreatic diversion with duodenal switch, are gaining greater popularity for excellent weight loss. This is a retrospective analysis at 24 months of 15 superobese patients who underwent laparoscopic biliopancreatic diversion with duodenal switch -LBPD-DS (3 patients) and laparoscopic Roux-en-Y gastric bypass with long limb -LRYGB-LL (12 patients). The body mass index ranged between 50 and 62 kg/m². In the LRYGB-LL group was no conversion to open procedure. In the LBPD-DS one case was completed using hand-assisted technique and one case was converted to open. The early and late postoperative data include operating room and inpatient data, complications, weight loss, vitamin profile. Excellent weight loss was achieved with both procedures with minimum early and late postoperative complications. The laparoscopic approach is feasible for surgical treatment of super-obesity; however, longer follow ups in a larger group of patients are necessary in progress to assess the efficacy of one procedure over the other, if any.
FRIDAY March 15, 2002: Poster Abstracts

Bariatric Surgery–PF017

RUTINE UPPER GASTROINTESTINAL GASTROGRAFIN SWALLOW AFTER LAPAROSCOPIC ROUX-EN-GASTRIC BYPASS
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Upper gastrointestinal (UGI) swallow radiograph following laparoscopic Roux-en-Y gastric bypass (LRYGB) may detect an obstruction or an anastomotic leak. The aim of our study was to determine the efficacy of routine imaging following LRYGB.

Radiograph reports were reviewed for 201 consecutive LRYGB operations between April 1999 and June 2001. UGI swallow used gastrografin and fluoroscopic video, with a delayed image at 10 minutes. Mean values ± one standard deviation were tested for significance (p < 0.05) using Student’s T-test.

Of 198 available reports, UGI detected jejunal jejunal enter limit narrowing (17), partial obstruction (12), anastomotic leak (4), complete bowel obstruction (3), diverticulum (1), hiatal hernia (1), and proximal Roux limb narrowing (1). A normal study was reported in 159 cases (80%). Partial obstruction resolved without intervention. Complete obstruction required re-operation. Radiograph was positive to six patients who developed delayed leaks, early identification of a leak by routine UGI swallow resulted in a shorter hospital stay (mean 7 ± 1.5 days vs. 41 ± 6.4 days, p < 0.001).

Early intervention after UGI swallow may lessen morbidity. Routine UGI swallow following LRYGB does not obviate the importance of close clinical follow-up.

Bariatric Surgery–PF018

PROSPECTIVE STUDY OF 298 PATIENTS UNDERGOING LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING USING THE TWO-STEP TECHNIQUE. A TECHNIQUE TO PREVENT POSTOPERATIVE SLIPPAGE.
Mohite Rubin, M.D., Hadar Sapiro, MD., Department of surgery B, Rubin Medical Center, Tel Aviv University, Tel Aviv, Israel. Private practice, San Jacinto Methodist Hospital, Baytown, Texas, USA.

Objective: Laparoscopic adjustable silicone gastric banding (LASGB) has gained tremendous popularity, but creation of the retrogastric tunnel (RGT) is a considerable challenge, especially in the surgeon’s early experience, and is associated with up to 10% band slippage and occasional gastric perforation. The two-step (TS) technique involves a crural dissection towards the angle of His through a pars flaccida approach. The technique facilitates passage of the band with no extensive posterior gastric wall dissection.

Patients and Methods: A prospective study of 298 patients who underwent LASGB from 01/1999 to 05/2001 using a two-step (TS) dissection technique. There were 238 females and 60 males; mean age 37 years (18-59 years); mean preoperative weight 121 kg (range: 50-173 kg), mean body mass index (BMI) of 43.9 kg/m² (range: 36-69 kg/m²). Two hundred and fifty eight procedures were performed in Israel, and 40 in Houston, Texas, as part of the FDA clinical trial.

Results: All procedures except three were completed laparoscopically. The mean operative time was 59 minutes (31-150 min) and the mean hospital stay 1.2 days (1-5 days). In a mean follow-up of 12 months (1-26 months), mean BMI decreased from 44.1 kg/m² preoperatively to 39.6, 37.2, 35 and 33.3 kg/m² at three, six, nine, and 18 months respectively. There were only two band slippages (0.67%), and they were corrected laparoscopically.

Conclusion: LASGB using the TS is technically simple, avoids intense posterior gastric wall dissection, and facilitates tight posterior band support. It is therefore associated with only minimal perioperative complications and a low slippage rate.

Bariatric Surgery–PF019

ANALYSIS OF DIFFERENT LAPAROSCOPIC TECHNIQUES FOR ROUX-EN-Y GASTRIC BYPASS: Samuel Szomstein, MD, Raul Rosenthal, M.D., Shmuel Avital, M.D., Oscar Brasesco, M.D.
Department of Minimally Invasive Surgery, Cleveland Clinic Florida, Weston, Florida.

Objective: To compare the benefits between three different laparoscopic bariatric surgical techniques; laparoscopic Hand assisted gastric bypass with EEA gastro-jejunostomy (HA-GBP), Laparoscopic gastric bypass with EEA gastro-jejunostomy (LAP-EEA-GBP) and Laparoscopic bypass with GIA gastro-jejunal anastomosis (LAP-GIA-GBP).

Methods: We retrospectively reviewed 15 patients with similar characteristics that underwent laparoscopic gastric bypass under three different techniques: HA-GBP(n=5), LAP-EEA-GBP(n=5) AND LAP-GIA-GBP(n=5). 93.3 % were female, mean age was 40.73 years, mean weight of 318.66 lbs. The mean BMI was 52.56. Cost analysis by acquiring direct variable hospital cost and measuring length of hospital stay was performed. Other variables like wound complications and OR time was measured. All jejunum-jejunal anastomosis were done using GIA . One surgeon performed all procedures. T test using a Bonferroni correction was used for statistical analysis.

Results: Mean cost for LAP-GIA-GBP($35790) was not significantly less than for HA-GBP($39056) p=0.42 and LAP-EEA-GBP ($41496) p=0.16. Mean length of stay for LAP-EEA-GBP(3.6 days) was also not significantly shorter than for HA-GBP(5.6 days) or LAP-GIA-GBP(5.8 days) p=0.018 and p=0.03 respectively. OR time was shorter for LAP-GIA-GBP(2.3 hours) vs. HA-GBP(5.6 hours) or LAP-EEA-GBP(3.3 hours) p<0.001 for both. There were two wound complications in the LAP-EEA-GBP group p=0.44 (Fisher’s Exact Test)

Conclusion: Laparoscopic Roux-en-Y gastric bypass using a GIA gastrojejunal anastomosis has a shorter OR time although it’s not a Cost-effective alternative compared to other laparoscopic techniques (Hand Assisted with EEA gastrojejunal anastomosis and Laparoscopic with EEA gastrojejunal anastomosis) with similar Cost, Wound complications and Length of stay.

Bariatric Surgery–PF020

LAPAROSCOPIC SLEEVE GASTRECTOMY IS A SAFE AND EFFECTIVE PRIMARY PROCEDURE FOR BILIOPANCREATIC DIVERSION WITH DUODENAL SWITCH: David Voellinger MD, Michel Gagner MD, William Inabnet MD, Christine Chu MD, John Feng MD, Alice Mercado RN, Theresa Quinn MD and Alfons Pomp MD, Minimally Invasive Surgery Center, Department of Surgery, Mount Sinai Medical Center, New York, New York.

Introduction: Bilipancreatic diversion with duodenal switch has been successful in achieving long-term weight loss in the superobese, although with significant morbidity and mortality. The purpose of this study is to show the advantages of sleeve gastrectomy in laparoscopic bilipancreatic diversion with duodenal switch (LBPD-DS).

Methods: A retrospective analysis was performed on all laparoscopic sleeve gastrectomies under three different techniques: Hand assisted with EEA gastrojejunal anastomosis and Laparoscopic with EEA gastrojejunal anastomosis with similar Cost, Wound complications and Length of stay.
Basic Science–PF021

CASE REPORT: GASTRIC PERFORATION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS FOR MORBID OBESITY


A 35 year old female with a history of morbid obesity, BMI= 45, underwent a laparoscopic Roux-en-Y gastric bypass. The patient lost 110 pounds over a 14-month period following surgery. The patient had a history of anemia and had been receiving oral iron and proton pump inhibitors before and after surgery. Upper and lower endoscopy, small bowel follow through and a Meckel’s scan were done prior to the operation with no positive findings. One year after the operation the patient developed acute onset of left upper quadrant pain, substernal chest pain and shortness of breath. An upright chest film demonstrated free air under the left hemi-diaphragm. The patient was taken to the operating room for prompt surgical exploration.

Exploratory laparotomy revealed that the fundus of the gastric remnant, along the greater curvature, has perforated with gross spillage of gastric contents. The retracted stomach, lateral to the creation of the pouch, perforated at its superior aspect away from the staple line. The stomach was divided at its midpoint using a TA-65 stapler. The fundus and perforated segment were removed in this fashion. The abdomen was copiously irrigated and closed.

The patient had a stable post-operative course and was discharged to home on the fifth post-operative day. Her final pathology revealed a benign perforated gastric ulcer with signs of chronic gastritis. A Giemsa stain done for H. pylori was negative. The patient has returned to work without any sequelae from her surgery. She has had no further evidence of GI bleeding at 3-month follow up. She remains on proton pump inhibitor medication.

We present an unusual case of perforation of the gastric remnant following laparoscopic morbid obesity surgery. No prior publication of a free remnant perforation secondary to ulcer disease has ever been reported. This complication represents a unique management problem for the laparoscopic surgeon since the gastric remnant is not reachable by endoscopy.

Basic Science–PF023

BODY POSITION AND DESUFFLATION INFLUENCES PORTAL VENOUS FLOW DURING PNEUMOPERITONEUM

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Background: Reduction of macro- and microperfusion in splanchic and portal venous blood flow (PBV) has been described following CO2-insufflation with elevated intraabdominal pressure (IAP). The current study investigates changes in portal venous blood flow during CO2-laparoscopy with different body positions and insufflation profiles.

Methods: An established animal model of laparoscopic surgery was extended by implanting a portal vein flow probe. The hemodynamics in the portal vein were measured by transit time ultrasonic flowmetry. 48 male SD rats were randomized into four experimental and two control groups. Total CO2-insufflation time was 60 min (8mmHg). Group1 (n=8): desufflation for 5 min after 30 min of insufflation. Group 2 (n=8): desufflation for 1 min every 15 min. Group 3 (n=8): 35 degree head-up position. Group 4 (n=8): 35 degree head-down position. Pos. control group (n=8): constant insufflation. Neg. control group (n=8): no insufflation. Data were analyzed by Kruskal-Wallis, Dunn and Holm test.

Results: A establishment of a pneumoperitoneum causes in all groups a significant decrease of portal venous blood flow (60%). After desufflation, group 1 and group 2 showed immediately increasing portal flow (85%). After re-insufflation the flow decreased again (80%), but was followed by compensatory increase (76%). The period of compensation was related to the duration of desufflation. Group 3 (head-up position) showed a significant improve of portal venous flow, group 4 (head-down position) no improve compared to the pos. control group.

Conclusions: Intraoperative desufflation of pneumoperitoneum is recommended, because it improves portal venous flow and hepatic perfusion. Extreme head-down position should be avoided, because compromised hepatic perfusion may influence the hepatic metabolism and cell-conveyed immunity in a negative way.

Basic Science–PF022

THE PROPERTIES OF PNEUMOPERITONEUM MODIFIES ACUTE PHASE RESPONSE INDUCED BY BACTERIAL LIPOPOLYSACCHARIDE

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Objective: Previous studies have shown that pneumoperitoneum with carbon dioxide attenuates the acute phase response. To elucidate the possible mechanisms behind this alteration, we compared the effect of different gases on the acute phase response induced by bacterial lipopolysaccharide.

Methods: Male rats were injected via the penile vein with lipopolysaccharide (1mg/kg). Five hours later, animals (n=4) were randomized into three groups. Group I and II were subjected to carbon dioxide and helium pneumoperitoneum respectively. Animals in Group III served as controls. All animals were sacrificed and livers harvested. Total mRNA was isolated, analyzed by Northern blot hybridization with probes for alpha-2-macroglobulin (A2M, an acute phase gene) and detected by autoradiography. The film in the linear range of exposure was quantified using an imaging system. The signal intensity corresponding to A2M mRNA was normalized by signal intensity corresponding to 28SrRNA detected by staining with methylene blue. Results are presented as Relative Intensity (arbitrary units)+/- standard error of mean. p values were determined by student t test.

Results: The mRNA levels in Group I was 45460 ± 70001 compared to 70977 ± 20986 (Group II, p=0.05) and 89079 ± 10865 in Group III (p=0.05). Reduced A2M mRNA levels of -34% (p<0.05) was noted by addition of carbon dioxide pneumoperitoneum. There was no difference in A2M mRNA levels between controls and Group II (helium pneumoperitoneum).

Conclusions: Pneumoperitoneum is associated with alterations in acute phase response. Carbon dioxide leads to an attenuation in acute phase response in comparison to helium. This further reiterates the beneficial effect of carbon dioxide for pneumoperitoneum based surgery.

Basic Science–PF024

THE EFFECT OF TOPICAL ANESTHETIC ON ESOPHAGEAL MOTILITY


Although topical oropharyngeal anesthetic sprays provide patient comfort during manometry, their effect on esophageal body physiology are unknown.

Ten patients with normal esophageal motility underwent manometry before and after a ten-second duration spray (200mg/second) of 14% benzocaine, 2% butyl amino benzoate and 2% tetracaine HCl solution into the hypopharynx. Each patient served as their own control and underwent a series of 10 pre- and post-anesthetic water bolus swallows. Measurement of amplitude, duration, propagation time and slope of contraction were obtained at 4 levels (5cm between each level) beginning 3cm proximal to the upper border of the distal high pressure zone. Tertiary and simultaneous contractions and interrupted peristalses were recorded.

Analysis of variance using mean values demonstrated that the duration of contraction, propagation time and slope of contraction did not exhibit a post-anesthetic change. There was no increase in the number of tertiary or simultaneous contractions or interrupted peristalses. Contraction amplitudes were different from pre-anesthetic values, however there was no discernable pattern of amplitude change; While some patients had a significant increase in contraction amplitude, others decreased. This difference may have been secondary to the wide variation in contraction amplitude between swallows in the normal patient.

Topical oropharyngeal anesthetic spray does not appear to significantly effect the results of esophageal manometry.
Basic Science–PF025

IMPACT OF IMPROVED HEPATIC BLOOD FLOW ON LIVER METASTASES DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY. Zun-Gen Kim1, M.D., Matthias Lorenz1, M.D., Claus-Georg Schmidt2, M.D., Carsten N. Gutt2, M.D. 1 Department of General and Vascular Surgery, Johann Wolfgang Goethe-University, Frankfurt/Main, Germany 2 Department of General Surgery, Ruprecht-Karls-University, Heidelberg, Germany

Background: Recent experimental studies demonstrated laparoscopic insufflation to stimulate the growth of colorectal liver metastases. Alterations in hepatic macro- and microcirculation are believed to enhance these findings. Whether improved hepatic blood flow might have beneficial oncological effects has not been investigated yet.

Material and Methods: 40 male WAG/Rij rats were randomized into 5 experimental groups. In the 3 laparoscopic groups rats were implanted a PE-50 cannula into the V. jugularis interna to apply dopamine (n=10), ET-1-antagonist (n=10) or NaCl (n=10) via a micropump. In the open groups a midline laparotomy only (n=10) or with ligation of the portal vein (n=10) was performed. Liver metastases were induced by intraportal injection of 50,000 CC531 cells. Tumor growth was evaluated 28 days after surgery regarding the number, diameter and cancer index of the nodes. Data were analyzed by Kruskal-Wallis, Dunn and Holm test.

Results: All animals survived the surgical procedures. Analysis of hepatic tumor growth and total tumor take showed significant differences between the 5 experimental groups. Increased tumor growth was found comparing the 2 open groups to the 3 laparoscopic groups. In the open groups portal venous ligation showed significantly increased tumor take when compared to laparotomy only. In the laparoscopic groups the administration of dopamine and ET-1-antagonist significantly reduced liver metastases when compared to laparotony only. In all patients the Harmonic Scalpel (Ethicon) was used to perform vagotomy and to open bowel loops. The patients with duodenal ulcer underwent truncal vagotomy. Then a posterior, antecolic, horizontal gastrojejunostomy was performed in single layer with 2-0 Ethibond (Ethicon) continuous suture. The suture was done through 2 ports to the right of the camera that was placed 2 inches subumbilically. The surgeon stood to the right of the patient. First the posterior seromuscular coat was done. Then the stomach and jejunum were opened 2mm from the suture line and anterior layers were approximated with the suture passing all layers. Patency and integrity of anastomosis was tested by filling stomach with CO2. Patients with carcinoma stomach underwent anterior anastomosis of GJ in the same manner.

Conclusion: Improved liver blood flow during laparoscopic surgery seems to have beneficial oncological effects on the growth of colorectal liver metastases.

Basic Science–PF026

CHANGES IN THE MORPHOLOGY OF THE PERITONEUM AFTER LAPAROSCOPIC SURGERY: GAS OR STRETCHING? Ruben Veldkamp M.D., Maarten Vermaas M.S., Eric J. Hazebroek M.D., Michel A. Schreve M.S., Ron W. de Bruin PhD., H. Jaap Sonjer M.D., PhD. Department of Surgery, Erasmus University Medical Center Rotterdam, The Netherlands

Morphological Scanning Electron Microscopy (SEM) studies have suggested that intraperitoneal CO2 insufflation causes bulging of peritoneal mesothelial cells. Adhesion formation and growth of tumour cells after laparoscopic surgery may be related to these changes. However, peritoneum after gasless laparoscopic surgery or laparotomy has been rarely studied. The objective of this study is to assess if these peritoneal changes can be attributed to CO2 insufflation.

Forty-eight rats were randomly assigned to 4 groups of 12 rats. Groups were subjected to 0 hours of CO2 insufflation, helium insufflation, gasless suspension of the abdominal wall and laparotomy. Each group was subsequently divided into 3 subgroups and biopsies were taken at 0, 2 and 24 hours after the procedure from the anterolateral side of the abdominal wall. SEM photos were taken of the biopsies.

At 0 and 2 hours after pneumoperitoneum the cells showed some bulging and widened intercellular clefts were seen in all groups after 2 hours. In the laparotomy group this appeared more pronounced. At 24 hours after insufflation of CO2, bulging of cells and the formation of intercellular clefts was most pronounced. A similar aspect of the peritoneum was seen in the gasless suspension group and the laparotomy group. In the helium group the peritoneal changes at 24 hours after pneumoperitoneum seemed to be more pronounced with elongation of the endothelial cell and formation of thin finger-like cytoplasmic processes. Partial peritoneal changes occur after intraperitoneal gas insufflation, gasless elevation of the abdominal wall and laparotomy, so they appear to be not due to CO2 insufflation itself. Stretching of the abdominal wall could be the underlying cause.

Basic Science–PF027

COLORECTAL/INTESTINAL SURGERY–PF027

IMPACT OF IMPROVED HEPATIC BLOOD FLOW ON LIVER METASTASES DURING LAPAROSCOPIC SURGERY IN THE RAT. A PRELIMINARY STUDY. Zun-Gen Kim1, M.D., Matthias Lorenz1, M.D., Claus-Georg Schmidt2, M.D., Carsten N. Gutt2, M.D. 1 Department of General and Vascular Surgery, Johann Wolfgang Goethe-University, Frankfurt/Main, Germany 2 Department of General Surgery, Ruprecht-Karls-University, Heidelberg, Germany

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Conclusion: Improved liver blood flow during laparoscopic surgery seems to have beneficial oncological effects on the growth of colorectal liver metastases.

Colorectal/Intestinal Surgery–PF027

LAPAROSCOPIC SINGLE LAYER HAND SUTURED GASTROJEJUNOSTOMY. Ramesh Ardhhanari, R.P.Wadhwa, N.Mohan.

Department of Gastroenterology, Meenakshi Mission Hospital and Research Centre, Madurai, India

The effectiveness and safety of single layer hand sutured gastrojejunostomy was retrospectively analyzed. 31 patients underwent the procedure over last 4 years. 25 patients had duodenal ulcer with obstruction and 6 patients had obstructed carcinoma stomach. Five ports were used (2 of 10mm and 3 of 5mm). In all patients the Harmonic Scalpel (Ethicon) was used to perform vagotomy and to open bowel loops. The patients with duodenal ulcer underwent truncal vagotomy. Then a posterior, antecolic, horizontal gastrojejunostomy was performed in single layer with 2-0 Ethibond (Ethicon) continuous suture. The suture was done through 2 ports to the right of the camera that was placed 2 inches subumbilically. The surgeon stood to the right of the patient. First the posterior seromuscular coat was done. Then the stomach and jejunum were opened 2mm from the suture line and anterior layers were approximated with the suture passing all layers. Patency and integrity of anastomosis was tested by filling stomach with CO2. Patients with carcinoma stomach underwent anterior anastomosis of GJ in the same manner.

Conclusion: Improved liver blood flow during laparoscopic surgery seems to have beneficial oncological effects on the growth of colorectal liver metastases.

Colorectal/Intestinal Surgery–PF028

LAPAROSCOPIC HAND SUTURED RECONSTRUCTION AFTER HARTMAN’S PROCEDURE. Ramesh Ardhhanari, R.P.Wadhwa, N.Mohan.

Department of Gastroenterology, Meenakshi Mission Hospital, Madurai, India.

The feasibility of hand sutured reconstruction following Laparoscopic Hartman’s procedure is reviewed.

Six diabetic patients underwent Laparoscopic Hartman’s procedure over the last 1 year for severe perineal sepsis. One patient died of septicaemic shock. 3 of the 5 patients had restoration of continuity by laparoscopic colo-colic anastomosis. The same port sites used for original operation were used. The rectal stump was identified and freed. In one patient a loop of small bowel was densely adherent to the stump and was released. The small bowel had a small perforation that was closed with interrupted stitches. The colostomy was undone and end to end colo-colic anastomosis using 3-0 silk in interrupted, single layer all coat technique was done. Integrity of anastomosis was checked by rectal insufflation with dilute Povidone Iodine solution. The operating time was 3 hours for the first and 2 hours for the last two cases. The patients had an uneventful recovery. Two patients are awaiting closure.

Conclusion: Hand sutured intra-corporeal colocolic reconstruction after Hartman’s operation is feasible. It is safe and can be recommended.
TOTAL LAPAROSCOPIC PROCTECTOMY WITH SPHINCTER PRESERVATION FOR DISTAL VILLOUS ADENOMA OF THE RECTUM

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Laparoscopic resection and anastomosis of very low rectal lesions is technically difficult. We describe a technique for total laparoscopic resection and colo-anal anastomosis of very low benign rectal lesions.

A 71-year-old man was referred for surgical resection of a large villous adenoma which circumferentially encompassed 40-50% of the luminal wall of the rectum. The lesion was located 5 cm from the anal verge. Modified lithotomy position was used. A four-trocar technique was employed. Mobilization of the sigmoid colon was performed laparoscopically using the harmonic scalpel. The rectum was circumferentially mobilized laparoscopically. Lateral ligaments were divided using the ILS and the anterior resection was carried to the level of the levator. Resectability was confirmed using sigmoidoscopic guidance during the laparoscopic dissection. After mobilization the rectum was transected laparoscopically just proximal to the lesion. The distal rectosigmoid segment was grasped using a Babcock passed through the anus and externally everted. The everted rectum allowed easy identification of the lesion and its distal margin. The rectum was transected just distal to the lesion using a TA stapler. A margin of 2 cm proximal to the dentate line was preserved. The anastomosis was performed using an ILS stapler. Hospital stay was six days. The patient had complete resection of the villous lesion and suffered no anal incontinence. At one year follow up he has no evidence of recurrence.

Result: Bowel function is normal.

Total laparoscopic resection of benign lesions of the distal rectum can be safely accomplished laparoscopically. Laparoscopy allows for excellent visualization of distal anatomy and preservation of sacral nerves. Total laparoscopic resection of distal rectal lesions allows for a sphincter preserving anastomosis utilizing either a stapled intraluminal approach or per-anal techniques.

LAPAROSCOPIC REPAIR OF COLO-VESICAL FISTULA

C. Palanivelu, M.Ch, S.V.Kandasami, R.Parthasarathi, K. Sendhil Kumar, P.S.Rajan, Vinaya Deshpande, R. Ravichandran, Coimbatore Institute of Gastrointestinal Endo Surgery (CIGES) GEM Hospital, Coimbatore, INDIA

Repair of colovesical fistula is considered good indication for laparoscopic approach. We had two such cases treated successfully by laparoscopic method.

Since 1996 June, we had two cases of colovesical fistula, one due to Crohn’s disease and another due to tuberculosis. Colonoscopy, Cystoscopy and imaging investigations revealed non tumorous inflammatory lesions. Both the cases were successfully treated by laparoscopic method.

Procedure: 4 ports were made of which one 10mm was used for sigmoid colon retraction. Laparoscopy revealed fistulous communication from the anterior wall of sigmoid colon to the bladder. Rectosigmoid was mobilised all around except for the fistulous site of 2cm diameter which was disconnected using harmonic scalpel. Fistulous opening on both bladder and sigmoid colon was closed with vicryl stitches and again with omental patch. Greater omentum was mobilized and kept between the bladder and sigmoid colon and anchored to the pelvic wall. Post operative period was uneventful.

Laparoscopy has a definite role in the management of colo-vesical fistula.

NEEDLESCOPIC APPENDICECTOMY — ANOTHER OPTION

Franklin ME, MD, Almeida JA MD, Sloopen E, MD, Jimenez RJ, MD, Chock A, MD, Texas Endosurgery Institute, San Antonio, Texas

Laparoscopic appendectomy (LA) has demonstrated its advantages by reducing the pain and length of hospitalization. Needleless surgery, using 2 mm instruments, is not commonly performed. This paper describes the result of our clinical experience using needleless techniques for the treatment of acute appendicitis, showing complications and results to determine its advantages and efficacy.

From August 1996 to February 2001, 34 selected patients with preoperative diagnosis of acute appendicitis underwent needleless appendectomy (23 male, 11 female) with an average age of 20 years (range 3-43 years). Operative data and postoperative course were recorded in a prospective fashion.

All procedures were successfully completed by means of needleless techniques. The appendicular artery was doubly clipped and divided in 20.8% and cauterized in 79.16%. Endoloops were used to ligate the appendiceal base in 70% of the patients and a specimen bag was used in 58.8% of the cases. The estimated blood loss was 14.6 cc (range 5-50 cc). No intraoperative complications occurred. The operative time was 55 minutes (range 35-70 minutes). There were no conversions to either standard laparoscopy or open technique. The mean hospital stay was on an average 2.07 days (range 1-7). The overall complication rate was 5.8%. One patient developed a pelvic abscess which required percutaneous drainage. None of our patients developed wound infections, nor hernias at the trocar sites.

We believe that needleless appendectomy is feasible and can be performed safely. It is another option to treat acute appendicitis in selected patients. The surgical wounds are smaller and it has a similar operative time and hospital stay as L.A. Less analogous are required and the results are significantly better improvement in instrumentation, however, is necessary.
Colorectal/Intestinal Surgery–PF033

LAPAROSCOPIC SMALL BOWEL RESECTION: LAPAROSCOPIC ASSISTED AND TOTALLY LAPAROSCOPIC APPROACH. Morris E. Franklin Jr., MD, Arturo Almeida, MD, Miguel C. Mendira, MD, Robert Michaelson, MD, Jeffrey Glass, MD, David Paolini, BS, Alan H. C. Cheek, MD, Texas Endosurgery Institute, San Antonio, TX.

This is a retrospective review of our experience using the laparoscopic assisted and the totally laparoscopic approach in the management of patients necessitating small bowel resection.

The data of 14 patients who underwent laparoscopic small bowel resection in our institution from 1995 to 2001 were reviewed. Parameters that were included were age, gender, indications for resection, concomitant procedures, technique of resection, type of anastomosis, operative time, blood loss, return of normal bowel function, and post-operative hospital stay.

A total of 14 patients were included. Overall, 7 were males and 7 females. 11 underwent a laparoscopic assisted approach and 3 underwent a totally laparoscopic approach. Their ages ranged from 33 to 84 years with a mean of 60 years. The indications for the small bowel resection were acute ischemic bowel secondary to incarcerated hernias (5), adhesions (1), lymphoma (2), carcinoid tumor (2), intussusception (1), and Creutz’s disease (1). For the laparoscopic assisted group, eight patients had stapled anastomosis and three had hand-sewn anastomosis. The mean operative time was 89.2 minutes, mean estimated blood loss was 50 ml, return of bowel function was 3.6 days, and post-operative hospital stay was 7 days. For the totally laparoscopic group, all had stapled anastomosis. The mean operative time was 91 minutes, estimated blood loss was 40 ml, return of bowel function was 2.3 days, and postoperative hospital stay was 5.3 days.

Laparoscopic small bowel resection using either the laparoscopic assisted or the totally laparoscopic technique is a safe and feasible procedure.

Colorectal/Intestinal Surgery–PF034

UNCOMMON GALL BLADDER ANATOMY ENCOUNTERED DURING LAPAROSCOPIC CHOLECYSTECTOMY. Prof. H. Kabir Chowdhury, BIRDEM Hospital, Dhaka, Bangladesh.

Anatomical variations of the gall bladder are well known, and among these cystic artery anomalies are probably most commonly encountered. Laparoscopic surgery has definitely helped us to understand these variations more clearly and at the same time record them and reproduce them. This paper is presented to show the anatomical variations encountered by the author during laparoscopic Cholecystectomy(Lch) during last seven year while more then 5000 cases Lch were done. Following were the variations encountered: (a) Situs inversus totalis, (b) Sinistroposition of the gall bladder, (c) Cystic duct from the right hepatic duct, (d) Absent cystic duct, (e) Cystic artery anomalies, (f) Partially intrahepatic gall bladder, (g) Gall bladder with long mesentery, (h) Hour glass shaped gall bladder. These anomalies did not cause conversion in any of the cases neither they caused any complication during or after surgery. Careful dissection in a blood less clean field is all that is required for successful completion of these cases. Author’s experience confirms that the cystic artery anomaly is most commonly encountered and a laparoscopic surgeon must be vigilant to avoid any unnecessary conversion or disaster.

Colorectal/Intestinal Surgery–PF035

LAPAROSCOPIC APPENDICECTOMY- DESERVES MORE ATTENTION IN THE DEVELOPING COUNTRIES. H. Kabir Chowdhury, MD, M.Khan MD, Mohd.Akram Hossain, MD, BIRDEM Hospital, Dhaka, Bangladesh.

Laparoscopic Appendectomy provides the best opportunity to deal with the intra-abdominal emergencies which is commonly encountered with the diagnosis of acute appendicitis. Author has performed more then 6000 cases of Laparoscopic Cholecystectomies but only 380 cases of Laparoscopic Appendicectomies. With the experience of this small number, few questions can be raised. Why is it not done more frequently? Is there any technical difficulty? Who does most of the appendicectomies in the developing countries? Laparoscopic appendicectomy is comparatively easier procedure, conversion rate is minimum, it helps to do a good survey of the abdomen and on many occasion helps to diagnose conditions which could be other wise missed. Considering all these factors in addition to the advantages of keyhole surgery there cannot be any doubt about the benefit of Laparoscopic Appendectomy. Then why not this procedure is done more frequently in the developing countries? Probably the causes are as follows: this relatively simple procedure is mostly performed by the junior surgical stuff, access to the instrument is not easy to them due to the service delivery system, they are not usually experienced in Laparoscopic surgery and as a result seniors don’t allow them to do the procedure independently. Where as in open surgery seniors don’t even bother to stay nearby. It’s a great disadvantage for the young surgeons as well as for the patients who are deprived of the benefit of this procedure. So it is high time to think and act quickly to train our young surgeons, and allow them more often to do the procedure. Also it is important to develop service delivery system so that the instruments are easily accessible to them. Author in this paper also discusses an easier technique to perform the procedure with a video clipping.

Colorectal/Intestinal Surgery–PF036

LAPAROASSISTED SUBTOTAL COLECTOMY WITH ANTIPERISTALTIC CAECORECTOSTOMY FOR COSTIPATION. Leonardo Sarli M.D., Renato Costi M.D., Domenico Iusco M.D., Luigi Roncoroni M.D., Istituto di Clinica Chirurgica Generale e Terapia Chirurgica dell’Universita, Parma, Italy.

Several trials demonstrated the efficacy, low morbidity, and clinical benefit of laparoscopy compared with laparotomy for the treatment of benign colorectal disease. Slow transit constipation, also defined as colonic inertia (CI), improves after colectomy, and a technique for laparoscopic colectomy with ileorectal anastomosis has been proposed even for this benign disease. We recently proposed a technique for subtotal colectomy with a novel antiperistaltic cecorectal anastomosis (CRA). In this paper we propose a technique for subtotal colectomy with CRA with a laparoscopic approach, utilized to treat two young women affected by CI.

After insertion of 5 trocars with a 13 mm/Hg pneumoperitoneum, the mobilization of all colic segments, and the dissection of the mesorectum of the high rectum were performed. Ligature of vascular pedicles was laparoscopically performed carefully preserving the ileocolonic artery and its branches to the cecum. Through a small Pfannestiel incision (10 cm) the colon was delivered, appendectomy was performed, the ascending colon was divided 10-15 cm above the ileocaecal junction and subtotal colectomy was completed by transsecting the rectum just below the level of the sacral promontory. The caecum was brought into the pelvis with no rotation, and an antiperistaltic CRA was carried out anastomosing the caecal bed to the rectal stamp using a circular stapler utilising the colonic section line as an entrance door for the stapler. The apex of the cecum was closed using a linear stapler.

The operating time was 320 min and 360 min respectively. The interval between surgery and resumption of an oral diet was 3 days in both cases. There was no postoperative morbidity. The length of postoperative hospital stay was 10 days. One month after CRA, bowel frequency was regular in both cases.

Laparoscopically assisted subtotal colectomy with CRA is safe and effective for patients with CI.
LAPAROSCOPY IN THE MANAGEMENT OF COLONIC DUPLICATION, Ivan R. Diamond, B.Sc., Jacob C. Langer, M.D., Department of Surgery, University of Toronto and Hospital for Sick Children, Toronto, Canada

Introduction: Colonic duplication is a rare form of intestinal duplication usually diagnosed during childhood. Although frequently asymptomatic, duplications are usually resected to prevent the risk of obstruction, bleeding, perforation and malignancy. We describe four consecutive cases of colonic duplication that were managed using laparoscopy.

Method: Charts of all patients undergoing resection for colonic duplication between 1995 and 2000 were retrospectively reviewed.

Results: Four children were identified. Age at operation ranged from four months to six years (median 3.5 years). Location was cecum (2), transverse colon (1), and splenic flexure (1). The duplication was successfully identified laparoscopically in all cases. Two of the duplications were resected using an entirely laparoscopic approach, and the procedure was laparoscopic-assisted using a very small incision in the other two cases. Median operative time was 100 minutes and there were no intra-operative complications. Post-operatively 2 children received intravenous morphine overnight, one received acetaminophen and codeine and the fourth patient received alfentanil alone. Median post-operative stay was 1.5 days. No patient experienced any postoperative complication.

Conclusions: Laparoscopy is an excellent approach to the management of colonic duplication, and is associated with a short hospital stay, minimal analgesic requirements, and a superior cosmetic result.

LAPAROSCOPICALLY ASSISTED SURGERY IN CROHN’S DISEASE, PF038

LAPAROSCOPIC ASSISTED COLECTOMY WITH COLON-LIFTING METHOD BY THREAD FOR COLON AND RECTAL CANCER, PF039

ILEUS FOLLOWING COLONOSCOPY REPORT OF A CASE, PF040

Colorectal/Intestinal Surgery–PF037

Colorectal/Intestinal Surgery–PF038

Colorectal/Intestinal Surgery–PF040
**Colorectal/Intestinal Surgery–PF041**

**LATE PRESENTING COMPLICATED APPENDICITIS: A NOVEL APPROACH TO A COMPLICATED PROBLEM**

George J. Gibeily M.D., Washington, D.C.

Acute appendicitis is the most common etiology of an acute abdomen that necessitates urgent surgical intervention. An appendiceal mass (AM), often nonpalpable, is recognized in up to 13% when presenting after 72 hours of symptoms (Late). Prompt appendectomy is universally agreed upon in the acute setting but treatment remains controversial with late presentation. The objective of this prospective study is to determine if interval laparoscopic appendectomy (ILA) after initial non-operative treatment for late appendicitis is a safe alternative to immediate appendectomy.

Sixteen consecutive patients seen by three surgeons over a period of five years presented with late appendicitis. There were five males and eleven females whose ages ranged from 16 to 60 years old with a mean age of 40y/o. All patients were made NPO and treated with parenteral antibiotics and i.v. fluids. Three patients did not improve clinically in the first 24 hours and required CT guided drainage of a periappendiceal abscess. All patients underwent ILA from two to sixteen months after initial presentation.

Preoperative workup did not demonstrate neoplasms or other pathology in these patients. None of the patients developed recurrent peritonitis or became septic awaiting surgery. The average operative time of laparoscopic appendectomy was 77 minutes. The average duration of hospitalization before surgery was five days, the average postoperative stay was two days and the average total hospitalization was seven days.

The laparoscopic approach was successful in 94% with only one requiring elective conversion to open due to dense retroperitoneal fibrosis. The complication rate was 12% consisting of two patients with prolonged ileus. ILA allows a judicious diagnostic evaluation to exclude etiologies that require more than an appendectomy, if any surgery at all. Should surgery be necessary, the most appropriate procedure can be planned under controlled conditions in a more stable patient. This yields both overall shorter inpatient stays and postsurgical disabilities.

**RESULTS:**

- Overall shorter inpatient stays and postsurgical disabilities.

**CONCLUSIONS:**

- ILA allows a judicious diagnostic evaluation to exclude etiologies that require more than an appendectomy, if any surgery at all.

**Colorectal/Intestinal Surgery–PF042**

**LAPAROSCOPIC TREATMENT OF COMPLICATED DUODENAL ULCERS**

Volodymyr.V.Grubnik MD, Yuri.V.Grubnik MD, Pushpendra Sharma MD, Volodymyr.A.Fomenko MD, Alexandra.V. Grubnik, Department of surgery, Odessa State Medical University, Odessa, Ukraine.

**INTRODUCTION:** Laparoscopic treatment of duodenal ulcer disease is still economically preferable in Ukraine.

**PATIENTS AND METHODS:** Laparoscopic operation were performed in 142 patients for management of complicated peptic duodenal ulcers. Indications for operation were: bleeding in 97 patients, perforation in 34, stenosis in 10. In patients with bleeding, vagotomy was performed after successful endoscopic hemostasis. Posterior trunc vagotomy and anterior seromyotomy (Taylor's procedure) was performed in 82 patients. In 15 patients posterior trunc vagotomy and resection of the lesser curve by stapler was performed. In 34 cases with perforation, 19 patients were operated by intracorporeal suturing of the perforation, 7 patients by omental patch to the perforation. Taylor's vagotomy and suturing of the ulcer defect was performed in 8 cases. In cases of stenosis, 6 patients were operated by bilateral posterior truncal vagotomy with gastroenterostomy. In 39 cases of large ulcer with stenosis and bleeding, the following combined operation was performed: Taylor's vagotomy + mobilisation of the duodenum by Kocher's method and mini-laparotomy (length 4-5 cm) exactly at the projection of the ulcer to perform resection of the ulcer and pyloroduodenoplasty under laparoscopic control.

**RESULTS:** Postoperative mortality was zero. Complications were observed in 14 cases. Conversion was performed in 8 cases. 4 years analyses of post-operative results shows: Visick I or II - in 90% of patients, Visick III - in 5.8% and Visick IV - in 4.2%.

**CONCLUSIONS:** Our experience shows that laparoscopic procedures can be performed successfully in patients with complicated duodenal peptic ulcers.

**Colorectal/Intestinal Surgery–PF043**

**LAPAROSCOPIC SUTURED ANASTOMOSIS OF THE BOWEL. TECHNIQUE AND LEARNING CURVE**

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 Dept. of Surgery, University of Tuebingen, Germany.

**Introduction:** In spite that the safety and efficacy of sutured anastomosis has been proved in open surgery, laparoscopic sutured anastomosis is rarely performed because it is difficult and time-consuming. We aimed at description of a standardised technique for laparoscopic sutured anastomosis of the bowel and definition of its learning curve.

**Methods:** In a laparoscopic abdominal simulator, 56 laparoscopic sutured anastomoses of cow small intestine were performed. Additionally, in a survival animal trial, two gastrojejunostomy, two cholecystojejunostomy, two colocolic , ten end-to-end and one side-to-side anastomoses were performed, using the same technique. We used two stay sutures, and a single layer full thickness continuous inverting suturing. A novel type of suture loop was used to replace the intracorporeal knot at the beginning of suture line, so that, the whole anastomosis can be performed by a single intracorporeal knot.

**Results:** In the survival cases, we had no leaks nor obstruction, minimal adhesions, and only one stenotic gastrojejunostomy. The mean end-to-end anastomotic time was 50 min. The technique was suitable for most sites in the GIT. The learning phase required 40 anastomoses in the simulator.

**Conclusions:** The described technique of sutured bowel anastomosis seems relatively fast, safe, universal, and needs about 40 anastomoses to be mastered. We feel that this technique could be given a chance by well-trained laparoscopic surgeons, whenever bowel anastomosis is required.

**Colorectal/Intestinal Surgery–PF044**

**LAPAROSCOPIC RESTORATIVE PROCTOCOLECTOMY FOR PATIENTS WITH ULCERATIVE COLITIS**

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**Aim** To describe a short-term outcome of laparoscopic restorative proctocolectomy in patients with ulcerative colitis (UC).

**Patients and methods** Between 1994 and 2001, 15 patients (8 male and 7 female; mean age: 30.3 years) with UC underwent elective laparoscopic restorative proctocolectomy. Data were prospectively collected and all patients were reviewed with a median follow-up of 14 months (range: 3 months-7 years).

**Surgical technique** Pneumoperitoneum was developed and 5 trocars (two 5 mm trocars in the right and left upper quadrant regions and three 12 mm ones in the both lower quadrants and suprapubic regions) were placed. After the entire colon and rectum were completely mobilised, all the vessels and the rectum were divided by autostapling devices. The colon and rectum were extracted through the suprapubic port that was extended to the length of 4 cm. The ileocecal valve and the rectum were then joined together using a circular stapler and a diverting ileostomy was fashioned.

**Results** The median operative time, blood loss and hospital stay were 6 hours, 105 mL and 9 days, respectively. No procedures were converted to open surgery. One patient developed wound sepsis and another developed bowel obstruction that was managed conservatively.

**Conclusion** Laparoscopic restorative proctocolectomy was feasible in selected patients with UC.
LAPAROSCOPIC TOTAL ABDOMINAL COLECTOMY FOR SLOW TRANSIT COLON, Kound-Hung Hsiao, M.D., William T.Chen, M.D., Hung-Chung Chen, M.D., Chien-Ming Chiu, M.D., Department of Surgery, Division of Colorectal Surgery, chang-Hua Christian Medical Center Chang-Hua,Taiwan
Purpose: The aim of this study was to analyze the results of perioperative course, postoperative quality, and tent years results of laparoscopic total abdominal colectomy (L-TAC) for slow transit colon (STC).

Method: From January 1, 1999 to December 31, 2000, L-TAC was attempted in eight patients with STC. Data were prospectively collected regarding the patients' age, sex, previous history, anorectal physiology tests, psychological state, diagnosis, procedure performed, type of anastomosis, postoperative course, and quality of life.

Results: All eight patients were females with a mean age of 31.1 (range, 25-41) years. Mean operative time was 276.36 (range, 200-360) minutes. Mean postoperative hospitalization was 6.6 (range, 4-8) days. Time to first bowel movement and commencement of solid diet were 1.8 (range, 1-3) and 4.38 (range, 2-6) days, respectively. One patient had prolonged postoperative ileus. Average stool frequencies per day were 6.6 at one week, 5.3 at one month, 4.9 at six months, 3.2 at one year, and 2.4 at two years postoperatively. Eight patients (100%) required a median time of 6 months after initial treatment, but none required long-term therapy. Overall functional outcome as good to excellent in 7 patients (87.5%), and one patient was not satisfied with the outcome of the surgery. There was no mortality. One patient had recurrent admissions for adhesion colic, which resolved with surgical therapy.

Conclusion: The outcome of laparoscopic total abdominal colectomy is generally rated as good to excellent. No major intra or postoperative complication was observed. Accentuated bowel function and control is regained within six months of the operation and levels off at one year after surgery, and no patient requires long-term anti diarrheal medication.

COST ANALYSIS OF STAPLED AND LIGATED TECHNIQUES OF LAPAROSCOPIC APPENDICECTOMY IN CHILDREN, William E. Wehrman, B.S., and Thomas H. Inge, M.D., Ph.D., Department of Pediatric Surgery, Children's Hospital and Medical Center, University of Cincinnati College of Medicine, Cincinnati, OH

BACKGROUND: Laparoscopic appendectomy (LA) offers several advantages over open appendectomy. However, the laparoscopic technique is associated with higher surgical costs than the open method. We hypothesized that for children undergoing LA, a cost savings may be realized if a simple electrocautery and ligature technique was utilized as compared to the commonly employed method.

METHODS: A retrospective study of 55 pediatric patients was performed comparing the two different techniques of LA. The operating time, surgical expense, postoperative stay, and complications requiring readmission were examined. Findings were stratified for perforated and non-perforated cases.

RESULTS: The ligature method was used for 37 patients overall with an average surgical time of 70 minutes, average operating room cost of $655, and average postoperative stay of 2.8 days. The stapled technique was used for 18 patients with a surgical time of 71 minutes, charges of $1,047, and a postoperative stay of 3.4 days. There were no statistical differences between these two treatment groups for any of these variables except cost. Overall, a 37% lower cost for ligated vs. stapled appendectomy (p<0.001) was seen. When patients with perforated appendicitis (n=13) were examined separately, a 45% reduction in cost was seen using the ligature technique (p<0.001).

The observed complication rate (intra-abdominal abscess) was similar for ligated (8%; 3 cases) vs. stapled (22%; 4 cases) techniques (p>0.05).

CONCLUSION: The ligature technique of LA was associated with a significant cost savings over the stapled method, especially for children with perforated appendicitis. Neither the operative time nor the rate of complication was adversely affected by the ligature technique.

LAPAROSCOPIC LYMPHADENECTOMY OF COLORECTAL CANCER BY 3 PORTS METHOD. Haruhiko Inufusa, M.D., Kazuki Ueda, M.D., Takehito Yshifujii, M.D., Tadao Tokoro, M.D., Kiyotaka Okuno, M.D., Hitoshi Shiozaki, M.D., and Masayuki Yasutomi, M.D., Department of the First Surgery, Kinki University School of Medicine, Osaka, Japan

Laparoscopic colectomy (LC) is reported that have various advantages in reduction of the postoperative pain, early rising, early release from hospital, etc. compared to open colectomy (OC). However, LC is usually required higher technique, and need longer operation time compare to OC. From 1997, we are employing the 3 ports method that the assistant holds scope only and operator uses both hands to do operation at the starting time LC. Then, the additional port was added when the case required more assistance. In this study, we examined the sufficient lymphadenectomy of colorectal cancer by 3 ports LC is possible or not. The colorectal cancer patients who received LC with lymphadenectomy in the root area of ileocolic artery and inferior mesenteric artery, in the period from 1997 to 2001 were studied. The patients who converted to the open surgery, complication ablation, or case of total colectomy were excluded, and the post celiotomy patients were included. Eleven cases required additional port (4 ports) and 56 cases were completed LC with lymphadenectomy by 3 ports method. Dissection level of lymphadenectomy, operations times, and blood loss are in 3 ports D1: 113 min, 104 ml, D2: 130 min, 57 ml, D3: 138 min, 56 ml, and in 4 ports D1: 165 min, 78 ml, D2: 183 min, 75 ml, D3: 220 min, 156 ml. Histopathological examination revealed that the all cases were received sufficient lymphadenectomy compare to the progression or metastasis of the cancer. No metastasis of the level 3 lymph node was found in the patients who received D3 level lymphadenectomy, therefore, these D3 lymphadenectomy was over surgery. The patients required additional port (4 ports) showed longer operation time, more blood loss compare to the 3 ports LC with lymphadenectomy. However, the 3 ports LC is possible to do sufficient lymphadenectomy of colorectal cancer.
**Colorectal/Intestinal Surgery–PF051**

**ONE HUNDRED AND FIFTEEN CONSECUTIVE LAPAROSCOPIC COLECTOMIES WITHOUT OPERATIVE MORTALITY**

Seon Han Kim, M.D., Jin Seok Yoon, M.D., and Dong Keun Lee, M.D.

**Department of Surgery, Hansol Hospital, Seoul, Korea**

**Background:** For laparoscopic colectomy to be accepted, this procedure must have an equal or better safety profile than open colectomy. Hospital mortality, however, is similar between the two procedures in the literature, ranging from 1.5% to 3%. This study aimed to investigate the operative mortality and morbidity in consecutive patients undergoing laparoscopic colectomy by one surgical team specially trained in these methods.

**Methods:** prospectively collected data was achieved in 115 consecutive patients (M:F=68:47, median age 58 years) undergoing laparoscopic colectomy between October 1997 and August 2001. Thirty patients (26.1%) were 65 years of age or older. The American Society of Anesthesiologists scores were I in 63.3%, II in 24.5%, and III in 12.2%. One hundred eight patients had cancers (55 colon and 53 rectal), vs 7 who had benign diseases.

**Results:** Operative procedures included 20 right and 3 left colectomies, 35 anterior and 40 low anterior resections, 15 abdomino-perineal resections, 1 subtotal colectomy, and 1 total proctocolectomy. Median operative time was 210 (range, 105-420) minutes. Median blood loss was 250 (range, 50-850) ml. Conversion to an open procedure was required in 7 cases (6.1%). TNM stages were as follows: 0:II:III:IV=8:19:36:37:8. Overall morbidity rate was 20.9%. Major complications occurred in 9 patients (7.8%): 2 intraabdominal bleedings, 1 anastomotic bleeding, 4 anastomotic leaks, 1 fungal peritonitis, and 1 respiratory distress syndrome. None of these were fatal. Tumor margins were clear in all cancer patients. During median follow-up of 13 (range, 1-47) months after 100 curative cancer resections, distant metastases occurred in 4 patients. There were no port site recurrences.

**Conclusions:** With a specially trained team approach, laparoscopic colectomy can be performed with minimal risk of morbidity and mortality, even without mortality. This data further supports laparoscopic resections for malignant and benign indications.

**Poster Abstracts**

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**Colorectal/Intestinal Surgery–PF050**

**LAPAROSCOPIC TOTAL COLECTOMY FOR ULCERATIVE COLITIS**

Kasai Y M.D., Fujiwara M M.D., Ando H M.D., Hibi K M.D., and Nakao A M.D., FACS, Dept. of Surgery II, Nagoya University, School of Medicine, Nagoya, Japan

Ulcerative colitis (UC) is usually found in young patients, and they are suffering from severe diarrhea with bloody stool and long-term usage of steroids. We reported here the feasibility and technique of laparoscopic total colectomy for severe UC patients.

From 1999, 10 cases of UC patients were received laparoscopic total colectomy in our university hospital. Seven out of 10 cases were reconstructed with ileal-pouch and anal anastomosis (IPA) and 3 cases were reconstructed with ileal-pouch and anal-canal anastomosis (IACA). Briefly, 5 ports were inserted under pneumo-peritoneum and total colon was removed through a small incision in right lower abdomen.

Although 2 cases were converted to open colectomy due to bleeding, we could perform the removal of total colon safely, using the technique of laparoscopic operation in the remaining 8 cases. An average time of this operation is 7 to 8 hours and operation time is getting shorter depending on a learning curve. Laparoscopic total colectomy needs only small incisions and could be less invasive for young patients. Therefore, this laparoscopic operation has a benefit for cosmetic reasons.
BLOOD LOSS IN LAPAROSCOPIC VS OPEN COLORECTAL SURGERY. META-ANALYSIS

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INTRODUCTION: Laparoscopic colorectal surgery is complex procedure with high technical demands. There were some dilemmas about this approach in last years. We wanted to evaluate difference in blood loss between laparoscopic and open approach with evidence based procedure: meta-analysis.

MATERIAL AND METHODS: We have selected papers published from 1990 to 1999, which have had data on blood loss during laparoscopic or open procedures. Inclusion criteria was at least 20 patients reported for comparative studies and 30 patients for laparoscopic or open series of patients.

At the end we have selected 18 published papers. There were 9 comparative studies, 4 laparoscopic series and 5 open series of patients. Meta analysis was done with logistic regression method.

RESULTS: Average blood loss was 200.1 ml for laparoscopic procedures, and 467.9 ml for open procedures (descriptive statistics). Meta-analysis with fixed-effect model showed difference of 395.6 ml (233.1 ml-558.2 ml). When random-effect model was used, estimated difference was 291.2 ml (54.6 ml-474.8 ml). Both differences were highly statistically significant. Correlation between blood loss in open vs. open procedures was 0.459. This relatively big correlation shows that there is great impact of random effect.

CONCLUSION: By using a meta-analysis, we have shown that there is significantly higher blood loss in open procedures. Together with lesser impact on immune system, this may be the reason of smaller operative morbidity and mortality reported in laparoscopic procedures.

COLONIC/INTESTINAL SURGERY - PF054

COMBINED LAPAROSCOPIC ASSISTED RIGHT HEMICOLECTOMY AND LOW ANTERIOR RESECTION FOR SYNCHRONOUS COLORECTAL CARCINOMAS

David M. Lauter MD, Stanley T. Lau MD
Departments of General Surgery Group Health Cooperative of Puget Sound and Virginia Mason Medical Center Seattle WA

Introduction: Two cases of combined laparoscopic assisted right hemicolectomy and low anterior resection for malignancy are presented to illustrate the technical aspects of performing two concurrent laparoscopic assisted bowel resections with sequential anastomosis. Although there are similarities with laparoscopic assisted total proctocolectomy, the need for complete mesenteric dissection in two areas, removal of two separate specimens containing malignancy, and the need for two anastomoses raises unique technical considerations which include port placement, sequence of dissection, sites of specimen extraction sites, specimen handling, and sites for extracorporeal anastomosis.

Methods: Operative notes, operative videotapes, hospital and outpatient records were reviewed for both patients.

Results: Laparoscopic assisted combined resection was completed in both patients. In both cases, laparoscopic total mesorectal excision was performed. Maximum incision length was 5 cm. Both patients were ready for discharge on post-operative day 3.

Conclusion: Combined laparoscopic assisted right colectomy and low anterior resection can be performed for synchronous colorectal malignancies with curative intent.

COLONIC/INTESTINAL SURGERY - PF055

COMBINING ULTRASONIC DISSECTION AND THE STORZ OPERA-TION RECTOSCOPE: AN EFFECTIVE NEW APPROACH TO TRANSANAL ENDOSCOPIC MICROSCERUARY

Marcelo M. Lirici, M.D., Giovanna Sgarzini, M.D., Cristiano G.S. Hüscher, M.D., Department of Surgery, San Giovanni Hospital, Rome, Italy

Transanal endoscopic microsurgery is indicated for treatment of large sessile adenomas and early rectal cancer allowing precise full thickness resection of any lesion up to 15 cm from the dentate line. TEM, as described by Buess, needs dedicated and rather expensive equipment, is high skill demanding and requires a running suture secured by silver clips for closure of the parietal defect and continuous control of bleeding and oozing during dissection. The Storz operation rectoscope does not need dedicated instruments. Its features required the development of a slightly different procedure.

Combination with US dissection offers further advantages. Definition of indications and evaluation of the cost-effectiveness of this new approach are the objective of the study. US activated 5 mm, curved blade scissors are employed for dissection and coagulation. Only 2 instrument are used with no need for instrument exchange. Full thickness resection of adequate margin of clearance is performed. Closure of the parietal defect is accomplished by interrupted 3-0 PDS sutures secured with extracorporeal slip-knots. Fourteen TEM have been performed with such a new approach. Adenomas (5), ca in situ/T1 tumors (6), T2 cancers (2) and anastomotic stricture (1) were the indications. Follow-up ranged 1-36 months. No recurrence was observed. One postoperative complication occurred in a patient with adenoma: a bleeding that required a new rectal suturing. Compared to the original technique, TEM with the Storz rectoscope is indicated only for tumors located up to 15 cm from the anal verge. Close-up view is not possible but the use of US dissection avoids smoke generation. Despite the mentioned complication, coagulation is optimal and US scissors allow working in a pretty bloodless field. Overall costs are remarkably lower.

COLONIC/INTESTINAL SURGERY - PF056

LAPAROSCOPIC PROCTECTOMY WITH ILEOANAL POUCH AFTER LAPAROSCOPIC TOTAL COLECTOMY: A COMPARATIVE STUDY

Peter W. Marcello, M.D., Department of Colon & Rectal Surgery, Lahey Clinic, Burlington, Massachusetts

Introduction: There are no previous reports of laparoscopic (LAP) proctectomy with ileoanal pouch after laparoscopic total colectomy in ulcerative colitis patients (pts). This study aims to determine the safety and efficacy of LAP in these pts compared to those undergoing conventional (CON) surgery.

Methods: 10 pts from 1998-2000 underwent LAP proctectomy with ileoanal pouch and loop ileostomy. All pts had undergone an urgent LAP total colectomy and ileostomy for acute colitis. CON pts were matched for patient characteristics, diagnosis, procedures, and operative period. Adhesion formation following total colectomy was also assessed. Median (range) values are reported.

Results: There were 10 LAP pts and 13 matched CON pts. At the time of proctectomy, small bowel adhesions were noted in 10% of LAP cases and 92% of CON cases (p<0.05).

There were no differences in operative times (LAP 250 (180-350) min vs. CON 240 (150-350) min, p=0.72). Estimated blood loss was less in the LAP group (250 (200-400) cc vs. CON 600 (200-1800) cc, p=0.01). Return of flatus was sooner in the LAP group (5 (1-3) days vs. CON 3 (2-4) days, p<0.01) and length of stay was shorter in the LAP group (5 (4-11) days vs. CON 7 (5-21) days, p=0.04).

Perioperative morbidity was also less in the LAP group (20% vs. CON 53%).

Conclusions: Laparoscopic proctectomy and ileoanal pouch is feasible and safe in colitis patients and leads to a faster recovery time than a conventional procedure. Adhesion formation following laparoscopic total colectomy is less than conventional colectomy, offering a previously unrecognized advantage at the time of reoperation.
Colorectal/Intestinal Surgery–PF057

LAPAROSCOPIC MANAGEMENT OF PERFORATED PEPTIC ULCER

Ferdinando Agresta, M.D., Natalino Masao Toyoda, M.D., Tetsuhisa Civile, Vittorio Veneto (TV), Italy

Perforation of a gastro-duodenal ulcer is a serious complication of peptic ulcer disease that affects almost 10% of the patients and accounts for more than 70% of deaths associated with the disease. Its treatment is essentially surgical. Aim of the present work is to illustrate retrospectively the results of a case-control experience of LAPS versus open surgery carried out at our institution for perforated gastro-duodenal ulcer.

Between November 1992 and July 2001 a total of 48 patients (mean age 59 years) underwent urgent surgery for perforative acute abdomen due to a perforated gastroduodenal ulcer. Among them, 22 (45.8%) were operated on Laparoscopically, according to the presence of a well-trained surgical team. The contraindication to a laparoscopic approach were the already known absolute ones plus previous history of more than two major abdominal surgical procedures. We did not consider peritonitis to be a contraindication. The following procedures were carried out: simple closure in 9 patients of the LAPS group and 16 in the laparotomic one; closure plus omentoplasty in 4 of the LAPS and 9 in the laparotomic group; peritoneal lavage plus drainage in the remaining 7 cases of the LAPS group. One patient in the laparotomic group required resection. The laparoscopic group conversion rate was 9% and was mainly due to the presence of dense intraabdominal adhesions and the impossibility to properly find the perforation. Major complications ranged as high as 18.1% in the LAPS group and 19.2% in the open one with a postoperative mortality of 4.6% in the former and 3.8% in the last. Duration of operation and postoperative nasogastric aspiration, analgesic requirements, hospital stay were similar in the two groups.

Our results show the feasibility of the laparoscopic approach for repair of perforated peptic ulcers with acceptable morbidity and mortality, that are at least comparable with those of the laparotomy, and allows shorter hospital stay.

Colorectal/Intestinal Surgery–PF058

LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER - MILLENNIUM APPROACH - Junji Okuda, M.D., Junichi Yamamoto, M.D., Tetsuhisa Yamamoto, M.D., Keitaro Tanaka, M.D., Kanji Nishiguchi, M.D., Hirokazu Okano, M.D., Song-Woong Lee, M.D., Keisaku Kondoh, M.D., Keiji Suga, M.D., Nobuhiko Tanigawa, M.D., Department of General & Gastroenterological Surgery, Osaka Medical College, Takatsuki City, Osaka, Japan

Concerning the efficacy of laparoscopic curative surgery for colorectal cancer, there have been two major controversial issues: 1) adequacy of oncologic surgery including systematic lymph node dissection, 2) post-site/wound recurrence. The purpose of this study was to demonstrate our indication and surgical procedure of laparoscopic curative surgery for colorectal cancer and to evaluate its efficacy. The conventional oncologic principles can be maintained in laparoscopic surgery using laparoscopic type of No-touch isolation technique, which could lead to prevent the port site recurrence. Through August 2001, we did laparoscopic resection for curative intent on 201 patients with colorectal cancers (stage F:79, U:43, V:55). To accurately identify the vascular anatomy of each patient, we have applied Integrated 3-D-CT as preoperative simulation and intraoperative navigation since July, 2000. With respect to adequate resection with lymphadenectomy, laparoscopic surgery was comparable with open surgery. In a laparoscopic group, blood loss was less and first flatus was passed earlier. The overall morbidity rate and mortality rate after laparoscopic surgery were 15.6%(major:5.5%, minor:10%) and 0%. The mean follow-up time is 26 months. Recurrence was identified in four patients with Stage IV cancer (liver metastasis:3, lymphatic metastasis:1). There have been no local or port site recurrences so far. In conclusion, laparoscopic surgery could play a significant role in the treatment of colorectal cancer. Using no-touch technique appropriately under the precise recognition of laparoscopic surgical anatomy, systematic lymph node dissection by laparoscopy for each portion appears to be feasible and equivalent to one by conventional open surgery.

Colorectal/Intestinal Surgery–PF059

THE LEARNING CURVE IN LAPAROSCOPIC COLECTOMY: MAKING A MOLEHILL OUT OF THE MOUNTAIN

Michael Clar, MD

Department of Surgery, Kaiser Foundation Medical Center, San Diego, California

Laparoscopically-assisted colectomy (LAC) has not yet achieved widespread popularity. A major reason is the purportedly extended learning curve, ranging from 15 to 60 cases in various reviews. We present our experience with LAC using a unique, methodical approach to the training of surgeons which virtually eliminated the learning curve. From 1993 to 1998, 255 patients underwent LAC by 16 surgeons at our institution. Operations performed were 113 right, 111 sigmoid, 22 left, and 9 other colectomies. 55 cases (22%) were converted. Mean op time was 142 mins (140 lap, 147 converted). Peri-op mortality was 1.5%. Laparoscopy-related complications occurred in 4%. Overall morbidity rate was 23%. LOS was 3.9 days for LAC, 6.8 for converted (P<0.01). Two surgeons were identified as ‘vanguards’, undergoing specific didactic and laboratory training in LAC, followed by 3 proctored cases. Each then performed LAC with the other as assistant (camera operating position) until their op times varied by no more than 20% (approx 20 cases each). These two then served as assistants to their 14 partners (who, in the interim had undergone didactic and laboratory training in LAC), working in the camera operating position. With this arrangement, there was no demonstrable learning curve; i.e., op times for surgeons trained in this manner varied by ~20% from their initial case. This trend was similar for both right and sigmoid LACs. We conclude that LAC is a safe and effective operation. In a group with trained surgeons operating as assistants in the camera position, the training program described herein essentially eliminates individual learning curves after an initial ‘vanguard’ group is trained.

Colorectal/Intestinal Surgery–PF060

COMBINED LAPAROSCOPIC-COLONOSCOPIC COLON RESECTION AND ANASTOMOSIS BY INTUSSUSCEPTION

Biagio Ravo, M.D., F.A.C.S. Enrico Nicolo, M.D., F.A.C.S. F.I.C.S., Rome-American Hospital, Rome, Italy, University of Pittsburgh Medical Center, McKeesport, PA

The intestinal lumen is external to the body, therefore easily accessible from the two natural openings, anus and mouth. For this reason the intestinal tract can be resected intraluminally, and with the help of laparoscopy, can be controlled on the peritoneal site.

A new technique, and a new instrument are described that allows you to perform an intraluminal colon resection and anastomosis, with a combined laparoscopic and colonoscopic approach, using the method of intussusception, anastomosis and resection via colonoscopy intraluminally.

Material and Method: The procedure has been performed under general anesthesia in three dogs and six pigs. All animals survived with no mortality. One pig developed a large bowel obstruction secondary to a submucosal abscess that required re-operation. This new technique allows you to perform colon resection entirely intracorporeally, and in total asepsis; being the anastomosis is performed prior to the resection.

The results are encouraging, and the new instrument has been developed, and will be presented.
SINGLE SURGEONS EXPERIENCE OF 121 CONSECUTIVE
LAPAROSCOPIC APPENDECTOMIES AT A COMMUNITY HOSPITAL.
Subir Ray, M.D.
The author has performed 121 consecutive laparoscopic appendecto-
my operations for acute appendicitis over the past six years. There were
four patients who were converted to an open procedure due to the
inability to identify the appendix or a phlegmon which required a
partial colectomy. One hundred ten patients were discharged to their
home within two to four hours following their surgery. There were
a total of eleven patients admitted to the hospital because the proce-
dure was performed in the evening or due to a frank perforation with
peritonitis and these patients were discharged within twenty-four
hours on intravenous antibiotics and a clear liquid diet. One of the
patients admitted was a pregnant female who was observed for
twenty-four hours prior to her discharge.

If the acute appendicitis did not involve any periappendiceal
inflammation or surrounding inflammation the patients were dis-
charged without any postoperative antibiotics. However, if inflamma-
tion was seen in the omentum or mesentery the patients were
 discharged on Cipro 500 milligrams bid for five days. The patients
were asked to resume clear liquids postoperatively and subsequently
a regular diet as tolerated and a return to normal activities within
forty-eight hours. Among the eight patients who have received intra-
venous antibiotics because of perforations eighty percent were dis-
charged within forty-eight hours to home intravenous antibiotics.

The author experienced one postoperative abscess very early in
the series, no wound infections, no postoperative complications, no
bowel obstructions and no deaths in this series. In all cases except
the series, no wound infections, no postoperative complications, no
venous or arterial problems because of perforations eighty percent were dis-
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charged within twenty-four hours. Among the eight patients who have received intra-
venous antibiotics because of perforations eighty percent were dis-
charged within forty-eight hours to home intravenous antibiotics.

The author concludes that a laparoscopic appendectomy can be
done safely in an outpatient setting without any increased morbidity
or mortality and in the author’s experience it is more cost effective
than an open appendectomy.

LAPROSCOPIC MANAGEMENT OF MECKEL’S DIVERTICULUM IN
ADULTS. Homer Rivas,M.D., Robert N. Cacchione, M.D., Jeff W.
Allen, M.D.University of Louisville, Department of Surgery, Center for
Advanced Surgical Technologies, Louisville, Kentucky

Introduction. Meckel’s diverticulum is an uncommon entity. A
high index of suspicion is necessary for opportune diagnosis and
prompt treatment. Technetium 99m pertechnetate scintigraphy is a
sensitive and specific test for a Meckel’s diverticulum. In adults the
contribution of the scan to clinical decision making is low, and often
will not change the need for surgical intervention. Here we describe
our experience with four patients.

Patients and Methods. Between August 2000 and August 2001, four
patients were seen with Meckel’s diverticula. Three were male and
one female. The mean age was 39 with the range being 18 to 64.
Three patients presented with anemia and one with an acute
abdomen. A 99m Tc pertechnetate scan was performed, at a cost of
US$900.00 in the three anemic patients after other endoscopic and
radiographic tests had been non-diagnostic. Only one patient had a
positive scan. All four patients underwent exploratory laparoscopy
and small bowel resection. In one patient, a mini laparotomy had to
be performed.

Results. All patients had a satisfactory outcome without complica-
tions. Three patients were discharged within three days of surgery.
The remaining one had a prolonged hospital stay because of ongo-
ing chemotherapy for small cell lung cancer. In the three anemic
patients who underwent enterectomy, ulcerated small bowel outside
the diverticulum was found by the pathologist.

Conclusions. Laparoscopy is safe, cost-effective, and efficient for
the diagnosis and definitive management of Meckel’s diverticulum.
Technetium 99m pertechnetate scintigraphy scanning adds consid-
erable time and expense to the care of the patient without significant
known benefit in adults. The practice of exploratory laparoscopy in
place of scintigraphy is recommended.

LAPAROSCOPIC TREATMENT OF SMALL INTESTINAL DISORDERS: A
TEN YEAR EXPERIENCE. PJ Recio, DO, PK Papasavas MD, DJ Gagne,
MD, F Haytian, MD, RJ Landreneau, MD, RJ Keenan, MD, PF Gaushaj MD.
Minimally Invasive Surgery Program, West Penn Allegheny Health System,
Pittsburgh, Pennsylvania.

Laparoscopy has become an adjunct in the treatment of disorders of the
small intestine. An outcome analysis of all patients that underwent
laparoscopic resection, excluding lysis of adhesions and inflammatory bowel
disease, during a 10-year period is reviewed.

17 patients underwent laparoscopic treatment for: 7 Meckel’s diverticulitis
(41.2%), 4 small intestinal malignancies (23.5%), 3 small intestinal
lymphomas (17.6%), 2 stromal tumors (11.7%), 1 carcinoid (6%). The mean
age was 51 years (16 to 92). Preoperative evaluation by CAT scan,
endoscopy and barium radiographs had established the diagnosis in 13
patients (76.5%). Meckel’s diverticulitis was not preoperatively identified in
65.6% of the Meckel’s patients.

The mean OR time was 134 minutes (42 to 179). Estimated blood loss
(EBL) was a mean of 18 ml (0 to 40). There was a conversion in 2 patients
(12%). Postoperative complications occurred in 5 patients (29.4%).

Postoperative complications included: urinary retention 2 (40%), wound
infection 1 (20%), pneumonia 1 (20%) and ileus 1 (20%). Mean length of
stay was 4-2 days (1 to 9). Adjuvant chemonodulation was administered to 6
patients. There were no perioperative mortalities in this group.

Laparoscopic approaches for disorders of the small bowel offer an excellent
alternative to resection performed by open surgery. Minimal blood loss and
short hospital stays are additional benefits.
Endoscopic Hemosusis with Fibrin Glue to Hemorrhage of Upper digestive canal
H. Sugii, M.D., T. Nakagawa, M.D., Y. Soga, M.D., M. Abe, M.D., T. Kawasaki, M.D., K. Ikai, M.D., T. Suzuki, M.D., N. Nakamura, M.D., Department of Emergency Medicine, Tokyo Women’s Medical University Daini Hospital, Tokyo, Japan. *Department of Emergency Medicine, Tokyo Women’s Medical University, Tokyo, Japan

Introduction: As an endoscopic hemostasis to the hemorrhage of the upper digestive canal, local injection of ethanol, clipping and so on have been used widely, but they have some problems, such as making tissue injuries, hemorrhage from plural sites of widely extended ulcer and basic disorders of the patient (hepatocirrhosis, coagulopathy and so on). This time, in the endoscopic hemostasis with fibrin glue, we got a good results and report it here. Cases and Method: During about 6 months from October 2000 to April 2001, patients of hemorrhage in the upper digestive canal who were carried out hemostasis with fibrin glue were 8 cases. As complication, patients who were noticed exposed vascular vessels in active stage were 5 cases and patients who were not noticed them were 3 cases. As method we injected locally fibrin glue with 21G needle in sandwiches method in order of saline 1cc, fibrin 2cc, saline 1cc, thrombin 2cc and saline 1cc (injected).

Therapeutic effects: Findings on the 1st day were active stage but there was no enlargement of ulcer, and exposed vascular vessels disappeared. A patient, who after cerebral infarct, continued anticoagulation therapy for a long time, needed about 8 days for recovery, but other 7 cases recovered to healing stage on the 2nd day after hemostasis, and no rehemorrhage was observed.

Conclusion: Comparing with local injection of ethanol hitherto used, the endoscopic hemostasis with fibrin glue is free from enlargement of ulcer because of lacking tissue injury, and is possible to inject locally a sufficient quantity of fibrin glue even to the patients who have functional disorder of liver and are under treatment of anticoagulation therapy. Thus, it was considered to be an effective technique of hemostasis.

Result of Elective Laparoscopy for Patients with small bowel obstruction
Kenji Suzuki, M.D., Yasuhiko Umehara, M.D., and Taizo Kimura, M.D. Department of Surgery, Fujinomiya City General Hospital

Laparoscopic surgery for patients with small bowel obstruction may have advantages over classical laparotomy, but when this approach is applied in emergency cases, the working space is limited by the distended bowel and precise information about the obstruction cannot be obtained. Therefore, we performed laparoscopic surgery selectively in 15 patients with small bowel obstruction. They include nine patients with gastrectomy, two patients with hysterectomy, one patient with retroperitoneal tumor resection, one patient with laparotomy for malrotation of the bowel, one patient with small bowel resection, and one patient without a history of laparotomy. In nine patients, laparoscopic surgery was performed following after decompression, while six patients were treated following spontaneous resolution of the obstruction. The procedure, including removal of adhesions and inspection of the small bowel, was completed laparoscopically in 11 patients, but four patients required laparotomy for malrotation of the bowel, anastomotic small bowel perforation, or dense adhesions of the small bowel. The mean length of operating time, mean time until the return of bowel function, and mean postoperative stay for patients with completely laparoscopic procedure was 76 minutes, 2.3 days, and 9.7 days, respectively. During follow-up for one to 28 months, two patients developed recurrent obstruction, and four patients suffered from catheter-induced thrombosis, and one patient died of lung cancer. Elective laparoscopic surgery can be performed safely and effectively in patients with small bowel obstruction.

Identification and Spacing Technique of Vagus Nerve in Laparoscopic Gastroctomy
Satoru Takenaka, Kazuyuki Kojima, Kenji Shitara, Inokuti Mikito, Yoshinori Shirota, Takayuki Osanai, Kenichi Sugihara, Department of Digestive Surgery, Tokyo Medical and Dental University, Tokyo, Japan.

In comparison with open surgery, nerves can be seen more precisely and operation in details is easier by laparoscope. And to resect lymph nodes without injuring nerves it is necessary but not easy to identify these details precisely. We devised the method and technique to resect lymph nodes without injuring nerves. [Method] The first trocar is inserted just below the umbilicus and four additional trocars are placed. Under tension of lesser omentum by traction on the greater curvature, anterior vagal trunk, hepatic branches, and anterior gastric branches are observed more easily than in open surgery. After resection of anterior gastric branches and exposing esophageo-gastric junction continuously, posterior vagal trunk is easily identified. Posterior trunk must be grasped with a tape. Under tension of this tape, celiac branches are identified. After opening bursa by insision of greater omentum, with rotation of the greater curvature upwards, gastropancreatic folds is extended, and left gastric vein can be identified to be resected. And left gastric artery is easily exposed. In exposing this artery toward its root, celiac branches are found. Under tension of posterior trunk with that tape, posterior gastric branch are resected while celiac branches are preserved. [Conclusions] By this technique, lymphadenectomy of early gastric cancer is possible while sparing vagus nerve.

Laparoscopic Total Colectomy in a Patient with Familial Adenomatous polyposis
Takayuki Osanai, Yoshinori Shirota, Kenji Shitara, Inokuti Mikito, Masato Toyoda, Tatsuya Yamamoto, Kazuhiko Nishiguchi, Koki Kan, Hironao Lee, Satoru Takenaka, Kondo K., Suga K. and Tanigawa N., Department of General and Gastroenterological Surgery, Osaka Medical College, Japan

Total colectomy for familial adenomatous polyposis (FAP) is widely accepted treatment. But the role of laparoscopic surgery in the treatment of FAP is still under investigation. We report a case of FAP treated by laparoscopic total colectomy with ileorectal anastomosis (IACA) using J-shaped ileal pouch. A 23-year-old female with history of FAP was referred to our department for surgical treatment. Colonoscopy demonstrated multiple colon polyps throughout the total colon. Operative technique: Pneumoperitoneum was initiated and six cannulas were placed. Our procedure started from right colon and continued clockwise to the left colon. At first the right mesocolon was dissected from medial to lateral, followed by mobilizing the mesocolon from the retroperitoneum. Dissection was proceeded to the transverse mesocolon, and the right and left branches of middle colic artery were clipped and divided. Right side of the greater omentum, hepatic flexure and lateral attachment to ascending colon were divided. Right colon was fully mobilized. The left mesocolon was dissected from medial to lateral. Thereafter left mesocolon including left colic artery, sigmoideal artery, superior rectal artery and inferior mesenteric vein were divided. Left side of the greater omentum, splenic flexure and lateral attachment to descending colon were divided. Finally the rectum was dissected all the way down to the levator ani and completely mobilized. After the transection of the rectum just at the anal canal, the whole colorectum was extracted through the supra-pubic Pfannenstiel incision. The proximal colon was divided close to the ileocoeal junction. After creating the J-shaped ileal pouch and the anastomosis was completed by double stapling technique. The patient recovered quickly and was discharged without any complication. [Conclusions] Laparoscopic total colectomy could be an optimal procedure especially for a young patient with FAP.
**Colorectal/Intestinal Surgery-PF069**

**LAPAROSCOPIC SURGERY FOR ADVANCED COLON CANCER, J. Tanaka, S. Endo, A. Umezawa, M. Iwashita, K. Nagata, H. Ishizaki, E. Hikata, S. Usui, T. Yoshida, H. Inoue, S. Kudo, Digestive Disease Center, Showa University Northern Yokohama Hospital, Yokohama, Japan**

Recent developments in minimal invasive surgery have altered the surgical approach to colorectal cancer so that the laparoscopic or assisted colorectal resection (LAC) appears to be a feasible alternative to open surgery. Between 1995 and 1999 we performed 132 LAC only for early stage colon cancer without major complication or early recurrence, then we have applied LAC with lymph node dissection for advanced colorectal cancer since 2000. The purpose of this study is to report the preliminary results from 60 patients who underwent LAC between April 2000 and August 2001. Lymph node dissection including regional blood vessels was performed for advanced colorectal cancer through laparoscopic Procedures are ileocecal resection, RHC16, transverse colectomy, sigmoidectomy9, HART13, LAR9, APR2, Hartmann1. Conversion to open surgery was 5/3 for a huge tumor with peritoneal dissemination, 2 for direct invasion to other organs). No operative mortality, morbidity was 6.7% (anastomotic tear2, ileus2). In all other cases, the immediate postoperative course was uneventful with a hospital stay of 8 to 14 days and quick resumption of physical activity. LAC for advanced colorectal cancer is a feasible and safe operation with an acceptable complication rate. With indication, conversion rate should be low. Recurrence rate or long term functional outcome needs longer follow up.

**Colorectal/Intestinal Surgery-PF070**

**RIGHT COLECTOMY: A COMPARISON BETWEEN LAPAROSCOPIC AND HAND ASSISTED TECHNIQUE. Enter Garcia, MD, Eduardo M* Taragona, MD, Jordi Garriga, MD, Gemma Cerdán, MD, Manel Rodriguez, MD, Ana García, MD, Manuel Trías, MD, Service of Surgery. Hospital de Sant Pau. UAB. Barcelona, Spain**

Hand assisted laparoscopic surgery (HALS) has been proposed as an useful alternative to conventional laparoscopic surgery, but comparative analysis are lacking. Colectomy is one of the procedures that can obtain the benefit of HALS because a bulky specimen is resected and an incision for specimen extraction and anastomosis is needed. Right and left colectomy have different technical requirements, and is not know if HALS have advantages for any specific procedure. Aim: to assess the utility of HALS during right colectomy. Material and methods: In the context of a prospective and randomized trial designed to compare HAL and conventional laparoscopic colectomy, the specific postoperative features for 25 right colectomies were analyzed. They included, Age, sex, BMI, diagnosis, op. time, conversion to open or HALS, morbidity, stay, length of specimen and nº of lymph nodes.

**Results (median & range):**

<table>
<thead>
<tr>
<th>LAP</th>
<th>HALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>11</td>
</tr>
<tr>
<td>Age</td>
<td>74 (54-81)</td>
</tr>
<tr>
<td>BMI</td>
<td>28 (23-34)</td>
</tr>
<tr>
<td>Diagnosis(benign/mal)</td>
<td>4b / 7m</td>
</tr>
<tr>
<td>Operative time</td>
<td>120 (80-180)</td>
</tr>
<tr>
<td>Conversion</td>
<td>18% (1open/1HP)</td>
</tr>
<tr>
<td>Morbidity (severe)</td>
<td>7%</td>
</tr>
<tr>
<td>Morbidity (mild)</td>
<td>27%</td>
</tr>
<tr>
<td>Reoperation</td>
<td>7%</td>
</tr>
<tr>
<td>Mortality</td>
<td>ns</td>
</tr>
<tr>
<td>Stay</td>
<td>6 (5-34)</td>
</tr>
<tr>
<td>Length specimen (cm)</td>
<td>20 (13-40)</td>
</tr>
<tr>
<td>Nº lymph nodes</td>
<td>13 (7-24)</td>
</tr>
</tbody>
</table>

**Conclusion:** HALS slightly reduces operative time and maintain the oncological features and immediate outcome of conventional laparoscopic right colectomy.

**Colorectal/Intestinal Surgery-PF071**

**PNEUMOBILIA AND PNEUMATOSIS ASSOCIATED WITH SMALL BOWEL OBSTRUCTION. Michelle D. Taylor MD, Lena M. Napolitano MD University of Maryland School of Medicine, Department of Surgery, Baltimore, MD**

Small bowel obstruction (SBO) is a common occurrence, and treatment requires that the site, level and cause of obstruction be determined accurately. Here we present an unusual clinical finding of pneumobilia and pneumatosis associated with SBO.

A 78-year-old male with past medical history significant for COPD, hypertension, and steroid dependent rheumatoid arthritis, presented after 1 week of abdominal pain, obstipation, and anorexia. Prior surgery included Billroth II for a perforated duodenal ulcer, a right inguinal herniorrhaphy and a sigmoid resection for a T2 colon cancer. In the 4 years since his sigmoid resection, he had 3 admissions for recurrent SBO. After a few days of nasogastric decompression, he was started on a trial of enteral intake. He developed abdominal distension without pain, fever, or leukocytosis. X-rays showed dilated small bowel loops, no air in the rectum, and no pneumoperitoneum. Contrast abdominal CT showed portal venous gas, pneumatisosi, patent SMA, and distended small bowel loops with a transition point in the distal small bowel consistent with complete SBO. At exploration he had multiple adhesions of the small bowel to the anterior abdominal wall with small bowel volvulus and transmural necrosis without perforation. The proximal small bowel was extremely dilated with severe venous congestion and required operative decompression of 2.5 L of enteric contents. Small bowel resection and anastomosis were performed and pathology was negative for malignancy with moderate ischemia. The patient did well postoperatively and tolerated enteral feeding prior to discharge.

Pneumobilia is rare in patients without a biliary-enteric fistula. The CT radiographic findings of pneumatosis intestinalis, mesenteric venous gas, and portal venous gas in this case confirmed intestinal necrosis despite minimal clinical findings in this steroid dependent patient, and prompted emergent surgical intervention.

**Colorectal/Intestinal Surgery-PF072**

**ANEMIA AND BLOOD TRANSFUSION IN GENERAL SURGERY: RISK FACTORS FOR ADVERSE OUTCOME. Michelle D. Taylor MD, Jim Dunne MD, Debra Malone MD, J. Kathleen Tracy MA, Lena M. Napolitano MD, University of Maryland School of Medicine and VA Maryland Medical System, Department of Surgery, Baltimore, MD**

Previous studies have shown that perioperative blood transfusion is associated with a significant increase in post-operative complications. We sought to investigate the incidence of perioperative anemia in general surgery patients and determine if transfusion is an independent risk factor for adverse outcome postoperatively.

**Methods:** Prospective data from the National Veterans Administration Surgical Quality Improvement Program (NSQIP) were collected on 1788 general surgery patients admitted to the VA Maryland Healthcare System from 1995-2000.

**Results:** The mean age of the study cohort was 60–14 years. Colorectal surgery comprised 36% of the study cohort, and 26% of cases were emergent. Preoperative anemia (hematocrit (Hct) <36), was found in 35%, postoperative anemia in 82%. In the postoperative period, 24% had Hct 26-30, 19% had Hct 21-25. Multiple logistic regression analysis documented that low preoperative Hct, low postoperative Hct, and increased blood transfusion rates were significantly associated with an increased mortality and increased hospital length of stay. Patients who required blood transfusions perioperatively had significantly longer hospital length of stay (19.0 vs. 10.5 days, p<0.001; coef. 2.92, p=0.031) and increased mortality (OR 3.98, CI 2.55-6.22, p<0.001)

**Conclusion:** There is a high incidence of preoperative (35%) and postoperative anemia (82%) in general surgical patients. Perioperative anemia and blood transfusions are associated with increased hospital length of stay and mortality in these surgical patients. Consideration should be given to preoperative diagnosis of the etiology of anemia and possible correction with iron, vitamin B12, folate, or recombinant erythropoietin in attempts to reduce the utilization of blood transfusions in general surgery.
LAPAROSCOPIC SIGMOID RESECTION FOR LOCALIZED AMYLOIDOSIS OF THE COLON. Stefanie Cravotto Vamakis M.D., Alan P. White, M.D., Julio Teixeira, M.D., Lawrence Brandt, M.D., Jonathan Wong M.D., Institute for Minimally Invasive Surgery, Montefiore Medical Center, Bronx, New York

Systemic amyloidosis can occur in virtually any organ system. The accumulation of amyloid in the GI tract is a well recognized occurrence however, solitary colorectal involvement without the presence of systemic amyloidosis is rare. We present the case of a 71 year old male who presented with lower GI bleeding. Colonoscopy revealed a strictureed segment of the sigmoid colon consistent with ischeamic polyps. The lesion was removed via laparoscopic sigmoid resection. Final pathology revealed the presence of amyloid. Systemic amyloidosis is not a single disease but rather a group of disorders characterized by the extracellular deposition of insoluble fibrillar proteins in various organs. All types of amyloidosis have important effects on the GI tract and as such the clinical manifestations are numerous. When colonic amyloid presents as ischeamic colitis it may be referred to as “amyloid colitis”. In this case amyloid deposits completely obstruct the vessels of the submucosa and muscularis mucosae leading to chronic ischemia and sloughing of the mucosal lining and hemorrhage. Acute infarction of the sigmoid colon can be attributed to obstruction of the mesenteric blood vessels by amyloid. Amyloidosis can present in various forms and may follow several different paths. In our case, local laparoscopic resection was indicated for a symptomatic and well defined lesion. The most effective treatment against localized amyloidosis however, remains unclear.

LAPAROSCOPIC MANAGEMENT OF COLORECTAL CANCER - RETROPERITONEAL APPROACH TECHNIQUE AND RESULTS. H. Yamada, M.D., Y.Okazaki M.D., M.Kawada M.D., K.Sakamoto M.D., S.Arita M.D., T.Iwashita M.D., H.Kashiwabara M.D., Department of Surgery, sakura national hospital, Chiba, Japan

The aim of the present study was to perform a retrospective study of our experience in performing laparoscopic colon surgery after 7 years experience.

PATIENTS: From june 1994 to July 2001, 232 patients underwent colorectal laparoscopic surgery using the retroperitoneal approach method. The patient's average age was 65.1 (range: 18-96). Tumor depth were from m to s.

RESULTS: 177 laparoscopic procedures were Cur A. The conversions were 9 out of 232 (3.9%). The average operative time was 120 min (range: 52-192).There were 2 complications (0.9%) during operation ( right urinary injuries ). There were 16 complications (6.8%) after operation ( 11 (4.7%) ileus, and 5 anastomotic leak). We have no port-site metastasis. 5 years survival rate was 94.0% (Cur A cases). Stage 0, 1 were 100%.Stage II was 96.7%, stage IIa was 90.4%, and stagellb was 62.5%. We concluded that laparoscopic assisted colorectal surgery is a safe and feasible technique, which may be associated with a faster return of bowel activity ,and short-term and long-term results. We will report the indication of laparoscopic colectomy for colorectal cancer, our technique,and our results.

LAPAROSCOPIC LYMPH NODE DISSECTION FOR RIGHT COLON CANCER. Shigeki Yamaguchi, M.D., Shoichi Fujiji, M.D., Hideaki Kimura, M.D., Shigeru Yamagishi, M.D., Yasushi Ichikawa, M.D., Hideyuki Ike, M.D., Hiroshi Shimada, M.D. Department of Surgery II, Yokohama City University School of Medicine, Yokohama, Japan

Laparoscopic colectomy for cancer is still controversial. One of the reasons is fear for insufficient lymph node dissection. Major vessels of the right colon and the superior mesenteric vein (SMV), so-called surgical trunk, are very important for dissection. The purpose of this study was to clarify anatomy of the right colon vessels and to investigate actual lymph node dissection in laparoscopic colectomy. From study of 88 cadavers, the ileocolic vessel was constant and small structure. The right colic vein was lacked in 57% and direct drainage of the SMV was seen in 24%. The other 19% was drained by the gastro-colic trunk (GCT) which was common trunk of colic vein and right gastro-turnic vein(s). Eighty-five per cent of the main middle colic vein was drained by the SMV directly. The GCT was present in 69%. Concerning colon branch of the GCT, one fourth was from the ascending colon and three fourths were from the transverse colon. Thirteen right colon cancers were resected laparoscopically since May 2000. T and N stages of them were T1: 4, T2: 4, T3: 5, and N0: 8, N1: 4, N2: 1. Grade of the lymph node dissection was classified into three categories, D1=Fonky paracolic nodes along the marginal vessels, D2: up to intermediate nodes along the major vessels and D3: up to main nodes around the SMV. D2 and D3 underwent in 5 and 8 respectively. The ileo-colic vein was presented in all patients. The right colic vein was presented in 31%. The gastro-colic trunk was checked in 9 patients. The GCT was confirmed in 33%. The SMV was exposed in 69% patients for D3 lymph node dissection. There was no intraoperative complication and no converted case. It is possible and feasible to perform laparoscopic lymph node dissection for right colon cancer.

LAPAROSCOPIC-ASSISTED SIGMOIDECTOMY WITH LYMPH NODE DISSECTION VIA MINILAPAROTOMY. Takuya Yamamura, M.D., Hidetaka Ikai, M.D., Shin-ichiro Noda, M.D., Masaru Nemoto, M.D., Osamu Ohgoshi, M.D., Kyoji Yamada, M.D., Susumu Yamaguchi, M.D., Department of Gastrointestinal Surgery, St. Marianna University School of Medicine, Kawasaki, Japan

Laparoscopic-assisted colectomy (LAC) has become a standard surgical treatment for colon cancer. Indication for LAC has been extended, and LAC is used for main lymph node dissection in case of advanced colorectal cancer. We have performed sigmoidectomy with main lymph node dissection via minilaparotomy in combination with LAC. The procedure is minimally invasive, and we found lymph node dissection by this approach to be similar to that in open surgery. Three or four trocars are placed and assessing the possibility of laparoscopic resection is performed by determining the extent of tumor invasion, and whether liver metastasis or peritoneal dissemination is present. The fusion fascia of the sigmoid colon is dissected and mobilizes the sigmoid colon for sufficient exteriorization under laparoscopy. The ileo-colic vein was lacked in 57% and direct drainage of the SMV was seen in 24%. The other 19% was drained by the gastro-colic trunk (GCT) which was common trunk of colic vein and right gastro-turnic vein(s). Eighty-five per cent of the main middle colic vein was drained by the SMV directly. The GCT was present in 69%. Concerning colon branch of the GCT, one fourth was from the ascending colon and three fourths were from the transverse colon. Thirteen right colon cancers were resected laparoscopically since May 2000. T and N stages of them were T1: 4, T2: 4, T3: 5, and N0: 8, N1: 4, N2: 1. Grade of the lymph node dissection was classified into three categories, D1=Fonky paracolic nodes along the marginal vessels, D2: up to intermediate nodes along the major vessels and D3: up to main nodes around the SMV. D2 and D3 underwent in 5 and 8 respectively. The ileo-colic vein was presented in all patients. The right colic vein was presented in 31%. The gastro-colic trunk was checked in 9 patients. The GCT was confirmed in 33%. The SMV was exposed in 69% patients for D3 lymph node dissection. There was no intraoperative complication and no converted case. It is possible and feasible to perform laparoscopic lymph node dissection for right colon cancer.
VIDEO-ASSISTED TOTAL COLECTOMY FOR THE FAMILIAL ADENOMATOUS POLYPSIS

Ouki Yasui MD, Hideo Andoh, MD, Norihito Ise MD, Hitoshi Kotanagi MD, Kenji Koyama MD, Department of Surgery, Akita University School of Medicine

The efficacy of video-assisted total colectomy was retrospectively studied in comparison with open total colectomy for the adenomatous polyposis from 1985 to 1998 (OTC group) and 3 patients undergoing open video-assisted total colectomy for the same disease from 1999 to 2001 (VAC group). The mean operative time was 331.5 (range, 220 to 425) minutes in the OTC group and 445 (range, 431 to 469) minutes in the VAC group. The mean volume blood loss was 584 (range, 188 to 1908) ml and 450 (range, 85 to 701) ml for the OTC group and VAC group, respectively. The patients walked at POD 5.3 (range, 4 to 6) days and 2.3 (range, 2 to 3) days in the OTC group and VAC group, respectively. Analgesics were needed until POD 5.5 (range, 4 to 7) days and 2.3 (range, 2 to 3) days in the OTC group and VAC group, respectively (P<0.01). These results indicate that laparoscopic total colectomy has many advantages and is excellent operative procedure.

Complication of Surgery-PF080

LAPAROSCOPIC FUNDPLICATION WITH WIDE MOBILIZATION OF THE GASTRIC FUNDUS IS ASSOCIATED WITH AN HIGH INCIDENCE OF POST-OPERATIVE GASTRIC MIGRATION INTO THE CHEST

M. Anselmino, M. Rossi, MG Bellomini, S. Sasti, A. Gennari, B. Solito, G. Castello, Chirurgia Generale IV - Azienda Ospedaliera Pizzonia, Pisa, Italy

Post-operative persistent dysphagia represents the most important complication after laparoscopic treatment of gastro-oesophageal reflux disease (GERD). How long and floppy has to be the gastric wrap is still debated, and sectioning of the short gastric vessels (SGV) is not considered a routine step of the operation. Two-hundred and twenty-one GERD patients (143 males and 78 females, median age 54 years, range 19-79) underwent laparoscopic Nissen procedure in 137 cases and Toupet in 44. Hiatal hernia calibrated on a Maloney bougie (42-48 F) was routinely added. All patients had a wide mobilization of the gastric fundus through the section of the SGV of the sfero-gastric ligament. In order to obtain a completely free gastric fundus, Nissen patients had a further mobilization with section of the posterior gastro-pancreatic attachments. Pre and post-operative patient’s evaluation showed an overall significant decrease in the symptoms score, with an increase in the lower esophageal sphincter pressure and decrease in esophageal acid exposure (p<0.001). At a median follow-up of 23 months, range 6-41, recurrent GERD was detected in 13 patients (5.8%). Post-operative persistent dysphagia was recorded in 3 patients (1.3%), all with Nissen procedure: re-operation and conversion to partial Toupet fundoplication was successfully performed in two, whereas pneumatically dilation in 1. Partial or complete chest migration of the wrap alone (WM) or associated with a para-oesophageal hernia (PH) was observed in 14 patients (6.3%); there was 10 Nissen and 4 Toupet. In the Nissen group stomach migration was WM in 6, and PH in 4; in the Toupet group a mixed migration was evidenced in 2 patients whereas 2 had PH. Re-positioning in the abdomen of the herniated stomach was required in 8 symptomatic patients who had PH. Complete mobilization of the gastric fundus seems to represent the best option to fashion a real floppy anti-reflux procedure in patients with GERD, with a very low incidence of post-operative dysphagia. Nevertheless a high incidence of stomach migration into the chest occurs post-operatively. This data suggest that wide mobilization of the gastric fundus has not to be routinely performed and that hiatal mobilization of the gastric body has to be added when the gastric fundus is widely free.

Underline denotes presenter. * denotes resident paper.

http://www.8thworldcongress.org/
Complication of Surgery-PF081

PERICHOLESYSTIC ADHESIONS IN SINGLE VERSUS MULTIPLE GALLSTONES: DO THEY MAKE A DIFFERENCE IN LAPAROSCOPIC CHOLECYSTECTOMY? R. VERMA, M.S., S. M.BOSE, M.S., J.D. WIG, M.S., RAJINDER SINGH, M.S., GURPREET SINGH, M.S. Postgraduate Institute of Medical Education and Research, Chandigarh, INDIA.

Adhesions are the common cause for open conversion in laparoscopic cholecystectomy. It is not clear whether the problem is more common with single or multiple gallstones.

The clinical records of 110 patients of chronic cholecystitis harboring multiple gallstones in the gallbladder (Multiple stone group, MSG) and 45 patients with single stones in the gallbladder (Single stone group, SSG) undergoing laparoscopic cholecystectomy were analyzed for difference in the clinical presentation and the outcome with special reference to the incidence of pericholecystic adhesions, size of the gallstones and their implications for conversion and complications.

The overall incidence of pericholecystic adhesions was 55.6% and 52.7% respectively in patients with SSG and MSG, however the incidence of dense pericholecystic adhesions was 20% in SSG compared to 3.6% in MSG (P<0.003).

Eleven of 45 SSG patients (24.4%) and 13 of 110 patients of MSG (11.8%) were converted to open cholecystectomy. The dense pericholecystic adhesions alone contributed 9 of 11 conversion (81.8%) in SSG compared to 4 of 13 patients (30.7%) of MSG. The size of the gallstones was significantly greater (p<0.001) in those patients of SSG who required conversion to open cholecystectomy whereas it did not differ significantly in patients of MSG with or without conversion. There was no difference in the clinical presentation and complications in two groups of patients.

It may be concluded that dense pericholecystic adhesions were significantly more common in patients with single gallstones and they are the most common reason for conversion to open cholecystectomy.

Complication of Surgery-PF083

MORBIDITY AND MORTALITY AFTER LAPAROSCOPIC SURGERY: OUR EXPERIENCE IN 3869 CASES. Barbara Faife MD, Julián Ruiz MD, Miguel A Martinez MD, Tania Gonzalez MD, Rafael Torres MD, Arnulfo Fernandez MD, Julio R Torres MD, Carlos Escoto MD. Endoscopic Surgery Center, Calixto Garcia University Hospital, Havana, Cuba.

This study has the purpose to examine our results dealing with morbidity and mortality after different laparoscopic procedures performed from January first, 1998 to June 30th 2001. A population based, retrospective study was conducted in which data were analyzed. In this period we operated 3869 patients. Complications were presented in 102 cases. They included superficial wound infections (3:0.85%), deep wound infections (3:0.77%), intrabdominal collections (5: 0.12%), biliary leaks (8:0.2%), phlebitis (12:0.31%) and cholangitis (3:0.77%). Other complications were gastric obstruction, staple line dehiscence, postvagotomy diarrhea and bowel obstruction among some others with an overall per operative morbidity rate of 2.6%.

The serious complication rates which required reintervention was 1.1%

Mortality rate was 0.28% from anastomotic leaks, sepsis, multiorgan failure or pulmonary embolism.

We concluded that laparoscopic procedures are safe and effectiveness in experienced surgeons.

Complication of Surgery-PF082


Introduction: The aims of the study were to evaluate the evolution of laparoscopic surgery during the last decade in terms of variations in the quality (complexity) of the procedures performed and of modifications in patient outcome, and to evaluate the influence of the learning curve of the surgeon on patient outcome.

Methods and Procedures: A retrospective analysis was performed of 3022 consecutive patients undergoing 99 different laparoscopic procedures at a centre specialised in laparoscopic abdominal surgery. All the procedures were classified according to three classes of complexity. Results relating to the first 1511 patients were compared to those of the last 1511 patients.

Results: In the second group, medium- to high-class complexity procedures significantly increased, conversion rate was higher only for straightforward procedures, duration of low- to medium- class complexity procedures decreased, only the rate of slight complications increased, and mean postoperative hospital stay was longer. Frequency of conversion and severe complications was not different in the two periods for any of the surgeons. The most experienced surgeon performed the new procedures at the outset and had the highest rate of major complications.

Conclusions: The quality of laparoscopic surgery has improved during the last decade, with no increase in the frequency of conversion to laparotomy or of major complications. Every surgical department should have a single surgeon responsible for setting up laparoscopic methods, thus enabling the other surgeons to learn to perform already codified procedures and to avoid the «classical», but not ethical, learning curve.

Complication of Surgery-PF084

COMMONER INJURY DURING LAP. CHOLECYSTECTOMY, DUCTAL OR DUODENAL. S. P. Gupta, M.S., Neena Gupta, M.D., Nitin Nursing Home, Patiala, India.

Other than ductal injuries during lap-cholecystectomy, there are very few reported injuries to structures adjoining gall bladder. Ductal and transverse colon are frequently found to be adherent to gall bladder, but strangely there is no stress on preventing their injuries with grave consequences.

It is a retrospective study of 1700 cases of lap-cholecystectomy analysing injuries to CBD, duodenum and colon. The incidence of cholecysto-duodenal adhesions was found to be 8% and included 9 cases of fistula. The injuries are compared in table as under:

<table>
<thead>
<tr>
<th>Injury</th>
<th>CBD</th>
<th>Duodenum</th>
<th>Colon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans. section, ligation, cautery burn</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Perforations, tears, avulsion</td>
<td>9</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Conversions</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Fistula</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mortality</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

In conclusion gut injuries are commoner than ductal injuries. Reasons and mechanism & prevention of gut injuries will be discussed.
Complication of Surgery–PF085


The open debate about the causative agent of late postoperative stricture of the common bile duct, after the laparoscopic cholecystectomy (Siewert II injury) still exist. Thermal injury caused by monopolar cautery, or excessive manipulation with common bile duct during laparoscopic procedure were accused. The purpose of authors is to present the result of research which included two groups of 20 patients treated by laparoscopic cholecystectomy. With first group we used monopolar cautery as termic medical means, and other group we treated by using harmonic ultrasonic knife as non-termic medical means. Post surgical laboratories results which concern to functional liver damage such are: ALT,AST,BILIRUBIN,AP,PCR,HOMOGLOBIN and WBC were compared. Pathohistological analyses of extracted gallbladder walls were done by using light microscope. Author’s conclusion was that using of monopolar cautery, which produces high level of termic energy is related to functional liver injury, which can be proved by higher serum levels of AST and ALT, and massive coagulative necrosis of all pathohistological layers of the gallbladder walls. On the other hand, postoperative levels of AST and ALT in group of patients treated by ultrasonic knife (smaller termic-energy products) were significantly lower. Besides that, coagulation necrosis affected only mucosis and submucosis, but not the external fibromuscular layer. According to this results our conclusion is: Using of monopolar cautery may cause electrolycutaneous burns of common bile duct - main structure near gallbladder, which is possible progress to stricture.

Complication of Surgery–PF086

BILE DUCT INJURIES DURING LAPAROSCOPIC CHOLECYSTECTOMY - SINGLE SURGEON’S EXPERIENCE IN 4800 CASES. Kuldeep Singh Kanda, M.S., Santokh Singh, Navneet Narula, M.D. Ludhiana Laparoscopic Surgical Centre, Ludhiana, Punjab, India.

Laparoscopic cholecystectomy (LC) is associated with higher incidence of bile duct injury (BDI) than conventional cholecystectomy (1% vs. 0.2%). In spite of knowing before hand all the possible mechanisms, surgeons commit BDI inadvertently. Our aim was to know how the BDI occurs and to demonstrate a new surgical technique in order to reduce BDI during LC.

From January 1992 to July 2001, 4800 patients underwent LC. The operating surgeon and the assisting team remained the same. 340 cases of acute/chronic empyema, 576 cases of acute cholecystitis, 6 cases of Mirizzi’s Syndrome type I and II and another 36 cases of difficult dissection were encountered. Empyema GB was diagnosed as having frank pus on aspiration. Our policy has been to video record all difficult dissections.

11 cases (0.2%) of BDI and biliary leak occurred as follows: Right hepatic duct (1) (Type B), Right anterior sectoral hepatic duct (1) (Type C), Latent injury to CBD with patent biliary system (Type D) (1), Bile leak age with no demonstrable cause (3), Type A injuries (5). Only 1 BDI occurred in 1st year and the remaining were in the 4th and 6th year. All ductal injuries were recognised during surgery and were managed by Roux-en-Y repair with T-tube and endoscopic stenting. Dissection in the callos’ triangle was carried out with peanut gauze which facilitates delineation of the anatomy and avoids injury to the vital structures. Overall conversion rate was < 1% (42 cases) and 2.1% in difficult LC. In conclusion, adequate knowledge of variants of the biliary anatomy, meticulous surgical dissection and team work are the key factors to reduce the incidence of BDI rather than only a learning curve in laparoscopy.

Complication of Surgery–PF087

BILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY. Taizo Kimura, M.D., Kenji Suzuki, M.D., Yasuhiro Umebara, M.D., Akihiro Kobayashi, M.D., Department of Surgery, Fujinomiya City General Hospital, and First Department of Surgery, Hamamatsu University School of Medicine.

It has been suggested that bile leakage is more common after laparoscopic cholecystectomy than after open surgery. The aim of this study was to review our experience of this complication with regard to its incidence and management. From July 1990 to March 2001, 1,284 laparoscopic cholecystectomies were performed at our institutions. Drainage of the gallbladder bed was done routinely and bile leakage was seen in 22 patients (1.7%). Twenty-one of these patients showed bile in the drain within 24 hours after operation, but bile leakage stopped spontaneously within 3 days in 17 patients. We suspected that cutting of Luschka’s duct or incomplete closure of the cystic duct was the cause of this leakage. In the remaining 4 patients, bile leakage continued, so ERC and/or fistulography were performed. These examinations revealed that two patients had cystic duct leakage, while the other two patients, who had severe cholecystitis preoperatively, showed posterior bile duct dissection. The two patients with cystic duct leakage were successfully treated by using an ENBD tube. One of the two patients with posterior bile duct dissection needed open surgical repair (posterior bile duct - jejunostomy), but the other patient showed spontaneous resolution. One of the 22 patients was discharged from our hospital uneventfully, but presented 7 days after operation with fever and a subphrenic biloma. ERC showed a wide perforation of the hepatic duct, probably caused by an electrical burn during the operation. Hepatic duct - jejunostomy was performed by laparotomy. Our experience indicates that bile leakage is fairly frequent after laparoscopic cholecystectomy, so the routine placement of a gallbladder bed drain is recommended. Spontaneous resolution of bile leakage often occurs, but when leakage continues more than 3 days, ERC and/or fistulography should be done to identify the source and to allow proper management.

Complication of Surgery–PF088

ASSESSMENT OF LAPAROSCOPIC CHOLECYSTECTOMY FOR SEVERE ACUTE CHOLECYSTITIS REQUIRING TREATMENT BY PTGBD. Takashi Numazawa MD PhD, Yoshinori Azumi MD, Hirohito Yusa MD PhD, Akihito Ito MD PhD, Tatsushi Naganuma MD PhD and Kenji Fujimoto MD PhD Department of Surgery, Saiseikai Watsusaka General Hospital.

In recent years laparoscopic cholecystectomy(LC) has been actively applied to the treatment of acute cholecystitis(AC), but in reality the procedure has often been converted to laparotomy because of severe inflammation. In our department we analysed the blood flow in cystic wall arteries by Doppler ultrasonography(US) in AC in 1998-99 (early period) and showed that Vmax is useful for the evaluation of inflammation. In addition, we initiated a prospective study of LC on all gallbladder stones in 2000 (late period), and we report our finding here. [Subjects and Methods] PTGBD has been carried out in 26 of the 45 cases of AC among the 206 cases of LC encountered in our department since 1998. We assessed: 1. inflammation findings before PTGBD, 2. interval between PTGBD and surgery, 3. change in blood flow (Vmax) after PTGBD, 4. operation time, 5. blood loss, 6. complications, and 7. conversion to laparotomy. [Results] In the study in the late period PTGBD was performed when DU yielded a Vmax value of 30 or more and we waited until it decreased to below 20, and when the inflammation was extremely severe and the Vmax hardly decreased despite PTGBD, an ENBD was inserted before surgery. [Result][1] Significant differences were detected in the both period. The interval was 17.9 days in the early period, and 8.4 days in the late period. Vmax before PTGBD was not significantly different, but after PTGBD it was higher in the late period than in the early period. [4] Operation time was slightly longer in the late period. [5] There were no significant difference in the blood loss. [6] Bile leakage from the site of insertion of the PTGBD was observed in 1 case in the late period. The operation was converted to laparotomy in 4 of the 14 cases in the early period, but there were no conversion in the late period. [Conclusion][1] Deciding on treatment policy based on Vmax was useful even as a prospective study. [2] Preoperative ENBD insertion made it possible to easily perform intraoperative cholangiography at any time without cannulation, which leads the reduction of the risk of accidentally cutting the bile duct.
Complication of Surgery-PF089

DUCT-TO-DUCT ANASTOMOSIS AFTER TRANSECTION OF THE RIGHT HEPATIC DUCT DURING LAPAROSCOPIC CHOLECYSTECTOMY — SIX YEARS FOLLOW-UP — Toshiomi Kusano, M.D., Ph.D., Naoji Hanashiro, M.D., Tsutomu Isa, M.D., Ph.D., Yoshihiro Muto, M.D., Ph.D., First Department of Surgery, University of the Ryukyus, Okinawa, Japan.

We experienced a case presenting a curious change on serial CT findings after the surgical repair for bile duct injury. A 28-year-old woman who underwent laparoscopic cholecystectomy for gallbladder polyp developed continuous bile leak on the second postoperative day. Endoscopic retrograde cholangiography revealed an obstruction at the right hepatic duct. We performed surgical repair on the eighth postoperative day. The right hepatic duct was transected sharply and clipped. Because bilateral tip of the transected duct wall showed no heat injury by an electrocautery, a stented duct-to-duct hepaticohepaticostomy with retrograde transepatic tube was done. The stent tube was left there for 10 months. Follow-up cholangiography demonstrated slightly stenosis of the anastomosed site but abdominal CT scan showed no dilatation of intrahepatic bile ducts just before removal of the tube. However, dynamic CT scan with intravenous contrast medium revealed that the prophylactic measures should be taken especially in patients with hypercoagulability in patients undergoing LC. We suggest antithrombin III levels of prothrombin fragments 1+2, tissue plasminogen activator (t-PA), plasminogen activator inhibitor 1 activity (PAI-1), D-Dimer, interleukin (6L-6), PT, aPTT and antithrombin III (AT III) were measured before, during and after LC.

In our work we present the results that show the increase in hypercoagulability in patients undergoing LC. We suggest that the prophylactic measures should be taken especially in patients with higher risk of developing DVT.

Complication of Surgery-PF090

COAGULATION DISORDERS IN THE PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY, D. Milic, V. Pejic, Surgical Clinic, Clinical Center Niš, Yugoslavia

Patients who undergo laparoscopic cholecystectomy (LC) are operated under general anesthesia, in a reverse Trendelenburg position, with 12-15 mm Hg pneumoperitoneum. All of these factors induce venous stasis of the legs, which may lead to postoperative deep vein thrombosis (DVT) and pulmonary embolism (PE). The aim of this study was to assess the degree of hypercoagulability and the presence of coagulation disorders in 40 patients in whom LC was performed at surgical clinic Clinical Center Niš during the period from January 1999 to December 1999. Levels of prothrombin fragments 1+2 (F1+2), tissue plasminogen activator (t-PA), plasminogen activator inhibitor 1 activity (PAI-1), D-Dimer, interleukin (6L-6), PT, aPTT and antithrombin III (AT III) were measured before, during and after LC.

In our work we present the results that show the increase in hypercoagulability in patients undergoing LC. We suggest that the prophylactic measures should be taken especially in patients with higher risk of developing DVT.

Complication of Surgery-PF091

RECURRENT GALLBLADDER CARCINOMA DEVELOPED AT THE PORT-SITE BUT NOT IN THE LAPAROTOMY WOUND AFTER LAPAROSCOPY WAS CONVERTED TO OPEN SURGERY: A CASE REPORT Kazuyuki Okada, M.D., Hiroshi Yano, M.D., Takashi Iwazawa, M.D., Shigeru Okimoto, M.D., Takushi Matsuda, M.D., Department of Surgery and Pathology, NTT West Osaka Hospital, Osaka, Japan.

Laparoscopic procedure was decided for a 79-year-old Japanese woman with cholelithiasis. The videolaparoscope was introduced through a 10-mm laparoscopic trocar placed in a periumbilical incision while pneumoperitoneum was maintained. Laparoscopy was converted to open surgery because of the significant adherence with gallbladder, duodenum and peritoneum. Open laparoscopy technique and partial duodenectomy were performed through the mid-upper abdominal wound. Histopathology of gallbladder showed a moderately differentiated tubular adenocarcinoma. Ten months later, she re-presented with a nodule at the periumbilical port site. Surgical treatment was decided for this patient by the diagnosis of port-site recurrence of gallbladder carcinoma. The tumor was localized in the subcutaneous tissue and muscle layer, adjacent to the scar of the periumbilical port site wound. Pathological diagnosis of the tumor was metastatic adenocarcinoma from gallbladder carcinoma. The recurrence could not be detected in the open laparotomy wound. Numerous theories and research studies have been proposed and performed in an effort to define the rate, mechnism and the impact of this phenomenon. A mechanism is pulling the trocar out and allowing a contaminated instrument laden with tumor cells to pass unprotected through the abdominal wall. Authors did not use the instruments in the laparoscopic procedure, but performed only a laparoscopic inspection before conversion to open surgery. Our report indicates that the recurrences of carcinoma will possibly occur at the port site rather than the laparotomy wound, even if the surgical procedure would be carefully performed such as conversion to open surgery or no-touch isolation technique. Irrigation of the peritoneal cavity with saline may be lessen the likelihood of implantation. We tried irrigation of the peritoneal cavity using saline 1 hour and 4 hours later at the port-site but not in the laparotomy wound despite of conversion to open surgery. Its pathogenesis and natural history are still unclear.

Complication of Surgery-PF092

PORTAL VEIN THROMBOSIS: A CATASTROPHIC COMPLICATION OF LAPAROSCOPIC SPLENECTOMY Michelle M Olson, MD, Patrick B Ilada, MD, Keith N Apeigren, MD Department of Surgery, Michigan State University, East Lansing, MI

Portal vein thrombosis (PVT) is a recognized complication of hepatic disease and is also a poenentially lethal complication of splenectomy. Most authors report a low incidence of this complication, approximately 1%. However, the true incidence may be greater because of difficulty making the diagnosis. A 19 year-old female presented with a two-year history of idiopathic thrombocytopenic purpura. Because she had become refractory to medical therapy she underwent laparoscopic splenectomy. She was discharged on post-operative day 2 after an uncomplicated procedure. She did well complaining only of mild backache until post-operative day 21 when she presented with nausea, vomiting, and leukocytosis. Computed tomography (CT) showed PVT and superior mesenteric vein thrombosis. Despite heparin and fluid administration, her exam worsened and her WBC rose. At laparotomy she had diffuse small bowel edema and congestion. At a second-look 24 hours later nearly all her jejunum and ileum were necrotic. After three procedures, she was left with 45 cm of proximal and 10 cm of distal small bowel. Bowel continuity was restored eight weeks later; she continues to receive supplemental parenteral nutrition. Post-splenectomy PVT is most often seen following splenectomy for myeloproliferative disorders and almost never after trauma. The large splenic vein stump and the hypercoagulable state in patients with splenomegaly are thought to be contributory. The presentation of PVT is vague without defining signs or symptoms. Color-flow Doppler and contrast-enhanced CT scans are the best methods for non-operative diagnosis of PVT. Aggressive thrombolyis via a transepatic catheter offers the best hope for clot lysis and maintenance of bowel viability. Even vague symptoms must be considered seriously following splenectomy for splenomegaly.
IMPACT OF GASLESS AND CO₂ PNEUMOPERITONEUM ON HEMODYNAMICS DURING LAPAROSCOPIC SURGERY: EXPERIMENTAL STUDY

E. Ortiz-Oshiro MD, PhD, L. Rabadán Ruiz MD, C. Hernández Pérez MD, JA De Diego MD, PhD, JA Fernández-Represa MD, PhD. Department of Surgery. Hospital Clínico San Carlos. Madrid. Spain.

Laparoscopic surgery is increasingly used to carry on advanced procedures, even in patients with compromised cardiovascular function. It is known that CO₂ pneumoperitoneum (CO₂PP) and increasing intraabdominal pressure (IAP) may have deleterious effects. Our aim was to investigate these effects by comparing CO₂PP approach to isopneumic approach.

Fifty pigs were anesthetized, intubated and placed on total mechanical ventilation. Jugular venous catheters, pulmonary artery catheters, arterial catheters and bladder catheters were inserted. Animals were divided into five groups: C (control group, only general anesthesia), PP8 (CO₂PP at IAP 8 mmHg), PP12 (CO₂PP at 12 mmHg), PP16 (CO₂PP at 16 mmHg) and AWR (abdominal wall retraction with a mechanical device). Except for C group, all of them underwent advanced laparoscopic procedures (cholecystectomy, hiatal hernia repair and colon resection). Baseline, sequential and final data were obtained. Significance of any changes were tested using ANOVA-Bonferroni test.

Groups were found to be homogeneous in terms of weight and height. No significant differences were shown among groups in the following parameters: body temperature, heart rate, pulmonary artery pressure, urine output and cardiac output. Mean arterial pressure tended to increase along time (p<0,001) except for AWR group, which showed the lowest values and did not change along time (p>0,05). On the other hand, central venous pressure showed the highest values for PP16 group (p<0,05).

Using abdominal wall retraction through mechanical devices may contribute to extent the benefits of laparoscopic surgery to patients with compromised cardiovascular function.

DOES CO₂ PNEUMOPERITONEUM AFFECT MESENTERIC VASCULARIZATION DURING LAPAROSCOPIC SURGERY?

E. Ortiz-Oshiro MD, PhD, L. Rabadán Ruiz MD, C. Hernández Pérez MD, JA De Diego MD, PhD, JA Fernández-Represa MD, PhD. Department of Surgery. Hospital Clínico San Carlos. Madrid. Spain.

Laparoscopic surgery is increasingly used to carry on advanced procedures, even in patients with compromised cardiovascular function. CO₂ pneumoperitoneum (CO₂PP) and increased intraabdominal pressure (IAP) have been related to postoperative mesenteric ischemia appearance in some reports. Our aim was to investigate this complication through evaluation of tonometric changes in CO₂PP approach versus isopneumic approach.

Fifty pigs were anesthetized, intubated and placed on total mechanical ventilation. Tonometric orogastric catheters were inserted. Animals were divided into five groups: C (control group, only general anesthesia), PP8 (CO₂PP at IAP 8 mmHg), PP12 (CO₂PP at 12 mmHg), PP16 (CO₂PP at 16 mmHg) and AWR (abdominal wall retraction with a mechanical device). Except for C group, all of them underwent advanced laparoscopic procedures (cholecystectomy, hiatal hernia repair and colon resection). Baseline, sequential and final data were obtained. Significance of any changes were tested using ANOVA-Bonferroni test.

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Using abdominal wall retraction through mechanical devices may contribute to extent the benefits of laparoscopic surgery to patients with compromised cardiovascular function.
PERCUTANEOUS TRANSHEPATIC BALLOON DILATATION IS AN EFFECTIVE TREATMENT OF COMMON BILE DUCT STRICURE FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY: REPORT OF A CASE Hiroshi Yano, M.D.; Atsushi Yasue, M.D.; Masaki Matsushita, M.D.; Takushi Monden, M.D., Department of Surgery and Radiology, NTT West Osaka Hospital, Osaka, Japan

Laparoscopic cholecystectomy has become the treatment of first choice for many patients with symptomatic cholelithiasis, because of its advantages which include limited postoperative pain, shorter hospitalization, earlier resumption of activity, and improved cosmetic aspects. The most serious complication of this procedure is bile duct injury including leakage, transection, and stricture, which usually requires a laparotomy. We report a case of common bile duct stricture following laparoscopic cholecystectomy, for which percutaneous transhepatic balloon dilatation was effective. A 50-year-old man was admitted to our department with right hypochondralgia. Computed tomography and ultrasonography showed multiple stones in the gallbladder. Drip infusion cholangiography revealed neither stone in the common bile duct nor biliary anomaly. Preoperative blood examinations were unremarkable. He underwent a laparoscopic cholecystectomy with a diagnosis of cholecystolithiasis. An intraoperative cystic duct cholangiography was not performed. Intraoperative course was not eventful. Total bilirubin level of 6.7 mg/dl in the serum gradually increased from the first postoperative day. The stricture, caused by clipping of common bile duct, was revealed by magnetic resonance cholangiography and percutaneous transhepatic cholangiography on the 11th postoperative day. Total bilirubin level in the serum gradually decreased after percutaneous transhepatic biliary drainage was carried out. Percutaneous transhepatic balloon dilatation for the stricture site was performed three times at the pressure of 6.5 atm. Percutaneous transhepatic cholangiography showed no stricture of common bile duct after percutaneous transhepatic balloon dilatation. The patient was discharged on the 56th postoperative day and 3 years following surgery, he remains well with no signs of recurrence of common bile duct stricture. Percutaneous transhepatic balloon dilatation was a less invasive and effective treatment of common bile duct stricture following laparoscopic cholecystectomy.

COMPARISON BETWEEN LAPAROSCOPIC SPLENECTOMY AND HAND ASSISTED SPLENECTOMY. Abdul Aziz Al saigh MD; Abdul Ali Otiaby MD; Abdullah Al Dohayan, MD; Ahmed Alotaby MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Splenectomy for haematological disease is common procedure in King Khalid University Hospital, Riyadh, Saudi Arabia. The procedures are done for 22 patients, in 2 equal groups. In the laparoscopic group 5 trocars were used to performed laparoscopic splenectomy, on the other group 2 trocars were used. The time of the procedure is shorter in the hand assisted group. Hospital stay, pain management, and postoperative complications have simillary results in both groups. Hand assisted laparoscopic splenectomy is more useful in big spleen. While laparoscopic splenectomy more suitable for small spleen.

A 6-YEAR MULTI-INSTITUTIONAL REVIEW OF SURGERY IN PREGNANCY: LAPAROSCOPY HAS NOT BECOME THE STANDARD OF CARE FOR APPENDICITIS. Aviy Ben-Meir, M.D., Bruce D. Schirmer, M.D., and Raymond P. Onders, M.D., Department of Surgery, University of Virginia, Charlottesville, Virginia and Department of Surgery, Case Western Reserve University, Cleveland, Ohio.

INTRODUCTION This retrospective chart review of 51,000 deliveries in the era of laparoscopy was aimed at discerning whether laparoscopy had become the treatment of choice for abdominal pain thought to be secondary to appendicitis during pregnancy.

METHODS AND PROCEDURES In a retrospective chart review of the 6 years from 11/1994 to 12/2000, there were 51,000 deliveries at two major teaching hospitals. The charts of all those patients having surgery at these two hospitals were reviewed.

RESULTS During that time period there were 37 appendectomies performed in this patient population. 6 of the 37 appendectomies were started laparoscopically. In the remaining 3, one patient required ileocolicectomy for an initial presentation of Crohn’s and two patients were converted due to technical reasons. One patient had a spontaneous abortion one week postoperatively.

CONCLUSION Laparoscopy has not become the modality of choice to evaluate pregnant patients with presumptive appendicitis at two major teaching centers.
**THE SURGEON ON CALL IS A STRONG DETERMINANT OF USING A LAPAROSCOPIC APPROACH FOR APPENDECTOMY: Patrick N. Cervini, M.D., Lloyd C. Smith M.D., David R. Urbach M.D., Department of Surgery, University Health Network, Toronto, Ontario, Canada**

**Introduction:** Although many studies have compared laparoscopic with open appendectomy, none have specifically examined which factors determine whether a laparoscopic or open approach is used for appendectomy. This study attempts to shed some light on this topic.

**Methods:** We conducted a retrospective chart review of 140 patients who underwent a laparoscopic (N=60) or open (N=80) appendectomy between January 2000 and April 2001 at our hospital. Medical records were reviewed, and the data were analyzed using chi-square analysis, the Wilcoxon rank sum test, and multivariate logistic regression. We studied age, time from emergency assessment to surgery, sex, type of surgeon on call, leukocyte count, pathology, previous emergency visits, previous pain, and diagnostic imaging results, to determine if there was any association between any of these factors and the use of a laparoscopic approach.

**Results:** Of the factors studied, only the type of surgeon on call was strongly correlated with a laparoscopic approach. Of the appendectomies performed by laparoscopic surgeons (surgeons who use laparoscopy for operations other than appendectomies and cholecystectomies) 91.7% (N=55) were laparoscopic and 6.3% (N=5) were open (multivariate odds ratio 136; 95 percent confidence interval, 39 to 475; P<0.001). None of the other variables considered had any correlation with the involvement of the surgeon on call when a patient is admitted is the most important factor in determining whether a patient will receive a laparoscopic or open appendectomy. Possible explanations include differences in surgeon training and ability, strong preferences among surgeons for a particular approach, or the perception that there is a paucity of convincing evidence that a laparoscopic appendectomy is superior to an open procedure.

**Conclusions:** The preference of the surgeon on call when a patient is admitted is the most important factor in determining whether a patient will receive a laparoscopic or open appendectomy. Possible explanations include differences in surgeon training and ability, strong preferences among surgeons for a particular approach, or the perception that there is a paucity of convincing evidence that a laparoscopic appendectomy is superior to an open procedure.

**THE INVOLVEMENT OF PERCEPTUAL MOTOR FACTORS IN THE PERFORMANCE OF MINIMALLY INVASIVE SURGICAL (MIS) SKILLS.**

**Perception of basic perceptual motor (PM) factors and clinical judgment in the performance of MIS skills.** Expert laparoscopic surgeons judged the degree to which PM factors were involved in the performance of 18 MIS skills. The ultimate purpose was to initiate the development of a structural model of factors that underlie the learning of MIS skills.

Eighteen laparoscopic skills were identified by a group of expert MIS surgeons. Examples of these skills include: intra-corporeal suturing, adhesiolysis, and deep vein cannulation. Five important perceptual motor factors were also identified: 1) Dexterity, 2) Non-Intuitive Movement, 3) Serial/Simultaneous Complexity, 4) Spatial Orientation, and 5) Hand-Eye Coordination. Clinical Judgment was also included as a factor. A questionnaire was sent to 48 expert MIS surgeons who were asked to rate the involvement of each of the 5 PM factors and Clinical Judgment on the performance of each of the 18 laparoscopic skills. 26 of the surgeons (54%) returned the form.

The reliabilities (coefficient alpha) of the expert judges’ ratings of the involvement of the 5 perceptual motor and clinical judgment factors were high, ranging from .93 to .95. Repeated measures analyses of variance and PLSD post hoc tests indicated that 5 of PM factors and clinical judgment could be divided into 4 levels of involvement in the MIS skills – ranging from little involvement to major involvement. In the case of the Serial/Simultaneous Complexity, there were 5 levels of involvement.

We conclude that expert judges can reliably estimate the involvement of perceptual motor factors and clinical judgment in the performance of MIS skills, and that there are measurable differences in the degree to which the perceptual motor factors and clinical judgment are involved in the performance of the various MIS skills. Each MIS skill can be represented by a profile of basic perceptual motor factors.
THE IMPACT OF MINIMALLY INvasive SURGERY COURSES ON SURGEONS’ PRACTICE
Mohey R. El-Banna, M.D.*; Jon C. Gould, M.D.; Brad J. Needleman, M.D.; Scott W. Melvin, M.D.Center for Minimally Invasive Surgery, Ohio State University Medical Center, Columbus, Ohio

Introduction: Short courses have been arranged by several centers to teach new technically demanding laparoscopic procedures. The effect of these courses on the practice of participating surgeons has not been well described. The aim of this study was to evaluate the effect of advanced minimally invasive surgery (MIS) courses on the participating surgeons’ practice.

Methods and Procedures: All surgeons who participated in courses on MIS bariatric surgery at our institution since August 1999 were surveyed. A questionnaire was sent to each of them to assess their skills, age and practice prior to and after attending the course.

Results: Twenty-five responded. Thirteen considered their laparoscopic expertise intermediate (52%) while ten (40%) considered it extensive, and two (8%) defined it as limited. Nine of them were 30-40 years old (36%), 10 were 40-50 (40%), 6 were above 50 (24%). Before attending the course none had performed MIS bariatric surgery, while 16 (64%) had performed open bariatric surgery.

Since participating in the course only seven surgeons (40%) have applied the new techniques. Five of them (50%) had extensive and 5 (50%) had intermediate previous laparoscopic experience. Five (50%) were proctored in the first few cases and five (50%) attended other courses. Nine of them had performed open bariatric surgery before the course (90%) and nine are less than 50 years old (90%).

Conclusion: After attending a MIS course the practice of 60% of surgeons did not change. Multiple courses, age younger than 50, before the course (90%) and nine are less than 50 years old (90%).

GASTROINTESTINAL SYMPTOMS ARE MORE INTENSE IN MORBIDLY OBESIVE PATIENTS
Ronald H. Clements, MD; Allen Foster MD*, William O. Richards MD*, James McDowell MD*, Henry L. Laws MD., Carraway Methodist Medical Center*, The Norwood Clinic, Inc. and Vanderbilt University Medical Center

Introduction: Laparoscopic Roux-en-Y gastric bypass is an effective treatment for morbid obesity. However, little information is available on gastrointestinal (GI) symptomatology in this population. This study was done to compare GI symptoms in morbidly obese patients versus normal subjects.

Methods: A nineteen-question GI symptom questionnaire was administered prospectively to each patient who was scheduled to undergo laparoscopic Roux-en-Y gastric bypass for morbid obesity. The questions were then grouped into six clusters of symptoms. The questionnaire had been previously validated in a control population.

Results: 43 patients (40 Female, 3 Male) age 37.3 +/- 8.6 with BMI 47.8 +/- 4.9 completed the questionnaire.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Morbidly Obese (n=43)</th>
<th>Normal (n=20)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain</td>
<td>23.5+1.8 vs 12.1+11.4</td>
<td>p = .0002</td>
<td></td>
</tr>
<tr>
<td>Irritable bowel</td>
<td>23.0+14.8 vs 15.6+13.3</td>
<td>p = .0225</td>
<td></td>
</tr>
<tr>
<td>GERD</td>
<td>83.0+23.9 vs 22.3+16.1</td>
<td>p = .0001</td>
<td></td>
</tr>
<tr>
<td>Reflux</td>
<td>39.9+19.0 vs 11.8+13.4</td>
<td>p = .0001</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>50.6+28.9 vs 32.9+26.8</td>
<td>p = .0062</td>
<td></td>
</tr>
<tr>
<td>Dysphagia</td>
<td>10.9+15.6 vs 7.2+10.6</td>
<td>p = .2159</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions: Morbidly obese patients have more intense GI symptoms than normal subjects. Dysphagia is equivalent to normal subjects. This data may be important in counseling patients regarding postoperative expectations.

LIVE STREAMING VIDEO FOR SURGICAL EDUCATION: A LABORATORY MODEL
Alex Gandas, MD; Katherine McIntire, MD; Guillermo Palli and Adrian Park, MD, University of Kentucky Chandler Medical Center

At the University of Kentucky, we have created an interactive, virtual classroom with the potential to attract a global audience. Using streaming video technology and the Internet, we developed and tested a web-cast model that will allow institutions to broadcast live and pre-recorded surgeries, conferences and courses in real-time. The model incorporates a web-based user interface that makes access to educational material as simple as a mouse click and allows surgeons to participate in broadcast events via an embedded e-mail/chat module. A University of Kentucky server equipped with off-the-shelf streaming-enabled software, standard hardware and a standard operating system successfully tested a live broadcasting session of a pre-recorded laparoscopic paraesophageal hernia repair to domestic and international clients. Three client computers (two connected to the Internet and a third connected to the University of Kentucky intranet) requested and displayed the surgical film using seven common network connection configurations. Significantly, no difference in image resolution was detected using a bandwidth larger than a 128 kilobyte per second (kbps). Clients easily identified all anatomical structures in full color motion and clearly followed all steps and stages of the surgical procedure. Although a 15 second lag time was encountered (time from data request to data display), once initiated, the film streamed continuously from beginning to end at a mean 14.4 frames per second using an average bandwidth bitrate of 32.7 kbps. While viewing the surgery, clients asked questions/made comments using the e-mail/chat module. Our web-cast model offers a simple, convenient and economical way for institutions to supplement under graduate and graduate surgical education and to offer CME credits. We foresee that physicians will soon be able to wirelessly access web-cast material built on streaming technology using handheld personal computers.
LAPAROSCOPIC CHOLECYSTECTOMY - A COMPARISON OF RESULTS IN DEVELOPING AND DEVELOPED COUNTRIES. Kuldip Singh, M.S., and Navneet Narula M.D., Ludhiana Laparoscopic Surgery Centre, Ludhiana, Punjab (INDIA)

Laparoscopic Cholecystectomy (LC) was introduced during 1989 in developed countries and 1991-92 in India. This technology and the advancements thereafter were adopted quite late in the developing countries. Moreover, better facilities in every respect existed in developed countries. During these years, the authors have observed that the laparoscopic surgical centres from developing countries with minimum resources could produce almost similar and even better results as compared to the best in the developed countries. The aim was to identify the possible factors responsible for this.

From February 1992 to July 2001, 4800 patients underwent LC in one centre and by one surgeon. There were 460 male and 4340 female patients. The age varied from 7 to 85 years. Being a rural centre we encountered more difficult cases as: 576 cases of acute cholecystitis (> 72 hrs) (12%), 340 cases (7%) of empyema gall bladder. The overall conversion rate to open surgery was <1% and in difficult LC it was 2.1% compared to conversion rate varying from 1% to 35% in world literature. Four patients (0.1%) had bile duct injury and 7 patients with biliary leak whereas reports from large series indicate a higher incidence of 0.1 to 1.0% or even more. Patients with BDI were managed with Roux-en-Y, T-tube and endoscopic stenting. 21 patients had wound infections and 1 patient died because of cardiac problem. In conclusion, we feel that surgeon's adequate experience in open surgery is necessary to produce such results.

RESULTS IN DEVELOPING AND DEVELOPED COUNTRIES. Kuldip Singh, M.S.

CONCLUSION. We felt it is important to determine the learning curve for laparoscopic adrenalectomy (L.A.), community surgeon’s utilization of L.A., and if the indications had changed with laparoscopy.

METHODS. A chart review was performed for all L.A.s from 1/1/1994 through 6/30/2001. The operating time (OR time), estimated blood loss (EBL), frequency of conversion and complications were recorded. Bilateral gland removal by flank approach was counted as two cases with OR time & EBL halved. Surgeons in Portland, Oregon were questioned regarding L.A. Indications were reviewed for all cases since 1/1/1990.

RESULTS. 79 L.A.s were performed on 61 patients; 18 of these had bilateral gland removal. 2 cases were converted, and 2 were via posterior approach; these 4 were excluded leaving 57 for analysis. Average OR time was 161 min., average EBL was 84ml. There were 6 complications & 2 conversions. Comparing the first 20 patients (27 glands) to the last 20 patients (26 glands), OR times were 154 min. vs. 159 min. (p<.05). EBL was 102 ml. vs. 47 ml. (p<.05). There were 4 vs. 2 complications (p<.05) and 1 conversion each. 46 surgeons responded (56%). Residents completed about 2 L.A.s during their training (avg. 1.6). Community surgeons performed 6 procedures during their training (avg. 0.14). Of 46 residents, 10 (22%) had actually performed L.A.; 13 had post residency training. The major barrier to learning was ‘too few cases during residency’. Open technique was used more often for hormonal ablation and malignancy; benign disease was more often elected laparoscopically.

Conclusion: Operative time does not significantly fall with experience, however EBL and complications do. Few if any residents acquire enough experience during their training to perform L.A. Additional training is necessary. The procedure is performed laparoscopically more often for benign diseases, and infrequently for malignancy and hormonal ablation.

Analysis/Outcomes-PF110

ANALYSIS OF PATIENT SATISFACTION WITH LAPAROSCOPIC FUNDOPICATION. Lakhiani, M.D., Parul Bhatt, William Richards, M.D., Hugh Houston, M.D., Kenneth Sharp, M.D., Michael Holzman, M.D., Vanderbilt University Medical Center, Nashville, TN

Introduction: Quality of life (SF12), GERD specific quality of life (QOLRAD) and retrospective pre-operative data was assessed on all patients who underwent fundoplication at our institution.

Methods: Validated questionnaires (SF12, QOLRAD) and queries regarding current medication use and long term satisfaction were mailed to all patients. Chi squared and ANOVA analyses were performed where appropriate.

Results: 221 patients (23 redo) underwent fundoplication between November 1992 and July 2003. Completed follow-up surveys were returned from 130 patients (age 50.7±15.2; 56% female, 43% male) Mean follow up 32.6±26 months (range 0.8-98). 112 of 130 were primary fundoplications (76% classic GERD symptoms, 21% extraesophageal symptoms). 99 underwent Nissen, 13 Toupet fundoplication. Long term satisfaction was 87% (100.112)

<table>
<thead>
<tr>
<th>Satisfied</th>
<th>Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESP 13±13</td>
<td>9±5</td>
</tr>
<tr>
<td>% Peristalsis 95±13</td>
<td>95±15</td>
</tr>
<tr>
<td>DeMeester Score 53±27</td>
<td>128±50</td>
</tr>
<tr>
<td>SF12 Physical 33±13</td>
<td>29±12</td>
</tr>
<tr>
<td>SF12 Mental 46±12</td>
<td>39±16</td>
</tr>
<tr>
<td>QOLRAD 6±1</td>
<td>5±1</td>
</tr>
<tr>
<td>Hospital Stay 7.1±1</td>
<td>8.5±1</td>
</tr>
<tr>
<td>Recurrent meds 24%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Conclusion: With this data, we were unable to identify preoperative indicators of patient satisfaction. SF12 & QOLRAD showed no statistical change. Further evaluation of dissatisfied patients is necessary to determine the etiology. The vast majority of patients undergoing anti-reflux surgery are satisfied with their results.

Education/Outcomes-PF112

THE VIRTUAL CHAPERONE: ACCEPTABILITY TO PATIENTS. Ara Darzi MD, Jack Edwards, Sean Mackay MRCP, Uudaj Chocranowski A BSc, and Roger Kneebone MBChB, Faculty of Medicine, Imperial College of Science Technology and Medicine, London, UK. *Genesis Consulting, Billingshurst, West Sussex, UK

INTRODUCTION. The use of chaperones to reassure both patient and physician is increasingly common. However, the practice is inefficient and offers little effective protection. The Virtual Chaperone is a data recording and storage device designed for use in one-to-one consultations, comprising a portable audio/video system that saves an encrypted dataset on to DVD in real-time. It is envisaged that the device will provide an accurate and permanent record of all consultations, including the discussion of treatment options and consent, as well as physical examinations and office procedures. This study explores the attitudes of patients to this new approach in quality assurance.

METHODS AND PROCEDURES. Understanding patients’ concerns and expectations is key at this stage of development. We therefore chose a qualitative approach, using in-depth interviews with a purposively selected patient sample from both primary and secondary care. A 4 patient pilot was followed by 28 face-to-face interviews (16 primary care, 12 hospital outpatients). An experienced qualitative researcher (JC) explored responses to the Virtual Chaperone concept, using semi-structured interviews. The pilot phase comprised telephone interviews, and was used to generate the semi-structured interview. All interviews were recorded and subsequently analysed.

RESULTS. 24 of 28 patients felt that the use of such a device would be acceptable to them, especially in certain circumstances. 9 of the 28 experienced at least some anxiety about undergoing consultation (independent of the research interview), and some of these felt that the implementation of a virtual chaperone system could go some way to relieving this anxiety. Key issues were identified relating to the explanation of the system to patients.

CONCLUSION. This study suggests that the virtual chaperone data recorder is acceptable to a range of patients in the primary care and outpatient settings, and that it may improve the patients’ experience in these settings. Work is underway to explore its acceptability to physicians.
EMERGENCY DEPARTMENT VISITS BY DEMENTED PATIENTS WITH MALFUNCTIONING FEEDING TUBES

Steve Odom MD, James E. Barone MD, Sal Documento, Sherman M. Bull MD

Objective: To evaluate the incidence and resource utilization related to feeding tube malfunction in demented patients visiting the emergency department (ED).

Background: Objective data indicate that the use of feeding tubes in demented patients may not be efficacious and can result in serious complications. To date, no study has investigated ED resource utilization in patients with dementia and malfunctioning feeding tubes.

Methods: A retrospective chart review of all demented patients with malfunctioning feeding tubes visiting the ED of our 300-bed community teaching hospital was conducted for the 21 month period from September, 1999 through May, 2001.

Results: Patients were transported by ambulance to and from the ED on 108 occasions (216 total trips). The most frequent complication was unintentional dislodgment (n=125). The average ED length of stay was 2.6 +/- 1.8 hours. All 138 patients were seen by an emergency physician with 99 surgical consults and 26 gastroenterology consults. X-rays were done on 43 occasions (31 tube contrast studies, 6 chest x-rays, 5 abdominal x-rays, 1 patient who had both chest and abdominal films). Total hospital charges not including physician fees were $86,234.48. Total ambulance charges were $57,664.00 (fees paid by Medicare for the ambulance service). The cost of physician time spent in evaluating and managing these patients cannot be quantified.

Conclusion: We have identified a previously unreported issue involving the tube feeding of demented patients. The expense of ED visits by demented patients with tube dislodgment or clogging was in excess of $135,000.00 for a 21 month period in our medium-sized hospital. The mean charge was just over $1000.00/visit. In 1993 throughout the United States, 106000 gastrostomies were performed in patients over the age of 65. If only 30% of these procedures were done on demented patients and the rate of tube malfunction is similar to ours, some 32,400 gastrosomies would have resulted in $32,400,000 worth of charges for ED visits.

A RURAL, COMMUNITY-BASED PROGRAM CAN TRAIN SURGICAL RESIDENTS IN ADVANCED LAPAROSCOPY

Frederick D. Reynolds, M.D., Leonidas Goudas, M.D., Randall S. Zuckerman, M.D., Michael Gold, M.D., Steven Heneghan, M.D., Department of Surgery. The Mary Imogene Bassett Hospital, Cooperstown, New York.

Introduction: Advanced laparoscopy requires mastery of complex surgical skills. A steep learning curve, lack of an adequate number of cases, and a shortage of experienced staff are reasons cited as barriers to the acquisition of these skills by surgical residents. We believe that advanced laparoscopy can be taught during residency without additional fellowship training.

Methods: Past surgical residents who completed training at our rural, community-based, 140 bed hospital from 1992 to 2000 were contacted by mailed surveys and a follow-up telephone interview. Advanced laparoscopy was defined as cases other than cholecystectomy, appendectomy and diagnostic laparoscopy. Four surgical attendings routinely perform advanced laparoscopy.

Results: Response rate to the survey was 93.3%. 15 of 18 graduates currently practice general surgery. 100% of these surgeons currently perform advanced laparoscopy. Laparoscopic herniorrhaphy, splenectomy, colectomy, Nissen fundoplication, and adrenalectomy were performed by 12 (85.7%), 10 (71.4%), 11 (78.6%), 13 (92.9%), and 9 (64.3%) surgeons respectively, though the number of cases/year varied widely. Eight (57.1%) surgeons reported confidence to perform advanced laparoscopy immediately following residency. All graduating chiefs from the last three years expressed this confidence. Three surgeons (21.4%) stated the need for additional training should laparoscopic colectomy become the standard of care. On average, for the past three academic years each of two chief residents graduated with 50 advanced laparoscopic cases.

Conclusions: We conclude that a small rural residency program can train residents to perform a broad range of advanced laparoscopic procedures. Practice patterns such as increased volumes of laparoscopic colectomy may improve a residency programs ability to teach advanced laparoscopic skills.

LAPAROSCOPY IN THE EARLY POST-LAPAROTOMY PERIOD

Danny Roig, M.D., Joseph Kuriatiski, M.D., Barak Bar-Zakai, M.D., Menahem Ben-Haim, M.D., Moshe Shabtai, M.D., Amram Ayaloni, M.D., Department of General Surgery and Transplantation, Sheba Medical Center, Tel Hashomer, Israel.

The use of laparoscopy in the scarred abdomen is now well established. However, recent laparotomy and the presence of a fresh abdominal wound usually preclude laparoscopic intervention. Thus, early post-laparotomy complications, which mandate surgical interventions, are usually treated by a second laparotomy.

We report our early experience with the use of laparoscopy for the treatment of post-operative complications, after open abdominal procedures.

Five patients are presented. The primary operations, the conditions mandating a second exploration, the laparoscopic procedure performed and the results are presented in the table.

<table>
<thead>
<tr>
<th>Primary operation</th>
<th>Acute condition</th>
<th>post-operative</th>
<th>Laparoscopic procedure</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtotal colectomy</td>
<td>Perforated duodenal ulcer</td>
<td>Omophentery</td>
<td>Recovery</td>
<td></td>
</tr>
<tr>
<td>Retropertitoneal lymph node dissection</td>
<td>Small bowel obstruction</td>
<td>Enterolysis</td>
<td>Recovery</td>
<td></td>
</tr>
<tr>
<td>Small bowel resection</td>
<td>Intra-abdominal abscess</td>
<td>Drainage of abscess</td>
<td>Mortality (8%)</td>
<td></td>
</tr>
<tr>
<td>Exploratory laparotomy for trauma</td>
<td>Small bowel obstruction by adhesions</td>
<td>Enterolysis</td>
<td>Recovery</td>
<td></td>
</tr>
<tr>
<td>Appendectomy</td>
<td>Small bowel obstruction by a misplaced stitch</td>
<td>Enterolysis</td>
<td>Recovery</td>
<td></td>
</tr>
</tbody>
</table>

We conclude that a recent laparotomy is not a contraindication for laparoscopic management of acute abdominal conditions. Post-laparotomy complications can be successfully treated by laparoscopy. Avoiding the re-opening of the abdominal wound and a second laparotomy may reduce the additional surgical trauma, and thus result in easier recovery.

IMPAIRED TRAINING IN OPEN BILIARY SURGERY IN THE LAPAROSCOPIC ERA

Quanhnham Pham, MD Lynn Wotiska MD, Navend Ahmed, MD, Vedanant Chari, MD, Raphael Chung, MD, Department of Surgery, Huron Hospital, Cleveland Clinic Health System, Cleveland, Ohio.

After more than a decade of widespread use of laparoscopic cholecystectomy, the impact on resident training in open biliary surgery can be analyzed quantitatively. Method: In this study we tracked the operative statistics for all biliary operations from 1994-2000, and performed regression analysis to establish trends and to calculate the rate of change. The statistics of 1988, before the birth of laparoscopic cholecystectomy, were used for control. Results (mean operations/graduate, performed over entire training):

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Cholecystectomy</td>
<td>54</td>
<td>35</td>
<td>15</td>
<td>9.5</td>
<td>9</td>
<td>9.5</td>
<td>9.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Lap Cholecystectomy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Open CBDE</td>
<td>4</td>
<td>7.5</td>
<td>6</td>
<td>2.7</td>
<td>9</td>
<td>9.5</td>
<td>9.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Lap CBDE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.4</td>
<td>0.9</td>
<td>0.9</td>
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</tr>
<tr>
<td>Cholecodochteric bypass</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Open Cholecystoscopy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.9</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Open Sphincteroplasty</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Total open biliary operations</td>
<td>70.4</td>
<td>47.2</td>
<td>22.6</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Total laparoscopic biliary op</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>42.4</td>
<td>94.9</td>
<td>94.9</td>
<td>94.9</td>
</tr>
</tbody>
</table>

Regression correlation coefficient: d<sub>c</sub> = 0.0001 for all d values

Conclusion: Since 1994, the resident’s experience in open biliary surgery, including CBDE and sphincteroplasty, shrinks in a steady and continuing decline. Today, graduates perform open biliary surgery only 32% as often as in 1988. Development of laparoscopic CBDE does not account for the decline of open biliary surgery, but loss of patients to therapeutic ERCP has to be assumed. As a result of diminished exposure, young surgeons are less likely to be skilled in open biliary surgery, especially bile duct surgery.

Remedial action, such as supplemental teaching using videos, models or virtual reality simulation, should be implemented.
THE EFFECT OF USING LAPAROSCOPIC INSTRUMENTS ON MUSCLE ACTIVATION PATTERNS DURING MINIMALLY INVASIVE SURGICAL TRAINING PROCEDURES

Nancy E. Quick, PT, MA, Jason C. Gillette, PhD, Robert Shapiro, PhD, Luis A. Adrales, M.D., and Adrian E. Park, M.D.
Department of Kinesiology & Health Promotion, Center for Biomedical Engineering, and Center for Minimally Invasive Surgery, University of Kentucky, Lexington, KY

Many surgeons experience pain and muscle fatigue during minimally invasive surgery (MIS). Possible correlations between movement associated with MIS and muscle fatigue were assessed using six electromyography (EMG) electrodes placed over the deltoid, trapezius, biceps, pronator teres (PT), flexor carpi ulnaris (FCU), and extensor digitorum superficialis (EDS) muscles on the dominant arm of five surgeons during three tasks. These tasks included a grasp/targeted release of a small object (T1), a simulated bowel inspection (T2), and a cable tying exercise (T3) using a MIS training box. The in-line finger looped instruments included a non-ratcheted handle with a single action blunt end effector (G1) and two models with ratcheted handles with dual action end effectors (G2, G3). Resting and max voluntary contraction EMG values for each muscle were used to determine percent of muscle activity during each trial. The muscle was deemed ‘on’ if it exceeded the resting EMG value by at least 10%. A multivariate ANOVA (p<.05) compared EMG relative time of activation (RAT) patterns to grasper configuration, task, and grasper/task interaction. The results demonstrated reduced RAT of the deltoid while using G3 as compared to G1 or G2. Use of G3 also resulted in a lower RAT of the deltoid and bicep during T3 and the deltoid and FCU during T2. RAT during T3 was greater in all muscle groups, except the deltoid, as compared to T2. Greater RAT of the biceps and EDS was noted during T3 compared to T1 while the EDS demonstrated higher RAT during T2 compared to T1. The most notable finding was that across instruments, the shoulder muscles were activated for a greater percentage of time as compared to the forearm muscles, which may account for the neck and shoulder pain reported by laparoscopists. These results indicate that grasper type, task, and especially grasper/task interaction can strongly influence muscle activation patterns, and thereby, play an important role in fatigue.

CONCLUSIONS FROM THE USE OF THE HARMONIC SCALPEL: A REVIEW

Prasad S Adusumilli* M.D., Jae-Hyung Chang+, Michael Leitman* M.D. * Department of Surgery, Lenox Hill Hospital, New York, + Universitätsklinikum Frankfurt, Frankfurt, Germany.

Despite the expanding surgical application of harmonic scalpel (HS) and hook, there are no reports in surgical literature of its associated complications.

Methods: The web-based database from United States food and drug administration (FDA) - Center for devices and radiological health were reviewed from 1992 to 1997. All the published events in English literature to the present were also analyzed.

Results: There are twelve reports of complications associated with HS (9 from FDA web site). There were two deaths and ten untoward events, of which there is direct evidence of injury in six events. Two deaths reported to FDA happened after tonsillectomy and laparoscopic Nissen fundoplication (necrosis of stomach). Among untoward events; one patient underwent a reoperation for anastomotic leakage from right hemicolecotomy, in three patients laparoscopic procedure was converted to open when HS failed to achieve adequate coagulation. Among the six events where HS is directly involved, one patient had iliac artery injury, two had trocar site burns, one patient had bowel injury from direct contact of heated HS tip and in one patient there was tracheal tube damage from direct contact by HS. A white coagulum inside the harvested vessel was reported in arterial concomitant with HS (n=559).

COMPLICATIONS DURING HARMONIC SCALPEL USE: A REVIEW

Michael Leitman M.D., Robert Shapiro, and Luis A. Adrales, M.D.
Department of Surgery, Lenox Hill Hospital, New York, New York., Universitaetsklinikum Frankfurt, Frankfurt, Germany.

The purpose of this study was to review the complications reported to the FDA during the use of harmonic scalpel (HS). A total of 12 events were reported to the FDA during 1992-1997. Two deaths were reported, one from HS use during tonsillectomy and the other from high viscosity HS use during an arterial concomitant with HS.

Methods: The web-based database from the United States food and drug administration (FDA) - Center for devices and radiological health were reviewed from 1992 to 1997. All the published events in English literature to the present were also analyzed.

Results: There are twelve reports of complications associated with HS (9 from FDA web site). There were two deaths and ten untoward events, of which there is direct evidence of injury in six events. Two deaths reported to FDA happened after tonsillectomy and laparoscopic Nissen fundoplication (necrosis of stomach). Among untoward events; one patient underwent a reoperation for anastomotic leakage from right hemicolecotomy, in three patients laparoscopic procedure was converted to open when HS failed to achieve adequate coagulation. Among the six events where HS is directly involved, one patient had iliac artery injury, two had trocar site burns, one patient had bowel injury from direct contact of heated HS tip and in one patient there was tracheal tube damage from direct contact by HS. A white coagulum inside the harvested vessel was reported in arterial concomitant with HS.

CONCLUSIONS: Avoidance of physical strains on the laparoscopic blade extender sheath prompt response to malfunction signals, avoidance of contact with tissue, metal or plastic by the overheated blades from prolonged activation are important ways to prevent complications. Releasing the tissues while the blade is still activated avoids tearing of tissue from heated tissue too adherent to the HS blades prevents overheating. The internal mammary artery should be allowed to bleed freely and the radial artery should be flushed until free of coagulum to prevent embolization.

THE USE OF AN ERGONOMICALLY DESIGNED HANDLE DOES NOT ENHANCE PERFORMANCE IN A CLOSED BOX LAPAROSCOPIC TASK

Simon Bennet MB BS, Miroslav Kral, PhD, Vivek Datta MB BS, and David Arziti MD, Department of Surgical Oncology and Technology,Imperial College of Medicine at St. Mary’s Hospital, London, U.K.

Aims: Does the use of an ergonomically designed laparoscopic handle enhance performance as detected by motion tracking.

Methods: Two different laparoscopic handle types, one a standard Autosuture, Endodosesthe other the ergonomically designed Surgical Innovations F4, were both tested in a closed box environment. They were tested with and without ratchets; performance was tracked using the Imperial College Surgical Assessment Device (ICSAD). 9 surgeons of intermediate laparoscopic experience performed the task in a randomised fashion, under standardised conditions, using both hands individually. The task consisted of picking up and object and transferring it across obstacles to a destination 10 cm diagonally away. Subjective analysis of the handles was by questionnaire after each task.

Results: Objective data: time taken, path length and number of movements, showed no statistically significant differences between the handles. Subjective data: No statistically significant difference in the scores for precision, comfort, rotation, ease of opening and closing and overall score. No significance in the feeling of pain/pressure for all handles. Three different sites mentioned for pressure/pain; base of thumb, index finger and ring finger, F4 handle mentioned in 5 cases and standard in 3.

Conclusion: The F4 handle has been designed to avoid the ergonomic problems associated with standard handles e.g. neuropraxia, ulnar deviation of wrist and poor force transmission. However in a small study performance indicators showed no advantage for the ergonomic handle as measured both objectively and subjectively.

THE RELATIONSHIP BETWEEN SURGICAL GLOVE SIZE AND DIFFICULTY USING LAPAROSCOPIC INSTRUMENTS: A SURVEY OF 726 LAPAROSCOPY SURGEONS

Ramon Benquer MD, Alan Hreljac PhD Department of Surgery, University of California Davis. School of Engineering, California State University Sacramento.

BACKGROUND: Hand size is an important variable to consider when designing hand tools. Laparoscopic instruments have been reported to cause hand pain and upper extremity discomfort. This study investigates the correlation between surgical glove size and musculoskeletal problems using laparoscopic instruments.

METHODS: Approximately 11,000 questionnaires were sent to SAGES, AAGL, and AWS members. Questions included basic demographic and practice data, surgical glove size, the presence of musculoskeletal problems, and the perceived difficulty using several types of laparoscopic instruments. There were 726 responses (159 female and 567 male). Subjects were grouped by hand size (Male: Small <= 8.5, Medium 6.5-7.0, Large >7.5; Female: Small <= 6.0, Medium =6.5, Large > 6.5). An ANOVA method was used to test for differences between groups.

RESULTS: The reported difficulty of using all laparoscopic instruments was greater for the Small glove size group compared to both the Medium and Large groups (p<0.001). In females, the scissors and staplers were more difficult to use for the Small and Medium glove size group compared to the Large group (p<0.001). Subjects who reported musculoskeletal problems (n=145) performed a significantly greater percent of laparoscopic cases and found the stapler and grasper more difficult to use than those not reporting problems (p<0.05).

CONCLUSION: Hand size is a significant determinant of difficulty using laparoscopic surgical instruments. Individuals using glove sizes 6.5 or smaller experience significantly greater percent of laparoscopic cases and found the stapler and grasper more difficult to use than those not reporting problems.
**Ergonomics/Instrumentation-PF112**

**EFFECTS OF IMAGE VARIABLES ON VIDEOSCOPIC TASK PERFORMANCE**

**Background:** The aim of this study was to investigate the influence of image presentation on laparoscopic surgeons' work environment and their skill performance.

**Methods:** The study involved 12 participants, who were seated in front of a screen displaying a laparoscopic view of the upper abdomen. They were asked to complete a series of laparoscopic tasks, such as suturing and grasping, under different image conditions.

**Results:** The results showed that the participants had significantly higher task completion times and lower accuracy rates when the image was presented in a suboptimal manner, compared to optimal image presentation.

**Conclusion:** The study highlights the importance of optimizing image presentation in laparoscopic surgery to improve surgeons' performance and patient outcomes.

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**Ergonomics/Instrumentation-PF113**

**EVALUATION OF A METHOD FOR CONTROL OF CLEANING PERFORMANCE IN REUSABLE HOLLOW INSTRUMENTS FOR MINIMALLY INVASIVE SURGERY**

**Background:** The validation of cleaning reusable laparoscopic (MIS) instruments is an unresolved issue. Contamination of hollow instruments can be detected using labor-intensive endoscopic methods. Other methods (radionuclide, chemical) are more sensitive, but they render the MIS instrument examined unsuitable for further use. The objective of the study was to evaluate cleaning performance in reusable MIS instruments, for which purpose residual contamination after cleaning was assessed by precision weighing.

**Methods:** In a first course, the empty weight of six new instruments was determined as well as the weight before each new experiment. In a worst-case scenario, the instruments were contaminated with 1.5 ml sheep’s blood, were weighted again and, after a drying period of 21 hours, processed in a washer/disinfector. Afterwards the instruments were weighted a third time. The difference was repeated 10 times. The results of the weight control were confirmed by optical-endoscopic method. In a second course (12 cycles, 7 instruments) the drying period was shortened to 1 hour in order to facilitate the processing conditions.

**Results:** In the first course the MIS instruments were contaminated with an average of 0.33 g of sheep’s blood. After processing in the washing/disinfector, a median of 0.02 g blood remained in the instrument (range: 0.01-0.07 g). Compared with the optical method a sensitivity of 100% and a positive predictive value of 92.6% were demonstrated. In the second course a median of 0.023 g contamination remained in the lumen.

**Conclusion:** The results of the first course show that residual contamination of hollow instruments can be detected quantitatively by weighing the instruments. The results of the second course demonstrated that - even under facilitated conditions - the cleaning of hollow instruments for the MIS is an unresolved issue. Further studies are necessary to demonstrate whether this relatively simple method can be employed for routine control, especially for instruments with hidden surfaces.
Ergonomics/Instrumentation-PF125

OBJECTIVE ASSESSMENT OF HAND ASSIST VERSUS CONVENTIONAL LAPAROSCOPIC SURGERY

Vivek Datta MB.BS, Simon Bann MB.BS, Juan Hernandez MD, Ara Darzi MD, Department Surgical Oncology and Technology, Imperial College, London UK.

Objective: Though several reports have subjectively highlighted the benefits of hand assisted versus conventional laparoscopic surgery, there has been no objective comparative analysis between these two techniques.

Methods: 11 trained laparoscopic surgeons completed standardised knot tying and dissection tasks in a laparoscopic trainer, using both hand-assisted (HandPorttm, Smith+Nephew) and traditional laparoscopic (L) techniques. Motion analysis, utilising the Imperial College Surgical Assessment Device, was used to assess performance, measuring the number of movements made, pathlength of hand travel and time taken. Mann-Whitney-U tests were used to compare hand assisted (HA) versus conventional laparoscopic (L) performance. A p value <0.05 was deemed significant. Means and standard deviations are shown in the results.

Results: With respect to knot tying, there was a significant reduction in the number of movements made (dominant HA 114 +/- 50, L 321 +/- 118, p<0.001; non dominant HA 89 +/- 36, L 296 +/- 96, p<0.001), patlength (HA 1083mm +/- 680, L 3837mm +/- 1852, p<0.001; non dominant HA 548mm +/- 339, L 2556mm +/- 1042, p<0.001), and time taken (HA 162secs +/- 50, L 460secs +/- 179, p<0.001) for both dominant and non dominant hand between hand assisted and conventional laparoscopic techniques. However, there was no statistical difference for any measured variable with respect to the dissection task.

Conclusion: Hand assisted surgery significantly improves knot tying ability in trained laparoscopic surgeons. However, there appears to be no improvement in performance for this specific dissection task.

Ergonomics/Instrumentation-PF127

LAPAROSCOPIC VIDEO MONITORS: MINIMALLY INVASIVE SURGICAL SUITES OFFER IMPROVED ERGONOMICS.

Trudy A.G. Kenyon, RN, David Urbach, MD, Rob Strickland, OTR, Lee L. Swanson, MD, Department of Minimally Invasive Surgery, Legacy Health ion Surgical Technologies, Portland, Oregon.

The Occupational Safety and Health Administration (OSHA) has an ergonomics program standard to minimize the exposure to risk factors in the workplace. Ergonomics, particularly, repetition and awkward posture, are recognized as important considerations in minimally invasive surgery (MIS), and has led to the creation of specialized operating rooms (OR) that permit dynamic height adjustments of the video display terminals (VDT). Improper viewing can lead to hypertension in the neck, muscle fatigue and contribute to work-related musculoskeletal disorders (MSD). We studied the ergonomic disparity between the VDT correlation to eye height in a modern MIS suite and on video carts in the standard OR.

Ergonomic outcomes were analyzed from both OR environments. VDTs were positioned at the lowest and highest range. The VDT height was calculated by direct measurements and compared to industrial standards for viewing distance, angles and heights and related to anthropometric data for height and eye position for adult men and women in the 5 to 95 percentile.

The average adult eye height is 62.0 +/- 5.6 inches. Normal sight is 10 degrees below the horizontal line of sight. In the standard OR, the mean VDT height was 72.4 inches and fixed. The mean line of sight’s vertical rise was 10.4 inches. At a distance of 48 inches, the viewer must look up 22 degrees, a significant amount. In the MIS suite, the mean VDT height at the lowest position was 55.5 inches. The mean line of sight’s vertical rise was 0 inches. At a distance of 48 inches, the viewer must look up 2 degrees. The flexible VDT height from 55.5 to 91.6 in. eliminated improper neck angles. At a distance of 24 to 48 inches for the 5 to 95 percentile adult eye height.

Conclusion: Only 4% of the adult population can attain OSHA’s VDT standards using fixed video carts compared with 96% adult population in the MIS suite. The MIS suite achieves the Gold Standard of a neutral balanced head position for the most varied population of users.

Ergonomics/Instrumentation-PF126

MUSCLE-STRAIN AND TASK-PERFORMANCE IN RELATION TO MONITOR-POSITION IN LAPAROSCOPIC SURGERY


Background: The ergonomic aspects of computer work places are very well evaluated and their design has been improved. The study of the ergonomics of the operating room is a relatively new field of research. One of the key problems in laparoscopy is the correct positioning of the monitor. In this study we tested task performance and muscle-strain of subjects in relation to monitor-position during laparoscopic surgery.

Material and Method: 18 subjects simulated laparoscopic suturing by continuously threading tiny pearls. This was repeated in three measurements (15 minutes each) without changing their angle of view. The sequences of the three monitor positions were randomized:

- A: Frontal - at eye level
- B: Frontal - in height of the operating field
- C: 45° to the right side at eye level

During a fourth measurement the subjects were allowed to move the head and to observe every monitor. Afterwards they were asked for their preferred monitor position. During all tests the EMG activity of six main neck muscles was recorded and the pearls were counted.

Results: The EMG activity of the six neck muscles was significantly (p<0.05) lowest for position A. No significant difference was found between the positions B and C.

The number of threaded pearls as an indicator for task performance was highest for position B, but not significant higher than for position A. Although there was a significant difference in task performance between positions A and C, no subject preferred the monitor at the side (C).

Conclusion: Regarding EMG data the monitor positioned frontal at eye level is preferable. Reflecting personal preferences of subjects and task performance it should be of advantage to place two monitors for the surgeon: one in position A for lowest neck strain, and the other one in position B for difficult tasks with optimal task performance. The monitor position at the side is not advisable.
A COMPARISON OF THE ERGONOMICS OF DIFFERENT HANDLES FOR MINIMALLY INVASIVE SURGERY - AN EMG BASED STUDY

Rico Bergmann Dipl.-Ing., Carsten Giebmeyer Dipl.-Ing., LUIGI FRIDAY

Background: Only few studies have been performed to test different instrument handles in Minimally Invasive Surgery (MIS) and it remains unresolved which handle design is best. The aim of the present study was to evaluate the difference in muscle activity when manipulating various types of MIS instrument’s handles.

Methods: Four different handles (Ring 333121, Karl Storz, Shank 25.00, Wilo, Axial PM 553 R, Aesculap, VG-Hirschberg (own build functional model)) were tested by 12 volunteers manipulating two micro switch with a standardized pinch point of resistance (0.1N, 2.5N). During the test the electromyogram (EMG) activity of 4 forearm muscles (M. extensor digitorum communis (EDC), M. flexor carpi ulnaris (FCU), M. flexor digitorum superficialis (FCS), Thenar muscle (TH)) was recorded and normalized with respect to the maximum voluntary activity of the respective muscle (p<0.05).

Results: Generally the axial-handle requires the highest muscle activity followed by the Shank handle. The ring- and the vario-handle show lower EMG values, while the ring-handle requires more thenar activity, the vario handle more activity in the EDC.

There is no significant difference between the muscle activities using the two different switch forces for any muscle when manipulating with the ring-, Shank-, or axial handle. Using the vario-handle there is a difference between the switch forces for the EDC. With this muscle the functional element of the handle is manipulated for closing the instrument.

Conclusion: Less EMG activity and thus muscle strength is needed, when using the vario- or ring-handle compared to Shank- or axial-handles. Regarding the literature about pressure areas and neurapraxia when working with ring handles the concept of the vario-handle seems to be preferable for grasping functions. The difference in the EMG activity between the switch forces for the EDC. With this muscle the functional element of the handle is manipulated for closing the instrument.

Hand assisted laparoscopic surgery provides the surgeon with tactile and effective visceral retraction without giving up the advantages of minimally invasive surgery. It may be indicated in all the so-called complex laparoscopic procedures such as colorectal cases, splenectomies, operations on the retroperitoneum, especially when a short (6-8 cm) incision is required for specimen extraction and/or extracorporeal anastomosis.

METHODS AND PROCEDURES: Between May 2000 and June 2001 11 patients underwent HA procedures for colorectal diseases. They were 6 males and 5 female, age ranging between 48 and 74 yrs. Operation consisted of 4 anterior resections, 4 sigmoid resections and 3 right hemicolectomies. Incisions were placed in the left lower quadrant in all but the three procedures on the right colon (incision in the RLQ).

The HA device was, in our experience, necessary to obtain anatomical exposure on the pelvis in elderly or overweight patients who could not bear exaggerated Trendelenburg; to verify the degree of infiltration of the retroperitoneal structures (sigmoid cancers); to control a severe bleeding from retracted left colic artery (one case).

RESULTS: Mean length of operation on the left and on the right colon was 168 min and 145 min, respectively. These results were comparable with those obtained with laparoscopic procedures only, even in terms of reestablishment of oral feeding and patient discharge.

CONCLUSIONS: In our experience HA tools represent an useful device to improve the safety of colorectal laparoscopic procedures without impairing the expected advantages of minimally invasive surgery. This is particularly true when a short incision is already planned. Therefore we believe that the HA technique teaching should be included in routine laparoscopic training programs.

A NOVEL SUTURE WELDING DEVICE: PRE-CLINICAL RESULTS

Steven D. Schwaitzber M.D, Raymond Connolly Ph.D, Thomas D. Egan, Dept of Surgery, New England Medical Center, Boston, MA, Axya Medical, Inc. Beverly, MA

Laparoscopic knot tying is a task common to advanced laparoscopic surgeons, yet remains difficult for the novice surgeon. The objective of this study was to demonstrate the safety and efficacy of a new device that implants welded suture loops (WL), and compare them to interrupted hand-tied suture loops (HL). A midline incision of 10 –15 cm was made in a cadaver model. Half of the incision was closed first with either all HLs or all WLs, the choice selected at random. The remaining half of the incision was closed with the alternate technique. The suture used for both the HL and the WL was #0 polypropylene. Welded air loops and hand-tied air loops were made at the time of the implants in order to assess comparable loop strengths. The animals were survived for four weeks. At harvest the complete fascial closure was observed for healing, and any differences between the segments were noted. Portions of both WL and HL were sent with surrounding tissue for histology. Remaining suture loops were harvested for loop strength testing.

On average it took 52.4 sec to complete an HL (range 117 to 36 sec). This compared to an average of 22.0 sec per loop for the WL (range 36 to 15 sec). Tissue bite sizes and tissue edge approximations appeared normal. The hand tied air loops and the welded air loops were pulled to failure on a Lloyd Instruments Tensile Test Machine, with a preload of .05 lbf at a rate of 3.0 in/min. The avg. strength of both WL and HL exceeded USP requirements for size #0 polypropylene. Welded loop strength was comparable to hand-tied loop strength (range 36 to 15 sec). Tissue bite sizes and tissue edge approximations appeared normal. The hand tied air loops and the welded air loops were pulled to failure on a Lloyd Instruments Tensile Test Machine, with a preload of .05 lbf at a rate of 3.0 in/min. The average strength of both WL and HL exceeded USP requirements for size #0 polypropylene. Welded loop strength was comparable to hand-tied loop strength (range 36 to 15 sec). Tissue bite sizes and tissue edge approximations appeared normal. The hand tied air loops and the welded air loops were pulled to failure on a Lloyd Instruments Tensile Test Machine, with a preload of .05 lbf at a rate of 3.0 in/min. The average strength of both WL and HL exceeded USP requirements for size #0 polypropylene. Welded loop strength was comparable to hand-tied loop strength (range 36 to 15 sec).
ABDOMINAL ESOFAGO-GASTRIC RESECTION BY LAPAROSCOPY CAN BE FACILITATED BY A DOUBLE-STAPLED ANASTOMOSIS.

Ahilberg G., Nilsson M, Rosseland A, Arvidsson D, Department of Surgery, Karolinska hospital, Stockholm

Introduction: Esofago-gastric resections are performed for malignant disease in the distal esofagus and/or proximal stomach. A traditional approach often includes both laparotomy and thoracotomy. We describe a technique in which thoracotomy can be omitted and laparotomy changed to a hand-assisted laparoscopy.

Methods and procedures: A hand-assisted laparoscopic gastric resection or gastrectomy in combination with resection of the distal 5-10 cm of the esofagus is performed. The esofagus is divided with a linear cutting stapler. When the specimen has been removed, the part to be anastomosed (Gastric tube or Roux limb of jejunum), together with a circular stapler without the anvil, is brought up to the esofageal end. With a gastroscope, the inside of the stapled esofageal end is visualized and a needle with a guidewire is directed through the staple line. The guidewire is grabbed from below and an introducer with the attached anvil is brought down transorally. The stapler is connected and fired through the previously performed linear staple line of the esofagus, thus creating a double-stapled anastomosis.

Results: In three patients this technique has been tested, one total gastrectomy including distal 5 cm of the esofagus for proximal gastric cancer, and in two for a esofago-gastric resection with a gastric tube brought through the hiatus (one esofageal cancer, one GIST tumor in the cardia region). No postoperative NG tube was used, and the patients were allowed free fluids on the day after surgery. No complications occurred and all three patients had a rapid recovery. After one year, two out of one patient has died 6 months after surgery from his advanced gastric cancer (cancer growing in 21 of 24 excised lymph nodes of the specimen), the other patients are doing well. Two patients needed initial balloon dilatation of the anastomosis (25 mm stent).

Conclusions: In laparoscopic esofago-gastric resections a double-stapled anastomosis could facilitate the procedure.

ENDOSCOPIC TASK PERFORMANCE UNDER SPATIAL MISALIGNMENT CONDITIONS Bin Zhang, M.D., Shermeen Chan, Christine L. MacKenzie, Ph.D., Human Motor Systems Laboratory, Simon Fraser University, Burnaby, British Columbia, Canada

A major problem in minimally invasive surgery is that the displayed surgical field is not always aligned with the actual field. This study evaluated task performance in endoscopic surgery under various misaligned conditions. We hypothesized that task performance is degraded when misalignment exists; the performance will improve when the displayed surgical field is superimposed over the work plane.

The experiment was done in a mock endoscopic surgical set-up that including an endoscopic camera and a training box. The image of the work plane inside the training box was projected either on a vertical mirror placed at the eye level of the subject or superimposed over the training box by means of a half silvered mirror. The work plane consisted of a start plate, a screw plate and a target plate. Subjects reached from the start plate, picked up a metal screw at the screw plate and transported it to the target plate using an endoscopic grasper. Rotating the camera along its longitudinal axis misaligned the displayed and the actual work plane.

When misalignment was present, subjects took longer in both the reach and the transport phases. When the image was superimposed over the work plane, the movement time of reach was shorter than that in the vertical display condition. There was an interaction between display arrangement and the work plane alignment. Under misaligned conditions, the transport time was shorter with superimposed display. In contrast, in aligned conditions, vertical display had some benefit, perhaps because this is how surgeons usually work.

Task performance was worse with misalignment. The interaction of display arrangement and the work plane alignment supported the hypothesis that superimposed display facilitates endoscopic performance when misalignment exists.

LAPAROSCOPIC NISSEN’S FUNDOPLICATION APPLIED TO PARTIAL GASTRECTOMY -G., Takashi Akaishi, M.D., Osamu Akaishi, M.D., and So Sato, M.D, Department of Surgery, Akaishi Hospital, Shiogama, JAPAN

Gastrostomy is a well-known surgical technique to establish nutrition access for patients in whom oral food intake is not available. However, we experienced difficulties in managing a patient who underwent simple gastrostomy and was suffered from relapsing pneumonia after surgery. Then we started to check gastro-esophageal reflux before gastrostomy.

METHODS AND PROCEDURES: From 1999 to 2001, enteral tube feeding became necessary for seven patients in our hospital. Five of the seven patients had preceding cerebrovascular attacks and the remaining two had swallowing insufficiency without any apparent neurological disorder. Those seven patients were examined by fluoroscopy using a fine tube introduced into the esophagus. Five of 7 had gastroesophageal reflux and all of them were suffered from frequent debilitating pneumonia.

The patients who did not have gastro-esophageal reflux underwent simple percutaneous endoscopic gastrostomy. And the patients having reflux underwent Nissen’s fundoplication, followed by Witzel’s gastrostomy, under general anesthesia.

RESULTS: The two patients without gastro-esophageal reflux were doing well with simple percutaneous endoscopic gastrostomy.

The remaining five patients, despite their poor performance status, tolerated laparoscopic Nissen-fundoplication followed by Witzel’s gastrostomy under general anesthesia. In four out of five, previous relapsing pneumonia was gone and nutrition was improved. Frequent pneumonia occurred in one patient in whom anti-reflux procedure was insufficient.

CONCLUSIONS: Gastro-esophageal reflux seemed to play a definitely offensive role against the patient who need tube feeding. Therefore, esophageal reflux fluoroscopy is recommended to find out gastro-esophageal reflux. And anti-reflux surgical procedure prevented relapsing pneumonia. The laparoscopic procedures may be preferred to the open procedures because those patients are usually at very poor conditions.
### Esophageal/Gastric Surgery–PF137

**OUTCOME OF LAPAROSCOPIC ANTI-REFLUX SURGERY IN PATIENTS WITH FUNCTIONAL HEARTBURN.**

<table>
<thead>
<tr>
<th>M Anvari MB BS PhD, CJ Allen MB Ch, M Lewis BSc, J Safa-Sefat BSc, C Gill Pottruff BSc, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada</th>
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<tr>
<td>Patients with acid induced heartburn but normal amount of acid reflux in 24 hours present a challenge in decision making for anti-reflux surgery.</td>
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<tr>
<td><strong>Aim:</strong> to evaluate the outcome of laparoscopic fundoplication in patients with functional heartburn.</td>
</tr>
<tr>
<td><strong>Methods:</strong> We prospectively followed 21 patients (mean age 49.4 ± 2.1 years, range 29-67, 5 M:16 F) with primary symptom of heartburn induced by esophageal acid exposure (Bernstein test: blinded randomized acid and saline infusion), but normal 24 hour pH study (% acid reflux ≤ 4%), who chose to undergo laparoscopic fundoplication in preference to long-term acid suppression therapy. During the same time 39 patients (mean age 48 ± 2.83 years, range 21-75,14 M:25 F) with primary heartburn induced on acid infusion (+ve Bernstein) and abnormal acid reflux exposure (% acid reflux ≥ 4%) underwent laparoscopic anti-reflux surgery. Both groups underwent comprehensive evaluations prior to and 6 months after surgery.</td>
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<tr>
<td><strong>Results:</strong> Both groups had similar symptom scores for heartburn and other GERD symptoms before surgery and reported a similar and significant improvement in these score after anti-reflux surgery:</td>
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<tr>
<td><strong>CONTROL</strong></td>
</tr>
<tr>
<td>+ve pH test, +ve Bernstein</td>
</tr>
<tr>
<td><strong>FUNCTIONAL HEARTBURN</strong></td>
</tr>
<tr>
<td>+ve pH test, +ve Bernstein</td>
</tr>
<tr>
<td>% Acid Reflux in 24 hours</td>
</tr>
<tr>
<td>Heartburn Score</td>
</tr>
<tr>
<td>off meds</td>
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<tr>
<td>Gastroesophageal Reflux Symptom Score</td>
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<td>off meds</td>
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</tbody>
</table>

Values shown are mean ± se * p < 0.01 cf preoperative values

**Conclusions:** Laparoscopic fundoplication is effective treatment in patients with acid induced heartburn who may have normal esophageal acid exposure on 24 hour pH testing. A blinded randomized Bernstein test is essential in selection of these patients for surgery.

### Esophageal/Gastric Surgery–PF138

**EFFICACY OF LAPAROSCOPIC ANTI-REFLUX SURGERY IN PATIENTS WITH ACID INDUCED CHEST PAIN.**

M Anvari MB BS PhD, CJ Allen MB Ch, M Lewis BSc, J Safa-Sefat BSc, C Gill Pottruff BSc, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

Non-cardiac chest pain can be a disabling symptom in patients with Gastroesophageal Reflux Disease (GERD).

**Aim:** to evaluate the effectiveness of laparoscopic fundoplication in control of non-cardiac chest pain in patients with proven GERD.

**Method:** We prospectively followed 21 patients (mean age: 50 years, range 18-75, 17 F: 4 M) with proven GERD who presented with primary complaint of chest pain and underwent laparoscopic fundoplication. Preoperatively, the chest pain was reproduced during esophageal infusion of acid (Bernstein test: blinded randomized acid and saline infusion). The patients underwent comprehensive re-evaluation at 6 months after surgery.

**Results:** All patients had a significant improvement in 24 hour esophageal acid exposure and reported a significant improvement in GERD symptom score and symptom of chest pain after surgery. 52% (11/21) reported complete resolution of chest pain after surgery.

<table>
<thead>
<tr>
<th>Preop</th>
<th>6 Months Postop</th>
</tr>
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<tbody>
<tr>
<td>% Acid Reflux in 24 hours</td>
<td>8.89 ± 1.35</td>
</tr>
<tr>
<td>Chest Pain Score off medication</td>
<td>9.57 ± 0.80</td>
</tr>
<tr>
<td>GERD Symptom Score</td>
<td>45.00 ± 3.31</td>
</tr>
</tbody>
</table>

Values shown are mean ± se * p < 0.001

**Conclusions:** Laparoscopic fundoplication is effective in control of acid induced chest pain in patients with proven GERD. A randomized blinded Bernstein test is useful in patient selection for surgery.

### Esophageal/Gastric Surgery–PF140

**INCIDENCE OF SYMPTOMATIC GASTROESOPHAGEAL REFLUX DISEASE AFTER LAPAROSCOPIC HELLER’S MYOTOMY WITHOUT ANTI-REFLUX PROCEDURE.**

F Bahmeriz MD, M Misra MD, M Anvari MB BS PhD, CJ Allen MB Ch, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada

Laparoscopic Heller’s Myotomy (LHM) has been shown to improve dysphagia in over 90% of patients with primary Achalasia. The need to add an anti-reflux procedure to LHM is debated among surgeons.

The aim of this study was to evaluate the incidence and severity of reflux symptoms in patients following LHM without an anti-reflux procedure. 15 patients (5 M: 10 F) with mean age of 49.5 years (range 30-75) who were confirmed with the diagnosis of primary achalasia underwent LHM without an anti-reflux procedure. The patients were followed over a five year period and underwent a comprehensive evaluation including gastroscopy, 24 hour pH study and GERD symptom score evaluation.

**Results:** The mean follow-up evaluation was 32 months after surgery. LHM produced a significant drop in LES basal and nadir pressures and was associated with significant improvement in dysphagia symptom score (p=0.0001). The Heartburn score also improved after surgery (p<0.05). Only 8/15 patients had an abnormal (>4%) acid reflux time in 24 hours within 5 years. All 8 patients were well controlled on omeprazole with no complaints on proton pump inhibitors.

<table>
<thead>
<tr>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p value</th>
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<tbody>
<tr>
<td>LES Basal Pressure(mm Hg)</td>
<td>26.9 ± 3.7</td>
<td>5.4 ± 1.4</td>
</tr>
<tr>
<td>LES Nadir Pressure(mm Hg)</td>
<td>20.6 ± 3.1</td>
<td>3.8 ± 1.1</td>
</tr>
<tr>
<td>Dysphagia Score</td>
<td>10.5 ± 0.5</td>
<td>0.7 ± 0.5</td>
</tr>
<tr>
<td>Heartburn Score</td>
<td>5.7 ± 1.3</td>
<td>2.4 ± 0.9</td>
</tr>
<tr>
<td>% Acid Reflux in 24 hrs</td>
<td>4.0 ± 1.4</td>
<td>3.7 ± 1.1</td>
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</table>

**Conclusions:** Addition of an anti-reflux procedure to Laparoscopic Heller’s Myotomy is not necessary. Half the patients will experience chronic reflux symptoms which can be easily controlled on acid suppressive therapy. A prospective randomized study is recommended.

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Underline denotes presenter  * denotes resident paper.

http://www.8thworldcongress.org/
Esophageal/Gastric Surgery–PF142

How effective are present staging modalities for oesophageal cancer?  
T T Bhatti, Mr. J Ahmed, Dr. J Freeman, Dr. A Cole, Mr. S Y Ilkhar.  
Derbyshire Royal Infirmary & Derby City General Hospital

Abstract: Accurate staging of oesophageal cancer is important for the selection of appropriate mode of treatment. Use of laparoscopy allows clear visualization of the peritoneum and serosal surfaces. EUS is described as being the best loco-regional staging tool. This retrospective study aims to evaluate the two staging modalities for their effectiveness.

Patients and methods: We highlighted 104 patients who had EUS; however, only 42 patients had all three (CT scan, staging laparoscopy and EUS) investigations as preoperative workup and were considered to have operable disease.

Results. 4 (9.5%) patients were under staged by laparoscopy, EUS and CT. Two (4.8%) patients were pre-operatively over-staged by EUS. Overall staging accuracy by EUS was 74% for correct T stage identification and 45% for N stage. 1 patient on CT was shown to have extensive loco-regional spread, although laparoscopy, EUS and final histology did not show this.

Conclusion: EUS as a staging modality is satisfactory at correctly identifying the T stage, however, for loco-regional spread, accuracy is low. Laparoscopy has its limitations too. Correct patient management requires the use of more than one staging modality.

Esophageal/Gastric Surgery–PF143

MICROLAPAROSCOPIC FUNDOPLICATION USING THE LEFT SIDED FIRST APPROACH.  
Helmuth T. Billy M.D., Donald J. Waldrep, M.D., Steven C. Patching M.D., Sacramento/Sierra Advanced Laparoscopic Surgery Associates, Sacramento, California

Intersetion: Microlaparoscopy may increase the potential of oesophageal injury during this dissection. We present 60 consecutive laparoscopic fundoplications performed with 3 mm endosurgical instrumentation using a left sided first approach.

Between February 1999 and July 2001, 60 patients underwent laparoscopic fundoplication using a five-trocar approach. 3 mm instrumentation was employed except when limited by available technology. In 50 patients, 36 had a history of previous abdominal surgery. Nissen fundoplication was done in 57 patients, Toupet fundoplication in 3. In all cases the crural dissection was started from the left side first. The short gastric vessels were divided harmonically. The dissection continued cephalad, the left crus and the fibers of the right crus were completely exposed. The gastrohepatic ligament was then opened and dissection of the right crus completed. In all cases the retroesophageal window exposed itself easily.

Esophageal/Gastric Surgery–PF144

LAPAROSCOPIC NISSEN FUNDOPLICATION IN PATIENTS WITH A REPLACED LEFT HEPATIC ARTERY. USING THE LEFT SIDED APPROACH TO PRESERVE THE REPLACED LEFT HEPATIC ARTERY.  
Helmuth T. Billy M.D., Donald J. Waldrep, M.D., Steven C. Patching M.D., Sacramento/Sierra Advanced Laparoscopic Surgery Associates, Sacramento, California

Replaced left hepatic arteries can pose an anatomic difficulty when performing laparoscopic Nissen fundoplication. The replaced artery arises from the left gastric artery and can significantly obstruct visualization of the right crus making anatomic dissection difficult and tedious. Ligation and transection of the vessel has been done in order to improve exposure but can lead to hepatic necrosis. We report four cases in which the replaced left hepatic artery was easily preserved by using a left sided first approach in patients undergoing Nissen fundoplication.

In all patients a large replaced left hepatic artery was identified which prevented adequate visualization of the right crus through the gastro-hepatic ligament. In order to avoid transecting the artery the crural dissection was started from the left side beginning with the short gastric vessels. These were divided using the harmonic scalpel. The dissection continued cephalad. The left crus and the fibers of the right crus were completely exposed. The retroesophageal window was completed through the left side approach. A monorose drain was used to retract the esophagusatraumatically. Placement of an esophageal bougie and closure of the crural fibers also occurred completely from the left side. A modest opening in the gastro-hepatic ligament was still necessary. In 4 patients the replaced left hepatic artery did not interfere with visualization. Average operating time was 88 minutes. No patient required conversion to laparotomy. All patients had resolution of their preoperative symptoms and were discharged home the next morning.
RESULTS OF TRANSGRANAR MINIMALLY INVASIVE SURGERY FOR ZENKER DIVERITICULARM. Bowers MD, B. Bischof M.D., C. Daniel Smith MD, Simon KH Wong MD, YH Lam MD, Enders KW Ng MD, SC Sydney Andrew, Emory University Hospital, Atlanta, GA; Department of Surgery, Oregon Health Science University, Portland, OR

Objective: The standard treatment of Barrett’s esophagus with high-grade dysplasia (HGD) is esophagectomy; however, minimally invasive techniques of resection and endoscopic mucosal ablation have been developed in response to the high morbidity of esophagectomy. The authors developed a novel technique of esophageal mucosal resection with mucosal continuity reestablished by esophageal mucosal-submucosal advancement.

Methods: In 12 male swine, intragastric laparoscopy was established using balloon-tipped ports. After a submucosal injection of saline at the squamo-columnar junction, the distal esophageal mucosa was dissected off of the underlying muscularis propria and fixed to an oro-gastric tube. The mucosa was stripped to the level of the cricopharyngeus muscle and readvanced with establishment of mucosal continuity by anastomosis with the gastric cardia. A two to five cm segment of distal esophageal mucosa was resected after readvancement in 6 animals. Animals recovered, were returned to a normal diet and underwent contrast esophagram at a mean time of 30 days (range 7-60) before euthanasia and autopsy. Graft take was defined as the percentage length of esophagus lined by normal squamous epithelium at autopsy.

Results: All animals survived the procedure. Histological analysis of the resected specimens confirmed esophageal mucosal and submucosal resection. Five animals developed postoperative infectious complications, and had a 40% graft take. The remaining animals had a 71% graft take. There was a trend towards greater graft take in animals that did not have Schatzki ring resection. P.D. Peter Vanier M.D., Reinhold Fueger M.D.,

Conclusion: Laparoscopic esophageal mucosal stripping enables an esophageal mucosal resection at a depth that is appropriate for the treatment of HGD in Barrett’s esophagus. An esophageal mucosal-submucosal advancement graft was used to close the defect. Graft take, and the investigation of mucosal substitutes is warranted.
Esophageal/Gastric Surgery-PF149

DEFINING THE NORMAL LARYNGO-PHARYNGEAL ENVIRONMENT: ITS RELATION TO THE DIAGNOSIS OF GASTROESOPHAGEAL-LARYNGEAL ACID REFLUX

L Chang, MD, B Oelschlager, MD, M Barreca, MD, N Marronian, MD, A Hillel, MD, M Bronner, MD, V Reyes, MD, J Yang, MD, C Pellegrini, MD, Departments of Surgery, Otolaryngology, and Pathology, University of Washington, Seattle, Washington

Objective: Accurate diagnosis of gastroesophageal-laryngeal reflux remains elusive. This study was designed to define the normal laryngeal and pharyngeal environment in order to better assess their pathologic state.

Methods: We studied 11 subjects who had no gastroesophageal reflux, voice, or respiratory symptoms. They each underwent 24-hr quadruple probe pharyngeal-esophageal pH monitoring, esophageal manometry, direct flexible laryngoscopy with the findings quantified by the reflux finding score (RFS), and laryngeal biopsy.

Results: 24-hr pharyngeal-esophageal pH monitoring revealed a mean total percent time pH <4 in the proximal esophagus (3 cm below the UES) of 0.3% and in the distal esophagus (13 cm below the UES) of 1.3%. Only 2 of the eleven patients had a single episode of true pharyngeal reflux while the remaining 9 patients had none. Esophageal manometry revealed a mean LES pressure of 18.6 mmHg with complete relaxation in all patients. Wet swallows elicited peristaltic waves in all patients. Mean amplitude was 58.1 mmHg proximally and 83.9 mmHg distally. A reflux finding score (RFS) was determined by characteristics seen on laryngoscopy. The mean RFS score was 2.1 (SD +/- 1.4) out of a possible maximum 26 points. Laryngeal biopsies performed during flexible laryngoscopy showed no PMN’s or eosinophils.

Conclusion: Our study shows that normal subjects do not reflux into the pharynx more than once. If two or more episodes of pharyngeal reflux are detected, this should be considered evidence of pathologic reflux. Patients who undergo laryngoscopy may exhibit changes which should be considered normal up to an RFS of 7. PMN’s and eosinophils are uniformly absent in laryngeal biopsies of normal subjects.

Esophageal/Gastric Surgery-PF151

LAPAROSCOPIC APPROACH TO SUPRA-DIAPHRAGMATIC ESOPHAGEAL BENIGN TUMOR

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Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES)
GEM Hospital, Coimbatore, INDIA

Surgical excision of supra-diaphragmatic benign tumor is considered difficult to approach. Laparoscopic approach to supradiaphragmatic region by dividing the crura anteriorly provides better exposure.

In June 2000, 43 years aged lady presented with progressive dysphagia of 2 years and pain of one month. Imaging evaluation revealed a benign circumscribed tumor arising from the anterior wall of the esophagus.

Procedure : With five parts, esophago-gastric junction was mobilised, dissected from the crura. By dividing the crura anteriorly, the whole tumor could be mobilised all round and excised. The tumor was arising from esophageal musculature. After excising, exposed mucosa was covered by Dor’s anterior plication. Post operative period uneventful.

Laparoscopic approach to supradiaphragmatic benign tumor by dividing the crura enables adequate and safe excision.

Esophageal/Gastric Surgery-PF152

ROLE OF LAPAROSCOPIC TENSION FREE CRUROPLASTY IN THE MANAGEMENT OF LARGE HIATUS

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Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES)
gem Hospital Coimbatore INDIA

Background : In cases with wide hiatal defect with weakened crura, primary closure with non absorbable stitches do not provide adequate stability to prevent the development of paraoesophageal hernia or transthoracic migration of the wrap. These cases can be effectively managed by synthetic mesh reinforcement of the hiatus.

Method : Between June 1995 to June 2001, 220 patients had undergone fundoplication. Out of these 14 patients presented with large hiatus with type II hiatus hernia. The apparent shortening of the oesophagus was corrected by adequate trans hiatal oesophageal mobilisation. The crural closure was done using prolene sutures in all cases and reinforced with Polypropylene mesh of adequate size with ‘C’ cut to accommodate oesophagus anteriorly. The mesh was fixed to the crurae and the undersurface of the diaphragm with prolene stitches.

Results : This method was uniformly successful in relieving the symptoms. The mean operative time was 90 minutes. No postoperative dysphagia. Hospital stay was comparable with the non-mesh group. With the mean follow-up of 42 months, there was no complication or recurrence.

Conclusion : The tension-free mesh hiatroplasty in addition to fundoplication is an effective treatment in large hiatus hernias to prevent the development of paraoesophageal hernia or migration of the wrap.

Esophageal/Gastric Surgery-PF150

LAPAROSCOPIC APPROACH TO SUPRA-DIAPHRAGMATIC ESOPHAGEAL BENIGN TUMOR

C.Palanivelu, M.Ch, P.S.Rajan,K.Sendhil Kumar,R.Parthasarathi,T.Laxmikanth
Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES)
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Laparoscopic approach to supradiaphragmatic benign tumour by dividing the crura enables adequate and safe excision.
Esophageal/Gastric Surgery–PF153

EFFICACY OF SURGISIS ES (NOVEL SOFT-TISSUE GRAFT) FOR CLOSURE OF FULL-THICKNESS GASTRIC PERFORATION IN RATS. G. de la Fuente MD; D. Curtis Lawson MS; Chris R. Mantyh MD and Theodore N. Pappas MD, Department of Surgery, Duke University Medical Center and Durham VAMC, Durham, North Carolina.

Objective: Anastomosis failure in the gastrointestinal tract is a common cause of morbidity. Previous attempts using non-absorbable materials to help seal anastomosis have failed, probably due to an intense immunological reaction stimulated by these materials. Surgisis tm ES, an inert soft-tissue graft obtained from porcine intestinal submucosa serves as biological scaffolding allowing regrowth and deposition of collagen necessary for bridging tissue defects. In the present study we tested the efficacy of Surgisis tm ES to seal a full-thickness defect in the stomach of rats.

Methods: Six rats (320g) were instrumented with an iatrogenic gastric perforation. Animals were weighed and withheld from food 24 hours prior to surgery. On the day of surgery, anesthesia was induced with isoflurane and a 5 cm midline laparotomy was made. A 1 cm defect was then created in the stomach by removing the full thickness of the anterior gastric wall. The defect was then sealed with two layers of Surgisis tm ES (previously soaked in saline for 10 min) and sutured to the stomach in a continuous fashion using 5-0 prolene. Sutures were taken from the seromuscular layer and placed within 1 mm of the edge of the graft. Entry points were then closed and animals recovered from anesthesia.

Results: All animals tolerated the procedures and resumed feeding the same day of the surgery. None of the animals showed any evidence of leaks or peritonitis three weeks after surgery. Comparison between pre and postoperative (three weeks) weights showed that all animals gained weight after surgery (320.6 + 5.6 g vs. 371.5 + 5.9 g). Necropsy evaluation showed neither perforation of the patch nor signs of chronic inflammation.

Conclusion: The present short-term study shows that Surgisis tm ES is reliable for sealing stomach perforations in rats. It remains to be determined if this novel material can be safely used to prevent anastomosis failure in the gut.

Esophageal/Gastric Surgery–PF155

POTENTIAL ROLE FOR EXCESSIVELY TIGHT CRURAL CLOSURE IN POST LAPAROSCOPIC FUNDOPLICATION DYSPHAGIA. Steven R. DeMeester, MD*, Peter F. Crookes, MD**, Departments of Cardiothoracic Surgery* and Surgery**, The University of Southern California, Los Angeles, California.

Introduction: Persistent dysphagia after laparoscopic fundoplication is often attributed to an excessively tight fundoplication. However, crural closure accompanies fundoplication, and with the laparoscopic technique it is difficult to gauge the tightness of the crural closure. We hypothesized that excessively tight crural closure could also be a source of post laparoscopic fundoplication dysphagia.

Methods: Farm pigs (n=4) weighing 70-75 pounds underwent baseline video esophagram and esophageal motility. Subsequently each animal underwent laparoscopic crural dissection and excessively tight closure (n=2), appropriate closure (n=1), or lax closure (n=1). No fundoplication was performed. Post-operatively the motility was repeated on day 0 and day 10-14 along with a video esophagram.

Results: Baseline video esophagram and motility studies in all animals demonstrated normal esophageal barium transport and motility. Immediately after excessive crural closure there was 100% simultaneous waves noted on motility, and these findings persisted on the late study. Video esophagram demonstrated stasis and abnormal barium transport. In addition, both animals lost weight. Immediate post-operative motility was normal in the appropriate and loose crural closure animals; however, the loose crural closure animal died post-operatively from a strangulated intrathoracic stomach. The appropriate crural closure animal ate normally, gained weight, and had a normal late motility study.

Discussion: Excessively tight crural closure can induce severe motility and video esophagram abnormalities, difficulty eating, and weight loss in pigs. Likely some of the post-fundoplication dysphagia in humans is related to the crural closure, but on the other hand too lax a closure probably contributes to an increased incidence of recurrent hernias after laparoscopic fundoplication. A mechanism to gauge the degree of crural closure with laparoscopic fundoplication would be beneficial.

Esophageal/Gastric Surgery–PF156

SIX YEARS OF EXPERIENCE IN LAPAROSCOPIC SURGERY OF THE ESOPHAGEAL ACHALASIA. M.D. Arnulfo F.Fernández;M.D. Miguel A. Martinez; M.D. Rafael Torres;M.D. Julian Ruiz;M.D. Bárbara Faife;M.D.; Julio R. Torres;Ph.D. Sandra Garce;M.D. Carlos M Escoto, Centro de Cirugía Endoscópica Hospital Universitario Gral. Calixto García, Habana, Cuba.

Background: We show the experience of six years in laparoscopic surgical therapeutic of the esophageal achalasia, making use of the Heller-Dor and Heller - Toupet operation with transoperative control endoscopy.

Methods: One hundred interventions were done between November 1995 and May 2001

We studied operative time separating in esophagogastroscopyo - my time, transoperative control endoscopy time and antireflux procedure time. We analyzed the relation between postoperative clinical evolution and clinical stage of the disease. We have done clinic, radiological and manometric follow-up.

Result: The mean surgical time of the intervention is 138 minutes, include tran operative control endoscopy of 15,4 minutes, however we consider it is of great utility. The clinical stage of the disease influenced in the results of postoperative clinical evolution. It was not necessary conversion to open surgery. Clinical results are classify like excellent in 94 patients and good in 5 patients in accordance to Vantrappen classification.

Morbimortality ratio is about 0,3%

Conclusions: We indicate that surgical procedure like an alternative for first line in the treatment of esophageal achalasia. It is necessary to have special care in early diagnostic of later evidences of injury by electrosurgery.
Esophageal/Gastric Surgery—PF157


Background: It is unclear whether correction of reflux by laparoscopic fundoplication is associated with improvement of esophageal dysmotility.

Objectives: To determine the effect of laparoscopic fundoplication on esophageal motor function (lower esophageal sphincter, LES, and esophageal peristalsis).

Setting: University-based tertiary care center.

Patients and Methods: Fifty-five pts (30 men and 25 women, mean age 49 years), who underwent laparoscopic fundoplication for treatment of GERD and had reflux corrected as confirmed by pH monitoring. Patients with normal or minimally abnormal esophageal peristalsis underwent a 360° fundoplication (Group A, 34 pts, 62%), and patients with abnormal peristalsis (DEA ≤ 40 mmHg) underwent a 240° fundoplication (Group B, 21 pts, 38%). Esophageal manometry and pH monitoring were performed before and 8 weeks or more after the operation. Follow-up was an average of 27±7 months.

Results: Group A (360°) Group B (240°)
Pre-op Post-op Pre-op Post-op
Pre-op LES length (cm) 2.3±0.8 2.9±0.8 2.3±0.7 2.4±0.6
Pre-op LES pressure (mmHg) 11.5±6 16±6 8.5±5 13±5
Pre-op LES pressure (mmHg) 93.4±3 84.±4 35.1±6 53±24
LES pressure and length increased after 360° and 240° fundoplications. Peristalsis improved only after 240° fundoplication, although it was still abnormal, and the changes were unpredictable and clinically unimportant. Improvement occurred in 67% of pts, remained the same in 14% of pts, and worsened in 19% of pts.

Conclusions: These data show that laparoscopic fundoplication: (a) controls GER by increasing the length and pressure of the LES; (b) slightly improves esophageal dysmotility in most patients.

Esophageal/Gastric Surgery—PF158

LAPAROSCOPIC DIALT GASTRECTOMY FOR SEVERE CORRO- SIVE GASTRITIS: A CASE REPORT. Fujitani M., Kyunpara Y., Kawai J., Mochizuki K., Kasai Y., Akiyama S., Ito K., Nakao A. Department of Surgery II, Nagoya University Hospital, Nagoya, Japan.

A case of effective laparoscopic gastrectomy for severe corrosive gastritis due to alkali ingestion is reported.

A 38-year-old Japanese female who attempted suicide by ingesting Drano registered (50%NaOH) was admitted Nagoya University Hospital after initial management. 1 month after the ingesting attempt she cannot take food without Ensure liquid reg- istered. Upper gastrointestinal (UGI) series showed the structure of the antrum and poor passage of barium. Upper gastrointestinal scopy showed mild esophagitis and erosive gastritis without ulcer in the proximal stomach, though the antrum was so distorted that the scope could not pass to the distal antrum.

She was treated conservatively with total parenteral nutrition but anteral stricture was unchanged after 2 months hospital stay. It was thought surgical treatment was indicated for this case. She underwent laparoscopic 1/2 distal gastrectomy with Billroth I gastroduodenostomy, and was discharged after 13 days uneventful post operation course.

Endoscopy 2 months after operation showed gastritis had been healed and no residual food residue in the remnant stomach which suggested gatroduodenal stoma works well. Pt. had no complaints about food intake and no body weight loss after oper- ation. Also, she had satisfaction of minimal wound scar.

Gastrectomy is indicated for the patients of corrosive gastritis with severe stricture after a few months conservative manage- ment. Less invasive operation is better for such benign diseases. Although surgical management is useful, anastomotic leakage was reported in literature. Sufficient observation period until inflammation subsided may be necessary.

Esophageal/Gastric Surgery—PF159

A NEW TECHNIQUE FOR LAPAROSCOPICALLY ASSISTED DISTAL GASTRECTOMY WITH LYMPHADENECTOMY. Tetsu Fukunaga M.D., Akira Kodokoro M.D., Masako Fukukaga M.D., Kunihiko Nagakari M.D., Seiichiro Yoshikawa M.D., Kazumitsu Hamasuna M.D., Juntendo University School of Medicine, Juntendo Urayasu Hospital, Department of Surgery CHIBA,JAPAN.

Laparoscopically assisted distal gastrectomy with lymphadenectomy (LAGD) for gastric cancers has not yet become prevalent as compared to laparoscopic colecotomy with lymphadenectomy for colorectal cancers. One reasons for that is the technical problems including the treatment of many blood vessels. To solve this problem, we developed a technique in which all of the blood vessels can be cut off without clips using an Ultrasonically activated device (USAD) and Bipolar vessel sealing system (LigaSureTM).

Patients and Methods: The subjects were 8 patients who suffered from early gastric cancer with submucosal invasion in the middle and lower stomach. All of them went through LAGD, during which right gastroepiploic vessels, right gastric vessels, left gastroepiploic vessels, and left gastric vessels were cut off at their bases. Veins were coagulated and cut off with USAD, while arteries were cut off after being sealed with LigaSureTM.

Conclusions: Blood vessels were securely yet simply treated in LAGD with the aid of USAD and LigaSureTM. These devices helped solve the problems of the treatment procedure, and eventually reduced the number of clips erroneously left inside a patient’s body as foreign bodies. The use of those devices is considered to be a useful method for generalizing LAGD.

Esophageal/Gastric Surgery—PF160


No convincing evidence exists to assist the surgeon in determining the neces- sity of combining a Heller myotomy with an antireflux procedure in the laparo- scopic treatment of achalasia. Protagonists of combined antireflux surgery document a 20-50% incidence of clinically significant reflux symptoms following myotomy. Antagonists feel that avoidance of extension of the myotomy to the stomach is sufficient to reduce the risk of reflux symptoms. We describe a technique that employs reconstruction of the angle of His as an antireflux mechanism.

Between October 1996 and July 2000, 46 patients underwent one of 3 proce- dures based on surgeons’ preference. A total of 26 angle of His (AoH) repairs were performed following laparoscopic myotomy. These were performed by placing 4 sutures between the medial wall of the gastric fundus and the left mus- cle bundle created by the myotomy. The exposed myotomy was left uncovered placing 4 sutures between the medial wall of the gastric fundus and the left mus- cle bundle created by the myotomy. The exposed myotomy was left uncovered.

Symptom follow-up was blinded. There were no operative mortalities. All patients were discharged within 72 hours. One patient required re-operation at 80 days for recurrent dysphagia on the basis of a slipped Dor fundoplication.

<table>
<thead>
<tr>
<th>HM</th>
<th>Na20</th>
<th>HM/DF</th>
<th>Na10</th>
<th>HM/AoH</th>
<th>Na26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysphagia</td>
<td>Improvement</td>
<td>10</td>
<td>9</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Weight Gain</td>
<td>8</td>
<td>9</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Loss</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflux symptoms</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antireflux therapy</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All three operations are associated with long-term improvement in achalasia- associated dysphagia, as shown by patients’ weight gain. The angle of His repair is simpler to perform than a Dor anterior fundoplication with an acceptably low occurrence of reflux symptoms. A myotomy alone is associated with a 30% risk of symptomatic reflux and a 20% need for ongoing antireflux medication.
Esophageal/Gastric Surgery–PF161

**LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR USING PROSTHETICS IN A CANINE MODEL**

Valerie J. Halpin, MD, Bryan F. Meyers, MD, Donna Luttmann, RN, Peggy Frisella, RN, Thomas Meininger, Nathaniel J. Soper, MD, Department of Surgery, Washington University, St. Louis, Missouri

**INTRODUCTION**

The purpose of this study was to evaluate the effects of paraesophageal hernia (PEH) repair using a bio-prosthetic mesh made of small intestinal submucosa (SIS, Cook, Inc.) compared to polytetrafluoroethylene (PTFE, Dualmesh, Gore, Inc.) and primary repair.

**METHODS AND PROCEDURES**

PEH were created in 22 mongrel canines via a thoracoscopic approach. Four animals died due to volvulus or intraoperative events prior to hernia repair. At 4 weeks the animals were randomized to one of 4 laparoscopic repair groups: A) 4-ply SIS (n=5), B) 8-ply SIS (n=4), C) primary (n=5), or D) PTFE (n=4). All repairs were performed using a keyhole and slit technique with overlap of the two mesh arms at the anterior portion of the esophageal hiatus. Eight weeks following hernia repair the animals were euthanized. PEH recurrence, location of the mesh, adhesion formation and histology were assessed. Esophageal manometry was performed at baseline, after hernia creation, and prior to sacrifice.

**RESULTS**

There was one death in the primary repair group due to gastric outlet obstruction. There were two recurrent PEH, a small clinically insignificant hernia in an 8-ply animal and a large hernia secondary to a loose stitch resulting in volvulus and death of a 4-ply animal. There were no other complications in the primary or PTFE groups. Two animals in the 4-ply group and 3 in the 8-ply group developed mesh contraction with external esophageal constriction (p = 0.10 and p < 0.03 respectively compared to both primary and PTFE repair.) Three of these animals required euthanasia prior to study completion due to esophageal obstruction. On histological exam a severe fibrotic reaction was noted in 8/8 SIS animals and 1/7 non-SIS animals (p < 0.05).

**CONCLUSIONS**

Paraesophageal hernia repair with small intestinal submucosal mesh using a keyhole technique may result in mesh contraction with esophageal obstruction in a canine model.
Esophageal/Gastric Surgery–PF165

LAPAROSCOPIC-ASSISTED GASTRECTOMY WITH SYSTEMATIC LYMPHADENECTOMY: CAN SUCH A COMPLICATED PROCEDURE BE PERFORMED SAFELY AND EFFECTIVELY? Takanobu Hoshide, M.D., Y. Fujino, H.Yamada, T. Suzuki, K. Shinohara, H. Ishida, N. Murata, Dajo Hashimoto, M.D., Department of Surgery, Saitama Medical Center, Japan

Laparoscopic curative resection of stomach cancer has not yet been well established because of its anatomical complexity and relatively high incidence of lymph node (LN) metastases. This dilemma could be solved by our new procedure of laparoscopic-assisted distal gastrectomy (LADG, in combination with Sliding Window Method (SWM)).

Methods: LADG comprises two parts, gasless method for laparoscopic maneuvering and SWM for direct maneuvering. LN dissection within lesser and greater omentum, a highly complicated part, can be performed by direct maneuvering through "sliding window", a small abdominal incision which can be closed horizontally by our system to cover the most of the area of the omentum. LN in deeper areas (around T2 junction, spleen, left gastric a., common hepatic a.) are dissected laparoscopically. Gasless method is required so the "window" can be opened through the whole procedure.

Results: LADG with SWM was performed in 140 cases since June 1994. Mean operating time was 189 min, blood loss 110 ml, conversion to open surgery 0%, oral feeding on 4.5 POD*, hospital stay 12.2 days*, mortality 0%, morbidity 2%, post operative recurrence 0% (*p<0.05) compared to open surgery. The number of LN retrieved was 32.2 per case, which was comparable to that in open distal gastrectomy.

Conclusions: LADG with SWM appears to be safe, smooth, and curative as open gastrectomy, without jeopardizing the less-invasiveness of laparoscopic surgery.

Esophageal/Gastric Surgery–PF166

SAFETY AND EFFICACY OF LAPAROSCOPIC ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFLUX DISEASE IN ELDERLY PATIENTS OVER 80 YEARS OF AGE Hitoshi Idani, M.D., Ph.D., Hitoshi Kin, M.D., Ph.D., Kenji Uda, M.D., Ph.D., Masahiko Muro, M.D., Ph.D., Tomoya Yoshitaka, M.D., Ph.D., Tatsuki Itah, M.D., Ph.D., Kazuyoshi Ota, M.D., Ph.D., Toshio Nishikawa M.D., Ph.D., Department of Surgery, Fukuyama Municipal Hospital, Fukuyama, Hiroshima, Japan

The efficacy and safety of laparoscopic antireflux surgery (LARS) for elderly patients (>80 years) with gastroesophageal reflux disease (GERD) have not been clearly established. The aim of this retrospective study was to evaluate the surgical outcome after LARS in patients aged over 80 years. Between May 1997 to June 2001, 29 patients underwent LARS. They were divided into two groups based on age: group 1 included 23 patients aged <80 years (27-79 years) and group 2 of 6 patients aged ≥80 years (80-88 years). All patients underwent laparoscopic floppy Nissen fundoplication with 54-60 Fr bougie. Results were compared between age groups with Student’s t-test. The preoperative American Society of Anesthesiologists (ASA) score of patients of group 2 (2.5) was significantly higher than that of group 1 (1.7, p<0.01). The vital capacity was smaller in group 2 than in group 1 (1.70 vs. 2.38 L, p<0.05), but no significant differences were noted in %VC (78.3 vs 90.7%) and FEV1% (94.5 vs 87.6%) between the two groups. Preoperative grades of esophagitis and pH values were not significantly different between the two groups. There was no conversion to open surgery and no mortality in both groups. There were no significant differences in operative time (147 vs. 119 min), blood loss (130 vs. 64 g), start of oral intake (1.8 vs. 1.9 days), and time to ambulation (2.90 vs. 2.60 days) between the two groups. Both groups demonstrated equivalent postoperative improvement in symptoms (84 vs. 91%, in efficacy). Left pneumothorax occurred during surgery in one patient of the younger age group. One patient from each group underwent reoperation. Our results indicate that the surgical outcome of laparoscopic antireflux surgery for the treatment of GERD in elderly patients ≥80 years of age is comparable to that of patients <80 years. Thus, such treatment could be employed in properly selected patients.

Esophageal/Gastric Surgery–PF167

CURTAIN RETRACTION TECHNIQUE FOR BIG HIATAL HERNIA Atsushi Iida M.D., Kanji Katayama M.D., Kazuo Hirose M.D., and Akio Yamaguchi M.D., First Department of Surgery, Fukui Medical University, Fukui, JAPAN

Introduction: Big hiatal hernia causes atelectasis or respiratory symptom, not only GERD. But the procedure of laparoscopic Nissen fundoplication for big hiatal hernia had difficulty for dissection and retraction of herniated stomach, and some cases resulted in pneumothorax or serosal injury of the stomach. We present our CURTAIN RETRACTION TECHNIQUE for big hiatal hernia as safe and easier technique.

Methods and Procedures: We perform laparoscopic Nissen fundoplication for four patients with esophageal hiatal hernia of mixed type (type 3) over 8 cm. They also have reflux esophagitis.

We use four 5mm trocars, one 11mm one and LCS-JS (Johnson & Johnson Co.), placing TFT LCD monitor (Sharp Co.) above patient’s head in good hands-eyes coordination. Starting from dissection of hernia sac at the top of hiatus, we make curtain of sac and pull it. This procedure make it possible to retract the herniated stomach easily without serosal injury or pneumothorax. With pulling the dissected peritoneal curtain, we dissect around the S-shaped esophagus in direct view. After retraction, the sac is cut and removed. We perform following suture for hiatus and fundoplication.

Results: No complications were occurred after surgery. The patients started liquid to eat at three post operative date. No leakage or reflux after surgery.

Conclusion: Our curtain retraction technique for big hiatal hernia enables safer and easier dissection in difficult cases.

Esophageal/Gastric Surgery–PF168

BOUinge OR NO BOUinge: DOES IT AFFECT THE POST OPERATIVE DYSPHAGIA RATE? A RETROSPECTIVE ANALYSIS. Patrick B. Flada, M.D., Maurice Arregui, M.D., Department of Surgery, St Vincent Hospital and Health Care Center, Indianapolis, IN

Bougie dilators by tradition have been used for Nissen fundoplication. The use of a dilator aids in judging how tight a Nissen wrap should be. It does carry a 1% risk of esophageal perforation. One such incident happened at our institution. Since that time we have abandoned its use. The purpose of this study was to see if the dysphagia rate has increased as a result.

Ninety-two consecutive charts were evaluated for the study. After a learning curve of 36 cases the next 55 consecutive patients underwent a laparoscopic Nissen fundoplication without the bougie. Postoperative dysphagia was assessed with interview and patient’s complaint of dysphagia.

There were equal numbers of men and women in the two groups. Here are our results.

<table>
<thead>
<tr>
<th>Group</th>
<th>Early Dysphagia</th>
<th>Late Dysphagia</th>
<th>Persistent Dysphagia</th>
<th>Needing Dilatation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bougie</td>
<td>14 (31%)</td>
<td>10 (22%)</td>
<td>3 (6%)</td>
<td>5 (11%)</td>
</tr>
<tr>
<td>No Bougie</td>
<td>22 (44%)</td>
<td>15 (33%)</td>
<td>6 (12%)</td>
<td>11 (23%)</td>
</tr>
<tr>
<td>P Value</td>
<td>0.123</td>
<td>0.912</td>
<td>0.33</td>
<td>0.119</td>
</tr>
</tbody>
</table>

Although more patients in the non-bougie group had early dysphagia, needed dilatation, and remained with unresolved dysphagia, statistical significance was not reached. The late dysphagia rate was identical.
Esophageal/Gastric Surgery-PF169

POST-OPERATIVE TRENDS IN PULMONARY FUNCTION FOLLOWING LAPAROSCOPIC ANTI-REFLUX SURGERY IN ASTHmatic

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Asthmatic patients experience accelerated deterioration of pulmonary function which may be exacerbated by untreated gastroesophageal reflux disease (GERD). We have previously shown that surgical correction of GERD reduces atypical pulmonary related symptoms; however there has been variable success in literature on objective improvements in pulmonary function. The purpose of this study was to determine if surgical correction of GERD is effective in limiting the deterioration of pulmonary function seen over time in asthmatics.

METHODS: Retrospective analysis was performed on thirty two asthmatic patients referred for surgical evaluation between October 1998 and March 2000. At the time of initial evaluation all patients were receiving proton pump inhibitors (PPI) for control of GERD or reflux induced asthma symptoms. Eighteen patients underwent laparoscopic fundoplication with the remaining fourteen patients serving as the control group. PPI therapy was discontinued in all patients following surgery. Spirometry data was analyzed for a ten month period following the institution of either medical or surgical therapy. Trend lines were then assigned to the plotted FEV1 values to determine slopes. Statistical analysis was performed to compare medical and surgical therapy.

RESULTS: Positive slopes, indicative of improving pulmonary function were seen in 55.5% of the patients undergoing surgery compared to 35.7% of the medically treated group (p=0.127). The study was limited to the early gastric cancer with submucosal invasion at L and M region of the stomach.

The indication of LADG with sufficient D2 lymphadenectomy is more useful than open distal gastrectomy in the management of gastrectomy. The mean blood loss were 210 (150-380)ml. The mean number of lymphnodes were performed via a minilaparotomy through an 5 cm long in the epigastric area. Resection of stomach with stapled side-to-end anastomosis were performed via a minilaparotomy through an incision, 5 cm long in the epigastric area.

Conclusion: The new procedures reduce stress on the surgeons and the number of thoracic ports compared with simple thoracoscopic esophagectomy, and may also reduce the operating time because the use of the hand yields a tactile sense and direct support.

Esophageal/Gastric Surgery-PF170

MINIMALLY INVASIVE SURGERY FOR GASTRIC CANCER (LADG: LAPAROSCOPY-ASSISTED DISTAL GASTRECTOMY)

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AIMS: The aim of this study was to establish a procedure for laparoscopy-assisted distal gastrectomy (LADG) with sufficient D2 lymphadenectomy.

Patients: We performed ten laparoscopy-assisted distal gastrectomy from May 2001 to September 2001. The indication of LADG is limited to the early gastric cancer with submucosal invasion at L and M region of the stomach.

Method: After pneumoperitoneum was established using the open technique, 5 ports (12 mm and 5 mm in diameter) were placed. The mobilization of the stomach, and D2 lymphnode dissection were performed by laparoscopic coagulating shears. Dissection and divide of the left gastric and right gastric arteries and veins, the left and right gastroepiploic arteries and veins and D2 lymphadenectomy were performed under the pneumoperitoneum. Resecion of stomach with stapled side-to-end anastomosis were performed via a minilaparotomy through an incision, 5 cm long in the epigastric area.

Result: The mean operative time were 286 (230-420) minutes. The mean blood loss were 210 (150-380) ml. The mean number of dissected lymphnodes was 21 ± 8. All patients had no complications.

Conclusion: LADG with sufficient D2 lymphadenectomy is more useful than open distal gastrectomy in the management of patients with gastric cancer from the viewpoints curability, minimal invasiveness, and quality of life of patients.
Esophageal/Gastric Surgery–PF173

HISTOLOGICAL CHANGES IN CANINE ESOPHAGEAL MUCOSA FOLLOWING ACID REFLUX AND MIXED ACID AND ALKALINE REFLUX Sandhya Lagoo, MD, PhD; Leonardo Villegas, MD; Bassem Eldaif, Jose Pinheiro, MD; Miranda Voss, MD; Michael Gupta, Ross McMahon, MD; Rebecca Greene; Robert McRae; Erik Glyn, DVM; Marcia Gottfried, MD and Steve Eubanks, MD, Departments of Surgery and Pathology, Duke University Medical Center, Durham, North Carolina

Aim: To develop a model of Barrett’s epithelium due to gastro-esophageal reflux disease (GERD) is well known. Our aim is to compare the pathophysiology of acid reflux (AR) with mixed acid and alkaline reflux or duodenogastric reflux (DGR). Using an established canine model of GERD with AR and DGR, we evaluated the esophageal mucosa at multiple intervals following surgery.

Methods: Group I: AR was initiated in 5 animals with thoracotomy, incision of the left crura, Heller myotomy (HM), and creation of a para-esophageal hernia (PEH). Group II: DGR was initiated in 5 animals with laparotomy, incision of the left crura, HM, PEH creation, duodenal stapling distal to the pylorus, and creation of a para-esophageal hernia (PEH).

Results: Post-operatively, 24-hour pH studies with a dual channel probe showed significantly increased acid reflux in Group I animals, while Group II animals showed increased alkaline reflux, with documentation of bile in the refluxate. Esophagography with barium showed reflux in Group I after 6 weeks, 12 weeks and 1 year in Group I and after 6 weeks, 12 weeks and 6 months in Group II. At 6 weeks, Group I showed severe acute esophagitis with basal cell hyperplasia and accentuation of the rete pegs, intrapapillary lymphocytes and neutrophils. At 12 weeks, 3/5 subjects showed evidence of esophagitis, and 2/5 showed regression of the esophagitis. However, at one year, all 5 subjects showed evidence of moderate to severe esophagitis. In one subject, the columnar epithelium at the squamo-columnar junction showed apoptotic necrosis of cells. Group II showed no evidence of esophagitis at 6 weeks, moderate esophagitis at 12 weeks and regression of the esophagitis at 6 months.

Conclusions: Both AR and DGR cause reflux esophagitis in our animal model. Short-term follow up shows more severe esophagitis with acid reflux than with duodenogastric reflux. Long term follow up of these subjects will be needed to study the progression of reflux esophagitis to Barrett’s metaplasia.

Esophageal/Gastric Surgery–PF174

PREOPERATIVE SIMULATION OF LAPAROSCOPIC ASSISTED GASTRECTOMY FOR EARLY GASTRIC CANCER WITH THREE-DIMENSIONAL IMAGING BY MULTIDETECTOR HELICAL CT Lee Sang-Woong M.D., Hisashi Shinohara M.D., Junji Okuda M.D., Masao Toyoda M.D., Keitaro Tanaka M.D., Kanji Nishiguchi M.D., Ikiyohiro Masuda M.D., Mitsuru Matsuki M.D., Shusuke Yoshikawa B.S., Isamu Narabayashi M.D., Nobuhiko Tanigawa M.D., 1) Department of General and Gastroenterological Surgery, 2) Department of Radiology, Osaka Medical College, Osaka, Japan

Introduction: Treatment of early gastric cancer may be a therapeutic candidate for laparoscopic surgery (LS), which is considered as less invasive procedure as compared with conventional open surgery. However, LS requires a more detailed understanding of local anatomy. In compensation for these disadvantages, we have recently introduced 3-dimensional CT angiography (3D-CTA) in preoperative simulation and intraoperative navigation of perigastric vascular ananmies. Here we determine the accuracy of 3D-CTA and its value in the preoperative simulation of laparoscopic gastric cancer surgery.

Methods: Between December 2000 and August 2001, 30 patients with early gastric cancer underwent laparoscopic assisted gastrectomy. Helical CT was performed using a multidetector scanner, after intravenous injection of 100ml of contrast material at 5ml/sec. Arterial phase images were acquired at 20sec. 3D images were obtained using a volume-rendering workstation (zion9000; ZIO software, Inc., Tokyo, Japan).

Results: All 30 examinations were diagnostic and successful. The left gastric artery, the right gastric artery, and the right gastroepiploic artery were identified in 100%, 60%, and 100%, respectively. Replaced left gastric artery, the right gastric artery, and the right gastroepiploic artery were identified in 100%, 60%, and 100%, respectively. Replaced left hepatic artery, arising from the left gastric artery, was detected in three (10%) patients. These anatomical findings facilitated the intraoperative procedures.

Conclusions: Preoperative imaging by 3D-CTA provides a valuable arterial road map, which is critical for surgical guidance, and hence prevents the operative risks. We conclude that 3D-CTA can play an important part in the preoperative planning of the cancer operations, especially in laparoscopic surgery.

Esophageal/Gastric Surgery–PF175

CURRENT STATUS OF ANTIREFLUX PROCEDURE IN LAPAROSCOPIC HELPER MYOTOMY. META-ANALYSIS. Sergey Lyass, M.D., David Thoman, M.D., Edward H. Phillips, M.D. Cedars-Sinai Medical Center, Minimaly Invasive Surgery Institute. Los Angeles, CA

Introduction: Persistent dysphagia and postoperative gastro-esophageal reflux (GER) are the most cited reasons for surgical failure of laparoscopic Heller myotomy. Adding an antireflux procedure to Heller myotomy has been proposed to prevent reflux. We performed a meta-analysis to summarize published data and determine the efficiency of antireflux procedure in prevention postmyotomy GER.

Material and Methods: Meta-analysis of laparoscopic Heller myotomy studies and reported in the English language literature from 1991 to 2001. Studies were eligible for inclusion if they reported the outcome of the surgery in terms of GER symptoms or results of 24 hours pH studies.

Results: Antireflux procedure accompanied laparoscopic myotomy in 15 studies with 532 patients enrolled. In 6 studies with 69 patients no antireflux procedure was added to laparoscopic myotomy. Follow up was available on 489 patients (92%) with partial fundoplication. The rate of GER diagnosed at pH studies was 7.3% (18 of 228 patients studied), while only 5.9% of patients experienced symptoms of GER (29 of 489 patients followed). Of the 69 patients without fundoplication 47 (68%) were available for follow up. Forty patients (85%) were studied with pH-monitoring postoperatively, with 4 (10%) demonstrating reflux. Six patients (13%) had severe symptoms. The difference in the rate of GER diagnosed with postmyotomy pH-studies in patients with or without fundoplication was not significant (7.9% vs. 10% respectively, p=0.75), nor was the difference in the incidence of postmyotomy GER symptoms (5.9% vs. 13% respectively, p=0.12).

Conclusions. Reflux is not necessarily eliminated with the addition of a partial fundoplication. Based on the published data, recommendations cannot yet be made regarding the efficacy of adding an antireflux procedure to laparoscopic Heller myotomy. Prospective randomized study is needed to clarify the place of antireflux procedure after laparoscopic Heller myotomy.

Esophageal/Gastric Surgery–PF176

THE MYTH OF THE SHORT ESOPHAGUS Atul K. Madan MD, Constantime T. Frantzides MD, PhD, Department of Surgery, Rush University, Chicago, IL

Background: The advent of laparoscopic surgery has increased the number of fundoplications performed today. With the increase of the laparoscopic fundoplication, the reports of short esophagus continue to increase. The literature continues to discuss the prevalence, diagnosis, and treatment of the short esophagus. This investigation was undertaken to review our data regarding the entity described as the short esophagus.

Methods: All charts of patients who had laparoscopic fundoplication for early gastric cancer surgery were reviewed. Conversions, recurrences, complications, and incidence of short esophagus were noted. Patients with laparoscopic fundoplications were received esophagrams 3 months postoperatively and then every 6 months thereafter.

Results: A total of 828 fundoplications were performed with 351 requiring hiatal hernia repair. Seventy-two patients had extremely large hiatal defects. After appropriate esophageal mobilization was performed, no further esophageal lengthening procedure was needed. There were 4 (0.6%) conversions, 16 (2.5%) recurrences, and 7 (1.1%) complications, and no deaths. Recurrences were due to hiatal hernia recurrences (n=8; 1.3%), ‘slipped fundoplication’ (n=3; 0.5%), and ineffective valves (n=5; 0.8%).

Conclusion: In our series of fundoplications and hiatal hernia repairs, no short esophagus was noted. With proper esophageal mobilization, clinically the entity described as ‘short esophagus’ may not exist.
Esophageal/Gastric Surgery–PF177

A CLINICAL PATHWAY FOR LAPAROSCOPIC DIATIAL GASTRECTOMY
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Background: Clinical pathways (CP) have been shown in various
diseases to be useful tool for optimal quality management and
cost management. Recently laparoscopic operations have been
increasing, and since 1999 the most popular method for gastric
cancer in our hospital is laparoscopic distal gastrectomy(LDG).
Laparoscopic gastrectomy needs more resources than open con-
terventional operation, but can reduce hospital stay because of
faster postoperative recovery. We expect CP for laparoscopic gas-
trectomy reduce resource utilization and total cost. We evaluate
the effect of CP for LDG.

Cases and Methods: 54 cases underwent laparoscopic distal
gastrectomy for early gastric cancer at Nagoya University
Hospital in 1999-2000 including 36 cases treated without CP
(before institution of CP)[pre-CP group], and 18 cases treated with
CP[CP group]. Invasiveness of operation such as lost blood, oper-
ation time , and complications, resumption of oral intake, the
length of hospital stay, and total expenses of hospital stay are
investigated.

Results: Although there is no significant differences between
Pre-CP group and CP group about operative invasiveness and
complications, the resumption of oral intake in CP group was ear-
tier than that of pre-CP group and the hospital stay of CP group
was shorter than that of pre-CP group. Total expenses in hospital
stay of CP group is less than that of pre-CP group.

Conclusions: CP decreased hospital stay and reduces the total
expenses. CP is useful for high-resource and quick-recovery oper-
ation such as laparoscopic gastrectomy.

Esophageal/Gastric Surgery–PF178

INDICATIONS AND MANAGEMENT OF PROTHESES TO CLOSE THE
CRURA DURING LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL
HERNIAS
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Introduction: One of the problems associated to the laparoscopic
approach of paraesophageal hernias is the evaluation of how to close
the crura, since it has been reported a high incidence of recurrences. The
use of prosthetic meshes have been suggested as an alternative to close the
crura, being still discussed indications, type of mesh and way of fixation.

Patients and Method: We retrospectively evaluated the outcome of 81
consecutive patients with type II (22 patients) or III (59 patients) para-
esophageal hernias treated laparoscopically. Sac was reduced in the last
cases of our series. Protheses reinforcement was performed in recurrent
hernias and primary hernias in which a tension in the suture line was
observed, being all cases defect larger than 8 cm. Prosthesis placed in
the hiatus was in all cases a mesh of PTFE-e (Dual-Mesh plus with
holes). The mesh used was prepared making an U shape, being fixed to
the crura with tacks. A funduplication was performed in all cases and the
fundus was fixed to the mesh with 3-4 stitches.

Results: Two patients were converted to open surgery (3.27%): one
gastric perforation and one massive ephysema. Simple closure was per-
formed in 55 cases, being placed a protheses in 9 cases: 6 primary and 3
recurrent paraesophageal hernias. The recurrence rate of the serie was
6.1% (4/65 cases): three of the patients in which a simple closure was performed
corresponded all of them to the initial cases of our serie in which
in the sac was not excised, the other recurrence corresponds to one
patient in which a cruroplasty was performed, being observed a posteri-
or herniation due to a failure in the posterior fixation of the fundoplica-
tion to the mesh.

Conclusions: Sac must be excised to avoid recurrences during laparo-
scopic repair of paraesophageal hernias, while mesh reinforceement of
the crura is a good method to decrease the rate of recurrences in large
and recurrent hernias. There are no complications related to the use
of protheses and to the method the fixation, being important to fix the
fundus properly to the mesh to avoid recurrences

Esophageal/Gastric Surgery–PF179

MINIMALLY INVASIVE MANAGEMENT OF ESOPHAGEAL DIVERTICULI
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Esophageal diverticuli (ED) are rare lesions which have traditionally
been resected via thoracotomy. Minimally invasive techniques have
made both thoracoscopic (Thor) and laparoscopic (Lap) approaches
attractive alternatives. The purpose of this study was to review our
experience managing this difficult problem.

A retrospective review of all symptomatic ED patients surgically treat-
ed between August 1997 and June 2001 was performed. Preoperative
clinical presentations and perioperative data were collected and exam-
ined.

Five patients with symptomatic distal ED were identified (3 females
ages 72-77 years; 2 males ages 52 and 64 years). All patients com-
plained of dysphagia and had experienced symptoms for at least 12
months. Other symptoms included regurgitation (80%), weight loss
(60%), heartburn/aspiration/cough (40%), chest
pain/hoarseness/nausea/vomiting (20%). All patients were initially eval-
uated by barium esophagograms, esophagogastroduodenoscopy, and
manometry. Dysmotility was identified in only 3 of the patients. One
patient underwent multiple esophageal dilatations plan for surgical refer-
ral. Four patients underwent Lap diverticulectomy and myotomy; 3 of
these also had a Toupet fundoplication. One patient underwent Thor
diverticulectomy and myotomy. All ED measured 5 cm or less. Operative
times ranged from 175 to 334 (mean 245) minutes and blood
loss was minimal (30-100cc). Postoperatively all patients underwent con-
trast swallowing studies prior to resuming a diet (postop days 1-4). The
Lap patients had a mean length of stay of 2.75 days (range 2-4 days),
while the Thor patient stayed until postop day 6 due to pulmonary
issues (severe COPD). During an average follow-up of 11.6 months
(range 2-36 months), only one patient reports occasional dysphagia with
solid foods. There were no wound or other long term complications.

Minimally invasive management of ED can be safely and effectively
performed with minimal morbidity.

Esophageal/Gastric Surgery–PF180

SHORT ESOPHAGUS AND ITS IMPACT ON FAILURE AFTER NISSEN
FUNDOPICATION
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Patients with short esophagi may have higher failure rates after fun-
dopication, due to intrinsically worse disease severity or inability to
obtain a tension-free wrap. Aggressive application of lengthening pro-
cedures such as Type II mediastinal dissection and Collis gastroplasty
may achieve failure rates. This study compared outcomes after fundo-
plication using aggressive lengthening techniques in patients with
short esophagi with patients having normal esophageal length.

A retrospective review of prospectively gathered intra-operative
data sheets recording the extent of esophageal mobilization needed to
achieve 2.5cm of tension-free intra-abdominal esophagus on all
Nissen fundoplications performed during a 4-year period was per-
formed. Patients with follow-up of > 6 months were included.

Patients with short esophagi were identified by the need for a Type II
mediastinal dissection (>5 cm into mediastinum) or Collis gastroplas-
ty. Outcomes were compared to patients with normal esophageal
length (Type I dissection). A Chi-square test was used to compare fail-
ure rates.

147 patients were identified during the study period. 97 patients
underwent Type I dissection, 46 patients underwent Type II dissection,
and 4 patients underwent Collis gastroplasty. Median follow-up was 8
months. Objective follow-up (pH study) was obtained in 86%, 74%,
and 75% of patients in each group, respectively. Failure occurred in
8.2% (8/97), 8.7% (4/46), and 25% (1/4) of patients, respectively, and
were not significantly different between groups.

We report medium-term outcomes in patients with short esophagi
as defined by the need for an esophageal lengthening procedure.
No difference was seen in failure rates between patients who required
a lengthening procedure and those who did not. This data suggests that
aggressive application of Type II dissection and Collis gastroplasty,
thus obtaining adequate esophageal length and a tension-free wrap,
may reduce failure in patients with short esophagi, and provide a suc-
cess rate similar to that of patients with normal esophageal length.
Esophageal/Gastric Surgery–PF181

VIDEO-ASSISTED THORACIC SURGERY AND LAPAROSCOPIC SURGERY FOR CANCER OF THE THORACIC ESOPHAGUS. Soji Ozawa, M.D., Yuko Kitagawa, M.D., Eiichi Nakamura, M.D., and Masaki Kitajima, M.D., Department of Surgery, School of Medicine, Keio University, Tokyo, Japan.

Aim: Surgery for thoracic esophageal cancer through thoracotomy and laparotomy is attended with great surgical invasion. To reduce the surgical invasion we have successfully performed video-assisted thoracic surgery and/or laparoscopic surgery on 36 patients with esophageal cancer. The surgical procedure and the results are presented.

Methods: The patient was placed in the left lateral decubitus position and a mini-thoracotomy was put and four trocars were inserted. The thoracic esophagus and regional lymph nodes were resected thoracoscopically. Next the patient was placed in the supine position and the stomach was mobilized and the abdominal esophagus was dissected laparoscopically. After the left gastric artery was divided, the whole stomach was pulled out. The stomach tube was made safely with pyloroplasty and pulled up to the left neck through the posterior mediastinum. The anastomosis between the cervical esophagus and the stomach tube was performed with a circular stapler. We compared 36 patients with endoscopic procedures with 22 patients with open procedures in terms of surgical invasion.

Results: Although mean operative duration for thoracoscopic procedure (TP) was longer than that for thoracic open procedure (TOP) (p = 0.02), there was no difference between mean operative duration for laparoscopic procedure (LP) and for abdominal open procedure (AOP). Numbers of dissected lymph nodes in TP and LP were almost the same as numbers in TOP and AOP, respectively. Postoperative respiratory function and intestinal movement recovered earlier in LP patients than in AOP patients (p<0.05). The serum IL-6 levels in LP patients were lower than in AOP patients. There was no postoperative complication related to TP and LP.

Conclusions: Both video-assisted thoracic surgery and laparoscopic surgery for thoracic esophageal cancer are feasible, and the laparoscopic procedure is less invasive. Quality of lymph node dissection with endoscopic procedures seems to be the same as quality with open procedures.

Esophageal/Gastric Surgery–PF182

DO FUNDIC GLAND POLYPS SECONDARY TO PPI THERAPY REGRESS AFTER LAPAROSCOPIC FUNDOPULICATION? N Pereira MD, M Anyvari MB BS PhD, C Gill Pottruff BSc, J Lau, D Hong MD, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario, Canada.

An increased incidence of fundic gland polyps in patients on long-term Proton pump inhibitor (PPI) therapy has been noted. Although the natural history of these polyps has not been well delineated, the possibility that they might regress after cessation of proton pump inhibitor (PPI) use following laparoscopic anti-reflux surgery has been proposed.

Methods: We prospectively followed 13 patients (mean age: 58.2 ± 3.5 years) with fundic gland polyps. None had a family history of adenomatosis polyposis coli. All patients were on proton pump inhibitors for a mean duration of 41.1 ± 12.5 months. 6 of the 13 patients decided to stop PPI therapy and chose to have laparoscopic anti-reflux surgery. The other 7 patients continued on maintenance PPI therapy. Follow-up gastroscopy was done to assess progression of fundic gland polyps.

Results: 5 out of 6 patients who stopped PPIs after antireflux surgery exhibited regression in the number of fundic gland polyps at a mean follow up of 14.3 ± 7.5 months. In three patients the polyps completely disappeared. There was however regression of polyps observed in 4 out 7 patients who continued on PPI therapy after a follow up of 16.4 ± 2.4 months.

Conclusion: The regression of fundic gland polyps may occur in patients who remain on long-term PPI therapy. Complete cessation of PPIs after laparoscopic anti-reflux surgery is associated with complete or near complete regression of fundic gland polyps in most patients.

Esophageal/Gastric Surgery–PF183

ASSESSMENT OF THE FAILED FUNDOPULATION BY COMPUTERIZED AXIAL MANOMETRY (CAM) Jose Pinheiro, MD; Miranda Voss, MD; Sandyha Lagoo, MD, PhD; Erik Clary, DVM; Rebecca Greene, Robert McRae, Steve Eubanks, MD, Department of Surgery, Duke University Medical Center, Durham, North Carolina.

Introduction: Laparoscopic fundoplication has an unsatisfactory outcome in approximately 10% of patients, many of who require surgical revision. Several well-recognized patterns of failure are currently defined by endoscopic and radiographic means. Computerized axial manometry (CAM) is a relatively new technique, which has been shown to define lower esophageal sphincter (LES) anatomy and to predict gastroesophageal reflux. The aim of this study was to assess the value of CAM in defining the anatomy of the failed fundoplication.

Methods and Procedures: Six patterns of fundoplication failure were reproduced at open surgery in six adult female dogs. The dogs, equipped with an esophagostomy cannula, underwent pre and post-operative manometry, which was performed by two observers blinded to the surgical procedure. The fundoplication was assessed using an 8-channel, radial, water perfused system. A 50cm continuous pull through analysis was followed by an 8cm pressure vector volume analysis with 3D computerized reconstruction of the sphincter. At completion of the study, the dogs were sacrificed and underwent necropsy with confirmation of the type of abnormal fundoplication.

Results: Three failed fundoplications were identified by CAM. The LES vector volume was strikingly elevated on the tight wrap. An intra-thoracic wrap was correctly identified by standard manometry and CAM. Identification of a twisted wrap configuration required reconclimation of vector volume data with anatomical findings at post-mortem examination. The other three patterns of failed fundoplication were not identified by CAM.

Conclusions: The LES vector volume provided useful information in analysis of the correctly identified tight wrap. Other patterns of failure were either identified on standard manometry or were not identified. Currently, CAM provides excellent representation of the LES preoperatively but does not accurately predict patterns of failure of fundoplications.

Esophageal/Gastric Surgery–PF184

LAPAROSCOPIC NISSEN VERSUS TOUPEF FUNDOPULICATION IN PATIENTS WITH GASTROESOPHAGEAL REFLUX DISEASE AND IMPAIRED DISTAL OESOPHAGEAL MOTILITY. Harald Puhalla M.D., *Johannes Lenglinger M.D., Peter Dubsky M.D.,*Johannes Miholic M.D., *Georg Stacher M.D., Georg Bischof M.D, Department of General Surgery, *Psychophysiology Unit, University Hospital, Vienna, Europe.

A Nissen fundoplication for gastroesophageal reflux disease may more often lead to persistent dysphagia than a Toupet fundoplication. The aim of this study was to assess the results of laparoscopic Nissen versus Toupet fundoplication in patients with reflux disease and impaired distal oesophageal motility.

In 15 patients a laparoscopic Nissen and in 17 a laparoscopic Toupet fundoplication was carried out. Criteria for an impaired motility of the distal oesophageal third were a mean amplitude of < 30 mm Hg of swallowing-induced contractions, or > 33 % nonpropulsive or non-transmitted contraction waves. Before surgery, heartburn, dysphagia, regurgitation and other symptoms were scored and endoscopic manometric and 24 hour pH-metric investigations performed. Patients were reinvestigated 3 to 30 (median 13) months after Nissen and 3 to 42 (median 7) months after Toupet fundoplication.

After Nissen as well as after Toupet fundoplication heartburn was significantly less frequent, whereas dysphagia and all other symptom-scores remained unchanged. In the 26 patients reinvestigated manometrically, the resting pressure of the lower oesophageal sphincter was significantly higher following both operations and the residual sphincter pressure upon swallowing higher only after Nissen fundoplication. The amplitude of swallowing-induced contractions and the per- centages of nonpropulsive and non-transmitted contraction waves were not significantly changed. In the 15 patients restudied p-hetrically, reflux activity was significantly reduced after both Nissen and Toupet fundoplication.

In patients with reflux disease and impaired distal oesophageal motility, laparoscopic Nissen fundoplication yielded satisfactory results and neither operation led to increased dysphagia.
Esophageal/Gastric Surgery–PF185

EVALUATION OF FIBROSIS FORMATION AFTER BOTULINUM TOXIN OR FORCED BALLOON DILATION TO THE LOWER ESOPHAGEAL SPHINCTER. William S. Richardson, M.D., Gladden W. Willis, M.D., James W. Smith, M.D., Department of Surgery, Alton Ochsner Medical Foundation, New Orleans, Louisiana

It has been postulated that Botulinum toxin injection and forced balloon dilation cause fibrosis to the lower esophageal sphincter making Heller myotomy difficult and increasing risk of esophageal perforation in case of achalasia. Our aim was to evaluate fibrosis after forced balloon dilation or Botulinum toxin type A injection to the lower esophageal sphincter in swine.

Eighty 40 to 60 kilogram female swine were divided into three groups of six. Group One was euthanized and their lower esophageal sphincters harvested. Group Two underwent endoscopic injections with 80 mu of Botulinum type A to the lower esophageal sphincter. Group Three underwent forced balloon dilation of the lower esophageal sphincter to 30 millimeters. Group One and Two were allowed to survive for 30 days, then were euthanized and their lower esophageal sphincters harvested. All sphincters were reviewed and the specimens in a blinded fashion and the lower esophageal sphincters were sectioned and stained. Results: There was no difference in grading by histopathology. In non-graded slides fixed in formalin, there was superficial ulceration with inflammation as well as increased fibrous tissue versus control in the untreated group. There was no muscle fracture detected in any specimen.

Inflammation
Group   Mode  P
1 (10)   1.00
2 (3)    0.04
3 (13)   0.01

Botulinum toxin injection and forced balloon dilation cause significant reflux disease in swine. Forced balloon dilation did not cause microscopic evidence of muscle fracture in this model. Forced balloon dilation did not cause a fibrotic reaction.

Esophageal/Gastric Surgery–PF186

LAPROSCOPIC OMENTOPLASTY OF DUODENAL ULCER PERFORATION IN 25 PATIENTS, DR. DEEPENDRA K SAWDE, DR. SHOBHANA SAXENA M.S., DURGA CHIKITALAYA, DEPARTMENT OF M.A.S. HOUSING BOARD COLONY KATNI M.P. INDIA 483504

LAPROSCOPIC MANAGEMENT OF DUODENAL ULCER PERFORATION IS PROVED TO BE BETTER ALTERNATIVE TO OPEN SURGERY, AIM IS TO SUPPORT ALREADY ESTABLISHED FACT WITH A SHORT REPORT. WE HAVE DONE LAPROSCOPIC MANAGEMENT OF DUODENAL ULCER PERFORATION IN 25 PATIENTS IN TWO YEARS AND 6 MONTHS, AGE RANGING FROM 21 TO 59 MEAN OF 34 YEARS ALL PATIENTS ARE MALE.

PATIENT PLACED IN LOW LITHOTOMY WITH REVERSE TRENDLEBERG POSITION. SURGEON STANDING IN BETWEEN PATIENT`S LEGS. 10MM UMBILICAL PORT MADE FOR TELESCOPE, THREE 5 MM PORTS MADE IN EPIGASTRIUM (LIVER RETRACTION), LEFT MIDLEGS. 10MM UMBILICAL PORT MADE FOR TELESCOPE, THREE 5 MM PORTS MADE IN EPIGASTRIUM (LIVER RETRACTION), LEFT MIDLEGS. 10MM UMBILICAL PORT MADE FOR TELESCOPE, THREE 5 MM PORTS MADE IN EPIGASTRIUM (LIVER RETRACTION), LEFT MIDLEGS.

Methods and procedures: A retrospective, case-control study was performed on patients who underwent a complete fundoplication and had postoperative complications. We hypothesized that a complete floppy wrap may be safer and curative compared with an open gastrectomy. This technique is not only less invasive, but similarly effective in terms of early and late outcomes. The mean esophageal body pressure in the study group was 42.1 mm Hg and 87.5 mm Hg in the control group (p<0.05). The study and control groups were followed up for 40.3 months (5-66) and 28.4 months (5-66) respectively. Three patients in the study group and 5 controls (NS) had post-operative dysphagia exceeding 4 months. None had persistent dysphagia. Average time to complete resolution of dysphagia was 10.1 weeks in the study and 12 in the control groups. Four study and 5 control patients have mild heartburn requiring no medical care. All patients but one (control) grade their life quality improvement as good to excellent.

Conclusion: Our data suggests that a 360-degree fundoplication has similar long-term results in GERD patients with and without esophageal motility dysfunction. It seems that a standard, floppy 360-degree fundoplication may be performed in all patients for the treatment of GERD, including patients with mild to moderate esophageal body dysfunction.
Esophageal/Gastric Surgery–PF189

TWO CASES OF FIBROMUSCULAR THICKENING TYPE OF CONGENITAL ESOPHAGEAL STENOSIS DIAGNOSED BY ENDOSCOPIC ULTRASONOGRAPHY. Tetsuya Tomonaga, M.D., Kazuo Ishida, M.D., Kazunori Furuta, M.D., Hiroshi Kida, Ph.D., Tsuyoshi Takahashi, Ph.D., Goro Kaneda, M.D., Department of Surgery, Kitasato University Hospital, Kanagawa, Japan. 2Department of Surgery, National Sagamihara Hospital, Kanagawa, Japan.

Case one: A 10-month-old Japanese girl presenting with post prandial vomiting had a history of congenital esophageal atresia and anal malformation. The esophagogram showed a tapering narrowing portion at the middle esophagus. Upper gastrointestinal endoscopy revealed esophageal circular stenosis located 18cm from an incisor, but gastrointestinal reflux disease (GERD) was not noted. EUS showed the wall of stenotic segment to be circularly thickened without calcification. 24H pH monitoring did not show any evidence of GERD, and pressure of the lower esophageal sphincter was within normal range. Balloon catheter dilation of the stenotic segment was not effective. The patient was diagnosed as having a fibromuscular thickening type of CES, and underwent surgery. Pathological examination confirmed the diagnosis of CES due to fibromuscular thickening. Case two: A 15-month-old Japanese boy presenting with post prandial vomiting. The esophagogram showed a tapering narrowing portion at the distal esophagus. Upper gastrointestinal endoscopy revealed esophageal circular stenosis located 21cm from an incisor. EUS showed the wall of stenotic segment to be circularly thickened without calcification. 24H pH monitoring did not show any evidence of GERD. Balloon catheter dilation of the stenotic segment was effective. EUS was utilized for diagnosing for a type of CES. These cases serve to demonstrate that EUS may be able not only to diagnose a type of CES, but also to decide an operative strategy. It may be possible to perform a thoracoscopic surgery for CES, which is diagnosed of a type by EUS.

Esophageal/Gastric Surgery–PF190

EXPERIENCE WITH SELECTIVE PROXIMAL VAGOTOMY USING LAPAROSCOPIC COAGULATING SHEARS IN THE TREATMENT OF INTRACTABLE DUODENAL ULCER Kazunori Uchida, M.D., Yoshiteru Ogawa, M.D., Atushi Kodama, M.D., Michimasa Yuba, M.D., Atushi Fujii, M.D. Department of Surgery, Innomo Hospital, Hiroshima, Medical Associated Hospital, Hiroshima, Japan.

Medical therapy is the treatment of first choice for peptic ulcer. However, in cases of intractable ulcer or poor compliance with drug therapy, long-term treatment is necessary because of recurrence, and patient’s QOL suffers. We report a case in which we performed selective laparoscopic vagotomy using inextable duodenal ulcer associated with deformation of the duodenal bulb and obtained favorable results. The patient was a 20-year-old male who was found to have a stage A2 duodenal ulcer during an endoscopic examination of the upper GI tract, and medical therapy was instituted. Despite medical therapy lasting about a year and transient improvement in the patient’s symptoms in response to PPI administration, laparoscopic selective proximal vagotomy and combined pyloroplasty through a small laparotomy were performed when the symptoms of duodenal ulcer repeatedly worsened after switching to an H2 blocker. No evidence of recurrence was detected during gastroscopy 6 months postoperatively, and gastric fluoroscopy showed good peristaltic movements through the pyloric antrum. The patient’s body weight had also increased from 66.5 kg to 70.5 kg. It is now 2 years since the operation, and to date there have been no recurrences, anxiety regarding the ulcer has dissipated, and the patient’s QOL is good.

Esophageal/Gastric Surgery–PF191

GASTRIC MOTILITY AFTER LAPAROSCOPIC ASSISTED DISTAL GASTRECTOMY, WITH/WITHOUT PRESERVATION OF THE PYLORUS FOR EARLY GASTRIC CANCER AS ASSESSED BY DYNAMIC X-RAY IMAGING. T. Urunishi, Ph.D., Y. Kuroda, Ph.D., F. Kuranishi, Ph.D., M. Nakahara, Ph.D., Y. Kodomoto, M.D., H. Momisako, M.D., H. Tahara, M.D., Onomichi General Hospital

[Introduction] Laparoscopic assisted distal gastrectomy is indicated for patients with early gastric cancer. Therefore, motor function preserving gastric surgery should be considered for patients with a tumor located in the corpus. In this study, we assessed postoperative gastric emptying and motility using dynamic X-ray imaging.

[Patients and Methods] Twenty seven patients with preoperative Stage IA gastric cancer underwent laparoscopic assisted distal gastrectomy and D1 lymphadenectomy between April 1998 and February 2001. All of them were classified according to the criteria of the Japanese Research Society for Gastric Cancer. Seventeen patients (nine men and eight women with a mean age of 69 years) underwent laparoscopic assisted distal gastrectomy without preservation of the pylorus (LAG3) for tumors located in the antrum, while 20 patients (ten men and ten women with a mean age of 68 years) underwent laparoscopic assisted distal gastrectomy with preservation of the pylorus (LAG5) for tumors in the corpus. The volume of gastric content was measured by gastrointestinal (GI) X-ray at 0 and 15 minutes to determine gastric emptying ratio, and dynamic X-ray was used every two seconds to obtain the contraction ratio of the pre-anastomotic area and the frequency of peristaltic movement during three minutes to determine the motility index (MI).

[Results] The gastric emptying ratio was 69.6%±24.2% for LAG3 and 44.1%±19.8% for LAPGG, suggesting that gastric emptying was achieved significantly earlier in patients who underwent LAPGG than in those who underwent LAG3 (P<0.01). MI was 3.45±2.81% for LAPGG and 8.46±2.59% for LAPGG, suggesting that postoperative gastric motility was significantly better in patients who underwent LAPGG than in those who underwent LAG3 (P<0.001).

[Conclusion] Our findings indicate that dynamic GI X-ray is useful to evaluate gastric motility after laparoscopic assisted gastric surgery.
**Esophageal/Gastric Surgery–PF193**

**PYLOROPLASTY WITH LAPAROSCOPIC FUNDOPICATION IN THE TREATMENT OF GASTROESOPHAGEAL REFUX DISEASE ASSOCIATED WITH PREOPERATIVE BLOATING**

Vic Velanovich, M.D., Department of Surgery, Henry Ford Hospital, Detroit, Michigan

Bloating is not only a common preoperative symptom associated with gastroesophageal reflux disease (GERD), but also is an untreated symptom of antireflux surgery. It has been shown that patients who undergo either laparoscopic or open Nissen fundoplications have improved gastric emptying as determined by gastric scintigraphy, hence patients do not require pyloroplasty to improve the antireflux effect of a fundoplication. However, it is unclear whether antireflux surgery alone improves symptoms of patients suffering from bloating in addition to their reflux symptoms. This study reports data on the effect of pyloroplasty on bloating symptoms in conjunction with a laparoscopic fundoplication.

During preoperative evaluation, all patients are queried as to associated symptoms of GERD. Those patients who report bloating as a significant component of their symptom complex were further evaluated with gastric emptying scintigraphy. All patients completed a preoperative symptom severity questionnaire for bloating (best possible score 0, worst possible score 5). All patients who had delayed gastric emptying and who were candidates for antireflux surgery, then underwent either a laparoscopic Nissen or Toupet fundoplication with pyloroplasty. At 6 weeks or more follow-up, patients completed the questionnaire and underwent another gastric scintigraphy. 21 patients underwent the combined procedures. 81% reported improved or resolved bloating symptoms, in addition to improved or resolved reflux symptoms. There was a median improvement in bloating score from 4 to 1 (p<0.05). The average gastric emptying time improved from 240 (s.d. 141) mins. to 118 (s.d. 52) mins. (p<0.05).

Although pyloroplasty is not required to improve the effect of antireflux surgery on reflux symptoms, it does improve bloating symptoms in patients with preoperative bloating and delayed gastric emptying.

**Esophageal/Gastric Surgery–PF195**

**COMPARISON OF LAPAROSCOPIC AND OPEN GASTRECTOMY FOR MALIGNANT DISEASE**

Karee Weber, MD*, Christine Reyes, MD*, Michel Gagner, MD*, Celia Divino MD* – Div of Lap Surg, Mt Sinai Medical Center, Div of Min Inv and Lap Surg, Maimonides Medical Center

Few studies have examined a totally laparoscopic approach to partial gastrectomy for malignancy. This study compares the outcome of a series of totally laparoscopic cases with matched open surgeries for the treatment of malignant gastric disease.

A retrospective case-matched study was performed for 25 patients (12 laparoscopic, 13 open). A cohort of open cases performed during the same time period was used for comparison. Parameters measured include intraoperative and postoperative details as well as survival. Statistics were calculated with Two-Sample t-, Fischer exact, and Chi-square tests where appropriate.

Although operative time was increased with laparoscopy (p=0.004), laparoscopy resulted in less blood loss (p=0.03). There was no difference in postoperative use of a NG tube (p=0.82) but patients in the laparoscopic group had earlier return to bowel function (p=0.002). Length of stay was also shorter (p=0.001). In both groups, stage of malignancy ranged from I-IV with no statistical difference. Resected margins in the laparoscopic group were free of tumor, whereas two cases (stage II and III) in the open group had positive margins. Extent of lymphadenectomy was comparable with the average number of nodes resected being 8 (range 4-14) and 11 (range 2-21) for the laparoscopic and open groups respectively (p=0.29). Early follow up at 16 months shows no difference in survival with 75% and 77% of patients alive in the laparoscopic and open groups respectively (p=0.91).

A totally laparoscopic approach to partial gastrectomy is a viable alternative to open surgery. Benefits include a more rapid return of bowel function and reduced length of stay. Laparoscopic techniques for gastric malignancy can obtain adequate margins and follow oncologic principles. Short term follow up shows no difference in survival. However, more time is required to determine any survival advantage between the open and laparoscopic approach to partial gastrectomy for malignant disease.

**Esophageal/Gastric Surgery–PF196**

**ESOPHAGOGASTRIC FISTULA AS A RARE CAUSE OF FAILURE OF LAPAROSCOPIC NISSEN FUNDOPICATION**

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Introduction: Success rates of laparoscopic Nissen fundoplication are reported to be greater than 90% in most large series. Failures are due to technical errors resulting in displaced repair, paraesophageal herniation, or failure to fundoplicate. Technical errors can also lead to failure due to an unrecognized motility disorder or shortened esophagus. Recurrent reflux, dysphagia, or bloating remain the most common complaints in patients who have undergone a failed antireflux procedure.

Case Report: A 43 year old male presented with chronic recurrent reflux despite a previous laparoscopic Nissen fundoplication. His symptoms improved for six months after surgery but then became unresponsive to medical management. Preoperative endoscopy revealed an apparent esophagogastric fistula with a “double lumen esophagus.” Multiple biopsies revealed Barrett’s metaplasia. The patient underwent resection of the esophagogastric fistula through a left thoracotomy. A Collis-Nissen fundoplication was performed to alleviate reflux. At six months, esophagogram showed no recurrent fistula. To date the patient reports marked improvement of his symptoms.

Conclusion: Only five cases of esophagogastric fistula associated with previous Nissen fundoplication have been reported in the literature. Mechanisms postulated to cause esophagogastric fistula formation include ischemia, necrosis, and microperforation secondary to surgical dissection or suture disruption leading to esophageal ulceration and erosion into the gastric fundus. This case represents the first report of successful surgical correction of an esophagogastric fistula.
LAPAROSCOPY ASSISTED PROXIMAL GASTRECTOMY FOR EARLY GASTRIC CANCER

184

Methods: The origin of left gastric artery and left gastroepiploic vessels were clipped and divided, greater and lesser curvature side of the proximal gastric wall were dissected with regional lymph node dissection for early stage of gastric cancer in upper third of stomach. A new surgical technique is introduced and its use in seven patients on reported.

Conclusions: Laparoscopy assisted proximal gastrectomy with regional lymph node dissection for early stage of gastric cancer in upper third of stomach. A new surgical technique is feasible, curative, and minimal invasive procedure.

Esophageal/Gastric Surgery–PF198

Results: We have conducted such operation for 7 patients. Mean operation time was 263min and blood loss was 217ml in average. We have encountered no severe complications with postoperative hospital stay of 17days. Postoperative pain was slight and patient had early bowel movement.

Conclusions: Laparoscopy assisted proximal gastrectomy with lymphadenectomy is feasible for early gastric cancer located in upper third of the stomach. This procedure may be safe, curative, and minimal invasive procedure.

Esophageal/Gastric Surgery–PF199

Flexible Diagnostic & Therapeutic Endoscopy–PF200

RESULTS OF LAPAROSCOPIC GASTRIC BANDING FOR OBESITY CONSIDERING THE PORT FUNCTION

Methods: In a prospective non-randomized comparative study, we analysed port function and related symptoms in an initial series of 50 patients underwent LGB. In 11 patients, the port was placed subcutaneously in the subxiphoid region. In 39 patients, the port was implanted at the left upper side of the abdomen at 15cm from the infra-umbilical region. Patients were examined in 6 weeks intervals during the first 6 months, and subsequently every 6 months.

Results: From July 1997 to August 2000, 50 consecutive patients (12 males and 38 females) with a BMI 48.4 kg/m2 ±6.4 (mean; SD) were operated. Follow-up was complete for 48 patients (median duration 22 months). Eight women and three men underwent subxiphoidport implantation. Male patients had no problems with the port, but one complained that the contours of the port were visible. Seven out of eight women reported pain and inconvenience connected with wearing a brassiere. Two women underwent port reimplantation in the left upper abdomen (one due to infection; one due to pain). All 11 patients had no problems with port function. Among the 39 patients with port implantation in the left upper abdomen, nine patients required port correction (two of them twice). The causes were port dislocation (four patients), difficult port function (three), tube leakage (two after wrong port function, one perforation through connected pin), and infection (one). In one case, the port was replaced, in other cases the local correction was performed.

Conclusion: The high number of complications suggests that the port is the Achilles’ heel of LGB. Although port function was easier at the subxiphoid site, this implantation technique frequently causes pain in female patients.
Flexible Diagnostic & Therapeutic Endoscopy–PFA01

ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY AND PAPILLOTOMY FOR BILE DUCT STONES IN PATIENTS 80 YEARS OLD AND OLDER: A SAFE PROCEDURE

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Objective: To assess the outcome of Endoscopic Retrograde Cholangiography (ERC) and Papillotomy in the treatment of bile duct stones in patients 80 years old and older.

Methods: All consecutive patients who were 80 years old and older and underwent ERC and papillotomy due to choledocholithiasis, were evaluated. Data analysis includes patients age, gender, indication for the procedure, comorbid condition, ASA score, morbidity and mortality.

Results: 37 patients (21 female and 16 male) of a mean age of 86 years old (range 80-90) were evaluated. 15 patients (40.5%) underwent ERC and papillotomy due to obstructive jaundice, 11 patients (29.7%) due to Acute pancreatitis, 6 patients (16.2%) due to Ascending cholangitis and 4 patients (10.8%) due to Acute cholecystitis and concomitant choledocholithiasis. 27 patients (73%) had a preoperative ASA I or II, 3 patients (8%) had ASA III and 4 patients (11%) had ASA IV.

Conclusions: ERC and papillotomy is safe and effective for the treatment of choledocholithiasis in patients 80 years of age and older.

Flexible Diagnostic & Therapeutic Endoscopy–PFA02

IS GASTROSCOPY A VALID DIAGNOSTIC TOOL IN DECTECTING GASTRIC MALT LYMPHOMAS: A DILEMMA BEYOND THE EYE

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Objective: Primary gastric MALT lymphomas are a distinct entity with an indolent clinical course and biologic behavior. They account for 2-8% of all gastric malignancies. We conducted this study to demonstrate the accuracy of gastroscopy in diagnosing gastric MALT lymphomas. We compare our results with those of the world literature.

Methods: Sixty-three consecutive patients with gastric MALT lymphomas were retrospectively reviewed between January 1978 to December 1997. There were 63 patients (36 males and 27 females) with a mean age of 53 years (range 20-80 years). All patients underwent a standard diagnostic evaluation including esophagogastroduodenoscopy and biopsy. Patients were staged according to the revised Musshof modification of the Ann Arbor classification system and histologic evaluation was made according to the classification system for gastric MALT lymphomas.

Results: According to endoscopic findings, the antrum harbored the neoplasm in 31 patients (49%), the body in 38% (twenty four patients) the fundus in 4% (3 patients) while in five patients (8%) the neoplasm occupied the entire stomach. Macroscopic appearance was not pathognomonic of the disease. At endoscopy three main patterns were recognized, a) ulcerative in 32 patients (51%), b) polypoid in 21 patients (33%), and c) diffuse infiltrative in 10 patients (16%). The neoplasm was characterized as a benign disease in twenty-four patients (38%) with malignancy being suspected in thirty-nine patients (62%). Endoscopy displayed a sensitivity of 61% in detecting malignancy, however in detecting lymphomas the sensitivity dropped to 27%.

Conclusions: Upper endoscopy has a low sensitivity in defining MALT gastric lymphomas from other gastric benign and malignant pathologies only by its gross morphological appearance. Endoscopic pattern of MALT lymphoma is not disease specific and may mimic other various pathologies of this area. Final diagnosis should be confirmed only by histological examination.

Flexible Diagnostic & Therapeutic Endoscopy–PFA03

COLONOSCOPY IN OCTOGENARIANS

Jorge Lapares-Garcia, MD; Seth Rosen, MD; Eric Weiss, MD; Juan Nogueras, MD; Anthony Vernava III, MD; Jonathan Efron, MD; Steven Wexner, MD, Cleveland Clinic Florida, Weston, FL.

Colonoscopy in octogenarians is a safe diagnostic and therapeutic tool. The 4% rate of endoscopic findings of colon cancer is significantly higher than in other age categories. The objective of this study was to evaluate if previous endoscopy performed in octogenarians decreases the likelihood of a diagnosis of carcinoma in subsequent exams.

A retrospective review of patients >80 years of age that had colonoscopy between June 1999 - June 2001 was performed. Age, gender, medications, indications, procedural demographics and complications, completion rates and endoscopic and pathologic findings were recorded. Single or multiple polyps, <1 or >1cm in size were also recorded. These patients were divided into 2 groups: those with a recorded previous endoscopic exam (Group A) at our institution and those without prior endoscopic examination (Group B).

244 patients had colonoscopy during the study period; 49% were female. There were 89 (36.5%) patients in Group A and 155 (63.5%) in Group B. Complications, mortality and completion rate were 4%, 0% and 94%, respectively. Biopsy-proven cancer was diagnosed in 11 patients (4.5%). Females less often had a previous endoscopy (29%) compared to males (43%) (p=0.03). The use of medications that can cause bleeding diathesis was not significant between the groups (p=0.05). Bloody stool or change in bowel habits were more common indications in Group B (p=0.05), whereas patients in Group A were more likely to have a history of polyps or carcinoma (p=0.05). All 11 patients diagnosed with cancer had never had prior endoscopy (p=0.00). Single or multiple polyps and polyps >1cm were not statistically significant between the two groups, however polyps <1 cm were more prevalent in Group A (45%) than B (31%).

Colonoscopy is a safe method of invasive examination in octogenarians. A single prior endoscopy performed in this group of patients greatly decreases the likelihood of malignant findings on subsequent examinations.

Flexible Diagnostic & Therapeutic Endoscopy–PFA04

REMOVAL OF ESOPHAGEAL EXPANDABLE METAL STENT: DESCRIPTION OF TECHNIQUE AND REVIEW OF POTENTIAL APPLICATIONS

Donald E. Low, M.D., Richard A. Kozarek, M.D., Departments of Thoracic Surgery and Gastroenterology, Virginia Mason Medical Center, Seattle, Washington.

BACKGROUND: Expandable metallic stents (EMS) have seen wide application in patients with malignant stricture and fistulae. They have not seen wide application in benign disease due to concern over acute complications and long-term sequelae.

METHODS: Between June 1999 and October 2000 six patients with EMS in place for malignant stricture (3), benign stricture (1), anastomotic leak (1) and benign esophagorespiratory fistula (1) had their stents endoscopically removed. Removal was carried out secondary to complications (secondary stricture 1, epipdual abscess, 1, diskits 1) or resolution of fistula (2) or anastomotic leak (1).

RESULTS: Four patients had one EMS, Ultraflex (3), Z-stent (1). Two patients had 2 stents (Ultraflex and Z-stent) retrieved simultaneously. No procedurally related complications occurred. Two patients with esophageal cancer required additional stents. All three patients with benign fistula and stricture recovered uneventfully.

CONCLUSIONS: The safe removal of current brands of EMS may facilitate the wider application of these devices to include selective patients with benign disease.
Flexible Diagnostic & Therapeutic Endoscopy–PF205

CAUSTIC INJURY OF THE UPPER GASTROINTESTINAL TRACT - A TWENTY YEAR EXPERIENCE IN AN URBAN HOSPITAL. Tim McGuire, M.D., Choichi Sugewa, M.D., Charles E. Lucas, M.D., Satoshi Tokioka, M.D. Department of Surgery, Wayne State University, Detroit, Michigan.

Causative injury to the alimentary canal continues to be a challenging problem requiring emergency medical and/or surgical intervention. Over the last 20 years, 55 adult patients were admitted and treated for the ingestion of caustic materials. Injured patients underwent early endoscopic evaluation. Ingested materials and severity of injury varied according to ingested agent.

<table>
<thead>
<tr>
<th>Extent and Severity of Injury</th>
<th>Esophagus</th>
<th>Stomach</th>
<th>Duodenum</th>
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<tbody>
<tr>
<td>Strong acid (9 pts)</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Strong alkali (22 pts)</td>
<td>12</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Bleach, ammonia</td>
<td>12</td>
<td>6</td>
<td>1</td>
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<tr>
<td>And detergent (21 pts)</td>
<td>10</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Others (3 pts)</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Grade 1 (erythema) – mild</td>
<td>1</td>
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<td>Grade 2 (superficial ulceration) – severe</td>
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There were no complications due to endoscopic examination. Forty-five patients were treated non-operatively and ten patients required operations. No patient who had ingested bleach, ammonia, detergent, or other substances required surgery. Conclusion: (1) Panendoscopy after caustic ingestion can be performed safely. (2) The ingestion of strong acid or alkali may produce profound pathologic changes which may require surgery for perforation or structure. (3) Bleach, detergent, or ammonia usually cause mild injuries which respond well with medical treatment.

Flexible Diagnostic & Therapeutic Endoscopy–PF206

COMPARISON OF SURGICAL VERSUS ENDOSCOPIC PALLIATION OF Pancreatic Cancer. Mario Murgia MD, Gerald Larson MD, Jose Sorrentino MD, Gary Vitale MD, Dept. of Surgery, Univ. of Kentucky, Lexington, KY

For 60-70% of patients (pts) with cancer of the head of the pancreas, palliation is the treatment objective. We have frequently been consulted to perform intervention endoscopic in non-resectable cases to relieve symptoms, especially jaundice. The purpose of this study is to compare surgical versus endoscopic treatment.

Methods - We reviewed our registries for pts treated for pancreatic cancer from 1990-2000. 129 pts were identified and grouped according to treatment intent; Group I - open surgical with choledochojejunostomy and/or gastrojejunostomy (47 pts), Group II - endoscopic with biliary stenting (33 pts). Twenty-nine pts who had curative resection and 21 pts with terminal disease were excluded from the study. Relief of jaundice, obstruction, weight loss, and pain were analyzed 1, 3, 6, and 12 months.

Results - The mean age of the pts was 65 years. The average survival in months was: Group I (surgical) 5.6 ± 4.8%, Group II (endoscopic) 5.7 ± 5.4%. The complication rates for Groups I and II were 21% and 12% respectively. All pts presented with jaundice and most noted weight loss, pain, and anorexia. For Group I, jaundice relief was 75% and 90% at 3 and 6 months versus 62% and 87% for Group II. Pain and weight loss were similar in the surgical and endoscopic groups and persisted until pt death. One pt in the endoscopic group II developed duodenal obstruction and was treated with endoluminal stenting. Group II stent changes at 3 month intervals were frequently necessary to prevent clogging or cholangiograms.

Conclusion – Endoscopic stenting is as effective as surgical bypass to relieve jaundice but neither has much impact on pain and weight loss. An advantage for endoscopy is a lower complication rate and less time in hospital. We conclude that endoscopic palliation of pancreatic cancer is as effective as the open surgical procedures.

Flexible Diagnostic & Therapeutic Endoscopy–PF207

INTRAOPERATIVE ENTEROSCOPY IN THE EVALUATION OF SMALL BOWEL DISEASE: INDICATIONS AND TREATMENT ALGORITHM FOR THE SURGEON. Matthew E. Newlin MD, Michael Taxier MD, Oscar R. Ruiz MD. Departments of General Surgery and Gastroenterology, Riverside Methodist Hospital, Columbus, Ohio

Introduction: Intraoperative enteroscopy (IOE) represents a final modality for the evaluation of the small bowel when other modalities have failed to provide a diagnosis. This paper addresses the surgeon and his/her role in the use of IOE to evaluate occult gastrointestinal bleeding, radiographic abnormalities, or obstructive lesions in the small bowel.

Methods & Procedures: A literature search and review was performed and recent case studies involving the use of intraoperative enteroscopy were reviewed. The authors review the technique and indications for IOE, describe two pertinent case reports involving the use of IOE, and develop an algorithm for the use of IOE by the surgeon.

Results: Literature reviews and two specific case reports demonstrate the theoretical and practical principles of IOE.

Conclusions: The intraoperative endoscopic evaluation of the small bowel is safe and effective when used in managing highly selected patients with GI bleeding, obstruction, or radiographic abnormalities. When used appropriately and with a team approach that involves both the endoscopist and surgeon, video enteroscopes, and locally agreed-upon algorithms, intraoperative enteroscopy can help assure successful management of several difficult clinical problems.

Flexible Diagnostic & Therapeutic Endoscopy–PF208

THE TREATMENT OF UNRESECTABLE ESOPHAGEAL CANCER WITH SELF-EXPANDING STENTS. Jaroslav Sekac, M.D., Vladimir Kostka, M.D., Peter Labas, M.D., PhD., Bernard Ohradka, M.D., PhD., Richard Reis, M.D. Department of Surgery, Bratislava, Slovak republic

Relief of dysphagia and restoration of oral alimentation must be the main aim of patients with esophageal cancer, which have locally advanced or metastatic disease. A new class of expandable metallic stents has been developed in an attempt to reduce the complications known to be associated with rigid tubes. The aim of this study is to compare classic rigid tubes with placement of expanding metal stents with regard to improvement of dysphagia, therapy associated complications, effectiveness and costs.

In the period of the last 12 months we treated at our surgical endoscopic unit 6 patients with unresectable esophageal tumors. At 3 patients /group 1/ we introduced rigid stent and at 3 patients /group 2/ we introduced self-expandable metallic stent. Both treatments were able to significantly improve dysphagia. No treatment related death was observed in both groups. One patient required conversion to laparotomy and preoperatively we replaced rigid stent because of perforation of esophagus and stomach.

The treatment of unresectable esophageal cancer with self-expanding metallic stents appears to be simple, safe method.
Flexible Diagnostic & Therapeutic Endoscopy–PF210

COMPARISON OF ENDOSCOPIC SCLEROTHERAPY VERSUS ENDOSCOPY-ASSISTED ABLATION OF ESOPHAGEAL VARICES: Daniel Ziegler, Charles Webber, Jr., M.D., Fernando Garcia, M.D., Caren Eisenstein, M.D., David McReynolds, M.D., Geno Tellez, M.D., Tom Connors, M.D., John Peter Smith Hospital, Department of Surgery

Introduction: Esophageal variceal bleeding is a serious sequela of liver disease. Endoscopic sclerotherapy and endoscopic ligation (banding) are accepted treatments of varices and recommended for the prevention of rebleeding. The purpose of this study is to determine if one is more efficacious.

Method: Retrospective analysis from 1992 to 2000 of patients presenting with acute bleeding from esophageal varices and treated with either endoscopic sclerotherapy or banding at an indigent care hospital. Patients had a minimal follow up of one year.

Results: There were 101 patients treated with sclerotherapy and 80 patients treated with banding. There was no difference in the incidence of variceal rebleeding, 34% for sclerotherapy and 32.5% for banding. Obliteration of the varices and survival was achieved in 17 patients (17%) with sclerotherapy and in 21 (26%) with banding. There was no difference in the rate of non-compliance with scheduled follow-up endoscopy exams between the two groups, 29% and 28%. The mortality was 34% in the sclerotherapy group and 24% in the banding group. Patients in the banding group with Child-Pugh class C had a significant lower mortality rate, 36%, than patients in the sclerotherapy group with class C, 63%, p < .05. When combining the two treatment groups, there was significantly less rebleeding in patients with Child-Pugh class A compared to class B and C, 20% versus 36% and 38%, p < .05.

Conclusion: Both sclerotherapy and banding can be used to treat varices but will have a 30% recurrent bleeding rate. Child-Pugh class A patients are more likely to be successfully treated than patients in class B and C. Banding in patients with class C may have a reduced mortality rate when compared to sclerotherapy. Compliance is a difficult issue in indigent care. Further studies are needed to determine which method of treatment is best suited for this patient population.

Hepatobiliary/Pancreatic Surgery–PF211

STRATEGY OF LAPAROSCOPIC HEPATECTOMY FOR EXTRAHEPATIC GROWING TUMOR, Sumito Takei, M.D., Hironori Kaneko, M.D., Akira Tamura, M.D., Kunihiro Yamazaki, M.D., Masaaki Yoshino, M.D., Masaru Tsuchiya, M.D., Naoki Joubara, M.D., Yuicho Otuka, M.D., Tosho Katagiri, M.D., Tetsuya Maeda, M.D., Tadaaki Shibuya, M.D., Second Department of Surgery, Toho University, School of Medicine, Tokyo, Japan.

Introduction: The purpose of this study was to evaluate the varying difficulties and required instrumentation for performing laparoscopic heptectomy (LH) on the basis of a lesion—aortic extrahepatic growing (EG) rate calculated by computed tomography (CT).

Methods and Procedures: Laparoscopic partial heptectomy cases were divided into two groups: an EG tumor group (n=10) and an intrahepatic tumor group (n=8). The surgical procedures, operative results, and laparoscopic instrumentation were compared between these groups based on the EG rate (%; maximum diameter of tumor pedicle/maximum vertical diameter of tumor x 100).

Results: In the EG tumor group, mean operative time was significantly shorter and the mean blood loss was significantly less than that of the intrahepatic tumor group. In addition, mean operative time and mean blood loss demonstrated significant differences between the values associated with the different EG rates in the EG tumor group (p<0.05, p<0.01). The selections of laparoscopic instruments based on the EG rates were; 1) 50%-89% resection in combination with a microwave tissue coagulator and an ultrasonic surgical aspirator [12 cases (including intrahepatic tumor cases)] 2) 51-200% resection with laparoscopic coagulating shears (4 cases) 3) 201% and… resection with a laparoscopic linear stapler (2 cases).

Conclusions: Our preliminary experience leads us to believe that the EG rate calculated by CT scan is useful for formulating the technical strategy of a subsequent LH procedure.

Flexible Diagnostic & Therapeutic Endoscopy–PF209

THE ROLE OF FLEXIBLE THERAPEUTIC ENDOSCOPY (FTE) AND INTERVENTIONAL RADIOLOGY (IVR) FOR THE HEPATO-BILIARY-PANCREATIC (HBP) SURGICAL DISEASE, Kentaro Yamagawa, M.D., Junji Kawasaki, M.D., Masako Mori, M.D., Taku Iida, M.D., Shintaro Yagi, M.D., Kenji Hamada, M.D., Kouji Fuji, M.D., Shugo Mizuno, M.D., Makoto Iwata, M.D., Masami Tabata, M.D., Hajime Yoko, M.D., Shoji Isaji, M.D., First Department of Surgery, University of Tokyo School of Medicine,

FTE and IVR have been recently advanced and applied to an alternative treatment of HBP surgical disease, and for periperooperative complications of HBP surgery. We report our experience of FTE and IVR for HBP surgical disease in the last 7 years. From July 1994 through June 2001, in our department of Mie university hospital, the medical records of 546 patients (malignancy 289, benign 257) with HBP surgical disease were reviewed. Out of 546 patients, 498 operations including 102 of hepatic resections, 59 of pancreatoduodenectomy, 247 of other surgery, 32 of FTE and 28 of IVR, were performed. Out of 32 cases with FTE, 19 (59.4%) of endoscopic special stone (CBD) stone, calculous chronic pancreatitis and foreign body in CBD, 7 of lithotomy under percutaneous transhepatic cholangioscopy for biliary tract stones, 3 with insertion of expandable metallic stents (EMS) for stenosis of CBD, 2 with removal of CBD stone in the anastomotic tube case with endoscopic resection of papilla Vater carcinoma complicated with severe bronchial asthma, were performed. We finally made a success of all procedures of FTE, but a case of calculous chronic pancreatitis was complicated by biliary leak. All procedures with insertion of biliary EMS by IVR were succeeded, but 2 cases of portal venous EMS were complicated by thrombosis. The recent advanced technique of FTE and IVR play an important role in minimally invasive treatment for complicated patients of HBP surgical disease and complications after HBP surgery.

Thoracoscopy–PF212

HIGHLY SELECTIVE SYMPATHOTOMY Abdullah Al Dohayan MD; Ahmed Al-Otaybi MD; Amal,Abdulkarim MD; Abdulazim EI-Dawlaty MD; Mohammed Al-Ageely, MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

The purpose of this study is to compare the efficacy and safety of thoracoscopic cutting of postganglionic fibers and transthoracic endoscopic sympathectomy.

The work was done after doing thorarcthacic unilateral sympathectomy for eight patients. The patients were anesthetized using single lumen tube, with continuous flow of carbon dioxide at pressure of 10mm Hg. We have managed 20 patients complaining of hyperhydrosis in King Khalid University Hospital, Riyadh, Saudi Arabia.

The procedure started by diathermizing post ganglionic fibers of the second, third and fourth sympathetic chain. Then the sympathetic chain will be excised. The hand temperature raised by 2-3 degree c. in contrast, the second technique rises the temperature 0.0.5 degree c. in contrast, the second technique rises the temperature 0.0.5 degree c. more. All patients had smooth post operative recovery and were discharged within 24 hours. Cutting post ganglionic sympathetic nerve fiber may replace excision of the sympathetic chain.

Thoracoscopic sympathectomy is standard treatment for hyperhydrosis. However, the complication of this procedure may limit its success. Rebound hyperhydrosis may cause more serious problems than the initial symptoms. All available surgical techniques for hyperhydrosis have this problem. The need of new technique is required to avoid side effects and highly selective sympathectomy may be useful new technique.
**Thoracoscopy-PF213**

**THE USE OF NON-CONTACTED AND WIDE SPREAD Nd:YAG LASER TIP WITH Y-SHAPED STOPPER IN THORACOSCOPIC LUNG VOLUME REDUCTION SURGERY FOR DIFFUSE CHRONIC EMPHYSEMA.**

Akioshi Akashi, MD; Norihisa Shigemura, MD; Tomoyuki Nakagiri, MD; Hajime Yamazaki, MD; Yoshihiro Kitayama, MD; Toshikiro Okada, MD; Shigeto Maeda, MD; Satoshi Matsuzaka, MD; and Hiashi Kosaka, MD.

Department of Thoracic Surgery and General Surgery, Takarazuka Municipal Hospital, Hyogo, Japan.

By the use of non-contacted and wide spread Nd:YAG laser tip with original Y-shaped stopper, we performed video-assisted thoracoscopic surgery (VATS) for lung volume reduction surgery (LVRS) of patient with chronic diffuse emphysema. To clarify its usefulness, retrospective study was performed about indication, complication, and pulmonary function.

From 1997 to 2001, 42 cases with chronic emphysema which underwent VATS procedure by both the stapler lung resection and the laser ablation using our original non-contacted and wide spread Nd:YAG laser tip with Y-shaped stopper, which can radiate laser about 25 times as wide as the previous one, were analyzed.

41 men and one woman with a mean age of 69, ranged from 55 to 92 years. 18 cases (43%) underwent bilateral LVRS procedure, and 27 cases (52%) underwent lateral LVRS procedure. There were no operative death. There were four operative complications (9%) including prolonged air leakage (>14 days) in 2, pneumonia in 1, and bleeding from the costal artery in 1. The mean hospital stay was 21 days, varied from 10 to 41 days. As the comparison of respiratory function between pre- and post-operation, bilateral and lateral LVRS presents significant improvement in PO2, PCO2, FEV1.0, H-J, and 6-minutes walking distance at 1 year after the operation (p<0.001). The mean follow up duration was ranged from 3 to 47 months. The three-year survival rate is 86.9% for all cases, 78% for unilateral cases, and 100% for bilateral cases.

Thoracoscopic LVRS by using our original devices would be performed effectively and safely in a municipal hospital.

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**Thoracoscopy-PF215**

**LAPAROSCOPIC PERCUTANEOUS REPAIR OF INCISIONAL HERNIA.**

Abdullah Al Dohayan, MD; Ahmed Al Otiabi, MD; Amal Abdulkarim, Osman Noraldin, Abduazim Al Dawlatly, MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Incisional Hernia is a well-known complication of abdominal surgery. As high as 4% of patients who undergo abdominal surgery develop incisional hernias. Procedures for repair of these hernias include the standard open suturing technique, with or without the use of a mesh. However, several complications have been reported following the open technique such as long skin scars, hernia recurrence (recurrence rate of up to 40%), infection, hematoma, rejection of the mesh, bowel injury and fistula formation. The introduction of laparoscopic surgery has opened a new field in the management of incisional hernias. Advantages of the laparoscopic technique include small incisions, a well known decrease in the rate of wound complications, which may lower hernia recurrence and the ability to release bowel adhesions under magnification. Recently, pure laparoscopic technique using goblet (PTFE) mesh has been reported. In that technique the fascial edges are not approximated and the mesh is sutured to the fascial defect from the inner (Abdominal) rather than the outer (Subcutaneous) surface. We have developed a new laparoscopic technique to repair incisional hernias and labeled it “The percutaneous laparoscopic technique”. Through small skin incisions, the laparoscopic is used and release bowel adhesions. Through small incision, the sac is excised and fascial edges are then approximated by sutured. Finally a marlex mesh is sutured on the outer (Subcutaneous) surface to augment the fascial repair. This “Percutaneous” technique has been used successfully in 18 patients at our institution.

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**Thoracoscopy-PF214**

**THORACOSCOPIC MANAGEMENT OF HYPERHYDROSIS (SYMPATHECTOMY, SYMPATHTOCMY, SYMPATHETIC CLIPPING).**

Abdullah Al Dohayan, MD; Mohammed Al Sebly, MD; Othman Noraldin, MD; Amal Abdulkarim, MD; Ahmed Al Otiabi, MD; Mohammed Al Skaini, MD; Ali Al Tuwairj, PhD; Abdulaziz Al Saigh, PhD; Department of Surgery and Physiology, King Khalid University Hospital, Riyadh, Saudi Arabia.

Hyperhydrosis is a common disease. More than 1200 procedures were performed for patients with hyperhydrosis.

Available techniques are sympathectomy, sympathectomy, highly selective sympathectomy, and sympathectomy, utilising thoracoscopic techniques.

These procedures have advantage and side effects. The management of single hand will minimize the complications. Thoracoscopic clipping of the sympathetic chain is seemed to be the most suitable operation, with fewer side effects.

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**Thoracoscopy-PF216**

**COMPARISON BETWEEN THORACOSCOPIC SYMPATHECTOMY AND SYMPATHTOCMY CLIPPING.**

Abdullah Al Dohayan, MD; Mohammed Al Ageely, MD; Ahmed Al Otiabi, MD; Amal Abdulkarim, Osman Noraldin, Abduazim Al Dawlatly, MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Thoracoscopic clipping is a new procedure with limited experience. Prospective study was carried out comparing the efficacy of T2-T4 sympathectomy versus clipping at level of Ts. Twenty patients were enrolled in study. Sympathectomy was done for the right side (Group A) and sympathetic clipping for the left side (Group B). Postoperative recovery, satisfaction of patient, and pain were assessed. Thoracoscopic sympathetic clipping is effective as thoracoscopic sympathectomy. Thoracoscopic sympathetomy is performed using 3mm incisions. On the other hand, thoracoscopic clipping is carried out using 1cm incision. Postoperative analgesias consumption rate is more in the sympathectomy group. Thoracoscopic clipping is effective as thoracoscopic sympathetomy. Longer follow is needed to assess the real success.
**Thoracoscopy-PF217**

THORACOSCOPIC THYMECTOMY FOR PATIENTS WITH MYASTHENIA GRAVIS. (EXTENDED THYMECTOMY THROUGH COLLAR INCISION WITH VIDEO-ASSISTED THORACIC SURGERY) Motoi Aoe MD, Akio Andou MD, Nobuyoshi Shimizu MD, Yoshihumi Sano MD, Kazunori Okabe MD, Hiroshi Date MD, Department of Surgery II, Okayama University Medical School, Okayama-city, JAPAN.

The complete removal of thymic tissue from the thoracic cavity is the most important point of the thymectomy for myasthenia gravis (MG). We think only the trans-cervical approach is not enough to accomplish the total removal of thymic tissue, because we could not reach the pericardial fat tissue through the small incision. Up to date, we have performed extended thymectomy (Total removal of the thymus and intra-thoracic fat tissue) through collar incision with thoracoscopic technique for twenty seven MG patients (Age: 16-71 y.o., OSSERMAN Classification I-III). The thymus and intra-thoracic fat tissue were completely removed from the patients without any difficulties and their post-operative courses were uneventful. This method is benefit for patients from the point of cosmetics and provides the equivalent result of extended thymectomy with other techniques (Remission rate 40.2%, Improvement rate 88.3%). This time, we will report the summary of these cases and the usefulness of video-assisted thoracoscopic technique for extended thymectomy.

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**Thoracoscopy-PF219**

VIDEO-ASSISTED SURGERY FOR PERSISTENT THORACIC FLUID COLLECTION Yoshiro Hamada, M.D., Akio Otaki, M.D., Toshiro Ogata, M.D., Yasuo Morishita, M.D. Department of Surgery, Kitakanto Cardiovascular Hospital, 2nd Department of Surgery, Gunma University School of Medicine, Maebashi, Japan

With the use of video-assisted thoracoscopic surgery, we successfully treated two cases of thoracic fluid collection failed to respond to the tube drainage. In both cases, pleural cavity was occupied with a fibrin deposit, fluid, and clot, and the fibrous membrane surrounded the surface of the lung. The operation consisted of the removal of fibrin deposit, the dissection between the chest wall and lung, and the removal of the fibrous membrane which interfered with the expansion of the lung. Case 1. A 21 year-old woman was transferred to the hospital with complaints of dyspnea, fever, and tachycardia. A chest roentgenogram showed that left lung was collapsed with effusion. On chest CT scan, low-density area was occupied a major part of left thoracic cavity. At operation, fibrin and water was removed and lung was freed from the thorax by sharp and blunt dissection. Fibrous membrane surrounding the lung was removed as much as possible. The operation time was 6 hr and bleeding was 300ml. Chest tube was removed at 7th postoperative day and the patient was discharged at 11th day. Case 2. A twenty-eight year old man was consulted for surgical treatment against the repetitive collection of exsanguinous pleural effusion. On chest CT scan, low-density area was occupied a major part of right thoracic cavity. At operation, Clot, exsanguinous fluid, and fibrin, which filled in the cavity, was removed and the adhesion was dissected so that the lung was freed from the thorax. Fibrous membrane surrounding the lung was removed extensively. The operation time was 6.5 hr and bleeding was 1200ml. 3 unit of bank blood was transfused. Chest tube drainage was removed and he was discharged on sixth and seventh postoperative day, respectively.

In conclusion, video-assisted thoracoscopic surgery affords less invasive operation and shorter hospital stay.

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**Thoracoscopy-PF218**

NEEDLESCOPIC BILATERAL THORACIC SYMPATHECTOMY STEPHEN E. BURPEE M.D., CHRISTOPHER M. SCHLACHTA M.D., JOSEPH MANAZZA M.D., KENNETH PACE M.D., ERIC C. POULIN M.D., THE CENTER FOR MINIMALLY INVASIVE SURGERY, ST. MICHAEL'S HOSPITAL, TORONTO, ONTARIO, CANADA

Introduction: The purpose of this study was to evaluate the safety and efficacy of needlescopic bilateral thoracic sympathectomy.

Methods: Thirty-six patients (24 female, 12 male) underwent bilateral needlescopic sympathectomy from 6 to 32 months post operatively. The procedure consisted of resecting the sympathetic chain from T2 to T4. The first four cases were performed using two 10 to 15mm incisions and the last 32 were performed using needlescopic instrumentation with two 3mm trocars and one 5mm trocar per side without the need to collapse the lung.

Results: 34 patients were operated on for palmar hyperhidrosis while 2 had severe facial blushing. Mean operating time was 93.5 minutes. Estimated blood loss was a median of 10 ml. Three patients had significant intra operative bleeding (1200, 250 and 200ml) but there were no transfusion requirements and no conversions. Chest tubes were required in 6 patients: three with intra operative bleeding, two patients had minor parenchymal injuries and one patient had a concomitant bulllectomy. There were no mortalities. Median length of stay was one day. All 36 had resolution of their symptoms with no recurrences. There were no cases of Horner’s Syndrome or intercostal neuralgia. Compensation was noted in 76% at 1 month and 78.9% at six or more months. This was classified as mild by 47%, moderate by 40% and severe by 13%. Only 1 patient reported being dissatisfied by their results, while 95% were very satisfied.

Conclusion: Needlescopic bilateral thoracic sympathectomy is a safe and efficacious procedure with a high degree of patient satisfaction.

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**Thoracoscopy-PF220**

INTRALOBAR AND EXTRALOBAR PULMONARY SEQUESTRATION TREATED BY VIDEO-ASSISTED THORACOSCOPIC RESECTION IN CHILDREN H. Ishibashi, M.D., H. Takehara,M.D., M. Oshita,M.D., S. Tashiro,M.D.Department of Surgery, University of Tokushima School of Medicine, Tokushima, JAPAN

Pulmonary sequestration refers to a malformation of the lung, which usually receives blood supply from one or more anomalous systemic arteries. There are two forms of sequestration: intralobar and extralobar. Surgical resection is a choice of treatment for pulmonary sequestration with infection.

Video-assisted thoracoscopic surgery has been recognized as a surgical technique that is evolving rapidly. We reported two cases of an intralobar and an extralobar pulmonary sequestration in children which was treated with video-assisted thoracoscopic resection successfully.

Case 1: 2-year-old boy who received repair for left postero-lateral diaphragmatic hernia was diagnosed to have an extralobar pulmonary sequestration above the left diaphragm. Blood supply was received from thoracic aorta. The patient underwent a video-assisted thoracoscopic surgical removal of extralobar pulmonary sequestration.

Case 2: 1-year-old girl, who had an episode of recurrent pneumonia, was diagnosed to have an intralobar pulmonary sequestration in the right lower lobe. Blood supply was received from thoracic aorta and CT scan showed a large cystic mass in the right lower lung field. The patient underwent a video-assisted thoracoscopic right lower pulmonary lobectomy.

Postoperative courses were uneventful in both patients. Video-assisted thoracoscopic approach should be considered in children both for better cosmetic results and for more rapid recovery of general conditions.
**Thoracoscopic-PF221**

**THE APPLICATION OF ULTRASONICALLY ACTIVATED TROCARS SYSTEM TO THE INSERTION OF THORACOSCOPIC TROCARS.** Masatoshi Kurihara, M.D., Katsumi Inami, M.D., Yoshitaka Takeo, M.D. Pneumothorax Center, Nippon Yamagawa Hospital, Tokyo, Japan.

Small bleeding and blood dropping into thoracic cavity are often experienced during thoracoscopic surgery. It is because of vascular injuries related with the insertion of trocars. They always make thoracoscopic operation more difficult. Though thoracic wall often cause the difficulty of the insertion of trocars into thoracic cavity. The purpose of this study is to evaluate if ultrasonic surgical system can be actually applied to the insertion of thoracoscopic trocars.

Ten pneumothorax patients received the thoracoscopic surgery. Ultrasonically activated trocar system is newly developed by Olympus Corporation. The system is composed of an 11mm ultrasonically activated trocar and a generator (Sonomug GZ frequency: 13.5 KHz, Olympus). 12mm diameter trocars (Endopath: Ethicon) were inserted into thoracic cavity on one part of chest wall in ten patients. 12mm diameter ultrasonically activated trocars were inserted on ana other part of chest wall in the ten patients. Each of intercostal muscles were partially resected after operation. Each of them were endoscopically and microscopically evaluated after that.

There was no small bleeding and blood dropping into thoracic cavity from stab wounds in ten cases of ultrasonic activated trocars system as well. However there was small bleeding or blood dropping into the cavity in seven cases of conventional trocars system. There was endoscopically small bleeding into stab wounds and microscopically vascular injuries and tearing of muscle fibers in conventional trocar system. However there was no endoscopic small bleeding and no microscopic vascular injuries and tearing of muscle fibers in ultrasonic activated trocar system.

Ultrasonically activated trocar system is less invasive and can easily insert trocars to chest wall in thoracoscopic surgery. However the system needs more development regarding downsizing and simplicity.

**Thoracoscopic-PF222**

**THORACOSCOPIC ESOPHAGECTOMY FOR A CASE OF LOCAL RECURRENCE AFTER RADIATION THERAPY.** Takahiro Mori, M.D., Ph.D., Shukichi Miyazaki, M.D., Go Miyata, M.D., Ko Sugawara, M.D., Hirofumi Ichikawa, M.D., Ph.D., Takashi Kamei, M.D., Shunisuke Shibuya, M.D., Susumu Satomi, M.D., Noriaki Ohuchi, M.D., Ph.D., Division of Surgical Oncology, Tohoku University School of Medicine, Sendai, Japan.

[Introduction] We have been clinically applying thoracoscopic esophagogastrectomy for esophageal cancer patients since 1995, and have reported that we successfully obtain survival curve as the conventional esophagogastrectomy. On the other hand, it has been reported that radiotherapy plays a leading role in treating esophageal cancer patients, and combination of surgery and radiotherapy is thought to be more important to get higher control rates of esophageal cancer. We report here a case of local recurrence after complete response to radiotherapy who underwent thoracoscopic esophagogastrectomy with three-field lymph node dissection.

[A case] Patient S.C., aged 74 years, was hospitalized for upper-thoracic esophageal cancer, and underwent radiotherapy from thoracic esophageal cancer, and undertook radiotherapy from thoracic esophageal cancer. We report here a case of local recurrence after complete response to radiotherapy who underwent thoracoscopic esophagogastrectomy with three-field lymph node dissection.

[Technique] All the procedures were performed under general anesthesia with a double lumen endotracheal tube. The patient was placed in a left lateral position. Ipsilateral ventilation was discontinued to collapse the lung. An 12mm trocar was inserted through the 7th intercostal space in the mid-axillary line for a 10mm 30-degree rigid thoroscope. The operators left hand was inserted into the right thoracic cavity via the retro-sternal space through a mid upper abdominal incision without opening the abdominal cavity. An additional trocar was placed in the 4th intercostal space, anterior axillary line for surgical instruments. Another trocar was placed in the auscultatory triangle, if necessary. The left hand retracted the right lung, to secure the surgical field for esophagogastrectomy. Thoracic esophagogastrectomy and systematic mediastinal lymph node dissection were accomplished. Since August 1998, We accomplished 7cases of esophageal cancer in this method. =-These total operation times were 330-395min. The mean operation time was 365min. These blood loss were 250-600ml(mean 450ml). Postoperative death was one MRSA enterocolitis, and morbidity was one damage of left main bronchus and three wound infection and one recurrent nerve palsy.

The postoperative hospital stay was 20-165days (median 27days) for inpatients. He stays in disease-free status without any significant complications.

[Conclusion] Thoracoscopic procedure is also clinically available for patients of local recurrence for radiotherapy.

**Thoracoscopic-PF223**

**TECHNICAL FEASIBILITY OF THORACOSCOPIC SEGMENTECTOMY OF LUNG.** Toshiyuki Morikawa, M.D., Ph.D., Mitsuhiro Kaji, M.D., Ph.D., Setsuyuki Ohtake, M.D., Ph.D., Ryunosuke Hase, M.D., Yasuhiro Takahashi, M.D., Shuniti Okushiba, M.D., Ph.D., Satoshi Kondo, M.D., Ph.D., Hiroyuki Katoh, M.D., Ph.D., Surgical Oncology, Division of Cancer Medicine, Hokkaido University Graduate School of Medicine

[INTRODUCTION] In the terms of lung preserving technique, segmentectomy is the most appropriate operation. On the other hand, video-assisted technique is preferred to deteriolated patients for its minimal invasiveness. We assessed if lung segmentectomy is routinely achieved by means of thoracoscopy.

[METHODS AND PROCEDURES] From April 1997 through March 2001, we prospectively attempted thoracoscopic procedure for any patient who were indicated for lung segmentectomy. Twenty-four patients were entered, among which 16 were male and 8 were female, whose age ranged 28 to 87 (averaged 62.3). Caustive diseases were, 13 patients of primary lung cancer, 9 of metastatic lung tumor, and 2 of miscellaneous diseases. Resected segments in the right lung were, 1 of 10th segment, 4 of 6th segment. In the left lung were, 2 patients of upper division segment, 7 of lingular segment, 3 of apico-posterior segment, 1 of posterolateral segment and 1 of posterior basal segment. Operative procedures were all performed through thoracic cavity, with several skin incisions sized 2-3cm. Responsible arteries were divided and cut using endo-staplers. Then responsible bronchi were also divided and cut using endo-staplers. If necessary, responsible veins were also divided and cut in the same manner. Finally, cutting line was estimated on lung surface by inflating the collapsed lung, then the lung was divided using endo-staplers. Hilar and/or mediastinal lymph nodes were excised when necessary.

[RESULTS] In all the patients, lung segmentectomy was completed by means of thoracoscopy, through videoendoscopic view and small incisions. The operation achieved satisfactory outcome and postoperative courses were uneventful.

[CONCLUSION] Thoroscopic lung segmentectomy was safely performed in all patients of relatively small group. This technique may be applied routinely.
THORACOSCOPIC EXTRACTION OF IMPACTED FOREIGN BODY ESOPHAGUS
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Most of the foreign bodies (about 90% of cases) in the esophagus passes spontaneously. For the remaining cases, endoscopic removal is often successful. About 1-2% of the cases only need surgical management. In the era of minimal invasive surgery, the same can be managed by either laparoscopy or thoracoscopy. Although few reports are there regarding the removal of foreign body by laparoscopic approach, there is no report of removal by thoracoscopy. In June 2001, a 52 years old, known epileptic patient presented with difficulty in swallowing. Initial endoscopy showed features in favor of growth oesophagus at 25 cms. Biopsy was negative. Check endoscopy was done after 15 days. On palpation with biopsy forceps, a stony feel was felt. After suspecting an impacted foreign body, patient was asked regarding the denture. Patient told that he had lost his denture 4 months back following an attack of fits. CT scan confirmed the presence of foreign body without involving the major vessels and trachea. Since it was firmly impacted foreign body, it was decided to go for thoracoscopic removal.

Patient was put on prone position and right thoracic approach with left lung ventilation was used. The denture with plate (5cm long) lying just behind the azygos arch, forming an inflammatory mass, was removed by an incision over the oesophagus just proximal to the impaction, avoiding the vein. The oesophagotomy was closed by using vicryl endosutures. Chest drain kept and wound closed. Patient was discharged on the 6th Post operative day with solid diet.

Thoracoscopic extraction of impacted foreign body esophagus avoids the morbidity of thoracotomy and gives the benefits of minimal invasive surgery to the patient.

ROLE OF LAPROSCOPIC SURGERY IN ACUTE ABDOMEN [247 CASES ]- A RETROSPECTIVE STUDY
DEEPAK SAXENA MS , SHOBHANA SAXENA MS, DURGA CHIKITSALAYA , HOUSING BOARD COLONY , KATNI,M.P.INdia- 483504

DIAGNOSTIC LAPROSCOPY HAS STOOD THE TEST OF TIME IN ACUTE ABDOMEN BUT LAPROSCOPIC SURGERY IS RELATIVELY NEW. AIM IS TO SHARE THE EXPERIENCE OF 247 CASES MANAGED LAPROSCOPICALLY IN LAST 2 YEARS AND 6 MONTHS (THAT IS MARCH 1999 TO AUGUST 2001)

INCLUDES 88 CASES OF ACUTE APPENDICITIS, 12 CASES OF PERFORATED APPENDIX , 25 CASES OF DUODENAL ULCER PERFORATION , 21 CASES OF ECTOPIC PREGNANCY ,11 CASES OF TWISTED OVARIAN CYST, 41 CASES OF ACUTE CHOLECYSTITIS, 7 CASES OF OBSTRUCTED UMBILICAL AND VENTRAL HERNIA AND 42 CASES OF INTESTINAL OBSTRUCTION MANAGED BY CONVERTING INTO A MINI LAPROTOMY AND MANAGING STRIC-TURES, ILEO- CAECAL KOCHS, BANDS AND ADHESIONS.

UMBILICAL PORT MADE BY HASSANS TECHNIQUE AND SUBSEQUENT PORTS MADE ACCORDINGLY, ANESTHESIA USED SPINAL OR ENDOTRACHEAL. AFTER MANAGING DIFFERENT CONDITIONS LAPROSCOPICALLY UMBILICAL PORT CLOSED IN TWO LAYERS AND 5 MM PORTS CLOSED IN ONE LAYER . PATIENT AGE RANGING FROM 12 YEARS TO 64 YEARS MEAN AGE IS 34 YEARS. MALE : FEMALE RATIO IS 1:3.

ALL PATIENT RECOVERED UNEVENTFULLY. TO CONCLUDE IF THE PATIENT IS HAEMODYNAMICALLY STABLE AND TOLERATE ANESTHESIA CAN BE MANAGED EVEN IN DIFFICULT SITUATIONS LAPROSCOPICALLY.
FLEXIBLE STAGING LAPAROSCOPY FOR UPPER GASTROINTESTINAL MALIGNANCIES - IMPROVING YIELD THROUGH FAILURE ANALYSIS
Gary R. Gecelter MD, Keith Meslin MD, Kelly Alexander MD, Patricia Mikell NP and H. Hank Simms MD, Department of Surgery, Section of Surgical Oncology, North Shore Long Island Jewish Health System, New Hyde Park, NY

The greatest impact of staging laparoscopy (SL) is seen in patients who have metastatic disease unrecognized by pre-operative imaging, and who can thus avoid unnecessary laparotomy. Following analysis of 2 early failures, we have employed flexible laparoscopy since 1996, increasing our degrees of freedom to more closely emulate formal laparotomy.

Prospective data was collected on 124 consecutive patients with upper GI carcinomas (pancreatic/biliary, 64; GE junction, 38; stomach, 22) who underwent SL. The first 30 cases (Group 1) were performed with 0/30 deg rigid telescopes. The next 94 cases (Group 2) were performed exclusively with flexible laparoscopes. Laparoscopic ultrasound was used to evaluate the liver in both groups. Failed SL was defined as the discovery of metastatic disease at conversion to laparotomy for definitive resection.

In Group 1, 7 of 30 patients (23%) were found to have unrecognized metastatic disease. By conventional laparoscopy we were unable to identify metastatic disease in 2 of these 7 patients (failure rate 29%), 1 pancreas cancer with a solitary metastasis in segment VII and 1 gastric carcinoma with posterior lesser sac metastases. In Group 2, 25 of 94 patients (27%) were found to have occult metastases. By flexible laparoscopy we were unable to identify metastatic disease in 2 of these patients. One patient with pancreas cancer had liver metastases under omental adhesions from a prior cholecystectomy. A second patient with gastric cancer had tumor encasement of the celiac trunk at laparotomy despite laparoscopic exploration of the lesser sac. 32 of 124 patients in this series had occult metastases. SL successfully upstaged 25 of these patients (88%) avoiding unnecessary laparotomy.

SL should properly upstage patients with occult metastases, supplanting formal laparatomy but still demanding the same stringent standards expected from open surgery. Flexible laparoscopy may be superior to non-flexible techniques for precise staging.

LATENT COLON ADENOCARCINOMA DISCOVERED DURING OR AFTER LAPAROSCOPIC CHOLECYSTECTOMY
N. Alexakis MD, D. Mylonaki MD, MM.Konstadoulakis MD, E.Leandros PhD, G.Androulakis MD, Laparoscopic Unit, First Department of Propaedeutic Surgery, Athens University, Hippocration Hospital, Athens, Greece

Background The wide acceptance of laparoscopic cholecystectomy (LC) has resulted in increased rates of cholecystectomies performed, hence increasing the number of patients discovered with concomitant malignancy or other pathological states.

Methods A total of 3751 patients operated for LC between January 1996 and December 2000 were included in this study. Nine cases of coexisting malignant colon neoplasm were discovered. All patients but one underwent therapeutic resection.

Results The survival of these 9 patients was the same with that of 62 consecutive colon cancer patients hospitalized in our department at the same period. The rate of postoperative complications in the study group was higher than the control group (21% vs 9.5%). Hospital stay in these patients was also increased (17 days vs 10 days).

Conclusion The rate of accidentally discovered colorectal carcinomas during LC in our Department was 0.24%. These patients had increased complication rates and hospital stay.

LAPAROSCOPIC CHOLECYSTECTOMY IN ELDERLY PATIENTS
Kelly Alexander MD, Gary Gecelter MD, Deborah Stein MD, Keith Meslin MD, H. Hank Simms MD, Department of Surgery, North Shore Long Island Jewish Health System, New Hyde Park, NY

Laparoscopic cholecystectomy (LC) has been demonstrated to be both safe and effective in a wide range of patients with gallbladder disease. It is now considered to be the definitive treatment for both acute and chronic cholecystitis. However, the elderly are often thought to have too many co-morbid conditions to safely undergo LC.

Of 2063 patients who underwent attempted LC at Long Island Jewish Medical Center, from December 1994 to May 1999, 76 were identified to be 80 years or older (mean age 84.4, range 80-97). Charts were retrospectively reviewed for age, medical history, previous surgery, conversion rate, length of stay, operating time, anesthesi time, and intraoperative findings.

Statistically significant findings included a higher conversion rate in the study group compared to the control - 18.4% vs 5.2% (p<0.0001). Subgroup analysis shows a significantly increased conversion rate of emergency procedures versus elective - 37% vs 4.9% (p<0.007). There was a trend towards higher mortality in the study group with 13% compared to 0.1% in the control (p=ns). Overall morbidity in the study group was 15.8% (28.6% - emergency, 4.9% - elective).

Advanced age alone is not a contraindication to laparoscopic cholecystectomy. It is a safe procedure in elderly patients. The higher conversion rate in the study group may be attributed to chronicity of the disease process and consequently, more complex biliary anatomy and to the identification of additional pathology upon laparoscopy in the study group. From this data can be extrapolated that LC should be performed on elderly patients on an elective basis rather than as an emergency with the associated increased morbidity.
Hepatobiliary/Pancreatic Surgery–PS005

LAPAROSCOPIC CHOLECYSTECTOMY FOR SUSPECTED EARLY GALLBLADDER CANCER, Hideaki Andoh, Norihito Ise, Ouki Yasui and Kenji Koyama, Department of surgery, Akita university school of medicine

Thirty-seven laparoscopic cholecystectomy was performed for the gallbladder tumors, which was suspected early gallbladder cancer. When the tumor existed at the gallbladder bed, partial heptectomy was added under laparoscopic procedure. We never leak the bile juice within the operation and use the vinyl sac to remove the gallbladder.

Five cases were early gallbladder cancer and one case was advanced gallbladder cancer. Four cases were converted open method for the lymph node dissection and the resection of the gallbladder bed or S5+S4a segmentectomy of the liver. Liver metastasis was detected in one case at 18th month after operation, who had the same lymph node metastasis at the operation. Other recurrence such as peritoneal dissemination or port site recurrences were not observed in our department. From these results, laparoscopic cholecystectomy was the reasonable procedure even for early gallbladder cancer, if operation was performed without bile contamination.

Hepatobiliary/Pancreatic Surgery–PS006

ROUTE LOW-VERSUS STANDARD-PRESSURE PNEUMOPERITONEUM DURING LAPAROSCOPIC CHOLECYSTECTOMY - INITIAL RESULTS OF PROSPECTIVE RANDOMIZED CLINICAL TRIAL. Marcin Barczyński, M.D., PhD, Roman M. Hermann, M.D., PhD, 3rd Department of General Surgery, Jagiellonian University College of Medicine, Krakow, Poland.

Capnoperitoneum with standard pressure (SP) of 12mmHg has become a gold standard in laparoscopic surgery. However, the increased intraabdominal pressure results in cardiopulmonary, renal and autonomic depression. To diminish the deleterious effects of SP the low-pressure (LP) of 7mmHg was introduced to clinical practice. The purpose of this study was to investigate the advantages and limits of LP in comparison to SP pneumoperitoneum in a prospective randomized clinical trial.

A group of 97 consecutive patients qualified for laparoscopic cholecystectomy (LC) due to uncomplicated symptomatic gallstones were randomized to either SPLIC or LPLC. All the procedures were performed by the same team of surgeons experienced in laparoscopy. The following data were statistically analyzed: sex, mean age, Body Mass Index, operative time, complication rate, conversion rate, postoperative pain assessed in Visual Analogue Scale of Pain (VAS) including incidence of shoulder-tap pain, postoperative hospital stay, recovery time and quality of life within 72 hours following the operation. p<0.05 was considered to indicate significance.

There was no case of neither conversion to open procedure nor major complication in both groups. The operative time was similar in both groups (LP: 57.4±18.9 min vs. SP3.6±29.2 min). Postoperative pain was significantly lower after LP versus SPLIC (p<0.05). The incidence of shoulder-tap pain was 2.3 times less after LP vs. SPLIC (p<0.05). Quality of life within 72 hours following the operation was remarkably better (mean 34.6±7.5%) after LP than after SPLIC (p<0.01).

The postoperative course was uneventful, except for a delay in umbilical port site closure. Histological examination revealed a severe granulomatous inflammatory process of the gallbladder consistent with Crohn’s disease. Following the pathological results the patient underwent a thorough evaluation for intestinal Crohn’s disease. No evidence for other sites of Crohn’s disease was found. The patient experienced no further symptoms in a six months period follow up.

The extra intestinal location of Crohn’s disease is a known but unusual diagnosis. To our knowledge this is the first report of primary Crohn’s disease of the gallbladder without any intestinal manifestation of Crohn’s disease. Primary Crohn’s disease of the gallbladder could be found with or without other evidence of disease in other typical locations. Physicians treating Crohn’s disease should be aware of the possible primary involvement of the gallbladder. This entity could be symptomatic by itself, without any compromise or activity in the rest of digestive tract. Laparoscopic cholecystectomy appears to be a safe and curative treatment for primary gallbladder Crohn’s disease.

Hepatobiliary/Pancreatic Surgery–PS008

ACUTE CHOLECYSTITIS DUE TO GALLBLADDER CROHN’S DISEASE. Oscar E. Brasesco, M.D, Pablo Pauoluci, M.D, Shmuel Avital, M.D., Samuel Szomstein, M.D., Raul Rosenthal, M.D., Department of Surgery, University Hospital of Cordoba, Argentina and the Section of Minimally Invasive Surgery, Cleveland Clinic Florida, Weston, Florida.

Crohn’s disease and its extraintestinal manifestations including secondary involvement of the biliary tract in extensive bowel disease are well documented. There are only few case reports of Crohn’s disease of the gallbladder associated with extensive bowel disease. We report a case of an isolated Crohn’s disease of the gallbladder manifested as an acute cholecystitis.

A 71 year-old male was admitted for a right upper quadrant abdominal pain. He denied any GI or medical disorders. Physical examination revealed tenderness and defense in the right upper quadrant. Laboratory findings showed no abnormalities. Ultrasonography demonstrated a distended gallbladder with thickened wall and stones. Laparoscopy revealed an inflamed gallbladder with extensive adhesions. The cystic duct – common bile duct junction was severely inflamed. A laparoscopic cholecystectomy was performed. The intraoperative cholangiogram was normal. The histological examination revealed a severe granulomatous inflammatory process of the gallbladder consistent with Crohn’s disease. Following the pathological results the patient underwent a thorough evaluation for intestinal Crohn’s disease. No evidence for other sites of Crohn’s disease was found. The patient experienced no further symptoms in a six months period follow up.

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Underline denotes presenter. * denotes resident paper.

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LAPAROSCOPIC COMMON BILE DUCT EXPLORATION AND CHOLEDOCHOLITHOTOMY. Dr. Manoj Kumar Chowdury M.D., H.K. Rajkhowa M.S., Dr. S. Dawka M.S., Department of Surgery, Gauhati Medical College, Guwahati, Assam, India.

Laparoscopic cholecystectomy has become an established procedure today.

After years of experience in laparoscopic surgery, lap. CBD exploration and cholecdocholithotomy is also gaining popularity gradually. Since 1999 we have been working on lap. CBD exploration. In this study during the period from July 1999 to August 2001, we have selected thirty-two cases for CBD exploration (with clinical suspicion of CBD calculi but negative on ultrasound, like previous history of obstructive jaundice, pancreatitis, raised alkaline phosphatase, dilat. CBD, wide cystic duct with small calculi etc.)

The procedure is started like lap. cholecystectomy. Cystic duct is clipped towards gallbladder and nicked open at a safe distance from CBD. Cholangiogram is done to see presence of calculus. CBD exploration is done if stone is detected in CBD, either by trans-cystic route (37.5%) or trans-CBD route (62.5%) and with the help of choledochoscope, stones are extracted with Dormia under direct vision. Post extraction cholangiogram is done. Cystic duct is clipped / transfixd, CBD is repaired with 3-0 vicryl in case of trans-CBD exploration.

Nine cases out of thirty-two (28%) showed stones in CBD, which were successfully extracted. None had to be converted. One case had temporary biliary leakage which stopped spontaneously by the 8th day. Average hospital stay was 3 days.

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Laparoscopic CBD exploration and cholecdocholithotomy along with laparoscopic choledochotomy has definite indication in experienced hand, specifically like this study or cases where ERCP has failed and, with experience, this procedure will be an effective alternative to ERCP.

MODIFIED NEEDLESCOPIC SURGERY FOR CHOLECYSTECTOMY. H. K. Chowdury MD, Minimally Invasive Surgery Centre (MISC), Department of Surgery, BIRDEM Hospital, Dhaka, Bangladesh.

As we need to do more and more Needlescopic cholecystectomy, it was necessary to modify the technique to provide benefit to most of the patients. Since Gallbladder extraction requires a 10 mm port in most of the cases, it was decided to use a 10 mm umbilical port from the beginning.

Three other trocars are 3 mm in diameter and are placed as usual. Retractions and dissections are carried out through 3-mm ports under a 10-mm.-scope vision which provides better vision and a wide angle. Clipping is done through the umbilical port under guidance of needlescope through the midline 3 mm trocar. And lastly the gallbladder is removed through the umbilical port under guidance of needlescope through the midline 3 mm trocar.

Author is performing needlescopic cholecystectomy since 1998. Since then 780 cases were performed in this technique. Conversion to standard procedure was required in 19 cases and one case was converted to open procedure. Eighty three cases of acute cholecystitis were performed in this series. Early cases could be completed, though operating time was almost double (30-60 min).

Average operating time in the first 25 cases was 25 min, which is 7 min more than the average operating time for standard procedure by the author. There was no morbidity or mortality in the series. Patient acceptance was very good, post operative pain was less and recovery was earlier than the standard procedure.

This modification allowed the do the procedure with more comfort and safety under a 10 mm laparoscopic vision. Removal of resected gallbladder even with bigger stones is always much easier through umbilical trocar than the epigastric port. In conclusion, in this modification, we achieve both desired cosmetic result and adequate vision for safe surgery, which are the prime targets for both the surgeon and the patient.
Hepatobiliary/Pancreatic Surgery–PS013

LAPAROSCOPIC MANAGEMENT OF GANGLIONOUS CHOLECYSTITIS. David Espinolas, M.D., Sunday Dayu, M.D., A. Kaur Bhunie, M.D., Shere Ting, M.D., Varsha Shanai, M.D., Departments of Surgery and Pathology, Loyola University Medical Center, Maywood, Illinois.

Laparoscopic cholecystectomy is the standard treatment for biliary colic and is often successful in the management of acute cholecystitis. Ganglionic cholecystitis (defined histologically as acute cholecystitis with transmural ganglia) has been approached laparoscopically, but with a high incidence of conversion to open, with potential for a higher incidence of complications. To consider laparoscopic cholecystectomy for treatment of ganglionic cholecystitis (GC), the advantages of the laparoscopic approach must outweigh the potential risk of complications associated with laparoscopy. Additionally, recognizing the factors predictive of conversion to open cholecystectomy may improve clinical outcome.

A retrospective review of 29 consecutive patients who underwent cholecystectomy for GC from August 1996 to August 1999 was performed. The patients were divided into three groups according to the type of procedure performed. Laparoscopic cholecystectomy (LC), open cholecystectomy (OC), and attempted laparoscopic but converted to open cholecystectomy (CC). Patient demographics, ASA physical status score, length of procedure, estimated blood loss (EBL), time until resumption of general diet, length of hospital stay, postoperative complications as well as surgeon's experience were reviewed.

Results: Most patients had open cholecystectomy without attempt at laparoscopy. Patient demographics and ASA physical status classification were similar for the three groups. CC took an average of 151 minutes as compared to 126 and 115 for CC and OC respectively (p=0.078). Average EBL for LC was 72 milliliters as compared to 175 and 272 for CC and OC respectively (p=0.05). Resumption of regular diet within 24 hours of surgery was higher for CC than for LC and OC (p=0.02). The average length of hospital stay following LC was 2.4 days as compared to 4.1 and 5.8 days for CC and OC respectively (p=0.002). There were no perioperative deaths and the incidence of postoperative complications was similar for the 3 groups. Surgeon experience was an independent predictor for conversion.

Laparoscopic cholecystectomy for GC may be performed safely and with a low incidence of conversion to open. When laparoscopic cholecystectomy is successfully accomplished, it results in lower blood loss, earlier resumption of diet, and shorter hospital stay. Surgeon’s experience is likely to predict conversion to open cholecystectomy. Unless physiologic effects of laparoscopy cannot be tolerated, we recommend laparoscopic cholecystectomy. Performed by an experienced laparoscopic surgeon, as standard management for ganglionic cholecystitis.

Hepatobiliary/Pancreatic Surgery–PS014

CASE OF LAPAROSCOPIC Pancreatic CYSTGASTOROSTOMY. KAZUNORI FURUTA, TETSUYA TOMONAGA, HIROKI HOSHINO, KOICHI ITABASHI, KEN SHIMADA, TSUYOSHI TAKAHASHI, MUNEKI YOSHIDA, AKIRA KAKITA. DEPARTMENT OF SURGERY, KITASATO UNIVERSITY, KANAGAWA, JAPAN.

Internal drainage of acute pancreatic pseudocysts is indicated that have not reduced in size after the first occurrence of pseudocyst. Pancreatic pseudocysts are best drained by pseudocystgastrostomy, when they are located in adhered closely with the posterior wall of the stomach. Pseudocystgastrostomy can be completed using of intraorgan surgical technique.

We present the case of laparoscopic pancreatic cystgastrostomy. Using a technique of percutaneous endoscopic gastrostomy, under gastoendoscopic observation, three intragastric ports are placed through the abdominal walls and the anterior gastric walls. One port for a telescope and the other two ports for bi-hand instruments are established.

After the location of the pseudocysts is confirmed, the posterior gastric wall and cyst wall can be incised and drainage orifice is made by electrocutomy and Harmonic Scalpel (Ethicon Endo-Surgery). After a sufficient orifice is made, the cyst contents are discharged into the stomach completely. After the intragastric ports are removed, the defect of the anterior gastric walls are closed with sutures in laparoscopically.

In the first our case, the cyst was recurred at one month after operation. The reasons was that drainage orifice was not made of ge enough. In this case, the size of cyst was 12cm in diameter. But the drainage orifice was made only 2.5cm in width.

This approach is less invasive than the conventional procedure and a safe procedure for cyst drainage. However, in the treatment for pancreatic pseudocysts, there are many options that convention surgery, catheter drainage of cysta , using interventional radiology technique and endoscopic interventions. Laparoscopic pancreatic cystgastrostomy is one of the treatment options.

This procedure should be the one of the method of choice when the interventional methods are not effective.

Hepatobiliary/Pancreatic Surgery–PS015

LAPAROSCOPIC PORTOCAVAL SHUNT IN THE PORCINE MODEL: A FEASIBILITY STUDY. Paolo Gentileschi, MD, Subhash Kini, MD, Greg Dakin, MD, Shoji Fukuyama, MD, Wong Woo Kim, MD, Michel Gagner, MD. Division of Laparoscopic Surgery, Mount Sinai School of Medicine, New York, NY.

Introduction: randomized trials have shown that TIPSS provides less optimal outcomes than small diameter H-graft portocaval shunt for patients with portal hypertension and variceal bleeding. The wide acceptance of TIPSS in the clinical practice may be revised. To date, good-risk patients with portal hypertension and variceal bleeding can still be referred for surgical shunt. The aim of this study was to investigate the feasibility of both laparoscopic side-to-side and H-graft portocaval shunt in a porcine model.

Methods: Laparoscopic side-to-side and H-graft (PTFE, 4 mm) portocaval shunts were performed in 5 and 3 pigs, respectively. Each procedure started with the isolation of the portal vein (PV). The inferior vena cava (IVC) was isolated at a level between the renal veins and the inferior margin of the liver. The PV and the IVC were extensively dissected to be able to approximate the two veins without tension. Heparin was administered intravenously (10,000 U). The PV was cross-clamped with a laparoscopic vascular clamp, while the IVC was side clamped with a conventional Satinsky clamp, introduced into the abdomen through a small incision. Both direct and H-graft portocaval anastomoses were performed using a 6-0 Goretx suture. At the end of the procedure, euthanasia and necropsy were performed and the portocaval shunt was carefully inspected.

Results: In all cases, the side-to-side and H-graft portocaval anastomoses were found to be patent and intact. Mean operative time was 242 ± 48.1 minutes (range, 190 to 300 minutes) for side-to-side shunt and 274 ± 50.4 minutes (range, 220 to 360 minutes) for H-graft shunt. Mean anastomotic time was 41. ± for H-graft shunt.

Conclusion: Both shunts were feasible, although technically challenging. Laparoscopic H-graft portocaval shunt took longer than side-to-side laparoscopic portacaval shunt (p=0.05).

Hepatobiliary/Pancreatic Surgery–PS016

LAPAROSCOPIC TREATMENT OF HEPATIC ECHINOCOCCOSIS. Volodymyr V.Grubnik MD, Sergei.G.Chetverikov MD, Pushpendra Sharma MD, Sabri Al Nidary, Department of surgery, Odessa State Medical University, Odessa, Ukraine

INTRODUCTION: The aim of the study is to improve the results of treatment of hepatic echinococcosis by minimal invasive methods in endemic region of Ukraine.

PATIENTS AND METHODS: 56 patients with solitary or multiple hydatid cysts of the liver were treated laparoscopically and 117 patients – by percutaneous transhepatic ultrasound guided cyst drainage. In 27 patients co-existing cysts were observed in the lungs. Endocyst and the daughter cysts were aspirated and removed with the use of endoscopic bags. The endoscope was advanced into the cyst cavity to check. In 35 patients (I group) we used thermal coagulation for the cyst cavity. In 21 patients (II group) we used thermal coagulation for the cyst cavity. In 21 patients (II group) we used thermal coagulation for the cyst cavity.

RESULTS: There were no deaths, major complications and conversion to open surgery in any of the groups. Minor complications were observed in 2 (5,7%) patients from the I group and in 3 (14,3%) from the II group. Temporary bile leakage was observed only in 2 (9,5%) patients from the II group. Follow-up time ranged from 6 months to 6 years. In 2 (9,5%) patients from the II group recurrence was observed. In 7 (6,0%) patients from the percutaneous transhepatic group recurrence was observed. Good results were achieved in 89%.

CONCLUSIONS: Laparoscopic treatment of hepatic hydatid disease is the method of choice. Percutaneous drainage is indicated for small hydatid cysts in difficult for access liver segments.
Hepatobiliary/Pancreatic Surgery–PS017

LAPAROSCOPIC CYSTOJUJNISTOMY FOR A GIANT PANCREATIC PSEUDOCYST
Mustafa A. Hamad, M.D.
Dept. of Surgery, Assiut University Hospital, Assiut, Egypt.

Introduction: Therapeutic options for active management of pancreatic pseudocysts are either surgery, percutaneous drainage or endoscopic drainage. Of these, operative internal drainage, mainly to the jejunum, is the most favourable and commonly used technique. Laparoscopic management of pancreatic pseudocyst has recently been reported, but mainly performing cystogastrostomy. We report a case of giant pancreatic pseudocyst, for which we performed laparoscopic cystojjunostomy and describe its technique.

Methods: An 18 year old male presented with a giant pancreatic pseudocyst measuring 20x16x11 cm, three months after blunt abdominal trauma. Through a laparoscopic approach using four ports set in the lower abdomen, the transverse colon was retracted upwards to reveal the cyst, which was opened and evacuated. The cyst was anastomosed to the nearby proximal jejunum using single-layer continuous full thickness inverting suturing technique with polydioxanone, and a peritoneal drain was left.

Results: The operation lasted 110 minutes. The postoperative period was uneventful. The patient stayed in hospital for four days. Follow up CT scan after three months revealed complete disappearance of the cyst.

Conclusions: Cystojjunostomy, which is the preferred internal drainage method for pancreatic pseudocyst, could be performed laparoscopically. We feel that this technique is promising, as it combines the potential advantages of both surgical and endoscopic approaches, namely accuracy and minimal invasiveness respectively.

Hepatobiliary/Pancreatic Surgery–PS019

TELEROBOTIC LAPAROSCOPIC CHOLECYSTECTOMY ACHIEVES THE SAME RESULTS AS STANDARD ROBOTIC LAPAROSCOPIC CHOLECYSTECTOMY
K. Houmont, R. Davies, S. Periera, A. Waselewski, G.H. Ballayntyne, Hackensack Unv Med Center, Hackensack, NJ

INTRODUCTION We have used a voice controlled robot (AESOP) to hold the camera in all laparoscopic cholecystectomies (LC) since 1997. Although the FDA recently approved remote surgeon, telerobotic abdominal surgery with DaVinci, few studies have documented its clinical utility and safety.

HYPOTHESIS We hypothesized that if telerobotic surgery merits clinical use, it should achieve the same results as standard robot assisted LC. AIMS The aim of this study was to compare the use of AESOP and DaVinci in concurrent operations.

METHODS We prospectively compared all LCs performed by one surgeon (GHH) from 8/10/00 until 9/4/01. RESULTS:

<table>
<thead>
<tr>
<th>Robotic</th>
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<th>DaVinci</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
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<td>51.9</td>
</tr>
<tr>
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<td>Operating time (Op time)</td>
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<tr>
<td>Recovery time (Rec time)</td>
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<td>0.7 day</td>
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</tbody>
</table>

Values expressed as mean ±median

25 patients underwent AESOP and 25 DaVinci operations. The two groups were similar in age, sex, body mass index (BMI), number of previous abdominal operations and indications for surgery. There were no deaths and no conversions in either group. There were 2 wound infections for the DaVinci group (8.6%) and one incident of trocar site bleeding (4.5%) in the AESOP group. There were no significant differences in postoperative length of stay (LOS), blood loss, or length of operation (Op Time) between the two groups. Operating room (OR) time was significantly greater for DaVinci operations (134.4 vs. 154.8 minutes, p<0.05)

SUMMARY This study found that robotic and telerobotic operations were accomplished with the same mortality, morbidity, blood loss, length of operation and length of stay. The DaVinci operations required longer OR time.

CONCLUSION Telerobotic laparoscopic cholecystectomy achieved the same clinical outcomes as standard robotic laparoscopic cholecystectomy in this small trial. This study justifies further comparison of these techniques in a randomized prospective trial.

Hepatobiliary/Pancreatic Surgery–PS018

LAPAROSCOPIC CHOLECYSTECTOMY UNDER SPINAL ANAESTHESIA, IS IT POSSIBLE?
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Introduction: Various laparoscopic procedures have been successfully performed under spinal anaesthesia, whether in general surgery or obstetrics. Laparoscopic cholecystectomy, on the other hand, has not yet been reported under spinal anaesthesia. Being less invasive than general anaesthesia, spinal anaesthesia would, theoretically, be more appropriate to the minimal invasiveness of laparoscopic cholecystectomy. But is it feasible to perform laparoscopic cholecystectomy under spinal anaesthesia?

Methods: To answer this question ten successive non-selected laparoscopic cholecystectomies were performed under spinal anaesthesia. The surgical technique was modified in the form of nitrous oxide for insufflation, intraabdominal pressure not more than 11 mmHg, all four trocars at the level of umbilicus, and gentle manipulation specially near the copula. We used spinal anaesthesia by intrathecal hyperbaric 10-12 mg bupivacaïne with 10 μg fentanyl, to give an anaesthetic level at T8-T9.

Results: 6 males and 4 females were included, with a mean age of 39.3 years. Nine patients had adhesions to the gall bladder and one had adhesions to the abdominal wall. Only one patient experienced shoulder pain, severe enough to dictate conversion to general anaesthesia, four others had mild discomfort. One patient vomited intraoperatively. Nine patients, considered the procedure well tolerated under spinal anaesthesia. The mean operative time was 47.4 min. Postoperatively, there were minimal pain and no vomiting. The mean hospital stay was 18.8 hours.

Conclusions: Laparoscopic cholecystectomy can be performed successfully under spinal anaesthesia and is well tolerated. Further comparison with general anaesthesia is still needed.
Hepatobiliary/Pancreatic Surgery–PS021

CHOLEDOCHAL CYST: LAPAROSCOPIC EXCISION AND HEPATICOJEJUNOSTOMY–PERSONAL EXPERIENCE
K. Sendhil Kumar, M.S., Juno J. Valiyaveettil, M.D., N. K. S. Gopalsekharan, M.S., R. Suresh, M.S., P. K. Muralidharan, M.S., G. M. S. Ramakrishnan, M.S.

INTRODUCTION: The laparoscopic surgical management of choledochal cysts is well established, but the optimal surgical approach remains controversial. The aim of the present study was to clinically evaluate the efficacy and safety of laparoscopic excision and hepaticejunostomy.

PROCEDURE: A total of 10 patients underwent laparoscopic excision and hepaticejunostomy for choledochal cysts. All patients were male, with a mean age of 35 years. The cysts were classified according to the Todani classification system. Laparoscopic excision of the cyst was performed using a combination of ultrasonic and harmonic shears. Reconstruction was performed using a Roux-en-Y jejunostomy with a single enteroanastomosis.

RESULTS: All procedures were successfully performed with a mean operative time of 210 minutes. Postoperative complications included one case of bile leakage, which was managed nonoperatively. The mean postoperative stay was 5 days. There were no cases of biliary stricture or anastomotic leak.

CONCLUSION: Laparoscopic excision and hepaticejunostomy is a safe and effective approach for the management of choledochal cysts. The procedure offers several advantages over open surgery, including reduced postoperative pain, shorter hospital stay, and faster recovery.

Hepatobiliary/Pancreatic Surgery–PS022

LAPAROSCOPIC AND THORACOSCOPIC TREATMENT OF HEPATOCELLULAR CARCINOMA
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INTRODUCTION: Hepatocellular carcinoma (HCC) is a common liver malignancy that often presents with advanced stage at diagnosis. Recent advances in surgical techniques have enabled the combination of laparoscopic and thoracoscopic approaches for the surgical management of HCC.

METHOD: A total of 21 patients underwent laparoscopic and thoracoscopic resection of HCC. The median tumor size was 3 cm, and the median number of lesions was 1. The tumors were located in segments 4a in 7 patients, 4b in 7 patients, and 7a in 7 patients. The procedures were performed using a combination of ultrasonic shears, harmonic shears, and LigaSure technology.

RESULTS: All procedures were successfully completed with a mean operative time of 300 minutes. The mean postoperative hospital stay was 5 days. There were no cases of postoperative complications.

CONCLUSION: Laparoscopic and thoracoscopic resection of HCC is a safe and effective approach for the management of early-stage HCC. The combination of laparoscopic and thoracoscopic approaches allows for a comprehensive surgical resection while minimizing postoperative morbidity.
SUCCESSFUL LAPAROSCOPIC TREATMENT OF MCSHERRY TYPE I MIRIZZI’S SYNDROME
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Mirizzi’s syndrome in one of the infrequent etiologies of obstructive jaundice owing to the calculus impaction at cystic duct or gallbladder neck, causing compression of bile duct (McSherry type I) or erosion of cystic duct-bile duct septum (McSherry type II). Not only the correct diagnosis of this entity is difficult, but also its management. Laparoscopic approach has been attempted with variable success. The objective was to analyze the feasibility of laparoscopic approach in Mirizzi’s syndrome.

From July 2000 to March 2001, ten patients with McSherry type I Mirizzi’s syndrome were identified and laparoscopically managed. All patients had cholelithiasis with acute inflammation and one of them, also cholecdocholithiasis. Subtotal cholecystectomy was performed and after the extraction of impacted cystic duct stone, the cystic duct stump was closed with laparoscopic suture device.

There were 8 men and 2 women, and the mean age was 55.7 (range, 27-71) years. All patients had mild to moderate degree of jaundice (mean total bilirubin 2.24 mg/dl, ranging from 1.24-7.84 mg/dl). The mean operative time was 143 (range, 70-200) minutes. All patients were successfully treated laparoscopically, but one patient showed signs of bile leak which lasted for 72 hr and spontaneously ceased. Mean hospital stay was 4.9 (range, 3-9) days.

Laparoscopic treatment of McSherry type I Mirizzi’s syndrome is feasible and safe when high-skilled laparoscopic surgeon is available. Suture closure is a relative safe method for managing an inflamed and thickened cystic duct stump.

TREATMENT OFBILE LEAKAGE AFTER LAPAROSCOPIC CHOLECYSTECTOMY
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Postoperative bile leakage occurred in 15 (1.6%) of the 966 patients who underwent laparoscopic cholecystectomy (LAP-C). The cause of bile leakage were due to cystic duct stump injury (n=7), right hepatic duct injury (n=2), cholecystohepatic duct injury (n=1), and accessory hepatic duct injury (n=1). In the 4 other patients, the site of bile leakage were not confirmed. Nine patients were treated by biliary drainage. Five patients were conducted conservative treatment. One patient with transection of right hepatic duct needed hepatectomy.

The average time from the biliary drainage until bile leakage stopped was 7.6 days.

When postoperative bile leakage is discovered, cholangiography is performed to identify the site of bile leakage. When there is no evidence of contrast medium leakage, i.e., when bile leakage from the cholecystohepatic duct or Luschka ducts are suspected, the natural course is observed. When injury of biliary tract is identified and not severe, bile duct drainage such as Endoscopic Nasobiliary Drainage or Percutaneous Transhepatic Biliary Drainage is performed with the conservative intent. When severe injury of biliary tract is detected operati is needed.

Cholangiography should be performed whenever bile leakage is discovered after LAP-C. When bile leakage is identified, biliary drainage should be performed as the treatment of first choice.

TRANSVAGINAL REMOVAL OF THE GALLBLADDER AFTER NEEDLESCOPIC CHOLECYSTECTOMY
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With the improvement of laparoscopes and instruments, laparoscopic cholecystectomy has entered the era of needlescopic cholecystectomy. Though the benefits of needlescopic cholecystectomy are less pain and a better cosmetic result, one of the ports (usually the umbilical port) has to be enlarged to remove the gallbladder. In this report, we describe our technique for transvaginal removal of the gallbladder after needlescopic cholecystectomy.

With the patient in the lithotomy position, four trocars were inserted (3-mm umbilical, 5-mm epigastric, and two 2-mm trocars for the lateral abdominal walls). After the gallbladder was freed from the liver bed, the body of the uterus was lifted toward the abdominal wall to obtain a view of the pouch of Douglas. Then a 12-mm trocar was inserted through the posterior fornix of the vagina, and the resected gallbladder was collected into an Endo-catch that was passed through the vaginal trocar. Next the gallbladder was extracted via the vagina using Endo-catch. The posterior fornix required 2 to 3 stitches of absorbable thread, but the abdominal wounds did not need suturing.

We have used this method in nine patients, and there have been no significant complications except for slight vaginal wall injury in 2 cases. In order to apply this method, distension of the vagina is necessary, so a good indication for this procedure is a pre-menopausal woman with a history of vaginal delivery. To avoid injury to the ureters, a clear view of the pouch of Douglas should be obtained during laparoscopy.

This method is technically easy, and because the posterior fornix of the vagina can be well dilated, even the large gallstones are easily extracted. We conclude that this technique can be used to decrease pain and obtain a better cosmetic outcome when performing needlescopic cholecystectomy.
Hepatobiliary/Pancreatic Surgery–PS029

INTRAOPERATIVE FINDINGS AND POSTOPERATIVE COMPLICATIONS IN LAPAROSCOPIC CHOLECYSTECTOMY. TEN YEARS OF EXPERIENCE.

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Background/Aims: We report our experience in treating cholecystectomy in a university teaching hospital. Issues as intraoperative findings, conversion and complication rates are analyzed.

Materials and Methods: Between November 1990 and November 2000 we performed 5539 laparoscopic cholecystectomies. Mean age was 57 years (range 15-90) and male to female ratio was 1:2.4. All patients presented with symptomatic cholelithiasis, asymptomatic cholelithiasis, or acute cholecystitis. Acute cholecystitis was diagnosed in 636 patients (11.4%). Laparoscopic cholecystectomy was eventually performed in 5440 patients.

Results: There was no intraoperative or in-hospital mortality in our series. Conversion to open cholecystectomy was decided in 99 cases (1.8%). During laparoscopic exploration coincident colon cancer was revealed in 9 patients (0.16%), other neoplasms in 12 patients, and perforated gastroduodenal ulcer in 7 patients (0.13%). Pathologic analysis revealed simple cholecystitis in 2453 patients (44.3%), chronic cholecystitis in 2354 patients (42.5%), acute cholecystitis in 304 patients (5.5%), hydrophobia in 138 patients (2.5%), empyema in 118 patients (2.1%), adenomyomatosis in 50 patients (0.9%), acalculous cholecystitis in 44 patients (0.8%), polyps in 36 patients (0.6%), gangrenous cholecystitis in 34 patients (0.8%) and gallbladder carcinoma in 11 patients (0.2%).

The complication rate in our series was 2.92% (162 patients). In 8 cases common bile duct injury occurred intraoperatively (0.14%) while severe postoperative bleeding requiring reoperation occurred in 12 patients (0.2%). The vast majority of our patients (92%) was discharged from hospital on the first postoperative day.

Conclusions: Laparoscopic cholecystectomy is a safe technique with satisfying results. The low morbidity/mortality and conversion rate reported in our series are due to the performance of this operation by specialized laparoscopic surgeons. With the advances in laparoscopic surgery, attention towards creation of specialized Laparoscopic units in major general surgery departments is advocated.

Hepatobiliary/Pancreatic Surgery–PS030

INCIDENTAL FINDING OF GALLBLADDER CARCINOMA DETECTED DURING OR AFTER LC

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Background. Carcinoma of the gallbladder is a rare neoplasm with a dismal prognosis. With the increase of cholecystectomies due to the wide acceptance of laparoscopic cholecystectomy, the incidental diagnosis of gallbladder carcinoma is more frequent.

We report our experience in diagnosing and treating gallbladder cancer diagnosed during or after the performance of laparoscopic cholecystectomy for cholelithiasis.

Methods. Eleven patients were found (0.2%), among 5539 patients who underwent laparoscopic cholecystectomy in the past 10 years. Patient gender, age, symptoms, signs, diagnostic tests, pathology reports, operative and adjuvant treatments were reviewed.

Results. In only two of the cases, where the cancer grossly cross the muscular layer, the diagnosis was made intraoperatively. In these patients the procedure was converted to open with liver bed resection and regional lymph node dissection, and in the other 9 cases cancer was diagnosed at the pathologic examination. Of these, 7 patients refused to undergo a reoperation, and the other 2 were judged inoperable.

Conclusions. The surgeon should always examine the gallbladder and send for frozen sections if he has any suspicion of cancer. Infiltrated, thickened, irregular gallbladder wall in patients without preoperative symptoms of cholelithiasis should raise a suspicion of cancer. The surgeon should be prepared to perform a conversion, and an appropriate radical operation if necessary.

Hepatobiliary/Pancreatic Surgery–PS032

RANDOMISED TRIAL OF LAPAROSCOPIC CHOLEDOCHOTOMY VS POST-OPERATIVE ERCP FOR COMMON BILE DUCT STONES

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Background. Cholangiographic identification of secondary bile duct stones allows intra-operative or post operative ERCP clearance, minimises the number of ERCPs performed where no stones are found and allows 75% of our patients with stones identified to have clearance of their bile duct using trans-cystic extraction. This trial identifies those where transcystic clearance is not possible with randomisation to either laparoscopic choledochotomy or post-operative ERCP. Those randomised to ERCP are sub-randomised to having an antegrade transampullary stent placed to aid ERCP access.

Over 42 months 157 patients have had trans-cystic clearance of their CBD stones outside the trial, with 70 patients randomised into the trial. Total operative time was 150min vs 157min and hospital stay 8.51 days vs 7.29 days. Morbidity expressed as events was: Pancreatitis 1 vs 2, Biliary leak or retained stones 4 vs 5, sepsis 3 vs 2, Haemorrhage 2 vs 0, Re-operation 1 vs 3, Mortality nil. Interim analysis of outcome suggest the trial should continue until target accrual has been completed.

Underline denotes presenter. * denotes resident paper. http://www.8thworldcongress.org/
DOME-DOWN LAPAROSCOPIC CHOLECYSTECTOMY: A MULTI-INSTITUTIONAL REVIEW. Marc Neff, MD, Brian Cantor, MD, Jim Koren, MD, Veshal Mehta, MD, Rachel Alonso, MPH, Peter Geis, MD., Department of Surgery, St. Peter’s University Hospital, New Brunswick, New Jersey. 

Institutional: Department of Surgery, St. Peter’s University Hospital, New Brunswick, New Jersey.

The technique of laparoscopic cholecystectomy has become the preferred treatment for patients with gallbladder disease, but there remains a higher incidence of common bile duct injury compared with open techniques. The Dome-Down Laparoscopic Cholecystectomy (DMLC) has offered several advantages compared to traditional laparoscopic cholecystectomy, specifically the safe identification of the anatomy of the biliary tree. We examined the multi-institutional results of the DMLC technique to evaluate its safety and efficacy.

All participants completed training in the performance of the DMLC technique and its benefits. The DMLC technique consisted of dissection that began at the fundus on the gallbladder and proceeded proximally to identify to cystic duct/CBD junction. Information was collected from each surgeon on his or her first 25 consecutive DMLC cases following training. Variables included procedure time, conversions to open, procedure complications, biliary injuries, and technical errors. Cases were graded, upon initial laparoscopic examination, on a scale of I to IV based on complexity of anatomy.

Thirteen surgeons representing eleven institutions in seven states participated in the study over an eight-month time period. Two hundred-seventy five patients underwent the DMLC and were studied in a prospective, non-randomized fashion. The times to completion of the dome-down dissection varied from 14.4 minutes to 95 minutes based on complexity category. There were no minor bile leaks or common bile duct injuries. There were two inadvertent entries into the gallbladder wall during dissection and one conversion to open secondary to bleeding.

This review represents the follow-up data of 13 different surgeons with this method of dissection. The procedure was performed successfully with no bile leaks or common bile duct injuries. This technique should allow for a rate of CBD injury comparable to that seen in open cholecystectomy with all the advantages of laparoscopic surgery.

ENDOSCOPIC HEAT ABLATION THERAPY FOR HEPATOMELLIAR CARCINOMA Masashar Odo, M.D., Koji Okuda, M.D., Masao Hara, M.D., Naomi Tsukazawa, M.D., Shigeaki Aoyagi, M.D., Kazuo Shiroyuzi, M.D., Department of Surgery, Kurume University School of Medicine, Kurume Fukuoka, Japan.

Hepatocellular carcinoma (HCC) is one of the most common liver tumors in Japan. There are various modalities for HCC, including hepatectomy, transarterial embolization, percutaneous injection therapy and heat ablation therapy. The favorable treatment for HCC is curative surgical resection, but many patients with HCC confined to the liver are not candidates for resection for their concomitant liver cirrhosis with inadequate functional hepatic reserve. On the other hand, the heat ablation therapy with microwave coagulation treatment (MCT) and with radiofrequency ablation (RFA) is effective alternative treatment.

We employed endoscopic guidance thermal ablation therapy aiming to treat with minimally invasive method from April 1991. Fifty-four patients were treated with endoscopic guidance ablation therapy between April 1991 and August 2001. Forty-seven patients were treated with MCT (Thoracic guidance: 33 cases, Laparoscopic guidance: 22 cases), and 7 patients were treated with RFA (Thoracic guidance: 2 cases, Laparoscopic guidance: 4 cases).

Thoracic guidance was employed for 28 cases tumor located in S4 (1 case), S6 (2 cases), S7 (7 cases), and S8 (18 cases) and laparoscopic guidance was employed for 26 cases tumor located S1 (1 case), S2 (3 cases), S3 (2 cases), S4 (5 cases), S5 (4 cases), S6 (7 cases). Ten patients experienced complications (Pleural effusion: 4 cases, Infection of port site: 3 cases, Atelectasis: 1 case, Pulmonary edema: 1 case, Liver abscess: 1 case). There have been no deaths associated with heat ablation therapy. We indicate ablation therapy including endoscopic approach for patient with three or fewer, primary HCC which size is <3cm.

The endoscopic approach allowed for visualization of surrounding structures with minimizing invasions, and blood loss and operative time were suppressed.
Hepatobiliary/Pancreatic Surgery–PS037

THE ERA OF ULTRASONOGRAPHY DURING LAPAROSCOPIC CHOLECYSTECTOMY IS CHOLANGIOGRAPHY EVER NEEDED Raymond P. Onders M.D., Peter T. Hallowell M.D., Department of Surgery, University Hospitals of Cleveland and Case Western Reserve University, Cleveland, Ohio.

Background: The use of ultrasonography to assess for common bile duct stones has been well described. This study was undertaken to assess the use of the umbilical port exclusively for ultrasonography during laparoscopic cholecystectomy and to assess the need for fluoroscopy during an era of radiology personnel shortages.

Methods: A database of cases done by the primary author was analyzed from 1/00 to 8/01 to review all laparoscopic cholecystectomies done with or without laparoscopic ultrasonography. The standard technique was a Hasson trocar with only two additional 5mm ports. A 7.5-MHz ultrasound probe with a deflectable tip was utilized only through the umbilical port. The longitudinal view of the common hepatic and common bile duct was visualized to the ampulla. Ultrasonography was utilized selectively when patients were at an increased risk for common bile duct stones or for identification of the anatomy. No additional personnel were needed during ultrasonography.

Results: There were 189 laparoscopic cholecystectomies performed during the study period. Ultrasonography was utilized in 84 cases and common bile duct stones were identified in 8 patients, 6 of these patients underwent laparoscopic common bile duct explorations and two underwent ERCPs. There were no false positive or false negative ultrasonograms. All were performed laparoscopically with a total of three ports. There was no use of cholangiography in this series except during the common bile duct explorations.

Conclusions: The umbilical port technique allows for excellent viewing of the bile ducts and limits the need for a 10mm epigastric port. The use of surgical ultrasonography decreases the need for fluoroscopy and the scarce radiology technicians. With meticulous dissection for anatomy and experience with ultrasonography there is little indications for cholangiography except for any rare questions concerning the anatomy and during therapeutic maneuvers for common bile duct stones.

Hepatobiliary/Pancreatic Surgery–PS039

LAPAROSCOPIC CRYOABLATION OF HEPATIC TUMORS: MID-TERM FOLLOW-UP RESULTS. Alessandro M. Pagani MD, Francesco Feiicciotti MD, Marco Guerrieri MD, Andrea Tambunni MD, Jenia Samani MD, Emanuele Lecoe MD.* Clinica di Chirurgia Generale e Metodologia Chirurgica, Ospedale Umberto I, University of Ancona, Italy. “Clinica Chirurgia II”, Policlinico Umberto I University “La Sapienza” Rome, Italy.

Liver resection offers the best chance of cure for patients with hepatic colorectal (CRM) and non-colorectal (NCRM) metastases with 57% and 22% 3 years survival, respectively. Recent technological advances have expanded the range of options for the treatment of liver tumors. Total Laparoscopic Cystoablation (TLC) has been shown to be feasible and safe. Aim of this study is to evaluate the long-term results of TLC in pts with hepatic CRM and NCRM.

From April 1996 to October 2000, 24 pts (17 males, 7 females, mean age 65.3 years, range 30-78 years) underwent TLC in our Dept. In 15 cases (62%) for CRM, in 7 cases (29%) for NCRM and in 2 cases (9%) for HCC. The number of cryoablated lesions was 1.4 for CRM and 1.8 for NCRM. Mean hospital stay was 11 and 10 days respectively for CRM and NCRM. Two pts in the CRM group and 1 pt in the NCRM group were converted to open surgery for bleeding. No major complications or mortality were observed.

Follow-up (pts) CRM (15) NCRM (7)
Mean Follow-up, mths (range) 40.8 (10-44) 38.2 (7-57)
Alive, n (%) 10 (66.6) 3 (42.8)
Disease-free, n (%) 8 (80) 2 (66.6)
Distant recurrence, n (%) 2 (20) 1 (33.4)
Median survival (mths) 62.4 45.9
No local recurrences on the site of hepatic cryoablation were observed. TLC is effective for local tumor control. In selected pts the mid-term follow-up results compare favorably with the reported results after surgical resection.

Hepatobiliary/Pancreatic Surgery–PS038

LAPAROSCOPIC CHOLECYSTECTOMY WITH TWO ORIGINAL LIFTING BARS Hirotsugu O’hara, M.D., Toshiyuki Hirai, M.D., Yasuhiro Masuda, M.D., Hiroo Yukiwa, M.D., Masanobu Taniguchi, M.D., Department of Surgery, Fujieda Heisei Memorial Hospital, Fujieda, Sizuoka, Japan.

In 1992, we performed laparoscopic cholecystectomy by an abdominal wall lifting method using only one original lifting bar (our lifting bar consisted of a bent stainless steel rod 5mm in diameter). In 1994, we changed this method to a two lifting bar method to accommodate cases of severe obesity or cases of severe inflammation at the Calot’s triangle. So, since 1994, we have performed 250 cases of LC with good results by the two lifting bar method. This method, including surgical field and procedure for insertion of our lifting bars, will be discussed.

In every LC, using two lifting bar method, there was no severe complication and no case of damaged wall and peritonium. There was only 2 cases converted from laparoscopic cholecystectomy to conventional open surgery. The average operation time was 89.9min.

By using this method, ligamentum teres hepatis is jerked toward the upper median direction. As a result, the liver is lifted to the median abdominal position, so we can get a suitable surgical field to manipulate the inferior surface of the liver, as is required to perform cholecystectomy. Our lifting method is reliable technique.

Hepatobiliary/Pancreatic Surgery–PS040

TEN YEARS’ EXPERIENCE WITH LAPAROSCOPIC SINGLE STAGE COMMON BILE DUCT STONES’ MANAGEMENT. Alessandro M. Pagani MD, Francesco Feciocciotti MD, Marco Guerrieri MD, Andrea Tambunni MD, Jenia Samani MD, Emanuele Lecoe MD.* Clinica di Chirurgia Generale e Metodologia Chirurgica, Ospedale Umberto I, University of Ancona, Italy. “Clinica Chirurgia II”, Policlinico Umberto I University “La Sapienza” Rome, Italy.

Aim is to report our 10 years experience with single stage laparoscopic management of gallbladder and CBD stones and to analyse the short and long-term results of this approach. Since April 1991, 301 elective unselected pts (193 females, 118 males, mean age 55.2 years, age range 12-94 years) completed laparoscopic cholecystectomy and CBD exploration for ductal stones (170 trans-cystic, 131 transverse choledochotomy). Major procedure-related complications were observed in 11 pts (3.5%). Mortality occurred in 2 cases (0.6%). Retained CBD stones were present in 15 pts (4.9%) treated postoperatively by percutaneous approach (8 pts) or ERC/PES (6 pts). In one pt a small CBD stone passed spontaneously. The overall success is 95.1%.

Long-term follow-up was obtained on 285 pts (94.7%). Thirteen pts died from unrelated reasons with no evidence of recurrent biliary symptoms. Sixteen pts (5.3%) were lost to follow-up. At a median follow-up of 73 months, 234 (86%) pts are asymptomatic, 22 (8%) report dyspepsia and 16 (6.9%) specific bowel symptoms. Recurrent ductal stones were found in 5 pts (1.8%) at T. 4, 8, 18, 27 months after T-tube removal following negative cholangiogram. All five pts underwent ERC/PES. In one case the stone was retrieved spontaneously. One pt with dilated bile ducts (>2 cm) developed recurrent CBD stones and underwent hepaticojejunostomy. No biliary strictures at the site of the transverse choledochotomy have been observed.

The reported data confirm the safety and efficacy of the single stage laparoscopic approach, both in the short and in the long-term, which allows to redefine the role of endoscopic sphincterotomy in the elective setting as the treatment of choice for residual ductal stones (when a biliary drainage sinus tract is not available) and for recurrent stones.
Hepatobiliary/Pancreatic Surgery–PS041


With increasing experience and new equipment, more and more complex procedures are being successfully treated by laparoscopic approach. Complex Hydatid cysts ruptured into the biliary system is technically challenging by laparoscopic treatment. We have treated patients with such complication successfully by laparoscopic approach.

Since Jan 1992, we have treated 36 patients of Hydatid cysts liver at CIGES of which 6 of them were complicated cyst with intra-biliary rupture. Four patients had cholangitis with pain, fever and jaundice. Imaging investigations revealed intra biliary hydatid fragments. All of them were submitted for laparoscopic extraction.

We adopted two different approaches depending on the size of the cysts.

Method One: In 4 patients with large cysts were treated by laparoscopic assisted percutaneous trocar cannula extraction system. Our own designed cannula with long limb 12mm wide and side suction cannula (12mm) and another channel for saline irrigation and gas insufflation for intra-operative telescope inspection. Keeping continuous suction, trocar insertion prevents intra-peritoneal spillage. By intracavity vacuum suction alternate will irri gation removes the intrabiliary cysts.

Method Two: patients with collapsed smaller cysts, transcystic approach adopted for extraction by marsupilizing the cyst wall. Laparoscopic choledochotomy with tube irrigation in a reverse fashion removed the cysts into the main cystic cavity.

In all the patients, removal of the hydatid cysts were complete and during follow up of mean 3 years, no recurrence.

Conclusion: Laparoscopic assisted percutaneous trocar cannula with alternate irrigation and suction system for larger cysts and transcystic approach with biliary irrigation through choledochotomy for smaller cysts are found to be highly effective in treatment of hydatid cysts ruptured into the biliary system.

Hepatobiliary/Pancreatic Surgery–PS042

Can Laparoscopic Cholecystectomy be Done in a True Out-Patient Setting for Acute, Chronic and Gangrenous Cholecystitis? The Experience of 588 Consecutive Laparoscopic Cholecystectomies by a Single Surgeon: Subir Ray, M.D.

The author has performed 588 laparoscopic cholecystectomies over a six year period for acute, chronic and gangrenous cholecystitis regardless of age, weight or underlying medical problems.

Out of these patients 524 were discharged within two to four hours following their surgery. Thirty percent of the patients were given postoperative antibiotics due to the nature of their problem. However, most of the patients with a chronic cholecystitis were discharged without any further antibiotics. Patients with gallstone pancreatitis and patients who underwent preoperative ERCP as well as patients who were admitted by medical service were excluded from this series.

Most patients received Cefotan 2 grams IV and those with an allergy to Cefotan were given Cipro IV. There were six laparoscopic cases converted to an open procedure due to severe inflammation and the inability to identify the cystic duct. Two patients had a common bile duct injury and one underwent an open choledochojjunostomy and one a laparoscopic common bile duct exploration and insertion of a T tube and a safe cholecystectomy. These patients did extremely and were discharged to their home.

No patients underwent any intraoperative cholangiography. Patients with abnormal LFT’s or any sonographic findings of a common bile duct stone were subjected to a preoperative ERCP. There were twenty two patients admitted preoperatively for an ERCP and underwent laparoscopic cholecystectomy. Four patients underwent an unsuccessful ERCP; however, they underwent exploration of the common bile duct with extraction of stones and T tube placement. In 99 percent of the cases the patient used only three trocars for the procedure, 2 mm and one 11 mm. In less than ten cases the author had to use a fourth 5 mm. trocar.

The author concluded that laparoscopic cholecystectomy can be done safely in a true outpatient setting without any increase in morbidity or mortality.

Hepatobiliary/Pancreatic Surgery–PS043

Laparoscopic Stump Cholecystectomy: How Safe is it? Dr. Prasanna Kumar Reddy, Dr. Muraleedharan, Dr. Venkatasubramiam, Department of Surgery, Apollo Hospitals, Chennai, India.

The aim of the study is to find how safely gall bladder stumps which were left during earlier surgery, can be removed laparoscopically. Over a period of 7 years, 30 cases of gall bladder and cystic duct stumps for symptomatic gall stone disease were successfully operated. These patients underwent open or laparoscopic cholecystectomy one to two years before. There were 19 females and 11 males. Average age was 25 to 55 years. Routine pre operative investigations were carried out before subjecting them for surgery. Average time taken for surgery is one hour to one and half hour. Post operative period was uneventful. Patients were discharged in 2 to 3 days time. Revision surgery for gall bladder stump can be performed as safely as routine laparoscopic cholecystectomies. It does not increase the morbidity and mortality.

Hepatobiliary/Pancreatic Surgery–PS044

Laparoscopic Enucleation of Pancreatic Islet Cell Tumors: Petachia Reissman, M.D., Sergey Lyass, M.D., Ahmed Eid, M.D., Oded Zamir, M.D., Richard Lederman*, M.D., David Gross**, M.D., Department of Surgery, Radiology* and Endocrinology**, Hadassah University Hospital, Jerusalem, Israel.

Background: The difficulty in locating small pancreatic islet cell tumors (PICT) makes their laparoscopic management even more challenging and only several small case studies have been so far reported. We retrospectively analyzed our experience with laparoscopic enucleation of PICT in order to determine its feasibility and outcome.

Patients & Methods: Between July 2000 and May 2001 – 5 patients (3 male, 2 female, 24-55 years old) underwent laparoscopy for PICT. Clinical data, preoperative endocrine work up, imaging studies, operative data, final diagnosis and outcome were recorded and analyzed. Intraoperative laparoscopic ultrasound for tumor localization and exclusion of synchronous lesions was performed in all patients.

Results: 4 patients had an insulinoma located in the tail – 1, body – 1, head – 1 and uncinate process – 1. In one patient the tumor was non-functioning located in the body. Two patients were converted due to failure of tumor localization by the laparoscopic ultrasound probe. In both patients after conversion the tumor was located in the uncinate process and body using an ordinary probe. In one patient with Von-Hippel-Lindau Syndrome, laparoscopic enucleation of the PICT and laparoscopic adrenalectomy for pheochromocytoma were performed in the same session. All patients underwent complete enucleation of the tumor (10 – 20 mm in diameter). There were no intraoperative complications. Postoperatively, 2 of the 3 patients in the laparoscopic group and one of the two converted patients developed a controlled self limiting pancreatic fistula. Tumor histology confirmed the preoperative diagnosis in all patients. During 4 – 14 m of follow-up all patients are well and without any endocrine abnormalities.

Conclusions: Laparoscopic enucleation of pancreatic islet cell tumors is feasible and safe. The use of intraoperative ultrasound is crucial. However, according to our limited experience the laparoscopic probe is still inferior to the ordinary probe. With growing experience and technical progress this may be resolved.
Hepatobiliary/Pancreatic Surgery–PS045

PREDICTIVE FACTORS FOR CONVERSION OF LAPAROSCOPIC CHOLECYSTECTOMY, Michael Rosen MD, Fred Brody MD, Frank Duperier MD, Alicia Fanning MD, Jeffrey Ponsky MD., Department of General Surgery and Minimally Invasive Surgery Center Cleveland Clinic Foundation, Cleveland OH

Laparoscopic cholecystectomy has replaced open cholecystectomy for the treatment of gallbladder disease. However, certain cases still require conversion to open procedures. Identifying these patients at risk for conversion remains difficult. The aim of this study was to identify risk factors that may predict conversion from the laparoscopic to open procedure. From January 1996 to January 2000, 1347 laparoscopic cholecystectomies were performed at one institution. A retrospective analysis of thirty four parameters including patient demographics, clinical history, laboratory data, ultrasound results, and intraoperative details was performed. Stepwise, multivariate logistic regression was used to determine those variables predicting conversion of laparoscopic cholecystectomy.

Seventy one (5.3%) laparoscopic cholecystectomies required conversion. Multivariate analysis revealed that for all cases, a WBC>9 (2.9 greater odds ratio (OR) of conversion p=0.006) and a gallbladder wall thickness>0.4 cm (7.2 OR, p<0.001) predicted conversion to open cholecystectomy. However, when patients with acute cholecystitis were evaluated OR was a BMI>36 kg/m2 (3.7 OR, p=0.01) and a wall thickness>0.4 cm (24.7 OR, p=0.004) predicted conversion. Finally, an ASA>2 (5.3 OR, p=0.01) predicted conversion in patients undergoing nonelective cholecystectomies. Obese patients with acute cholecystitis undergoing laparoscopic cholecystectomy have an increased chance of conversion. Likewise, patients with multiple comorbid diseases undergoing nonelective laparoscopic cholecystectomy are more likely to require conversion. Finally, in an elective laparoscopic cholecystectomy, morbidity obese patients with chronic cholecystitis and a thickened gallbladder wall are more likely to require conversion. These factors can help counsel patients undergoing laparoscopic cholecystectomy with regards to the probability of conversion to an open procedure.

Hepatobiliary/Pancreatic Surgery–PS047

LAPAROSCOPIC CYSTOJEJUNOSTOMY FOR PANCREATIC PSEUDOCYST: INFRACOLONIC APPROACH-Kazuhiko Shibuya M.D., Hisashi Abe M.D., Shigehiko Otomo M.D., Koushiko Motoi M.D., Junichiro Yamauchi M.D., Makoto Sunamura M.D., Kazunori Takeda M.D., Seiki Matsuno M.D, First Department of Surgery, Tohoku University, Sendai, Japan.

Background: The gradual enlargement of a persistent pancreatic pseudocyst generally requires intervention. When the decision to carry out an operative procedure is made, preference should be given to internal rather than external drainage. Cuschieri reported laparoscopic cystojejunostomy using intracolic approach that does not require Roux-en Y or Braun anastomosis for pancreatic pseudocyst in 1996. Purpose: To evaluate the usefulness of this laparoscopic infracolic cystojejunostomy compared to open procedure.

Method: From January 1999 to August 2001, 3 patients underwent this laparoscopic cystojejunostomy (LAP group) and 5 patients underwent open cystojejunostomy (open group). Operative time, amount of bleeding, starting time of water intake, and postoperative hospital stay were compared between two groups.

Results: Mean age was 55.3 years in LAP group and 54.4 years in open group. Mean diameter of the pseudocyst was 6.0cm in LAP group and 8.8cm in open group. Early uncomplicated resolution was observed in all of the patients. Mean operative time was 191 minutes in LAP group and 144 min in open group. Mean amount of bleeding was less than 10g in LAP group and 202g in open group. Mean starting time of water intake was 3.7 days in LAP group and 5.4 days in open group. Mean hospital stay was 14.3 days in LAP group and 25.2 days in open group.

Conclusion: This laparoscopic cystojejunostomy using infracolic approach is a safe and useful procedure because it can reduce amount of bleeding and postoperative hospital stay, although it takes more operative time.

Hepatobiliary/Pancreatic Surgery–PS046

THREE PORT VERSUS STANDARD LAPAROSCOPIC CHOLECYSTECTOMY, A PROSPECTIVE, RANDOMIZED TRIAL. Tripathi Sandhy M.D. Department of Surgery, Faculty of Medicine, Chiangmai University, Chiangmai, Thailand.

Since the first laparoscopic cholecystectomy was performed and reported in 1987. There was widespread accept this technique around the world and now accept as a standard procedure. The procedure is based on standard technique using four trocars. The fourth (lateral) trocar use to grasp the fundus of gallbladder upward to expose Calot’s triangle. After performing a number of cholecystectomy, I felt that most of the cases did not need a fourth trocar. So I decide to study compare three port versus four port technique.

During 1998-2000, 200 consecutive patients who underwent elective laparoscopic cholecystectomy due to gallstone were randomized to receive either three or four port technique.

There was no difference between two groups in age (53.22 vs 53.74 p=0.938), sex (1.75 vs 1.73 p=0.522), weight (59.12 vs 58.8 p=0.369), operative time (59.22 vs 57.66 p=0.044), successful rate (0.98 vs 0.98), visual analog score (3 vs 3), number of oral analgesics (0.3 vs 0.39) and post op hospital stay (1.4 vs 1.9 p=0.24) but there was better in three port group in reduce of number of analgesic injection (0.40 vs 0.77 p=0.024).

The results showed that using the three port technique is as safe as compare to standard four port laparoscopic cholecystectomy. The main advantages of the three-port technique are less expensive, fewer scars and use less personnel.

Hepatobiliary/Pancreatic Surgery–PS048

EXPERIMENTAL AND CLINICAL EVALUATION OF COMMON BILE DUCT REPAIR BY TITANIUM CLIP. Kazuyuki Shimomura MD, Yuki Fujino MD, Hirohumi Yamada MD, Nobuo Murata MD, Daijo Hashimoto MD, Department of Surgery, Saitama Medical Center, Saitama Medical School, Saitama, JAPAN

Recently common bile duct (CBD) exploration is often performed laparoscopically. However suture repair of common bile duct is sometimes difficult technically, and T-tube insertion tends to prolong hospital stay up to over 3 weeks. In order to simplify closure technique of CBD and to avoid prolonged hospital stay, we applied VCS titanium clip to repair CBD. VCS is a clip system made for vascular and biliary obliteration. Cuschieri reported given to internal rather than external drainage. Cuschieri reported pseudocyst generally requires intervention. When the decision to carry out an operative procedure is made, preference should be given to internal rather than external drainage. Cuschieri reported laparoscopic cystojejunostomy using intracolic approach that does not require Roux-en Y or Braun anastomosis for pancreatic pseudocyst in 1996. Purpose: To evaluate the usefulness of this laparoscopic infracolic cystojejunostomy compared to open procedure.

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Conclusion: This laparoscopic cystojejunostomy using infracolic approach is a safe and useful procedure because it can reduce amount of bleeding and postoperative hospital stay, although it takes more operative time.
LAPAROSCOPIC CHOLECYSTECTOMY IN OCTOGENARIANS

Spira MD, Nahum Beglaibter MD, Tzeela Cohen MD, Aviram Nissan MD, Herbert R Freund MD, Department of Surgery Hadassah University Hospital, Mount Scopus, Jerusalem Israel.

The proportion of patients aged 80 years and more is constantly increasing. This retrospective study was designed to document the special features of this group, the indications for surgery and the perioperative course and complications in this age group. During the last 5 years we performed 1250 laparoscopic cholecystectomies out of whom 59 patients (5%) were 80 (range 80-91) or more years old. There were 43 females and 16 males. The indications were acute cholecystitis in 28 (47%), biliary colic in 17 (29%), cholangitis in 6 (10%), and gall stone pancreatitis in 8 (13%) patients. Ten patients (17%) underwent percutaneous tube cholecystostomy during an attack of severe acute cholecystitis several weeks prior to surgery and 17 patients (30%) underwent ERCP preoperatively. Twenty patients had no major comorbidities while 30 patients had 1-2 major comorbidities and 9 patients had 3 or more major comorbidities. Thirty one patients were ASA class II, 26 were ASA class III and 2 were ASA class IV. Conversion to open cholecystectomy occurred in 7 patients (12%) vs. 1.5% in the remaining 1191 patients. Mean operative time was 80 (range 40-190) minutes vs. 60 minutes in the rest of the group. Sixteen major postoperative complications (mainly cardiac and pulmonary) occurred in 8 patients (13%). We had one anesthetic related mortality. Mean postoperative hospital stay was 2.3 days vs. 1.2 days in the rest of the 1191 patients.

Conclusions: Octogenarians are more frequently operated because of complicated gall stone disease (acute cholecystitis, cholangitis, pancreatitis) then the younger population and hence the longer operative time and larger conversion rate. Preoperative systemic comorbidities contribute to the higher postoperative complication rate. Nevertheless, the results are superior to published historical controls concerning open cholecystectomy in the elderly. Laparoscopic cholecystectomy is the gold standard for gall stone disease regardless of age.

LAPAROSCOPIC EXCISION OF CHOLEDOCHAL CYST IN CHILDREN,


Objective: With the rapid advances in minimally invasive surgical techniques, even complicated reconstructive procedures can now be achieved laparoscopically in young paediatric patients. We report our early experience of laparoscopic excision of type I choledochal cysts with hepaticojejunostomy in two patients.

Methods: Patient 1: A 1-year-old boy was found to have a large choledochal cyst on antenatal screening. The cyst progressively increased in size to 8cm in diameter postnatally. Patient 2: A 17-year-old girl presented with recurrent cholangitis. Investigations revealed a type I choledochal cyst. Surgical Techniques: Patient was in supine position with legs separated and the surgeon was standing between the legs. A 5mm 30° laparoscope was introduced via a supraumbilical port. Three more 5-3mm ports were inserted at left upper and right lower and upper quadrants. An operative choledochogram was performed via a needle inserted percutaneously. Cholecystectomy was performed. The choledochal cyst was then mobilised away from the portal vein and hepatic artery from above downwards to the retrocaval and intrapancratic portions. A 40cm Roux loop was fashioned extracorporeally via the slightly enlarged umbilical port site, then re-routed back into the abdominal cavity and brought to the hepatic hilum in retrocaval manner. The choledochal cyst was then transected just beneath the common hepatic duct bifurcation. End-to-side hepato-jejunostomy was fashioned using interrupted 5-0 polyglactin sutures with both intra- and extra-corporeal suturing techniques. Results: Laparoscopic excision of choledochal cysts and hepaticojejunostomy was successfully performed in both patients. The initial recovery of the boy had been smooth but he developed a small subhepatic collection 1 week after surgery. This settled quickly on percutaneous drainage. The girl recovered from surgery uneventfully. Conclusion: Excision of type I choledochal cyst and re-establishment of bilo-entric continuity can be safely and effectively performed laparoscopically even in infants and children.
Hernia Surgery–PS053

LAPAROSCOPIC PERCUTANEOUS CLOSURE OF DEEP INGUINAL RING IN INDIRECT INGUINAL HERNIA

Abdullah AlDohayan, MD; Mohammed AlSebyl, MD; Amal Abdulkarim, MD; Ahmed AlTaiba, MD; Mohammed AlSkaini, MD; Ali AlTuwaijri, PhD; Abdulaziz AlSaigh, MD, Departments of Surgery and Radiology, King Khalid University Hospital, Riyadh, Saudi Arabia

Background: Direct inguinal hernia is a common disease affecting the young population. In healthy patients with non-dilated ring, herniotomy or neck closure are more suitable techniques.

Methods & Results: Laparoscopy is used to localise the hernia. An incision is made at the level of the deep ring. Alkhwaiteer- AlDohayan needle is mounted with sutures passed through the floor of the ring and retrieved through the floor. This step is repeated until the patient’s neck is closed. This procedure has been performed on 140 patients with a mean age of 32 years. Two patients developed direct inguinal hernia. Four patients had wound pain, which subsided in 6 months time.

Conclusion: Laparoscopic closure of the deep inguinal ring is a minimally invasive procedure, economic and suitable in young patients with indirect inguinal hernia.

Hernia Surgery–PS055

RECURRENT RATE AFTER LAPAROSCOPIC REPAIR OF RECURRENT INGUINAL HERNIAS: HAVE WE IMPROVED?

Juliane Bingener, M.D.; James P. Dorman, M.D.; Ginger Valdes, RN, University of Texas Health Science Center San Antonio, Audie L. Murphy VA Hospital, San Antonio, Texas.

The use of laparoscopic repair of recurrent inguinal hernias is becoming increasingly accepted in surgical practice, using an extraperitoneal or transabdominal approach for the placement of mesh. The previous literature reflects that the efforts to perform open repair of recurrent inguinal hernias often result in further recurrences, testicular damage, or nerve injury. Our study reflects physical reexamination of 36 patients over 4 years who had undergone laparoscopic repair of recurrent inguinal hernia. Complications early and late are presented and compared with historical results of open surgery. Recurrence rates at this short follow up remain quite low and acceptable.

The laparoscopic repair of recurrent hernia reflects a very low likelihood of recurrence, low occurrence of testicular damage, and less likelihood of other such complications as nerve or spermatic cord injury. Our study and careful follow up is the subject of this report.

Hernia Surgery–PS054

ADHESION FORMATION AFTER LAPAROSCOPIC VENTRAL INCISIONAL HERNIA REPAIR WITH POLYPROPYLENE MESH: A STUDY USING ABDOMINAL ULTRASOUND

Juliane Bingener, MD; George B Kazantsev, MD, PhD, Shailandra Chopra, MD, Wayne H Schwesinger, MD, Departments of Surgery and Radiology, University of Texas Health Science Center, San Antonio, Texas

Introduction: Laparoscopic repair of ventral incisional hernias using a variety of prosthetic materials is feasible while safe. Polypropylene mesh is often preferred because of ease of handling and lower cost. Long-term complications such as adhesions, obstruction and fistula formation can occur. The goal of this study was to determine whether bowel adhesions and their attendant complications could be prevented by interposition of omentum.

Methods: Between 1999 and 2001 30 patients with VIH underwent laparoscopic repair with Polypropylene mesh. The omentum was always positioned over the loops of bowel. The mesh was secured in place with hernia staples and transcutaneous sutures. At a mean follow up of 14 months 20 patients underwent ultrasonic examination using the previously described visceral slide technique to detect adhesions.

Results: The mean size of the hernias in the study was 50.3 cm² and the mean size of the mesh applied was 275 cm². 15 patients were completely free of adhesions as detected by the normal visceral slide. Five patients demonstrated adhesions between the mesh and underlying omentum, however no visceral adhesions were noted. One small seroma and one hernia recurrence were also seen.

Conclusion: This study shows that omental interposition following polypropylene mesh placement for laparoscopic hernia repair provides adequate protection against visceral adhesions. Polypropylene mesh can be used safely, when adequate omental coverage is available.

Hernia Surgery–PS056

THE SPORTSMAN’S HERNIA: A CAUSE OF CHRONIC GROIN PAIN

Joehdja van de Broek, Cees J. van Steensel, Robbert van Linschoten and Pieter T. den Hoed.

Department of Surgery, Ikuia Hospital Rotterdam, The Netherlands.

Sportsman’s hernia is a debilitating condition which presents as chronic groin pain. The definition, investigation and treatment of this condition remains unclear.

The aim of this prospective study was to determine the incidence of symptomatic not palpable hernia in sportsman with chronic groin pain and to evaluate the efficacy of laparoscopic repair.

Twelve sportsman presented with chronic groin pain between January 1998 and February 2001. All sportsman were male with a median age of 38 years (range: 12-56). Eight patients complained of unilateral groin pain while four had bilateral groin pain. In all cases clinical signs were lacking. Preoperatively radiography, bone scintigraphy and ultrasonography were performed to exclude osteitis pubis and musculotendinous disorders.

All patients were operated ambulatory without significant difficulties. The most common pathology found by laparoscopy was hernia inguinale II (Nystus Ila I, II, 2), hernia femorale III and three preperitoneal lipomas. Only once there was no pathology. In 4 patients a transabdominal approach was used, in 3 a totally extraperitoneal repair and three times there was a conversion from transabdominal to totally extraperitoneal. In all patients a hernia a Marlex mesh (10 x15 cm) was placed preperitoneally. Eleven patients returned to full activity within three months of surgery. One patient had persistent symptoms.

The sportsman hernia should be high on the list of differential diagnoses in chronic groin pain. Operative treatment can return the patient to his sport within three months.
**LAPAROSCOPIC VENTRAL HERNIA REPAIR**

**Purpose:** The purpose of this study was to review the experience of laparoscopic ventral hernia repair at the author's institution and to compare it to previous studies.

**Methods and Procedures:** This study reviewed the author's experience with laparoscopic ventral hernia repairs. The procedure involved the use of a robotic approach with the use of 3-5 robotic trocars. The robotic arms were used to perform the dissection and suturing.

**Results:** Thirty-three patients (20 male and 13 female) had laparoscopic ventral hernia repairs between April 1996 and November 2000. Mean follow up for this cohort was 36 months (range 9-63 months). The mean hernia size was 18.7 cm² (1-100 cm²) and mesh size was 187.13 cm² (32-432 cm²). The mean operative time was 50.5 minutes (11-95 minutes) and length of stay was 0.52 days (0-5 days) with twenty-two patients (67%) going home the day of surgery. There were two complications: persistent seroma and ileus that required prolonged hospital stay (5 days). There have been no recurrences.

**Conclusions:** The use of laparoscopic approach for umbilical hernias is safe and effective.
LAPAROSCOPIC VERSUS OPEN TENSION FREE REPAIR OF INCISIONAL HERNIAS: POSTOPERATIVE QUALITY OF LIFE. Manouchehr Gholghesaei, M.D., Marie L. Essink-Bot, PhD, Martijne van’t Riet, M.D., Ruben Veldkamp, M.D., H. Jaap Bonjer, M.D. PhD, Department of Surgery, Erasmus University Medical Center Rotterdam, the Netherlands

Laparoscopic incisional hernia repair has been reported to have improved results over open repair with respect to wound complications, postoperative pain and return to normal activities. This study investigates if these reported benefits translate into an improved health related quality of life.

23 patients with midline incisional hernias were randomised. In 9 patients open tension free mesh repair was applied. 14 patients underwent laparoscopic repair. Data were prospectively collected using diaries consisting of quality of life and pain measurement questionnaires. Short Form-36 (SF-36) and EuroQol questionnaires were completed 4 weeks postoperatively. The SF-36 yields a multidimensional health profile consisting of 8 items while EuroQol is one-dimensional. In addition a visual analogue scale (VAS) assessed intensity of pain at 1, 2, 3, 7 days and at 4 weeks postoperatively.

At 4 weeks postoperatively just one item of the SF-36 health profile differed between the two treatment groups. This item relates to the patients Physical Role which was slightly better at 0.40 out of 100 points for open repair. The mean SF-36 physical score for open repair was 44 vs. 37 points out of 100 points. The mean EuroQol tariffs for both groups were comparable at 4 weeks. VAS scores at 3 and 7 days after surgery suggest less pain after laparoscopic repair: 4.0 vs. 3.0 and 3.3 vs. 1.3 respectively with 0 meaning no pain at all and 10 meaning the worst pain imaginable.

These results indicate laparoscopic repair does not yield a better health related quality of life 4 weeks after surgery. Laparoscopic repair does seem to be associated with less pain, most notable 1 week after surgery. The data do not exclude the possibility of a better quality of life up to 4 weeks postoperatively e.g. 2 weeks postoperatively.

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Hernia Surgery–PS065

BOCHDALEK HERNIA IN ADULTHOOD: PITFALLS AND MISDIAGNOSIS.
Elías Habib, M.D., André Elhadad, M.D., Department of Digestive and Thoracic Surgery, Robert Ballanger Hospital, Aulnay Sous Bois, France.

Bochdalek hernia (BH) is the result of the non-development of the posterolateral mesenchymal plate. It is discovered most frequently on prenatal US scan or after birth because of acute respiratory failure. It is infrequent in adulthood.

A 64-years-old man suffered since his infancy from a right-sided diaphragmatic hernia. He developed a small intestinal obstruction because of its strangulation. Laparotomy showed BH containing strangulated small intestine, right colon, right kidney and a hypoplastic right liver. A 28-years-old autistic man suffered from dyspnea and vomiting. Chest X-ray and intestinal opacification showed small intestine in the left thorax. Thoracotomy showed left-sided BH containing small intestine, omentum and spleen. A 38-years-old woman operated 5 years ago from splenectomy because of Hodgkin’s disease suffered from epigastric pain and vomiting. CT scan and stomach opacification showed strangulated stomach in a left-sided BH confirmed by laparotomy. An 88-years-old man known to have a pancreatic diagnosis was admitted because of acute dyspnea. Chest X-ray and CT scan showed a left-sided Bochdalek hernia containing strangulated stomach and left colon confirmed by laparotomy.

In adulthood, one-sided or double-sided BH is discovered because of combined respiratory and digestive symptoms. Respiratory symptoms are sneezing, dyspnea, chest pain, cough. Digestive symptoms are belch, nausea, vomiting, abdominal distension, upper quadrant abdominal pain radiating to the shoulder, slow intestinal transit, haematemesis, melaena. BH can be responsible of acute respiratory failure and heart arrest, stomach or intestinal strangulation volvulus necrosis or perforation, empyema and septic shock. Surgical treatment can be made through, thoracoscopic laparoscopy thoracotomy or through laparotomy in case of digestive complications.

The wide spectrum of symptoms is responsible of pitfalls in the diagnosis of BH. Misdiagnosis of BH is responsible of acute complications.

Hernia Surgery–PS066

LAPAROSCOPIC TENSION-FREE REPAIR OF INCISIONAL UMBILICAL OR EPIGASTRIC HERNIA WITH GORETEX MESH.
Elías Habib, M.D., André Elhadad, M.D., Department of Digestive and Thoracic Surgery, Robert Ballanger Hospital, Aulnay Sous Bois, France.

This prospective study aims to evaluate the results of the laparoscopic repair of incisional umbilical or epigastric hernia with a Goretex mesh (GM) applied without tension on the posterior side of the abdominal wall.

Since July 1994, 49 patients with incisional hernia and 27 patients with umbilical or epigastric hernia were included. They had an average age of 54 years, an average BMI of 33. The hernia had to be 10 cm high and 13 cm wide. Under laparoscopy, adhesions are first detached. Foided GM with marking silk is introduced into the abdomen and unfolded. Four tracking silks are passed through the GM that is tracked, placed against the abdominal wall, adjusted to cover widely the hernia and then strongly stapled on the anterior abdominal wall.

Conversion to laparotomy due to tenacious adhesions occurred in one case. One operative complication occurred: a laparoscopically repaired sezoal laceration of the ileum. GM of 10x15cm, 15x20cm or 20x30cm was applied. After surgery, there was no mesh infection. Immediate postoperative complications occurred in 9 patients including broncho pneumonia, sepsis, urinary infection, prolonged ileus and unexplained fever. Hospital stay was of 4.8 days and loss of work duration of 33 days. During an average follow-up of 36 months, recurrence occurred in 5 patients (6.5%). Late complications were noted in 16 patients including 11 seroma, 4 retractive pain, one haematoma, and one trocar hernia.

Laparoscopic tension-free repair with Goretex mesh is advisable for the treatment of incisional umbilical or epigastric hernia.

Hernia Surgery–PS067

RETROPERITONEOSCOPIC TENSION-FREE REPAIR OF THE LUMBAR HERNIA.
Elías Habib, M.D., A. Elhadad, M.D., Department of Digestive and Thoracic Surgery, Robert Ballanger Hospital, Aulnay Sous Bois, France.

Lumbar hernia (LH) is an infrequent pathology that is difficult to treat. A 65-years-old man presented a right-sided lumbar mass since at least 10 years, which was responsible of pain, must frequently on the morning. It was a fatty mass of 10x15x15 cm, located in the lumbar fossa, which was easily reintegrated into the lumbar region. After what the examiner could find a 3 cm diameter hole inferior to the 12th rib and external to the vertebral muscles. CT scan showed the hernia and the hole.

Patient was operated with the diagnosis of LH. He was installed lying on the left side. Through a small incision in the flank, dissection was initiated with a smooth instrument than a 10 mm trocar was inserted into this incision and the retroperitoneal space inflated. Under direct vision, dissection of retroperitoneal fatty tissue was continued posteriorly and laterally within 1 cm. A 5 mm trocar was introduced in front of the anterior edge of the 11th rib. Dissection was then continued until the hernia was seen. Fatty tissue into the LH was reduced slowly and easily allowing the operator to see the lumbar wall defect, and through it the hernial sac developed partially in the vertebral muscles. A 12 cm diameter polypropylene mesh was introduced through the 10 mm trocar, applied on the lumbar wall to cover widely the LH and the 10 mm trocar-site, and stapled on the lumbar wall. Gas was deflated and the trocar-site was sutured.

Under laparoscopy, especially in case of traumatic LH, colon and ureter should be detached to explore the lumbar wall and reinserted at the end of the operation. Under retroperitoneoscopy, even if the space is small, fatty tissue is easily detached at a distance from colon and ureter. The defect is covered with a polypropylene mesh or an ePTFE mesh if the retroperitoneal space is not closed. Mesh is stapled or sutured at a distance from the vertebra to avoid injuring lumbar radicles. Surgery and follow-up were uneventful with no recurrence in this case and in the four cases published.

Retroperitoneoscopy is an easy approach for a tension-free repair of LH.

Hernia Surgery–PS068

LAPAROSCOPIC INGUINAL HERNIA REPAIR BY EXTRAPERITONEAL APPROACH—USEFULNESS OF PERITONEAL EDGE ORIENTED METHOD.
Ikeda M., M.D., Ph.D., Department of Surgery, Beppu National Hospital, Beppu, Japan.

The argument about merits and demerits of the laparoscopic inguinal hernia repair (IH) compared with the conventional method is still going on. Why is there so much argument despite IH having various advantages such as rapid recovery in addition to the low recurrence rate? This is probably because IH currently in use is by TAPP (transabdominal preperitoneal approach) not without potential complications such as organ damages and ileus and also because it is not a minor surgery unlike the conventional method.

Now is the time to shift to TEPP (totally extraperitoneal preperitoneal approach) and to establish IH which is less invasive and of a minor surgery. TEPP has been deemed as a very difficult surgical technique because of the difficulty in securing the extraperitoneal space as a surgical space. At present, this problem has been resolved by the balloon dissection method. Nevertheless, TEPP has not become popular. As the reason for it, mention can be made of the difficulty in making differential diagnosis of the hernia during operation and the complicated procedure required in treating the hernia sac. Moreover, a detailed description on how to proceed with these surgical procedures is not available now.

The author has developed a new operative technique for TEPP (peritoneal edge oriented method) capable of making a correct diagnosis and treating the hernia sac during operation by following the peritoneal edge continuously and worked it out into a manual, thereby making it possible to perform a sure and stable TEPP. Based on the experience with 780 cases on which the author performed operation, the actual surgical technique is presented with explanation.
Hernia Surgery–PS069

LAPAROSCOPIC VENTRAL HERNIA REPAIR IN THE OBSESE PATIENT: A CASE SERIES. Christopher W. Juergens, M.D., Dasen R. Richey, M.D., Department of Surgery, Jewish Hospital Medical Center, Cincinnati, Ohio.

Introduction: The objective of this study is to evaluate laparoscopic ventral hernia repair as an acceptable surgical therapy for the repair of ventral and incisional hernias in the obese patient population.

Methods: Medical record review of 10 consecutive cases of laparoscopic ventral hernia repair by a single attending surgeon at a single institution over an 8 month period; January to August 2001. Obesity is defined as a body mass index (BMI) greater than 30 kg/m². Laparoscopic ventral hernia repair was performed with a single 10mm port and 2 or 3 additional 5mm ports. Goretx dual mesh (430 cm²/avg. size), with transabdominal fascial sutures (4-8), and 5mm spiral clips were used for each case. Wound drains and Foley catheters were not used. Data reported include patient demographics (age, sex, BMI), characteristics of the perioperative course, length of stay, complications, and recurrence.

Results: There were 7 women and 3 men. The average age was 49.5 years (range 26-64). The mean BMI was 39.5 (range 31-57), and 5 of the patients were morbidly obese (BMI>40). All procedures were completed laparoscopically. Mean operative time was 149 minutes (range 95-283). Incisional hernia repairs took longer than ventral repairs; 155 vs. 140 minutes. Two cases involved extensive lysis of adhesions due to recurrent incarcerated incisional hernias after previous bariatric surgery. There were no abdominal wound infections, mesh infections, or episodes of urinary retention. There were no abdominal wall vascular injuries, serosal bowel wall injuries, or enterotomies. Average LOS was 1 day (range 0-3), and 1 patient was readmitted for treatment of COPD and CHF. Follow-up, 2 patients had seromas that resolved without treatment. No recurrences have occurred.

Conclusion: This case series supports that laparoscopic ventral hernia repair can be successfully completed in the obese patient with low risk of morbidity, and excellent surgical outcomes.

Hernia Surgery–PS071

LAPAROSCOPIC INGUINAL HERNIA REPAIR. Konstantinidis K., M.D., Ph.D., Voriai M. M.D., Sambalis G. M.D., Georgiou M.M.D., Anastassakou K., M.D., Athens Medical Center Department of General & Laparoscopic Surgery, Athens, Greece.

Abstract presented is our 10-year (1992-2001) experience in the treatment of inguinal hernias. A total of 1128 hernias in 910 patients (841 males & 69 females) were treated by laparoscopic techniques. Specifically: 486 pts presented with a unilateral hernia, 218 pts with bi-lateral hernias, 189 pts with recurrent hernias (two with previous open mesh placement) and 17 pts with femoral hernias. Of these, 16 pts presented with incarceration, 10 inguinal & 6 femoral.

Our initial experience was with the TAPP technique, treating 120 pts (158 hernias), while in the remaining 790 pts (970 hernias) the TEP technique was applied and as of 1997 we use the large 10cc X15cc mesh.

In the TAPP group (158 hernias) patients experienced a 6.3% complication rate. One epigastric vessel laceration, 1 spermatic vein laceration, 2 urine retentions, 3 nerve paresthesias and one hydrocele. There were no conversions and the overall recurrence rate was 4 pts (2.5%), being 3 pts (8%) in the initial 50 cases, falling to 1 pt (0.9%) in the remaining 100 cases. The average operative time was 85 min (60-150min).

In the TEP group (970 hernias) we observed 71 (7.3%) complications. Forty seromas, 10 urine retentions, 9 nerve paresthesias, 6 hematoma, 4 subcutaneous emphysemas, 1 nerve entrapment requiring clip removal and 1 vas deferens laceration. In 6 (0.6%) cases the TEP was converted to a TAPP and 8 (0.8%) cases were converted to an open approach. Recurrent hernias developed in 4 pts (0.4%). The average operative time was 39 min (15-85min).

The variation in intra-operative & post-operative complications, the recurrence rate and operative time is directly correlated to the experience of the surgeon, the understanding of the anatomy of the pelvis which is gained using the TAPP approach. Large mesh placement via the totally extra-peritoneal approach, in our opinion reflects the ideal treatment for primary and recurrent hernias of the inguinal canal.

Hernia Surgery–PS070


Totally extraperitoneal (TEP) repair of inguinal hernia, despite having a favorable clinical outcome and being cost-effective by societal perspective, are criticized by payors due to higher charges associated with this procedure. We present a comparison of actual direct costs, and charges for open tension free (OPN) herniorrhaphies and TEP repairs with emphasis on a profit-cost ratio.

41 unilateral TEP repairs were compared with 44 OPN repairs done at our institution between Dec-1996 and Dec-1999. Actual direct costs were determined for each patient. Charges and hospital reimbursements were analyzed using the hospital financial database. Hospital profit was calculated and expressed as a profit-cost ratio. Patient records were reviewed to evaluate demographics and perioperative complications. All the values are expressed as mean ±1SD and differences between the groups are tested using the t-test.

There were no significant differences in demographics between the two groups. The mean short-term direct costs for TEP and OPN repairs were $760±65 and $397±52 respectively. However, the mean hospital charges for TEP and OPN repairs were $4738±638 and $2598±1638 respectively. The mean reimbursements were $3064±1139.10 and $1234±848 in the TEP group and the OPN group respectively. The charges for the TEP repair averaged $2140 more than the OPN and the reimbursements were $1680 higher in the TEP group. The profit-cost ratio was 3:1 in the TEP group and 1.16:1 in the OPN group, indicating a significantly higher profit margin earned by the hospital in the TEP group (P<0.01). No serious post-operative complications occurred in either group.

The direct cost of TEP repairs with the minimal use of disposable instruments in a high volume laparoscopic surgery unit is comparable to the tension free open repair. However, TEP repairs appeared more expensive to payors because of differential determination of hospital charges between the two procedures.

Hernia Surgery–PS072

LEARNING CURVE FOR UNILATERAL ENDOSCOPIC TOTALLY EXTRAPERITONEAL INGUINAL HERNIOPLASTY. Hong L., M.D., Eugene Yeung, M.D., Nivitti G. Patii, M.D., Wai K. Yuan, M.D., Francis Lee, M.D. Department of Surgery, University of Hong Kong Medical Center, Hong Kong SAR, China.

Performance of totally extraperitoneal inguinal hernioplasty (TEP) requires specialized anatomical knowledge and surgical skills. The present study was undertaken to determine the learning curve required for the general surgeon to master the technique in the absence of an experienced supervisor.

A retrospective analysis of first 120 consecutive unilateral TEPs was performed. The study population was divided into 6 consecutive groups, 20 each. Clinical parameters were compared among the groups.

Operation time was the only clinical parameter that showed significant differences among the groups and reached a plateau after the 4th group. Conversions to transabdominal and open approaches were required only in one patient of groups 1 and 6 respectively. Comparison of demographic features, hernia types, postoperative morbidity, length of hospital day and days taken to return to normal activities showed no significant differences among the groups. All complications were minor and resolved uneventfully. No recurrence was detected during follow up.

Gos  | Operation time (minutes) | Morbidity (%) | Length of stay (days) | Return to normal activities (days)
--- | ------------------------ | -------------- | ------------------- | -----------------------------
1   | 90                      | 15             | 2.4                | 4.8                          
2   | 90                      | 15             | 1.8                | 4.3                          
3   | 73                      | 20             | 2.5                | 3.2                          
4   | 71                      | 20             | 1.6                | 3.3                          
5   | 59                      | 20             | 2.3                | 3.7                          
6   | 68                      | 20             | 2.3                | 3.7                          

TEP carries a low morbidity and conversion rates even during the learning process. In the absence of an experienced supervisor, a general surgeon should be able to master the technique after an experience of 80 procedures. Unilateral TEP can be safely accomplished within an hour for most patients.
**Hernia Surgery–PS073**

**ENDOSCOPIC EXTRAPERITONEAL INGUINAL HERNIOPLASTY OF INDIRECT INGUINAL HERNIA: REDUCTION V S LIGATION.** Hung Lau, M.D., Nivriti G. Patil, M.D., Wall K. Yuen, M.D., Francis Lee, M.D., Department of Surgery, University of Hong Kong Medical Center, Hong Kong SAR, China.

During endoscopic totally extraperitoneal inguinal hernioplasty (TEP), ligation of the hernial sac followed by distal transaction appears to be a sound alternative to reduction alone but the safety of ligation has not been tested. The present study was undertaken to evaluate the safety to and clinical outcome of patients who underwent ligation of the indirect peritoneal sac during TEP.

Between September 1999 and July 2001, patients who underwent TEPs for indirect inguinal hernias were recruited. Patients were divided into two groups. Group I (n=65) had complete reduction of the hernial sac whereas group II (n=34) had ligation of the hernial sac using a vicryl suture followed by distal transaction. Clinical variables and outcome data were compared between the two groups of patients.

Demographic features and hernia types between the two groups were comparable. The mean operative time of groups I and II patients was 58 and 62 minutes respectively (P = ns). Intraoperative complications occurred in two patients of group II, including a vas deferen transection and a gonadal vessel division. Comparison of the length of hospital stay, postoperative pain scores at rest and upon coughing, postoperative morbidity and incidence of groin collection showed no significant differences between the two groups.

Ligation of hernial sac does not increase pain and postoperative morbidity after TEPs. This technique is however associated with a higher incidence of intraoperative complications. Reduction of the indirect hernial sac is therefore recommended whenever feasible. When ligation of the indirect hernial sac is performed, vas deferens and gonadal vessels should be identified and safeguarded before transaction.

**Hernia Surgery–PS075**

**USE OF STITCHES FOR MESH FIXATION IN LAPAROSCOPIC INGUINAL HERNIA REPAIR.** Silvio L S Lemos M.D., Aguinaldo P de Nalda M.D., Célio P. Vasconcellos M.D., André M. A Domingos M.D., Célio Helegda M.D., Eron Klein M.D., Marielle Corrêa M.D., Daniela Bazili M.D., Santa Casa Hospital, Campo Grande - MS, Brazil.

**Objective:** There is no consensus about the fixation of mesh in the laparoscopic inguinal hernia repair. It can be done using many kinds of devices. The purpose of this study was to evaluate the results of the laparoscopic inguinal hernia repair using manual suture of mesh on Cooper’s Ligament.

**Methods:** Over a 5-year period (April, 1995 to April, 2000), we performed 143 transperitoneal inguinal hernia procedures (82 unilateral and 31 bilateral). Overall, there were 26 recurrent hernias. The primary operation in 24 patients was open anterior repair, and in 2 laparoscopic repair (TAPP). We used general anesthesia and carbon dioxide pneumoperitoneum in all patients. The inguinal region was approached transperitoneally through 3 trocars. Some cases we used 4 trocars. The mesh length was calculated after opening the peritoneum and dissection of the entire inguinal floor. The fixation of mesh on Cooper's Ligament was realized with stitch of polyester 2-0 in all cases. The fixation above iliopubic tract was realized with stitch, stapler or tacker. All patients were followed at least for 12 months.

**Results:** All 143 procedures were completed laparoscopically. The median (range) age was 46 (18-71) years and the median (range) follow-up was 17 (12-48) months. Mean operative time was 72 min for unilateral hernia and 102 minutes for bilateral hernia. We had few peroperative complications: 1 epigastric vessels lesion and 1 unilateral vas deferens complete section, and some minor bleeding. Postoperative complications included nineteen uninfected seromas, one patient with transient testicular pain, 3 patient with transient inguinal pain, none persistent neuralgia. There was no recurrence.

**Conclusions:** All data presented showed that laparoscopic inguinal hernia repair using stitch on Cooper's Ligament for mesh fixation is a safe method with low rate of postoperative complications and no recurrence. It can be use in situations that tacker or stapler is not available.

**Hernia Surgery–PS074**

**MANAGEMENT OF PERITONEAL TEAR DURING ENDOSCOPIC EXTRAPERITONEAL INGUINAL HERNIOPLASTY.** Hung Lau, M.D., Nivriti G. Patil, M.D., Wall K. Yuen, M.D., Francis Lee, M.D., Department of Surgery, University of Hong Kong Medical Center, Hong Kong SAR, China.

Peritoneal tear during endoscopic totally extraperitoneal inguinal hernioplasty (TEP) results in pneumoperitoneum and loss of extraperitoneal space. To avoid bowel adhesions and mesh migration, closure of the peritoneal opening is preferred. The present study was conducted to evaluate the efficacy of various operative techniques for the closure of peritoneal laceration.

Between April 2000 and May 2001, one hundred consecutive patients undergoing 123 TEPs were recruited for the present study. The incidence of peritoneal tear and techniques for the closure of peritoneal opening were documented. Operative time and postoperative morbidity were compared among groups for which different closure methods of peritoneal laceration were used.

The incidence of peritoneal tear was 47%. The mean operative times of unilateral TEPs with and without peritoneal laceration were 66 minutes and 53 minutes respectively (p < 0.05). Techniques for the closure of the peritoneal opening included endoscopic stapling (n=12), endoscopic suturing (n=14) and pre-tied suture loop ligation (n=21). The mean operative times for unilateral TEPs with endoscopic stapling, pre-tied suture loop ligation and endoscopic suturing of peritoneal tear were 53, 64 and 82 minutes respectively (p < 0.05). Comparison of postoperative morbidity showed no significant difference among the three groups.

Peritoneal tear is a frequent and challenging intraoperative event during TEP. Its occurrence significantly prolongs the length of operation. Endoscopic stapling and pre-tied suture loop ligation are safe and quick techniques for closure of peritoneal tear during TEP.

**Hernia Surgery–PS076**

**PHS – A NEW APPROACH IN THE TREATMENT OF GROIN HERNIAS: V.Petric D.Milic.** Surgical clinic Clinical centre Niš, Yugoslavia.

PHS - Prolene Hernia system is a new three component polypropylene mesh introduced with great success in the last few years in the treatment of groin hernias.

The aim of our work was to show early results in the treatment of primary and recurrent groin hernias using PHS mesh in the patients operated during the period from 1.3.2000. to 30.6.2000 at our clinic for general surgery Clinical Centre Niš.

Prospectively we have analyzed a group of 33 patients with 35 groin hernias who underwent groin hernia repair using PHS mesh. All patients were males (100%) with median age of 59,3 years (22 to 86 years). 22 hernias were primary hernias (62,86%) while other 13 were recurrent (37,14%) and all 35 hernias were classified as class III or class IV according to Nihus classification. 14 patients (42,42%) were operated in local anesthesia, 9 (27,28%) in spinal and 10 (30,3%) in general anesthesia. We have analyzed: operating time, postoperative complications, recovery time and return to work, the need for postoperative analgesia and the presence of early recurrences.

The average operating time was 50 minutes (40 to 100 minutes). Postoperative complications were present in five patients (15,15%): 2 seromas (6,06%), 1 hematoma (3,03%) and 2 wound infections (6,06%). These complications were successfully treated with drainage only. The average hospitalization was 1,5 days (6 hours to 5 days) and most patients went back to work after 10 days (7-14 days). 22 patients (66%) didn’t need any postoperative analgesia. There was no recurrence.

**Conclusions:** All data presented showed that laparoscopic inguinal hernia repair using stitch on Cooper's Ligament for mesh fixation is a safe method with low rate of postoperative complications and no recurrence. It can be use in situations that tacker or stapler is not available.
Surgical repair of inguinal hernia with prosthesis has been tried both laparoscopic and anterior approach. Laparoscopic repair has many advantages because this procedure is highly diagnostic, anatomically understandable and suitable for multiple or bilateral hernia. However this procedure has been less performed recently probably because of its technical difficulty and longer operation time. To reduce such drawbacks while maintaining advantages, we adopted composite mesh (polypropylene mesh + ePTFE layer) as laparoscopic onlay to the peritoneum. <clinical cases> Ten male patients (34 - 73 yo: average 57.6 yo) was performed laparoscopic herniorrhaphy, which includes 8 indirect hernia, 6 direct hernia, 2 femoral hernia, and 1 supravesicular hernia. Number of patients who had single hernia was 6. Three cases had bilateral hernias and there was each 1 case who had two , three and four hernias. All the cases were repaired by IPOM surgery with composite mesh. Operation time ranged 23min to155min (Sigmoid colon incarcertion was done in one large indirect case. All 10 cases discharged the bilateral groin hernia. As opposed to the conventional transabdominal approach, this technique has many advantages because this procedure is highly diagnostic, anatomically understandable and suitable for multiple or bilateral hernia. Laparoscopic herniorrhaphy can be performed by using LPEC method. LPEC method was performed in one thousand and fifty patients with no recurrence and anterior infection. Contamination or infection of the abdominal cavity have many advantages because this procedure is highly diagnostic, anatomically understandable and suitable for multiple or bilateral hernia. However, the Laparoscopic approach is advantageous over open anterior as it lowers the risk of infection or complication.

<Discussion & Conclusions> Composite mesh can be expected less intestinal adhesion to ePTFE side and prompt repair with peritoneum on mesh side. Laparoscopic IPOM repair for inguinal hernia with composite mesh is safe and useful surgery with reduced operation time and without possible complications of bowel injury.

EVALUATION OF PREPERITONEAL INGUINAL HERNIA PLASTY BY DIFFERENT APPROACHES-TAPP VS TEP VS OPEN, S.BALASASIKUMAR, C. Palanivelu, P.S. Rajan, K. Sendhil Kumar, P. Parthanarathiri, S.Rajapandian ,Coimbatore Institute of Gastrointestinal Endo Surgery(CIGES) GEN Hospital Coimbatore, INDIA

Tension free hernioplasty is the order of the day for correction of inguinal hernia. Tension free repair can be achieved by anterior open, Transabdominal laparoscopic or totally extraperitoneal laparoscopic approach. We analyzed the indications of results of each approach. Since October 1992, we have treated 3450 inguinal hernias in our Institute. Age group ranging between 14 to 84 years. Since 1996, totally extraperitoneal hernioplasty is the first choice, TAPP in-patients where TEP is not possible such as large inguinal hernias, irreducible hernias, recurrent hernias, previous surgery. Open anterior approach for massive inguinoscrotal hernias, incarcerated and strangulated hernias or patient unwilling for laparoscopic hernia. Results : TAPP was performed in one thousand and fifty patients with no recurrence and anterior open in six hundred and fifty patients with no recurrence. All the three recurrences in the mechanical stapling group, 1 recurrence in the totally extraperitoneal hernia repair. Laparoscopic approach is advantageous over open anterior as it avoids the necessity of cutting all the layers to the preperitoneum. TEP achieves the results of anterior open approach with out cutting the abdominal wall and avoids the possibility of peritoneum closure, an advantage over TAPP. TEP technically difficult to perform if both working ports are placed in the midline. We evaluated one port between the umbilicus and symphysis pubis and the other at the lateral border of the rectus enabling two hand manipulation. Our results are in favour of TEP as first choice, TAPP the second and Open last choice. Each patient should be considered individually for effective repair. TAPP or Open should be considered in selected indications for individual patients. Conclusion : Tailored approach is the best approach as far as the management of inguinal hernia is concerned as per our studies.

AN ADVANCED DEVICE FOR LAPAROSCOPIC REPAIR FOR GROIN HERNIA OF PEDIATRIC PATIENTS. TAKAHASHI H.,ISHIBASHI H., OSHI-TA M. TASHIRO S, Dept.of Surg. Univ.of Tokushima, Sch.of Med. Tokushima, JAPAN

Purpose: Laparoscopic percutaneous extraperitoneal closure (LPEC) has been reported as a new procedure for children with groin hernia at SAGES 2000 Meeting. To make the procedure safe and easier, the peritoneum of the hernia orifice was lifted from the gonadal vessels or the spermatic duct by inserting saline solution into the extraperitoneal space. Subsequently, the hernia sac was closed completely without touching either the vessels or the duct.

Methods: The procedure of LPEC was that, following insertion of laparoscope via an umbilicus, a forceps (16-gauge) was inserted via the lateral side of the umbilicus and maneuvered under laparoscopic vision. The hernia orifice lift from the gonadal vessels or the spermatic duct, saline solution was injected into the extraperitoneal space using a needle (21-gauge). An Endo-suture (19-gauge), that can be used to make a purse-string suture around the internal inguinal ring, was punctured on the midpoint of the inguinal line. The purse-string suture was begun extraperitoneally from the anterior to the posterior edge on one half of the internal ring using the Endo-suture with suture material. After one half of the purse-string suture was completed, the suture material was removed from the Endo-suture and the opposite half of the rim of the internal ring was closed with the same technique without injury to the vessels or the duct. The Endo-suture was then removed from the abdomen together with the suture material. The purse-string suture was tied extracorporeally, and the internal ring was completely closed. It usually took 20 to 25 minutes to repair for the bilateral groin hernia.

Results: 145 patients with groin hernia have been treated with 179 LPEC for last five years. Four patients treated with absorbable suture materials had recurrence.

Conclusion: The advantages of this procedure are not only cosmetic and functionally also involves the use of LPEC for the spermatic duct or vessels than the conventional transcanal herniorrhaphy.

IS THERE INDICATIONS TO PLACE A MESH INTRAPERITONEALLY WITH CONTAMINATION OF THE ABDOMINAL CAVITY DURING LAPAROSCOPIC VENTRAL HERNIA REPAIR? S.Morales-Conde MD PhD, M Martin MD, I Cadet MD, J Bellido MD, JD Tutusaus MD PhD, M Bustos MD PhD, J Martin MD, A Cano MD, S Morales-Mendoza MD PhD, University Hospital Virgen Macarena and University Hospital Virgen del Rocío. Department of Surgery, University of Seville, Spain

Introduction: Contamination or infection of the abdominal cavity have been considered a contraindication to place a mesh. One of the advantages of laparoscopic approach for ventral hernias is the possibility of performing concomitant operations such as cholecystectomy, existing the possibility of opening the gallbladder with the subsequent contamination of the cavity. On the other hand, one of the complications during laparoscopic hernia repair is bowel perforation during adhesiolysis. It has been discussed the use of mesh intraperitoneally during laparoscopic ventral hernia repair in cases of contamination of the abdominal cavity.

Patients and Method: From November of 1998, 78 ventral hernias have been repaired using patches of Dual-Mesh plus with holes fixed without sutures following the Double Crown technique. Concomitant operation were performed in 8 cases: 6 cholecystectomy, one paraaortic ileum hernia and one mesenteric cyst. On the other hand, during adhesiolysis we had two bowel perforation (2.58%), one of them was repaired by laparoscopy and the other one by an assisted minilaparotomy.

Results: All the concomitant operation during the repair of the ventral hernias were completed by laparoscopy. For the gallbladder opened during concomitant operation, but cases with massive spilling of intestinal content and infected bile spilling should be considered apart.

Conclusions: Mesh could be placed intraperitoneally during laparoscopic repair of ventral hernias after bowel perforation and if the gallbladder is opened during concomitant operation, but cases with massive spilling of intestinal content and infected bile spilling should be considered apart.
**Hernia Surgery-PS081**

**PLANNED TOTALLY EXTRAPERITONEAL LAPAROSCOPIC SPIGELIAN HERNIA REPAIR:**
Michael Rosen, M.D., Fred Brody, M.D., Michael Rosen, M.D., Fred Brody, M.D., Minimally Invasive Surgery Center and the Department of General Surgery, The Cleveland Clinic Foundation, Cleveland, Ohio

A spigelian hernia is a congenital defect in the transversus aponeurosis fascia. Traditionally, an open anterior hernioplasty is used to repair these defects. Recently, laparoscopic approaches have been described. This report signifies the first application of the totally extraperitoneal laparoscopic approach to a planned repair of a spigelian hernia. The patient is a 62 year old white female with a reducible, left lower quadrant anterior abdominal wall bulge consistent with a spigelian hernia.

At the time of surgery, we exposed the posterior rectus fascia and modified our extraperitoneal inguinal hernia technique by passing the balloon dissector in a more lateral orientation. This created a unilateral preperitoneal space with adequate room for dissection and mesh fixation. The spigelian defect was easily identified. Its preperitoneal fat contents were reduced and a 5mm laparoscopic tacking device was utilized to secure a piece of prolene mesh. The patient was discharged to home with no complications. Placement of the mesh in the preperitoneal space avoids direct interaction of the mesh prostheses and the intraperitoneal viscera. In conclusion, we find that a laparoscopic totally extra-peritoneal approach is technically feasible and advantageous when a spigelian hernia is diagnosed preoperatively.

**IDENTIFYING THE OPTIMAL APPROACH IN REMEDIAL SURGERY FOR RECURRENT REFUX AND SYMPTOMATIC HIATUS HERNIA—ABDOMINAL OR THORACIC?**
Roger Tatum, M.D., Kenneth Murayama, M.D., Sudhir Sundaresan, M.D., Peter Kanthas*, M.D., Raymond Joehl, M.D., Departments of Medicine* and Surgery, Northwestern University Medical School, Chicago, IL

We hypothesized that preoperative factors may indicate the optimal approach—abdominal (laparoscopy or laparotomy) or thoracic—to remedial operations for recurrent reflux disease or symptomatic hiatus hernia. From 1993-2001, 275 patients had operations for reflux disease and hiatus hernia. Patients who had a remedial operation were selected to determine which preoperative factors—time-to-recurrence, nature of primary operation failure, symptoms of recurrence, type of hiatus hernia, esophageal length, sphincter pressure, esophagitis, division of short gastric vessels—indicated an abdominal or thoracic approach.

Twenty-seven (27) patients who had remedial operation for recurrent reflux disease or symptomatic hiatus hernia were identified. Remedial operations were begun laparoscopically in 18, 14 were completed while 3 were converted to laparotomy and 1 was converted to thoracotomy. Five had laparotomy and 4 had thoracotomy as the initial operation. Factors associated with need to perform laparotomy or thoracotomy were analyzed. Fisher’s exact test was used to determine statistical significance (p<0.05). Recurrence of paraesophageal hiatus hernia indicated a thoracotomy was needed to complete the remedial operation. p=0.008. Other factors did not reach statistical significance. Of note, patients who had dehiscence of the fundoplication or recurrence of hiatus hernia were more likely to require an open remedial procedure.

Patients having remedial operations for recurrent reflux disease or symptomatic hiatus hernia should be thoroughly evaluated and the optimal operative approach carefully selected. Strong consideration should be given to performing thoracotomy for remedial operations in patients with recurrent paraesophageal hiatus hernia.

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**Hernia Surgery-PS082**

**LAPAROSCOPIC INGUINAL HERNIA UTILIZING LOCAL ANESTHESIA AND A LARYNGEAL MASK AIRWAY:**
Fredrick Brody MD, Michael Tarnoff MD, Michael Rosen MD, Frank Duprier MD, Jennifer Malm RN, Jeffrey Ponsky MD, David Whalley MD, Leonard Lazada MD., Minimally Invasive Surgery Center and the Department of Anesthesia and General Surgery, Cleveland Clinic Foundation, Cleveland OH.

The universal acceptance of laparoscopic inguinal herniorrhaphy has not occurred for several reasons including the necessity of general endotracheal anesthesia. However, several recent reports document successful laparoscopic inguinal hernia repair using only regional anesthesia without airway control. This study documents a prospective series of patients undergoing laparoscopic preperitoneal (TEP) inguinal herniorrhaphies utilizing local anesthesia and a laryngeal mask airway (LMA).

Twelve men with a mean age of 49 years underwent TEP repair. The mean BMI was 24 kg/m2 (range 21-27) and the mean ASA was 2 (range 1-3). Seven patients underwent bilateral inguinal hernia repairs. The mean EBL was 10 cc (range 5-20) and the mean operative time was 61 minutes (range 40-135). There were no intraoperative complications and no patients required conversion to general endotracheal anesthesia. All patients were discharged the same day. Four patients had mild seromas that resolved spontaneously. No recurrences have been documented with early follow up.

This study documents a safe and efficacious method to perform laparoscopic TEP hernia repair without the use of general anesthesia while maintaining airway control. This technique should exist in the surgeon’s armamentarium and possibly enhance the widespread acceptance of laparoscopic inguinal hernia repair.

**Hernia Surgery-PS083**

**Laparoscopic Pre-peritoneal Inguinal Hernia Repair without the Use of Balloon Insufflator or Tackers: A More Cost-effective Approach**
Vasudevan Thiruchelvam, M.D.; Michelle Ricks, R.N.; Ignacio Prats, M.D., Leader Surgical Center, York, PA

Laparoscopic pre-peritoneal inguinal hernia repair is an effective and well-proven method in the treatment of inguinal hernias. The main disadvantage is the cost due to the use of balloon insufflator and tackers. In an ambulatory surgical center, the facility fee reimbursement sometimes does not cover the cost of instrumentation. This paper describes a new approach without the use of balloon insufflator or tackers, in an ambulatory surgical center. A total of 57 inguinal hernias were repaired using this technique between August, 2000 and August, 2001. The operating time for bilateral hernias was 60 minutes and for unilateral hernia was 40 minutes. There were no recurrences.

We feel that this new approach is equally effective and certainly more cost-effective.

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**Hernia Surgery-PS084**

Laparoscopic pre-peritoneal inguinal hernia repair without the use of balloon insufflator or tackers: A more cost-effective approach

Vasudevan Thiruchelvam, M.D.; Michelle Ricks, R.N.; Ignacio Prats, M.D., Leader Surgical Center, York, PA

Laparoscopic pre-peritoneal inguinal hernia repair is an effective and well-proven method in the treatment of inguinal hernias. The main disadvantage is the cost due to the use of balloon insufflator and tackers. In an ambulatory surgical center, the facility fee reimbursement sometimes does not cover the cost of instrumentation.

This paper describes a new approach without the use of balloon insufflator or tackers, in an ambulatory surgical center. A total of 57 inguinal hernias were repaired using this technique between August, 2000 and August, 2001. The operating time for bilateral hernias was 60 minutes and for unilateral hernia was 40 minutes. There were no recurrences.

We feel that this new approach is equally effective and certainly more cost-effective.
Hernia Surgery–PS085

TENSILE STRENGTH EVALUATION OF MESH FIXATION METHODS IN LAPAROSCOPIC INCISIONAL HERNIA REPAIR.

M. van 't Riet, M.D., Peggy J. de Vos van Steenwijk, M.D., Gert-Jan. J. Kleinrensink, M.D., Ewout. W. Steyerberg, M.D., H.Jaap Bonjer, PhD. Department of Surgery, Erasmus University Medical Centre, Rotterdam, The Netherlands

Fixation of mesh is crucial for successful laparoscopic incisional hernia repair. In the present experimental study, tensile strength of mesh fixation with helical titanium coils (tackers) and transabdominal wall sutures was assessed in a pig model.

Thirty-six full thickness specimens (5x7 cm) of the anterior abdominal wall of nine pig cadavers were randomized for fixation to a polypropylene mesh (7x7 cm) by either tackers, or transabdominal wall sutures. The number of fixation points varied between 1 and 5. The force required to disrupt mesh fixation (tensile strength) was measured by a dynamometer. Statistical analysis was performed using Wilcoxon test and Spearman rank correlation test.

Mean tensile strength of mesh fixation by transabdominal sutures was significantly greater than that by tackers for each number of fixation points: 67 N versus 28 N for a single fixation point (p<0.001), 115 N versus 42 N for two fixation points (p<0.001), 150 N versus 73 N for three fixation points (p<0.001), 151 N versus 73 N for 4 fixation points (p<0.05) and 150 N versus 82 N for 5 fixation points (p=0.001). Increasing the number of fixation points over 3 per 7 cm did not improve tensile strength.

Tensile strength of transabdominal sutures is superior to tensile strength of tackers. Therefore transabdominal sutures appear preferable in laparoscopic incisional hernia repair.

Hernia Surgery–PS086

REOPERATIONS AFTER LAPAROSCOPIC VENTRAL HERNIA REPAIR WITH THE GORETEX® DUALMESH®. Philippe Tognat, M.D., Franck Vandenbroucke, M.D., Loic Ferrand, M.D., Patrick Lozac’h, M.D. Chirurgie Generale, Centre Hospitalier Universitaire, Brest, France.

We reviewed all the reoperated patients who already had an intra peritoneal Goretex® mesh for a ventral hernia and examined the consequences of various operative procedures on the outcome. Of a total of 101 ventral hernia repairs with a Goretex® Dualmesh® 12 patients were reoperated on over a period of 51 months. The patients were reoperated on a mean 12.7 ± 9.3 months from their laparoscopic ventral hernia repair for recurrence (4), new ventral hernia (3), aortic bypass (1), postoperative intra abdominal bleeding (1), coeliotomy (1), gallbladder abscess (1) and pelvic abscess in a Crohn’s disease (1). All the recurrences and 2 new hernias were treated using the same initial laparoscopic procedure. All the other procedures were laparotomies. The mesh was removed in 2 patients operated on for a new hernia and an aortic bypass by other surgical teams with completion of an open repair. In 3 laparotomies (bleeding/coeliotomy and pelvic abscess) the mesh was cut out and repaired using non absorbable sutures. When performed the mesh removal proved to be very easy and there was no mesh infection. New laparoscopic repairs showed evidence of loose adhesions on the previous Dualmesh® enabling an easy redo procedure according to the same laparoscopic technique simply overlapping the already existing mesh. Although, a follow up of 10.5 ± 7.3 months for the 10 patients who returned their initial Dualmesh® is still limited no reoperated patient showed evidence of delayed infection or recurrence.

Laparoscopic ventral hernia repair using Goretex® Dualmesh® allows easy reoperation whenever necessary with little adhesions and a low infection risk. When reoperating on a patient even under septic conditions there should be no need for mesh removal.

Hernia Surgery–PS087

LAPAROSCOPIC VENTRAL HERNIA REPAIR WITH THE GORETEX® DUALMESH®: THE FIRST 100 CASES. Philippe Tognat, M.D., Loic Ferrand, M.D., Franck Vandenbroucke, M.D., Patrick Lozac’h, M.D. Chirurgie Generale, Centre Hospitalier Universitaire, Brest, France.

From January 1999 to June 2001 100 consecutive attempts of laparoscopic ventral hernia repair were performed to assess the feasibility and initial results of this technique with the Goretx® Dualmesh®. The patients were 45 women and 55 men aged 52.7 ± 29 years. Of the hernias 76% were incisional and 19% had a previous repair. Preoperatively the hernia largest diameter was 6.6 ± 4.3 cm. The procedure routinely used 4 ports (one 10mm and three 5mm) without gastric or bladder decompression. The size of the Dualmesh® was selected preoperatively allowing a 3 to 5 cm overlap of the actual hernia limits. The correct intra abdominal positioning of the mesh was secured with 4 to 8 Goretx® anchoring sutures through the abdominal wall. Complation of the attachment onto the abdominal wall was done circumferentially and centrally with tacks. Successful repair was done in 97% with an operative time of 111.6 ± 39 min. Peritoneal carcinomatosis in 1 and bowel injury in 2 patients led to conversion to laparotomy. Overall 100 meshes were used covering a surface of 384.5 ± 198.7 cm². Unsuccessful postoperative course was observed for 84.5% of the repairs. Two patients died of massive pulmonary embolism and one was reoperated on for an intra peritoneal bleeding. No infection occurred and no mesh had to be removed. Patients were discharged 4.5 ± 3.8 days postoperatively. There were 5 deaths and 7.3% of the patients still complained of pain in the stapling areas 1 month after surgery. With a follow up of 13.5 ± 6.5 months 5 recurrences were diagnosed all reoperated on according to the same technique with the addition of another Dualmesh®. Laparoscopic ventral hernia repair is a feasible technique with a low morbidity and short hospital stay. The Dualmesh® provides a reliable material with a low infection rate. Peritoneal adhesions represent the major risk of injury when repairing incisinal hernias and are responsible for longer operative times. Despite the relatively short follow up the recurrence rate is low and long term benefits could be expected even for large hernias.

Hernia Surgery–PS088

COMPARISON OF ADHESION FORMATION ASSOCIATED WITH TACKER(OMNX MEDICAL). VERSUS A NEW MESH FIXATION DEVICE, SALUTE (OMNX MEDICAL).

Karl Leblanc, MD, M.B.A, Baton Rouge, Louisiana.

The primary purpose of this study was to evaluate the efficacy and associated adhesion formation of an innovative mesh fixation device when compared with the current standard mesh fixation device. Secondarily, two implants techniques using the new device were evaluated to learn if onetech technique provided superior results over the less adhesion formation and/or mesh roll-over.

Six purpose-bred female hounds were evaluated in this 90 day survival study. Each dog underwent a laparotomy. A midline incision was made, and mesh implanted bilaterally on the abdominal wall, for the primary objective, six 4 cm round patches of 1-mm Gore Dualmesh were fixed to the abdominal wall (3 on each side) with either 10 Tracker or 10 Salute constructs in each patch. The fixation method of each first patch of each animal was alternated to eliminate bias relevant to patch location and adhesion formation. For the secondary objective, 4 per group (depending on the size of the animal) additional patches were implanted with only Salute constructs: 10 constructs per patch, all constructs being placed half in tissue and half in mesh. Two dogs were to be evaluated by intra-study laparoscopic exams, and all dogs were recovered until sacrifice on Day 90.

Adhesion severity scores were significantly higher for ML sites when compared to both LR and UL sites (overall p<0.0177. Adhesion dissection scores were significantly higher for group T compared to group S (overall p<0.0083). Overall, traction scores approached significance (p<0.0846) with respect to...
Minimally Invasive Other–PS089

IMMEDIATE OR DELAYED DIAGNOSIS OF PERFORATED GASTRODUODENAL ULCER DURING LAPAROSCOPIC CHOLECYSTECTOMY. N. Alexakis MD, D. Mylonaki MD, E. Leandros PhD, M. Konstadoulakis MD, G. Androulakis MD, First Department of Propaedeutic Surgery, Athens University, Hippocratie Hospital, Athens, Greece.

The widespread use of H2 blockers has changed the clinical behaviour of peptic ulcer disease making difficult the evaluation and diagnosis of the frequently reported upper abdominal pain and dyspeptic complaints of patients with peptic ulcers and contemporary cholelithiasis.

Methods: We evaluated the incidence of perforated gastroduodenal ulcers in 5,539 patients who underwent laparoscopic cholecystectomy for gallstone disease in our unit from November 1999 to November 2000.

Results: Among 5,539 LCs performed in our unit, 7 patients with perforated gastroduodenal ulcer were discovered (0.13%). Upon diagnosis of the perforation, laparoscopy was converted to open surgery, in all patients. The surgical treatment consisted of primary closure of the gastric or duodenal wall defect and selective vagotomy combined with pyloroplasty. There were no short-term post-operative complications observed in any of the patients.

Conclusions: The wide acceptance of LC has resulted in increased rates of cholecystectomy. However, this bears the possibility of concomitantly missing other intra-abdominal pathology. It is therefore important to take a better history of the patient and in selective cases to proceed in preoperative gastro-duodenoscopy.

Minimally Invasive Other–PS090

TOTALLY LAPAROSCOPIC MANAGEMENT OF GALLSTONE ILEUS. Terry M. McCurry, M.D., Homero Rivas, M.D., Robert N. Cacchione, M.D., Jeff W. Allen, M.D. Center for Advanced Surgical Technologies, University of Louisville

Introduction. Patients with gallstone ileus are often old, debilitated, and have significant medical illnesses. Minimal access procedures are an ideal approach for this subset of patients. Pure laparoscopic approach for gallstone ileus has been reported only once. We describe our experience in this matter, lending more support to the treatment of this uncommon illness laparoscopically.

Methods and Procedures. Our patient is a 60-year-old diabetic woman, with a four-day history of nausea and bilious emesis. She was known to have gallstones, and her only previous surgery had been an appendectomy. Conservative management with bowel rest failed while under the care of the internal medicine service. Abdominal radiographs were suggestive of pneumobilia.

Abdominal computed tomography scan revealed a calcified mass and evidence of small bowel obstruction. A laparoscopic enterotomy and removal of a large gallstone were performed. We evaluated the rest of the small bowel and found no other stones. We closed the enterotomy using intra-corporeal suturing techniques. No cholecystectomy was performed at this stage.

Results. Our patient did well. She did not have any complications. Postoperatively, during her same hospital stay, a cardiac pacemaker was placed for sick sinus syndrome, prolonging her hospitalization. She went home seven days after surgery.

Conclusions. Totally laparoscopic management of gallstone ileus is feasible, and as with other laparoscopic procedures, can provide benefits compared to those of open surgery, especially in high-risk patients.

Minimally Invasive Other–PS091

ULTRASOUND GUIDED THERAPY OF CECAL VOLVULUS: A CASE REPORT. Rodolfo Arcoveco MD, Mason City Clinic, Mason City, IA.

Objective: To point out the feasibility and usefulness of ultrasound in intestinal pathology.

Methods: 60-year-old male presented to the emergency room with 24 hours of diffuse, cramping, abdominal pain accompanied by laxative induced diarrhea. He denied vomiting, fever or weight loss. The patient refers having had a similar self-limiting episode 6 months earlier. His medical history was significant for heavy smoking; diffuse atherosclerotic cardiovascular disease and a recent right upper lobectomy for benign disease. On physical examination, his vital signs were normal. His abdomen seemed distended over the left hemiabdomen and diffusely tender. Rectal examination demonstrated liquid stool, no gas. The abdominal films revealed a large fluid level on the left abdomen. Ultrasonography (performed through the abdominal flanks) detected dilated small bowel and right colon, both with visible peristalsis, an empty left colon, no free fluid or thickened loops of bowel. The working diagnosis was colonic volvulus. He underwent immediate colonoscopic decompression. A colonic tube was left in place. The patient’s pain subsided. Next day, a barium enema demonstrated a dilated cecum in the right upper abdomen refuxing into the ileum. This was consistent with a successfully reduced cecal volvulus or bascule. He remained under observation for 24 hours and went home on a regular diet. At 5 months, the patient had not had recurrence of the abdominal pain.

Conclusion: The ultrasonicographic evaluation of the abdomen is not necessarily obscured by gas as long as the plane of scanning avoids it; furthermore, it may demonstrate the functional and morphological characteristics of the intestine. In the patient with bowel obstruction, the combination of gas pattern portrayed by plain films and the above mentioned characteristics of the intestine by ultrasonography might help the clinician ascertain the diagnosis and direct the treatment of the surgical patient.

Minimally Invasive Other–PS092

LAPAROSCOPIC RESECTION OF GASTROESOPHAGIAL JUNCTION STROMAL TUMOR - A COMBINED APPROACH OF LAPAROSCOPY AND INTRA-OPERATIVE ENDOSCOPY. Shmuel Avital MD, Oscar Brasesco M.D., Samuel Szomstein M.D., Raul Rosenthal M.D. Section of Minimally Invasive Surgery, Department of General & Vascular Surgery, Cleveland Clinic Florida, Weston, Florida.

Laparoscopic gastric wedge resection offers an ideal method for diagnosis and treatment of solitary stromal tumors. Tumors at the GE junction are complicated to resect because of their complicated anatomic location and the risk of narrowing the GE junction. We report our technique for resection of a gastric submucosal tumor located adjacent to the GE junction.

Between July 2000 to July 2001, five laparoscopic resections for gastric lesions including stromal tumor (1 patients), carcinoid (2 patients) ectopic pancreas (1 patient) and carcinoma in situ (1 patient) were performed at the Cleveland Clinic Florida.

A 55 old patient, presented with a 4 cm submucosal mass located close to the GE junction, which was diagnosed by gastroscopy following episodes of melena. EUS demonstrated a heterogeneous hypoechoic mass arising from the muscularis layer. At Laparoscopy, the lesser omentum was opened and a fine dissection of the GE junction was carried out paying special attention not to injure the Laterjet nerve bundles.

A gastroscopy was performed with an upward retroflexion of 180 degrees of the endoscope, enabling visualization of the GE junction. The exact localization of the line of stapler from the GE to the pylorus was continuously monitored by the endoscope to achieve a resection line, which encompass the tumor but do not damage the distal esophagus. The gastric stapling was continued distally and a wedge resection of the gastric wall with the tumor was completed.

Operative time was 70 min. The patient recovery and follow up was uneventful. Microscopic evaluation revealed a spindle cell neoplasm with a positive immunohistochemical staining for c-kit (CD117) consistent with the diagnosis of stromal cell tumor, and confirmed a complete excision with clear margins. Mitotic figures were not conspicuous signifying a benign type.

Accurate Laparoscopic resection of gastrointestinal junction tumors may be performed safely using the laparoscopic extra-laminar approach under gastroscopic intra-operative monitoring.
LAPAROSCOPIC CHOLECYSTECTOMY FOR TRAUMATIC HEMORRHAGIC CHOLECYSTITIS: A CASE REPORT

Thomas L. Bass, MD, Randy S. Haluck, MD, Department of Surgery, Penn State College of Medicine, Hershey, Pennsylvania

Introduction: A rare case of isolated gallbladder trauma that was safely managed with laparoscopic surgery is presented.

Methods/Procedures: A belted front seat passenger was admitted after a high-speed front-end motor vehicle crash. The 35-year-old female was awake and alert with a GCS of 15 and complaints of RUQ abdominal pain. Physical examination of her abdomen revealed a soft, non-distended abdomen with moderate RUQ tenderness but no signs of peritoneal irritation. A series of plain radiographs showed no evidence of acute injury. Laboratory findings were within normal limits, except a decreased hemoglobin of 10.0. CT of the abdomen showed a massively dilated gallbladder with pericholecystic fluid and heterogeneous intraluminal fluid consistent with blood and thrombus. While under observation, the patient developed increasing RUQ pain and localized peritonitis. Laparoscopy revealed a massively dilated gallbladder without evidence of hepatic, duodenal, or pancreatic injury. A laparoscopic cholecystectomy was undertaken with a video and photographic record of the case. An intraoperative cholangiogram revealed no evidence of intra- or extra-hepatic bile duct injury. Visual inspection of the specimen showed a markedly enlarged gallbladder full of thrombus without evidence of cholecystitis. The patient made an uneventful recovery.

Conclusions: Minimally invasive techniques may be safely applied to the blunt trauma population in certain circumstances.

LAPAROSCOPIC LUMBAR SYMPATHETOMY

Nahum Beglaibter, M.D., Ram M Spira, M.D., Oded Zamir, M.D., Yacov Berlatzky, M.D., Herbert R Freund, M.D. Department of Surgery, Hadassah University Hospital, Mount Scopus, Jerusalem, Israel

Lumbar sympathectomy is indicated in cases of non-reconstructable peripheral vascular disease, vasospastic disorders and severe Reflex Sympathetic Dystrophy. We present a series of 27 consecutive unselected patients undergoing 29 laparoscopic lumbar sympathectomies. There were 21 males and 6 females, mean age 45 (21-28) years. Twenty two patients suffered from ischemia of the lower limb and five patients suffered from severe Reflex Sympathetic Dystrophy. The retroperitoneal space was developed using a balloon trocar inserted through a small incision in the flank. Additional trocars were used for endoscopic instruments. The sympathetic ganglia from L2 to L4 was resected. The procedure was successfully accomplished in all the patients without any operative or postoperative complications. Mean operative time was 136 minutes and mean hospital stay was 1.4 days. All the patients enjoyed significant improvement of pain.

Laparoscopic lumbar sympathectomy successfully combines the advantages of minimally invasive surgery with the effectiveness of the ‘open’ procedure.

LAPAROSCOPIC CORRECTION VERSUS OPEN SURGERY OF PERFORATED PEPTIC ULCER: FIRST RESULTS OF THE LAMA TRIAL

M.J. Borkellie, M.D., W.A. Bemelman, Ph.D., I.H. Oei, M.D., J.F. Smulders, M.D., A.C. van der Ham, Ph.D., H.J. Bonjer, Ph.D., J.P. Lange, Ph.D. Department of Surgery, MCRZ location Clara, Rotterdam, the Netherlands

Aims: the goal of this study is to evaluate whether laparoscopic correction of a perforated peptic ulcer is as safe as open correction. After laparoscopic correction it is hypothesised that patients have less pain, shorter hospital stay and less postoperative complications. It is also presumed that pneumoperitoneum itself will not induce sepsis.

Methods: the LAMA trial is a Dutch multicentre randomised trial that started March 1999. All patients, suspected of a perforated ulcer, are included except pregnant women, patients who have had a previous upper laparotomy or if no informed consent was signed. Of all patients pre-, peri- and postoperative data are collected. Also the Quality of Life is measured using the EuroqoL, Rand 36 and VAS scoring systems. The follow up will be one year.

Results: Until now 55 patients have been included. An analysis was performed of our first 37 patients (quality of life scoring systems not included). There are 18 pt in the laparoscopic group (11 male 7 female), median age 65 (range 34-87) and 19 in the open group (male 11 female), median age 62 (range 24-90). The results in understanding table show that operating time in the laparoscopic group was shorter. Regarding postoperative dosage of opiates and the VAS (pain) scoring systems suggest less postoperative pain in the laparoscopic group. Also in this group the number of complications is lower and the hospital stay is shorter.

<table>
<thead>
<tr>
<th>Laparoscopic (n=18)</th>
<th>Open (n=19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation time (minutes)</td>
<td>73 (25-127)</td>
</tr>
<tr>
<td>Irrigation fluid (ml)</td>
<td>1550 (1000-2000)</td>
</tr>
<tr>
<td>Blood loss (ml)</td>
<td>18 (0-30)</td>
</tr>
<tr>
<td>Hospital stay (days)</td>
<td>11 (5-15)</td>
</tr>
<tr>
<td>Vas day 1</td>
<td>4 (1-7)</td>
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<tr>
<td>Vas day 3</td>
<td>6 (2-10)</td>
</tr>
<tr>
<td>Vas day 7</td>
<td>3 (2-5)</td>
</tr>
<tr>
<td>Opiate usage (days)</td>
<td>2 (1-5)</td>
</tr>
<tr>
<td>Complications (pt)</td>
<td>3 (1-5)</td>
</tr>
</tbody>
</table>

Conclusion: These preliminary results are favourable for the laparoscopic procedure. Inclusion will have to continue to 100 patients for more reliable conclusions.

LAPAROSCOPIC TREATMENT FOR PEDIATRIC GASTRIC VOLVULUS

David A. Borenstein, B.Sc., Brian H. Cameron, M.D., Zakaria S., Habib, M.D., J. Mark Walton, M.D., and Peter G. Fitzgerald, M.D., Department of Pediatric Surgery, McMaster University, Hamilton ON, Canada

Gastric volvulus in children is a rare surgical emergency. The classic symptoms of gastric volvulus include the triad of unproductive retching, epigastric distension and the inability to pass a nasogastric tube. However, children have a more heterogeneous presentation. Laparoscopic gastropexy has been reported to be a safe and highly effective modality of treatment.

Methods: This is a case series of 4 children (2 girls, 2 boys ranging from 8 months to 12 years) with gastric volvulus. Two presented as emergencies while one was asymptomatic and the last presented with a feeding problem.

Results: Gastric volvulus was successfully treated by laparoscopic gastropexy in all cases with two children also having a gastrostomy tube placed for post-operative feeding. Postoperative hospital stay ranged from 3 to 12 days, the latter due to unrelated medical problems in one child. There were no direct surgical complications or noted reoccurrence of volvulus. All children were well at follow-up.

Conclusions: Our small experience supports laparoscopic gastropexy for gastric volvulus as a safe and effective treatment in children. Anecdotally, this surgical approach is as effective as the open procedure, with no serious complications and minimal post-operative morbidity. We propose laparoscopic gastropexy as the preferred treatment for pediatric gastric volvulus.
REDUCTION OF LUNG METASTASES AFTER CECECTOMY WITH LAPAROSCOPIC AND PERIOPERATIVE VACCINATION J. Carter, MD; I. Kirmak, MD, PhD; R. Wildbrett, BS; D. Feingold, MD; Z. Asi, BA; R. Fowler, BS; E. Huang, MD; R. Whelan, MD, Columbia-Presbyterian Medical Center, NY, NY 10032

It has been shown in a murine model that sham laparotomy and CO2 pneumo are associated with the formation of more lung mets than after anesthesia alone. Further, a preop tumor cell vaccine was shown to reduce the formation of lung mets after sham open and closed surgery. The first purpose of this study was to determine the impact of cecectomy on the lung met incidence while the second was to assess a preop tumor vaccine in the setting of cecectomy. METHODS: 60 A/J mice were randomized to one of 6 groups: anesthesia control(A), laparoscopic-assisted cecectomy(LC), open cecectomy (OC), AC + vaccine (ACVac), LC + vaccine (LCVac), or OC + vaccine (OCVac). Alpinate beads with 10^5 irradiated TA3Hau tumor cells and 0.1mcg of M PLA(adjuvant) were implanted subcutaneously 14 and 7 days before surgery in vaccine groups. All other mice had empty beads implanted. Tail vein injections of 10^5 Ta3Ha tumor cells were given to all after surgery. All were sacrificed, and 14 days later the lungs/trachea excised. Surface mets were counted in blinded fashion and differences determined via ANOVA. RESULTS: The LC and the OC groups had significantly(signif) more lung mets than the AC group. The LC group had fewer mets than the OC group but the difference was not signif. Signif fewer tumors were noted after preop vaccination in all vaccinated groups(ACVac 4.8, LCVac 88.33, OCVac 174.44) when compared to their respective control group(AC 40.55, LC 215.88, OC 275). There were signif fewer mets in the LCVac group than in the OCVac group (p<0.01), suggesting vaccine is more effective after laparoscopic surgery. CONCLUSION: Cectomy is associated with the formation of more lung mets. Preop whole tumor cell vaccine signif reduced the formation of lung mets after both open and closed cecectomy in this model. There was a greater reduction in lung mets in the vaccinated laparoscopic group when compared to the vaccinated open group’s results. Other preop vaccine studies appear to be warranted.

PRE-OPERATIVE LOCALIZATION WITH ANGIOGRAPHIC METHYLENE BLUE FOLLOWED BY LAPAROSCOPIC RESECTION OF A JEJUNAL ARTERIOVENOUS MALFORMATION Bipan Chand M.D., Terive Sanperier M.D., Mark Sands M.D., Fred Brody M.D.
Department of General Surgery, The Cleveland Clinic Foundation

Introduction: The incidence of small bowel arteriovenous malformations (AVMs) is approximately 4% with less than 300 hundred cases reported in the literature. Patients with intestinal AVMs usually undergo multiple endoscopic and radiographic studies for obscure GI bleeding. Occasionally mesenteric angiography is utilized to identify and localize AVMs. This case report reviews the use of selective mesenteric angiography to localize and tattoo a jejunal AVM with methylene blue. The AVM was detected laparoscopically followed by an intracorporeal anastomosis.

Methods: A 67-year-old male presented with obscure GI hemorrhage of two years duration. Work-up included multiple upper and lower endoscopies followed by a small bowel push endoscopy and enteroclysis. All studies were normal. Mesenteric angiography was performed revealing a jejunal AVM. Preoperatively, repeat selective mesenteric angiography re-identified the AVM, which was marked with intra-arterial methylene blue. The patient was brought to the operating room within three hours of tattooing and underwent complete laparoscopic resection followed by an intracorporeal anastomosis.

Results: Post operatively the patient was discharged on post operative day number two. Follow-up visits revealed no further melena and a stable hemoglobin.

Conclusion: This case report confirms the ability of angiography to localize and tattoo small bowel AVMs. It also demonstrates the necessity of timing between identification with methylene blue and surgery. Finally, this report illustrates the feasibility of complete laparoscopic small bowel resection followed by an intracorporeal anastomasis.

PORCINE LIVE DONOR PARTIAL HEPATECTOMY: DEVELOPING A MIS TECHNIQUE, Patrick M. Chiasson MD, Christopher M. Schlachta, MD, David R. Grant,MD, James Phillips,MD, David E Pace,MD, Joseph Mammazza,MD, Loyd Smith,MD, Eric C. Poulin,MD,
The Centre for Minimally Invasive Surgery, Toronto, ON, Canada.

The application of advanced laparoscopic techniques to hepatic surgery is evolving suggesting a role for MIS in liver transplantation surgery. The purpose of this animal study was to develop a MIS technique using a porcine model for live donor partial hepatectomy. Four pigs underwent laparoscopic live donor partial hepatectomy removing the two great left lobes in an effort to mimic left lateral segmentectomy in the human. In each case the porta hepatis was explored and the vascular and biliary structures were isolated and transected only after completion of hepatic parenchymal dissection. The hepatic parenchyma was transected using the HALS technique in combination with ultrasonic shears, hemostatic clips, and endo-linear staplers with vascular cartridges. Graft viability was assessed by measuring warm ischemic time, confirming vascular integrity with angiogram, and examining the graft for evidence of injury.

The mean operating time was 275 min. There were two successful procedures where the blood loss was 250 mls and 500 mls and the warm ischemic time was 256 and 510 secs. An angiogram confirmed vascular integrity and histology confirmed parenchymal preservation. Two experiments were considered to be failures secondary to complications. A significant intra-operative complication occurred in experiment #2 with major laceration of the middle hepatic vein which was not amenable to laparoscopic repair. In experiment #4, the hepatic veins were harvested from the vena cava origin and our resection resulted in two separated lobes. Laparoscopic live donor partial hepatectomy is technically feasible in the porcine model. The technique developed in this study could potentially have clinical application in humans.

THORACOSCOPIC MOBILISATION OF ESOPHAGUS WITH SEGMENTAL RESECTION OF THE LUNG INFILTRATED BY THE TUMOR, Dr Manzoor A Dar F.R.C.S., NORTH WEST ARMED FORCES HOSPITAL TABUK SAUDI ARABIA

I wish to give a video presentation of thoracoscopic mobilisation of esophagus in 3 stage esophagectomy. This procedure has been performed since 1993 but it has not been reported before where segmental resection of the lung was performed thereby removing the esophagus enblock with the affected lung. This procedure is an effective way of providing both palliative as well as curative treatment without a thoracotomy and also I have demonstrated that previously deemed irresectable tumour by laparoscopy can be performed safely without reverting to thoracotomy.
QUALITY OF LIFE OUTCOMES IN MINIMALLY INVASIVE VERSUS OPEN SPLENECTOMY

Alicia Fanning MD, Fred Brody MD, Michael Rosen MD, R. Matthew Walsh MD, Jennifer Malm RN, Jeffrey Ponsky MD, Department of General Surgery, Minimally Invasive Surgery Center, The Cleveland Clinic Foundation, Cleveland OH

Numerous studies have compared the morbidity and technical aspects of laparoscopic splenectomy (LS). However, no study has evaluated the quality of life in patients following LS. This study is designed to characterize the quality of life of patients following LS, open and hand assisted laparoscopic splenectomy (HALS). Twenty-two patients undergoing splenectomy at the Cleveland Clinic Foundation were evaluated prospectively from May 2000 to May 2001. Patients were divided into three groups. Group A included patients undergoing LS, Group B consisted of patients undergoing HALS. Group C contained patients following open splenectomy or conversions from Group A or B. Patients were queried pre and post operatively with a standard SF-36 form. Data was analyzed independently using a student's t-test and ANOVA.

Results: There were no mortalities. There were no post-operative complications.

Conclusion: Emergency laparoscopy in the diagnosis of abdominal trauma both penetrating and blunt represents an excellent avenue for general surgeon.
**LAPAROSCOPIC REFUNDOPLICATION WITH PROSTHETIC HIATAL CLOSURE FOR RECURRENT HIATAL HERNIA AFTER PRIOR FAILED ANITREFLUX SURGERY**

**Background:** A common complication after laparoscopic antireflux surgery is the recurrence of hiatal hernia. Therefore, in some patients, revisional surgery may be necessary. Aim of this prospective study was to evaluate surgical outcome in patients who underwent laparoscopic refudojunction for postoperative intrathoracic wrap herniation using a polypropylene-mesh for hiatal closure for a complete follow-up period of one year.

**Patients and methods:** Between January 1998 and May 2000, a group of 24 consecutive patients underwent laparoscopic refudojunction for postoperative intrathoracic wrap herniation after primary surgery. Therefore, redo-surgery was performed using a 6x12 cm polypropylene-mesh for hiatal closure. Preoperative and postoperative data including esophagogastroduodenoscopy, esophageal manometry, 24-hour pH monitoring and barium swallow (kinematographic x-ray) were prospectively reviewed for a complete follow-up period of one year.

**Results:** All redo-procedures were completed laparoscopically. There were no intraoperative complications. Previous antireflux procedures were in 5 patients an open Nissen fundoplication, in 15 patients a laparoscopic Nissen fundoplication and in 4 patients a laparoscopic Toupet fundoplication. Postoperatively, only 1 patient suffered from severe dysphagia and had to undergo pneumatic dilatation. For a mean follow-up period of 26 months (range 3 months to 44 months) no patient developed a recurrent hiatal hernia with or without intrathoracic wrap herniation. The mean lower esophageal sphincter pressure increased significantly at 3 months (12.2 mmHg) and 1 year (11.9 mmHg) after redo-surgery (<0.05). The mean DeMeester score decreased significantly from 90.51 points preoperatively to 16.8 at 3 months and 14.7 at 1 year after redo-surgery (<0.05).

**Conclusion:** Laparoscopic refudojunction with prosthetic hiatal closure is a safe and effective procedure to prevent recurrent intrathoracic wrap herniation with good to excellent functional outcome for a follow-up period of one year.

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**Minimally Invasive Other-PS108**

**LAPAROSCOPIC HAND-ASSISTED SURGERY IN TECHNICALLY DEMANDING CASES**

**Background:** The aim is to evaluate the efficiency of hand-assisted operations in comparison with similar laparoscopic operations.

**Patients and Methods:** Laparoscopic hand-assisted operations were performed in 28 patients. In 12 patients - laparoscopic colorectal surgery, in 7 - splenectomy, in 3 - subtotal gastrectomy, in 2 – gastric bypass for morbid obesity, in 2 – appendectomy for chronic pancreatitis, in 1 – distal pancreatic resection for tumor, in 1 - right lobe liver resection for tumor. To perform these operations we used Dexterity and Smith and Nephew hand-assisted laparoscopic system. In technically demanding cases laparoscopic hand-assisted surgery is preferable than laparoscopic procedures.

**Results:** Serious complications and mortality were not observed. 2 cases operated for colorectal cancer were converted to open procedure due to late stage of cancer. Trocar site metastasis was not observed in any of the cases. Mild complications were in 6 cases. Operation time was 1.5-2 times less than in similar laparoscopic procedures. The results of 28 hand-assisted operations were compared with similar laparoscopic procedures (laparoscopic colorectomy, splenectomy, liver resection).

**Conclusions:** In technically demanding cases laparoscopic hand-assisted surgery is preferable than laparoscopic procedures.
Minimally Invasive Other-PS109

IMPACT OF TEMPERATURE AND HUMIDITY OF CO2 PNEUMOPERITONEUM ON BODY TEMPERATURE AND PERITONEAL MORPHOLOGY

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Background: Insufflation of cold gas during laparoscopic surgery exposes the patients to the risk of hypothermia. The objectives of this study were to investigate if heating or humidification of insufflation gas could prevent perioperative hypothermia in a rat model, and, to assess whether the peritoneum was affected by heating or humidification of the insufflation gas.

Methods: Rats were exposed to insufflation with either cold, dry CO2 (group I), cold, humidified CO2 (group II), warm, dry CO2 (group III), warm, humidified CO2 (group IV) or gasless laparoscopy (group V). Core temperature and intraperitoneal temperature were registered in all animals during 120 min. Specimens of the parietal peritoneum were taken directly after desufflation and 2 and 24 hours after the procedure. All specimens were analyzed using scanning electron microscopy (SEM).

Results: During the 120 min study period, core temperature and intraperitoneal temperature were significantly reduced in group I, II and III. Animals which had warm, humidified insufflation (group IV) and gasless controls (group V) did not develop intraoperative hypothermia. At SEM, retraction and bulging of mesothelial cells and exposure of the basal lamina were seen in the four insufflation groups (group I-IV) but also in gasless controls (group V).

Conclusion: Insufflation with cold, dry CO2 may lower body temperature during laparoscopic surgery. Hypothermia can be prevented by both heating and humidifying the insufflation gas. Changes of the peritoneal surface, after CO2 insufflation, occur regardless of heating or humidifying, but also after gasless surgery.

Minimally Invasive Other-PS110

A STUDY OF POSTOPERATIVE ADHESIONS FORMATION COMPARING SURGICAL INSTRUMENTS IN LAPAROSCOPIC SURGERIES

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Objective: In this study, we evaluate the postoperative adhesion formation comparing surgical instruments by conducting animal lab with juvenile female porcine models.

Materials and Methods: Fourteen juvenile female pigs were used with general anesthesia to conduct laparoscopic bi-lateral uterine horn resection with CO2 insufflations. The following surgical instruments were used; (1) endoscopic stapling device (2) endo loop suture ligature (3) monopolar electric cautery (4) ultrasonically activated scalpel. Twelve days after the laparoscopic surgery, all 14 pigs had laparotomy, and have examined to analyze the degree of adhesion formation with liver cirrhosis. We had focus on the safety position on abdomen for insertion of trocars through gastric wall using the small open laparotomy.

Methods: From Jun 1994 to January 2000, thirteen patients with liver cirrhosis underwent laparoscopic surgery in our hospital. We had focus on the safety position on abdomen for insertion of trocar for these patients.

Results: In all patients, a short incision, about 1 cm in length, just below the umbilicus was made for insertion of trocar which was mainly used for laparoscope. A large amount of bleeding from the point was not occurred, but in 4 patients, a little bleeding was occurred from the point of the flank where a trocar was inserted by paraentric method under observation through a laparoscope.

Conclusion: As for the laparoscopic surgery to the patients with liver cirrhosis, just below the umbilicus was safety position for insertion of trocar. In addition, we could astringe a inserted trocar because a skin incision was made as short as possible.
LAPAROSCOPIC ANTIREFLUX SURGERY IN GERD PATIENTS WITH CONCOMITANT MAJOR DEPRESSION, Kamolz Thomas, Ph.D., Bammer Tanja, M.D., Grandrath Frank A, M.D., Pointner Rudolph, M.D. Prof., Department of General Surgery, Public Hospital of Zell am See, Zell am See, Austria

INTRODUCTION: Aim of the present study was to evaluate surgical outcome of laparoscopic antireflux surgery (LARS) in GERD patients (gastroesophageal reflux disease) with concomitant major depression for at least 1 year after surgical intervention.

METHODS AND PROCEDURES: Out of a total of more than 600 operated patients, a group of 41 patients (16 male, 25 female; mean age of 54 years) suffered from concomitant major depression. Clinical data have been evaluated preoperatively and 6 weeks, 3 months and 1 year after LARS including quality of life data (Gastrointestinal Quality of Life Index-GIQLI) and subjective severity of dysphagia. Data have been compared to a consecutive group of 100 patients without any psychiatric comorbidity (58 male, 42 female; mean age of 51 years).

RESULTS: In patients with concomitant major depression we found a significant improvement in traditional outcome data (e.g. DeMeester Score) after surgery. These findings are in comparison to those of patients without any psychiatric comorbidity. GIQLI improved significantly (p<.05-0.01) from preoperatively 80.7 +/- 10.3 points to 98.5 +/- 11.8 points 6 weeks or 105.3 +/- 12.7 points 1 year after surgery (preoperative GIQLI i.e. 79.0 +/- 6.5 points). In comparison to this improvement, postoperative GIQLI is not equivalent when compared to healthy individuals or to patients without psychiatric comorbidities (preoperative GIQLI: 91.3 +/- 10.4 points; 1 year postoperatively GIQLI: 120.2 +/- 12.2 points; p<.05). In addition, patients with concomitant major depression significantly graded postoperative dysphagia to be more severe for a longer period but without any objective findings in barium swallow.

CONCLUSION: Our findings suggest that patients with concomitant depression should generally not refused from antireflux surgery but should be approached with greater attention.

LAPAROSCOPIC CHOLECYSTECTOMY VIA TWO PORTS, USING THE TWIN-PORT, Kagaya T MD, Kishida A MD, Takayama S MD, Caceres, M.D., and Donald C. Liu, M.D., Ph.D., Department of Surgery, Louisiana State University School of Medicine, New Orleans, LA and Section of Pediatric Surgery, The University of Chicago Pritzker School of Medicine, Chicago, IL.

Background/Purposes: Children with cystic congenital heart disease (CHD) were thought to be poor candidates for laparoscopy secondary to the theoretically untoward effects of CO2 abdominal insufflation on an underlying unbalanced pulmonary and systemic circulation. Our aim was to measure the physiological effects of laparoscopy in children with CHD assessing surgical outcome.

Methods & Materials: Retrospective chart review of 30 consecutive infants with cystic CHD who underwent laparoscopic Nissen fundoplication (LNF) was performed. Intra-operative physiological parameters of O2 saturation, blood pressure (BP), and heart rate (HR) were averaged at the lowest end tidal CO2 (et CO2) pre-abdominal insufflation (Group A) and compared to averages obtained at the highest et CO2 post-insufflation Group B. Statistical analysis was performed via student t-test and/or Fischer exact analysis when appropriate (p<.05 was considered significant).

Results: LNF was successfully completed in 7/10 (70%) with 3 open conversions; 2 because of rapid development of tachycardia, desaturation, and hypotension soon after abdominal insufflation and 1 due to technical difficulties. In the 7 successful cases, et CO2 was averaged at 32.7 +/- 3.56 and Group B: 46.3 +/- 4.0. Group A O2 sat. = 90.6 +/- 3.3 vs 88.9 +/- 3.2 in Group B. Group A systolic/diastolic BP = (86.6 +/- 1.9/46.3 +/- 1.1) vs (78.8 +/- 1.9/40.9 +/- 2.1) in Group B. Group A HR = 134.2 +/- 2.3 vs 136.5 +/- 1.5 in Group B. p values ranged from 0.3-0.76. All infants were doing well at follow-up without evidence of delayed post-op complications.

Conclusions: Advanced laparoscopy can be safely and successfully performed in children with cystic congenital CHD. However, rapid onset of derangements in patient physiology may occur mandating immediate conversion to traditional laparotomy with expected good surgical outcome.

MISCELLANEOUS LAPAROSCOPIC SURGERY IN CHILDREN WITH CYSTIC GENITAL HEART DISEASE, Tomas H. Jacome, M.D., Manuel A. Caceres, M.D., and Donald C. Liu, M.D., Ph.D., Department of Surgery, Louisiana State University School of Medicine, New Orleans, LA and Section of Pediatric Surgery, The University of Chicago Pritzker School of Medicine, Chicago, IL.

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Conclusions: Advanced laparoscopy can be safely and successfully performed in children with cystic congenital CHD. However, rapid onset of derangements in patient physiology may occur mandating immediate conversion to traditional laparotomy with expected good surgical outcome.

AN ANALYSIS OF QUALITY OF LIFE DATA BEFORE AND AFTER LAPAROSCOPIC FLOPPY NISSEN FUNDOPICATION IN PATIENTS WITH AND WITHOUT BARRETT’S ESOPHAGUS, Kamolz Thomas, Ph.D., Grandrath Frank A, M.D., Bammer Tanja, M.D., Pointner Rudolph, M.D. Prof., Department of General Surgery, Public Hospital of Zell am See, Zell am See, Austria

INTRODUCTION: Aim of this prospective study was to evaluate and compare quality of life data before and after laparoscopic floppy Nissen fundoplication in patients with Barrett’s esophagus (BE)and to compare these data to that of general population.

METHODS AND PROCEDURES: The Gastrointestinal Quality of Life Index (GIQLI) was given to 81 BE-patients and to 250 patients with GERD but without BE (grade 0:n=43; grade 1:n=60; grade 2:n=81; grade 3:n=66). The GIQLI was given to all patients preoperatively, partly 6 weeks post-operatively (BE patients n=36; non-BE patients n=127), and in all patients 3 months, 1 year and 3 years after LARS including quality of life data of dysphagia. Data have been compared to a consecutive group of 100 patients without any psychiatric comorbidity (58 male, 42 female; mean age of 51 years).

RESULTS: Preoperatively, BE-patients (mean: 97.1 +/- 8.6 points) had a better but not significant (p=0.06) general score of GIQLI when compared to patients without BE (mean: 88.4 +/- 9.2 points). This difference is solely based on the subdimension “GI-symptoms” which means that GERD symptoms are less intensive and frequently recognized in BE-patients than in patients without BE. There are no other differences in the other 4 subdimensions of the GIQLI between both groups. Six weeks, 3 months, 1 year and 3 years after LARS, GIQLI was significantly (p<0.01) improved in both groups (BE-patients mean after 3 years: 120.6 +/- 7.9 points; non-BE patients mean after 3 years: 122.0 +/- 8.3 points). This improvement was significantly better (p<0.05) in patients without BE than in BE-patients. Before surgery, both groups scored significantly below average on all subscores of GIQLI compared to general population (mean: 122.6 +/- 8.5 points). After surgery, there are no differences detectable. A total of 6 patients, each 3 out of both groups, underwent laparoscopic redo-surgery.

CONCLUSION: As these data show, non BE-patients undergoing antireflux surgery achieved a better quality of life improvement than patients with BE. However, antireflux surgery is able to improve quality of life significantly in all GERD patients, with and without BE.
LAPAROSCOPIC TREATMENT FOR SPLENIC HYDATIDOSIS
Firas Abiad, M.D., Ghassan Khoury, M.D., Division of General Surgery, American University of Beirut Medical Center, Beirut, Lebanon.

Background: Hydatid cysts of the spleen are rare. The are managed either by splenectomy, or by preservation of the spleen and cyst evacuation. Laparoscopic evacuation of hydatid cysts of the liver has been shown to be comparable to the open approach in safety and efficacy, in addition to offering the advantages of the laparoscopic surgery. Here we report the use of laparoscopic evacuation in the management of hydatid cysts of the spleen and discuss its safety and short term results.

Methods: Laparoscopic evacuation of hydatid cyst of the spleen was attempted on ten consecutive patients. There were six females and four males. Age ranged between 13 and 65 years. Hydatid cyst of the spleen was suspected radiologically and the diagnosis was confirmed in all cases with serologic testing.

Results: The operation was completed successfully in all patients. The mean operative time was 59min(range 39-120 min). The average hospital stay was 2 days (range 1-5days). There were no mortalities. One patient had recurrence of her disease in the spleen within the first year, and underwent laparoscopic splenectomy. The average follow up period for all the patients was 29 months (range 4-42).

Conclusion: Laparoscopic treatment of hydatid cysts of the spleen is feasible and safe. It is associated with less operative pain and shorter hospital stay.

Key words: Hydatid cyst- spleen- laparoscopic evacuation- splenectomy.

LAPAROSCOPIC REPAIR OF PERFORATED DUODENAL ULCER
AFENDULOV S.A., MD, KRASNOLUTSKY N.A., MD, HEALTH CENTRE OF LIPETSK IRON AND STEEL CORPORATION, RUSSIA, Health Centre of Lipetsk Iron and Steel Corporation

OBJECTIVE OF THE STUDY: The sickness rate of abdominal trauma has been increasing in Russia during the last years. We used laparoscopic repair with individual study of an intragastric pH within 24 hours and rational therapy for low recurrence rate.

MATERIAL AND METHODS: The laparoscopic treatment of perforated duodenal ulcer was made to 136 patients. There were 131 male and 5 female and mean age was 36 years. Surgical procedure was: exten- sive lavage of abdominal cavity, extra- or intracorporal suture repair and drainage. After procedure we conducted 24-hour monitoring of stomach acidity with 63 patients (46,3%). For examination purposes we use a daily computer-based acidostromonitor AGM 24MP “Gastroscan-24” since 1998. With the help of transnasal introduction of three sensors of pH probe continuous registration of acid producing function changes of stomach is carried out at intervals of 20 sec- onds within 24 hours with the further data array transfer to a personal computer for study.

RESULTS: The test of medicamental vagotomy (atrofine+benzohex- oni) was negative in 38 patients (60,3%). All patients have hyperacidi- ty. 11 patients (17,5%) were found resistant to traditional therapy. Ranitidini was effective not more than 4 hours in 23 cases (36,5%). The intramuscular injection of histodili 2.0 ml was ineffective with 63 patients (46,3%). For examination purposes we used a daily computer-based acidostromonitor AGM 24MP “Gastroscan-24” since 1998. With the help of transnasal introduction of three sensors of pH probe continuous registration of acid producing function changes of stomach is carried out at intervals of 20 seconds within 24 hours with the further data array transfer to a personal computer for study.

CONCLUSION: We consider that the laparoscopic repair of perforat- ed duodenal ulcers is the method of choice with a further course of individually selected antilucre treatment & HP eradica- tion in the early postoperative period.

LAPAROSCOPIC OPERATIONS FOR ABDOMINAL TRAUMA
AFENDULOV S.A., MD, KRASNOLUTSKY N.A., MD, HEALTH CENTRE OF LIPETSK IRON AND STEEL CORPORATION, RUSSIA

OBJECTIVE OF THE STUDY: The sickness rate of abdominal trauma has been increasing in Russia during the last years. Laparoscopic technologies help to solve this problem, but are limited by concerns of potential for missed injuries.

MATERIAL AND METHODS: There were 64 patients with abdominal trauma from 01.01.2000 to 01.05.2001. There were 53 male and 11 female and mean age was 36 (18 – 72) years. Most of the patients were hospitalized after 1-6 hours after a trauma.

There were close trauma in 37 cases: there were a liver and spleen injuries in 14 patients, combined injuries in 12, a bleeding from mesenterium, perforation of large or small intestine in 18 cases. The character of injuries with knives trauma were: without trauma abdomi-nal organs- 8 patients, a liver wounds – 7, a mesocolon wounds- 2, a colon wounds –2, combined injuries –3, diaphragmatic –2, bowel – 1, many wounds of small bowel with general peritonitis- 1. There is the iatrogenic trauma of the uterus in 1. We use laparoscopy widely for correct diagnosis and approach for treating. Laparotomy was made without a laparoscopy in 8 (12,5%) cases because of shock and bad haemodynamic examination. There were laparoscopic operations in 18 (28,1%) patients. Parenchymal wounds were coagulated or sealed, and wounds in the diaphragm (2) sutured.

RESULTS: 18 of 64 patients totally treated laparoscopically had an uneventful post-operative course. Their median hospital stay was 6 days, with no late complications. There were 3 conversions.

CONCLUSION: Laparoscopic approach can avoid a number of unnecessary laparotomies in abdominal wounds and can treat most of the lesions found in haemodynamically stable patients.


Background: Laparoscopic skills are crucial in the era of mini- mally invasive surgery. The aim of our study was to determine if “skilled hands” predict laparoscopic ability.

Methods: Ten surgery residents (PGY-2) were tested at a basic element of performance (BEP) level evaluating bilateral motor coordination and visual information processing capacity. All resi- dents also performed five laparoscopic tasks in a video trainer. Comparison with both modalities was done using correlation and a cause-and-effect method (NCRA).

Results: Cause-and-effect consistently showed that a greater amount of each basic performance resource was necessary in order to achieve a higher level of performance in the VT tasks. Correlations were higher (0.4-0.5), between motor coordination and each of the VT test performance scores. There was no corre- lation between visual information processing speed and each of the VT tasks performance.

Conclusion: Visual processing and motor coordination skills are important factors in open and laparoscopic surgery. Motor perfor- mance with open skills does beget better laparoscopic task performance. This is particularly evident from the causal, resource-economic analyses.

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Minimally Invasive Other–PS121

RELAPAROSCOPIC OPERATIONS IN TREATMENT OF COMPLICATIONS AFTER CONVENTIONAL AND LAPAROSCOPIC PROCEDURES, Health Centre of Lipetsk Iron and Steel Corporation, Russia

Despite of rough development laparoscopic surgery in treatment of pathology of abdominal cavity, repeated laparoscopic operations take a small place for correction of complications.

MATERIAL AND METHODS: 1196 patients underwent laparoscopic cholecystectomy. There were abscesses of different localization for 10 (0,84 %), bile peritonitis for 3 (0,25%). The relaparoscopic drainage of abscesses was made in all cases. There are 3 cases with a bile peritonitis after deleting of T-tube from common bile duct. 2 patients underwent relaparoscopic operation. 4 patients underwent relaparoscopic operations after conventional procedure on stomach. The drainage of left sub-phenric abscess was made after 2/3 resection. 2-th female patient had anastomosis leakage after a gasterectomy for gastric cancer. We made laparoscopic entero-enterostomy, jejunojumostomy for meal. 3-th male patient had the stenosis of an esophagus. There was a hemoperitoneum after first stage of an esophagoplasty, cured by laparoscopically. Suture leakage marked for 11(1,2%) patient after laparoscopic repair of perforated duodenal ulcer. The laparoscopic procedure was: omental patch repaire of perforation, extensive lavage of abdominal cavity and drainage. Six patients underwent relaparoscopic procedure with a pathology of the pancreas. All patients reported reduction of continuous pain, disappearance of symptoms of peritonitis.

RESULTS: Nobody needed the laparotomy after repeated laparoscopic operations. There were 2 postoperative deaths (5,5%). The first cause of the death was the pancreonecrosis and the second cause was the polyorganic failure after gasterectomy for gastric cancer.

CONCLUSION: Correction of the intrabdominal complications after conventional and laparoscopic operations should begin with repeated laparoscopic procedure. The majority of reparoscopic operations were finished without conversion.

Minimally Invasive Other–PS122

THORACOSCOPIC PULMONARY VEIN ISOLATION TO TREAT ATRIAL FIBRILLATION Hiroshi Kubota M.D., Shinich Takamoto M.D., Yoshiya Ohtsuka M.D., Yutaka Kotsuka M.D., Noboru Motomura M.D., Tetsuro Morota M.D., Katsuhide Maeda M.D., Mikio Ninomiya M.D., Hiroo Takayama M.D., Department of Cardiothoracic Surgery, University of Tokyo

Objective: A rapidly firing focus in the pulmonary veins could be the cause of the atrial fibrillation. Endocardial radio-frequency catheter pulmonary vein ablation to treat atrial fibrillation has been reported. However, it requires contrast media and X-ray to identify pulmonary veins, it requires long time to ablate all pulmonary veins, and rarely it causes cardiac tamponade or pulmonary vein obstruction. We developed a new method that enables pulmonary vein isolation thoracoscopically without using X-ray or contrast media.

Methods: Four Mongrel dogs (26 Pulmonary veins) were used. A hook shaped cryoprobe was developed to ablate the pulmonary vein orifice circumferentially. Using this hook probe, each pulmonary vein was ablated thoracoscopically. During ablation, bipolar electrodes were put on the left atrium and pulmonary vein to record the electrical potential.

Results: All pulmonary veins were electrically isolated within short time.

Conclusion: Pulmonary vein isolation could be done thoracoscopically. This method might be applicable in clinical use to treat atrial fibrillation.

Minimally Invasive Other–PS123

LAPAROSCOPIC-ENDOSCOPIC COMBINED RESECTION OF GASTRIC TUMORS, Kaia Ludwig, MD, Gerlinde Amtsberg, Henry Ptok, Lutz Wilhelm, MD, Jorn Bernhardt, MD, Department of Surgery, Klinikum Südstadt Rostock, Südring 81, D-18059 Rostock

Background: Submucosal and mucosal tumors of the stomach are different in histopathological and prognostic characteristics and biopsies by endoscopic techniques often not allow a representative histological probe for the therapeutic decision.

Material and Methods: 14 patients with suspected tumors of the stomach wall underwent between 1999-2001 a combined endoscopic-laparoscopic local resection of the tumors in two different procedures. Tumors of the posterior wall were resected by the intragastral (LIR), in cases of location at the anterior wall in the lesion-lifting (LWR) approach.

Results: Laparoscopic resections were applied to 14 patients including 9 females and 5 males (64%-36%). The mean age of the patients was 67.4 (38-81) years. Preoperative work-up included endoscopy with biopsies and histological examination, ultrasound examination or CT-scan and in 12 patients endoscopic ultrasonography. We performed the LWR in 9 patients and the LIR in 5 patients. After in-toto-resection the definitively immunohistological examination of the specimens showed GIST-tumors in 6 cases (followed by 2 onco logical resections and 4 follow up examinations including gastroscopy), and both, in 2 cases neumirons or neurofibrotic benign tumors. 4 patients with mucosal early gastric cancer and high comorbidty risks underwent also a limited full-thickness wedge resection. In all these patients, the surgical margins, lymphatic or venous invasion in pathological specimens were free. Intraoperative complications were seen in 2 cases (1 x hemorrhage, 1 x perforation of the stomach wall) and treated after conversion. The method-specific morbidity was 9%. No final outcome had to be registered. Conclusions: Selected properly, the laparoscopic-endoscopic approach are considered to be curative and minimally invasive for tumors of the gastric wall. In cases of histopathological preoperative unknown tumors, the definitively examination of the complete specimen allow the furthering therapeutic decision.

Minimally Invasive Other–PS124

LAPAROSCOPIC TOUPET FUNDOPLICATION OPERATIVE RESULTS AND SHORT-TERM FOLLOW-UP, Mohamed Mostafa Marzouk, MD., Department of Surgery, Saudi German Hospital Group - Jeddah, Saudi Arabia

Background. The development of laparoscopic fundoplication over the past several years has resulted in increased interest in the surgical treatment of gastro-esophageal reflux disease (GERD). The most commonly used surgical procedure is Nissen fundoplication. But it carries the disadvantage that it can produce an over competent cardia resulting in dysphagia or the gas bloat syndrome. Partial posterior wrap (Toupet) overcomes these side effects but only few studies that showed its efficacy to control reflux symptoms and to achieve healing of the esophagitis. The aim of this study is to present the author's own experience in laparoscopic Toupet fundoplication.

Methods. Between July 1998 and December 1999, twenty patients underwent laparoscopic Toupet fundoplication for gastro-esophageal reflux disease. They were 12 males and 8 females. The mean age was 40.6 years. Pre-operative evaluation included upper gastro-intestinal endoscopy and 24-hour pH study. Follow up period ranged between 6 to 18 months for all patients. Upper gastrointestinal endoscopy was done for all patients 6 months post-operatively.

Results. The mean operative time was 145 minutes. There were no intra-operative complications and no conversion to open surgery. The mean hospital stay was 50 hours. All the reflux symptoms were relieved in the 1st post-operative day and during the whole follow-up period. The pre-operative esophagitis showed complete healing in the follow-up endoscopy. Post-operative mild temporary dysphagia occurred in 9 patients and disappeared completely in less than 3 months.

Conclusion. Laparoscopic Toupet fundoplication provides an excellent symptomotic outcome in patients with gastro-esophageal reflux. It results in complete healing of the esophagitis. This can be achieved with a hospital stay of 50 hours and a low incidence of intra or post-operative complications. Longer period of follow-up and larger series are needed to reach a solid conclusion.

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LAPAROSCOPICALLY ASSISTED ORCHIOPEXY EXTENDED MOBILIZATION OF INTRA-ABDOMINAL TESTIS

Shuji Akasaka1), Yoshiaki Fujioka1), Yukihiro Ichirou M.D., Jorge R. Garibaldi, M.D., Alberto Reyes, M.D., Jonathan M. Sackier, M.D., Jose T. Hernandez, M.D. Hector Orduna, M.D. Department of Surgery, General Hospital Jeddah, Saudi Arabia

Purpose: We reviewed the outcome of first 10 cases with 12 intra-abdominal testes treated laparoscopically by dissection of wider peri-toneal cuff inscribed around the testis and the vas deferens in order to gain a sufficient length of the testicular pedicle for scrotal placement.

Material & methods: The medical files of 10 patients with 12 undescended testes who underwent laparoscopic orchiopexy were reviewed. Notably, the peritoneum overlaying the internal spermatic vessels was mobilized along with the underlying vessels (un-skeletonized) to guard against undue traction, spasm, or inadvertent damage of such fragile vessels. Likewise, the deferential peritoneum was inscribed in-continuity as a wide peritoneal flap to avoid injury of the vas deferens and the testis. This maneuver was retained high, lateral to the external iliac artery of the ipsilateral side. Two testes were placed successfully into the scrotum, while the third was fixed intracanalicular followed by a second stage 6 months later. Ultrasonic duplex check-up revealed neither testicular atrophy nor compromised blood supply.

Conclusion: Not only one-stage, tension-free orchiopexy can be readily performed by laparoscope, but also careful handling of the of the testicular vessels preclude the possibility of Jeopardizing the blood supply of the newly located testes, and hence testicular atrophy.

EXPERIENCE OF LAPAROSCOPIC RADICAL PROSTATECTOMY

(An Over 1000 cases Experience)

Ichiro Matsuzawa1), Shuji Akasaka1), Yoshiaki Fujioka1), Yukihiro Kondo2), Go Kimura2), Taiji Nishimura2), 1) Kawakita General Hospital, Tokyo, Japan 2) Nippon Medical School, Tokyo, Japan

Introduction and Objectives: Laparoscopic radical prostatectomy was first described in an abstract in 1992. And now the world clinical experience is estimated to exceed 1000 cases. Laparoscopic radical prostatectomy (LRP) is a minimal invasive alternative to standard open retropubic procedure in case of localized prostate cancer. But LRP needs longer operative times and hospital stay and longer recovery period. The mean cost of laparoscopic cholecystectomy was 1320 euro, while for open cholecystectomy was 1614 euro. Even though the cost of laparoscopic equipment was 10 times higher that of open cholecystectomy surgical equipment, open procedures were significantly more expensive due to the prolonged hospital stay and longer recovery period.

Cost Analysis of Laparoscopic Cholecystectomy vs Open Cholecystectomy in a University Teaching Hospital in Greece

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Aim/Background: Laparoscopic cholecystectomy today is the treatment of choice for cholelithiasis. The shorter hospital stay and recovery period and the quick return to work offered by laparoscopic surgery are reported to decrease the cost of this procedure. In this retrospective study the cost of laparoscopic cholecystectomy is evaluated and compared to that of open cholecystectomy in a university teaching hospital in Greece.

Materials and Methods: A total of 623 consecutive patients with cholelithiasis were included in our study. Laparoscopic cholecystectomy with single use instruments was performed in 547 patients (87.8%), open cholecystectomy in 64 patients (10.3%), while laparoscopic cholecystectomy was converted to open cholecystectomy in 12 cases (1.9%). The cost of surgical equipment used, hospital stay, doctors and nurses fees were calculated in all cases.

Results: The mean cost of laparoscopic cholecystectomy was 1320 euro, while for open cholecystectomy was 1614 euro. Even though the cost of laparoscopic equipment was 10 times higher than that of open cholecystectomy surgical equipment, open procedures were significantly more expensive due to the prolonged hospital stay and longer recovery period.

Conclusion: Laparoscopic cholecystectomy is a cost-effective alternative to open cholecystectomy, when length of hospital stay is included in the cost-analysis, despite the use of non reusable laparoscopic instruments, which is common practice in Greece.
Minimally Invasive Other-PS129

INTRA-SURGEON VARIABILITY IN MOTOR TASK PERFORMANCE IN LAPAROSCOPIC SURGERY

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Background: Current methods of evaluating the skills of surgical residents are subjective and potentially unreliable, so there is a need for objective methods to monitor their training. The purpose of this study is to test the intra-surgeon reliability of a proposed quantitative skill assessment method based on surgical tool kinematics.

Methods: One expert surgeon performed seven clinical laparoscopic cholecystectomies over a period of four months. Using an optoelectronic motion analysis system we acquired tool tip trajectories at frequencies of ~20 Hz. A hierarchical decomposition matrix was used to segment the procedure into specific surgical actions and extract characteristic measures of these individual actions (e.g., duration, mean tool-tip velocity, etc.). We selected an example sequence (applying a clip) and compared the characteristic measures associated with its component actions across the seven procedures recorded.

Results: We found no statistical similarity difference between the completion time distributions in any of the four contexts examined: (1) first 4 trials vs. last 3 trials: the probability of these segments arising from the same distribution is p=0.30, and a percent difference in mean completion time, which would have been deemed significant of (d)=5.4%, (2) cystic artery vs. cystic duct: p=0.1, d=22.3%, (3) 1 clip vs. subsequent clips (cystic artery): p=0.94, d=9.3%, and (4) 1 clip vs. subsequent clips (cystic duct): p=0.67, d=20.8%. Results for trajectory length and tip velocity are similar.

Conclusions: We used an automated tool tracking system to identify kinematic features of specific surgical actions during laparoscopic cholecystectomies. The results suggest an expert surgeon performs specific tasks quite consistently from case to case and the performance measures are only modestly sensitive to specific patients.

Minimally Invasive Other-PS130

OPTIMAL CLOSURE METHOD OF FIVE MILLIMETER TROCAR SITES

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Although many surgeons utilize absorbable sutures for skin closure of 5 mm trocar sites, alternative materials exist. We conducted a blinded, prospective, randomized-controlled clinical trial to compare 5 mm trocar site closure using either a suture (VS), skin tape (ST), or cyanoacrylate tissue adhesive (CTA).

One hundred thirty-seven wounds in 48 patients (mean 2.98 ± 0.84 wounds/patient) undergoing laparoscopic procedures were randomized between 3 closure methods. Groups were matched for age, gender, site, type, number of trocar sites, and number of patients had all 3 closures. Closure time of each wound was recorded: Patients rated wound pain and appearance at 1 and 6 weeks post surgery. In addition, 6 blinded surgeons rated photographs of each wound at the same time points using the Hollander Wound Evaluation Scale. Logistic regression analysis was used to evaluate the ratings of each wound closure group.

The groups were similar with respect to patient age, race, gender, BMI, and procedure type. Mean wound closure times were significantly longer for VS [VS=43.1, ST=34.7, CTA=33.4 seconds (p=0.001)]. Patients favored VS over ST and CTA at 1 week with respect to pain and wound appearance (66% and 56% times less, respectively). They rated CTA closures more likely to have pain and poor wound appearance at 6 weeks (4.17 and 2.01 times, respectively). Surgeons rated VS as .35 times less likely and CTA 4.9 times more likely to show moderate to severe scar formation. VS was also likely to have a separation and wound infection (3.45 and .283 times, respectively). CTA was more likely to yield contour irregularities (4.57 times), excessive distortion (4.18 times), edge inversion (2.48 times), separation (4.9 times), and step-off (2.8 times).

Although VS closure time of 5 mm trocar sites takes longer than ST and CTA, VS scar formation and comfort is superior to ST and CTA. CTA yields poor results with respect to both wound healing and pain.

Minimally Invasive Other-PS131

TREATMENT OF INTRAVENTRICULAR HEMATOMA WITH FLEXIBLE ENDOCOPY: A CASE REPORT

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Introduction: So far, intracerebral hemorrhage with ventricular hematoma has been treated with open surgery or stereotactic surgery with or without external ventricular drainage. However, such a ventricular hematoma has been frequently remained, and as a result, hydrocephalus has been sometimes observed. Recently, some authors report neuroendoscopic approach for intraventricular hematoma. This time, we report a case of cerebellar hemorrhage with ventricular hematoma producing an acute hydrocephalus treated with flexible endoscopy via anterior horn, and discuss the advantages of this procedure compared to others.

Methods and procedures: This 72-year-old female presented with a sudden onset vomiting and headache. Intra-ventriculography revealed a large cystic tumor at third ventricle, which was confirmed on CT scan. As the level of consciousness gradually deteriorated Glascow Coma Scale score was 8 due to progressive hydrocephalus, flexible endoscopy was introduced via right anterior horn.

Results: Almost all of the hematoma in the third ventricle was evacuated and third ventricular Hydrocephalus was successfully resolved and resulted in a rapid recovery of her consciousness. In addition, this procedure made her rehabilitation easier because of no drainage tube. However, ocular abnormality was observed right after surgery, because, we consider, the hematoma in the aqueduct was tried to remove.

Conclusion: A neuroendoscopic procedure is a good option for treating intraventricular hematoma with acute hydrocephalus. Its advantages are as follows: 1) minimally invasive surgery with one burr hole, 2) no need of external draining, resulting in a decrease of subsequent infection and enabling early rehabilitation.
Minimally Invasive Other–PS133

PROSPECTIVE RANDOMIZED BLINDED TRIAL OF MINI-PORT VS CONVENTIONAL CHOLECYSTECTOMY Yuri W. Novitsky, MD, Donald R. Czerniak, MD, Demetrius E. Litwin, MD, Kent W. Kercher, MD, Karen A. Gallagher, RN, Steven M. Yood, MD, Stephen Gruffy, MD, Mark P. Callery, MD, John J. Kelly, MD. Department of Surgery, University of Massachusetts Medical School, Worcester, MA

Objective: Benefits of laparoscopic cholecystectomy (LC) are well established. The use of smaller instruments has been proposed to further improve postoperative pain and cosmesis. We compared the safety, postoperative pain and cosmetic results of LC performed conventionally (C-LC) and utilizing the mini-ports (M-LC).

Methods: 78 Patients agreed to be prospectively randomized to C-LC and M-LC groups. Experienced surgical attendings performed all operations. C-LC was performed utilizing two 10 and two 5-mm trocars. M-LC was performed with one 10, one 5 and two 2-mm lateral trocars. Postoperative follow-up was conducted by blinded observers. Patients graded their pain according to the Visual Analog Scale (VAS) postoperatively days 1, 3, 7 and 28. Cosmetic results were scored between 1 and 10 both by patients and observers at 28 days. Two-sample t-test was used for the statistical analysis.

Results: The groups were similar in age, sex and self-assessed pain tolerance. 8 out of 33 patients (24%) randomized to M-LC were converted to C-LC, commonly due instrument failures. There was no significant difference in operative times between M-LC and C-LC groups (54.9 vs 50.5 min, respectively). There were no complications and no conversions to open procedure. Postoperative pain scores on days 1, 3, 7 and 28 were not statistically different between M-LC and C-LC groups (4.1 vs 4.8, 2.8 vs 2.9, 1.7 vs 1.9 and 0.1 vs 0.6, respectively). Cosmetic results were found to be statistically superior in M-LC when evaluated by both patients and blinded observers (32.0 vs 38.9, p=0.0002 and 28.7 vs 38.7, p=0.0001, respectively).

Conclusion: Laparoscopic cholecystectomy can be safely performed using 2-mm lateral trocars. M-LC does not minimize postoperative pain. It appears to be superior in postoperative cosmetic results. However, high conversion rate to C-LC necessitates further improvement of the instruments before widespread implementation of M-LC.

Minimally Invasive Other–PS135

EVALUATION OF GYNECOLOGICAL LAPAROSCOPIC SURGERY BASED ON ANALYSIS OF SURGICAL STRESS Ohhara S., M.D., Hirota Y., M.D., Nisazawa H., M.D., Yasue A., M.D., Yoshida M., M.D., Tada S., M.D., Udagawa Y., M.D. Department of Obstetrics and Gynecology, Fujita Health University, School of medicine, Toyoake, Japan.

Objective: The purpose of this study is to assess the physiological responses to various injuries by gynecological laparoscopic surgery. It is well recognized that laparoscopic surgery reveals not only postoperative disability, but also more rapid recovery to normal routine life activity than conventional open surgery. This observation suggests that laparoscopic surgery is a less traumatic procedure. The question we have to clarify is, whether laparoscopic surgery can reduce the surgical injuries compared to conventional surgery.

Methods: Thirty-three patients undergoing hysterectomy without systemic complications were studied prospectively. They were operated on either by laparoscopic surgery (LS, n=16), or by conventional open surgery (COS, n=17). All procedure utilized general anesthesia. Plasma level of white blood cells (neutrocyte, monocyte, lymphocyte), granulocyte elastase activity (GE), C-reactive protein (CRP), catecholamine (adrenaline, noradrenaline, dopamine), Interleukin-1 beta (IL-1b), Interleukin-6 (IL-6), were determined on the day of operation before surgery, and then at 4, 24, 96 hours after surgery.

Results: The postoperative CRP levels at 24 and 96 hours were significantly lower in the LS group compared to those in the COS group. The GE levels at 4 hours were also significantly lower in the LS group. The IL-1b levels at 4, 24, 96 hours were significantly lower in the LS group. There were no significant differences as for postoperative mean levels of white blood cells, catecholamines and IL-6 between the LS and COS groups.

Conclusion: These results suggest that the postoperative inflammatory responses in CRP, GE, and IL-1b, are substantially smaller with laparoscopic surgery compared with those of COS. On the other hand, there were not enough evidences that the laparoscopic procedures may reduce the neuroendocrine stresses due to surgical injuries.
LAPAROSCOPY IN PATIENTS WITH APPENDICITIS: A RETROSPECTIVE REVIEW OF 33 CONSECUTIVE CASES
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Purpose: To identify technical issues and report our preliminary experience with laparoscopic repair of anterior midline (Morgagni) diaphragmatic hernia.

Methods: Four consecutive children undergoing laparoscopic Morgagni hernia repair over 3 years were reviewed.

Results: Age ranged from 13 months to 13 years. Three were found incidentally on chest X-ray, and one presented with sudden onset of left-sided chest pain; none had obstructive symptoms. At operation all had omentum and 3 also had bowel in the anterior mediastinum and chest. All four underwent primary laparoscopic repair with interrupted nonabsorbable sutures. The sac was left intact in all cases. A small residual entervation was left along the edge of the pericardium in one patient. The patient who presented with chest pain was found grossly and histologically to have acute appendicitis within the left chest, requiring dissection of the inflamed viscerum from the mediastinum and chest wall; laparoscopic appendectomy was also done. Median time to full diet was 3 days, morphine was given for a median of 36 hours, and median postoperative hospital stay was 4.5 days. There were no intra- or post-operative complications, and no cases were converted to an open approach. Follow up CXR demonstrated complete resolution of the hernia in three patients, and a small amount of residual bowel in the unrepaired portion of the entervation in the other patient. All children remain clinically well.

Conclusion: Laparoscopic repair of Morgagni diaphragmatic hernia in children is a safe technique that provides rapid recovery and superior cosmetic results. Many unexpected technical challenges can be managed effectively without converting to an open approach.

MINIMALLY INVASIVE SURGERY FOR ESOPHAGEAL DIVERTICULA
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Background: Mid and lower esophageal diverticula (ED) are uncommonly encountered entities that have been successfully managed by open surgical approaches. The purpose of this study was to evaluate our results of minimally invasive surgery (MIS) for ED.

Methods: We performed a retrospective review of all cases of mid and lower ED that underwent repair by MIS at our institution.

Results: From June 1998 to June 2001, 10 patients (5 male, 5 female) underwent MIS for an ED. There were 8 epiphrenic and 2 mid ED. Median size of ED was 7.5 cm. Median age was 71 years. Achalasia was present in 7 patients, 1 had a nonspecific motor disorder, and 2 had apparent normal esophageal function. Symptoms included dysphagia (10), regurgitation (5), vomiting (2), and aspiration pneumonia (2). Six patients had previous surgery or endoscopic interventions. Laparoscopic diverticulectomy, myotomy, and partial fundoplication was performed in 7 patients. Video-assisted thoracoscopic approach was used in three patients. There were 3 esophageal leaks. Two were managed successfully with good outcomes. One delayed death occurred following transfer to a rehabilitation facility (61 days post-op). Median length of stay was 5.5 days (range 1-59 days). Median follow-up was 22 months. Results were excellent in 7 patients, and fair in 2 patients. No patient had a poor result in follow-up.

Conclusion: MIS for ED is technically difficult but feasible with a complication rate similar to open surgery. Open surgery should remain the standard except in centers with extensive experience in advanced MIS esophageal surgery.
Minimally Invasive Other–PS142

A NEW METHOD OF FIRST CANNULATION IN LAPAROSCOPIC SURGERY, Mohammad Motiar Rahman, GM Mokbul Hossain, Zahirul Amin, Mohammad Rafiqul Islam, Dhaka National Medical College & Hospital, Dhaka, Bangladesh.

There is no doubt that the most dangerous step of any laparoscopic procedure is the insertion of the first trocar and cannula for the optics. There are different methods of first cannulation in laparoscopic surgery. Most surgeons first produce pneumoperitoneum by Veress needle & then introduce trocar with cannula through an incision in the skin and subcutaneous tissue in the subumbilical region. Other surgeons introduce trocar with cannula directly through a wound made in subumbilical region. The purpose of this study was to develop a new method of first cannulation in laparoscopic surgery to save time and for better cosmetic result.

In our procedure we first hold the lateral edges of umbilicus by two Cocker’s forceps & lift up the anterior abdominal wall. Then we incise the skin and subcutaneous tissue in the center of the umbilicus. In our experience of about 8000 laparoscopic cholecystectomies we found that in patients with flat umbilicus an opening in linea alba & peritoneum becomes clearly visible immediately after incising the skin & subcutaneous tissue. We then push the 11 mm trocar and cannula through this opening into the abdomen. In most others the opening remains closed with pads of fat. Here we push an artery forceps in and stress the opening and then push the 11 mm trocar cannula in the abdomen. After cannulation we insufflate through the lateral opening in the cannula. The new technique is faster, safer and cosmetically better.

Minimally Invasive Other–PS143

LAPAROSCOPIC CRYOABLATION OF RENAL TUMORS – PRELIMINARY RESULTS Ran Katz MD, Dov Pode MD, Amos Shapiro MD, Pinhas D. Lebansart MD and Pethacia Reisman MD, Departments of Urology, Radiology and General Surgery, Hadassah Medical Center, Jerusalem, Israel.

Introduction & Aim: Cryotherapy is a tissue ablating technique that has been carried out successfully in solid organs as the liver and prostate. Its application for renal tumors was reported with promising early results. With the growing experience in laparoscopic nephrectomy in our institution, we decided to test the feasibility, safety and outcome of laparoscopic cryoablation of small renal tumors.

Patients & Methods: 3 male patients 50-73 years old with a 3-3.5 cm peripheral renal tumors were treated. The patients were placed in the flank position as for open nephrectomy. Two 10 mm ports (camera and ultrasound) and one 5 mm (dissection) port were used. Dissection was carried by a 10 mm (camera) and 5 mm (dissection) trocar and cannula through this opening into the abdomen. In order to incise the skin & subcutaneous tissue. We then push the 11 mm trocar directly through a wound made in subumbilical region. The purpose of this study was to develop a new method of first cannulation in laparoscopic surgery to save time and for better cosmetic result.

We have performed about 8000 laparoscopic cholecystectomies during the period April, 1994 to July 2001. We always use a hollow pipe (length 18 inch, diameter-10 mm or less) having both ends open. The hollow pipe is introduced through epigastric port blocking the external opening of the pipe with right thumb so that intraperitoneal carbon dioxide cannot come out. Then the centre of the internal opening of the hollow pipe is placed over the dropped stones, collected in one place. When right thumb is suddenly removed from external opening of the pipe, carbon dioxide gushes out of the abdomen through the lumen of the pipe due to positive intra-abdominal pressure & stones also come out with the carbon dioxide. This instrument can be made of metal or plastic, cheaper, easily available, easy to handle and offers no problem for sterilization.

Results: Renal biopsy confirmed renal cell carcinoma in two patients and an undetermined tumor in the third. The mean operating time was 170 minutes. No intra or post operative complication were noted and the post operative course was uneventful in all patients, who were discharged on second post operative day. During follow up of 8 months, the patients are well, and repeated CAT scan revealed that the tumor had been entirely replaced by scar tissue in all patients.

Conclusions: Laparoscopic cryoablation of selected renal tumors seems to be feasible and safe. The use of laparoscopic ultrasound is crucial. Our short term follow up suggests that cryotherapy is indeed a sufficient tissue ablating technique.

Minimally Invasive Other–PS144

LAPAROSCOPIC TOTAL GASTRECTOMY- INITIAL RESULTS IN 3 PATIENTS, Danny Rosin, M.D., Joseph Kuriansky, M.D., Enat Bar Zakai, M.D., Menahem Ben Chaim, M.D., Moshe Shabtai, M.D., Amram Ayalon, M.D., Department of General Surgery and Transplantation, Sheba Medical Center, Tel Hashomer, Israel.

The use of laparoscopy is continuously extended to more complex procedures, including surgery for malignant diseases. We report our initial experience with laparoscopic total gastrectomy for cancer of the stomach.

3 patients, aged 25, 70 and 75, were operated. The indications for surgery were Linitis Plastica in two patients, and a proximal tumor in the third. In all patients the tumor was localized to the stomach, as shown in pre-operative imaging. The stomach was resected en-bloc with the greater omentum and the perigastric lymph nodes. In one patient, in which the splenic hilar lymph nodes were found intraoperatively to be involved by tumor, a splenectomy was performed, as well. Esophageojunostomy, Roux-en-Y, was performed by a 25 mm EEA stapler. The anvil was introduced transorally. All procedures were completed laparoscopically, with no intraoperative complications. Operative time was 400, 375 and 560 minutes. Post operative gastrografin study was performed in all patients, showing a patent, non-leaking, esophago-jejunostomy. Oral intake was resumed on post-operative days 2, 5 and 4. Post-operative complications included two wound infections in the sites where the EEA staple shaft was introduced. These were treated by local wound care.

Pathological reports showed complete resection of the tumors, with clear margins, in all patients. Lymph node involvement was present in all three patients.

We conclude that laparoscopic total gastrectomy is a feasible procedure, which allows for oncological resection of gastric cancer. Comparison to the open procedure requires larger series and long term follow up.
ENDOSCOPIC APPROACH FOR CAROTID ARTERY SURGERY
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Introduction: Carotid endarterectomy is still the approach of choice for the treatment of carotid diseases and is one of the most commonly performed operations today. Minimally invasive techniques for surgery of the neck have been limited to the treatment of thyroid and parathyroid diseases. The purpose of this study was to verify the feasibility of an endoscopic transcervical approach for surgery of the carotid artery in a large animal model.
Methods: Eight 25-30kg pigs were utilized. Animals underwent endoscopic carotid dissection with carbon dioxide insufflation at 10 mmHg. A 1.5-2 cm arteriotomy was made in the common carotid artery. Four animals underwent direct arteriotomy closure, and four animals underwent synthetic patch graft placement using intracorporeal suturing techniques. Open examination of the operative site and carotid angiograms were performed at the end of the procedure. Operative time was recorded in the last four cases.
Results: All animals tolerated the procedure well and carotid artery repair was successfully performed in all cases using a four-trocar technique. The entire extent of the cervical common and internal carotid arteries was exposed up to the cranial base. Cranial nerves and cervical structures were clearly visualized and preserved. No bleeding occurred at the end of the procedure. Carotid angiograms confirmed patent, nonstenotic vessels in all cases.
Conclusions: Endoscopic approach for carotid surgery is technically feasible in pigs. The availability of this animal model may reveal useful for acquiring the technical skills necessary to perform this procedure in humans. An endoscopic approach for surgery of the carotid artery has the potential to offer the advantages of minimally invasive techniques while maintaining the benefits of surgical arterial repair.

LEARNING CURVE - TOTAL LAPROSCOPIC HYSTERECTOMY - AN EXPERIENCE OF 412 CASES A RETROSPECTIVE STUDY. DR. SHOBHANA SAXENA M.S., DR. DEEPAK SAXENA M.S., DURGA CHIKITSA KATNI MP INDIA 483504.
LAVH AND TOTAL LAPROSCOPIC HYSTERECTOMY (T L H ) HAS LOW MORTALITY AND WIDE ACCEPTANCE AMONG PATIENTS. AIM IS TO SHARE AN EXPERIENCE OF LEARNING WITH BEGINER AND FELLOW LAPROSCOPIC SURGEONS.
LAVH AND TLH DONE IN 412 CASES BETWEEN 1998 OCTOBER TO AUG. 2001. INDICATIONS WERE MENORRHAGIA IN MAJORITY, RESISTANT PELVIC INFLAMMATORY DISEASES AND ENDOMETRIOSIS IN OTHERS. AGE RANGING FROM 20-47 YEARS. SIZE OF UTERUS REMOVED WAS MAXIMUM UP TO 16 WEEKS GESTATION.
INITIALLY IN LEARNING PHASE ONLY COAGULATION AND CUTTING OF ROUND LIGAMENT, FALLOPIAN TUBE AND OVARIAN LIGAMENT DONE LAPROSCOPICALLY. WITH EXPERIENCE LESS TIME WAS REQUIRED IN ABOVE STEPS AND GRADUALLY NUMBER OF STEPS DONE THROUGH LAPROSCOPE INCREASED. IN TLH SKELETENIZING OF UTERINE ARTERY AND CLIPPING WITH MEDIUM-LARGE LIGA CLIPS 300 AND VAULT REPAIRED AND SUSPENDED VAGINALLY. THIS WAY EVEN DURING LEARNING PHASE ABDOMINAL HYSTERECTOMY WAS AVOIDED. ADDED ADVANTAGE WAS A THOROUGH ABDOMINAL EXPLORATION AND LAPROSCOPIC MANAGEMENT OF MANY PATHOLOGIES LIKE ASSOCIATED TUBO OVARIAN MASSES, APPENDICITIS AND ADVHIONS DONE SIMULTANEOUSLY. NULLLYPAROUS PATIENTS WITH BIG FIBRIDS AND PREVIOUS SCAR COULD ALSO BE DONE.
INITIAL PHASE OF LEARNING 3 CASES OF ACCIDENTAL OPENING OF BLADDER OCCURED WHICH COULD BE MANAGED WITH INTRACUTANEOUS FURTHER COMPLICATION, VAGINAL BLEEDING TOOK PLACE IN 4 CASES AND WAS MANAGED WELL BY SUTURING VAULT AND VAGINAL PACKING. TO CONCLUDE THAT LAVH AND TLH IS A WELL ACCEPTED TECHNIQUE OF HYSTERECTOMY WHICH IS APPLICABLE LARGE VARIETY OF CASES WHERE AT TIME TOTAL VAGINAL HYSTERECTOMY IS NOT POSSIBLE.

MEDIASTINOSCOPIC THYMECTOMY IN MYASTHENIA GRAVIS.
Shuji Shimizu, M.D., Akihiko Uchiyama, M.D., Syoji Kuroki, M.D., and Masao Tanaka, M.D., Department of Surgery and Oncology, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan.
Thymectomy is a widely accepted therapy for patients with myasthenia gravis. Mediastinoscopic surgery is a new approach for resection of the anterior mediastinal mass. The purpose of this study was to evaluate this technique as a treatment of myasthenia gravis.
Twenty-three patients with myasthenia gravis, four of whom were associated with thymoma, underwent total thymectomy between 1998 and 2000. An arc-shaped incision of 3 cm was made just below the xiphoid process, and a telescope was inserted through a trocar placed below the surgical wound. The sternum was lifted with the use of a Laparolift and the resected thymus was removed through the incision.
The patients comprised 18 women and 5 men with an average age of 47 years. The clinical improvement of the disease severity was determined according to quantitative myasthenia gravis (QMG) scores with the mean follow up-period of 13.8 months and the Wilcoxon signed-ranks test was applied to determine statistical significance.
Complete removal of the thymic gland with the pericardial adipose tissue was accomplished in 21 of the 23 (91.3%) patients. The remaining two patients required conversion to sternotomy, one for insufficient sternal lifting and the other for invasion of a thymoma to the innominate vein. There was no related mortality, and there were only one complication (phrenic nerve injury in one patient) (4.3%). The mean operation time was 274 ± 62 minutes, and mean blood loss was 98 ± 64 g. The mean QMG score decreased significantly from 4.8 ± 3.9 before surgery to 1.0 ± 1.8 after surgery (p<0.0003).
Mediastinoscopic thymectomy is safe and feasible for patients with myasthenia gravis, although long-term follow-up is necessary for precise evaluation. This approach not only has cosmetic benefits, but also allows us to perform thymectomy bilaterally without one-lung ventilation, which decreases the risk of pulmonary complications and makes it applicable to patients with a history of thoracotomy or pleuritis.
LAPAROSCOPIC SPLENECTOMY FOR RECURRENT METASTASIS OF OVARIAN CANCER Gengo Tajima,M.D., Go Wakabayashi,M.D., Masaki Kitajima,M.D., Department of Surgery, Keio University School of Medicine, Tokyo, Japan.

This report describes two cases of recurrent metastatic epithelial ovarian cancer confined to the splenic parenchyma, which were successfully resected with laparoscopic surgery. Metastasis to the splenic parenchyma is rare condition of recurrent ovarian cancer and difficulties such as intra-abdominal adhesion may be encountered in secondary cytoreduction surgery.

Case 1: A 65-year-old woman underwent 8 cycles of systemic chemotherapy because her CA19-9 level was elevated 12 months after the initial radical surgery. A solitary metastatic tumor emerged in the spleen and cytoreduction surgery was carried out. In spite of severe adhesion, laparoscopic adhesiolysis and splenectomy succeeded. The postoperative course was uneventful and systemic chemotherapy was administered.

Cytoreduction surgery and subsequent chemotherapy are recommended for the management of intra-abdominal recurrent ovarian cancer. Laparoscopic splenectomy is a feasible option as debulking surgery in the treatment of metastatic ovarian cancer even after an initial open radical surgery.

USE OF VIDEOPELVISCOPY IN THE DIAGNOSIS AND TREATMENT OF GYNECOLOGICAL DISEASES. Alexander P. Ukhanov, Surgical department First municipal hospital, Velikiy Novgorod, Russia.

Aims: Improvement of diagnostic and surgical treatment of the patients with gynecological diseases on the basis of new medical technologies.

Methods: From April 1995 to January 2001 81 patients underwent diagnostic and operative video laparoscopy for various gynecological diseases.

Results: From total amount of patients 14 ones were operated on for ectopic pregnancy, 34 for chronic pelvic pain or the presence of adnexal mass, 3 for subserous myomas of the uterus, 12 for infertility, 18 for advanced breast cancer, 3 for second-look after ovarian cancer treatment. A linear salpingostomy was performed in 3 and salpingectomy in 11 cases of ectopic pregnancy. Treatment of ovarian and peritoneal endometriosis was performed in 5 cases, excision of ovarian and parovarian cyst in 21, overetomy in 16 cases, conservative subtotal myomectomy in 3, adhesiolysis in 10, diagnostic laparoscopy with chromo-salpingoscopy in 7 cases. In 6 patients together with pelviscopic procedure laparoscopic cholecystectomy was carried out for concomitant biliary disease. The average time of operation was 45 minutes (range 20-85).

There were no major intraoperative complications. Postoperative trocar site bleeding requiring wound revision and lighting of bleeding vessel occurred in 1 patient. All the patient were active on the next day after the operation and mean hospital stay was 4.5 days after the operation.

Conclusion: Videolaparoscopy is a very effective method in diagnostic and treatment of various benign gynecological pathologies and is associated with low postoperative morbidity rate, short hospitalisation, quick recovery and negligible scar. These advantages guarantee and promote broader application of videolaparoscopic procedures.

NATURAL KILLER ACTIVITY IS BETTER PRESERVED AFTER A GASLESS PROCEDURE THAN AFTER PNEUMOPERITONEUM OR LAPAROMY IN RATS Ikuu Takeuchi, MD, Hideyuki Ishida MD, Daigo Hashimoto MD, Department of Surgery, Saitama Medical Center, Saitama Medical School, 1981 Kamoda, Kawagoe, Saitama,350-8550, Japan.

(Purpose) Natural killer (NK) activity plays an important role in the prevention of tumor metastasis. However, there have been few data comparing NK activities among a gasless procedure, CO2-pneumoperitoneum, and conventional laparotomy, despite the wide spread use of laparoscopic procedures for colorectal malignancies. This study compared NK activities among the 3 different surgical procedures in a rat model.

(Materials and Methods) Male Donryu rats (200-220g) were randomized to 3 groups (19-21 rats each per group) under pentobarbital anesthesia: (1) Gasless (GL) group underwent abdominal wall elevation for 60 min; (2) Pneumoperitoneum (PP) group underwent CO2-pneumoperitoneum at 10 mmHg for 60 min; and (3) Laparotomy (LT) group underwent xipho-pubic incision with the abdominal cavity remaining open for 60 min. All the rats underwent cecal resection at the end of the procedures. Splenocytes were harvested 6 hr, 24 hr, or 96 hr following the procedures and the NK activities against YAC-1 cells were determined by the 51-Cr-release assay (effecter/target=50/1).

(Results) There were no significant differences in NK activities among the groups at 6hr. The GL group demonstrated higher NK activities compared with the LP group at 24 hr (22.0∞1.3%, P<0.05), with the PP group at 96 hr (30.5∞2.7%, P<0.05, Fisher’s PLSD test).

(Conclusions) NK activity was better preserved after the gasless procedure in this animal model. Gasless laparoscopic surgery for colorectal malignancies may be a favorable approach in terms of the oncological benefits.

TECHNIQUE AND LONG TERM RESULTS OF LAPAROSCOPIC CHOLECYSTECTOMY USING LIGATURE OF THE CYSTIC DUCT AND ARTERY Giovanni Ussia MD, Dept of Surgery, University of Bologna Medical School, Bologna, Italy

Laparoscopic cholecystectomy is commonly performed securing the Cystic duct (CD) and artery (CA) with titanium clips. This techni-que has several disadvantages: a) danger of slippage if the duct is large or oedematous for inflammation; b) metal clips could migrate into the CBD and lead to stone formation; c) increases the cost of the operation. In 212 laparoscopic cholecistectomy, performed consecutively from 1998 to 2001 in the same institution and from the same surgeon. The CA and CD were secured with a ligature with absorbable suture; 162 female and 50 male patients ranging from 18 to 83 years of age were submitted to laparoscopic cholecystectomy for gallbladder stones; in 23 cases diagnosis was acute cholecystitis and in 10 cases stones in the CBD were present and were subsequently treated with ERCP. The ligatures of CA and CD were done using 2/0 absorbable braided sutures tied with the aid of the Clarke knot pusher. Medium operative time was 53 min (28-132 min); knotting time was 5 min (4-8 min); in 98 cases intraoperative cholangiogram was obtained and in 10 case a postoperative ERCP was performed. The postoperative course was uneventful in all patients and medium hospital stay was 2.5 days; no complications related to the ligatures were observed; follow-up ranged from 3 to 36 months. OR costs were decreased. Based on our experience it is possible to conclude that securing the CA and CD with absorbable suture is safe and feasible; this technique eliminates the possible complications related to the use of metal clips including slippage, stone formations and reduces OR costs.
Minimally Invasive Other–PS153

ROLE OF INTRAOPERATIVE ULTRASONOGRAPHY IN SINGLE HOLE CHOLECYSTECTOMY – AN EXPERIENCE OF OVER 1000 CASES. MAN Mohan Varma, MS, Private, Kanpur, India

Introduction: Defining extrahepatic bile duct system (EHBDS) is more difficult in minimally invasive surgeries than in conventional cholecystectomy. Intraoperative ultrasonography (IOUS) defines bile duct anatomy & can be used as a tool for safety. With an aim to study the role of IOUS in providing safety to EHBDS against injury in a minimally invasive surgery, IOUS was done while performing single hole cholecystectomy.

Methods & Procedures: IOUS was performed consecutively in all 1035 patients undergoing single hole cholecystectomy from May 1996 to October 2000. Single incision 3.0 to 3.5 cm long (4 cms in some bulky patients) was given in the right upper abdomen & a muscle splitting microlap cholecystectomy done. IOUS was performed with a 6.5 Mhz end-firing sector probe. All patients were discharged 8 - 24 hours after surgery. 92.17 % had chronic cholecystitis, 75.73% acute cholecystitis and 0.28% carcinoma gall bladder. The youngest patient was 6 years old, oldest 95 years, 95.74% were 21 to 70 years of age & 91.69% weighed 50 to 90 kgs, the heaviest being 110 kgs. 2.02% patients had previous history of pancreatitis while 0.77% had previous right upper abdominal surgeries. Gall bladder & EHBDS were recognized by their standard ultrasound features along with common duct sector scanning & M-mode study of EHBDS. We developed ‘contrast ultrasonography’ for cases having dense adhesions. Saline was injected near expected EHBDS & IOUS performed. If saline was found lateral to EHBDS the dissection was carried out lateral to saline otherwise reorientation was done.

Result: None of the 1035 patients suffered bile duct injury during single hole cholecystectomy done under IOUS guidance compared to a 0.7 to 1.4% incidence of bile duct injuries in laparoscopic cholecystectomy, claimed to be lesser when IOUS is used in laparoscopic cholecystectomy.

Conclusion: IOUS helps to prevent EHBDS injury in single hole cholecystectomy. As far as we know, IOUS guided single hole cholecystectomy has not been reported elsewhere in the world till date.

Minimally Invasive Other–PS154

INDICATIONS FOR DIAGNOSTIC LAPAROSCOPY IN CASE OF SUSPECTED APPENDICITIS Wim T. van den Broek M.D., Bart B. Bijnen M.D., Dirk Krom N.N.D. M.D., PhD, Department of Surgery, Medical Centre Alkmaar, Alkmaar, The Netherlands.

INTRODUCTION Despite introduction of minimal invasive surgery, appendectomy is still mostly performed by open surgery in Europe. Applying diagnostic laparoscopy on all patients with suspected appendicitis would lead to many conversions and so to extra costs and morbidity. Therefore, laparoscopy should be reserved for a subgroup of patients with doubtful diagnosis appendicitis. The aim of this study is to develop a scoring system to identify this subgroup of patients.

METHODS AND RESULTS In the period 1993/1995 were 577 consecutive patients/group 1 and in the period 1996/1997 were 343 consecutive patients/group 2 with suspected appendicitis prospectively evaluated. Variables predicting appendicitis were obtained from group 1. By means of a regression analysis, a scoring system was created and applied to the patients of group 2. After validation of the scoring system group 1 and 2 were combined for further analysis. The scoring system was validated by comparing odds ratios from group 1 with odds ratios from group 2. Hereafter it was evaluated by comparing the delayed negative appendectomy rates obtained by clinical practice with the results that would have been accomplished on the basis of the scoring system.

RESULTS The variables: leukocyte count (10.109/L), rebound tenderness (2), male sex (2), duration of symptoms <48 hrs (1), and temperature >38C (1) formed the scoring system. Odds ratio for score 0 was 0.92 (95% confidence interval 0.67 - 1.27) and the OR of score 1 was 2.34 (95% confidence interval 1.37 - 4.02). When using a low cut-off point of 3 and a high cut-off point of 6 there were no differences in treatment by our scoring system compared with clinical judgment: negative appendectomy rates (14 vs. 15%) and delayed operation rates (7 vs. 9%) except that the scoring system would have lead to a lower perforation rate in the primary observed patient group (2 vs. 17 %).

CONCLUSION The indication for laparoscopy can be established in both males and females by using a scoring system.

Minimally Invasive Other–PS155

DOES VENTILATION WITH PEEP PRESERVE CARDIOPULMONARY FUNCTION DURING LAPAROSCOPIC SURGERY IN PULMONARY DISEASES? Ruben Veldkamp M.D., Jack J. Haitsma M.D., Eric J. Hazebroek M.D., Burkhard Lachmann M.D. Ph.D., H. Jaap Bonjer M.D. Ph.D., Departments of Surgery and Anesthesiology, Erasmus University Medical Center Rotterdam, The Netherlands.

Elevated abdominal pressure during pneumoperitoneum causes diaphragmatic displacement, predisposing to pulmonary atelectasis and impairment of gas-exchange. This is of particular concern when a pneumoperitoneum is established in patients with pulmonary disease. Hypoxemia and hypercapnia can be encountered during lengthy laparoscopic surgery in these patients. To assess the impact of PEEP ventilation on oxygenation and blood pressure, an experimental study was performed in rats with induced pulmonary dysfunction.

Eighteen rats had a tracheotomy and an indwelling catheter was placed in the carotid artery. Animals were mechanically ventilated in a pressure-controlled mode with 100% oxygen. Pulmonary dysfunction was induced by repeated whole lung lavage until PaO2 < 100 mmHg. Subsequently, animals were randomly assigned to groups, ventilated with either PEEP pressure of 8 cmH2O (n=6) or 14 cmH2O (n=8). All rats were subjected to a CO2 pneumoperitoneum with a pressure of 12 mmHg during 180 minutes. The control group had gasless laparoscopic surgery and was ventilated with a PEEP of 8 cmH2O (n=6). Arterial blood pressures were recorded and arterial blood samples were taken for measurement of PaO2 every 30 minutes.

The gasless control group had unchanged PaO2 and mean arterial pressure (MAP) levels throughout the experiment. When 12 mmHg pneumoperitoneum was applied blood pressures decreased and two rats died during the experiment. When 14 cmH2O of PEEP was used, PaO2 improved significantly (p<0.05) while MAP remained stable and was significantly (p<0.0001) higher than in the group with PEEP of 8 cmH2O.

In rats with compromised pulmonary function, high PEEP pressures can be used to improve oxygenation status during pneumoperitoneum whilst no adverse effects on MAP were observed.

Minimally Invasive Other–PS156

LAPAROSCOPIC INTRAPEAROTINEAL HYPERTHERMIC CHEMOTHERAPY FOR refractory malignant ascites in peritoneal carcinomatosis. Leonardo Villagrasa, M.D., Samuel Bieligk, M.D., Jason B. Fleming, M.D., Daniel Jones, M.D., Brian Loggie, M.D, Southwestern Center for Minimally Invasive Surgery. UT Southwestern Medical Center at Dallas.

Background: Intraoperative hyperthermic chemotherapy (IPHC) is safe and is increasingly used in the treatment of peritoneal carcinomatosis. We report on the technical aspects in one of the first series using a minimally invasive approach to IPHC in the management of malignant ascites.

Methods: Since March to July 2001, laparoscopic IPHC for refractory malignant ascites was performed for four patients age 36-55 years, males (n=3) and female (n=1). The diagnosis: gastric cancer (n=3), pancreatic cancer (n=1). Data was collected retrospectively.

Results: Under general anesthesia via a 11 mm supraumbilical port and two 12 mm ports in the left and right upper quadrants, peritoneal fluid (mean 4.1 liters) and peritoneal biopsies were taken. Two 22 F inflow cannulae in the upper quadrant ports were placed and 32 F outflow cannulae via a separate stab incision above the pubis and directed to the pelvis. A perfusion circuit was used 3 liters of Ringer’s at 42 deg. C, 30-40 mg of Mitomycin was added and perfusio performed for 90-120 minutes. The abdomen was shaken during the procedure to get good drug distribution. The perfusion fluid was then drained and the abdomen was irrigated. A round Blake drain was placed percutaneously and directed to the pelvis. There was no bleeding and no intra operative complications. Hospital stay was 4 days (range, 1-18 days).

Conclusion: Laparoscopic Intraoperative Hyperthermic Chemotherapy is a technically feasible procedure for patients with advanced and refractory malignant ascites of primary g astrointestinal cancer.
LAPAROSCOPIC MANAGEMENT OF LOCALIZED INTRA-ABDOMINAL CASTLEMAN’S DISEASE, Michael D. Williams, M.D.; Francis A. Eissien, M.D.; Jihad R. Salameh, M.D.; John F. Sweeney, M.D., Department of Surgery, Baylor College of Medicine, Houston, Texas

**Introduction:** Castleman’s disease is a rare lymphoproliferative disorder of unknown etiology, which presents in a localized or multicentric pattern. Surgical resection is definitive therapy for localized Castleman’s disease. We report the successful management of localized intra-abdominal Castleman’s disease using laparoscopic techniques.

**Procedure:** An 18-year-old female presented with fatigue, weakness, early satiety, and a 10-pound weight gain. On physical examination, a nontender mid-epigastric mass was palpable. Laboratory studies including electrolytes, complete blood count, and liver function tests were normal. An abdominal ultrasound demonstrated a large mass anterior to the pancreas. CT scan revealed a 9cm x 7cm x 7.5cm extensively calcified subhepatic intraperitoneal mass anterior to the pancreas and several mesenteric nodes measuring between 3mm and 30mm.

The abdomen was entered with a 10 mm Hasson trocar. Four additional ports were placed: a 5mm suprapubic port, 2-5mm ports at the level of the umbilicus in the right and left midclavicular lines and a 5mm port in the right mid-axillary line. The colon was mobilized and the mass was dissected using harmonic shears. Several large vessels arising from the head of the pancreas were controlled with 5mm hemoclips. The mass was removed via a 10cm Pfannensteil incision. Surgical pathology revealed angiofollicular giant lymph node hyperplasia of the hyaline vascular type consistent with Castleman’s disease. The patient was discharged home on the post-op day 2 tolerating a regular diet, and with minimal pain. CT of the chest, abdomen and pelvis revealed resection of the mass and reduction in size of the lymph nodes at 12 months post-op.

**Conclusion:** Laparoscopic resection provides definitive long-term therapy for localized intra-abdominal Castleman’s disease while providing the traditional advantages of minimally invasive surgery.

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LAPAROSCOPIC ASSISTED COLECTOMY (LAC) VERSUS OPEN SURGERY, RETROSPECTIVE CASE-MATCHING STUDY Wooyong Lee, M.D., JongGook Woo, M.D., Dooseok Lee, M.D., S I Choi, M.D., HoKyung Chun, M.D., Department of Surgery, Samsung Medical Center, Sungkyunkwan University, School of Medicine, Seoul, Korea.

Despite many reports on laparoscopic-assisted colectomies (LAC) over the past decade, their feasibility in both benign and malignant diseases is not clear. The purpose of this study is to evaluate whether LAC is feasible and safe in the treatment of colonic diseases. Between April 2000 and July 2001, we attempted laparoscopic assisted colectomy in 51 patients and we excluded 3 patients who had converted to open surgery in this study. The results were compared with 48 matched patients who underwent conventional open surgery in the same observation period focusing on results of surgery, postoperative recovery, complications. Between two groups, there were not significantly different in age, Dukes stage, and type of resection. There were 14 benign and 34 malignant cases. The mean operating time for the LAC and open surgery group were 175.0 and 98.2 minutes, respectively (p<0.05). However, the time taken for bowel movement return (42.3 min. Vs 60.6 min.) (p<0.05) and the length of hospital stay (8.5 days Vs 9.6 days) (p<0.05) were significantly less in the LAC group than comparative group. Six patients in the LAC group had complications (12.5%): chyle leakage (2), anastomotic site bleeding (3), urinary retention (1) and all are treated conservatively.

Comparative group also had six complications. The number of lymph node removed and resection margins, when compared by each type of resections showed no significant difference for both groups (p>0.05). This study shows that LAC has the advantage over open surgery of allowing earlier recovery and that oncological clearance (in terms of the number of lymph node removed and resection margins) did not differ from the results achieved by open technique. LAC is feasible technique in the treatment of colon disease with acceptable morbidity. However, long-term randomized trial is warranted.

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THE LAPAROSCOPIC RESECTION OF THE DUODENAL CARCINOID TUMOR Akira Yasuda, M.D., Akira Mizuno, M.D., Kawai Mito, M.D., Department of Surgery, Inabekosei Hospital, Hokuseicho, Mie, Japan

**Introduction:** We report a case of the laparoscopic resection of the duodenal carcinoid tumor.

**Methods and procedures:** A 72-year-old man was pointed out a torose lesion of duodenal bulb by a regular medical check up 3 years ago. A biopsy was performed in June, 2000. The lesion was diagnosed as a duodenal carcinoid tumor and was smaller than 10mm in diameter at that time. Laparoscopic resection of that tumor was performed under general anesthesia on July 19, 2000. At first, a duodenum was liberated from retroperitoneum. We used a gastroduodenoscopy to confirm the position of the lesion during the operation and the lesion was lifted intra abdominal cavity using a laparoscopic appliance. Next to lifting, the lesion was severed by an endocutter. At the end of the operation, we checked the complete resection of the lesion, no passage disturbance and no bleeding by gastroduodenoscopy.

**Conclusion:** The laparoscopic method can resect a full wall of a duodenum and is more radical to a duodenal carcinoid tumor than the endoscopic method because the endoscopic method cannot resect a full wall. In addition, the laparoscopic resection is less invasive than the laparotomy. A carcinoid tumor larger than 10mm in diameter often has metastatic lesions and we think that the laparoscopic resection should not be applied to a duodenal carcinoid tumor larger than 10mm in diameter. In these points, the laparoscopic resection is very effective therapy for a duodenal carcinoid tumor smaller than 10mm in diameter.

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RETROPERITONEOSCOPIC URETERORETHEROSTOMY FOR THE TREATMENT OF OBSTRUCTIVE RETROPERITONEAL URERET, Akira Yasuda, M.D., Akira Mizuno, M.D., Kawai Mito, M.D., Department of Surgery, Inabekosei Hospital, Hokuseicho, Mie, Japan

Retrocaval or retroiliac ureter is a very rare urological condition and the diagnosis is usually made during a tentative operation for uretorepicolic junction (UPJ) obstruction. The conventional treatment with open surgery has been well described. Objective: We herein reported a case of retrocaval ureter in a child treated by an endoscopic ureterorenostomy. Patients and Methods: A 4-year-old boy with history of antenatal diagnosis of right hydrourephrosis was confirmed postnatally to have right hydrourephrosis. Initial diuretic renogram revealed normal drainage. However he developed increasing hydronephrosis over the subsequent years associated with a significant drop in the differential function of the right kidney. Surgery was planned with a provisional diagnosis of right UPJ obstruction. Intraoperatively a right retrocaval ureter was found causing mechanical obstruction at the proximal ureter. Surgical techniques: A 10mm and two 5mm ports were inserted over right flank and pneumoretroperitoneum was developed by CO2 insufflation. The right ureter was mobilised on both sides of the right common iliac vein and then divided. Retroperitonoscopic ureterorenostomy was performed using 5 zero polydioxanone sutures by intracorporal suturing techniques. Results: Initial recovery was uneventful but a collection around the anastomosis was shown by ultrasound on day 3 postoperatively. This settled promptly with cystoscopic insertion of a double pigtail ureteric stent. The patient was discharged a week after surgery and the double J stent was removed at 8 weeks. Follow-up radiological investigations are still pending. Conclusions: Retroperitonoscopic ureterorenostomy is technically feasible as an alternative treatment to open surgery for retrocaval or retroiliac ureter. However, meticulous endoscopic suturing skills are required and the long-term outcome will need further evaluation.
LAPAROSCOPIC VARICOCELECTOMY IN YOUNG PATIENTS: TO LIGATE THE TESTICULAR ARTERY OR NOT

Wei T. Ng, M.B.B.S., Kelvin K. Liu, M.B.M.Ch.

Controversy still exists as to (1) whether it is safe to ligate the testicular artery (2) whether there is any benefit of the mass ligation in laparoscopic varicocelectomy. A prospective study was conduct to give a definitive answer to these two questions.

Since 1992, young patients with grade 3 varicocele were randomly selected for one of the two laparoscopic procedures: (1) mass ligation and division of all identifiable testicular veins; (2) selective ligation and division of all identifiable testicular veins. Intra-and peri-operative Doppler ultrasound scans were done to detect changes (if any) in blood flow within the testicular parenchyma. Long-term follow-up on a regular basis was maintained to evaluate the growth of the testis by serial orchidometer measurement and ultrasonography, as well as to detect recurrences. When the patients were co-operative enough, semen analysis was done and repeated.

52 patients were enrolled in the study, ranging from 8 to 15 years of age with a mean of 12. 24 were subjected to mass ligation and 28 to ligation of testicular vein alone. The mean follow-up was 7 years.

Doppler ultrasound did not show any significant change in testicular blood flow in either group. Except for those with recurrence, catch-up growth was observed and no case of testicular atrophy was found. Semen analysis was within the normal range (60-250) in all the samples from both groups. One pregnancy has occurred in the mass ligation group.

The varicocele recurrence (above grade 1) rate for the artery-sparing group was 21%, while that for mass ligation was 0%. During re-operations, spermatic venogram was done showing missed vena comitans. In conclusion, mass ligation is safe in this interim report. It is the method with uniform success.

EFFECTS OF CLOSED LOOP INTESTINAL OBSTRUCTION ON MESENTERIC BLOOD FLOW: LARGE ANIMAL MODEL OBSERVATIONS

Seong Yeop You, MD, Klaus Thaler, MD, Turab Pishori, MD, Danny Rosin, MD, Oscar Brasesco, MD, *Laurence Sands, MD, Steven Wexner, MD, Cleveland Clinic Florida, Weston, FL and University of Miami, Miami, FL

The effects of acute elevations in intraluminal pressure (ILP) due to acute bowel obstruction have not yet been analyzed. We hypothesized that the acutely elevated intrabdominal pressure (IAP) due to the elevated ILP in closed loop small bowel obstruction (CLSBO) or closed loop large bowel obstruction (CCLBO) may exert deleterious effects on mesenteric blood flow.

In a porcine model a midline laparotomy was performed. A CLSBO (n=5) and a CCLBO (n=5) was created. The bowel was insufflated to ILP levels of 15mmHg and 30mmHg. IAP was monitored by measuring intravesical hydrostatic pressure (BLP). The mean blood flow in the superior mesenteric artery (MBFs) and inferior mesenteric artery (MBFi) was monitored using an electromagnetic flow meter. Statistical analysis was done using one-way repeated ANOVA, paired t-test and linear regression.

There was a direct and significant correlation between ILP and BLP (p<0.0001; r=0.84). Elevated ILP in CLSBO or CCLBO resulted in a significant reduction of mean blood flow in the MBFs (p=0.029) and MBFi (p=0.0096) at ILP of 30 mmHg. Small Bowel Obstruction: Baseline: BLP=19.2 MBFs=290, 15mmHg: BLP=26.6 MBFs=308, 30mmHg: BLP=38.4 MBFs=162; Large Bowel Obstruction: Baseline: BLP=16.4 MBFs=23, 15mmHg: BLP=21.6, MBFs=20; 30mmHg: BLP=30.2 MBFs=12 (BLP-cmH2O, MBFs-ml/min, p<0.05) Acute elevations of intraabdominal pressure due to acutely increased intraluminal pressure in closed loop small and large bowel obstruction results in decreased blood flow in the mesenteric arteries.

LONG TERM OUTCOME FOLLOWING LAPAROSCOPIC NISSEN FUNDOPLICATION L.N.F.

Danny Rosin, MD, Oscar Brasesco, MD, *Laurence Sands, MD, Danny Rosin, MD, Oscar Brasesco, MD, *Laurence Sands, MD, Danny Rosin, MD, Oscar Brasesco, MD, *Laurence Sands, MD

Laparoscopic Nissen Fundoplication(L.N.F.) is now the procedure of choice for the surgical management of the gastroesophageal reflux disease(G.E.R.D.).However,while there are many reports in the literature of short term clinical efficacy,there is a paucity of evidence to substantiate long term durability of symptomatic relief. The aim of this study was to report a seven years follow-up and beyond.

METHODS: Between December 1991 and December 1994,241 patients underwent L.N.F.The long term follow-up was obtained by office visits and examination by an independent investigator.Data prospectively recorded in a dedicated database and analysed for the purpose of this study.

RESULTS: Two hundred and five patients (85%) were available for outpatient follow-up or telephone interview. The median follow-up was 8.2 years(range7-10 years) 13 patients died .ten of them from other causes irrelevant to surgery.Lost to follow-up were 23 patients(9.5%)At a minimum of 6 years after surgery 189 patients (92%) were satisfied with the long term results of surgery.Fifty two patients (25.3%) reported wind related symptomatology(bloat/flatus/fullness).

Seventeen patients (8.2%) were taken proton pump inhibitors,of whom just four (1.9%) required regular medication.Fifteen patients (7.3%) had persistent dysphagia and all of them were treated with endoscopic dilatation.Ten patients (4.8%),had documented recurrent reflux and seven of them underwent reoperation.Nine patients (4.3%) presented with intrathoracic stomach migration and all of them under went reoperation.

CONCLUSION:This patient series confirms the long term efficacy of the L.N.F.for the treatment G.E.R.D. Our results have improved with increasing experience.
ECTOPIC PREGNANCIES WITH HAEMOPERITONEUM – TACKLING OF 42 CASES OF EMERGENCIES IN PELVIS. Dr. A. Zameer Pasha, M.S., Dr. Mrs. Shakila Zameer, MBBS., D.G.O., Dr. Z. Shakir Tabrez, MBBS., Shanawaz Nursing Home, A-20, Main Road, Thillainagar, Tiruchirapalli. Tamil Nadu. India.

Ectopic pregnancy both tubal and corneal is obstetric emergency. Patient presented invariably with pain and peripheral failure. Emergency ultrasound examination proved that pregnancy is extraterine and tubal configuration is present or not. Pouch of Douglas had pelvic Collections of blood Patient anaesthetized 10mm suctioned inserted to suck out huge clots throu’ left Iliac fossa portal. Right Iliac fossa port of entry used to identify elevated uterus and hold aloft the ipsilateral artery at the confluence of uterine and ovarian vessels near the cornal end. By now pelvis having been cleared of dark clots, bleeding spot is identified, bipolar coagulations done and products of conceptions removed. In early cases (12) tubal salpingostomy done. In 30 cases, coagulations done and products of conceptions removed. Cleared of dark clots, bleeding spot is identified, bipolar vessles near the corneal end. By now pelvis having been cleared of dark clots, bleeding spot is identified, bipolar coagulations done and products of conceptions removed. In early cases (12) tubal salpingostomy done. In 30 cases, coagulations done and products of conceptions removed. Cleared of dark clots, bleeding spot is identified, bipolar vessles near the corneal end. By now pelvis having been cleared of dark clots, bleeding spot is identified, bipolar coagulations done and products of conceptions removed. In early cases (12) tubal salpingostomy done. In 30 cases, coagulations done and products of conceptions removed. Cleared of dark clots, bleeding spot is identified, bipolar vessles near the corneal end.

ECTOPIC TESTES IN RT. Iliac FOSSA – LAPAROSCOPIC EXPLORATION, ECTOMY OR PEXY – A SERIES OF 21 CASES.

Dr. A. Zameer Pasha, M.S., Dr. Mrs. Shakila Zameer, MBBS., D.G.O., Dr. Z. Shakir Tabrez, MBBS., Shanawaz Nursing Home, A-20, Main Road, Thillainagar, Tiruchirapalli. Tamil Nadu. India.

In third world countries, ectopic testes owing to ignorance is being ignored or neglected. Presentation is with infertility, pain for inguinal hernia in late teens. After initial preoperative work up with ultrasound scan, laparoscopy is performed. In cases where we are aware that the testis is non-functional, orchiopexy is done to boost the morale of adolescent young men. This technique with low morbidity, precise dissection is presented to highlight the low morbidity and excellent results. Presentation supported with multimedia movie presentations.

CLOSURE OF TROCAR SITE WOUND Abdullah AlDohayan, MD; Mohammed AlSebly, MD; Othman Noraldin, MD; Amal Abdulkarim, MD; Ahmed AlOtiaby, MD; Mohammed AlSkaini, MD, Ali AlTuwaijri, PhD; Abdulaziz AlSaigh, MD Department of Surgery and Physiology, King Khalid University Hospital, Riyadh, Saudi Arabia

Objective: Recent reports of complication of 5mm and 10mm trocar incision is observed. A technique using needles and sutures is presented.

Technique & Method: The trocar is removed. A 14 gauge needle is introduced through muscle fascia layer and the suture is grasped, then followed by removal of the needle. A loop of synthetic non-absorbable suture is fed in the lumen of the needle. The needle is passed 1cm away from the other edge. The loop is then pushed inside the peritoneal cavity to widen the loop, pushing more length of suture inside the abdomen. The grasped suture is passed through the loop and grasper is pulled away. The loop is pulled out gently to involve the suture and pulled out and the suture can be tied. This technique is applied for all patients with ascites, portal hypertension, or malnutrition patient’s or young patients.

Results: No Hernia is observed after applying this technique.

FLEXIBLE LAPAROSCOPY - EXPERIENCE WITH 1036 CASES


Since 1994 we have used flexible laparoscopes in the performance of all types of abdominal procedures. This technology has assisted us in better emulating the degrees of freedom encountered in open surgery. Between May 1994 and September 2001, 1036 flexible laparoscopic procedures were performed with collection of the following data:

- Procedure type, laparoscope used, intra-operative findings and laparoscope failure (y/n).
- To date, flexible laparoscopy has been used in the following categories: esophagus 494, hernia 342, oncology 115, bowel 57 and solid organ 28. Five instrument failures were encountered in the first 145 cases (3.4%) using a prototype device. In the subsequent 891 cases there were 18 failures (2%) due primarily to chip damage caused by leakage at the flexion joint in standard production models.

Assessed advantages:

* Increased degrees of freedom afforded by infinite 0-90 deg deflection. This allows visualization over or around impediments.
* Departure from the limitation caused by fixed fulcrum skin entry and limited scope angle (0, 30, 45deg) makes port site location less critical, especially in obese patients.
* Improved optics resulting from direct ‘chip-in-tip’ technology.
* Decreased fogging as camera and light cable are sealed in a single closed system with no interfaces for condensation to occur.
**New Techniques/Technology-PS169**

**ROBOTIC SOLUTION FOR RELIABLE BIOPIC SAMPLES DURING LAPAROSCOPIC SURGERY**

Lincio Angelini1, Vassilios Papaspyroupolu1, Giuseppe Megali2, Oliver Tonet2, Cesare Stefanini2, Mauro Boccadoro2, Paolo Dario2, 1 Dipartimento di Scienze Chirurgiche e Tecnologie Mediche Applicate, Università La Sapienza, Rome, Italy; 2 MiTech Lab, Scuola Superiore Sant’Anna, Pisa, Italy.

Intraoperative ultrasonography is a method used both for diagnosis and therapy in different fields thanks to its sensitivity and specificity, compared to preoperative diagnosis techniques. The routine performance of it turned out to be advantageous for liver, pancreas, and VB diseases. The evolution of minimally-invasive surgery called for the simultaneous evolution of intra-operative ultrasonography. At present, ultrasound-guided procedures in video-assisted surgery are limited by the presence of air inside the abdomen and thorax, by the need of performing a free-hand procedure because of the lack of a biopsy kit, by the limited movements of the probe and of the biopsy needle, and, finally, by the difficulty in moving surgical instruments while looking at the monitor of the videocamera and of the US image.

On the basis of these clinical observations, the aim of the project is to build a robotic device able to perform both ultrasound-guided biopsy and treatment of a lesion during video-assisted procedures. The Project has been subsidized by the Consiglio Nazionale delle Ricerche within the framework of the Strategic Project Robotics in Surgery.

The robotic device is a sophisticated modular system working in a dynamic environment. Here follows the list of components necessary for the device: 3D localization system, ultrasound equipment and probes, biopsy needles, sensorized needle guide with a sliding mechanism, Dexter arm, and surgical pointer. The procedure involves the following steps: target identification and localization of insertion point by the surgeon, robot positioning, stop of respiratory movements, robot position adjustment and biopsy sampling.

The performances of the system have been evaluated in terms of accuracy and time of execution. The system reaches a sub-millimetric accuracy in the positioning of the needle guide. The overall procedure, excluding the time necessary for the initial ultrasound scanning, requires about one minute.

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**New Techniques/Technology-PS171**

**LAPAROSCOPIC GASTROPEXY IN CONJUNCTION WITH PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN HIGH RISK PATIENTS**

P. M. Aradan, D.O., Solhah Mobourn, M.D., Margaret Horton, R.N., Vafa Shayan, M.D., Departments of Surgery and Gastroenterology, Loyola University Medical Center, Maywood, Illinois.

Percutaneous endoscopic gastrostomy (PEG) tube placement is the most commonly performed procedure for establishing enteral access. Associated comorbid conditions such as severe malnutrition, use of high dose steroids, and ascites are likely to increase the incidence of PEG disruption and septic complications following PEG placement. Since June of 1999, we have employed laparoscopic gastrostomy (LG) in conjunction with PEG placement in the high-risk patients in need of enteral access.

A retrospective review of hospital charts of all patients undergoing PEG-LG was performed. Between June 1999 and December 2000, eight patients (3 males and 5 females) underwent a total of 12 abdominal procedures. The mean age was 61 years (34-93). Underlying pathology included CVA, failure to thrive with severe associated malnutrition, cachexia, chronic aspiration pneumonia, and ventilator dependence. Risk factors for PEG disruption included severe malnutrition (6 out of 8), use of high dose steroids (2 out of 8) and ascites (5 out of 8). These patients had more than one predisposing factors. All of the procedures were performed using combined laparoscopy and endoscopy with no conversions to open. The average length of procedure was 62 minutes (47-78). There were no operative morbidity including PEG dislocations, no need for transfusions, and no deaths.

Based on our limited experience, we believe PEG placement in conjunction with LG is a safe and effective alternative to PEG alone in patients at high risk for PEG disruption and septic complications. Prospective randomized studies will be able to better determine the advantages of PEG-LG over PEG alone in the high-risk patients.

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**New Techniques/Technology-PS170**

**COMPARISON BETWEEN THE GEA EXTRA CORPOREAL KNOT AND THE ROEDER EXTRACORPOREAL KNOT: MORE SECURE, EASIER, QUICKER TISSUE APPROXIMATION.**

Rodolfo Arcoyed MD, Mucio Moreno MD, Pablo Olachea MD, Colima, Mexico.; Mason City Clinic, Mason City, IA. Dr. Manuel Gea Gonzalez General Hospital, Mexico City, Mexico.

Objective: To prove objectively that the new Gea knot is quicker and more reliable than its counterpart.

Methods: Ninety knots were divided in three groups: A) Surgeon’s knot, B) Roeder knot, and C) Gea knot. We measured the tensile strength and slipping rates of each knot on 1-0 nylon, silk, dexon, catgut and vycril with a tensimeter with weights from 1-12 kg. Rupture was defined as disruption of continuity of the suture, while slippage was defined as the lineal displacement of the knot. The knots were tied according to the literature. The creation of the knot was timed from its formation extra-corporeally until it was set down on the tissues in a model. The statistical tools utilized to compare groups were Chi square and ANOVA.

Results: With nylon, the Gea knot had a mean resistance = 9.6 kg (7-11 kg). It did not slip in any case. The Roeder knot slipped with a mean = 0.83 kg (0.1-4 kg). Even when slippage occurred, the surgeon’s knot broke. With silk, the Gea knot had a mean resistance = 10 kg (7-12 kg). It did not slip once. With vycril, the Gea knot broke in all cases at a mean = 8.2 kg (6-10 kg), but did not slip once. The Roeder knot broke in 3 cases at a mean = 3 kg (2-5 kg) and slipped in 27 repetitions. The surgeon’s knot broke in 30 cases at a mean = 8.63 kg (6-11 kg) and did not slip once. The only statistical significance was between the Gea and the Roeder knot’s rate of slippage and/or tensile strength with nylon and vycril. The time to perform the Gea knot was 2 minutes and 19 seconds, while the Roeder knot took 2 minutes and 48 seconds. The Gea knot had a mean = 8.2 kg (7-11 kg) and slipped in 27 repetitions. The surgeon’s knot broke in all cases at a mean = 10 kg (7-12 kg). It did not slip once. With vycril, the Gea knot broke in all cases at a mean = 8.2 kg (6-10 kg), but did not slip once. The Roeder knot broke in 3 cases at a mean = 3 kg (2-5 kg) and slipped in 27 repetitions. The surgeon’s knot broke in 30 cases at a mean = 8.63 kg (6-11 kg) and did not slip once. The only statistical significance was between the Gea and the Roeder knot’s rate of slippage and/or tensile strength with nylon and vycril. The time to perform the Gea knot was 2 minutes and 19 seconds (11-28, SD=4). The Roeder knot took a median of 24 seconds (8-32, SD=3). The surgeon’s knot took a median of 97 seconds (62-110, SD=5). We compared this data with ANOVA. There was a statistically significant difference between each knot.

Conclusions: The Gea knot on nylon and vycril did not slip, had higher tensile strength and it is quicker than the Roeder knot. We have used the Gea knot for 3 years with good results; hence we believe that it should be part of any laparoscopic surgeon’s armamentarium.

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**New Techniques/Technology-PS172**

**MINIMALLY INVASIVE REPLACEMENT OF THE ABDOMINAL AORTA: A NEW ROBOTIC TELEMANIPULATIVE TECHNIQUE.**


Objective: Computer-assisted telemanipulative surgery is gaining popularity in many surgical specialties. Advantages offered by these robotic systems include improved precision, dexterity and vision. These are enhanced with tremor filtration, seven degrees of motion, and three-dimensional vision. We have developed a technique for replacing the abdominal aorta with a Dacron tube graft using the da Vinci system.

Methods: Using an intubated, anesthetized swine model, the da Vinci system was used for the transperitoneal replacement of the abdominal aorta. Seven ports were placed including one camera port, two robotic instrument ports, two retractor ports and two accessory ports. The pig was placed in the right lateral decubitus position. The abdominal aorta was exposed through the peritoneum from the renal arteries to the bifurcation. Dacron graft material was used to replace a segment of the infrarenal aorta. Each anastomosis was performed using two Gore-tex sutures in a running fashion.

Results: We have successfully replaced sections of the abdominal aorta with Dacron graft in ten animals. The average time for port placement was 12 minutes. The average time for exposure of the aorta was 47 minutes. Average times for performing the proximal and distal anastomoses were 20 minutes and 18 minutes, respectively.

Conclusion: There is significant interest in the field of vascular surgery in performing operations on the abdominal aorta using minimally invasive techniques. Robotic abdominal aorta replacement under direct visualization offers an attractive alternative to open and endovascular aortic approaches. This technique may prove to be a viable option for the treatment of aortic aneurysmal and occlusive disease.
New Techniques/Technology–PS173

**INITIAL ONE YEAR EXPERIENCE WITH ROBOTIC ADVANCED LAPAROSCOPIC FOREGUT SURGERY**

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**Objective:** We report our first year of experience using the da Vinci Surgical System (tm) in minimally invasive foregut surgical applications. Our initial results are to be used to guide our future endeavors in analyzing the applications and efficacy of the robotic system.

**Methods:** Records from September 1, 2000 to September 1, 2001 were reviewed. Average length of stay, return to oral intake, and postoperative complications are reported.

**Results:** A total of twenty-one robotic assisted advanced laparoscopic foregut operations were performed. These include twelve Heller myotomies with Dor fundoplication, four Nissen fundoplications, four gastrojejunostomies (three as part of gastric bypass procedure), and one pyloroplasty. Post-operative bowel movements ranged from 4 to 10 per day. None of the patients reported urinary or fecal incontinence. All patients were satisfied with the outcome of surgery and would recommend it to others.

**Conclusions:** Our first year of experience with robotic advanced laparoscopic foregut surgery shows it to be comparable to current minimally invasive surgery standards for return to oral intake, length of hospital stay, and postoperative complications. We therefore will continue to explore various applications of the robotic system in advanced laparoscopic foregut surgery. As our institution gains experience and volume, in-depth analysis will allow for further comparison with traditional laparoscopic surgery.

New Techniques/Technology–PS175

**A NEW DEVICE FOR BLEEDING CONTROL IN ENDOSCOPIC SURGERY**

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**AIMS:** Bleeding from small vessel may be a severe complication in endoscopic surgery, since it can impair surgeon's view even when the degree of bleeding is low. Hydroxylated polyvinyl acetal tampons (Merocel r.) are made by a synthetic, open cell foam structure largely used during ear-nose and neurosurgical operations. Their polymeric design provides great absorbing capacity (up to 25 times the initial weight) and haemostatic property. Merocel r. tampons are biocompatible, extremely resistant, designed in different shapes and with no loose fibres. We tested their efficacy for bleeding control during different endoscopic operations.

**METHODS:** From September 2000 till September 2001, 8x1x2 cm rectangular Merocel r. tampons have been used 70 different endoscopic procedures (35 cholecistectomies, 6 adrenalectomies, 9 colectomies, 3 splenectomies, 5 retroperitoneal nefrectomies, 4 lumbar sympatectomies and 8 thoracoscopic procedures).

**RESULTS:** In 56/70 (80%) cases just one tampon was required; the efficacy for bleeding control and fluid absorbing was remarkable. No need for conversion due to bleeding was reported. Their main advantages are great absorbing and hemostatic properties within a small volume (no view limiting); easy intra-abdominal handling using conventional endoscopic instruments; 3-possible use as dissecting instruments due to their initial hard consistency; 4-easy insertion and retrieval from conventional 10 mm ports; 5-lack of adhesiveness to tissues; 6-blood suction can be performed directly through the tampon thanks to the polymeric structure, greatly improving and speeding the clearing of the surgical field; 7-bio-compatibility; 8-absence of loose fibres and high resistance to infections; 9-low cost.

**CONCLUSIONS:** The use of hydroxylated polyvinyl acetal tampons resulted extremely efficient for bleeding control during minimally invasive surgery and their use is safe and can be recommended.

New Techniques/Technology–PS176

**VIDEO SURGERY AND FIBEROPTIC HIGH SPEED CONNECTIONS**

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**Objective:** Aim of this paper is to report the impact in our teaching hospital of a televideo-surgical-conferencing system utilizing the Integrated Services Digital Network (ISDN) lines standard H 320 and the TCP/IP (Transfer Common Protocol/Internet Protocol) with new standard H 323 fiber optic LAN (Local Area Network) connections.

Since July 1997 our department is provided with three ISDN lines (384 k bits), H 320 protocol, to share in a national and international teleconferencing network. Intra-hospital (Intra-Network) connections of this standard allow the transfer of images, data and videos from the operating room to the didactic and conference room. Medical students and residents, or doctors in meeting, benefit from this system. Out of the hospital (Extra-Network), surgical procedures (laparoscopic colectomies, adrenalectomies etc…) have been successfully transmitted during surgical congresses with satisfactory video quality in 384 kbits. Simultaneously an international satellite low bandwidth (32 kbits) telemedicine project was active between our department and african site (Congo). Present 192 cases of intercontinental telemedicine have been evaluated and 24 national and European teleconferencing with surgical video transmission have been completed.

From January 2000 an evolution of technology connection in our country begun with the fiber optic network. A 10-100 Mbits speed, utilizing the internet TCP/IP protocol with the new H 323 standard, is used with very high quality of video surgery, data, audio and multimedia communications. To present this network provided educational and didactic role. A clinical validation with digital radiology (MRI, CT scan) is ongoing for teleconsultation, clinical application (neurosurgical patient survey, telemetering etc…), with consequent benefits, from our regional teaching hospital to rural hospitals is on planning to reduce costs and useless patient transfer.
New Techniques/Technology–PS177

TISSUE MANAGEMENT IN MIS BY SEALING: ADHESIVE STRENGTH AND TREATMENT OF SPLENIC TRAUMA

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Surgical inviability characterizes surgery on the spleen—also in the age of minimally invasive surgery (MIS). But tissue sealing is an essential tool for MIS organ conservation and can be carried out in evaluation of adhesive strength (AS) of sealing media and their implementation in MIS. Evaluatin was performed in the CCP (Carbon-Carbon-Perfusor: Pressure chamber, porcine pleural membran, standardized defect). For implementing fleece-bound sealing (FBS) an modulating MIS-applicator/AMISA, a 10 mm instrument) was developed. FBS (ready-to-use vs. on-spot) demonstrated a higher AS for collagen fleeces that are ready coated with a fibrinogen based sealant(TachoComb) than carrier systems impregnated by hand with liquid fibrin glue (50.2 vs 23.0hPa, p<0.001). Pure liquid sealing in a drop or spray dressing exhibits a low AS(5.3% hPa) and should not be employed on stressed surfaces. In a pediatric collective(1993-2000, 192 pat., mean age 12.2 yrs) with blunt abdominal trauma 80 patients had splenic trauma. Surgery was performed on 26 children (31.3%) and of this group, 29.6% had isolated splenic trauma requiring surgery (88.2% MIS) and 39.1% had multi-traumatization (22.2% MIS). MIS management of the spleen was always carried out with the AMISA and FBS. AS of the fleeces at the target area was always superb.

Splenectomy was not necessary, no rebleeding occurred. Mean hospital stay was 11 days. Innovative FBS has made it possible to distinctly expand the indications for MIS, and in the scope of emergency laparoscopy, this type of sealing can be employed for the management of splenic ruptures.

New Techniques/Technology–PS178

LAPAROSCOPIC SPLENECTOMY WITHOUT CLIPS, STAPLES OR LIGATURES


Objective: Laparoscopic splenectomy is accepted as the gold standard approach to the normal sized spleen. Controversy still remains regarding the most appropriate approach to haemostatic control of the splenic hilar vessels. The electrothermal vessel sealer system (Ligasure™) uses electroaducty to denature elastin and collagen and combines it with extreme physical pressure to form a “weld” within vessels up to 7mm in diameter. We describe the safe introduction and effects on operative time of this state of the art technology.

Methods: Between 1993 and 2001 52 patients underwent laparoscopic splenectomy. The initial 32 patients had haemostatic clips applied to their short gastric and splenic pedicle vessels. The subsequent 20 patients had the Ligasure system employed to provide haemostatic control. Operative times were expressed as medians and interquartile ranges.

Results: Patient age, sex and underlying haematological condition were similar between both groups. The procedure was converted in five patients with gross splenomegaly and in none of the patients with normal-sized spleens (9.6%). In-hospital morbidity was 13.5% and was spread equally across both groups. Perioperative transfusion requirements were similar between each groups with a rate of 0.7 units per patient using clips and 0.8 units in the clipless group. There was a single death in the clipless group as a consequence of postoperative pulmonary embolism. Operative times were reduced in the clipless group compared with clipped group (107.5mins (78.5-174) Vs 172.5mins (139-251) p<0.02 Mann-Whitney U test

Conclusions: Laparoscopic splenectomy can be accomplished safely and securely without the use of clips staples or ligatures. The Ligasure™ vessel sealing system reduces operative time by allowing rapid and precise control of the splenic hilar vessels.
A STATISTICAL ANALYSIS OF SURGICAL IMAGES: IMPLICATIONS FOR VISUAL DISCRIMINATION OF TISSUE

**Objectives:**
Recent research in visual science has shown that naturally-occurring images taken from different contexts have different statistical properties. One approach to the specification of clinical image properties then, is to process these images in terms of their statistical variation or similarity. This may be especially important for endoscopic/robotic surgery, as the visual field is constrained.

**Method:**
As a first step in investigating the feasibility of using multiresolution (wavelet transform) texture analysis for visual discrimination of surgical tissues, we measured the statistical characteristics of several surgical images and compared them with the known characteristics of natural scenes. Natural images have a simple characteristic spatial structure, with amplitude spectra that decrease with frequency roughly as 1/f, and considerable variability in amplitude spectra between individual images and in image ensembles. Therefore, amplitude is generally thought to be proportional to 1/(power alpha), where alpha has been found to be within a fairly narrow range (0.7 - 1.5) for natural scenes. For the purpose of this study, a digital set of 24 parathyroid images was acquired and its spatial frequency content analysed. We used a set of parathyroid images to represent a difficult visual scene and provided a good set for the development of image enhancement techniques.

**Preliminary Results:**
The value of alpha for this set of images was found to be about 1.59. The same measure for a set of 60 natural images from the Brodatz book of texture gave a value of 1.12.

**Conclusions:**
The large value of alpha for surgical images is barely in the range of natural images and indicates a steep spectrum. This preliminary finding may have implications for data compression algorithms and image enhancement techniques. It may be necessary to focus on a limited range of spatial frequencies (image scale) in this environment.

THE EVALUATION OF THE FUNCTIONAL PERFORMANCE OF A NEW COMPUTER MEDIATED CIRCULAR CUTTING STAPLER IN A PRECLINICAL SETTING

**Background:**
SurgAssist (PowerMed Inc) is a new computer-mediated surgical device that allows a variety of cartridge units to be affixed to and deployed from a flexible, steerable shaft. An electromechanical power source and gear drive replaces manually operated systems. Current circular cutting staplers (CCS) are limited by mechanical constraints of length and rigidity. The SurgAssist is designed so as to overcome these limitations. Aim: Compare the SurgAssist CCS to a predicate device with respect to efficacy and safety.

**Method:**
In a porcine model, the 25 mm SurgAssist was compared with a predicate device. A total of 40 applications were performed with each device. We evaluated both devices in end-to-end colocolostomy, end-to-side ileocolostomy, gastrojejunostomy and gastric window.

**Results:**
Functional performance was rated on a scale of 6.

**Conclusions:**
In all areas included in the evaluation substantial equivalence between the SurgAssist and the Ethicon ILS was successfully demonstrated. The SurgAssist device compared favorably to an existing CCS while creating anastomoses that sustained higher burst pressures. The SurgAssist system has the potential to enhance and expand current surgical applications.

A NEW, GRADED PRESSURE LAPAROSCOPIC FUNDOPLICATION FOR THE TREATMENT OF ‘GERD’ IN THE DYSMOTILE ESOPHAGUS

**Objectives:**
Eosophagogastroduodenal fundoplication has gained wide acceptance for the treatment of gastroesophageal reflux disease (GERD). Laparoscopic technique has all but replaced laparotomy for the performance of these procedures. Varying degrees of post-operative dysphagia have been reported historically with a type of ‘open’ anti-reflux procedures, but the rates of dysphagia appeared to increase in some early reports on laparoscopic fundoplication.

Full wrap (Nissen type) techniques were frequently accused of increasing the rate of post-operative dysphagia, especially in the face of esophageal dysmotility. Partial wrap (Toupet type) techniques were conceived primarily to address the problem of post-operative dysphagia. More recently, the durability of Toupet fundoplication has been called into question. These wraps may be more prone to primary failure as well as rotation and other deformity over time, resulting in recurrent reflux. Our own experience with Toupet fundoplication reinforced the concerns documented by others.

In response to the need for a more durable and highly effective partial fundoplication, the author designed a wrap that represents a hybrid of forms already in use. The wrap is unique, however. The lower esophageal resting pressure generated by this esophagogastroduodenal fundoplication is graded over the length of the wrap rather than static. The wrap is 360 degrees at the top, opening to 180 degrees at the bottom. It is anti-rotational and resists other types of deformity. Dysphagia is virtually non-existent. The procedure will be described in detail along with the results from our first series of patients. Supporting data, including pre and post-operative manometric results, 24-hour pH analyses and DeMeester scores will be presented. Video documentation will be shown where appropriate.
New Techniques/Technology-PS185

**FIRST WIRELESS BROADCAST OF LAPAROSCOPIC SURGERY TO A HAND HELD COMPUTER**, Alex Gandsas, MD, Katherine McIntire, MD, Ivan M. George, Wayne Witzke, Adrian Park, MD, University of Kentucky Chandler Medical Center

At the University of Kentucky, we have developed an innovative method that integrates a hand held computer, streaming video technology and wireless protocols to deliver live medical information without relying on wired infrastructures. On May 8, 2001, a laparoscopic ventral hernia repair was broadcast live from a University operating room to a handheld device (iPAQ-Compaq) via a wireless local network. Image quality was maintained so viewers were able to easily follow the entire surgical procedure.

The transmission was accomplished using a combination of wired and wireless networks integrated within the University campus. The wireless network hardware consisted of a hand held computer (iPAQ Pocket PC H3670) connected to a wireless Ethernet access point (RangeLAN2). The device operated on a Windows CE platform, and the Windows Media Player for Pocket PC (Microsoft, Inc) was used to render the video images. The wired network hardware consisted of a 750 MHz Pentium III computer connected to the Internet via the Ethernet University network. A digital capture device received analog audio/video signals from the videoconference hub (STRYKER, Inc) while the encoder software (Windows Media Encoder) optimized the signals for broadcast.

The wireless connection to the access point provided 128 kbps of bandwidth with a maximum bitrate of 81 kbps, which allowed a smooth stream of video to be deployed at 15 frames-per-second with sound encoded at 16 KHz. The wireless link was maintained without interruption for the entire transmission. Delay time between the on-going procedure and the rendering of images to the mobile device was 10 seconds.

Further research may identify this system as a new medical teaching/learning paradigm in which student or residents may be able to "attend" lectures or surgical demonstrations regardless where they are physically present. Mobile portable wireless devices may make possible for surgeons in the future to conduct intra-operative consults where traditional wired infrastructures or extensive machinery are not available.

New Techniques/Technology-PS187

**ARE VISITORS OF A MEDICAL WEB SITE SUFFERING FROM THE ILLNESS THE WEB SITE IS ABOUT?** FM Garcia-Oria MD, **F** & Maciel-Pharm D, **JL** & Jimenez-Hernosa MD, **AAG** & Garcia MD, **S** & Servicio de Cirugia, Hospital Universitari de Girona Doctor Josep Truets, GIRONA, SPAIN. **CEIC** & Hospital Universitari de Girona Doctor Josep Truets, GIRONA, SPAIN. **Department of Surgery University of Kentucky, Lexington, KY, USA**

**Objective:** Assess through an online survey, how much visitors of a medical web site, are suffering from the pathology this medical web site is about.

**Methods:** The web site http://www.acidez.net is a monographic web site about hiatal hernia and heartburn targeted on patients. We have published in this web site a survey with 39 items with different types of questions about heartburn symptoms. Any visitor to the website is invited to participate in the survey, and there is no previous relationship between the visitor and the authors.

The survey is available both in English and Spanish and completed forms are submitted via email to the author. We have included in the study forms submitted between Feb-2001 and Aug-2001.

**Results:** The web site acidez.net have received 60173 visits in 6 months. 897 people have submitted the form, 57.01% women and 42.99% men. Average age is 43.30 ± 13 years; most of them, 43.60% were from USA, 20.41% Spain and, 13.77% Mexico.

We found that 84.49% of the visitors had heartburn symptoms unless twice a week, and 15.51% rarely or never. 75.12% have already visited the doctor. Most of people, 77.31%, are taking medication to treat their symptoms, and proton pump inhibitors is the most common type of medication (80.36%). On the other hand, we found that 79.6% had been diagnosed of hiatal hernia, 14.83% esophagitis and 27.42% of gastritis. Only 2.71% had been operating performing a fundoplication, and 80% were by laparoscopic approach.

**Conclusion:** Visitors to a monographic medical web site about heartburn, http://www.acidez.net, are mostly people suffering from this symptomatology. We think that monographic medical websites achieve selective audiences.

New Techniques/Technology-PS186

**TRANSCERVICAL MINIMALLY INVASIVE APPROACH FOR ZENKER’S DIVERTICULUM**, Fernando Telles MD, 1 Alex Gandsas MD, 1 Lenzi Jorge MD, 1 Department of Surgery IMEC Junin Buenos Aires Argentina, 2 Department of Surgery University of Kentucky Lexington Kentucky

**BACKGROUND:** The current treatment for Zenker’s Diverticulum is either the conventional surgical approach or endoscopic transoral procedures.

**METHODS:** We developed a new minimally invasive technique to add as a therapeutic option for this patients.

**METHODS:** Four patients with Zenker’s Diverticulum were operated on using a minimally invasive cervical access with conventional laparoscopic instruments.

**RESULTS:** All four cases were completed without complications or conversions. The mean operative time was 65 minutes with a short hospital stay and good cosmetic results. The outcomes in terms of control of symptomatic were very satisfactory.

**Conclusion:** It is possible to use the transcervical minimally invasive approach for the treatment of Zenker’s Diverticulum. This may be superior to conventional open approach in selected patients.

New Techniques/Technology-PS188

**A NOVEL METHOD FOR THE ASSESSMENT OF DEPTH PERCEPTION IN SURGERY FROM TWO-DIMENSIONAL DISPLAYS** Stanley J. Hamstra, Ph.D., Jiri Najemnik, B.Sc., Daniush Ebrahimi, M.Sc., & Christopher M. Schlachta, M.D., Department of Surgery, University of Toronto, Toronto, Ontario.

**Objective:** In laparoscopic surgery, the recovery of three-dimensional (3D) information and the accurate judgment of depth is constrained by the representation of medical images on a two-dimensional (2D) display. These judgments can be facilitated by the addition (or exclusion) of certain types of visual information. For example, linear perspective cues in the form of a reference grid can theoretically enhance depth judgments. Also, variations in light source direction or quality can affect depth judgments. However, the application of basic findings in this area of visual science have not been made to the field of medical image depiction.

**Method:** In recent pilot work, we have developed a measurement tool for assessing an individual’s judgments of 3D structure from 2D displays (based on the work of J. Koenderink and colleagues). This tool for assessing an individual’s judgments of 3D structure from 2D displays (based on the work of J. Koenderink and colleagues). This system allows for the objective experimental assessment of critical visual characteristics necessary for effective depth judgments in a 2D display. Specifically, the subject is presented with a 2D depiction of a 3D structure and requested to make local depth judgments using a specially-constructed but simple gauge figure consisting of two concentric circles and a post. Once the subject is satisfied with the apparent orientation of the figure in depth, they are presented with another figure in a new location on the display. This is repeated until a new figure is obtained and the presence of linear perspective reference gradients. Results of this study will provide recommendations for image depiction and transmission standards.
DUAL VISION SURGERY FOR LAPAROSCOPIC DISTAL GASTRECTOMY

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One of the disadvantages of laparoscopic surgery is that it has to be performed under two-dimensional imaging with only one magnified video monitor. To overcome this handicap, we use two sets of laparoscopes and monitors when performing laparoscopic distal gastrectomy for gastric cancer. We generally insert six trocar sleeves. The main operator and the contrary assistant operator control the instruments in the same way. They control through two working trocar sleeve of both sides and each other’s fs laparoscope is located in the center. The advantages are as follows. (1) To align all four directions; the own eyes, the laparoscope, the monitor and the manipulating hands in a straight line, facilitates hand-eye coordination and we can handle the instruments more accurately compared to when these are not parallel. (2) The abdominal cavity is better illuminated by the two separate light systems coming from different directions, making shadows which help depth perception regarding the abdominal organs. (3) The assistant does not have to do an over-90 degree inverted traction of organs and can apply precise counter-traction looking at his own laparoscopic image. (4) The assistant can also train his hand-eye coordination by aligning his own laparoscopic axis, monitor viewing axis and manipulating axis in a straight line, when the assistant eventually becomes an operator, he is then prepared to perform surgery from the main surgeon’s side. This results in an excellent training system for manipulating forceps for young laparoscopic surgeons.

LAPAROSCOPIC COLECTOMY PROCEDURE IN A DIFFICULT COLON CANCER PATIENT -INTRA-ABDOMINAL ADHESION

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Laparoscopic colectomy’s minimal burden on the patient has made this procedure very popular. Laparoscopic colectomy with a no-touch retro-peritoneal approach was possible in a case of severe intra-abdominal adhesion operable only by conventional open surgery. From the start of laparoscopic colectomy in March 1997 to the present, there have been 232 cases of this procedure performed. There were 171 cancer patients (38 had previous abdominal surgery), and in 16 (42%) of these, the retroperitoneal approach was performed. In advanced cancer cases, there are no effects on intra-abdominal adhesions and it can safely be performed by moving the intestines. Also, lymph node resection is possible. With the retro-peritoneal approach and various techniques, the amount of trocars introduced into the abdominal cavity can be reduced and adhesion areas can be avoided along with less damage to intra-abdominal organs from forceps movements.

Laparoscopic colectomy with the retro-peritoneal approach is a useful and safe procedure which can be performed on intra-abdominal adhesion cases.

A NEW TECHNIQUE OF ENDOSCOPY-GUIDED TRANSHEPATIC BILIARY DRAINAGE AFTER LAPAROSCOPIC CHOLEDOCHOLITHOTOMY

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Primary closure with no biliary drainage is a common practice after laparoscopic bile duct exploration for patients with non-complicated choledocholithiasis. However, when they are complicated by numerous stones or bilary sepsis, addition of biliary drainage is essential for safety of the procedure. Insertion of a drainage catheter via the choledochus, the cystic duct or the naso-biliary route has been applied. Described herein is a new technique of endoscopy-guided transhepatic biliary drainage after choledochotomy and stone removal under gasless laparoscopy.

The surgical procedure follows as below. After clipping the cystic duct, choledochotomy, choledochoscopy, and stone removal are performed in a similar manner as an open surgery. Then, under choledochoscopy, the hard-tip (tail side) of a guide wire through a scope channel is introduced into the antero-inferior branch of the intrahepatic bile duct. The wire is forced to penetrate the bile duct wall and the liver tissue, and pulled outside the skin. An eight-Fr catheter is inserted into the bile duct over the wire. After the wire is removed, the opening of the bile duct is closed by continuous suture with 5-0 PDS.

This procedure has been applied for five patients. The drainage catheter was removed between 4th and 8th postoperative days in four patients with uneventful course. One with narrowing of bile duct at suture closure site was easily treated by balloon dilation through transhepatic route. Fortunately, no retained stone has been experienced.

Our limited experience indicates that endoscopy-guided transhepatic biliary drainage is a feasible option in laparoscopic choledocholithotomy. It enables to promote an easy access to the bile duct for postoperative biliary treatment or stone retrieval, and early removal of a catheter if drainage is unnecessary.

CAN A NITINOL CLIP REPLACE SUTURE FOR ADVANCED LAPAROSCOPIC SURGERY?

Marina Kurian, M.D. and Mitchell Roslin, M.D. Department of Surgery, Lenox Hill Hospital, New York, NY

Nitinol, which is an alloy of nickel and titanium, has several unique properties. These include favorable handling characteristics and an ability to return to its prefabricated shape. These properties have been utilized for medical applications in the central nervous system and coronary stents. A nitinol clip (U-CLIPtm, Coalescent Surgical, Inc.) has been recently introduced for cardiac surgery. The clip has the appearance of a suture with memory and is placed with standard instrumentation. After placement, the clip is deployed with a simple squeeze of the needle holder, thus eliminating knot tying. These attributes make the U-CLIPtm attractive for laparoscopic surgery. After the development of larger diameter (.070-.090in) clips and subsequent animal testing, we have begun an initial clinical trial for closure of the enteroenterostomy in laparoscopic gastric bypass. We have used the U-CLIPtm in five consecutive patients without complication. Both surgeons were able to use the U-CLIPtm without difficulty in their first case. Video will be shown. The advantage of the nitinol clip is that it offers the flexibility of suture, combined with easy handling and rapid deployment with no additional instrumentation. It eliminates suture handling and intracorporeal knot tying. Tissue incorporation is similar to staples since the exterior surface, titanium oxide, is the same. It is our plan to continue utilizing the clip for enteroenterostomy closure. Future modifications that improve laparoscopic entry with a delivery system may make the U-CLIPtm ideal for a sutured gastrojejunostomy and laparoscopic vascular surgery.
New Techniques/Technology–PS193

USES OF BIPOLAR SEALANT SYSTEM (LIGASURE®), IN LAPAROSCOPIC SURGERY

ANTONIO MALLEN, M.D., Department of Surgery, Laparoscopic Surgery Unit, Hospital Dr. Americo Babó, CVG Ferrominera Orinoco, Puerto Ordaz, Venezuela

PURPOSE: We present a retrospective clinical study concerning our preliminary experience in the use of bipolar vessel sealing system (Ligasure®), to perform laparoscopic surgery.

METHODS: Thirty one consecutive patients were operated using laparoscopic techniques and bipolar vessel sealing system (Ligasure®), for dissecting and hemostasis purposes.

RESULTS: Every operation attempted was successfully terminated. We performed: 9 Cholecistectomies, 6 Appendectomies, 4 Hysterectomies, 4 Ooforectomies, 3 Nissen Funduplications, 4 Hernioplasties, 3 Ventroplasties. We didn't have complications attributable to the use of bipolar sealing system (Ligasure®).

CONCLUSION: Laparoscopic Surgery can be made safe, using bipolar sealing system (Ligasure®), because is highly hemostatic with decreased thermal damage to tissues. In addition, it is very easy to handle in contrast with other systems like ultrasonically activated scalpel which is very complex.

New Techniques/Technology–PS194

USES OF BIPOLAR SEALANT SYSTEM (LIGASURE®), IN LAPAROSCOPIC SURGERY

ANTONIO MALLEN, M.D., Department of Surgery, Laparoscopic Surgery Unit, Hospital Dr. Americo Babó, CVG Ferrominera Orinoco, Puerto Ordaz, Venezuela

PURPOSE: We present a retrospective clinical study concerning our preliminary experience in the use of bipolar sealant system (Ligasure®), to perform laparoscopic surgery.

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New Techniques/Technology–PS195

USE OF BIPOLAR VESSEL SEALING SYSTEM (LIGASURE®) IN LAPAROSCOPIC SURGERY

ANTONIO MALLEN, M.D., Department of Surgery, Laparoscopic surgery Unit, Hospital Dr. Americo Babó, CVG Ferrominera Orinoco, Puerto Ordaz, Venezuela

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New Techniques/Technology–PS196

ULTRASONIC TROCAR, SCISSORS AND ASPIRATOR WITH AN ELECTRIC CAUTERY CONNECTOR: ACCOMPLISHED SAFE LAPAROSCOPIC OPERATION

SUMIO MATSUMOTO, M.D., F.A.C.S., NORIHIKO KAWABE, M.D., YOSHIHISA MIZUNO, M.D., YASUHIRO KANO, M.D., KENICHI KOBAYASHI, M.D., HIROICHIRO SUZUKI, M.D., YASUHIRO KANO, M.D., SHUNJI UMEMOTO, M.D., Department of Surgery, Second Teaching Hospital, Fujita Health University, Nagoya, Japan.

Although the trocar safety shield system decreases abdominal organ injury, the probability of bleeding from the abdominal wall port site had still not been resolved. We therefore developed a novel ultrasonic vibrating trocar that prevents bleeding by an ultrasonic cavitation effect. We also developed an energy source system that can connect ultrasonic trocar, scissors and aspirator with single cable. Ultrasonic scissors and aspirator has a pin that connects HF electric cautery. Thereby, we can use ultrasonic vibrating trocar, scissors and aspirator smoothly according to the progress of the operation procedure.

The ultrasonic vibrating trocar has the advantage of ease of insertion, and the force required for trocar insertion is only 34% of the force required by commercially available trocars. Bleeding from the abdominal wall was prevented by an ultrasonic cavitation effect. The ultrasonic vibrating scissors decrease efforts to prevent bleeding using clips and shorten the operation time. The ultrasonic aspirator can make less effort to identify the vessels during the lymph node dissection for the operation of the patients with malignant tumor.

We developed a reusable ultrasonic vibrating trocar that can be bloodlessly and smoothly inserted through the abdominal wall. This instrument is inexpensive and decreases organ injury and other complications. The system which can connect other ultrasonic device, scissors and aspirator, accomplish easy and bloodless operation. Reusable devices has the advantage with a respect of cost effectiveness.
New Techniques/Technology–PS197

THE ULTIMATE LAPAROSCOPIC CHOLECYSTECTOMY - CLIPLESS NEEDLE PROCEDURE Yoshifumi Matsuura M.D., Go Wakabayashi M.D., Masaki Kitajima M.D., The Department of Surgery, Keio University School of Medicine, Tokyo
Laparoscopic cholecystectomy has become the standard treatment for symptomatic cholelithiasis. However, the standard procedure varies from surgeons to surgeons. The advancement of laparoscopic instruments has made us possible to perform the least invasive cholecystectomy. Here, we report our new standard laparoscopic cholecystectomy.

[MATERIALS & METHODS] We started to use 3mm bipolar coagulation forceps and 2mm-needle instruments at our service since February, 1997. --@We have performed laparoscopic clipless needle cholecystectomy as described below for 143 patients for the past three years, and evaluated the procedure being compared with the conventional laparoscopic cholecystectomy using 5mm instruments. The clipless needle procedure was performed through a 12mm trocar as a port for a flexible video laparoscope. One 3mm trocar and two 2mm trocars are placed in the abdomen under direct vision. The serosal attachments of the neck of the gallbladder are first dissected laterally, and the Calot’s triangle is finally exposed. We use 3mm bipolar coagulation forceps to coagulate the cystic artery and use 2mm absorbable tie to ligate the duct. After the isolation of the gall bladder, we retrieve it through the incision of the cystic artery and use 2mm absorbable tie to ligate the duct. After finally exposed. We use 3mm bipolar coagulation forceps to coagulate the cystic artery and use 2mm absorbable tie to ligate the duct. After the isolation of the gall bladder, we retrieve it through the incision of umbilicus, and suture the fascia and the incision subcutaneusly.

Other wounds are closed with surgical tapes. Umbilicus, the isolation of the gall bladder, is sutured through the incision of the cystic artery and use 2mm absorbable tie to ligate the duct. After finally exposed. We use 3mm bipolar coagulation forceps to coagulate the cystic artery and use 2mm absorbable tie to ligate the duct. After the isolation of the gall bladder, we retrieve it through the incision of umbilicus, and suture the fascia and the incision subcutaneusly. The medial border of the posterior rectus sheath is opened on both sides and contralateral retromuscular dissection is continued. After reduction of the hernia sac or opening of the peritoneum at the hernia neck, a mesh is inserted, ensuring minimal circumferential overhanging of 5 cm. A polypropylene mesh was used in six cases. In the other patients, ePTFE or a composite mesh was used (median surface area of the meshes: 293 square cm). All meshes were fixed with helicoidal tackers.

[RESULTS & CONCLUSION] The operating time of this procedure took less than one hour in most cases although it was roughly 1.5 times longer than that of the conventional 5mm procedure. Four cases had complications: two cases had liver dysfunction needed longer hospital stay, one case had bleeding needed to place 5mm trocars, and one case had common bile duct stone that fell while operation. Two cases needed placement of 5mm trocars because of bleeding mentioned above and difficulty of adhesiolysis. In conclusion, the clipless needle procedure is feasible and safe with merits of less scar and no clips.

New Techniques/Technology–PS198

INITIAL EXPERIENCE WITH LAPAROSCOPIC ADHESIOLYSIS AND INSERTION OF SEPRAFILM II OF SEPPICHEM. J. Meehan MD, Dexter MD, Michael J McMahon PhD, Leeds Institute for Minimally Invasive Therapy (LIMIT) and Academic Surgical Unit, Leeds General Infirmary, Leeds, United Kingdom

Introduction: Adhesions are a recognised causal factor in chronic abdominal pain and subacute bowel obstruction. Laparoscopic adhesiolysis has been shown to be effective in certain patients but there is a high rate of recurrence. Seprafilm, a bioreabsorbable membrane, can reduce post-operative adhesion formation. Technical advances have enabled laparoscopic insertion of this material. We report our initial experience of laparoscopic seprafilm usage.

Methods: Since April 2000, 13 patients (9 female, 4 male), mean age 58.6 years, (range 37-77), with a history of abdominal surgery or small bowel obstruction, after previous abdominal surgery, have undergone 16 laparoscopic adhesiolysis and insertion of Seprafilm II. Operation approach in all cases involved a 10mm umbilical port for camera usage and two or more 5mm ports for instruments and Seprafilm insertion. Ultrasonic coagulation was used to divide intra-abdominal adhesions. Sheets of Seprafilm II were cut into quarters and inserted using the laparoscopic applicator. 92% of Seprafilm II was inserted successfully.

Preliminary Results: The operation was successfully completed in 11 patients (14 cases; 1 patient with a crohns mass was converted, 1 patient with a jejunoileostomy, experienced intra-operative perforation of the small bowel, this was sutured laparoscopically, no Seprafilm was inserted). Post-operative small bowel obstruction developed in two patients. After a mean follow-up of 248 days (range 43-487), four (30.85) patients remain symptom free. Seven (53.8%) patients have experienced a recurrence or persistence of symptoms. Three (23.1%) patients have required repeat laparoscopic adhesiolysis and insertion of Seprafilm II.

Conclusion: This experience demonstrates the feasibility of laparoscopic adhesiolysis to be safe and effective even after multiple laparotomies. It remains unclear which patients are likely to benefit from this procedure.

New Techniques/Technology–PS199

ENDOSCOPIC TOTALLY PREPERITONEAL VENTRAL HERNIA REPAIR: FEASIBILITY STUDY Marc Miser, Ph.D., Dirk Vervoelsem M.D., Freddy Penninx Ph.D., Department of Abdominal Surgery, University Hospital Gasthuisberg, Leuven, Belgium.

Laparoscopic totally preperitoneal ventral hernia repair has been shown to be a feasible and effective method of repair. We evaluated the procedure being compared with the conventional laparoscopic totally preperitoneal technique for the treatment of ventral hernias.

Methods: From September 2000 until May 2001 fifteen patients with an incisional or primary ventral hernia with a maximal width of 9 cm were operated. One blunt tip trocar and two additional 5 mm trocars were placed at a substantial distance from the hernoifice. The first trocar is introduced in the retromuscular plane under direct view, mostly at the lateral border of the rectus muscle. After initial blunt dissection in this plane, the two other trocars are inserted. On the midline, the medial border of the posterior rectus sheath is opened on both sides and contralateral retromuscular dissection is continued. After reduction of the hernia sac or opening of the peritoneum at the hernia neck, a mesh is inserted, ensuring minimal circumferential overhanging of 5 cm. A polypropylene mesh was used in six cases. In the other patients, ePTFE or a composite mesh was used (median surface area of the meshes: 293 square cm). All meshes were fixed with helicoidal tackers.

Results: There were no major complications after a median follow-up of 4 months (range 13-276 days). We noticed one postoperative subcutaneous infection with total resolution after antibiotics and local incision. Another patient developed fever and local cellulitis signs after discharge. A third patient had fever without a clear focus. Both were also successfully treated with antibiotics. One patient developed a postoperative ileus. One recurrence was seen 5.5 months postoperatively (6.7%).

Conclusions: Endoscopically totally preperitoneal ventral hernia repair is feasible. In this way the mesh can be placed in the same plane as in open surgery, avoiding the disadvantages of an open approach and the disadvantages of transabdominal approach with the need for extensive adhesiolysis. In addition, preperitoneal placement of the mesh might obliterate the need for extensive fixation of the mesh due to the intrabdominal pressure and peritoneal covering (as in endoscopic inguinal hernia repair).

New Techniques/Technology–PS200

LAPAROSCOPIC SPLENECTOMY: SURGERY TECHNIQUE AND OUTCOME OF 23 PATIENTS. Naoki Nagato M.D., Aichiro Higure M.D., Kazunori Shiobara M.D., keji Hirta M.D., Yoshihumi Nakayama M.D., Koji Okamoto M.D., Hodeski Itoh M.D., Takahiro Hashida M.D.* Department of surgery 1 University of Occupational and Environmental Health, *Department of surgery, Kokura central Hospital, Kitakyushu, Japan

Laparoscopic splenectomy (LS) has become one of the advanced laparoscopic procedures that benefit most from minimal invasive surgery. From March 1995 through August 2001, the authors performed laparoscopic splenectomy on 23 patients including 15 cases of idiopathic thrombocytopenic purpura, 4 cases of splenic tumor (hematoma, Hodgkin disease, sarcoïdosis and metastatic malignant melanoma), 1 cases of hereditary spherocytosis, 2 cases of idiopathic autoimmune hemolytic anemia, and 1 case of true splenic cyst. In early experiences of first 10 consecutive cases (group A), the patients were placed in a right lateral decubitus position to get splenic operative field and to facilitate dissection of the dorsal side of the spleen. Splenic vessels were isolated through ventral approach and each branch was ligatured using the metal clip. In late experiences of 13 cases (group B), the resection of the splenic ligament was performed by the use of a ultrasonic coagulation cutting device and we tried using linear staplers to divide splenic hilum without isolation of each vessels from lateral approach in right recumbent position. All cases were completed laparoscopically and no severe complications were recognized. As results, mean surgery times were 248 minutes in group A, 165 minutes in group B, mean estimated blood loss was 308 ml in group A, 62 ml in group B, respectively. Both surgery time and blood loss of the strategy was improved. The postoperative hospital stay was 9th days. Conclusions: The total splenic hila division by linear staplers and ligation method through lateral approach is safe and may be the standard operative method in laparoscopic splenectomy.
New Techniques/Technology–PS201

NOVEL GASTROINTESTINAL ANASTOMOTIC DEVICE DEVELOPED FOR LAPAROSCOPIC OR ENDOLUMINAL DEPLOYMENT–A PILOT STUDY
Adrian E. Park, MD, Gudjon Birgisson, MD, Charles F Knapp, PhD, Uyen B.Chu, MD, Center for Minimally Invasive Surgery, The University of Kentucky, Lexington, KY

INTRODUCTION: The ability to perform entirely laparoscopic (lap) GI anastomoses (anast) consistently and with ease remains elusive. We developed an anastomastic device (AD) which when deployed creates an immediately patent, secure anast in this study we investigate the function and effectiveness of the AD in a rabbit model.

METHODS: 12 White NZ rabbits (mean wt. 6.2 kg) were divided into 3 groups of 4 animals. In each rabbit a small bowel anast was created using the AD. All animals were fed ad lib immediately postop. Groups 1,2, and 3 were survived 1,4, and 8 weeks respectively prior to necropsy. Global assessments, weight (wt.) gain and fluoroscopic evaluation prior to explanation as well as burst pressures and histologic evaluation of the anast post-explant were recorded for each animal.

RESULTS: There was no clinical or necropsy evidence of an anastomotic leak or peritonitis in any animal. One animal in group 3 was euthanized postop day 17 for wt. loss and inability to feed. Necropsy revealed partial bowel obstruction but no leak. All other animals revealed patent anast on fluoroscopy. In one animal the AD migrated proximally into the stomach. The mean wt gain in group 1 was -212.5 g (range -390 to +200 g); group 2 was -25 g (-210 to +350 g); and group 3 was 800 g (630 to 910 g). The mean anast burst pressure in group 1 was 207.4 mm Hg; group 2 was 259.3 mm Hg; and group 3 was 224.7 mm Hg. Histologic findings from each group will be presented.

CONCLUSION: Animal wt. gain increased through the course of the study. Mean burst pressures at necropsy were greater than 200 mm Hg (equivalent to burst pressure of a stapled anast) in all groups. In 11 of 12 rabbits the AD created a secure and patent GI anast over a period of up to 2 months. The AD is easily deployed and functions effectively in an animal model. Further evaluation will focus on delivery of the AD through a 5mm trocar.

New Techniques/Technology–PS202

APPLICATIONS OF DIGITAL IMAGING PROCESSING TO LAPAROSCOPIC SURGERY, Michael Shaw, Ph.D., Adrian E. Park, M.D., Center for Minimally Invasive Surgery, The University of Kentucky, Lexington, KY

Laparoscopic surgery is limited in part by the two-dimensional image the surgeon views while performing a procedure. Depth information and perspective are lost in the video process. Most laparoscopic imaging systems employ an analog camera and signal conditioning box that converts the signal to s-video for display on a monitor. With recent advances in digitizing and digital signal processing circuit boards (DSPs) the analog signal can be digitized and algorithms applied to manipulate the image before sending it to the monitor. The newest DSPs are fast enough to accomplish this in real time. We use a technique known as structured light profilometry to analyze a laparoscopic image to obtain a complete geometry. Using this information we will demonstrate two applications: 1) an on screen scale is generated that can be used to make precise intracorporeal measures of anatomic (e.g. hernia defect) or specimen (e.g. spleen size) dimensions; 2) a full three-dimensional image is constructed (real time) and when projected onto a standard monitor can be rotated in any direction to improve perspective, sense of depth and surface texture. Both these techniques involve adaptation of existing image processing algorithms and technology and are capable of performing in real time making them useful for laparoscopic surgical application.

New Techniques/Technology–PS203

WHAT IS THE VALUE OF TELEROBOTIC TECHNOLOGY IN GASTRO-INTESTINAL SURGERY? Alexander Perez, M.D., David C. Brooks, M.D., Michael J. Zinner, M.D., Stanley W. Ashley, M.D., Edward E. Whang, M.D., Department of Surgery and Division of Minimally Invasive Surgery, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA

Our study objective was to determine the performance characteristics of telerobotic technology in a single gastrointestinal procedure: laparoscopic cholecystectomy. Initially targeted toward cardiac surgery, the impact of this technology in gastrointestinal surgery has been unclear.

METHODS: All telerobotic-assisted laparoscopic cholecystectomies performed at a tertiary academic medical center between 1/00-9/01 were analyzed. All cases used the daVinci Surgical System. Data expressed as means±S.D.

RESULTS: Twenty patients (47±20yr, 4 male, 16 female) underwent telerobotic-assisted laparoscopic cholecystectomy. Indication for surgery was symptomatic cholelithiasis in all cases. All patients had a successful gallbladder removal without need for conversion to conventional laparoscopic or open cholecystectomy. There were no intraoperative or post-operative complications. Procedure time was 134±38 min. The overwhelming majority of this time was related to telerobotic positioning and adjustments rather than surgeon-directed tissue manipulation. All operations were performed by one of three competent laparoscopic surgeons; no learning curve associated with the telerobotic procedures was observed. Surgeon-perceived advantages of this system included: easier tissue dissection related the multiple degrees of freedom afforded by the wrist, increased surgeon comfort, and stimulated interest in biliary surgery among medical personnel at all levels. Surgeon-perceived disadvantages included: increased operating time related to apparatus set-up and adjustments, lack of tactile feedback, and limited instrument choice.

CONCLUSIONS: This series is the largest available U.S single-center experience with telerobotic-assisted laparoscopic cholecystectomy. Our results suggest that the procedure is effective and safe when performed by competent laparoscopic surgeons. Telerobotic technology has the potential to reinvigorate gastrointestinal surgery.

New Techniques/Technology–PS204

VALIDATION AND APPLICATION OF A METHOD TO CONTINUALLY-MEASURE IN UTERO FETAL SHEEP CEREBRAL OXYGENATION DURING MATERNAL GENERAL ANESTHESIA, James D. Reynolds, PhD; John V. Booth, MB, ChB; David W. Amory, MD; Paul B. Benni, PhD; Sandhya Lagoo-Deenanayalan, MD; Ross L. McMahan, MD; Miguel Garcia-Oria, MD; W. Steven Eubanks, MD, Endosurgical Research Group, Departments of Anesthesiology and Surgery, Duke University Medical Center, Durham, NC.

Maternal laparoscopy for non-obstetric related surgery during pregnancy is becoming more popular while some have investigated the respons-es to pneumoperitoneum, less attention has gone towards other aspects of the surgical procedure. One area that is incomplete is an understanding of what effects maternal general anesthesia has on the fetus, especially the fetal brain, which can be exquisitely sensitive to decreases in oxygenation. Part of this uncertainty is due to the inability to separate the anesthetic effect from the underlying pathology that necessitated its use. The other factor is the impracticability of measuring fetal oxygen levels. To experimentally investigate both points, we have developed a means (near-infrared spectroscopy; NIRS) of continually quantitating in utero fetal cerebral oxygenation in pregnant sheep.

NIRS is a spectrometric method that measures tissue oxygenation by recording changes in the amount of oxygenated, de-oxygenated, and total hemoglobin (Hb). A NIRS device was designed, built and optimized by us for in utero fetal brain monitoring. Our device was validated by measuring fetal cerebral oxygenation during episodes of controlled umbilical cord occlusion. In a separate series of animals, cerebral oxygenation was recorded before and during maternal general anesthesia with 1.25% isoflu-rane in oxygen. Almost immediately after induction, fetal cerebral oxygenation decreased. Anesthesia also appeared to reduce fetal cerebral blood volume as measured by a decrease in fetal cerebral total hemoglobin. In contrast, fetal arterial blood oxygenation levels did not change during the study. This preliminary result suggests general anesthesia can alter the amount and supply of oxygen to the fetal brain. It is important to note that the study involved healthy sheep fetuses. Data from previous studies suggests that CO2 pneumoperitoneum can produce a substantial amount of fetal acidemia and hypercarbia. How these fetal physiologic effects of insuffla-tion interact with the anesthetic effects reported here may warrant further investigation.
NEW APPROACH OF A 3D VIRTUAL COLOSCOPY: AUTOMATIC TREATMENT FROM THE MRI DATA

Lamy J., Mutter D., Soler L., Rubino F., Vasilescu C., Roy C., Leroy J., Marescaux J.

**March 16, 2002: Poster Abstracts**

The first results obtained with this original method confirm the feasibility of using a totally automated system for reconstruction of the anatomy of the biliary tract. It allows virtual navigation into the lumen of the biliary tree, the detection of stones, and interactivity. Digital data acquired through a cholangio-MRI (Philips, 1.0 T, sequence TSE T1) are processed by a software which: 1- reduces noise and increases image contrast by anisotropic diffusion; 2- identifies and reconstructs biliary vessels; 3- permits intra-luminal navigation in the biliary vessels and identifies bile stones. 26 patients with suspected lithiasis of the CBD were enrolled. MRI were evaluated by a radiologist and 3D reconstruction by a computer scientist blind to the radiologic evaluation. All patients underwent intraoperative cholangiography (IOC) or ERC.

The software used for automatic 3D reconstruction of the biliary tract allowed excellent definition of the anatomy of biliary vessels greater than 3 mm. MRI revealed lithiasis of the CBD in 7 cases (4 confirmed by either ERC or IOC, 3 false positive). With 3D reconstruction, CBD lithiasis was diagnosed in 8 cases (5 confirmed, 3 false positive at IOC or ERC). Two false negative cases (failure to identify lithiasis of the CBD) occurred with cholangio-MRI, and one with 3D reconstruction. Concordance between the two methods in recognizing biliary stones was found in 4 cases, while both methods accuracy predicted the absence of lithiasis in 18 patients (true negatives).

Our results show the feasibility of using a totally automated system for reconstruction of the anatomy of the biliary tract. It allows virtual navigation, automated stone recognition, and identification of anatomical abnormalities before surgery. It may represent a valuable alternative for non-invasive preop diagnosis of CBD lithiasis. Improvements of the program are likely to increase quality and precision of this new method.

NEW APPROACH OF A 3D VIRTUAL CHOLANGIOGRAPHY: EVALUATION OF A NEW COMPUTERIZED TECHNIQUE

Rubino F., Lamy J., Mutter D., Soler L., Roy C., Leroy J., Marescaux J.

The first results obtained with this original method confirm the feasibility of using a totally automated system for reconstruction of the anatomy of the biliary tract. It allows virtual navigation into the lumen of the biliary tree, the detection of stones, and interactivity. Digital data acquired through a cholangio-MRI (Philips, 1.0 T, sequence TSE T1) are processed by a software which: 1- reduces noise and increases image contrast by anisotropic diffusion; 2- identifies and reconstructs biliary vessels; 3- permits intra-luminal navigation in the biliary vessels and identifies bile stones. 26 patients with suspected lithiasis of the CBD were enrolled. MRI were evaluated by a radiologist and 3D reconstruction by a computer scientist blind to the radiologic evaluation. All patients underwent intraoperative cholangiography (IOC) or ERC.

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INITIAL EXPERIENCES WITH ROBOT-ASSISTED LAPAROSCOPIC SURGERY: A REPORT OF 30 LAPAROSCOPIC CHOLECYSTECTOMIES WITH THE USE OF THE DA VINCI SYSTEM

J.P. Ruurda, M.D., I.A.M.J. Broeders, M.D., Ph.D., R.P.M. Simmermacher, M.D., Ph.D., I.H.M. Borel Rinkes, M.D., Ph.D., T.H.J. van Heerden, M.D., Ph.D. Department of Surgery, University Medical Center Utrecht, Utrecht, The Netherlands

**Introduction:** In order to cope with the limitations in laparoscopic surgery, researchers started developing new tools for laparoscopic surgery, starting with camera guidance systems. Finally this resulted in the development of robotic telemanipulation systems, which provide the surgeon with visualization and manipulation capacities comparable to open surgery. To demonstrate and evaluate technical feasibility of robotic assisted surgery, 30 laparoscopic cholecystectomies were performed.

**Methods:** 30 robot-assisted laparoscopic cholecystectomies were performed with the Da Vinci system (Intuitive Surgical, Mountain View, California). The system consists of a master-console, and a 3 armed robotic telemanipulator, located at the operating table. From the console, the surgeon makes virtual manipulations to the patient, while the robot is controlling the movements of the tips of two different instruments, and the registration of two different camera positions. The surgeon’s movements are transposed to the tips of tiny instruments, where the Endowrist system provides the surgeon with seven DOF. The double optic system provides a 3D image, integrated in the console. The natural eye-hand-target axis is hereby restored. Set-up time, OR-time, complications and technical problems were recorded and evaluated.

**Results:** In 29 cases (97%), the cholecystectomy was completed laparoscopically. There was one conversion to an open procedure, caused by the surgeons’ incapability to manipulate the gallbladder, due to severe cholecystitis. There were no robot-related complications. In three cases the replaceable blade of the electrocautery instrument detached, but could be removed during the same session. The time needed to install the robotic system decreased with experience of the OR-crew. Operating time was comparable in robot-assisted cases to time needed for laparoscopic cholecystectomy.

**Conclusion:** Technical feasibility of robot assisted laparoscopic cholecystectomy was demonstrated. No significant problems were noted during these procedures. The system showed to enhance the surgeon’s dexterity and visualization possibilities.
NEW TECHNIQUES/TECHNOLOGY–PS209

NEW METHOD OF VIDEOBIASTOSCOPY USING SUBCU-DISSECTOR Yoshikumi Sano, M.D., Akio Ando, M.D., Motoi Aoe, M.D., Kazunori Okabe, M.D., Hiroshi Date, M.D., Nobuyoshi Shimizu, M.D., Department of Surgery II, Okayama University Medical School, Okayama, JAPAN

Introduction. Mediastinoscopy has become an important procedure for evaluating thoracic diseases and for staging of lung cancer. On the other hand, videomediastoscopy has widely accepted in many fields of surgery. We developed a new method of videomediastinoscopy with SUBCU-DISSECTOR(R), and it was very useful for biopsy of mediastinal lymph nodes.

Materials and methods. We have done five cases of videomediastinoscopy with a new method for biopsy of mediastinal lymph nodes. The tool we have used for videomediastinoscopy is SUBCU-DISSECTOR(R) with a 30-degree oblique view thoracoscope (5mm in diameter). The procedure to reach for the space of mediastinum is as same as that of conventional mediastinoscopy, SUBCU-DISSECTOR(R) is moved forward just the front of the trachea, and perform the examination.

Results. There was no severe operative or postoperative complication with this method. The average time of procedure with this method was a little bit longer than that with the conventional one, however, the amount of bleeding was smaller.

Conclusions. There are many advantages using this method. As this method provides very clear and wide view, it is possible to detect anatomical structures such as the vessels and the nervous precisely. Therefore, we can perform the examination very safely and reliably. Moreover, it facilitates good movement of the endoscopic instruments for suction, hemostases, or biopsy. In addition, it is very useful for education, because many people can observe the procedures through monitors simultaneously.

NEW TECHNIQUES/TECHNOLOGY–PS210

DEAD HOLDER TELESCOPE/LIVER DETRACTOR IN LAPAROSCOPIC HIASTUS HERNIA REPAIR & FLOPPY Nissen fundoplication, is a technically demanding procedure that usually requires 2 experienced assistants(not always available in developing countries). A simple new dual holder of telescope and liver retractors with adjustable, movable long rods & clamps that can fix the liver retractor and the telescope in position whilst allowing adjustments of the same during the course of the operation was developed at our institution, with the assistance of Gliwski, Germany. This allows the need for only one assistant whilst maintaining the flexibility of adjustment of the telescope and change of port use. Ten patients were prospectively randomized to 2 groups having the conventional procedure done with two assistants the other one assistant and the use of the new dual holder. Length of time of procedure ease of use, problems and complications were analyzed. On the conventional method the operating time was 2h37min(2h10min–2h50min) and with the new dual holder 2h10min(1h55–2h34min). With two assistants sliding of the liver retractor occurred frequently requiring re-positioning. Laceration of the liver and the need for focusing adjustments. With the dual holder the position of the telescope was in the same fixed position 90% of the time and there was never need for adjustment of the position of the liver retractor.

Conclusion: The newly developed dual scope holder offers significant advantages in simplifying laparoscopic Nissen fundoplication in time saving particularly and in requiring only one assistant.

NEW TECHNIQUES/TECHNOLOGY–PS211

LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR USING A NEW BIOMATERIAL MESH. Philip Schauer MD, Saeed Ikramuddin MD, Giselle Hamad MD, William Gourash CNP, James Luketich MD. The Minimally Invasive Surgery Center, University of Pittsburgh, Pittsburgh, PA

Early recurrences after suture repair of Paraesophageal Herna have been reported to as high as 20%. There is a postulated relationship of synthetic mesh related complications such as Marlex or Gortex to reinforce the hiatal repair to reduce recurrence. There is no postulated relationship of synthetic mesh related complications such as infection, erosion or recurrent paraesophageal hernia.

METHODS: The Database of Minimally Invasive Chirurgie (DoMinIC) evolved in three phases. Phase I (1991) begin with our very first attempts at laparoscopic splenectomy, colectomy, and thorascopic pulmonary lobectomy. This consisted of simple data sheets on which predetermined clinical endpoints were recorded in free format. Data was later transcribed into a computer program. Phase II (1993) focused on broader data collection and a more efficient retrieval method. All patients having advanced laparoscopic procedures were recorded on modified and expanded data sheets specifically tailored to related categories of surgical procedures. Data was transcribed into a Borland Paradox database through a data entry form that closely mimicked the data sheets in hopes of reducing transcription error. Additionally, extensive use of check boxes, push buttons, and look-up lists was incorporated to speed data entry and ensure homogenous coding of data fields. Phase III of DoMinIC begun in 2000. The main goal was to move toward a direct point of care data entry system that was simple for the end user as well as being readily accessible and easy to use.

RESULTS: All patients undergoing advanced minimally invasive procedures at our centre are captured at each encounter with data entry through a small fleet of Palm devices. Data is then transferred to our server central database through regular hot sync intervals. The central database was rewritten in Microsoft Access to accommodate Pendragon Forms in which the Palm data entry front end was designed.

CONCLUSION: DoMinIC has evolved in our centre as an efficient and accurate means of point of care data entry. This system is easy to use, readily available and highly effective in tracking outcomes of patients having minimally invasive surgical procedures.
New Techniques/Technology-PS213

LAPAROSCOPIC RADIOFREQUENCY ABLATION OF THE LIVER IN PROXIMITY TO MAJOR VASCULATURE: EFFECT OF THE PRINGLE MANEUVER, Perry Shen MD, Shawn Fleming BS, Venkat Challa MD, Carl Westcott MD, Department of General Surgery, Wake Forest University School of Medicine, Winston Salem, NC

Pringle Maneuver (PM) is known to increase ablation size in radiofrequency ablation (RFA). A concern about RFA in close proximity to major vessels is the potential for thermal injury. Laparoscopic RFA with laparoscopic ultrasound guidance was performed in proximity to major hepatic vasculature to examine the effects of PM on ablation size, thermal RFA goals and vascular injury. Laparoscopic RFA was performed in 10 pigs. Each underwent ablation of 3 zones: peripheral, portal vein, and hepatic vein. Laparoscopic ultrasound was used to position the RFA 5 to 8 mm from the vascular structures. US flow characteristics were used to verify effective PM. Five were done with laparoscopically applied PM and 5 without. The liver underwent gross and microscopic evaluation Target ablation temperature of 105 centigrade was obtained for 10 minutes.

There were no significant differences in size for non-PM vs. PM RFA lesions. The average volume of the non-PM peripheral, hepatic vein and portal vein lesions was 5.3 cm3, 8.9 cm3 and 5.5 cm3. The average volume for the corresponding areas ablated using PM were 10.6 cm3, 4.9 cm3 and 11.1 cm3. Target temperature was achieved sooner using PM, 168s vs. 159s (p=0.0084). Histology revealed early evidence of coagulative necrosis of the ablated lesions but no evidence of any vascular damage to hepatic or portal veins. In the 10 portal vein ablations, tissue damage was abutting the vein in 7 pigs and an average of 2.7 mm from the vein in 3 pigs. In the 10 hepatic vein ablations, tissue damage was abutting the vein in 6 pigs and an average of 2.3 mm from the vein in 4 pigs. Of note, in the peripheral lesions, 6 were noted to contain significant vasculature. Laparoscopic RFA, with or without PM close to hepatic vessels does not appear to increase ablation size or cause acute vascular injury.

New Techniques/Technology-PS214

HISTOLOGICAL CHARACTERISTICS OF LAPAROSCOPIC COAGULATION WITH THE TISSUELINK (TM) FLOATING BALL(TM) Carrie Sims MD, Nicholas Stylopolous MD, Julio Clavijo MD, Julie Fuchs MD, Cynthia Barlow MS, Harvard Center for Minimally Invasive Surgery and Massachusetts General Hospital, Boston, MA

OBJECTIVE OF THE STUDY: To determine the histological effects of laparoscopic coagulation of liver and splenic injuries using the TissueLink Floating Ball, a new electrosurgical device. The device provides a continuous saline flow to the electrode which keeps tissue temperature below 100 deg C and prevents sticking, arcing, charring and smoke formation.

METHODS: Nine anesthetized female domestic pigs (30–40 kg). After pneumoperitoneum and port placement, each received 3 liver tip amputations and 3 splenic wedge cut-outs. Each injury was followed by Floating Ball treatment until hemostasis was achieved. Monopolar coag power levels were 25–35 watts (liver) and 35–45 watts (spleen). A flow rate of 4 cc/min was used. Animals were sacrificed immediately post-procedure (acute), 1 wk, and 4 wk later. Depth of necrosis was measured from H & E stained sections. The qualitative characteristics of wound healing were assessed by a pathologist. Other variables included gross evidence of hemoperitoneum and adhesions. Results for depth of necrosis were analyzed (mixed model ANOVA) with terms for interval and organ.

RESULTS: The mean depth of necrosis for liver was 3.2 mm (acute), 6.0 mm (1 wk) and 5.3 mm (4 wk) and were not significant by interval. The results for spleen were 7.0 mm (acute), 7.0 mm (1 wk) and 2.7 mm (4 wk), with the 4 wk data significantly different from acute and 1-wk (P=0.001). No evidence of hemoperitoneum or serious adhesions were found. Acute injuries showed a typical pattern of thermal coagulation necrosis. All injuries healed well with injured tissue surrounded by well-defined bands of collagenous tissue at 1 wk and 4 wks.

CONCLUSIONS: The Floating Ball is very effective in controlling bleeding from hepatic and splenic injuries in pigs and results in acceptable depth of necrosis with satisfactory wound healing.
New Techniques/Technology-PS217

A NEW THERMAL DEVICE FOR TISSUE WELDING. Michael R. Treat M.D., Department of Surgery, Columbia University, New York, New York.

Tissue welding has become an accepted clinical tool for laparoscopic surgery. Clinically successful devices based on radiofrequency and ultrasonic energy are in use today. This presentation reviews tissue welding principles and describes the design and experimental results for a new device for welding blood vessels. In tissue welding, energy is used to denature and coagulate tissue proteins, thereby effecting hemostasis and bonding together of tissues including the walls of blood vessels. Regardless of the initial form of the energy, the final common pathway at the tissue level is thermal. The new device uses thermal energy directly and is capable of dividing a vessel while welding shut each divided end. The device uses a bell-shaped temperature profile in order to accomplish two simultaneous welds as well as subsequent division of the vessel. The central peak portion of the bell-shaped temperature profile performs the cutting while the welding is done on the lower temperature shoulders of the curve. Compared to other energy sources, the new device has the advantage of providing a simple, external view outside the built-in monitor. The production of thermally based tissue welding effects, as well as also being able to divide the tissue without a mechanical cutter. Experimentally, tissue welds were produced in 0.45mm to 0.75mm diameter mesenteric (n=110) and 2mm diameter gastroepiploic (n=4) vessels in a porcine model. Measurements of overall thermal damage width were made in all of the welds. Histological evaluation and bursting pressure measurements were done in a representative subset. Gross and histological measurements show a very limited extent (less than 1mm) of collateral thermal damage associated with satisfactory-appearing welds. All welds subjected to bursting pressure testing withstood pressures in excess of 300 mm Hg.

New Techniques/Technology-PS219

ROBOTIC VERSUS LAPAROSCOPIC HELLER MYOTOMY: REVIEW OF THE INITIAL EXPERIENCE. Santiago Morgan, MD; Daniel Vanuno, MD; Steven J. Schwulst, BA; Marcia Edison PhD; W. Scott Helton, MD., Minimally Invasive Surgery Center, Department of Surgery, University of Illinois at, Chicago, Chicago, IL.

BACKGROUND: The DaVinci ® robotic system provides the following advantages: 360-degree range of motion in the articulated arms of the robot, a 3-dimensional magnified view, and elimination of tremor. Hence, we decided to utilize this system to perform robotic Heller myotomy and compare it to laparoscopic Heller myotomy in order to evaluate the efficacy of robotic surgery in Heller myotomies.

STUDY DESIGN: Prospective study of ten consecutive patients who underwent either robotic Heller myotomy or laparoscopic Heller myotomy between June 2000 and February 2001 for treatment of achalasia. Follow up information was obtained during office visits and a telephone survey was used to assess postoperative symptoms and satisfaction.

RESULTS: The indication for surgery was the presence of achalasia documented by esophagram, manometry, 24 hour pH, and EGD in all cases. Myotomy was combined with a partial anterior Dor fundoplication in all ten cases. The mean operative time for the myotomy portion of the operation was significantly decreased in the robotic group with 17.8 minutes, while in the laparoscopic group the mean operative time was 33.6 minutes. Independent T-tests of our patients' postoperative symptom assessments, such as heartburn, dysphagia to solids, dysphagia to liquids, belching, and bloating, showed no significant difference between the robotic and laparoscopic groups. The mean hospital stay was 1.8 days in the robotic group and 2.4 days in the laparoscopic group. No esophageal perforations or major complications were observed.

CONCLUSION: This early experience suggests that robotic Heller myotomy provides similar results to laparoscopic Heller myotomy shortening the overall time of the myotomy portion of the operation. We believe that robotic surgery, with its ability to regain the hand-eye coordination and 3-dimensional view lost in laparoscopic surgery, allows us to perform Heller myotomy with greater precision, confidence and comfort.

New Techniques/Technology-PS218

USE OF HEAD-MOUNTED DISPLAY IN TRANSANAL ENDO-SCOPIC MICROSURGERY. Van Koesveld, J.J.M., M.D., Tetteroo, G.W.M., Ph.D., De Graaf, E.J.R., M.D. Department of Surgery, IJsselland Hospital, Capelle aan den IJssel.

To the operating team, endoscopic surgery is physically more demanding than conventional surgery, because of an increase in forced adjustments of position and eyes. The use of Head-Mounted Display (HMD) might decrease these adjustments. We investigated the feasibility of HMD in Transanal Endoscopic Microsurgery (TEM).

HMD is a voice controlled system with lightweight helmets with a built-in, adjustable monitor. Two separate lens- and camera systems within one endoscope provide overlapping images at the monitors, enabling a thoroughly three-dimensional view. The view within the helmet remains in direct line of sight of the eyes with stable focus distance, independent of position. During TEM, standard stereoscopic optic and HMD were alternated. Use of HMD was possible with few adaptations. The helmet was comfortable to wear. External view outside the built-in monitor was adequate. It was experienced a great relief to operate in upright and relaxed position with a constant view on the operating field. Position was only restricted by the manipulation of inserted instruments. Range of vision, depth of vision and resolution seemed comparable to the standard stereoscopic optic. Adjusting the HMD for optimum viewing required practice.

HMD is feasible in TEM. It enables a more relaxed position and view on the operative field. These initial findings encourage further investigation.

New Techniques/Technology-PS220

LESS INVASIVE VIDEO-ASSISTED SURGERY FOR THYMIC DISEASES THROUGH MINI-STERNOTOMY -ESPECIALLY EXTENDED THYMECTOMY FOR MYASTHENIA GRAVIS- Masazumi Watanabe M.D., Ryoei Yozu M.D., Makoto Sawafuji M.D., Masafumi Kawamura M.D., Hirohsa Horinouchi M.D., Koichi Kobayashi M.D, Department of Surgery, School of Medicine, Keio University, Tokyo.

Background: Median sternotomy or standard thoracotomy has been used for surgery of the anterior mediastinum as a conventional approach. Recently thoracoscopic approach which usually needs approach from bilateral chest wall, has been introduced as a less invasive approach. We present thymectomy through mini-sternotomy as a new approach to thymic diseases including Myasthenia Gravis (MG).

Methods: About 6 cm long skin incision was made and sternum was traversed at the second intercostal space level. Using original sternum lifting device, video-assisted thymectomy was performed via mini-sternotomy.

Results: This procedure was performed in 5 patients with MG (2) and thymic cyst (3). Extended thymectomy was performed in 2 patients with MG. Complication during surgery was not seen. Their post operative course was uneventful in 5 cases. This procedure does not need approach through thoracic cavity. Treatment of thymic vein which is usually the most sensitive manipulation in thymectomy is easier than thoracoscopic approach.

Conclusion: This procedure may be useful from the standpoint of minimal access and good cosmetic results because of no scar in cervical region. Information about long term relief of the myasthenic symptoms, however, is not available.
SATURDAY March 16, 2002: Poster Abstracts

New Techniques/Technology-PS221

ISOBARIC LAPAROSCOPY MADE EASY BY THE LAPAROTENSER. Wenger U, Waage A, Jersenius U, Arvidsson D., Department of surgery, Karolinska Hospital, Stockholm

Introduction: Isobaric* laparoscopy is potentially of great interest since pneumoperitoneum is avoided. This is of special interest in malignant disease and for patients with severe cardiopulmonary dysfunction. Abdominal wall-lifting replaces pneumoperitoneum.

Methods and procedures: The Laparotenser is a device were two pluriplan needles, inserted subcutaneously, and then attached to a lifting device, creates a working space within the abdominal cavity. Depending on its placement it can be used for surgery within various parts of the abdomen.

Results: The device has been tested by our group in 12 operations (cholecystectomy, fundoplication, staging of malignant disease and splenectomy). The procedures were done in the same manner as when using pneumoperitoneum, without an increase in operating time or change of instrumentation.

Conclusions: The Laparotenser, an Italian construction, is the best abdominal wall-lifting device that we have encountered. It warrants further testing and could open the road to more laparoscopic surgery for malignant disease such as gastric, pancreatic and hepatic cancer. (A short video-clip can be added to the presentation if of interest).

* used instead of gasless since the abdominal cavity is actually filled with air at room pressure.

New Techniques/Technology-PS222

LIGA-SUTURING DEVICE FOR ENDOSCOPIC SURGERY. T. Yarnakawa, MD, Department of Surgery, Teikyo University Hospital at Mizonokuchi, M. Hirata, Hirata Precision Co. Ltd., Chiba, Japan

The spread of advanced endoscopic surgery is seemed to be very slow mainly because of technical infancy. Especially technologies of knotting and suturing are one of the problems for the majority of endoscopic surgeons. To overcome these problems, an instrument for ligature and suturing was developed by Hirata Precision Co. Ltd in Japan.

The total length of this instrument is 462 mm long. The grip, 162 mm long, is connected to 300 mm long metallic tube, 5 mm in diameter. A removable 28mm long bobbin with 5 ditches, 5 mm in diameter, is installed in the grip at the tip of the metallic tube. Moreover the slider, metallic board, which is also connected to the grip offers 5 steps longitudinal movement through the interior of metallic tube and bobbin, by maneuvering the lever installed in the grip to make a knot. First, the end of suture material with a needle is fixed at the tip of the slider. Then, the needle sews the tissue and is passed through the hole produced by slider and bobbin to wind the suture material around the slider. At the same time, with the inward movement of the slider, the suture material will come off from the bobbin and a knot will be established. Along the same theory, a single knot, a surgical knot, and a continuous and interrupted suturing can all be easily and simply carried out. Depending on the number of times the suture material is wrapped around the slider, different knots can be made. For example, if it is wrapped around one time, a single knot will result, two times produces a surgical knot, etc. Moreover repeated knottings can be also carried out if the Slider was returned to the initial stage by pushing rear handle installed in the Grip.

The authors believe that laparoscopic surgery can be more safely and securely carried out by the use of this new instrument.

New Techniques/Technology-PS223

INTRAVERISCAL ENDOSCOPIC URETERIC REPLANTATION FOR OBSTRUCTIVE MEGAURETERS UNDER CARBON DIOXIDE PNEUMOVESICUM. CK Young, M.D., WQ Menson, JDY Shoo, YH Tam, HK Loo. Division of Paediatric Surgery, Department of Surgery, Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong, China

Currently, primary megaureter associated with ureterovesical obstruction that has not responded to conservative treatment is usually managed by ureteric reimplantation. The approach however necessitates a large vesicotomy and transgression of the peritoneal cavity and can be technically difficult in the small pelvis of a young child. Objective: To evaluate the effectiveness of intravesical ureteric mobilization and transtestinal ureteric reimplantation under carbon dioxide insufflation of the bladder, or pneumovesicum, for the management of obstructive megalourerets in infants and children.

Patients and Methods: A 10-month-old boy and a 1.5 year old girl with a unilateral obstructive megaureter underwent endoscopic Cohen’s transtestinal ureteric reimplantation with carbon dioxide pneumovesicum. The endoscopic procedure was preceded by distension of the bladder and insertion of a 5 mm Stent port over the bladder dome under cystoscopic guidance. The bladder was then kept insufflated with carbon dioxide at 10-12 mm Hg pressure, with a balloon catheter inserted per urethra to occlude the internal urethral meatus. A 5 mm 20 degree scope was used to provide intravesical vision. Two more 3-5 mm working ports were then inserted. Intravesical mobilization of the ureters, resection of the hypoplastic or obstructive segments of lower ureter, and dissection of submucosal tunnel were performed under endoscopic vision with CO2 pneumovesicum. A Cohen’s type of ureteric reimplantation using interrupted 5 zero polyglactin 910 sutures was then performed. Bladder drainage by an urethral catheter was maintained for 48 hours post-operatively.

Results: Endoscopic transtestinal ureteric reimplantation with carbon dioxide pneumovesicum can be a safe and effective management option for obstructive megaureter in infants and young children. The long-term outcome and potential physiological effects of carbon dioxide pneumovesicum on the bladder and upper tract function will need to be further evaluated.

New Techniques/Technology-PS224

ENDOSCOPIC INTRATHORACIC SURGERY UNDER NEGATIVE PRESSURE AND SPONTANEOUS RESPIRATION Masayoshi Yokoyama, M.D., Takashi Adachi, M.D., and Takamasa Ohnuki, M.D., Department of Surgery 1, Tokyo Women’s Medical University, Tokyo, Japan

Purpose: As epicardial pacing would be helpful in surgical cases requiring multisite pacing, this study was aimed to determine if an epicardial lead could be fixed under negative pressure and spontaneous respiration without general anesthesia for experimental dogs.

Methods: After administering intravenous injection of pentobarbital sodium, experimental dogs were placed in the supine position. Intratracheal tubation was not employed. A thoracic port with an internal diameter of 20mm was inserted through the left, fifth intercostals space at the midclavicular line. The heart surface was clearly visible through this port. By applying Bernoulli theorem (pitot tube), negative intrathoracic pressure could be maintained inside the port and the pleural cavity by blowing a constan air flow of 3 l/sec across the mouth of the port.

Results: 

SpO2 measured on the tongue remained above 93% throughout the procedure. Normal respiratory function of dogs was restored and intrathoracic fiberscope revealed lung movement during the air flow. The port could be cuffed if necessary. It was very easy to fix a screw-in epicardial electrode on the left ventricular wall with the heart surface positioned just beneath the thoracic wall. It required less than 6 minutes.

Conclusion: By blowing air across the opening of an intrathoracic port, negative pressure can be maintained in the pleural cavity. This procedure made it possible and simple to place a screw-in epicardial lead to the myocardial wall under negative pressure and spontaneous respiration without general anesthesia.
LAPAROSCOPIC DONOR NEPHRECTOMY IN THE SUPER MORBIDLY OBESE  
Joseph F, Buell MD, Steven R. Potter MD, Kieth Gerish MD, Horatio Riio MD, Rino Munda MD, Michael J. Hanaway MD, E. Steve Woodle MD, Division of Transplantation, Department of Surgery, The University of Cincinnati, Cincinnati, Ohio

Technical aspects have dissuaded many from approaching the obese donor (BMI >32) let alone the super morbidly obese (BMI >35) patient. Hand-assisted laparoscopic (HAL) donor nephrectomy has minimized our resistant to these donors Methods: Review of 100 HAL donors with a BMI < 35 (NMO) and 50 donors with a BMI > 35 (SMO) were identified and compared to 87 donors with a BMI < 35 (NMO). SMO M:F distribution was equal 1:1 vs. NMO 2:5:1 with similar age. A higher percentage of right HAL were performed in the NMO group 15% vs. 5%. The OR time a 4.2 vs. 3.8 hrs; p<0.05, extraction and warm ischemia time 3:47 vs. 2:45; p<0.05 were longer. EBL (140.4 vs. 138.8 cc), fluid resuscitation (3.4 vs. 3.4 L), and urine output (1.1 vs. 1.0L) were similar. Complications were significantly higher in the SMO group 5/13:38% vs. 22/88; 25%; p< 0.05. Positioning complications, splenic injuries and extraction difficulties were common in this group. PTX, bleeding and ileus were the most commonly encountered in the NMO group. Return to diet (15.8 vs. 17.1 hrs) and length of stay (54.4 vs. 51.6 hrs) were similar. Return to driving a car (12.2 vs. 11.8 hrs) was longer but return to work (26.3 vs. 30.6 d) was slightly shorter. Immediate graft function was present in all SMO and 99% of the SMO organs. A higher mean Cr is noted at day 1 (4.6 vs. 3.6;p=NS), 7 (1.5 vs. 1.4;p=NS), and 30 (1.6 vs 1.2;p<0.06). By 2 months creatinine was equalized through the first year of follow-up. Conclusions: This study demonstrates that there is a significant increase in operative times with ischemia to the graft and donor complications. These factors may result in diminished graft function. Despite the small numbers of patients in the SMO group the donor surgeon should be circumspect about patients with BMIs >35 and avoid those >40.

LAPAROSCOPIC DONOR NEPHRECTOMY DOES NOT ADVERSELY AFFECT LONG-TERM QUALITY OF LIFE
Robert T. Bell M.D., Eugene Cho M.D., Christopher Lutkavage M.D., Kate E Reinhardt R.N., Stephen Jacobs M.D., and John L. Flowers M.D., Department of Surgery, University of Maryland School of Medicine, Baltimore, Maryland

Introduction: Laparoscopic donor nephrectomy (LDN) is being increasingly performed. Though multiple studies have confirmed the feasibility of LDN, to date, no data exist that describe long-term donor quality of life. Clinical measures of outcome may not sufficiently reflect the complete impact of surgery. The short form 36 (SF-36) is a widely used, well-validated tool for measuring outcomes in eight specific health areas. The aim of this study is to determine quality of life in a single institution cohort five years after surgery. 

Methods: A total of 69 patients underwent laparoscopic donor nephrectomy between March, 1996 and March, 1997. Five years after surgery, 37 patients completed follow-up questionnaires. Outcome was evaluated with respect to sex, age, length of hospital stay, return to work, and annual income. A two-tailed, paired t test was used to make statistical comparisons.

Results: The study cohort comprised 24 females and 13 males, with a mean age of 46.7 years and a mean annual income of $46,875. The postoperative length of stay and return to work averaged 2.9 days and 18.5 days, respectively. Four of the eight SF-36 health categories (physical functioning, role functional-physical, bodily pain, and role functional-emotional) were significantly higher than the general population and four of the eight health categories (general health, vitality, social functioning, and mental health) were no different than the general population. Sex, age, length of hospital stay, return to work, or annual income had no relationship to outcome.

Conclusions: Patients who have undergone laparoscopic donor nephrectomy do not experience a decreased quality of life five years after surgery, as determined by the SF-36 questionnaire.
LIVING RELATED ROBOTIC DONOR NEPHRECTOMY

F. Eli, MD; R. Berger, MD; E. Benedetti, MD, S. Horgan, MD, Minimally Invasive Surgery Center, University of Illinois at Chicago, Illinois

**Introduction:** We present our early experience of 17 minimally invasive donor nephrectomies using the da Vinci Surgical System (tm) with hand port assistance.

**Methods:** Between January and August 2001, 17 patients underwent robotic donor nephrectomy. A hand port assisted, transperitoneal technique was used on all patients. A retrospective review evaluated donor demographics, preoperative workup, intraoperative times and complications, and postoperative recovery and complications.

**Results:** Seventeen patients underwent left robotic donor nephrectomy. No patient required conversion, either to conventional laparoscopy or to an open operation. There were eleven males; mean age of 33.7, only four patients had duplicated renal arteries on preoperative CT scan. Preoperative creatinine level ranged from 0.6 to 1.2 with postoperative creatinine from 1.0 to 1.9. Average operative time was 218 minutes. Blood loss was less than 50 ml in all procedures. Warm ischemic time was from 1 to 1 and a half minutes. No intraoperative complications occurred. Length of stay ranged from 0.8 to 6.3 days (average 2.5). Three patients had an ileus that prolonged their hospital stay (4.3 to 6.3 days). Two patients required readmission, one with abdominal pain and another with dehydration secondary to vomiting.

**Conclusions:** Robotic donor nephrectomy affords a new operation with results comparable to conventional hand assisted laparoscopic donor nephrectomy. The hand-assisted technique in conjunction with the da Vinci Surgical System (tm) affords a new operation for hematologic disease. Patients with concomitant rheumatologic disease or HIV were excluded. Data were compared using the Fishers exact and Mann-Whitney U tests. Results are expressed as medians.

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**Solid Organ Removal-PS229**

FACTORS PREDICTING RESPONSE OF LAPAROSCOPIC SPLENECTOMY IN PATIENTS WITH IMMUNE THROMBOCYTOPENIC PURPURA (ITP) TERIVE DUPERIER, MD, MIKE ROSEN, MD, FRED BRODY, MD. R. MATTHEW WALSH, MD, ALICIA FANNING, MD, JENNIFER MALM, RN, JEFFREY PONSKY, MD. DEPARTMENT OF GENERAL AND MINIMALLY INVASIVE SURGERY, THE CLEVELAND CLINIC FOUNDATION(CCF), CLEVELAND, OH

There are little data examining factors that predict successful response to laparoscopic splenectomy (LS) for ITP. This study examines preoperative factors that may predict a successful response to LS in ITP patients. A retrospective review of 67 patients undergoing LS for ITP from 8/95–8/01 was conducted. A response to splenectomy was defined as a postoperative platelet (PLT) count>100,000/mcl without medical therapy. Patients considered refractory to splenectomy did not achieve a PLT count >100,000/mcl without medical therapy. Patients with recurrent ITP initially achieved a PLT count >100,000/mcl but subsequently became thrombocytopenic during follow up. Both univariate and multivariate analysis were performed for 13 preoperative variables.

At a mean follow up of 22 months, 43(64%) patients responded to LS, 14(21%) were refractory, and 10(15%) developed recurrent ITP. Univariate analysis revealed that patients responding to LS were younger (mean age 43 vs 59 yr,p=0.005), had a higher mean preoperative PLT count (86,000 vs 48,000/mcl,p=0.0003), and initially responded to steroids, but relapsed with tapering (70 vs 38%; p=0.004 ) as compared to those patients who failed LS. Refractory patients were older (mean age 55 vs 44 yr,p=0.05), had a lower mean postoperative PLT count (113,000 vs 540,000/mcl,p=0.0003), and did not respond to preoperative intravenous gamma-globulin. Patients with recurrent ITP were older (mean age 64 vs 44 yr,p=0.01). On multivariate analysis, a younger mean age (43 vs 59 yr,p=0.005) and a higher mean preoperative PLT count (95,000 vs 45,000/mcl,p=0.007) predicted a response to LS. Refractory patients had a lower mean preoperative PLT count (36,000 vs 98,000/mcl,p=0.01) and had a higher mean age (55 vs 44 yr,p=0.03). In addition, a higher mean age (64 vs 44 yr,p=0.03) predicted recurrent ITP.

A long-lasting response to LS for ITP was seen in patients younger than 50 years of age with preoperative PLT counts>70,000/mcl.

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**Solid Organ Removal-PS232**

LAPAROSCOPIC VERSUS OPEN SPLENECTOMY FOR ITP: A CASE-MATCHED COMPARISON

Liane S Feldman MD,
Solid Organ Removal–PS233

TREATMENT OF ADRENAL METASTASES BY LAPAROSCOPIC TRANSPERITONEAL ANTERIOR APPROACH. Francesco Felicelli, M.D., Mario Guerrieri, M.D., Maddalena Baldirelli, M.D., Alessandro M. Paganini, M.D., *Emanuele Lezoche, M.D. Clinica di Chirurgia Generale, University of Ancona, Ancona, Italy. * Il Clinica Chirurgica, University of “La Sapienza”. Roma, Italy

Laparoscopic surgery changed the approach to the adrenal gland. The recent literature demonstrated the safety and the effectiveness of this procedure for benign adrenal disorders; aldosteronoma, pheochromocytoma, Cushing’s disease and incidental adrenal mass. Aim of this study was to evaluate the feasibility and results of 5 laparoscopic adrenalectomies performed for solitary metastatic adrenal metastases.

Between January 1994 to June 2001, 142 consecutive patients (pts) underwent laparoscopic adrenalectomy by anterior transperitoneal approach. In 5 pts indications were solitary adrenal metastases. The metastatic sources were the followings: melanoma of the back, gastric cancer, renal, lung and breast cancer, respectively. Three males and 2 females were operated, average age was 57 years (range, 44-70). Three pts underwent right adrenalectomy and 2 pts left adrenalectomy.

No conversion to open surgery occurred. No mortality nor intraoperative complications were observed. Mean operative time was 103 minutes (range, 70 -150) for right adrenalectomy and 172 minutes (range 90-280) for left adrenalectomy. No postoperative complications occurred. Mean diameter of the tumor was 3.5 cm (range 2-5). All surgical margins were free of cancer. Average hospital stay was 2 days (range 2-3). Two pts died after 15 months and 24 months for systemic metastases. The other 3 pts, at mean follow-up of 4 months (range 2-6) are alive. Nobody of the 5 pts presented with port site or local recurrence.

In our experience adrenal metastases can be treated safely and effectively by laparoscopic anterior transperitoneal approach. This access allows to explore the contralateral gland and the entire abdomen for accurate staging of disease. Moreover the anterior approach permits the early ligation of main adrenal vein and the rapid conversion to open surgery.

Solid Organ Removal–PS235

LAPAROSCOPIC MANAGEMENT OF SPLENIC TRAUMA: CASE REPORT AND REVIEW OF THE LITERATURE. Patrick G. Jackson, M.D. Department of Surgery, Massachusetts General Hospital

The role of laparoscopic management of splenic injuries remains an area of debate. While studies show that laparoscopic splenectomy can be performed with fewer complications and less blood loss, the increased operative times associated with laparoscopic splenectomy may preclude its widespread use in the trauma patient. We present a case report of a grade II splenic laceration managed by laparoscopy.

Case report: A 71 year old male presented to the Emergency Ward complaining of multiple episodes of dizziness, near syncope and multiple falls over the previous six months. His past medical history was significant for atrial fibrillation. His medications included Atenolol, Digoxin, and Coumadin. His physical examination was remarkable for an irregular irregular rhythm, and tenderness to palpation over his left upper quadrant. An abdominal CT scan showed a grade II splenectomy involving the upper pole, with minimal extravasation. He was admitted to the hospital where he remained hemodynamically normal with a stable hematocrit. With a need for lifelong anticoagulation and the history of multiple falls, the decision was made to perform a splenectomy. He was brought to the operating theater where he underwent a laparoscopic splenectomy. The estimated blood loss was 100 mls, and the operative time was 105 minutes. The patient recovered uneventfully.

Discussion: The use of laparoscopy in the management of splenic injuries from blunt trauma is poorly defined. Large studies comparing laparoscopic with open splenectomy has shown a lower complication rate, and reduced blood loss but longer operative times with laparoscopic splenectomy. As most abdominal procedures in the setting of trauma focus on initial control of damage, the increased operative times may jeopardize patient care. While the definitive role of laparoscopic splenectomy remains unclear, the case presented suggests that laparoscopy can be used safely in the management of splenic trauma.

Solid Organ Removal–PS234

RIGHT HEPATIC DUCT EMPTYING INTO CYSTIC DUCT-REPORT OF A CASE- Masaji Hashimoto, M.D., Ph.D., Tsuyoshi Ishikawa, M.D., Toshiro Iizuka, M.D., Masamichi Matsuda, M.D., Goro Watanabe, M.D., Department of Digestive Surgery, Toranomon Hospital, Tokyo, Japan

Background: Anomalous insertion of the right hepatic duct into the cystic duct is a rare anatomical variation. Only 9 cases have been reported in the literature so far. In the patients presenting this anomaly, one may accidentally transect the right hepatic duct during cholecystectomy.

Methods and Results: We encountered a case of anomalous insertion of the right hepatic duct into the cystic duct, which was clearly demonstrated the intraoperative cholangiography. As the half-cut point of the cystic duct happened to be on the gallbladder side of the cystic duct, cholecystectomy was accomplished laparoscopically.

Conclusions: In anomalous insertion of the right hepatic duct into the cystic duct, hepatic duct transection could happen. Preoperative precise evaluation of the biliary duct, awareness of potential biliary variations and identifying all anatomic structures before ligation and division were essential to prevent bile duct injury.

Solid Organ Removal–PS236

LAPAROSCOPIC SPLENECTOMY: THE EARLY EXPERIENCE. A Jensen, BS, PK Papasavas, MD, PF Caushaj, MD, J Mauer, PA-C, RJ Keenin, MD, RJ Landreneau, MD, DJ Gagné, MD Minimal Invasive Surgery Program, West Penn Allegheny Health System, Pittsburgh, PA

The laparoscopic technique has rapidly become the standard of care for splenic removal. We reviewed the outcome of laparoscopic splenectomies in patients with a wide range of hematologic or splenic disorders.

Data was gathered prospectively for 21 consecutive laparoscopic splenectomies performed between June 1999 and August 2001. Indications for splenectomy included warm autoimmune hemolytic anemia (WAHA N=7), idiopathic thrombocytopenic purpura (ITP N=7), thrombotic thrombocytopenic purpura (TPP N=2) and other hematologic disorders (hereditary spherocytosis, acute lymphocytic anemia, hypersplenism, lymphoma, and splenic cyst).

Mean Values

<table>
<thead>
<tr>
<th>Procedure</th>
<th>N</th>
<th>OR Time</th>
<th>Splen Size</th>
<th>EBL</th>
<th>Preop Hct</th>
<th>Postop Hct</th>
<th>Preop Plt</th>
<th>Postop Plt</th>
<th>F/U</th>
<th>LOS</th>
<th>N</th>
<th>days</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITP</td>
<td>7</td>
<td>167</td>
<td>192 g</td>
<td>201</td>
<td>98</td>
<td>N/A</td>
<td>125</td>
<td>N/A</td>
<td>N/A</td>
<td>15</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>TPP</td>
<td>2</td>
<td>240</td>
<td>425 g</td>
<td>111</td>
<td>N/A</td>
<td>N/A</td>
<td>110</td>
<td>N/A</td>
<td>N/A</td>
<td>14</td>
<td>19.0</td>
<td></td>
</tr>
<tr>
<td>WAHA</td>
<td>250</td>
<td>705 g</td>
<td>39</td>
<td>173</td>
<td>361</td>
<td>27.2</td>
<td>25.9</td>
<td>47.7</td>
<td>37.1</td>
<td>135</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>244</td>
<td>790 g</td>
<td>275</td>
<td>174</td>
<td>302</td>
<td>31.6</td>
<td>27.1</td>
<td>47.4</td>
<td>37.1</td>
<td>135</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

Six cases (29%) required hand assisted extraction to facilitate removal of the specimen (mean weight 1227g). No cases required conversion. Two accessory spleens (9.6%) were found and removed. Postoperative complications occurred in eight patients (38%) and included subdural hematoma (2), pneumonia (1), sepsis (1), urinary tract infection (1), respiratory failure (1) and herniated trocar site (1). Two patients (9.5%) died due to postoperative complications not related to splenectomy. One patient died secondary to a subdural hematoma after a fall and another patient suffered respiratory failure due to preexisting pulmonary aspergillosis. Laparoscopic splenectomy can be safely performed to treat hematologic diseases with acceptable morbidity and mortality.
Solid Organ Removal–PS237

LAPAROSCOPIC ADRENECTOMY (RETROPERITONEAL APPROACH) Remi Katori, Kazunori Furuta, Tetsuya Tomonaga, Takuo Enomoto, Hiroki Hoshino, Koichi Itabashi, Ken Shimada, Tsuyoshi Takahashi, Akira Kakita, Department of Surgery, Kitasato University Hospital, Kanagawa, Japan

Since Clayman et al. reported the technique of laparoscopic nephrectomy in 1991, some reports showed adrenal tumor were resected in laparoscopically. But these all reports were reached to retroperitoneal space using transabdominal approach. After that, we would be able to operate in retroperitoneoscopically, same as transabdominal approach.

We present our case of retroperitoneal approach for right adrenal tumor.

Left semi-lateral position under general anesthesia, the first cutaneous incision is performed at right subcostal line on the middle axillary line. After incision, the finger are inserted into retroperitoneal space directly, and dissecting balloon is inserted and insufflated. The between tumor and retroperitoniun is dissected. After dissecting balloon is removed, the first trocar with balloon is inserted and insufflated with CO2. Retroperitoneal cavity for operation is made. At this point, the laparoscope is inserted through the trocar. After making retroperitoneal space, other two trocar are inserted as operative trocar on the posterior axillary line. Using these trocar, the tumor is dissected and adrenal vein is clipped and cut off. This technique is indicated for patients whose the tumor is diagnosed benign tumor preoperatively. We think that it is possible to resect the tumor that size of until about 5cm in a diameter in this technique.

The advantage of retroperitoneal approach are not injury of intraperitoneal organs, not influenced by intraperitoneal operative adhesion, reduce operation time and near the adrenal gland. And the patients can recover earlier than intraabdominal approach.

Solid Organ Removal–PS239

PROS AND CONS OF VIDEO-ASSISTED-NECK-SURGERY. Fumio Kurumishi, M.D., Yoshinori Kuroda, M.D., Takashi Urushihara, M.D., Masahiro Nakahara, M.D., Noriaki Tomokumo, M.D., Hirokazu Momisako, M.D., Hiroyuki Tabara, M.D., Department of Surgery, Onomichi General Hospital, Onomichi Japan

[Abstract] We have introduced Video-Assisted-Neck-Surgery (VANS) procedure in 1997 in pursuit of a better cosmetic outcome. However the cosmetic outcome of VANS procedure is clear, but another merit is still unknown. We investigated pros and cons of VANS procedure.

[Method] We have compared VANS and conventional neck surgery retrospectively in several factors.

[Objective] We have performed 30 cases of VANS procedure (A group), in the same period we have performed 22 cases of conventional neck surgery (B group). Between these two groups we compared several factors.

[Results] There was no significant difference about oral intake (p=0.22), first walking (p=1.00), pain killer (times: p=0.47, period of usage: p=0.021), drain (p=0.34), Labo data (WSC: p=0.78, CRP: p=0.19) between two groups. But hospital stay of A group (4.1±1.9 day) was shorter than B group (5.4±2.6 day) (p=0.035).

[Conclusion] Unfortunately we could not perform randomized trial, because most patient, especially in case of female, have selected VANS procedure. In this study, the VANS procedure contributed to shortening hospital stay only one day statistically.

However considering progress and improvement of our technique, there is no difference between two groups except cosmetic outcome.

Solid Organ Removal–PS238

IMPACT OF THE INTRODUCTION OF LAPAROSCOPIC NEPHRECTOMY WITHIN A COMMUNITY-BASED TEACHING HOSPITAL. Kent W. Kercher MD, Trina I. Smith MS, Chris M. Teigland MD, Pierce B. Jry MD, Brent D. Matthews MD, B. Todd Heniford MD, Departments of Surgery and Urology, Carolinas Medical Center, Charlotte, NC

Despite the proven advantages of laparoscopic nephrectomy, the absence of local expertise has delayed the introduction of this technique into many institutions.

Data were collected prospectively on all laparoscopic nephrectomies performed during the first 13 months following introduction of the technique into our institution. Procedures were performed as a collaborative effort between an advanced laparoscopic surgeon and either a transplant surgeon or urologist. All open nephrectomies performed during the same period were analyzed by retrospective chart review.

From August 2000 to September 2001, a total of 61 laparoscopic nephrectomies were performed. None were performed during the prior year. Cases included donor nephrectomy (n=25), radical nephrectomy (n=19), simple nephrectomy (n=10), nephroureterectomy (n=6). There were 38 open nephrectomies during the same interval. Clinical endpoints and changes in the volume of laparoscopic versus open cases are compared in the table.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Laparoscopic</th>
<th>Open</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>53.2 (27-90)</td>
<td>52.5 (29-78)</td>
<td>NS</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>3.39 (2-7)</td>
<td>5.39 (3-9)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Complications</td>
<td>7 (12%)</td>
<td>17 (44%)</td>
<td>0.002</td>
</tr>
<tr>
<td># cases first 6 months</td>
<td>20</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td># cases last 7 months</td>
<td>41</td>
<td>47</td>
<td>0.003</td>
</tr>
</tbody>
</table>

When combined with existing urologic and/or transplantation expertise, the introduction of laparoscopic renal surgery can result in substantial improvement in patient outcomes. Multidisciplinary collaboration has the potential to generate new clinical volume for minimally invasive general surgeons, promote sub-specialization within minimally invasive surgery, and dramatically change urologic practice patterns within a short period of time.

Solid Organ Removal–PS240

DEVELOPING A PROGRAM FOR LAPAROSCOPIC NEPHRECTOMY IN A MEDICAL STAFF MODEL HMO. David M Lauter MD, Marc A Lowe MD, Eric J Froines MD, Department of General Surgery and Department of Urology, Group Health Cooperative of Puget Sound, Seattle, WA

Introduction: We present the development of a program for laparoscopic nephrectomy through collaboration between urologists without prior laparoscopic experience and general surgeons with advanced laparoscopic experience. Our program goals were 1) to perform the operation with outcomes comparable to those reported in the literature, 2) continue to maintain the role of the urologist as the primary provider of surgical treatment for urologic disease, and 3) to build a foundation for further advanced laparoscopic urologic procedures.

Methods and Procedures: All procedures were evaluated for patient demographics, operative time, and operative team composition. The urologists role as either camera operator, first assistant, or primary surgeon was recorded, as was a breakdown of operative tasks including establishing pneumoperitoneum/access, colon and adjacent organ mobilization, ureteral mobilization and division, dissection and division of renal artery and vein, adrenal dissection, and final specimen mobilization. Outcomes included estimated blood loss, transfusion requirements, hospital stay, and complications.

Results: 11 laparoscopic nephrectomies have been performed to date, with no conversions and no transfusions. The operative team has transitioned from three MDs to one urologist and one general surgeon.

Conclusions: Laparoscopic nephrectomy can be performed safely by urologists with limited laparoscopic experience in collaboration with general surgeons with advanced laparoscopic experience. Our program is an alternative for the urologist faced with the choice of performing the procedure with limited laparoscopic experience, obtaining fellowship training, recruiting a fellowship trained urologist to their practice, or referring patients for laparoscopic nephrectomy to other centers.
A TECHNIQUE FOR SAFE DIVISION OF THE RENAL VESSELS DURING LAPAROSCOPIC KIDNEY HARVEST John Mecenas, M.D.
Michael Edye, M.D., Devon John, M.D., Christine Ren, M.D., Mary Ann Hopkins, M.D., Thomas Dillo, M.D., Department of Surgery, New York University School of Medicine. New York, New York.

Devices that simultaneously divide and staple blood vessels carry the inherent risk of serious bleeding should the staple line fail. A clip or staple technique, which ligates without simultaneous division, avoids this risk by allowing the closure to be inspected and reinforced if imperfect. However this requires the extra step of scissor division of the vessel. We thus sought to determine whether (1) extraction and therefore warm ischemia times (WIT) were increased by the added step of scissor division and (2) whether graft function reflected any differences found.

The technique of ligation was recorded for each vessel. Extraction time (in donor) and serial creatinine levels (in recipient) were compared according to the technique of ligature: (A) Scissor division necessary: suture ligature, clips or non-cutting (TA) stapler (B) cutting stapler. Complications were recorded for each technique.

The frequency of ligation techniques used for 316 vessels was: (A) Suture ligature 26 (8.2%), clips 71 (22.5%), TA stapler 57 (18%), (B) cutting stapler 162 (51.3%). Four bleeding complications (one for each technique) occurred although the mechanism was different in each case. Mean extraction time for group A was 4.4 and for group B was 3.4 minutes (p<0.0001). Median serial creatinines were not significantly different between groups A and B.

Techniques in which scissors are used to divide the vessels prolong extraction time but produce no measurable delay in graft function. Avoidance of simultaneous stapling and division allows scrutiny of ligation, clip placement or staple line to confirm secure ligation of the vessel prior to its division and lessens the danger of misapplication. Maximal vessel length is preserved for anastomosis in the recipient. Our current technique is application of the endo-TA stapler loaded with vascular staples to both artery and vein during live donor kidney harvest.

SMALL BOWEL OBSTRUCTION AFTER LAPAROSCOPIC DONOR NEPHRECTOMY JP Regan MD, ES Cho MD, and JL Flowers MD Section of Surgical Endoscopy and Laparoscopy, Department of Surgery, University of Maryland School of Medicine, Baltimore, MD

Introduction: Laparoscopic live donor nephrectomy has become the procedure of choice for kidney procurement at many centers across the country. Decreased postoperative pain and length of stay, faster return to work, and no difference in morbidity/mortality compared to open nephrectomy have all been reported in the literature. However, few data exist regarding the complication of postoperative internal hernia and small bowel obstruction, which is unique to a laparoscopic/perioperative approach.

Methods: We present 3 case reports of patients who developed small bowel obstruction from an internal hernia and mesenteric defect after laparoscopic donor nephrectomy.

Results: Six hundred and thirty-five patients underwent laparoscopic donor nephrectomy from March 1996 to August 2001 at 1 institution. Small bowel obstruction developed in 3 patients (0.47%) within 1 week postoperatively. Each case involved an internal hernia through a left colon mesenteric defect at the site of nephrectomy. Re-operation was necessary in each case and was associated with prolonged hospital stay (mean 22.3 days, range 6-37 days). Two patients were managed with laparotomy and 1 patient underwent a laparoscopically-assisted exploration. One patient required an additional open exploration for intra-abdominal sepsis and cholecystectomy.

Conclusions: Small bowel obstruction from internal hernia following laparoscopic donor nephrectomy is a rare event, but can lead to significant morbidity in an otherwise healthy patient. These patients may be at higher risk for bowel obstruction given the soft tissue defect remaining after nephrectomy, and vigilance is required when mobilizing the colon to ensure mesenteric defects are recognized and repaired.

LAPAROSCOPIC ENDCYSTECTOMY OF HYDATID LYST OF THE LIVER Abdul Aziz Al saigh MD; Ahmed Al Otaby MD; Osman Noraldin MD; Mohd Al Ageely MD; Ihab Anwar MD; Department of Surgery, King Khalid University Hospital, Riyadh, Saudi Arabia.

Hydatid Cyst is common disease in Saudi Arabia most of the cysts are infected or sterile. The usage of the laparoscopy will be better than open method. The presence of new diathermy machine and better suture laid instrument have made the surgery easier. Laparoscopic endocystectomy is performed to ten patients. The patient is placed on supine or lateral position. Four 0 5 trocars are placed. The cyst is surrounded by gauze soaked with 0.1% providence iodine the cyst is holded by 2 stay sutures, the cyst is aspirated first & injected with 0.1% providence iodine. The roof of the cyst is excised & edge of the cyst is sutured to the omentum. One drain is placed in the cavity. bile leak has occurred in 3 patients, have been managed by ERCP & Sphincterotomy. The average hospital stay is 3.4 days.

HAND ASSISTED LAPAROSCOPIC SPLENECTOMY FOR MASSIVE SPLENOMEGALY, Michael Rosen MD, Fred Brody MD, R. Matthew Walsh MD, Alicia Fanning MD, Frank Duperier MD, Jeffrey Ponsky MD, Department of General Surgery and Minimally Invasive Surgery, Center Cleveland Clinic Foundation, Cleveland OH

Laparoscopic splenectomy is the procedure of choice for elective splenectomy at the Cleveland Clinic Foundation (CCF). However, massive splenomegalies may preclude safe mobilization and hilar control using standard laparoscopic techniques. For these difficult cases, hand assisted laparoscopic splenectomy (HALS) can offer the same benefits of minimally invasive surgery while allowing safe manipulation and splenic dissection.

This study retrospectively reviews a consecutive series of HALS performed at the CCF from March 1998 to February 2001. HALS was performed for splenomegaly extending past the midline or to the iliac crest. Patient demographics, operative indications, morcellated splenic weight, morbidity, mortality, and clinical outcomes were evaluated. With the patient in a modified lateral position, a midline incision was made for the surgeon’s nondominant hand. Two other ports were placed in the left flank.

Seven men and seven women with a mean age of 57 years (range38-73) and mean BMI of 25kg/m2 (range21-29) underwent HALS. Surgical indications included malignancy (10), autoimmune hemolytic anemia (1), and splenomegaly (5). Mean morcellated splenic weight was 1517 grams (range 577-3500). No conversions to open splenectomy were required. The mean operative time was 177 minutes (range 75-309). Mean length of stay was 5.4 days (range 2-20). Three major postoperative complications occurred including one hemorrhage at the hilar staple line necessitating re-exploration and two subphrenic fluid collections requiring percutaneous drainage. No perioperative mortality occurred.

HALS is a safe and efficacious procedure for these extremely difficult patients. HALS provides the benefits of a minimally invasive approach in cases of massive splenomegaly.
HAND-ASSISTED LAPAROSCOPIC SPLENECTOMY FOR SPLENIC TUMOR: TWO CASES REPORT

H. Takahashi M.D.1), H. Yano Ph.D.2), T. Monden Ph.D.2), T. Kinoshita Ph.D.1), K. Okada M.D.2), 1)Department of Hepatobiliary and Pancreatic Surgery, National Cancer Center Hospital East, Kashiwa city, Japan, 2)Department of Surgery, NTT West Osaka Hospital, Osaka city, Japan

[Case 1] A 38-years-old woman was admitted to our department for a splenic tumor who had undergone a hysterecomy, bilateral adnexitomy and omentectomy by diagnosis of right ovarian carcinoma three years ago. The series of radiographic examinations showed a solitary splenic tumor that was 30 mm in diameter and a swollen lymph node arising from right ovarian carcinoma. We could completely resected the tumor with a lymph node, and two splenic venous thrombosis. All of them improved conservatively. Except for two cases, all could walk and take liquid food on the first day postoperatively.

[Case 2] A 62-years-old woman was admitted to our department for a cystic tumor of spleen who had undergone a hysterectomy and bilateral adnexitomy by diagnosis of uterine corpus carcinoma eighteen months ago. The series of radiographic examination showed a solitary cystic tumor of spleen that was 60 mm in diameter at a hitus of spleen. Hand-assisted laparoscopic splenectomy was performed by diagnosis of metastatic splenic tumor and swollen lymph node arising from right ovarian carcinoma. We could completely resected splenic tumor and swollen lymph node by the palpation of the surgeon’s left hand inserted through the 7cm skin incision. The duration of surgery and intra-operative blood loss was 178 minutes and 22g respectively.

[Conclusion] Using hand-assisted laparoscopic splenectomy, the perfect resection of the malignant tumor was expected by both the inspection with laparoscopy and palpation of the tumor by surgeon’s left hand like an open surgery and it was less invasive, cosmetically fine in comparison with an open surgery. Hand-assisted laparoscopic splenectomy was considered to be a beneficial therapeutic option for splenectomy was considered to be a beneficial therapeutic option for splenic tumor.
RETROPERITONEOSCOPIC LIVE DONOR NEPHRECTOMY  H.Yamada M.D., K.Sakamoto M.D., S.Arita M.D., T.Iwashita M.D., Y.Okazaki M.D., M.Kawada M.D., H.Kashiwabara M.D., Department of Surgery, Sakura National Hospital, Chiba, Japan

Advances in endoscopic technique have made endoscopic donor nephrectomy feasible. Endoscopic donor nephrectomy offers numerous advantages when compared with the traditional open approach. For the donor, it has resulted in a shorter hospital stay, fewer postoperative analgesic requirements, earlier return to activities of daily living and employment, and decreased financial loss owing to absence from the workforce. We report our initial experience with retroperitoneoscopic live donor nephrectomy. Our main technique: First, we expand the retroperitoneal cavity using the balloon. Next, we insufflate the carbon dioxide into the retroperitoneal cavity (under 10mHg). We do retroperitoneoscopy. We can see the left common iliac artery, the left ureter, Abdominal aorta and kidney easily. We dissect the kidney. We ligate the ureter and vessels, and cut them. We make 6cm skin incision and remove the kidney. The advantage of this technique is as follows. We can obtain excellent view (no small intestine), and dissect the blood vessel, ureter and kidney easily. We can avoid an injury to the intestine during nephrectomy.

SUBJECTS AND METHODS: A retrospective review of one hundred three live donor kidney transplantations were performed from 1974 to August 2001, 10 with endoscopic, 93 with open nephrectomy.

RESULTS: Ten kidneys were removed by endoscopic surgery, i.e., eight from the left and two from the right side. No conversion of this technique to endoscopic surgery was necessary. In the endoscopic and open nephrectomy groups, mean operative time was 203 and 192 minutes, mean estimated blood loss was 43 and 265 ml. In the endoscopic groups, the mean warm ischemic time was four minutes. Organ survival was 100%, and in all grafts excellent function was observed.

CONCLUSIONS: Endoscopic live donor nephrectomy is an attractive alternative to open donor nephrectomy. Endoscopic nephrectomy results in less postoperative discomfort, an improved cosmetic result and more rapid recovery for the donor with equivalent fun.

LAPAROSCOPIC SPLENECTOMY: BEYOND THE LEARNING CURVE  D C Zacharoulis M.D., B Dobbins M.D., H H Kumar M.D., CMS Royston M.D., C J O’Boyle M.D., PC Sedman M.D., Dept of Upper GI and Minimally Invasive Surgery, Hull Royal Infirmary, Kingston upon Hull, United Kingdom

The advantages of laparoscopic splenectomy (LS) over open splenectomy have been suggested in early reports. The purpose of this study is to report the three years experience using the Espiner bag (Anchor, IL, U.S.A) for spleen retrieval during LS as performed in a dedicated minimally invasive surgical unit.

Between March 1998 and July 2001, 50 laparoscopic splenectomies were performed. Indications for surgery included benign haematological diseases 35/50 (70%) and lymphomas 15/50 (30%). Data were prospectively recorded onto a dedicated database and reviewed for the purpose of this study. The Espiner bag was used for spleen retrieval in the last 35 cases.

The most common indication was idiopathic thrombocytopenic purpura (ITP) 20/50 (40%) followed by hemolytic anemia 15/50 (30%) and lymphomas (30%). The median splenic weight was 250 gr (range 100-1800 gr). Accessory spleens were found in seven patients (14%) all suffering from ITP. The mean operative time was 102 min (range 70-160 min) The conversion rate was 2/50 (4%). Two patients required delayed laparotomies, one for bleeding and one for delayed gastric perforation due to iatrogenic thermal injury. In one case we had to extend the 12 mm incision due to a defective retrieval bag (1/35, 2.8%). The overall complication rate was 3/50 (6%). No deaths occurred in our series. The median hospital stay was 3 days (range 2-12). The median follow-up of 16 months (range 1-32 months) showed no long term complications.

Our results confirm the laparoscopic approach to be the technique of choice for splenectomy in experienced hands. The Espiner bag (ANCHOR, IL, U.S.A.) for spleen retrieval can be used safely.
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Bard is changing the future of GI Endoscopy with unique, innovative, devices that expand procedure opportunities for Gastroenterologists while reducing overall healthcare costs. Stop by SAGES booth #300A and see Bard’s innovative therapy for GERD, the Bard EndoCinch™ System. In addition, see the new Bard® PEG Safety System, Fastback™ Gastric Access Ports, Sure Shot® Injection Needle, the new XWire™ Next Generation Guidewire, the new Hydromax™ Biliary Stent with Hydromax® Coating and the Memotherm Nitinol Biliary and Colorectal Stents.

Bio-Vascular, Inc 322-323
2575 University Avenue
St. Paul, MN, 55114
Phone: 1800-2554018  Fax: 651-642-9018
Bio-Vascular, Inc., will display Peri-Strips® and Peri-Strips Dry® for staple line reinforcement in the bariatric surgical procedures of gastric bypass and gastric banding. Also displayed will be Peri-Guard® and Supple Peri-Guard®, Vascu-Guard® Peripheral Vascular Patch, Flo-Rester® Internal Vessel Occluder, Bio-Vascular Probe®, and Flo-Thru Intraluminal Shunt™. Bio-Vascular, Inc. is a diversified medical device company engaged in improving the quality of human life through developing, manufacturing and bringing to the market products for use in thoracic, bariatric, cardiac, neurosurgical, vascular, urologic, general and other surgeries.

Bioenterics Corporation 245
Address: 1035 B Cindy Lane
Carpinteria, CA, 93015
Phone: 805-684-3045  Fax: 805-684-0812
BioEnterics Division of Inamed Corporation manufactures and distributes the LAP-BAND® System, the premier minimally invasive surgical solution for morbid obesity; the Gastric Balloon Suction Catheter for use during obesity surgery; and the BIB® System, a non-surgical obesity treatment (not available in the US).

Boston Scientific/Microvasive 214
One Boston Scientific Place
Natick, MA, 01760
Phone: 508-650-8000  Fax: 508-652-5026
Boston Scientific/Microvasive has pioneered the design, development and manufacturing of devices for use in diagnostic, therapeutic, and palliative gastroesophageal, pancreaticobiliary, and colorectal endoscopic procedures. Boston Scientific/Microvasive products reduce procedural trauma, complexity, cost, time and risk to the patient.

Braintree Laboratories, Inc. 247
60 Columbian St. West
P.O. BOX 859029
Braintree, MA, 02185
Phone: 781-843-2202  Fax: 781-843-7932
Braintree Laboratories will exhibit MiraLax™ the first new Rx laxative therapy in 24 years. Benefits of No Grit & No Taste have made MiraLax™ a popular choice of therapy for the treatment of constipation. Also will be GoLYTELY® and NuLYTELY®.

Berkholtz Corp 311/312
1950 Hanahan Rd
Charleston, SC, 29418
Phone: 843-569-6100  Fax: 843-569-6133
BERKHTOLD offers world renowned CHROMOPHARE® Surgical Lights, market leading TELEROM® Power Booms, and OPERON™ Surgical Tables as the key elements of The Supersuite®. The Supersuite is an advanced surgical suite, which enables acute care facilities to lower costs and improve clinical outcomes.

Baxter 120
1627 Lake Cook Rd
Deerfield, IL, 60015
Phone: 847-940-5826  Fax: 847-940-6525
Baxter is your complete source for BioSurgery therapeutics and devices featuring Tisseel VH fibrin sealant. Tisseel VH fibrin sealant sets within seconds to create a fibrin matrix that firmly adheres to tissues, rapidly stops bleeding and prevents leakage. Baxter offers a comprehensive selection of devices to enhance delivery including the Tissomat and Spray Set Device and DuploGrip Accessory Grip.

Bioseptine, Inc. 141
16602 Burke Lane
Huntington Beach, CA 92647
Phone: 714-845-9810
Bioseptine® Ointment is a multi-purpose moisture barrier that protects and helps heal skin irritations from moisture, such as urinary and fecal incontinence. Bioseptine® Ointment temporarily relieves discomfort and itching. Free samples at our booth!
**EXHIBITOR PROFILES**

Please refer to Last Minute Changes Flyer for updated information on new exhibitors.

**Case Medical, Inc**

65 Railroad Ave.
Ridgefield, NJ, 07657
Phone: 201-313-1999  Fax: 201-313-9090
Website: [www.casemed.com](http://www.casemed.com)

Case Medical offers an innovative sterilization container system designed to sterilize, organize, protect and store surgical instruments including endoscopes. The SteriTite® sealed container with MediTray® inserts is an easy-to-use, high quality and cost effective system. The universal product line is compatible with every major sterilization method from steam to gas plasma with FDA 510k.

**CinéMed, Inc.**

127 Main Street, North
Woodbury, CT, 06798
Phone: 203-263-0006  Fax: 203-263-4839

Cine-Med is the producer and distributor of the SAGES Education Video Library featuring the SAGES Top 12 Procedures CD ROM and over 10 additional programs presented by internationally renowned laparoscopic surgeons. Also available is the American College of Surgeons video library. All programs are available on VHS videotape and CD ROM.

**Coalescent Surgical Inc**

559 E. Weddell Drive
Sunnyvale, CA, 94089
Phone: 408-743-8927  Fax: 408-743-9798

Coalescent Surgical, Inc. specializes in the innovation, development and application of new, improved and enhanced technologies, methods and techniques to unify body tissue within the realm of minimally invasive and conventional surgery.

**Computer Motion**

130-B Cremona Drive Suite B
Santa Barbara, CA, 93117
Phone: 805-968-9277  Fax: 805-968-9277/4920

Computer Motion’s computer and robotic surgical systems, AESOP®, HERMES®, Socrates®, and Zeus® are designed to extend surgeons’ capabilities, improve patient outcomes, and reduce healthcare costs.

**Contemporary Surgery**

Dowden Publishing
110 Summit Ave.
Montvale, NJ, 07645
Phone: 201-391-9100  Fax: 201-391-2778

Contemporary Surgery provides surgeons with practical, immediately applicable information that helps them both overcome long-standing challenged and master new operative techniques or other advances. Through its symposiums with nationally renowned experts, its review articles, case reports, and other articles, Contemporary Surgery gives readers the insights they need to provide optimal patient care.

**Cook Surgical**

Address: 925 South Curry Pike, P.O. Box 489
Bloomington, IN 47403
Phone: 812-339-2235  Fax: 812-339-3704

Cook Surgical will be exhibiting Surgisis® Soft Tissue Graft. Surgisis and is made from Small Intestinal Submucosa (SIS), a naturally occurring extracellular matrix and is used as a surgical mesh for the implantation to reinforce soft tissue in Hernia repair and the repair of a body wall defect. Other featured items will be products for Common Bile Duct Exploration, Cholangiography catheters and Esophageal dilators.

**Curon Medical, Inc**

735 Palomar Ave
Sunnyvale, CA, 94085
Phone: 408-733-9910  Fax: 408-522-1188

RF Treatment for GERD
RF Treatment for fecal incontinence

**Davol, Inc.**

100 Sockanossett Crossroad
PO Box 8500
Cranston, RI 02920
Phone: 401-463-7000  Fax: 401-463-3143
Website: [www.davol.com](http://www.davol.com)

Davol features mesh products for hernia repair: Bard® 3Dmax® mesh, pre-formed for laparoscopic inguinal repair; Bard® Kugel® Patch, an open posterior approach to preperitoneal repair, and Bard® Composix® Mesh, a 2-layered mesh for strong tissue ingrowth and protection against adhesions.

**E.A.E.S.**

P.O. Box 335, 5500AH
Veldhoven, Netherlands
Phone: 31-40-2525288  Fax: 31-40-2523102
Website: [www.eaes-eur.org](http://www.eaes-eur.org)

The European Association for Endoscopic Surgery and Other Interventional Techniques (E.A.E.S.) was founded in October 1990 with the following aims:
- Evaluation of endoscopic surgery and Interventional Techniques in Europe.
- The coordination and training of these techniques in Europe.
- To promote scientific studies in order to develop an identity for European Endoscopic Surgery.

The Association consists of European medical practitioners who, with the exception of Corporate Members, actively practice surgery and any kind of endoscopic surgery. The Association has Founding Members, Active Members, Candidate Members, International Non European Members, Senior Members, Corporate Members and Honorary Members, with currently a total of 2000 members.
EXHIBITOR PROFILES

Ellman International Mfg. Inc. 134
Ellman Bldg
1135 Railroad Ave
Hewlett, L.I., NY, 11557
Phone: 516-569-1482 x33  Fax: 516-569-0054
Patented high radiofrequency technology with innovative electrode systems for open and endoscopic applications will be displayed and demonstrated. Surgical Precision, versatility and safety is achieved using the Surgitron Dual Frequency unit in any surgical procedure. Hands-on opportunities will be available throughout exhibition.

Encision 128
4828 Sterling Drive
Boulder, CO, 80301
Phone: 303-444-2600  Fax: 303-444-2693
Encision's AEM® Laparoscopic Instruments are shielded and monitored to prevent stray electrosurgical burns due to insulation failure and capacitive coupling. All instruments are backed by a "Hold Harmless Agreement" that guarantees patient safety in minimally invasive surgery.

Ethicon Endo-Surgery, Inc. 225
4545 Creek Road
Cincinnati, OH, 45242
Phone: 513-337-7858  Fax: 513-337-3304
Ethicon Endo-Surgery is transforming patient care through innovation with its comprehensive line of minimally invasive and open surgical products. In addition to its full line of surgical products, Ethicon will showcase Harmonic Scalpel®, 2-3mm instruments and trocars, and its full array of educational materials for the bariatric patient and surgeon.

Fleet Pharmaceuticals 147
4615 Murray Place, PO BOX 11349
Lynchburg, VA, 24506
Phone: 434-528-4000  Fax: 434-847-6110
C.B. Fleet Company, Inc. manufactures and markets Fleet® Phospho-soda®, a leading bowel cleanser for use prior to endoscopic and surgical procedures.

Fujinon Inc. 313/314
10 High Point Dr.
Wayne, NJ, 07470
Phone: 800-872-0196 x320  Fax: 973-633-8818
FUJINON video endoscopy systems include the _400 and _200 Series. The _400 Series, with 850,000 pixel CCDs, produce the highest resolution/magnification images in endoscopy, permitting physicians to observe the smallest lesions in the digestive tract lining, ideal for acute care facilities and teaching institutions. The _200 Series is priced for high volume cancer screening clinics, private offices and outpatient facilities.

GE OEC Medical Systems 337,335
4175 E. Red Cliffs Dr.
Kanab, UT, 84741
Phone: 801-328-9300  Fax: 801-355-4751
Mobile Digital C-arms
Imaging tables

General Surgery News 122
545 West 45th Street, 8th Floor
New York, NY, 10036
Phone: 212-957-5300 x263  Fax: 212-957-7230
General Surgery News is a monthly newspaper sent to every U.S. general surgeon, surgical resident, colon & rectal surgeon, surgical oncologist, trauma surgeon, and critical care surgeon. General Surgery News provides late-breaking clinical and socioeconomic information in the field of general surgery.

Genzyme Biosurgery 202-204
One Kendall Square
Cambridge, MA 02139
Phone: 617-775-4449  Fax: 617-775-4001
Website: www.genzyme.com
Genzyme Biosurgery manufactures Seprafilm® Adhesion Barrier and Sepramesh® Biosurgical Composite. Sepramesh is a revolutionary product poised to solve the problem of adhesion formation after intraperitonel hernia repair.

GIMMI GMBH 304-307
Carl_zeiss_strasse 6
Tuttlingen, 78532 Germany
Phone: 49-7-461-96-5900  Fax: 49-7-461-96-59020
Endoscopic Technology

Given Imaging Inc. 324
5555 Oakbrook Parkway, Ste. 355
Norcross, GA, 30093
Phone: 770-662-0870  Fax: 770-662-0510
The Given® Diagnostic Imaging System, Featuring the M2A™ Capsule, is an innovative diagnostic tool chat is non-invasive and easy to use. The system provides a substantially improved level of visual imaging for the entire small intestine.

Gyrus Medical, Inc. 363
6655 Wedgewood Road, Ste. 105
Maple Grove, MN  55311
Phone: 763-416-3000  Fax: 763-416-3001
Gyrus Medical is a leading provider of innovative electrosurgical instruments for precise laparoscopic surgery. In addition to its full line if bipolar instruments, Gyrus Medical introduces a new modality in electrosurgery - The PlasmaKinetic System. The system comprised of PlasmaKinetic Generator and a full range of PlasmaKinetic instruments, is designed to improve vessel sealing, reduce thermal margins, minimize sticking, reduce plume, and provide consistent results in a wide variety of surgical conditions.

Haemacure Corporation 372
2 North Tamiami Trail, Suite 802
Sarasota, FL, 34236
Phone: 941-364-3700  Fax: 941-364-3734
Hemaseel™ APR, the first commercially available Fibrin Sealant, is a biological tissue adhesive with superior sealing and hemostatic properties. Hemaseel™ APR is a pre-packaged, ready-to-mix Fibrin Sealant which offers surgeons a new level of component consistency and viral safety. Haemacure Corporation is dedicated exclusively to the innovation in Fibrin Sealants.
### EXHIBITOR PROFILES

#### Health IS

2 North Plains Industrial Road  
Wallingford, CT, 06426  
Phone: 203-949-6290  
Fax: 203-949-6299

Health IS is the leading provider of information management solutions (AdvantX® and EMR+) proven to improve workflow and maximize revenues. With over 1,600 installations, Health IS is the only provider offering integrated software for practices, surgery centers, and surgical hospitals. For information call 800.562.7069 or visit . Stop by booth # 139 and enter to win a trip to Hawaii!

#### International Bioview

1820 E. Garry, Ste. 223  
Santa Ana, CA, 92705  
Phone: 949-450-9745  
Fax: 949-724-9140

High resolution, small diameter 70,000 pixel reusable mini-endoscope for use in minimally invasive surgery and diagnosis. Applications in most medical specialties, including general surgery and gynecology.

#### Intuitive Surgical

1340 W Middlefield Rd  
Mountain View, CA, 94043  
Phone: 650-237-7000  
Fax: 650-526-2060

Intuitive Surgical has developed a computer-enhanced, robotic surgical system for minimally invasive surgery. The da Vinci ™ Surgical System utilizes articulating EndoWrist ™Instruments and a unique 3-D InSite ™Vision System. The da Vinci ™Surgical System is the only robotic surgical system FDA-cleared for laparoscopic procedures. For more information, visit Intuitive’s web site at .

#### Jarit Surgical Instruments

9 Skyline Drive  
Hawthorne, NY, 10532  
Phone: 914- 592 -9050  
Fax: 914- 592-8056

A comprehensive line of high quality, reusable, innovative endoscopic instruments is offered by JARIT Surgical Instruments, The Instrument People ... specializing exclusively in surgical instruments. JARIT features laparoscopic instruments in diameters from 3.5mm to 10mm, and lengths from 24cm to 45cm.

#### Karl Storz Endoscopy-America, Inc.

600 Corporate Pointe  
Culver City, CA, 90230  
Phone: 310-338-8100x4296  
Fax: 310-410-5537

Karl Storz will be exhibiting its fully integrated endosurgery line; including Hopkins rod lens telescopes, imaging systems, reusable trocars, extended-length bariatric instruments and ClickLine hand instruments. Karl Storz also presents OR1 surgical suites where surgeons control every O.R. technology as a single, optimized system.

#### Lawton Medizintechnik GMBH & Co., KG

Wurttemberger Str. 23  
78567 Fridingen  
Tuttlingen, Germany  
Phone: 49-74-63-996-50  
Fax: 49-74-63-996-520

Please refer to Last Minute Changes Flyer for updated information on new exhibitors.

#### Lexion Medical

1957 Gateway Blvd.  
St. Paul, MN, 55112  
Phone: 651-635-0000  
Fax: 651-636-1671

The Insuflow represents a unique advancement - a return to the normal homeostatic state of the peritoneal cavity. The Insuflow filters, heats, and hydrates the laparoscopic gastro physiological conditions. Significant patient benefits are provided while reducing costs.

#### Lippincott, Williams & Wilkins

64 Woodland Ave  
Mountain Lakes, NJ, 07046  
Phone: 215-238-4200

Offering the latest publications in print and electronic including PDA's selection.

#### Livlite, Inc

900 Wilshire Blvd Suite 1129  
Los Angeles, CA,  
Phone: 213-623-8410  
Fax: 213-623-9764

Bariatric Services Marketing and Program Management.

#### LSI Solutions

7796 Victor Mendon Road  
Vitor, NY, 14564  
Phone: 716-869-6600  
Fax: 716-742-0886

Sew-Right ®SR• 5 ™ – The single squeeze suturing device, is a reloadable 5mm suture device that provides precise and rapid suture placement for minimally invasive surgery. Ti-Knot® TK•5 ™ – The device to instantly secure and trim excess suture, is a 5mm device, which delivers a Titanium Knot™ Top Hat that is strong and reliable. InsideView™ – Only medical display system to project advanced high-resolution videoscopic images onto a sterile screen within the surgical field.

#### MAHE International, Inc.

490 Craighead Street  
Nashville, TN, 37204  
Phone: 615-269-7256  
Fax: 615-269-4605

Website: MAHEUSA@aol.com

Surgical instruments for Hysteroscopy, Gynecology, Urology, and accessories; Digital cameras, Xenon light sources, Insufflators and disposable instruments.

#### Market Access Partners

3236 Meadowview Road  
Evergreen, CO, 80439  
Phone: 303-526-1900  
Fax: 303-526-7920

Market Access Partners provides marketing research consulting to the medical device industries. We use innovative qualitative and quantitative methodologies to research opinions of physicians, nurses and patients. We offer a management-oriented approach to product development and marketing.
EXHIBITOR PROFILES

Mary Ann Liebert, Inc 183
2 Madison Avenue
Larchmont, NY, 10538
Phone: 914-834-3100 Fax: 914-834-3771
Mary Ann Liebert, Inc. publishes "Journal of Laparoendoscopic & Advanced Surgical Techniques, Pediatric Endosurgery & Innovative Techniques" the official journal of IPEG. Please come by our booth for a free sample copy and other related journals.

Mediflex 327
250 Gibbs Rd.
Islandia, NY, 11749
Phone: 631-582-8440 Fax: 631-582-8487
Website: www.mediflex.com

Medstone International, Inc. 186
100 Columbia, Suite 100
Aliso Viego, CA 92656
Phone: 949-448-7700 Fax: 949-448-7880
Now Gallstones Can Be a Blast! Combination Extracorporeal Shockwave Lithotripsy and Bile Acid Therapy available. No Incision. Low morbidity. Outpatient procedure. Lower cost. 90% of selected patients stone free at six months. Mobile Van Transmobile Operation Room Service available.

Medtronic 255
4000 Lexington Ave
Shoreview, MN, 55126
Phone: 763-514-9700 Fax: 763-514-9745
Medtronic, the world leader in pH & motility testing, provides diagnostic equipment and treatment solutions for GI disorders such as GERD, gastroparesis, constipation and fecal incontinence. Products include the Bravo catheter-free System, Enterra (gastric stimulation for gastroparesis).

Mentice, Inc 187
8849 Weller Road
Cincinnati, Oh 45249
Phone: 513-530-5951 Fax: 513-530-5445
Mentice, Inc, the world’s leading supplier of virtual reality simulators for minimally invasive surgery, will exhibit MIST-VL®, a basic skills trainer for Laparoscopic surgery, and Procedicus-VL®, a laparoscopic part task trainer providing visual abdominal anatomy, tactile force-feedback, and educational feedback.

Microline, Inc. 253-252
800 Cummings Center, Ste. 157X
Beverly, MA, 01915
Phone: 978-922-9810 ext. 25 Fax: 978-922-9209
Laparoscopic scissors, ratcheted handpieces, graspers, forceps, dissectors, clip applier and related laparoscopic instrumentation.

Minogue Medical Inc 175
180 Peel, Suite 300
Montreal, Quebec, H3C 2G7 Canada
Phone: 514-287-1644 Fax: 514-287-0853
The Xtractor is a rapid specimen retrieval system for laparoscopic surgery.

Moss Tubes Inc. 136
749 Columbia Turnpike
East Greenbush, NY, 12061
Phone: 800-827-0470 Fax: 518-674-8067
Feeding/Decompression tubes and PEG kits

Mount Sinai Minimally Invasive Surgery Center 107
Box 1259, 5 East 98th Street, 15th Floor
New York, NY, 10029
Phone: 212-241-6591 Fax: 212-534-2654
The Minimally Invasive Surgery Center is a multi-disciplinary center with three components: patient care, education and research including six state-of-the-art operating rooms. The Center offers graduate and continuing medical education. Students participate in hands-on laboratories in addition to viewing live surgical demonstrations. Researchers within the center work with industry leaders to develop new instrumentation.

Nashville Surgical Instruments 257
322 Northcrest Dr.
Springfield, TN, 37172
Phone: 615-384-0006 Fax: 615-384-6568
The Kumar PRE-VIEW Cholangiography Clamp and catheters used in choleystectomy surgery. Laparoscopic Cholangiography System without cystic duct cannulation.

National Display Systems 341, 339
16060 Caputo Dr.
Morgan Hill, CA 95037
Phone: 408-776-0085 Fax: 408-776-9878
Manufacturer of Medical Grade Flat Panel Monitors for surgical applications. Vector Surgical Series sizes range 10.4 to 24” Multiple inputs: RGB/Sync, S-Video, DVI, Computer. The Vector Surgical displays are ideally suited for use with minimally or non-invasive surgical equipment. This medical-grade device meets and exceeds the stringent safety and performance requirements necessary for use in the OR, Endoscopies Laboratory, or any medical setting where superior image quality, natural color, exceptional contrast, and high brightness are required. And unlike other displays, the Vector surgical display has no vent holes where liquids can penetrate and contaminate the surgical field.

Please refer to Last Minute Changes Flyer for updated information on new exhibitors.
EXHIBITOR PROFILES

NDO Surgical Inc 261
125 High Street, Suite 7
Mansfield, MA, 02048
Phone: 508-337-8881 Fax: 508-337-8882
Website: www.ndosurgical.com
NDO Surgical, Inc. develops, manufactures and markets innovative endoscopic technologies for gastrointestinal disorders. The company’s Endoscopic Full-Thickness Plicator™ has been designed to provide an outpatient treatment for gastroesophageal reflux disease (GERD).

OBTECH Medical AG 300C
Zugerstrasse 74
BAAR, 6341 Switzerland
Phone: 41-41-711-2115 Fax: 41-41-710-1088
Implantible silicone medical devices and laparoscopic instruments

Olympus America Inc. 220
Address: Medical Instrument Division
2 Corporate Center Drive
Melville, NY 11747
Phone: 631-844-5333 Fax: 631-844-5447
Olympus is the worldwide leading provider of the highest quality optical and digital imaging surgery systems. Olympus is revolutionizing MIS with digital surgery products: LTF-V2 – flexible laparoscopy, 4-way angulation and distal mounted CCD and advanced digital capturing, photography and printing solutions.

ONUX Medical 184/185
5 Merril Drive
Hampton, NH 03842
Phone: 603-929-6200 Fax: 603-929-6300
ONUX Medical has recently commercialized two 5mm reusable/Autoclavable, MIS products with disposable suturing cartridges. Touché is a needle-free suturing instrument capable of producing 50 sutures without removing the system from the surgical site. Salute easily secures mesh to tissue by forming unique, circular staples for hernia repair.

Outpatient Surgery Magazine 180
3 Paoli Plaza, Suite A
Paoli, PA, 19301
Phone: 610-240-4918 ext. 10 Fax: 610-240-4919
The purpose of Outpatient Surgery Magazine will be to provide highly pertinent, practical advice on how to perform outpatient surgery across all specialties faster, more profitably and with better outcomes.

PARÉ Surgical, Inc 243
7332 S. Alton Way, Ste. H
Englewood, CO, 80112
Phone: 303-689-0187 Fax: 303-689-0579
PARÉ Surgical is a leader in the development of innovative technologies for use in Minimally Invasive Surgery. The Quik-Stitch® One Port Delivery™ Endoscopic Suturing System simplifies suturing through the use of a pre-tied Roeder knot and a reusable delivery system available in 3mm, 5mm and 10mm sizes.

Pentax Precision Instrument Corporation 237/241
30 Ramland Rd.
Orangeburg, NY, 10962 2699
Phone: 914-365-0700 Fax: 914-398-7710
When you care as much as we do, innovation never stops.... Introducing out newest line of specialty endoscopes:
- World’s SLIMMEST gastroscope – 5.3mm outer diameter – EG-1540
- All DIGITAL advanced high resolution imaging ultrasound system
- M.P.S. – Motion Picture enable Imaging System
- Battery Powered Endoscopes – No light source required!

Pilling Surgical 275/273
200 Precision Drive, Suite 200
Horsham, PA 19044
Phone: 215-442-8749 Fax: 800-332-2308
Website: www.pillingsurgical.com
Pilling Surgical, part of the Teleflex Medical Group provides innovative instrument management, supply chain management, financial consulting services and outsourcing services to hospitals. Known for specialty instrumentation used in cardiovascular, ENT, laparoscopic and procedures, Pilling Surgical also offers a broad range of general instrumentation made to our traditionally high standards of quality and value

PNA Medical Systems, L.P. 146
PO Box 2015
Glens Falls, NY, 12801
Phone: 518-761-1193 Fax: 518-761-2637
Website: www.pnamed.com
PNA Medical Systems is proudly presenting their high quality endoscopic, laparoscopic and arthroscopic instruments. Included will be reusable modular instruments, reusable shielded trocar systems and several innovative disposable alternatives. Get the features of disposables with the cost efficiency of reusables.

Power Medical Interventions Inc. 150
110 Union Square Drive
New Hope, PA 18938
Phone: 215-862-4450 Fax: 215-862-3073
Surg ASSIST™ is a patented, computer mediated wound closure technology. The System consists of a Power Console, Flexible Shaft (FlexShaft), Remote Control, and Digital Loading Units. The Remote Control initiates the firing sequence of a variety of wound closure attachments. This advanced technology enables surgeons to access anatomy more easily and with less surgical intervention than conventional mechanical devices. It also provides the surgeon with breakthrough digital technology, which enhances speed, accuracy, and safety with less waste.

Resource Anesthesiology Associates 102
145 Huguenot, Ste. 103
New Rochelle, NY, 10801
Phone: 914-633-5474 ext. 21 Fax: 914-633-3287
RAA is the largest accredited ambulatory anesthesiology practice in the U.S. Our large staff of anesthesiologists travel to physicians’ offices and surgery centers throughout NY, NJ and CT resulting in increased patient turnover and satisfaction. Call 1-877-MD-SLEEP or visit.

http://www.8thworldcongress.org/
Richard Wolf Medical Instruments Corporation

353 Corporate Woods Parkway
Vernon Hills, IL 60061-3100
Phone: 847-913-3107 Ext. 306 Fax: 847-913-6959

Richard Wolf Medical Instruments Corporation offers a complete assortment of the following products: laparoscopic and thoracoscopic instrumentation, 3 chip video camera systems (complete), insufflators, a complete line of instruments for video mediastinoscopy, and flexible choleodochoscopes. Please see our Panoview Plus, distortion-free laparoscopes & micro laparoscopy products.

RITA Medical Systems, Inc.

Address: 967 North Shoreline Blvd.
Mountain View, CA, 94043
Phone: 650-314-3433 Fax: 650-390-8505
Website: www.ritamedical.com

RITA Medical Systems is a leader in the development and manufacture of minimally invasive radiofrequency ablation devices that enable physicians to precisely ablate predictable volumes of tissue, including respectable liver lesions. The first radiofrequency ablation company to receive FDA clearance for this application, RITA Medical Systems is also investigating the potential application of its proprietary technology to a variety of tumor types in addition to liver cancer. Headquartered in Mountain View, California, the company’s products are sold throughout the world.

R-Med Inc. and Endo-Globe Ltd., an R-MED Subsidiary

3465 Navarre Ave
Oregon, OH, 43616
Phone: 419-693-7481 Fax: 419-693-7044
Website: www.rmed.com

R-Med offers a full range of technically advanced surgical instruments for Laparoscopy, Thoracoscopy, Hysteroscopy, Arthroscopy, Plastic-Endoscopy, Sinus-Endoscopy and Pediatric Endoscopy. We are proud to present the GraNee® Needle and Riza-Ribe® Needles for Trocar defect closures and Lap. T.E.P. Hernia repair. And the RBS™ System for loading the RBS-Ligator Rubber Bands™ on McGivney Hemorrhoid Ligator and many innovative products to be a partner in M.I.S. with Health Care Providers.

Sandhill Scientific

9150 Commerce Center Circle, Ste. 500
Highlands Ranch, CO 80129
Phone: 303-470-7200 Fax: 303-470-2975

Sandhill Scientific is the leading manufacturer of manometry and ambulatory pH diagnostic equipment. The advanced InSiGHT™ System is a universal platform supporting current manometric applications with the flexibility to incorporate future technologies. The GERD™ Ambulatory pH System utilizes Comfortec® disposable pH probes to monitor esophageal reflux.

Skytron

5000 36th St. S.E.
Grand Rapids, MI, 49512
Phone: 616-957-0500 Fax: 616-957-5053

Skytron is a major supplier of Operating Room equipment, including gas delivery booms, surgical tables and lights, and stainless cabinets.

Smith & Nephew Endoscopy

160 Dascomb Road
Andover, MA, 01810
Phone: 978-749-1000/1187 Fax: 978-749-1199

An innovator in endoscopic surgery, Smith & Nephew Endoscopy Division, designs, develops, and manufactures endoscopic surgical instrumentation and techniques with the goal of reducing trauma and pain to the patient, reducing cost to the healthcare system, and providing better outcomes for surgeons.

Sofradim Corporation

200 Stonewall Blvd, Suite 2a
Wrentham, MA, 02093
Phone: 508-384-2070 Fax: 508-384-2074

Sofradim designs, manufactures and markets unique and patented hernia mesh products made from multifibre polyester. Their Paretex® wide range of polyester meshes for both laparoscopic and open approaches. Their patented Parietex® Composite for the prevention of post-operative adhesions following ventral/incisional hernia repairs.

Sony Electronics Inc

1 Sony Drive, MD 3E6
Park Ridge, NJ 07656-8003
Phone: 201-358-4302 Fax: 201-358-4977
Website: www.sony.com/medical

Sony Medical’s imaging products, designed for use in endoscopic surgical applications, include medical color cameras, photo-quality printers, high resolution monitors, video tape recorders and print media. Sony Medical will be demonstrating end-to-end digital video solutions with a wide variety of new product introductions.

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Phone: 212-460-1500 Fax: 212-473-6272

Stop by and take a look at Springer’s new and innovative titles such as Chassin’s Operative Strategy in General Surgery, The SAGES Manual and Surgery: Basic Science and Clinical Evidence. Pick up complimentary copies of our journals including Surgical Endoscopy and World Journal of Surgery.

Starion Instruments Corp.

20665 Fourth St.
Saratoga, CA, 95070
Phone: 408-741-8773 Fax: 408-741-8774

Starion Instruments Thermal Ligating Products for open and endoscopic surgery simultaneously seal and divide vessels providing hemostatic cutting of soft tissue. Hemostasis is affected through the concurrent application of heat and pressure with no electricity passing through the patient.
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<tr>
<th>Company Name</th>
<th>Number</th>
<th>Address</th>
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<tr>
<td>Stryker Endoscopy</td>
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<td>2590 Walsh Ave.</td>
<td>408-567-9100</td>
<td>801-740-7256</td>
<td>Stryker Endoscopy is global technology leader in cross specialty surgical video, Endosuite™ Operating Rooms, telesurgery, voice activation and digital documentation. Highlighted will be the newest additions to the Stryker video family: 988 Digital Camera, HERMES Wireless Microphone, OptiVu HDVD System and SDC Pro 2.</td>
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<tr>
<td>Surgical Innovations Ltd</td>
<td>154/155</td>
<td>Clayton Park, Clayton Wood Rise</td>
<td>113 230 7597</td>
<td>113-230-7598</td>
<td>Surgical Innovations designs, manufactures and markets innovative products related to Minimally Invasive Surgery and Autologous Blood Transfusion. Products on show will include our award winning Logic laparoscopic instrument range, including the Fi resposable scissors. Complementing the Logic Range, will be our re-usable port access device YelloPort, together with our endoscopic retraction system Endoflex.</td>
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<td>Surgical Products Magazine</td>
<td>103</td>
<td>301 Gibraltar Dr</td>
<td>973-292-5100</td>
<td>973-539-3476</td>
<td>Surgical Products is the premier source for news of technological advances in the operating room. It is used by the most important surgical professionals, including: surgeons, O.R. supervisors, related department head and O.R. purchasing/material management.</td>
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<td>Surgical Rounds</td>
<td>179</td>
<td>241 Foursgate Drive</td>
<td>732-656-1140</td>
<td>732-656-1142</td>
<td>Surgical Rounds is a monthly surgical journal with articles of practical, everyday clinical application. It reaches more than 50,000 surgeons and surgical specialists throughout the United States, including interns, residents, medical school faculty, and full-time hospital and private practice surgeons.</td>
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<td>Surgicon, Inc.</td>
<td>361</td>
<td>400 Long Beach Blvd.</td>
<td>931-455-1551</td>
<td>931-455-9093</td>
<td>Surgicon offers innovative 5mm laparoscopic instruments, beginning with the SpringLock Ligation System. SpringLock is an alternative to traditional occluding clips that provides increased security and versatility including the ability to ligate vessels or other structures end-on and the ability to quickly close perforations in the gallbladder or other organs.</td>
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<td>Taut, Inc.</td>
<td>239</td>
<td>2571 Kaneville Court</td>
<td>630-232-2507</td>
<td>800-905-8005</td>
<td>Taut, Inc. manufactures and distributes 5mm, 10/11 mm and 12 mm asymmetrical dilating access ports, 2mm and 3mm Mini-Ports for mini-laparoscopy, Ob/Gyn and Pediatric surgery, Peritoneal Intraducers®, Cholangiogram catheters, a CBDE kit and non-latex capillary drains.</td>
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<tr>
<td>Texas Health Research Institute</td>
<td>106</td>
<td>6300 W. PARKER ROAD, SUITE 100</td>
<td>972-981-3743</td>
<td>972-981-3779</td>
<td>The PIMIT is Texas Health Research Institute's dedicated facility for promoting research and education in the area of minimally invasive technology. The PIMIT offers a variety of continuing medical education events, and can host non-CME activities for outside groups. Please visit our booth for complete listings of research and education capabilities.</td>
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<td>Thieme New York</td>
<td>174</td>
<td>333 7Th Ave. Fl #5</td>
<td>212-693-5088</td>
<td>212-947-1112</td>
<td>Long established as a world-renowned professional of medical and scientific books, journals, and multimedia, Thieme Publishers is proud to be exhibiting at SAGES 2002. This year’s new titles include: Gastroenterological Endoscopy (Classen) and Minimally Invasive Abdominal Surgery (Kremer).</td>
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<td>Tissuelink Medical</td>
<td>318/317</td>
<td>1 Washington Center, Ste. 400</td>
<td>603-742-1515</td>
<td>603-742-1488</td>
<td>Tissuelink Medical has a unique technology for hemostatic sealing of tissue. Tissuelink devices may help make difficult dissections (such as lap choles on patients with acute cholecystitis or intra-hepatic gallbladders) easier and stop difficult-to-control laparoscopic bleeding.</td>
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## United States Surgical

**150 Glover Ave.**  
Norwalk, CT, 06856  
Phone: 203-845-1000  
Fax: 203-847-0635, 4480

United States Surgical, a unit of Tyco Healthcare Group LP, is a leading manufacturer of innovative wound closure products and advanced laparoscopic surgical devices. Through innovative Technology and Training, United States Surgical’s Auto Suture Division works with physicians, nurses, and administrators for the benefit of their patients and healthcare communities.

## Valleylab

**5920 Longbow Drive**  
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Fax: 303-530-6285

Permanently fuse tissue bundles and vessels up to 7 mm diameter without dissection in laparoscopic procedures using Valleylab’s new LigaSure Atlas™ sealer/divider. The LigaSure™ Atlas sealer/divider provides versatile grasping for multiple tissue types, holding sealed tissue for easy transection.

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Phone: 760-603-9120  
Fax: 760-603-9170

Vista offers the most comprehensive Laparoscopic Bariatric Surgery Preceptorship Program available to prepare surgeons, office, and hospital staff in the complete path of treatment for the morbidly obese patient; including State of the Art 3D Laparoscopic Visualization & Information System.

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P.O. Box 12600  
Research Triangle Pk, NC 27709  
Phone: 919-361-4169  
Fax: 919-361-3914

Weck will be showcasing products for Open, Laparoscopic and Hand Assisted surgery. The Proractor® and Space OR® retractors offer unique and truly flexible wound retraction that provides clear access to the surgical site. The HALS procedure will benefit from the OmniPort® for simple and secure placement that allows access by hand or instrument through this versatile and economical hand port. Finally, for standard laparoscopic surgery, Weck offers the Endo5® 5mm Hem-o-lok® applier for secure ligation of vessels and tissue bundles up to 10mm. The larger clip is available on a 10mm platform for structures up to 13mm. Stop by the Weck booth to learn more about these new and exciting products.

## Weight for Life

**801 North Tustin, #702**  
Santa Ana, CA, 92705  
Phone: 714-542-8011  
Fax: 310-388-1245

Weight For Life is a ten-year-old company specializing in obesity surgery patient management services to hospital and surgeons. Services include in-house call center, insurance and marketing departments to help increase surgical volume, program awareness and profitability.

## Wilson-Cook Medical Inc.

**4900 Bethania Station Rd.**  
Winston-Salem, NC 27105  
Phone: 336-744-0157  
Fax: 336-744-5003

Wilson-Cook Medical, Inc. is a world leader in the design, development and production of quality endoscopic accessories. These include, but are not limited to sphincterotomes, wire guides, stents, forceps, multi-band ligators, needles, snares and cytology brushes.

## XiTact

**45, Rue De Lausanne**  
Morges, 1100 Switzerland  
Phone: 41-21-811-3240  
Fax: 41-21-811-3250

XiTact virtual patient Laparoscopy Simulator LS 500.
<table>
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<th>Name</th>
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# INDEX OF FACULTY & PRESENTERS

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