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### Communications at the SAGES Meeting

You will be able to reach the world and the world will be able to reach you while you are in attendance at the SAGES meeting.

**Option 1:**
A message can be left for you at either of the following phone numbers. A fax message can be sent using the number below. The phone or fax message will be posted for you on SAGES Message Board outside the Main Session Room.

Registration: 303-228-8293  
SAGES On-Site Office: 303-228-8291  
SAGES On-Site Office Fax: 303-228-8292

**Option 2:**
Five email stations will be available at which attendees can check and send email. Two stations will be placed in the Exhibit hall, one in the Olympus booth (309) and one adjacent to booth 230. An additional two stations will be located outside the Main Session room. A final station will be located in the Foundation Donors booth (accessible to Foundation donors only).

### Thanks to our Corporate Supporters!

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- Southern Anesthesia and Surgical  
- Synovis Surgical Innovations  
- Taut, Inc.

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General Information

SAGES Meeting
Where?
Colorado Convention Center
700 14th Street, Denver, CO 80202

Who?
Society of American Gastrointestinal Endoscopic Surgeons (SAGES)
11300 W. Olympic Blvd., Suite 600, Los Angeles, CA 90064
Phone: 310-437-0544, Fax: 310-437-0585
Email: Sagessweb@sages.org Website: www.sages.org

On-Site SAGES Office phone: 303-228-8291, fax: 303-228-8292

SAGES fully complies with the legal requirements of the ADA and the rules and regulations thereof. If any participant of the program offered by SAGES is in need of special accommodations, please do not hesitate to call and/or submit your request in writing to the Meeting Registrar in order to receive service.

SAGES Registration Hours:
Registration Phone: 303-228-8293

- Tuesday, March 30, 2004: Noon - 5:00 PM
- Wednesday, March 31, 2004: 7:00 AM - 7:00 PM
- Thursday, April 1, 2004: 6:30 AM - 5:00 PM
- Friday, April 2, 2004: 7:00 AM - 5:00 PM
- Saturday, April 3, 2004: 7:00 AM - 3:00 PM

Visit the Exhibits, Posters and Learning Center:
Exhibit Dates and Times:
Wednesday, March 31st
Opening Reception 5:00 - 7:00 PM
Thursday, April 1st
Hall Open 9:30 AM - 2:30 PM
Friday, April 2nd
Hall Open 9:30 AM - 2:30 PM
Saturday, April 3rd
Exhibit Hall Closed
Posters & Learning Center Open 10:00 AM - 2:00 PM

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.sages.org/

Hotels:
Marriott Denver City Center
(SAGES Co-Headquarter Hotel)
303-297-1300
1701 California Street, Denver, CO 80202, 4 blocks away from Convention Center

Hyatt Regency Denver
(SAGES Co-Headquarter Hotel)
303-295-1234
1750 Welton Street, Denver, CO 80202, 3 blocks away from Convention Center

Westin Tabor Center, Denver
303-572-9100
1672 Lawrence Street, Denver, CO 80202, 3 - 4 blocks away from the Convention Center

Holiday Inn Denver Downtown
303-573-1450
1450 Glenarm Place, Denver, CO 80202, 1 block away from the Convention Center

SAGES Shuttle Schedule
Shuttles will transport attendees to and from the Westin, Hyatt and Marriott to the Colorado Convention Center, and to and from all hotels to Jillian’s for the Friday evening event and Sing-Off.

Tuesday, March 30, 2004
7:00am-5:30pm (Every 10-15 minutes)

Wednesday, March 31, 2004
7:00am-10:00am (Every 6-7 minutes)
10:00am-3:30pm (Every 10-15 minutes)
3:30pm-5:30pm (Every 6-7 minutes)
5:30pm-9:30pm (Every 10-15 minutes)

Thursday, April 1, 2004
7:00am-10:00am (Every 6-7 minutes)
10:00am-3:30pm (Every 10-15 minutes)
3:30pm-5:30pm (Every 6-7 minutes)
5:30pm-9:30pm (Every 10-15 minutes)

Friday, April 2, 2004
6:00am-10:00am (Every 6-7 minutes)
10:00am-3:30pm (Every 10-15 minutes)
3:30pm-5:30pm (Every 6-7 minutes)
5:30pm-6:30pm (Every 10-15 minutes)

Shuttles will also be available at the Colorado Convention Center to take residents, new members and fellows to the Meet the Leadership Reception at Jillian’s.

Saturday, April 3, 2004
7:00am-10:00am (Every 6-7 minutes)
10:00am-3:30pm (Every 10-15 minutes)
3:30pm-5:00pm (Every 6-7 minutes)
# SAGES 2004 Meeting Schedule at a Glance

## Wednesday, March 31, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>Postgraduate Course I: Complications in Bariatric Surgery</td>
</tr>
<tr>
<td>7:30 AM - 12:00 PM</td>
<td></td>
</tr>
<tr>
<td><strong>Afternoon</strong></td>
<td>Hands-On Course Lab: Advanced Laparoscopic Techniques</td>
</tr>
<tr>
<td>1:00 - 5:30 PM</td>
<td></td>
</tr>
<tr>
<td>3:00 - 5:00 PM</td>
<td>Primer on Establishing &amp; Running a MIS/GI Fellowship Program</td>
</tr>
<tr>
<td><strong>Evening</strong></td>
<td>Exhibit Hall Opening Reception</td>
</tr>
<tr>
<td>5:00 - 7:00 PM</td>
<td></td>
</tr>
<tr>
<td>7:00 - 9:00 PM</td>
<td>SAGES Evening Video Session</td>
</tr>
</tbody>
</table>

## Thursday, April 1, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>Surgeon in the Digital Age Hands-On Course:</td>
</tr>
<tr>
<td>7:30 - 11:30 AM</td>
<td>PDA Workshop for Surgeons</td>
</tr>
<tr>
<td>7:30 - 11:30 AM</td>
<td>SAGES Allied Health Professionals Course</td>
</tr>
<tr>
<td>7:30 - 11:30 AM</td>
<td>Postgraduate Course II: Top to Bottom GERD</td>
</tr>
<tr>
<td>8:00 AM - 4:00 PM</td>
<td>Tour 1: Art Castings in Loveland &amp; Tastes of Boulder</td>
</tr>
<tr>
<td>9:30 - 10:00 AM</td>
<td>Break: Exhibits, Posters, Learning Center</td>
</tr>
<tr>
<td><strong>Afternoon</strong></td>
<td>Break: Exhibit Hall, Posters, Learning Center</td>
</tr>
<tr>
<td>11:30 AM - 2:00 PM</td>
<td>Postgraduate Course III: Top to Bottom GERD</td>
</tr>
<tr>
<td>2:00 - 5:00 PM</td>
<td>Postgraduate Course IV: Minimally Invasive Surgery in HPB Tumors</td>
</tr>
<tr>
<td>2:00 - 5:00 PM</td>
<td>Resident and Fellow Scientific Session</td>
</tr>
<tr>
<td><strong>Evening</strong></td>
<td>Industry Education Events</td>
</tr>
<tr>
<td>5:30 - 9:00 PM</td>
<td></td>
</tr>
</tbody>
</table>

## Friday, April 2, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>Industry Breakfasts</td>
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<tr>
<td>6:30 - 8:00 AM</td>
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</tr>
<tr>
<td>8:00 - 9:00 AM</td>
<td>Scientific Sessions: Plenary Session I</td>
</tr>
<tr>
<td>9:00 AM - 4:00 PM</td>
<td>Tour 2: Cherokee Ranch &amp; Castle: Garden of the Gods &amp; Lunch</td>
</tr>
<tr>
<td>9:00 - 9:30 AM</td>
<td>Karl Storz Lecture: Surgical Education and Training</td>
</tr>
<tr>
<td>9:30 - 10:00 AM</td>
<td>into the New Millennium – Ara Darzi, MD</td>
</tr>
<tr>
<td>10:00 - 10:30 AM</td>
<td>Presidential Address: Lee Swanstrom, MD</td>
</tr>
<tr>
<td>10:30 - 11:30 AM</td>
<td>Panel 1: Clinical Trials 101</td>
</tr>
<tr>
<td><strong>Afternoon</strong></td>
<td>Break: Exhibit Hall, Posters, Learning Center</td>
</tr>
<tr>
<td>11:30 AM - 2:00 PM</td>
<td>Paper and Video Sessions</td>
</tr>
<tr>
<td>2:00 - 6:00 PM</td>
<td>Panel 2: Gut Motility</td>
</tr>
<tr>
<td>4:30 - 6:00 PM</td>
<td>Panel 3: Minimally Invasive Endocrine Surgery</td>
</tr>
<tr>
<td><strong>Evening</strong></td>
<td>Meet the Leadership Reception for New Members, Residents and Fellows</td>
</tr>
<tr>
<td>6:00 - 7:00 PM</td>
<td></td>
</tr>
<tr>
<td>7:30 PM</td>
<td>SAGES Main Event &amp; Sing-off at Jillian's</td>
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</table>

## Saturday, April 3, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>Scientific Sessions: Plenary Session II</td>
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<tr>
<td>7:30 - 9:00 AM</td>
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</tr>
<tr>
<td>9:00 AM - 2:00 PM</td>
<td>Tour 3: Mile High City Highlights</td>
</tr>
<tr>
<td>9:00 - 9:30 AM</td>
<td>SAGES Awards Ceremony</td>
</tr>
<tr>
<td>9:30 - 10:00 AM</td>
<td>Marks Lecture: Paradigm Shifts and Loss of Domain:</td>
</tr>
<tr>
<td></td>
<td>Implications for Surgical Education - Jeffrey Ponsky, MD</td>
</tr>
<tr>
<td>10:00 - 11:00 AM</td>
<td>Panel 4: Patient Safety</td>
</tr>
<tr>
<td>10:00 AM - 2:00 PM</td>
<td>Posters &amp; Learning Center Open</td>
</tr>
<tr>
<td>11:00 AM - 12:00 PM</td>
<td>Paper and Video Sessions</td>
</tr>
<tr>
<td><strong>Afternoon</strong></td>
<td>SAGES Business Meeting—All Members Should Attend!</td>
</tr>
<tr>
<td>12:00 - 12:30 AM</td>
<td>Educator's Lunch: SAGES FLS: Conception, Validation and Distribution</td>
</tr>
<tr>
<td>12:30 - 2:00 PM</td>
<td>Technology Lunch: Robots: After the Honeymoon is Over</td>
</tr>
<tr>
<td>12:30 - 2:00 PM</td>
<td>Pediatric Lunch: Ileo-Colic Disease in Young Adults</td>
</tr>
<tr>
<td>2:00 - 5:00 PM</td>
<td>Paper and Video Sessions</td>
</tr>
<tr>
<td>2:00 - 3:00 PM</td>
<td>Panel 5: MIS From the Far Side</td>
</tr>
<tr>
<td>3:00 - 4:00 PM</td>
<td>Panel 6: PROS and CONS: Issues in General Surgery</td>
</tr>
</tbody>
</table>

GENERAL INFORMATION

SAGES 2004 Meeting Leaders:
Program Chair: Jo Buyske, MD
Top to Bottom:
GERD Postgraduate Course Chair: C. Daniel Smith, MD
Top to Bottom:
GERD Postgraduate Course Co-Chair: Jeffrey Marks, MD
Top to Bottom:
Colon Postgraduate Course Chair: Anthony Senagore, MD
Top to Bottom:
Colon Postgraduate Course Co-Chair: Howard Ross, MD
Complications in Bariatric Surgery and How to Manage Them Postgraduate Course Chair: Daniel Herron, MD
Complications in Bariatric Surgery and How to Manage Them Postgraduate Course Co-Chair: Santiago Horgan, MD
Minimally Invasive Surgery in HPB Tumors Postgraduate Course Chair(s): Frederick Greene, MD & Ricardo Rossi, MD
Advanced Laparoscopic Techniques Hands-On Course Chair: Sherry Wren, MD
Advanced Laparoscopic Techniques Hands-On Course Co-Chair: Paul Cirangle, MD
Surgeon in the Digital Age PDA Hands-On Course Chair: Steve Schwartzberg, MD
Surgeon in the Digital Age PDA Hands-On Course Co-Chair: Daniel Herron, MD & Alex Gandzas, MD
Evening Video Session Chair: Horacio Asbun, MD
Allied Health Professionals Course Chair: Donna Stanbridge, RN
Allied Health Professionals Course Co-Chair: Annette Wasielewski, RN
Poster Chair: John Marks, MD
Video Chair: Tonia Young-Fadok, MD
Learning Center Chair: Mark Callery, MD
Learning Center Co-Chair: Daniel Jones, MD
Discussants Coordinator: Marian McDonald, MD
Educator’s Lunch Coordinator: Gerald Fried, MD
Technology Lunch Coordinator: Patrick Reardon, MD
Pediatric Lunch Coordinator: Steven Rothenberg, MD
Resident’s Day Coordinators: Edward Lin, MD & Gretchen Purcell, MD

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

- 4.25 credit hours for the Complications in Bariatric Surgery Postgraduate Course
- 4.50 credit hours for the Advance Techniques Hands-On Lab
- 2.00 credit hours for the Evening Video Session
- 3.50 credit hours for the Top to Bottom – GERD Postgraduate Course
- 3.50 credit hours for the Top to Bottom – Colon Postgraduate Course
- 4.00 credit hours for the Surgeons in the Digital Age: PDA Workshop
- 3.50 credit hours for the Allied Health Professionals Course
- 3.00 credit hours for the Minimally Invasive Surgery in HPB Tumors Postgraduate Course
- 3.00 credit hours for the Resident & Fellow Scientific Session
- 3.00 credit hours for the Learning Center
- 15.00 credit hours for the Scientific Session
- 1.50 credit hours for the Educator’s Lunch
- 1.50 credit hours for the Technology Lunch
- 1.50 credit hours for the Pediatric Surgery Lunch

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.

The American Medical Association has determined that physicians not licensed in the US who participate in this CME activity are eligible for AMA PRA category 1 credit.

Thanks to SAGES Corporate Supporters!

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GENERAL INFORMATION

SAGES Program Committee:

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Stephen B. Archer, MD
George Berci, MD
Gene D. Branum, MD
L. Michael Brunt, MD
Luis E. Burbano, MD
Jo Buyske, MD
Jorge Cervantes, MD
Paul Thomas Cirangle, MD
Ricardo V. Cohen, MD
Manolo Cortez, MD
Peter F. Crookes, MD
Jorge Cueto, MD
Daniel J. Deziel, MD
Mohe Duda, MD
W. Stephen Eubanks, MD
Michel Gagner, MD
Jack Jakimowicz, MD
Goro Kaneda, MD
Roger G. Keith, MD
Demetrius E. M. Litwin, MD
Jeffrey M. Marks, MD
John H. Marks, MD
Michael R. Marohn, MD
Nicholas W. Morris, MD
Sean J. Mulvihill, MD
Adrian E. Park, MD
David W. Rattner, MD
William O. Richards, MD
Steven S. Rothenberg, MD
Steven D. Schwartzberg, MD
Paul A. Severson, MD
Phillip P. Shadduck, MD
Blayne A. Standage, MD
Lee L. Swanstrom, MD
Mark A. Talamini, MD
Telemont E. Udadia, MD
Steven D. Wexner, MD
Manabu Yamamoto, MD

SAGES Past Presidents:

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Kenneth Forde, MD 1983 - 1984
Thomas L. Dent, MD 1984 - 1985
James A. Lind, MD 1985 - 1986
John A. Collier, MD 1986 - 1987
Theodore R. Schrock, MD 1987 - 1988
Talmadge A. Bowden, MD 1988 - 1989
Lee E. Smith, MD 1989 - 1990
Jeffrey Ponsky, MD 1990 - 1992
Frederick L. Greene, MD 1992 - 1993
George Berci, MD 1993 - 1994
Bruce V. MacFadyen, Jr., MD 1994 - 1995
Col. Richard M. Satava, MD 1995 - 1996
Greg Stiegmann, MD 1996 - 1997
Desmond Birkett, MD 1997 - 1998
John Hunter, MD 1998 - 1999
Jeffrey H. Peters, MD 1999 - 2000
Nathaniel J. Soper, MD 2000 - 2001
L. William Traverso, MD 2001 - 2002
Bruce D. Schirmer, MD 2002 - 2003

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A.M.A. H.O.D. Representative: John A. Collier, MD

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Steven D. Wexner, MD

For more information and applications, please go to: http://www.sages.org/applications/ or visit the SAGES member services booth outside the main session rooms.

SAGES represents a worldwide community of surgeons, surgeons-in-training, and allied health professionals that can bring minimal access surgery, endoscopy and emerging techniques to patients in every country.

See page 66 for a complete list of our educational resources. Benefits of membership include:

- Subscription and/or online access to our official monthly journal: Surgical Endoscopy
- Significant discounts to the annual SAGES Postgraduate Courses and Scientific Session and other educational materials
- Reduced dues rates for surgeons in developing countries
- Participate in a growing, dynamic Society that views networking and peer-to-peer education as part of the everyday mission
- Innovative practice projects such as outcomes measurement
- Patient education information

Why Join the Society of American Gastrointestinal Endoscopic Surgeons?
**WEDNESDAY, MARCH 31, 2004**

<table>
<thead>
<tr>
<th>Course/Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postgraduate Course I:</td>
<td>7:30 AM - 12:00 PM</td>
<td>Ballroom 1</td>
</tr>
<tr>
<td>Complications in Bariatric Surgery and How to Manage Them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAGES Hands-On Course Lab: Advanced Laparoscopic Techniques</td>
<td>1:00 PM - 5:30 PM</td>
<td>C201-209</td>
</tr>
<tr>
<td>Primer On Establishing and Running A MIS/GI Fellowship Program:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A Joint Symposium of SAGES and the MIS Fellowship Council</td>
<td>3:00 PM - 5:00 PM</td>
<td>Ballroom 1</td>
</tr>
<tr>
<td>Exhibit Hall Opening Reception</td>
<td>5:00 PM - 7:00 PM</td>
<td>Exhibit Hall</td>
</tr>
<tr>
<td>SAGES Evening Video Session</td>
<td>7:00 PM - 9:00 PM</td>
<td>Ballroom 1</td>
</tr>
</tbody>
</table>

Pencil us in for next year:

**SAGES Annual Meeting**  
(w/AHPBA, consecutive to ACS Spring Meeting)

**April 13 - 16, 2005 • Westin Diplomat Resort • Ft. Lauderdale, Florida**
Complications in Bariatric Surgery and How to Manage Them

Time: 7:30 AM - 12:00 PM
Duration of Course: Half Day
Location: Ballroom 1
Course Chair: Daniel M. Herron, MD
Course Co-Chair: Santiago Horgan, MD

Course Description:
Bariatric surgery is currently the fastest-growing subspecialty within general surgery. All bariatric surgeons should understand how to avoid bariatric complications and be able to diagnose and treat them when they occur. Due to the growing number of bariatric patients in the U.S. population, general surgeons should also be familiar with the evaluation and treatment of acute and chronic bariatric complications. This course will feature nationally respected experts discussing a broad spectrum of bariatric complications, from minor to life-threatening. The evaluation and management of early sepsis and chronic abdominal pain will be emphasized. Speakers will address technical complications such as leaks, strictures, and internal hernias, as well as metabolic, nutritional, and critical-care oriented problems.

The course will focus on the practical application of evidence-based clinical medicine. After discussing the latest clinical data in their area, each speaker will present actual cases to allow course attendees to formulate diagnoses and participate in the management process. Course attendees will have the opportunity to function as “surgical consultants,” evaluating lab tests and radiological studies, making a diagnosis, and formulating a treatment plan. Speakers will evaluate these treatment plans, recommend alternative interventions, and review surgical outcomes. Substantial time will be allotted for participants to present questions to be addressed at a round-table panel discussion.

Objectives:
At the conclusion of this activity, the participant will be able to:

- Describe and summarize the latest evidence-based data regarding various technical complications of bariatric surgical procedures
- Formulate a plan to evaluate and manage the postoperative bariatric patient with sepsis, abdominal pain, or vomiting
- Understand complications unique to laparoscopic adjustable gastric banding
- Diagnose and manage nutritional and metabolic sequellae of weight loss procedures
- Assess the patient with inadequate weight loss following bariatric surgery
- Recognize the diagnostic value of various laboratory and imaging studies in the management of bariatric complications
- Be able to formulate a specific treatment plan for these various bariatric complications

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 - 7:35 AM</td>
<td>Course Welcome and Introduction</td>
<td>Daniel Herron, MD</td>
</tr>
<tr>
<td>7:35 - 7:55 AM</td>
<td>Diagnosis and Management of Early Postoperative Sepsis</td>
<td>Alan Wittgrove, MD</td>
</tr>
<tr>
<td>7:55 - 8:15 AM</td>
<td>Evaluation and Management of Abdominal Pain and Vomiting in the Postoperative Patient</td>
<td>Bruce Schirmer, MD</td>
</tr>
<tr>
<td>8:15 - 8:35 AM</td>
<td>Non-technical Complications (DVT, PE, resp., wound infx, etc.)</td>
<td>Sayeed Ikramuddin, MD</td>
</tr>
<tr>
<td>8:35 - 8:55 AM</td>
<td>Lap Band Complications</td>
<td>Christine Ren, MD</td>
</tr>
<tr>
<td>8:55 - 9:25 AM</td>
<td>Ask the Experts: Open Mike Q&amp;A and Roundtable Discussion</td>
<td>Wittgrove, Schirmer,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderator: Herron, Ikramuddin, Ren</td>
</tr>
<tr>
<td>9:25 - 9:40 AM</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>9:40 - 10:00 AM</td>
<td>Critical Care: Managing the Morbidly Obese Patient in the ICU</td>
<td>Alfons Pomp, MD</td>
</tr>
<tr>
<td>10:00 - 10:20 AM</td>
<td>Long-term Nutritional Complications</td>
<td>Scott Shikora, MD</td>
</tr>
<tr>
<td>10:20 - 10:40 AM</td>
<td>Management of Weight Loss Failure</td>
<td>Harvey Sugerman, MD</td>
</tr>
<tr>
<td>10:40 - 11:00 AM</td>
<td>Legal Ramifications of Bariatric Complications:</td>
<td>Walter Lindstrom, JD</td>
</tr>
<tr>
<td></td>
<td>What Constitutes Standard of Bariatric Care</td>
<td></td>
</tr>
<tr>
<td>11:00 AM - 12:00 PM</td>
<td>Ask the Experts: Open Mike Q&amp;A and Roundtable Discussion</td>
<td>Pomp, Shikora, Sugarman, Lindstrom, Moderator: Daniel Herron</td>
</tr>
</tbody>
</table>

The Course Directors recommend that attendees of this course visit the SAGES learning center during the meeting to reinforce the techniques described in this course.

SAGES gratefully acknowledges Karl Storz Endoscopy for an educational grant in support of this course.

http://www.sages.org/
SAGES HANDS-ON COURSE LAB  
Wed., March 31, 2004

Advanced Laparoscopic Techniques

Time of Lab: 1:00pm - 5:00 PM, Location: C201-209  
Chair: Sherry Wren, MD, Co-Chair: Paul Cirangle, MD

Objectives:  
Upon completion of the course all participants will be able to demonstrate:
  ● Sutured and stapled intestinal anastomoses
  ● In vivo use of energy devices to divide vascularized tissues
  ● Compare and contrast energy sources
  ● In vivo use of the 30 degree laparoscope

HPB Module:  
Participants will:
  ● Demonstrate basic laparoscopic ultrasound techniques in a porcine liver
  ● Demonstrate basic techniques of radiofrequency ablation
  ● Demonstrate laparoscopic methods of hemostasis
  ● Perform image guided radio frequency ablation of a liver abnormality
  ● Perform laparoscopic liver resection
  ● Perform ultrasound guided biopsy of the liver

Endoscopic Management of GERD Module:  
Participants will:
  ● Discuss basic mechanical components of the Stretta, Enteryx, Plicator, and EndoCinch devices
  ● Demonstrate application steps for each of the devices
  ● Demonstrate in vivo use of the Stretta, Enteryx and EndoCinch device, and ex vivo use of the Plicator in the porcine model

Faculty:
Reid Adams, Charlottesville, VA  
Sunil Bhoyrul, San Diego, CA  
Fred Brody, Washington, DC  
L. Michael Brun, St. Louis, MO  
Paul Cirangle, San Francisco, CA  
Ed H. Cussati, West Babylon, NY  
Quan-Yang Duh, San Francisco, CA  
Brian Dunkin, Miami, FL  
Thomas Eubanks, Portland, OR  
Paul Hansen, Portland, OR  
Michael Holzman, Nashville, TN  
Santiago Horgan, Chicago, IL  
William Barry Inabnet, New York, NY  
Blair A. Jobe, Portland, OR  
Leena Khaitan, Atlanta, GA  
Jennifer Kieran, Stanford, CA  
William S. Laycock, Lebanon, NH  
Christina Li, Philadelphia, PA  
Demetrius E. Litwin, Worcester, MA  
Kirk Ludwig, Durham, NC  
Peter W. Marcello, Burlington, MA  
Michael R. Marohn, Baltimore, MD  
Marian P. McDonald, Bethlehem, PA  
John M. Morton, Stanford, CA  
Emma J. Patterson, Portland, OR  
Alfonso Porn, New York, NY  
Bruce J. Ramshaw, Atlanta, GA  
Howard M. Ross, Wynnewood, PA  
Shirin Towfigh, Los Angeles, CA  
Thadeus L. Trus, Lebanon, NH  
Jason T. Wong, Portland, OR  
Sherry M. Wren, Palo Alto, CA  
Tonia M. Young-Fadok, Scottsdale, AZ

Solid Organ Module:
Participants will complete in the porcine model using two handed techniques:
  ● Bilateral adrenalectomy (including proper positioning of animal)
  ● Bilateral nephrectomy
  ● Demonstrate techniques of solid organ retrieval and extraction

Lab Description:
  ● 30 Pig Stations
  ● First half of lab will cover Suturing, Stapling, GI Anastomoses, and Energy Devices
  ● Class will then be divided into three sections to focus on the following areas:
    Hepatobiliary disease OR Endoscopic Management of GERD OR Solid Organ

Lab Schedule:

| 1:00pm - 1:15pm | Introduction  
|                | Overview of lab  
|                | Discussion of new devices  
|                | Suturing & Energy Devices  
|                | Angled scopes  
|                | Anastomotic techniques - how to set it up  
|                | GI Anastomosis  
|                | Energy Sources & Angled Scopes

CLASS DIVIDES INTO THREE SECTIONS

Section One
3:15pm - 5:00pm HPB Module  
  Overview of equipment  
  Ultrasound of liver, biliary tract  
  RF ablation of hepatic tumor  
  Ultrasound guided liver biopsy  
  Liver resection techniques

Section Two
3:15pm - 5:00pm Novel GERD Therapy Module  
  Overview of equipment  
  Stretta, EndoCinch, Enteryx, and Plicator

Section Three
3:15pm - 5:00pm Solid Organ Module  
  Nephrectomy, Adrenalectomy  
  Extraction techniques

Conclusion
5:00pm - 5:20pm Course Review and Evaluation

SAGES gratefully acknowledges educational grants from the following companies in support of this course:
Aloka  •  Auto Suture   •  Bard Endoscopic Technologies  
B-K Medical  •  Boston Scientific  •  Curon Medical, Inc.  
Fujinon, Inc. •  Paré Surgical  •  Stryker Endoscopy  
SurgRx  •  Valleylab

Contributions In-Kind:
Applied Medical • Bovie Medical • ConMed  
Karl Storz Endoscopy • NDO Surgical • Olympus America  
Radionics/Valleylab • RITA • Snowden/Pencer  
Tetrad • TissueLink • Weck, a Teleflex Company

http://www.sages.org/
A Joint Symposium of SAGES and the MIS Fellowship Council

Time: 3:00 - 5:00 PM
Location: Ballroom 1
Course Director: C. Daniel Smith, MD
Co-Director: Adrian Park, MD

Description:
The symposium will provide fellowship directors and potential fellowship directors a format/structure on how to ensure they have and continue to have a good fellowship. The format will be a late afternoon program during SAGES Annual Meeting. There will be no registration fee to attend this symposium.

Objectives:
At the completion of the program participants will:

- Understand the role fellowships serve today and why they are important
- Develop some strategies for selecting a fellow
- Understand the importance of ensuring that education is appropriately balanced with service
- Review examples of different fellowships and how they are structured
- Be aware of the needs of fellows with respect to their work environment and compensation

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 - 3:10 PM</td>
<td>Who is The MISFC Council and Why Should You Care?</td>
<td>Adrian Park, MD</td>
</tr>
<tr>
<td>3:10 - 3:20 PM</td>
<td>Brief History of MISFC</td>
<td></td>
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<tr>
<td>3:20 - 3:35 PM</td>
<td>What is a Fellowship?</td>
<td>Bruce Schirmer, MD</td>
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<td></td>
<td>Clarify differences between ACGME fellowships vs. SSO Fellowships vs. others</td>
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<td></td>
<td>Examples of different types of fellowships (global, bariatrics, liver)/settings (private, academic)</td>
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<tr>
<td>3:35 - 3:45 PM</td>
<td>Strategies for Adding/Integrating a Fellowship</td>
<td>Dennis Fowler, MD</td>
</tr>
<tr>
<td></td>
<td>Chairman / Dean Issues</td>
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<td></td>
<td>Hospital administrator Issues</td>
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<td></td>
<td>Residency Issues</td>
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<tr>
<td>3:45 - 4:00 PM</td>
<td>How to Select the Best Fellow for Your Program</td>
<td>Scott Melvin, MD</td>
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<tr>
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<td>Reviewing applications</td>
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<td></td>
<td>Interviewing</td>
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<td></td>
<td>The match</td>
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<tr>
<td>4:00 - 4:15 PM</td>
<td>Balancing Service and Education</td>
<td>Keith Lillemoe, MD</td>
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<td>Template for ensuring educational benefits</td>
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<td></td>
<td>Minimum components to say there is education</td>
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<tr>
<td></td>
<td>What not to do - too much service = indentured servant</td>
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<tr>
<td>4:15 - 4:30 PM</td>
<td>Ethics of Running a Non-Accredited Fellowship</td>
<td>Joseph Petelin, MD</td>
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<td>Salary</td>
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<td>Benefits</td>
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<td>Time off</td>
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<td></td>
<td>Appropriate backup/coverage</td>
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<td></td>
<td>Commitment to fellow if program director leaves</td>
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</tr>
<tr>
<td>4:30 - 5:00 PM</td>
<td>Program Reviews: From the Community to The Ivory Tower</td>
<td>Patrick Reardon, MD</td>
</tr>
<tr>
<td></td>
<td>Details from a community program</td>
<td>C. Daniel Smith, MD</td>
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<tr>
<td></td>
<td>Details from an academic program</td>
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<td></td>
<td>Discussion</td>
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</tbody>
</table>
SAGES EVENING VIDEO SESSION  Wednesday, March 31, 2004

Time: 7:00 - 9:00 PM
Location: Ballroom 1
Chair: Horacio Asbun, MD

Description:
During this special video session, some of the best videos from previous SAGES meetings will be showcased. The senior author of each video will be present to provide commentary and updates. Expert panelists will discuss the videos, and the audience will have a chance to ask questions of the authors and the panelists.

Objectives:
- To become familiar with the surgical techniques for the surgical procedures shown in the video presentations
- To learn how experts in the field perform the procedures showcased
- To understand the reasoning behind the surgical approach

Expert Panelists:
Michael Edye, MD
Daniel Deziel, MD
Eduardo Targarona, MD

Videos:

<table>
<thead>
<tr>
<th>Videos</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical Applications and Geometry of the 360 Degree Fundoplication</td>
<td>Patrick Reardon, MD</td>
</tr>
<tr>
<td>(SAGES 2003)</td>
<td></td>
</tr>
<tr>
<td>Laparoscopic Lumbar Hernia Repair</td>
<td>Author: Jacques Marescaux (not in attendance)</td>
</tr>
<tr>
<td>(SAGES 2001)</td>
<td></td>
</tr>
<tr>
<td>Laparoscopic Extraction of Complicated Hydatid Cyst Liver with Biliary Rupture</td>
<td>C. Palanivelu, MD</td>
</tr>
<tr>
<td>(SAGES 2003)</td>
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</tr>
<tr>
<td>Then and Now: Lessons Learned from 400 Laparoscopic Donor Nephrectomies</td>
<td>Brian Dunkin, MD</td>
</tr>
<tr>
<td>(SAGES 2000)</td>
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<tr>
<td>Laparoscopic Total Colectomy with Advanced Access Port</td>
<td>Peter Marcello, MD</td>
</tr>
<tr>
<td>(SAGES 2002)</td>
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</tr>
<tr>
<td>Laparoscopic Bilipancreatic Diversion with Duodenal Switch for Superobesity</td>
<td>Michel Gagner, MD</td>
</tr>
<tr>
<td>(SAGES 2000)</td>
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</tbody>
</table>

SAGES gratefully acknowledges an educational grant in support of this event from Auto Suture.

5:00 - 7:00 PM  EXHIBIT HALL OPENING RECEPTION

SAVE THE DATE!!

SAGES Scientific Session & Postgraduate Course: April 13 - 16, 2005
Westin Diplomat Resort, Ft. Lauderdale, FL (will be held with AHPBA, & consecutively with the ACS Spring Mtg.)

SAGES Scientific Session & Postgraduate Course: April 26 - 29, 2006
Wyndham Anatole Hotel, Dallas, TX (will be held with IPEG, & consecutively with the ACS Spring Mtg.)

SAGES Scientific Session & Postgraduate Course: April 19 - 22, 2007
Paris Las Vegas Hotel, Las Vegas, NV (will be held consecutively with the ACS Spring Mtg.)

Related Meetings

13th Annual Congress for Endosurgery in Children, IPEG: Maui, Hawaii, May 5-8, 2004

12th EAES International Congress: Barcelona, Spain, June 9 - 12, 2004

13th EAES International Congress and 14th Annual Congress for Endosurgery in Children, IPEG: Venice, Italy, June 1 - 4, 2005

http://www.sages.org/
<table>
<thead>
<tr>
<th>Course/Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon in the Digital Age Hands-On Course:</td>
<td>7:30 - 11:30 AM</td>
<td>C108-112</td>
</tr>
<tr>
<td>PDA (Personal Digital Assistant) Workshop for Surgeons</td>
<td></td>
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</tr>
<tr>
<td>SAGES Allied Health Professionals Course</td>
<td>7:30 - 11:30 AM</td>
<td>Ballroom 1</td>
</tr>
<tr>
<td>SAGES Postgraduate Course II: Top to Bottom: GERD</td>
<td>7:30 - 11:30 AM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>Exhibits, Posters, Learning Center Open</td>
<td>9:30 AM - 2:30 PM</td>
<td>Exhibit Hall</td>
</tr>
<tr>
<td>SAGES Postgraduate Course III: Top to Bottom: Colon</td>
<td>2:00 - 5:30 PM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>SAGES Postgraduate Course IV: Minimally Invasive Surgery in HPB Tumors</td>
<td>2:00 - 5:00 PM</td>
<td>Ballroom 1</td>
</tr>
<tr>
<td>Resident &amp; Fellow Scientific Session</td>
<td>2:00-5:00 PM</td>
<td>Ballroom 4</td>
</tr>
<tr>
<td>SAGES 2004 Industry Education Events</td>
<td>5:30 PM</td>
<td>Ballrooms 1-4</td>
</tr>
</tbody>
</table>

Posters will be on display Thursday and Friday in the Exhibit Hall during Exhibit hours, and Saturday from 10:00 AM - 2:00 PM. The top 20 - 25 posters will be recognized on site.
**SURGEON IN THE DIGITAL AGE HANDS-ON COURSE**

PDA (Personal Digital Assistant) Workshop for Surgeons

**Time:** 7:30 - 11:30 AM, **Duration of Course:** Half Day

**Location:** C108-112

**Chair:** Steven Schwaitzberg, MD

**Co-Chairs:** Daniel Herron, MD and Alex Gandsas, MD

**Course Description:**

This course is designed for health care professionals who have a PDA and want to get more out of it. It is also for users who have never owned a PDA and want to explore the possibilities for use in their practice. Minimal computer experience is needed to participate fully in the workshop. You do not need to own a PDA to participate. Hewlett-Packard has provided IPAQ PDAs for use by the participants. (2 participants at each PDA station).

**Course Objectives:**

- Provide participants with an overview of mobility in healthcare possibilities utilizing PDAs
- Familiarize the participant with basic PDA features that will assist in surgical practice organization and patient education
- Demonstrate and utilize drug referencing software for incorporation into daily practice
- Demonstrate and practice clinical dictation on the PDA and understand its capabilities for integration of the documentation for effective practice management such as E&M coding
- Demonstrate and practice effective digital media (still photos, video) manipulation to utilize the PDA in order to give Powerpoint® presentations, or demonstrate photo or video files for medical professional or patient education purposes

**Workshop Outline:**

**Mobility in Healthcare:**

What is possible today and tomorrow?

- Basic PDA function
- Address function
- Calendar function
- Moving data between PDAs
- Windows based
- Palm based

PDA as a updatable drug reference tool

Using the PDA as a practice management tool

- Dictation
- E&M coding

PDA as a presentation tool

- Media file incorporation and manipulation
- Powerpoint®

PDA based presentation for digital projection

---

SAGES gratefully acknowledges support of this program from the following companies:

Hewlett Packard, Karl Storz Endoscopy, Stryker Endoscopy
Time: 7:30 - 11:30 AM  
Duration of Course: Half Day  
Location: Ballroom 1  
Course Chair: Donna Stanbridge, RN  
Course Co-Chair: Annette Wasielewski, RN, BSN, CNOR

**Description:**

Nursing and Allied Healthcare professionals roles are undergoing rapid changes in the surgical setting. Much of these changes can be attributed to advances in technology and the introduction of evidence-based practices. Nurses are facing new challenges, as well as discovering new opportunities in this environment. The concept of teams is a necessity for optimal surgical performance and outcomes. This session will focus on ways for the perioperative professional to expand their MIS knowledge base and encourages the development of a more active nursing role.

**Objectives:**

At the conclusion of this course, participants will be able to:

- Describe strategies of MIS competency assessment/education for nurses and Allied Healthcare professionals
- List strategies that contribute to a positive introduction of a new MIS procedure and benefits of the team approach
- Describe the potential educational role of VR simulators for nurses and Allied Healthcare professionals
- List indications for laparoscopic radical prostate surgery and perioperative preparation
- Compare and contrast the types of laparoscopic colon procedures
- Identify indications and techniques for the use of bedside mini-laparoscopy
- Discuss the creation of an MIS journal
- Identify the considerations for the pediatric MIS patient

<table>
<thead>
<tr>
<th>Program:</th>
<th>Faculty:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 AM Welcome and Introduction</td>
<td>Donna Stanbridge, RN &amp; Annette Wasielewski, RN</td>
</tr>
<tr>
<td>7:40 AM Development of MIS Nursing and Allied Healthcare Professionals Competency Assessment/Education</td>
<td>Donna Stanbridge, RN</td>
</tr>
<tr>
<td>8:00 AM Introduction of a New MIS Procedure</td>
<td>Liane Feldman, MD</td>
</tr>
<tr>
<td>8:20 AM Simulator Development for Nurses/First Assistants</td>
<td>Randy Haluck, MD</td>
</tr>
<tr>
<td>8:40 AM Creating a MIS Journal</td>
<td>Adrian Park, MD</td>
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<tr>
<td>9:00 AM Discussion Panel</td>
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<tr>
<td>9:15 AM Break</td>
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<tr>
<td>9:45 AM Advances in Laparoscopic Radical Prostatectomy</td>
<td>Annette Wasielewski, RN</td>
</tr>
<tr>
<td>10:05 AM Update of Laparoscopic Colon Surgery</td>
<td>Garth H. Ballantyne, MD</td>
</tr>
<tr>
<td>10:25 AM Bedside Mini-Laparoscopy</td>
<td>Nancy J. Hogle, RN, BSN</td>
</tr>
<tr>
<td>10:45 AM Laparoscopic Incisional Hernias</td>
<td>Gerald Fried, MD</td>
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<tr>
<td>11:05 AM Discussion Panel</td>
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<tr>
<td>11:20 AM Closing remarks</td>
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</tbody>
</table>

**Allied Health Professionals: SAGES has a new membership category for you!**

Contact the SAGES office or [www.sages.org/applications/](http://www.sages.org/applications/) for more information.

**SAGES Outcomes Initiative**

**New PDA Software Now Available**

Come by the SAGES booth across from the main session area to pick up your copy today.

Free to all current participants.

**Questions? Ask the Expert**

George Maupin from Whispercom will be available to answer your technical questions regarding the SAGES Outcomes Initiative. Please stop by the SAGES booth during the following times:

- **Thursday, April 1:** 1:30 - 3:00 pm
- **Friday, April 2:** 9:30 - 10:00 am and 11:30 - 3:00 pm
Top to Bottom: GERD

Time: 7:30 - 11:30 AM
Duration of Course: Half Day
Location: Ballroom 2/3
Course Chair: C. Daniel Smith, MD
Course Co-Chair: Jeffrey Marks, MD

Course Description:
This half-day course is for any clinician who is caring for patients with GERD. This widely prevalent disease is one of the most common conditions of the GI tract for which patients seek help. Therapies including medication, surgery and endoscopic procedures are continuously being refined, and new therapies are rapidly becoming available. This course will provide an update on all manners of management of GERD. In addition, several presentations will focus on antireflux surgery including the various techniques, their outcomes and strategies to help properly select patients for each of the various therapeutic offerings available today.

Course Objectives:
After attending this 1/2 day course, participants should:
- Understand the significance of GERD in the US
- Describe the various therapies currently available for the treatment of GERD
- Identify patients best suited for the various treatments available
- Recognize surgical refinements that are improving outcomes of antireflux surgery
- Develop strategies for managing complex cases of GERD

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 - 7:40 AM</td>
<td>Welcome</td>
<td>Jeffrey Marks, MD</td>
</tr>
<tr>
<td>7:40 - 8:00 AM</td>
<td>GERD: Epidemiology, Consequences and Diagnosis</td>
<td>Cedric Bremner, MD</td>
</tr>
<tr>
<td>8:00 - 8:20 AM</td>
<td>Medical Management</td>
<td>J. Patrick Waring, MD</td>
</tr>
<tr>
<td>8:20 - 8:40 AM</td>
<td>Surgical Management</td>
<td>Reginald Bell, MD</td>
</tr>
<tr>
<td>8:40 - 9:00 AM</td>
<td>Endoscopic Management</td>
<td>C. Daniel Smith, MD</td>
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<tr>
<td>9:00 - 9:30 AM</td>
<td>Panel Discussion: What Would you Do?</td>
<td>All Speakers, Jeffrey Marks, MD Moderator</td>
</tr>
<tr>
<td>9:30 - 10:00 AM</td>
<td>Break: Exhibits, Posters, Learning Center</td>
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</tr>
<tr>
<td>10:00 - 10:15 AM</td>
<td>Fundamentals of Antireflux Surgery</td>
<td>Steven Bowers, MD</td>
</tr>
<tr>
<td>10:15 - 10:30 AM</td>
<td>Failed Antireflux Surgery: Why Do They Fail and What To Do?</td>
<td>John Hunter, MD</td>
</tr>
<tr>
<td>10:30 - 10:45 AM</td>
<td>Secondary GERD: To Wrap or Not?</td>
<td>William Richards, MD</td>
</tr>
<tr>
<td>10:45 - 11:00 AM</td>
<td>GERD Associated Conditions: Motility Abnormalities and Others</td>
<td>Mehran Anvari, MD</td>
</tr>
<tr>
<td>11:00 - 11:25 AM</td>
<td>Panel Discussion: Challenging Case Management</td>
<td>All Speakers, Daniel Smith, MD Moderator</td>
</tr>
<tr>
<td>11:25 - 11:30 AM</td>
<td>The Future of GERD Management: The Surgeon’s Role</td>
<td>C. Daniel Smith, MD</td>
</tr>
</tbody>
</table>

The Course Directors recommend that attendees of this course visit the SAGES learning center during the meeting to reinforce the techniques described in this course.

SAGES gratefully acknowledges educational grants from the following companies in support of this course: Curon Medical, Ethicon Endo-Surgery, Inc., Karl Storz Endoscopy.
SAGES POSTGRADUATE COURSE III  Thurs., April 1, 2004

Top to Bottom: Colon

Time: 2:00 - 5:30 PM
Duration of Course: Half Day
Location: Ballroom 2/3
Course Co-Chairs: Anthony Senagore, MD & Howard Ross, MD

Course Description:
Laparoscopic colectomy increasingly plays an expanding role in the surgical treatment of colon and rectal disease. This course explores the evidence for applying laparoscopic techniques to the surgical management of both benign and malignant diseases of the colon and rectum. The colon course has been designed to provide participants with evidence based analysis of laparoscopic approaches to colon cancer, inflammatory bowel disease, diverticulitis and rectal prolapse. New technologies and management paradigms that may represent the future of colon and rectal surgery will be highlighted.

Course Objectives:
Participants in this course will:

● Review the current status of laparoscopic colectomy for colon cancer
● Learn the techniques that enable an appropriate laparoscopic colectomy for cancer to be performed
● Gain cognition of how radiofrequency ablation can improve the treatment of the patient with hepatic metastases
● Analyze outcome data on laparoscopic colectomy for diverticulitis, Crohn’s disease, rectal prolapse and ulcerative colitis
● Explore how hand assisted techniques can facilitate the application of laparoscopic surgery to the broad spectrum of colon and rectal disease
● Examine the financial implications of laparoscopic colon resection
● Wonder in the possibilities of applying robotics to colon and rectal surgery
● Investigate whether critical pathway utilization optimizes care of the laparoscopic colectomy patient

Program:

<table>
<thead>
<tr>
<th>I. Laparoscopic Colectomy for Cancer</th>
<th>Faculty:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00 PM What Is the Current Status of Resection for Cure?</td>
<td>Steven Wexner, MD</td>
</tr>
<tr>
<td>2:15 PM Surgical Techniques for Cancer</td>
<td>James Fleshman, MD</td>
</tr>
<tr>
<td>2:30 PM Assessment and Management of Liver Metastases with Radiofrequency Ablation</td>
<td>Alan Siperstein, MD</td>
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<tr>
<td>2:45 PM Discussion</td>
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<thead>
<tr>
<th>II. Outcomes for Benign Disease</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 PM Diverticular Resections</td>
<td>Jeff Cohen, MD</td>
</tr>
<tr>
<td>3:15 PM Crohn’s Disease</td>
<td>Tonia Young-Fadok, MD</td>
</tr>
<tr>
<td>3:30 PM Rectal Prolapse</td>
<td>Martin Luchtefeld, MD</td>
</tr>
<tr>
<td>3:45 PM Ulcerative Colitis</td>
<td>Peter Marcello, MD</td>
</tr>
<tr>
<td>4:00 PM Discussion</td>
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</tbody>
</table>

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<thead>
<tr>
<th>III. New or Old Technology and Management</th>
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</tr>
</thead>
<tbody>
<tr>
<td>4:15 PM Hand Assisted Colectomy Is the Future</td>
<td>Demetrius Litwin, MD</td>
</tr>
<tr>
<td>4:30 PM Standard Laparoscopic Colectomy Avoids an Expensive Bridge to Nowhere</td>
<td>Anthony Senagore, MD</td>
</tr>
<tr>
<td>4:45 PM Robotics: Is There an Android in Your Future?</td>
<td>Conor Delaney, MD</td>
</tr>
<tr>
<td>5:00 PM Fast Track Care of the Laparoscopic Colectomy Patient - Benefit or Risk?</td>
<td>Howard Ross, MD</td>
</tr>
<tr>
<td>5:15 PM Discussion</td>
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</tr>
</tbody>
</table>

The Course Directors recommend that attendees of this course visit the SAGES learning center during the meeting to reinforce the techniques described in this course.

SAGES gratefully acknowledges educational grants in support of this course from the following companies: Curon Medical, Ethicon Endo-Surgery, Inc., Karl Storz Endoscopy.

http://www.sages.org/
Minimally Invasive Surgery in HPB Tumors

Time: 2:00 - 5:00 PM
Duration of Course: Half Day
Location: Ballroom 1
Course Chairs: Frederick Greene, MD & Ricardo Rossi, MD

Course Description:
This half-day course will cover the appropriate evaluation and minimal access approaches to cancer of the liver and pancreas. The biology and staging of hepato-pancreatic tumors will be discussed in terms of approaches utilizing resection, ablative techniques and palliative maneuvers relating to endoscopic management. Case studies will be presented using an Audience Response System to maximize participation of faculty and attendees.

Objectives:

- To review the biology and staging of hepatic and pancreatic tumors in terms of endoscopic management.
- To discuss the various approaches to resection and ablation of hepatic and pancreatic tumors.
- To discuss the appropriate work-up for patients undergoing endoscopic management.
- To review case studies relating to issues relating to the endoscopic management of hepato-pancreatic cancer.

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Faculty</th>
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</thead>
<tbody>
<tr>
<td>2:00 - 2:10 PM</td>
<td>Introduction and Overview</td>
</tr>
<tr>
<td>2:10 - 2:25 PM</td>
<td>Laparoscopic Interface in the Biology of Hepatopancreatic Tumors</td>
</tr>
<tr>
<td>2:25 - 2:40 PM</td>
<td>Staging of HPB Cancer</td>
</tr>
<tr>
<td>2:40 - 2:55 PM</td>
<td>Pre-op Imaging</td>
</tr>
<tr>
<td>2:55 - 3:10 PM</td>
<td>Minimal Access Resection for Hepatic Tumors</td>
</tr>
<tr>
<td>3:10 - 3:25 PM</td>
<td>Radiofrequency Ablation</td>
</tr>
<tr>
<td>3:25 - 3:40 PM</td>
<td>Laparoscopic Approaches to Pancreatic Tumors</td>
</tr>
<tr>
<td>3:40 - 3:55 PM</td>
<td>Palliative Procedures for the Liver and Pancreas</td>
</tr>
<tr>
<td>3:55 - 4:10 PM</td>
<td>ERCP—Indication and Techniques</td>
</tr>
<tr>
<td>4:10 - 5:00 PM</td>
<td>3 - 4 Case Presentations and Audience Participation</td>
</tr>
</tbody>
</table>

Faculty:
Ricardo Rossi, MD & Frederick Greene, MD

The Course Directors recommend that attendees of this course visit the SAGES learning center during the meeting to reinforce the techniques described in this course.

SAGES gratefully acknowledges an educational grant in support of this event from Valleylab.

Posters will be on display Thursday and Friday in the Exhibit Hall during Exhibit hours, and Saturday from 10:00 AM - 2:00 PM. The top 20 - 25 posters will be recognized on site.

SAGES Outcomes Initiative
New PDA Software Now Available
Come by the SAGES booth across from the main session area to pick up your copy today. Free to all current participants.

Questions? Ask the Expert
George Maupin from Whispercom will be available to answer your technical questions regarding the SAGES Outcomes Initiative. Please stop by the SAGES booth during the following times:

Thursday, April 1: 1:30 - 3:00 pm
Friday, April 2: 9:30 - 10:00 am and 11:30 - 3:00 pm
RESIDENT & FELLOW SCIENTIFIC SESSION Thursday, April 1, 2004

Time: 2:00 - 5:00 PM
Duration of Course: Half Day
Location: Ballroom 4.
Coordinators: Gretchen Purcell, MD & Edward Lin, MD

Experts:
Steve Eubanks, MD, Abe Fingerhut, MD, Dennis Fowler, MD, Phil Schauer, MD

Description:
Outstanding abstract submissions from residents and fellows around the world will be presented at the Resident & Fellow Scientific Session. Each abstract will be critiqued by a distinguished member of the SAGES 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.

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 problem areas within research studies that might cause them to lose scientific merit
- Recognize possible solutions to avoid these pitfalls

2004 SAGES Resident’s Day Program

2:00 PM Presenter: Stephen Kolakowski; "ROUTINE POSTOPERATIVE BARIUM SWALLOW EVALUATION AFTER ROUX-EN-Y GASTRIC BYPASS: IS IT NECESSARY?", Stephen Kolakowski Jr. MD, Matt L Kirkland MD, Alan L Schuricht MD, Department of Surgery, Pennsylvania Hospital, Philadelphia, PA

2:15 PM Presenter: Alfredo M. Carbonell; "DO PATIENT OR HOSPITAL DEMOGRAPHICS PREDICT CHolecystectomy OUTCOMES? A NATIONWIDE STUDY OF 93,578 PATIENTS", Alfredo M Carbonell DO, Amy E Lincourt PhD, Brent D Matthews MD, Kent W Kercher MD, William S Cobb MD, Ronald F Sing DO, B. Todd Heniford MD, Carolinas Laparoscopic and Advanced Surgery Program, Department of General Surgery, Carolinas Medical Center, Charlotte, NC

2:30 - 2:40 10 Minute Discussion (Phillip Schauer)

2:40 PM Presenter: Alfonso Torquati; "PREVALENCE OF NON-ACID REFLUX FOLLOWING MEDICAL AND SURGICAL TREATMENT OF BARRETT’S ESOPHAGUS", Hugh Houston MD, Alfonso Torquati MD, Rami E Lutfi MD, Joan L Kaiser MS, William O Richards MD, Vanderbilt University Medical School

2:55 PM Presenter: John I Lew; "ROUTINE PREOPERATIVE ESOPHAGEAL MANOMETRY DOES NOT AFFECT OUTCOME OF LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING", John I Lew MD, Amna Daud MD, Mary F DiGorgi MD, Daniel G Davis* DO, Marc Bessler MD, Center for Obesity Surgery, New York-Presbyterian Hospital and Columbia University, College of Physicians and Surgeons, New York, NY; and Center for Obesity Surgery, Lawrence Hospital*, Bronxville, NY

3:10 - 3:20 10 Minute Discussion (Abe Fingerhut)

3:20 PM Presenter: Charles S. Joels; "EVALUATION OF MESH FIXATION STRENGTH, TISSUE INGROWTH AND ADHESION FORMATION AFTER PLACEMENT OF EPTFE MESH TO THE ABDOMINAL WALL USING TITANIUM SPIRAL TACKS, NITINOL ANCHORS, AND POLYPROPYLENE OR POLYGLACTIN 910 SUTURE", Charles S Joels MD, Brent D Matthews MD, Kent W Kercher MD, Catherine Austin, H. James Norton PhD, Cliff Williams, B. Todd Heniford MD, Department of General Surgery, Carolinas Medical Center

3:35 PM Presenter: Yuri W Novitsky; "DECREASED ACTIVATION OF PERITONEAL MACROPHAGES FOLLOWING HAND-ASSISTED VERSUS OPEN SURGERY IN A PORCINE MODEL", Yuri W Novitsky MD, Gordie G Kaban MD, Donald R Czerniach MD, Suzanne M Wheeler BS, Demetrius E Litwin MD, University of Massachusetts Medical School

3:50 - 4:00 10 Minute Discussion (W. Steve Eubanks)

4:00 PM Presenter: Kent R Van Sickle; “THE EFFECT OF ESCALATING FEEDBACK ON ACQUIRING PSYCHOMOTOR SKILLS FOR LAPAROSCOPY”, Kent R Van Sickle MD, Anthony G Gallagher PhD, C. Daniel Smith MD, Emory Endosurgery Unit, Emory University School of Medicine, Atlanta, GA

4:15 PM Presenter: Krishna Moorathy; "STRUCTURED TRAINING AND THE OBJECTIVE ASSESSMENT OF SKILL IN LOWER GI ENDOSCOPY: AN INNOVATIVE APPROACH", Krishna Moorathy MS, Julian Hance, Tim Orchard MD, Yaron Munz, Tim Rockall MD, Julian Teare MD, Ara Darzi MD, Imperial College, London, UK

4:30 PM Presenter: A. Albayrak; “DESIGN OF AN ERGONOMIC BODY SUPPORT TO IMPROVE THE POSTURE OF SURGEONS DURING LAPAROSCOPIC AND OPEN SURGICAL PROCEDURES”, A Albayrak MSc, C J Snijders PhD, H J Bonjer PhD, G Kazemier MD, Erasmus Medical Centre

4:45 - 5:00 15 Minute Discussion (Dennis Fowler)

SAGES gratefully acknowledges an educational grant in support of this event from Ethicon Endo-Surgery, Inc.

http://www.sages.org/
SAGES 2004 Industry Education Events

Thursday, April 1, 2004

All events begin at 5:30 PM. Light hors d’oeuvres and refreshments will be served.

Ethicon Endo-Surgery, Inc. and Karl Storz Endoscopy

Location: Ballroom 2/3

The Future of Colon and Rectal Surgery

Don’t miss this opportunity to hear industry thought leaders discuss the future of colon and rectal surgery. Key topics include comparisons of outcomes for the three major approaches (Open, Laparoscopic and Hand-Assisted Laparoscopic) and the latest findings on suitability of the minimally invasive approach for cancer. Enjoy cocktails, hors d’oeuvres and the opportunity to engage in discussion with the finest in the field. The reception and program will begin at 5:30 in the main session room and last approximately two hours.

Inamed Health

Location: Ballroom 1

Join Inamed Health as they present an evening seminar on “Your Bariatric Practice and the LAP-BAND”. The presentation will include:

1) How to setup and promote a new bariatric practice
2) Describe the clinical benefits of the LAP-BAND for morbidly obese patients
3) Detail how a new surgical alternative for morbidly obese patients can be incorporated into an existing bariatric practice

W. L. Gore and Associates, Inc.

Location: Ballroom 4

Join W.L. Gore as they present an evening of discussions on:

- Advances in staple-line reinforcement - SEAMGUARD® Bioabsorbale
- SEAMGUARD® Bioabsorbale Staple Line reinforcement material is a strong, easy-to-use material for reinforcement of staple lines in the lung, stomach and bowel/mesentery.

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FOUNDATION DONORS…BE OUR GUEST!

For those of you who have already contributed to the SAGES Education and Research Foundation, we’d like to say thank you in one more small way during the ’04 Meeting.

The Foundation has set up a small hospitality area for donors just outside the main session Ballroom. Join friends there for coffee or a cold drink. Use one of our internet stations to get on line.

The Foundation Hospitality Room will be open

<table>
<thead>
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<th>Day</th>
<th>Time</th>
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<tbody>
<tr>
<td>Wed., 3/31/04</td>
<td>7:30 AM - Noon</td>
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<td>1:00 - 5:30 PM</td>
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<td>Thurs., 4/01/04</td>
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<td>Fri., 4/02/04</td>
<td>7:30 AM - Noon</td>
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<td>2:00 - 5:30 PM</td>
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<tr>
<td>Sat., 4/03/04</td>
<td>7:30 AM - 12:30 PM</td>
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</tbody>
</table>

For those of you who have not yet donated, this week you have another opportunity to become a member of the “club.” Pick up and complete a pledge form either at the SAGES booth or the entrance to the Foundation Hospitality Room.

http://www.sages.org/
<table>
<thead>
<tr>
<th>Course/Event</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>SAGES 2004 Industry Breakfast Events</td>
<td>6:30 - 8:00 AM</td>
<td>C103, 105, 107, 109, 110, 112</td>
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<tr>
<td><strong>Scientific Sessions &amp; Panel Presentations</strong></td>
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<tr>
<td>Plenary Session I</td>
<td>8:00 - 9:00 AM</td>
<td>Ballroom 2/3</td>
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<tr>
<td>Karl Storz Lecture</td>
<td>9:00 - 9:30 AM</td>
<td>Ballroom 2/3</td>
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<tr>
<td>Presidential Address</td>
<td>10:00 - 10:30 AM</td>
<td>Ballroom 2/3</td>
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<tr>
<td>Panel 1: Clinical Trials 101</td>
<td>10:30 - 11:30 AM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td><strong>Exhibit Hall, Posters, Learning Center Open</strong></td>
<td>9:30 AM - 2:30 PM</td>
<td>Exhibit Hall</td>
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<tr>
<td>Scientific Sessions &amp; Panel Presentations</td>
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<tr>
<td>Paper and Video Sessions</td>
<td>2:00 - 6:00 PM</td>
<td>Ballrooms 1 &amp; 4</td>
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<tr>
<td>Panel 2: Gut Motility Panel</td>
<td>2:00 - 3:00 PM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>Panel 3: Minimally Invasive Endocrine Surgery</td>
<td>4:30 - 6:00 PM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>Meet the Leadership Reception for New Members, Residents &amp; Fellows</td>
<td>6:00 - 7:00 PM</td>
<td>Jillian's</td>
</tr>
<tr>
<td>SAGES Gala Main Event &amp; Sing-Off</td>
<td>7:30 PM</td>
<td>Jillian's</td>
</tr>
</tbody>
</table>

**SAGES 2004 Industry Breakfast Events**

Time: 6:30 - 8:00 AM

**Boston Scientific – Room C103**

Enteryx®: An Endoscopic, Injectable Treatment for GERD Symptoms

**Bridging Health Options – Room C105**

Need Custom Data Management to Help Establish and Manage Your Bariatric Practice?
Come and meet the Programmer who can make it happen!

**Curon Medical – Room C107**

The Stretta Procedure (RF energy) for GERD: Clinical and Practical Application

**LapSurgical Systems – Room C109**

Laparoscopic CBD exploration made easy! Come and learn about MIG (multiple instrument guide). MIG protects the choledochoscope, provides picture-in-picture visualization and increased access to the common bile duct.

**Olympus America – Room C110**

Future Trends in Minimally Invasive Surgery

**Sandhill Scientific – Room C112**

Optimizing GERD therapy! Sleuth® a new diagnostic tool to detect all reflux episodes with impedance.
**Description:**

This section of the SAGES Meeting includes panels with invited faculty who will speak on specific topics, and sessions of oral & video presentations of abstracts selected by the SAGES Program Committee.

**What Is Included:**

Fee includes entrance to all three session rooms on Friday & Saturday, Final Program, entrance to the Exhibit Hall, Learning Center and Exhibit Reception, continental breakfast and breaks, and the Friday Evening SAGES Social Event.

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**Plenary Room: Ballroom 2/3**

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**8:00 - 9:00 AM SS01-L: Plenary Session I**

**Moderators:** Lee Swanstrom, MD & Jack Jakimowicz, MD

**So01 Laparoscopic Surgery For Colonic Cancer: Short Term Results Of A Randomized Trial.** [H J Bonjer, MD, PhD, E Kuhry, MD, R Veldkamp, MD, Erasmus Medical Center, Rotterdam, The Netherlands]

**So02 Open And Not Laparoscopic Surgery Induces A Dramatic Decrease In The Level Of Circulating Intact Igfbp-3 In Patients With Colorectal Cancer.** [Richard L Whelan, MD, Vesna Cekic, RN, Natalia Poltoratskaia, MS, Irena Kirman, PhD, Columbia University, Department of Surgery]

**So03, LAPAROSCOPIC CENTRAL PANCREATECTOMY WITH PANCRECTO GASTROSTOMY.** [N. A. O’ourke, L. Nathanson, Royal Brisbane Hospital, Brisbane, QLD, Australia]

**So04 Surgical Therapy For Biliary Dyskinesia: A Meta-analysis And Review Of The Literature.** [Todd A Ponsky, MD, Fred Brody, MD, The George Washington University Medical Center]

*SAGES acknowledges a generous educational grant from GENERAL SURGERY NEWS in support of this session.*

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**9:00 - 9:30 AM**

**KARL STORZ LECTURE**

**Surgical Education and Training into the New Millennium**

**Professor Sir Ara Darzi, KBE**

*Professor of Surgery and Head of Department, St. Mary’s Hospital NHS Trust, London, U.K.*

This lecture is titled “The Karl Storz Lecture in Innovative Technology” after Karl Storz, whose contribution to endoscopic surgery advanced our path toward better patient care.

Currently Chair of Surgery, Imperial College, Science, Technology and Medicine and Honorary Consultant Surgeon at St. Mary’s Hospital NHS trust, Professor Darzi helped to set the national guidelines in education and training in Minimal Access Surgery for the U.K.

He obtained his fellowship in Surgery from the Royal College of Surgeons in Ireland and an M.D. degree from Trinity College, Dublin. He was subsequently granted fellowships in the Royal College of Surgeons of England, The American College of Surgeons, and is an Honorary fellow of the Royal College of Surgeons and Physicians of Glasgow. He has been a Hunterian Professor of the Royal College of Surgeons of England and the James The IV travelling fellow for 1999/2000.

Professor Darzi is an acknowledged innovator in minimal invasive therapy, including imaging and biological research. His work covers methods to measure core competencies of surgery objectively. He and his team have done innovative work in the development and use of allied technologies including surgical robots and image-guided surgery. He has addressed a wide spectrum of engineering and basic sciences research topics encompassing Medical Image Computing, Biomedical Engineering, Clinical Safety, Robotics, Man-Machine Interfacing, Virtual/Augmented Reality and Bio-Medical Simulation.

He relentlessly campaigns for the need for improved inter-disciplinary research with a closer integration of information technology, biotechnology and physical sciences. He recently published the national guidelines for day care surgery and also involved in setting the future model of diagnostic and treatment centres.

Professor Darzi was knighted by the Queen as a Knight Commander of the most excellent Order of the British Empire (KBE) in December 2002.

**Previous Storz Lecturers**

2003  Professor Samuel A. Wells, MD, North Carolina: “New Directions in Cancer Therapy”

2002  Professor Christopher Paul Swan, MD, England: “Innovations in Diagnostic and Therapeutic Endoscopy”

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 Ultrasoundography in the Staging of GI Malignancy”


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*Underline denotes presenter.*
PANEL 1: Clinical Trials 101
10:30 - 11:30 AM
Location: Ballroom 2/3

Description:
This panel will help participants to understand methodology for conducting and evaluating Human Clinical Trials.

Objectives:
○ To understand ethical issues regarding participants in clinical trials
○ To understand the role of an institutional IRB
○ To understand basic statistical methods commonly used to evaluate clinical trials

Panel Schedule:

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>10:30 - 10:45 AM</td>
<td>Evidence based medicine- evaluating the quality of a trial</td>
<td>Sam Finlayson, MD</td>
</tr>
<tr>
<td>10:45 - 11:00 AM</td>
<td>What is important in a trial from an IRB’s point of view</td>
<td>Greg Koski, MD</td>
</tr>
<tr>
<td>11:00 - 11:15 AM</td>
<td>Pitfalls in patient accrual to a clinical trial</td>
<td>Heidi Nelson, MD</td>
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<tr>
<td>11:15 - 11:30 AM</td>
<td>Discussion</td>
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</tbody>
</table>

SAGES acknowledges a generous educational grant from BOSTON SCIENTIFIC in support of this session.

11:30 AM - 2:00 PM Break: Exhibits, Posters, Learning Center

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

SAGES Outcomes Initiative
New PDA Software Now Available
Come by the SAGES booth across from the main session area to pick up your copy today.
Free to all current participants.

Questions? Ask the Expert
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Thursday, April 1: 1:30 - 3:00 pm
Friday, April 2: 9:30 - 10:00 am and 11:30 - 3:00 pm
PANEL 2: Gut Motility Panel

Description:
Can you do safe anti-reflux surgery on the dysmotile esophagus? What is the best management of post-vagotomy gastroparesis? This panel will explore our current understanding of motility disorders of the esophagus, stomach, small intestine, and colon. Topics will include discussion of presentation, diagnosis, and medical and surgical treatment options. The clinical significance of motility disorders and their impact on surgical decision making will also be discussed.

Objectives:
At the end of the program attendees will be able to:
1. Pursue a diagnostic work up on motility disorders of the esophagus, stomach, intestine, and colon
2. Discuss various therapeutic options for patients suffering from motility disorders
3. Understand the role of surgery in the management of these disorders.

Who should attend?
General surgeons, pediatric surgeons, and Allied Health professionals.

Panel Schedule:
Moderator: Daniel Dempsey, MD
2:00 - 2:12 PM Esophagus
  Peter Crookes, MD
2:12 - 2:24 PM Stomach
  John Meilahn, MD
2:24 - 2:36 PM Small intestine
  Benjamin Schneider, MD
2:36 - 2:48 PM Rectal
  Mary Otterson, MD
2:48 - 3:00 PM Discussion

Rules for Asking Questions During Scientific Sessions
1. You may question the presenter by proceeding to the microphone to ask a question from the floor.
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 questioner is limited to one question; not a discussion.

Concurrent Room I - Ballroom 1

SS02-S: Solid Organ

Moderators: Manabu Yamamoto, MD & Dan Dezel, MD

SS05 Ambulatory And Outpatient Laparoscopic Adrenalectomy. Nader Yamin, MD, Michael I Clar, MD, Tom Paluch, MD, Kaiser Foundation Medical Center, San Diego, CA

SS06 Laparoscopic Adrenalectomy: 100 Resections And Long Term Follow Up. Benjamin K Poulouse, MD, Michael D Holzman, MD, Oliver B Lao, BS, Eric L Grogan, MD, Richard E Goldstein, MD, Vanderbilt University Medical Center, Nashville, TN, USA, University of Louisville, Louisville, KY

SS07 Intraoperative Fluid Management In Laparoscopic Live Donor Nephrectomy: Challenging The Dogma. M C Vassiliou, MD, G M Fried, MD, S Bergman, MD, C G Andrew, MD, M Anidjar, MD, F Carli, MD, L S Feldman, MD, D D Stanbridge, RN, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada

SS08 Portal Vein Thrombosis After Laparoscopic Splenectomy. Nicholas A O’rourke, MD, George Fielding, MD, Leslie K Nathanson, MD, Laurent Layani, MD, Ian Martin, MD, Royal Brisbane Hospital, Brisbane, Australia

SS09 Laparoscopic Palliation Of Polycystic Liver Disease. Greg Everson, MD, Greg V Stiegmann, MD, Thomas N Robinson, MD, University of Colorado Health Sciences Center

SS10 Predictors Of Survival After Laparoscopic Radiofrequency Thermal Ablation Of Hepatocellular Cancer: A Prospective Study. E Berber, MD, A E Siperstein, MD, S Rogers, MD, The Cleveland Clinic Foundation

Concurrent Room II - Ballroom 4

SS03-S: Hernia

Moderators: Michael Nussbaum, MD & Alan Schuricht, MD

SS11 Routine Laparoscopic Inguinal Hernia Surgery: 515 Consecutive Repairs With A 97% Follow-up For A Mean Of 3 Years. Bengt Novik, MD, Karin Dahlin, Hans Hedelin, PhD, Ulla-britt Mork, Susanne Hagedorn, MD, As Andersson, Per Berggren, MD, Dept of Surgery, Skaraborg Hospital, Falkoping, Dept of Surgery, Skaraborg Hospital, Skovde, Gastro-Intestinal Center, Ersta Hospital, Stockholm, Sweden

SS12 Laparoscopic Bilateral Inguinal Herniorrhaphy Vs Open Tension Free Bilateral Inguinal Herniorrhaphy. Max - Olesevich, MD, Ponsky Jeffrey, Walsh R Matthew, Steven Rosneblatt, MD, Matthew L Mancini, MD, Hobart Akin, MD, University of Tennessee, Cleveland Clinic

SS13 Two-year Experience With Needlelesscopic Inguinal Herniorrhaphy In Children. William W Spurbeck, MD, Thom E Lobe, MD, Rajeev Prasad, MD, LeBonheur Children’s Medical Center

SS14 Laparoscopic Total Extraperitoneal Repair Of Recurrent Inguinal Hernias After Primary Laparoscopic Repair. Ghazali A Chaudry, MD, George S Ferzli, MD, Armando E Castro, MD, Staten Island University Hospital

SS15 Laparoscopic Repair Of Suprapubic Ventral Hernias. Ronald F Sing, DO, Alfredo M Carbonell, DO, Kent W Kercher, MD, Brent D Matthews, MD, William S Cobb, MD, B Todd Heniford, MD, Carolinas Laparoscopic and Advanced Surgery Program, Department of General Surgery, Carolinas Medical Center, Charlotte, NC

SS16 Tisseel® Vs Tack Staples As Mesh Fixation In Totally Extraperitoneal Laparoscopic Repair (tep) Of Groin Hernias: A Retrospective Study. Franck Vandenbroucke, MD, Philippe A Topart, MD, Patrick Lozac’h, MD, Chirurgie generale, Centre Hospitalier Universitaire de Brest

SAGES acknowledges a generous educational grant from W.L. Gore & ASSOCIATES in support of this session.

http://www.sages.org/
SS04-S: New Technology

Moderators: Mark Talamini, MD & Giselle Hamad, MD

S017 Routine Use Of Telerobotic Remote Surgery, M Anvari, MD, C McKinley, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario and North Bay General Hospital, North Bay, Ontario, Canada

S018 The Learning Curve Of Investigational Surgery: Lessons Learned From The First Series Of Laparoscopic Diaphragm Pacing For Chronic Ventilator Dependence. Raymond P Onders, MD, Anthony R Ignagni, Thomas J Mortimer, PhD, Departments of Surgery and Biomedical Engineering, Case Western Reserve Univ

S019 Peritoneal Nebuliser: A Novel Technique To Deliver Intraperitoneal Therapeutics In Laparoscopic Surgery. Paraskevas A Paraskeva, PhD, Nawar A Alkhamesi, MD, David H Peck, PhD,Ara W Darzi, MD,Imperial College London

S020 Acute Tensile Strength Analysis Of Collagen Solder For Mesh Fixation To The Peritoneal Surface. Michael A Soltz, Istvan Stadler, PhD,Robert Soltz, Barbara A Soltz, PhD,Raymond J Lanzafame, MD,Rochester General Hospital

S021 Maximal “Tolerable” Time Delay. Carl A Weiss, MD, Taewan Kim, MD, Pamela Zimmerman, MD, Upstate Medical University

S022 Modified Extraperitoneal Endoscopic Separation Of Parts For The Treatment Of Abdominal Compartment Syndrome. Philip F Caushaj, MD, Fernando D Hayetian, MD,Michael S O’mara, MD, Douglas E Newton, MD,Pavlos K Papasavas, MD,Jorge Urbandt, MD, Daniel J Gagne, MD, Gregory Barnes, MD, The Western Pennsylvania Hospital, Pittsburgh, PA

S023 Laparoscopic Ultrasound For Image Guided Liver Surgery. Philip Bao, MD, Alan Herline, MD,Ravi Chari, MD,Robert Galloway, PhD,John Warmth, MS, Vanderbilt University Medical Center

S024 Miniature Robots Can Assist In Laparoscopic Cholecystectomy. Mark E Rentschler, MS,Adnan Hadzialic, BS, Dmitry Olevynik, MD, Shane Farritor, PhD,Stephen R Platt, PhD,University of Nebraska Medical Center, Omaha, NE, USA, University of Nebraska, Lincoln, NE, USA

S025 A Preliminary Prospective Study Of The Utility Of A Magnetic Endoscope Locating Device During Colonoscopy. Anish Nihalani, MD,Pat Sylla, MD,Tracey D Arnell, MD,Kenneth A Forde, MD,Richard L Whelan, MD,Sheemie Ambardar, MD, Department of Surgery, Section of Colon and Rectal Surgery, New York-Presbyterian Hospital (Columbia Campus), New York, New York, USA

SAGES acknowledges a generous educational grant from ETHICON ENDO-SURGERY, INC. in support of this session.

SAGES acknowledges a generous educational grant from KARL STORZ ENDO-Thy

in support of this session.

http://www.sages.org/

SCIENTIFIC SESSIONS & PANEL PRESENTATIONS Friday, April 2, 2004

Plenary Room – Ballroom 2/3

Friday, 3:00-4:30 PM

SS05-S: MIS Round Table

Moderators: Greg Stieglmann, MD & Michael Brunt, MD

S031 Laparoscopic Cholecystectomy In Cirrhotic Patients. J Schiff, BS, M Misra, BA, J Rothschild, MD,Schwarzberg, MD, G Rendon, MD, Tufts · New England Medical Center, Boston, MA

S032 The Laparoscopic Approach To Omental Harvest: Experience With 51 Patients. Roy Cobean, MD, Jeffrey H Donaldson, MD, Thomas Brady, MD,Maine Medical Center

S033 Management Of Asymptomatic Cholelithiasis In Patients Awaiting Renal Transplant. Kim Lambert, MSc,Timothy Jackson, MD, Darin Treleaven, MD,Abigail D’sa, Daniel W Birch, MD,Dianne Arlen, MD, Department of Surgery, Department of Medicine, McMaster University, Hamilton, Ontario

S034 Laparoscopic Resection Of Spleenic Artery Aneurysms: A Case Series. Ese Otah, MD,Brent Matthews, MD, Michael J Reardon, MD,Stirling Craig, BS,Patrick R Reardon, MD, Mahsa Mossadegh, Department of Surgery; Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

S036 Electrical Safety Of Laparoscopy In The Netherlands: The Incidence Of Insulation Failure Of Endoscopic Instruments In Dutch Hospitals. A Albayrak, MSc,D W Meijer, PhD,H J Bonjer, PhD,C Schot, C A Grimbergen, PhD,Yuri A Casseres, MD, Erasmus University Medical Centre, Rotterdam The Netherlands; Technical University of Delft, Delft, The Netherlands; Catharina Hospital, Eindhoven, The Netherlands

S037 Abdominal Wall Dimensions And Umbilical Position Vary Widely In The General Populace And Should Be Taken Into Account When Choosing Port Locations. S Ambardar, MD, R L Whelan, MD,K A Forde, MD,K Baxter, RN,A Nihalani, MD,V Cekic, RN,T D Arnell, MD,Department of Surgery, Section of Colon and Rectal Surgery, New York-Presbyterian Hospital (Columbia Campus), New York, New York

S038 Objective Comparison Of Complications Resulting From Laparoscopic Bariatric Procedures. Christine Ren, MD, Scott Laker, MD, Matthew Weiner, MD, Omid Hajiseyedjavadi, MD, NYU School of Medicine, New York, NY

Underline denotes presenter.
Invasive Endocrine Surgery

Description:
This panel will present the rationale and technique behind different contemporary approaches to thyroid and parathyroid surgery, including traditional open surgery, video-assisted thyroid surgery, and minimally invasive approaches to parathyroid surgery. At the end of this panel attendees should be familiar with the surgical options available.

Who should attend:
Practicing general surgeons, head and neck surgeons, endocrine surgeons, residents, and allied health workers.

Objectives:
Attendees will:
1. be able to discuss the rationale behind the different surgical approaches to thyroid resection
2. understand the significant differences between open, minimally invasive, and video-assisted parathyroid surgery
3. have a working knowledge of the video-assisted approach to the neck

Panel Schedule:
Moderator: Quan Duh, MD
4:30 - 4:45 PM
The Case for the Video-Assisted Parathyroidectomy
Barry Inabnet, MD
4:45 - 5:00 PM
The Case for Minimally Invasive Open Parathyroidectomy
Doug Fraker, MD
5:00 - 5:10 PM
The Case for Bilateral Neck Exploration in the Management of Hyperparathyroidism
Ricardo Rossi, MD
5:10 - 5:20 PM
The Case for Open Thyroidectomy
Herbert Cohn, MD
5:20 - 5:35 PM
The Case for Video-assisted Thyroidectomy
Paoli Miccoli, MD
5:35 - 5:50 PM
The Different Approach to Video-assisted Thyroidectomy
Titus Duncan, MD
5:50 - 6:00 PM
Discussion

Friday Evening, April 2, 2004

6:00 - 7:00 PM
Meet the Leadership Reception for New Members, Residents and Fellows
Location: Jillian’s

7:30 PM
SAGES Main Event & Sing-Off at Jillian’s
http://www.sages.org/
### Scientific Sessions & Panel Presentations

<table>
<thead>
<tr>
<th>Course/Event</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
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<tr>
<td>Plenary Session II</td>
<td>7:30 - 9:00 AM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>SAGES Awards Ceremony</td>
<td>9:00 - 9:30 AM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>Marks Lecture</td>
<td>9:30 - 10:00 AM</td>
<td>Ballroom 2/3</td>
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<tr>
<td>Panel 4: Patient Safety</td>
<td>10:00 - 11:00 AM</td>
<td>Ballroom 2/3</td>
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<tr>
<td>Posters &amp; Learning Center Open</td>
<td>10:00 AM - 2:00 PM</td>
<td>Exhibit Hall</td>
</tr>
<tr>
<td>Paper and Video Sessions</td>
<td>11:00 AM - 12:00 PM</td>
<td>Ballrooms 1-4</td>
</tr>
<tr>
<td>SAGES Annual Business Meeting</td>
<td>12:00 - 12:30 PM</td>
<td>Ballroom 2/3</td>
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### LUNCHES

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<tr>
<th>Lunch Type</th>
<th>Time</th>
<th>Location</th>
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<tr>
<td>Educator’s Lunch:</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
</tr>
<tr>
<td>SAGES Fundamentals in Laparoscopic Surgery (FLS):</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
</tr>
<tr>
<td>Conception, Validation, and Distribution</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
</tr>
<tr>
<td>Technology Lunch:</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
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<tr>
<td>Robots: After the Honeymoon is Over</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
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<tr>
<td>Pediatric Lunch:</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
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<tr>
<td>Ileo-Colic Disease in Young Adults - Congenital Defects to Inflammatory Bowel Disease: Do We Do As Well As We Think?</td>
<td>12:30 - 2:00 PM</td>
<td>C205</td>
</tr>
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</table>

### Scientific Sessions & Panel Presentations

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper and Video Sessions</td>
<td>2:00 - 5:00 PM</td>
<td>Ballrooms 1-4</td>
</tr>
<tr>
<td>Panel 5: MIS from the Far Side:</td>
<td>2:00 - 3:00 PM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>Working with and Learning from our Colleagues in Other Fields</td>
<td>2:00 - 3:00 PM</td>
<td>Ballroom 2/3</td>
</tr>
<tr>
<td>Panel 6: Pros and Cons: Issues In General Surgery</td>
<td>3:00-4:00 PM</td>
<td>Ballroom 2/3</td>
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</tbody>
</table>

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Posters will be on display Thursday and Friday in the Exhibit Hall during Exhibit hours, and Saturday from 10:00 AM - 2:00 PM. The top 20 - 25 posters will be recognized on site.

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**Rules for Asking Questions During Scientific Sessions**

1. You may question the presenter by proceeding to the microphone to ask a question from the floor.
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 questioner is limited to one question; not a discussion.

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http://www.sages.org/
The SAGES Annual General Membership Meeting is no longer at 7:00 AM! All SAGES members are encouraged to attend the business meeting on Saturday, April 3 from 12 - 12:30 in the main session room (Ballroom 2/3).

**Plenary Room - Ballroom 2/3**

Saturday, 7:30 - 9:00 AM

**Plenary Session II**

**Moderators:** David Rattner, MD & Luis Burbano, MD


_S054 Results Of Laparoscopic Heller-toupet Operation For Achalasia._ Juan M Perrone, MD, Margaret M Frisella, RN, Ketan M Desai, MD; Nathaniel J Soper, MD; Department of Surgery, Washington University, St. Louis, MO.

_S055, LAPAROSCOPIC TREATMENT OF FULMINANT ULCERATIVE COLITIS._ A. Pietrabissa, F. Michelassi, C. Moretto, A. Peri, F. Mosca; Chirurgia Generale E Trapianti University Di Pisa - Italy, Dept. Of Surgery University Of Chicago

_S056 Incidence Of Pulmonary Embolism In Open Vs. Laparoscopic Gastric Bypass._ E Lipsitz, MD, P. Vemulpalli, MD, N Gargiulo, MD, K E Gibbs, MD, E Goodman, MD, T Okhi, W Suggs, MD, R Wain, MD, J Teixeira, MD, F Veith, MD, Montefiore Institute for Minimally Invasive Surgery, Albert Einstein College of Medicine

_S057 A Prospective Randomized Study Comparing Open Versus Laparoscopy-assisted Distal Gastrectomy In Early Gastric Cancer._ Joo-ho Lee, MD, Ho-seong Han, MD; Seoul National University Bundang Hospital

_S58, LAPAROSCOPIC TRANSHIATAL ESOPHAGECTOMY FOR CARCINOMA ESOPHAGUS LOWER THIRD._ Dr. C. Palanivelu MCh, FACS, GEM Hospital Coimbatore, Tamil Nadu India

_SAGES acknowledges a generous educational grant from INAMED HEALTH in support of this session._

_Underline_ denotes presenter.
Welcome and Introductions
Jo Buyske, MD, Program Chair

2004 Research Grant Winners

Presented by: Karen Horvath, MD, Research Committee Chair & Representatives of Supporting Companies as follows

<table>
<thead>
<tr>
<th>Primary Investigator</th>
<th>Project Title</th>
<th>Institution</th>
<th>Grant Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justin Burns, MD</td>
<td>Influence of In-Vitro Fibroblast Pre-Seeding of Polyglactin 910 Mesh on Host Tissue Integration in a Rat Ventral Hernia Model</td>
<td>Carolinas Medical Center</td>
<td>SAGES Foundation</td>
</tr>
<tr>
<td>Patricia Sylla, MD</td>
<td>Microarray Analysis of the Differential Effects of Open and Laparoscopic Surgery on Immune Function: Applications to Tumorigenesis and Cancer Progression</td>
<td>Columbia University</td>
<td>Ethicon Endo-Surgery, Inc.</td>
</tr>
<tr>
<td>David Urbach, MD</td>
<td>The Epidemiology of Surgery for Gastroesophageal Reflux Disease (GERD): Determinants and Outcomes of Surgical Therapy</td>
<td>University Health Network</td>
<td>Ethicon Endo-Surgery, Inc.</td>
</tr>
<tr>
<td>Benjamin Schneider, MD</td>
<td>Objective Competency Assessment in Minimally Invasive Surgery With Novel Performance Theory Based Methods</td>
<td>Harvard Medical School/Beth Israel Deaconess Medical Center</td>
<td>Autosuture</td>
</tr>
<tr>
<td>Gina Adrales, MD</td>
<td>Prospective, Randomized Trial Comparing Components Separation and Laparoscopic Ventral Hernia Repair</td>
<td>Medical College of Georgia Research Institute</td>
<td>Karl Storz Endoscopy America</td>
</tr>
<tr>
<td>Ann Seltman, MD</td>
<td>Use of Endoscopic Ultrasound to Characterize Failure After Antireflux Surgery</td>
<td>Portland VA Medical Center</td>
<td>Ethicon Endo-Surgery, Inc.</td>
</tr>
<tr>
<td>Robert O’Rourke, MD</td>
<td>Obesity-related Immunocompromise: T-cell Development and Function in Bariatric Surgery Patients</td>
<td>Oregon Health &amp; Science University</td>
<td>Autosuture</td>
</tr>
<tr>
<td>Brant Oelschlager, MD</td>
<td>The Use of Intraluminal Esophageal Impedance in Patients with GERD and Poor Response to Medical Therapy: Who are the Good Surgical Candidates?</td>
<td>University of Washington</td>
<td>Valleylab</td>
</tr>
</tbody>
</table>

Pencil us in for next year:
SAGES Annual Meeting (w/AHPBA, consecutive to ACS Spring Meeting)
April 13-16, 2005 • Westin Diplomat Resort • Ft. Lauderdale, Florida
2004 Young Researcher Award Winner

Presented by: Karen Horvath, MD, Research Committee Chair
Recipient: Daniel J. Scott, MD

The “Young Researcher Award” is awarded annually to encourage young surgeons to continue their research in minimal access surgery. It is presented for excellence in endoscopic surgical research to a SAGES member who is either in surgical training or who has completed training within the last five years. It is based on research submitted to SAGES, evidence of current and previous investigation, and a demonstrated interest in becoming an active participant in the SAGES organization. Daniel J. Scott was nominated by five (5) SAGES members and selected by the Awards Committee as the 2004 recipient.

He has served on the SAGES Continuing Education & Resident Education committees and was a SAGES 2000 Research grant winner.

Dr. Scott is Assistant Professor of Surgery and Director, Tulane Center for Minimally Invasive Surgery, Tulane University School of Medicine, New Orleans. He earned an undergraduate degree in biomedical engineering from Southern Methodist University, and his medical degree from Louisiana State University School of Medicine, New Orleans. He completed a surgical residency as well as a Laparoscopic Surgical Fellowship at the University of Texas Southwestern Medical Center Dallas, TX and was a Laparoscopic Fellow.

He was awarded the Best Resident Paper, “Effect of Hepatic Inflow Occlusion on Laparoscopic Radio-frequency Ablation Using Simulated Tumors” at the SAGES’ Annual Meeting, St. Louis, 2001 and Best Poster Presentation, “Comparison of Video Trainer and Virtual Reality Training on Acquisition of Laparoscopic Skills,” Annual Meeting of the North Texas Chapter, American College of Surgeons.

He served as a Member, Council of Representatives of the Candidate and Associate Society of the American College of Surgeons, 2000-2001 and was a Representative, appointed by the Association for Surgical Education to the Organization of Resident Representatives of the Association of American Medical Colleges, 2000-2002. He is currently serving on the Executive Council, Association for Academic Surgery.

He has won more than a dozen research grants, has written 8 book chapters and has published 25 papers, 2 videos and 31 abstracts. He has also presented more than 20 oral presentations.

SAGES gratefully acknowledges a generous educational grant from Styker Endoscopy in support of this award.

2004 Pioneer in Endoscopy Award Winner

Presented by: Kenneth Forde, MD
Recipient: George Berci, MD, FACS, FRCS Ed (hon)

The Pioneer in Endoscopy Award is granted to a physician or person in industry for significant, long-term scientific and technological contribution to the field of surgical endoscopy. The term “pioneer” has been recently used to describe everything from a new flavor of ice cream to better fabrics for sneakers. The dictionary, however, says that a pioneer means “one of the first explorers,” “one of the first investigators in a new field of research,” or “to prepare the way.” George Berci is a true pioneer in endoscopic surgery.

- In 1962 he developed a miniature camera and broadcast a live image from inside the body for the first time.
- He brought the Hopkins Rod Lens System to endoscopy when he found that it had a surgical application.
- He brought the ceramic xenon light source to the surgical community making it possible to see images brighter.
- He developed the choledoscope and a half dozen other endoscopes.
- He developed or invented a wide range of endoscopic instruments unrelated to general surgery including the Berci-Ward laryngoscope, the Kantor Berci laryngoscope, a pediatric otoscope, a pediatric laparoscope, several dozen hand instruments, a flexible video intubating scope, a video microscope, and most recently, an integrated video intubation system.
- He wrote the definitive text on endoscopy in 1976 and authored 11 other books.

His work for SAGES has been relentless and visionary. In addition to serving on almost every committee and chairing several, he served on the Board of Governors for 9 years, as Vice President and then President from 1993-1994. He directed the 1990 ground breaking postgraduate course in Atlanta. He initiated and directed the first series of training the trainers courses in laparoscopic cholecystectomy in 1990 and 1991, and is a Founding Director of the SAGES Education and Research Foundation. He has been an editor of Surgical Endoscopy since its inception.

Dr. Berci is Clinical Professor of Surgery, U.S.C. Medical Center, and Senior Director of Endoscopic Research, Cedars Sinai Medical Center, Los Angeles. Born in Hungary, he earned his medical degree from the University of Szeged and was a Rockefeller Fellow in Surgery at the University of Melbourne, Australia after escaping from Hungary in 1956. He has published 12 books, 72 chapters, 35 teaching films, videos or CD’s, and 215 papers in peer reviewed journals.

In 2000, SAGES named one of its most prestigious awards for him. It is called “The George Berci Lifetime Achievement Award.” In 2001, Cedars Sinai Medical Center named a Chair in his honor, known as the Karl Storz Mini Invasive Surgery Chair in Honor of George Berci.
The Distinguished Service Award is presented annually to a surgeon who has made a significant, long-term educational, research, clinical and/or technological contribution to the field of surgical endoscopy and has advanced the mission of SAGES. The 2004 honoree, FREDERICK L. GREENE, MD, FACS, is Chairman, Department of General Surgery Carolinas Medical Center, Charlotte, NC and Clinical Professor of Surgery, University of North Carolina, Chapel Hill.

Rick Greene was one of a few founding members of SAGES in 1981. He served as SAGES President from 1992-1993, and as SAGES representative to the ACS Board of Governors for six years until 2003. He is currently a Director of the SAGES Foundation. He has been dedicated to SAGES and its mission for 23 years and he has put his hours and his energy where his heart is. Rick has served SAGES in almost every capacity: Board of Governors, Continuing Medical Education Committee, SAGES and World Congress, Congress Director, Program Director, Associate Editor for SAGES to the American Surgeon, and Chairman or the Research and Awards Committees.

Rick Greene was Visiting Research Fellow at St. Mark’s Hospital, London and served as Lieutenant Commander, U. S. Naval Medical Corps for many years. An active member of more than 30 medical societies, he was President, American Cancer Society - South Carolina Division, Member, American Cancer Society - National Board, and has held many vital posts with the American College of Surgeons, including: Commission on Cancer Executive Committee, Approvals Committee Chairman, Liaison Physician Committee Special Issues Committee and is currently the Commission on Cancer, Chair Elect. He has also served as Chairman of the Executive Committee of the American Joint Committee on Cancer.

He has written 55 chapters, published 132 papers in peer reviewed journals and lectured all over the world. Rick Greene has been a busy guy! And he has been busy making the world of surgery a better place.

SAGES thanks the Corporate Council for generously supporting the Ed Standen Memorial Best Resident Presentation Awards. These awards will be selected following the conclusion of the meeting, and announced in SAGES newsletter SCOPE, as well as on SAGES website.

http://www.sages.org/
9:30 - 10:00 AM **GERALD MARKS LECTURE**
Paradigm Shifts and Loss of Domain: Implications for Surgical Education

Jeffrey Ponsky, MD, FACS
Professor of Surgery, Director of Endoscopic Surgery, Cleveland Clinic
Lerner College of Medicine, Cleveland, Ohio

The Gerald Marks Lecture is named for one of our distinguished founders, Gerald Marks, without whom SAGES would not have been established.

In addition to his stunning contribution to the field of flexible and laparoscopic surgery, Jeffrey Ponsky has been a pillar of support to SAGES from its fledgling years to its societal leadership position. As a founding member of SAGES he served as its first Resident Education Committee Chairman and, almost single handedly, forced the inclusion of flexible endoscopy as a requirement of surgical residency programs. He was president of SAGES from 1990-1992 and has served as Treasurer of the SAGES Foundation for 4 years. He has also served on the Board of Governors and almost every committee. He has been the standard bearer in the uphill battle to assure that flexible endoscopy is incorporated into surgical training.

When SAGES was appointed as a nominating organization to the American Board of Surgery in 1998, Jeffrey Ponsky was appointed to the new seat on the Board. He is now Vice Chairman-Elect of the American Board of Surgery.

Dr. Ponsky is the Director of Endoscopic Surgery and served as the Executive Director of the Minimally Invasive Surgery Center at The Cleveland Clinic Foundation from 1997 - 1999. He is presently the Vice Chairman of the Division of Education and Director of Graduate Medical Education at the Cleveland Clinic. He is Professor in the Department of Surgery at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University. Dr. Ponsky formerly served as the Director of Surgery at The Mt. Sinai Medical Center in Cleveland.

A graduate of Case Western Reserve University School of Medicine, he earned his Executive MBA from CWRU’s Weatherhead School of Management. He received the distinguished Kaiser Teaching Excellence Award at CWRU School of Medicine in 1993; the SAGES Distinguished Service Award for 2000; and in 2002 he received ASGE’s Rudolf Schindler Award.

He has published over 160 original articles and book chapters, authored or edited five textbooks and serves on the editorial board of eight journals. He is the originator of the percutaneous endoscopic gastrostomy which provided a minimally invasive substitute for operative placement of feeding tubes.

More important than any of the above, he has served as surgical and personal mentor to dozens of young surgeons who have gone on to take their places as leaders in surgery. He is beloved by his students, his fellows, his colleagues, his family and this Society.

### The Marks Lecture - A History

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<thead>
<tr>
<th>Year</th>
<th>Lecturer</th>
</tr>
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<tbody>
<tr>
<td>1987</td>
<td>Professor William Wolfe (not named Marks Lecture in '87)</td>
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<tr>
<td>1988</td>
<td>Professor Worth Boyce</td>
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<tr>
<td>1989</td>
<td>Professor Peter Cotton</td>
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<td>1990</td>
<td>Professor Alfred Cuschieri</td>
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<tr>
<td>1991</td>
<td>Professor George Berci</td>
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<td>1992</td>
<td>Professor Theodore Schroock</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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<tr>
<td>2002</td>
<td>Professor Hans G. Beger</td>
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<tr>
<td>2003</td>
<td>Professor R. Scott Jones</td>
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</tbody>
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**PANEL 4: Patient Safety**

10:00 - 11:00 AM

**Objectives:**
The objectives of this panel are to improve patient safety in endoscopic surgery by focusing on four different areas that will assist surgeons to advance and expand their laparoscopy and flexible endoscopy practices, while maintaining and improving patient safety.

Two talks will deal with the mechanisms by which surgeons can introduce new technology or new procedures into their practices in the most efficacious way without jeopardizing the delivery of high standard of care to their patients. Two other talks will address the issues of tiredness and outcomes as they relate to enhancing patient safety.

**Panel Schedule:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
</tr>
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<tbody>
<tr>
<td>10:00 - 10:12 AM</td>
<td>Introduction of New Technology with Patient Safety in Mind</td>
<td>Mark Talamini, MD</td>
</tr>
<tr>
<td>10:12 - 10:24 AM</td>
<td>The Safe Introduction of a New Procedure by a Surgeon</td>
<td>Aaron Fink, MD</td>
</tr>
<tr>
<td>10:24 - 10:36 AM</td>
<td>The Effects of Tiredness on Laparoscopic Skills and Patient Safety</td>
<td>Anthony Gallagher, MD</td>
</tr>
<tr>
<td>10:36 - 10:48 AM</td>
<td>Patient Safety: The Role of Outcomes</td>
<td>William Traverso, MD</td>
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<tr>
<td>10:48 - 11:00 AM</td>
<td>Discussion</td>
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</table>
### Plenary Room - Ballroom 2/3

**Saturday, 11:00-12:00 PM**

**SS08-S: Issues in MIS**

**Moderators:** Jeff Peters, MD & Aureo Depaula, MD

**So60 The Susceptibility To Infection Of Prosthetic Biomaterials.**

**Alfredo M Carbonell, DO, B. Todd Heniford, MD, Ronald F Sing, DO, Kent W Kercher, MD, Catherine E Austin, BS, Mareva Foster, BS, Brent D Matthews, MD, Didier Dreau, PhD, Carolinas Laparoscopic and Advanced Surgery Program, Department of General Surgery, Carolinas Medical Center, Charlotte, NC

**So61 Decrease In Circulating Ghrelin Predicts Long-term Weight Loss In A Novel Rat Model Of Roux-en-y Gastric Bypass.**

**Nicholas Styloupolous, MD, Jeffrey D Pettit, BS, Lee M Kaplan, MD, David W Rattner, MD, MGH Weight Center and Departments of Medicine and Surgery, Massachusetts General Hospital and Harvard Medical School, Boston, MA

**So62 Can Laparoscopy Eliminate Unnecessary Laparotomies In Penetrating And Blunt Trauma?.**

**P B Angood, MD, G K Kaban, MD, R A Perugini, MD, Dem Litwin, MD, Y W Novitsky, MD, J J Kelly, MD, D R Czerniach, MD, Department of Surgery, University of Massachusetts Medical School, Worcester, MA

**So63 Objective Measurement Of The Acquisition Of Psychomotor Skills On Laparoscopic Cholecystectomy Courses.**

**Courses. R Aggarwal, S Undre, A Darzi, MD, I Hance, K Moorthy, Y Munz, MD, Dept. of Surgical Oncology and Technology, Imperial College London.

**So64 Post Operative Complications Are Not Increased In Massively Obese Patients Undergoing Laparoscopic Roux-en-y Gastric Bypass.**

**Luke G Wolfe, MS, Jill Meador, RN, Eric J Demaria, MD, Harvey J Sugerman, MD, John Kellum, MD, Adolfo Z Fernandez, MD, David S Tichansky, MD, New Jersey Bariatrics at Univ. Medical Center of Princeton and St. Peter’s Univ Hosp, Monmouth Junction, NJ; Department of Surgery, Virginia Commonwealth Univ, Richmond, VA; Department of Surgery, Wake Forest Univ, Winston-Salem.

### Concurrent Room I - Ballroom 1

**Saturday, 11:00-12:00 PM**

**SS09-S: Esophagus I**

**Moderators:** Nat Soper, MD & Alberto Chousleb, MD

**So65 Laparoscopic Assisted Versus Open Transhiatal Esophagectomy: A Case-control Study.**

**John S Bolton, MD, Katharyn Q Bernabe, MD, William S Richardson, MD, Department of Surgery, Ochsner Clinic

**SS66, LAPAROSCOPIC INVERSION ESOPHAGECTOMY.**

**Charles Kim, M.D., Blair Jobe, M.D., Brett Sheppard, M.D., John Hunter, M.D., Oregon Health & Science University, Portland VA Medical Center

**So67 The Utility Of Endoscopy For Assessing Clinical Deterioration After Esophagectomy With Reconstruction.**

**Jeffrey H Peters, MD, Mary S Maish, MD, John Briel, MD, Tom R Demeester, MD, Jeffrey A Hagen, MD, Steven R Demeester, MD, Emmanuel Choustoulakis, MD, The University of Southern California Keck School of Medicine

**So68 Laparoscopic Resection Of Gastrointestinal Mesenchymal Tumors Located In The Upper Stomach.**

**Nobumi Tagaya, MD, Hitotosi Mikami, MD, Keiichi Kubota, MD, Second Department of Surgery, Dokkyo University School of Medicine

**So69 Laparoscopic Distal Gastrectomy With Regional Lymph Node Dissection For Gastric Cancer.**

**Masayuki Hishagino, MD, Yosuke Fukunaga, MD, Shinya Tanimura, MD, Department of Gastroenterological Surgery, Osaka City General Hospital

**S70 Laparoscopic Distal Gastrectomy With Regional Lymph Node Dissection For Gastric Cancer.**

**Masayuki Hishagino, MD, Yosuke Fukunaga, MD, Shinya Tanimura, MD, Department of Gastroenterological Surgery, Osaka City General Hospital

**SS071 "Nis Vs. Sages: A Comparison Of National And Voluntary Databases".**

**Ja Galanko, PhD, Im Morton, MD, Nj Soper, MD, De Low, MD, John Hunter, MD, LW Traverso, MD, Stanford University, Stanford, CA; University of North Carolina, Chapel Hill, NC; Washington University, St. Louis, MO; Virginia Mason Medical Center, Seattle, WA; Oregon Health & Science University, Portland, OR

### Concurrent Room I - Ballroom 4

**Saturday, 11:00-12:00 PM**

**SS10-S: Teaching & Learning (Education & Outcomes)**

**Moderators:** George Berci, MD & Bill Laycock, MD

**So71 Assessing The Learning Curve Of Laparoscopic Skills On A Virtual Reality Simulator.**

**Vadim Sherman, MD, Gerald M Fried, MD, Donna Stanbridge, RN, Rehan Kazmi, Liane S Feldman, MD, Hani A Al-qadhi, MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada

**So72 Intra- And Postoperative Complications After Laparoscopic Surgery In Switzerland – A Multiple Regression Analysis Of The Salts.**

**Prospective Data Base. Isabelle Oritz, MD, L Krahenbuhl, MD, U Giger, MD, W Gantert, MD, Cantonal Hospital Fribourg, St. Anna Hospital

**So73 Assessing The Learning Curve Of Laparoscopic Skills On A Virtual Reality Simulator.**

**Vadim Sherman, MD, Gerald M Fried, MD, Donna Stanbridge, RN, Rehan Kazmi, Liane S Feldman, MD, Hani A Al-qadhi, MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada

**So74 A Videotrainer Obstacle Course For Laparoscopic Camera Navigation Translates To The OR.**

**J D Scott, MD, J R Korndorffer, MD, D Hayes, BS, J B Dunne, PhD, C L Touchard, BS, R Sierra, D, Tulane Center for Minimally Invasive Surgery, Tulane University School of Medicine

**So75 Objective Testing Of Eye Motion Parameters Correlates With Level Of Experience In Video-assisted Surgery.**

**Necip Berme, PhD, Ergun Kocak, MD, Jan J Ober, BS, Scott Melvin, MD, The Ohio State University, Department of Mechanical Engineering and Department of Surgery, Center for Minimally Invasive Surgery

**So76 Value Of The Sages Learning Center In Introducing New Technology.**

**Sharon L Bachman, MD, Jason Zand, MD, Michael R Marohn, DO, Eric I Hanly, MD, Mark A Talamini, MD, Department of Surgery, The Johns Hopkins University School of Medicine
**Scientific Sessions & Panel Presentations**  
Sat., April 3, 2004

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>10:00AM - 2:00 PM</td>
<td>Posters &amp; Learning Center Open: LAST CHANCE!</td>
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<tr>
<td>12:00 - 12:30 PM</td>
<td>SAGES Annual Business Meeting – Ballroom 2/3</td>
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<tr>
<td>12:30 - 2:00 PM</td>
<td>All SAGES MEMBERS SHOULD ATTEND!</td>
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<tr>
<td>LUNCHES</td>
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**Panel 5: MIS FROM THE FAR SIDE: Working with and Learning from our Colleagues in Other Fields**

**Description:**
Unusual problems and unusual patients might require different equipment or techniques than most surgeons use every day. Experts in minimally invasive thoracic, pediatric, and general surgery will discuss tools and techniques used in their practices that might help get out of tight corners or challenging situations.

**Who should attend:**
Practicing general and gastrointestinal surgeons, rural surgeons, residents, and allied health workers.

**Objectives:**
Attendees will
1. understand what instruments and approaches are available to facilitate laparoscopic access to the very small patient
2. have a working knowledge of safe approaches to minimally invasive thoracic procedures accessible to the general surgeon if no thoracic surgeon is readily available
3. be able to discuss safe management of some common complications of minimally invasive surgery

**Panel Schedule:**
- **Moderator:** Kenneth Forde, MD
- **2:00 - 2:15 PM**
  - Instrumentation in Small People  
    Steve Rothenberg, MD
- **2:15 - 2:30 PM**
  - Safe Performance of Thoracoscopic Procedures  
    Joseph Friedberg, MD
- **2:30 - 2:45 PM**
  - Complications of MIS: Managing the Emergency Consultation  
    George Ferzli, MD
- **2:45 - 3:00 PM**
  - Discussion

**Panel 6: MIS FROM THE FAR SIDE: Working with and Learning from our Colleagues in Other Fields**

**Objectives:**
Attendees will
1. be able to discuss safe management of some common complications of minimally invasive surgery
2. have a working knowledge of safe approaches to minimally invasive thoracic procedures accessible to the general surgeon if no thoracic surgeon is readily available
3. be able to discuss safe management of some common complications of minimally invasive surgery

**Panel Schedule:**
- **Moderator:** Kenneth Forde, MD
- **2:00 - 2:15 PM**
  - Instrumentation in Small People  
    Steve Rothenberg, MD
- **2:15 - 2:30 PM**
  - Safe Performance of Thoracoscopic Procedures  
    Joseph Friedberg, MD
- **2:30 - 2:45 PM**
  - Complications of MIS: Managing the Emergency Consultation  
    George Ferzli, MD
- **2:45 - 3:00 PM**
  - Discussion

**Panel 7: MIS FROM THE FAR SIDE: Working with and Learning from our Colleagues in Other Fields**

**Objectives:**
Attendees will
1. be able to discuss safe management of some common complications of minimally invasive surgery
2. have a working knowledge of safe approaches to minimally invasive thoracic procedures accessible to the general surgeon if no thoracic surgeon is readily available
3. be able to discuss safe management of some common complications of minimally invasive surgery

**Panel Schedule:**
- **Moderator:** Kenneth Forde, MD
- **2:00 - 2:15 PM**
  - Instrumentation in Small People  
    Steve Rothenberg, MD
- **2:15 - 2:30 PM**
  - Safe Performance of Thoracoscopic Procedures  
    Joseph Friedberg, MD
- **2:30 - 2:45 PM**
  - Complications of MIS: Managing the Emergency Consultation  
    George Ferzli, MD
- **2:45 - 3:00 PM**
  - Discussion

**Panel 8: MIS FROM THE FAR SIDE: Working with and Learning from our Colleagues in Other Fields**

**Objectives:**
Attendees will
1. be able to discuss safe management of some common complications of minimally invasive surgery
2. have a working knowledge of safe approaches to minimally invasive thoracic procedures accessible to the general surgeon if no thoracic surgeon is readily available
3. be able to discuss safe management of some common complications of minimally invasive surgery

**Panel Schedule:**
- **Moderator:** Kenneth Forde, MD
- **2:00 - 2:15 PM**
  - Instrumentation in Small People  
    Steve Rothenberg, MD
- **2:15 - 2:30 PM**
  - Safe Performance of Thoracoscopic Procedures  
    Joseph Friedberg, MD
- **2:30 - 2:45 PM**
  - Complications of MIS: Managing the Emergency Consultation  
    George Ferzli, MD
- **2:45 - 3:00 PM**
  - Discussion

**Panel 9: MIS FROM THE FAR SIDE: Working with and Learning from our Colleagues in Other Fields**

**Objectives:**
Attendees will
1. be able to discuss safe management of some common complications of minimally invasive surgery
2. have a working knowledge of safe approaches to minimally invasive thoracic procedures accessible to the general surgeon if no thoracic surgeon is readily available
3. be able to discuss safe management of some common complications of minimally invasive surgery

**Panel Schedule:**
- **Moderator:** Kenneth Forde, MD
- **2:00 - 2:15 PM**
  - Instrumentation in Small People  
    Steve Rothenberg, MD
- **2:15 - 2:30 PM**
  - Safe Performance of Thoracoscopic Procedures  
    Joseph Friedberg, MD
- **2:30 - 2:45 PM**
  - Complications of MIS: Managing the Emergency Consultation  
    George Ferzli, MD
- **2:45 - 3:00 PM**
  - Discussion

SAGES acknowledges a generous educational grant from OLYMPUS AMERICA in support of this session.
SAGES acknowledges a generous educational grant from CURON MEDICAL in support of this session.
SAGES acknowledges a generous educational grant from STRYKER ENDOSCOPY in support of this session.

SAGES acknowledges a generous educational grant from AUTO SUTURE in support of this session.
2004 Learning Center  Thursday - Saturday, April 1, 2, 3, 2004

Chairs: Mark P. Callery, MD and Daniel B. Jones, MD

Hours of Operation:
Thursday, April 1  10:00 AM - 2:30 PM
Friday, April 2  10:00 AM - 2:30 PM
Saturday, April 3  10:00 AM - 2:00 PM

Location: Exhibit Hall B2

The Learning Center is a group of educational “classrooms” designed to tutor meeting attendees on specific content areas. Attendees select the station topics they are interested in learning more about. Then, station coordinators offer instruction to small groups and target the level of instruction to the attendees needs. Attendees choose which stations best suit their learning goals and visit the station as long as they would like.

New this year, in order for every participant to fully experience each station, the ‘Learn Fast Pass’ guarantees individual Learning Station appointments.

Again this year, we will be collecting outcomes data in the Learning Center through either written questionnaires or skills assessment scores. Attendees may then compare their scores with benchmark data of all other Learning Center participants.

The Learning Center will be open on Saturday from 10:00 AM to 2:00 PM!

Who Should Participate:
- Surgeons and Surgical Residents of any skill level looking to improve their skill or knowledge on one or more of the topics below
- Surgeon educators who would like to learn more about educational tools and methods
- Nurses and GI assistants interested in minimally invasive surgery

Basic Cognitive Laparoscopic Information
Coordinator: Blair Jobe, MD

Attendees will be introduced to the basics of laparoscopic surgery through a series of topic-focused computer-based didactic sessions. Participants will take a five question pre- and post-test, which will be scored and compared with other participants.

Objectives:
- To understand the basic physiological concepts behind minimally invasive surgery
- To provide direct feedback of participant knowledge base for a given laparoscopic topic before and after didactic instruction

Communication and Information Technology in Surgery
Coordinator: Gretchen Purcell, MD

This station will offer guidance for how to integrate the Internet into the surgeon’s daily struggle to keep up with surgical literature. Learners will be given a brief presentation of the tools available, then a short quiz to evaluate what they just learned.

Objectives:
- To become familiar with journal searching and storage programs
- To become familiar with PDA uses for surgeons

New Technologies for Learning
Coordinator: Daniel Scott, MD, Shishir Maithel, MD, C. Daniel Smith, MD

This new 2004 station will familiarize participants with CELTS and MIST VR simulators. Several investigators have demonstrated improvement for surgeon OR performance after short intervals of training on simulators. Participants will have opportunity to compare their baseline skills to medical student and resident reference performance measures. Participants will be provided a printed report of right vs left hand error performance on 1 of 6 tasks. With the CELTS, participants will also have opportunity to compare performance using a head mounted display.

Objectives:
- Practice laparoscopic skills in a simulator
- Exposure to HMD visualization mode
- To assess task performance relative to norms

Evolving Technologies for Tissue Approximation
Coordinator: Kenric M. Murayama, MD, Dmitry Oleynikov, MD, Harrith Hasson, MD

This new 2004 station will feature today’s newest approaches to close wounds, Anastomose viscera, etc. Whether this is accomplished glued, sodered, sealed, welded, or stapled, participants will learn new techniques and engineering limitations.

Participants will compare bursting strengths. A “Price is Right” format will have all participants guess and learn approximate cost of each technology they employ.

Objectives:
- To learn different technologies available to achieve tissue approximation
- To become familiar with relative cost of new technologies

Flexible Endoscopy
Coordinator: Brian Dunkin, MD

The Simbionix GI Mentor is one of most advanced virtual reality flexible endoscopy trainers in the world. This station will give participants the opportunity to learn a therapeutic flexible endoscopy procedure using this device. Each participant will have the choice of performing an upper endoscopic procedure to stop bleeding or lower endoscopy for snare polypectomy. And new for 2004, video stations featuring common endoscopy procedures will be added to this station.

Objectives:
- To teach basic techniques of managing upper gastrointestinal hemorrhage
- To teach the technique of snare polypectomy

Suturing
Coordinator: Zoltan Szabo, PhD

Intense hands-on suturing including intracorporeal techniques demonstrated with instantaneous feedback. Laparoscopic tissue handling and complex suturing maneuvers are also demonstrated. And for 2004, the newest iterations of laparoscopic suturing trainers will be available for all to try.

Objectives:
- To learn tips on how to suture laparoscopic in an inanimate environment
- To learn to tie an interacorporeal square knot and to place a stitch and tie a square knot

http://www.sages.org/
Ultrasound
Coordinator: Paul Hansen, MD
This station will focus on ultrasound techniques and applications. Participants will utilize the latest ultrasound technology on live models. The instructors will demonstrate and help the participant do surface ultrasound on models and use the latest laparoscopic probes to practice guided biopsies on inanimate models.

Objectives:
- Teach basic techniques of surface ultrasound
- Teach basic technique of laparoscopic ultrasound guided biopsy
- Familiarize participants with normal / abnormal ultrasound images of Common Bile Duct

Laparoscopic Common Bile Duct Exploration
Coordinator: Mark Watson, MD, Leo Villegas, MD
Having learned how to identify common bile duct stones with laparoscopic ultrasonography, participants will next learn how to remove them laparoscopically. Using validated models, and today’s newest equipment including cystic duct dilators, baskets, and flexible choledochoscopes, participants will be familiarized with a sequential and systematic approach to retrieving CBD stones. Though a new 2004 station, this topic remains front and center in MIS for most surgeons, and will be learned through systematic hands-on training.

Objectives:
- Learn what equipment is necessary/preferred to explore the common bile duct
- Learn a series of steps by which to perform exploration systematically
- Achieve identification and recovery of CBD stones using simulator models

Laparoscopic Inguinal Hernia Repair
Coordinator: Ben Schneider, MD
Many believe that unfamiliarity with normal pelvic anatomy has slowed adoption of laparoscopic inguinal hernia repair. This station utilizes an interactive CD, videotape procedure and pelvic model to allow surgeons the cognitive and skill set required for safe performance of a TEP repair.

Objectives:
- To learn normal anatomic relationships
- Practice mesh deployment and securing techniques

Procedure Videos- New for 2004
Coordinator: Horacio Asbun, MD
This station will present basic anatomy and short videos such as laparoscopic fundoplication, inguinal hernia repair, roux-en-y gastric bypass and right colectomy. New for 2004, this program will highlight SAGES TOP 12 Videos and other video clips from the SAGES Library. To supplement videos, participants will have access to SAGES web quizzes related to topic to emphasize the teaching points.

Objectives:
- To become familiar with the indications and techniques for the surgical procedures demonstrated in the videos
- To learn how to access SAGES web quizzes for ongoing independent learning

2004 Learning Center Corporate Sponsors:
- Aloka Ultrasound
- Ethicon Endo-Surgery
- Stryker Endoscopy

Contributions In-kind:
- Autosuture
- B-K Medical Systems
- Cine-Med
- Coalescent Surgical, Inc.
- Cook, Inc
- Karl Storz Endoscopy
- Limbs and Things

Massachusetts General Hospital / Center for Integration of Medicine and Innovative Technology
- METI
- Simbionix
- Synovis Surgical
- W. L. Gore and Associates, Inc.
SAGES will offer three educational lunches on Saturday from 12:30 - 2:00 PM. Tickets will be required at the door for each lunch. Tickets are still available on-site for purchase from registration.

Educator’s Lunch

SAGES Fundamentals in Laparoscopic Surgery (FLS): Conception, Validation, and Distribution

Location: Room C205
Lunch Course Chair: Gerald M. Fried, MD

Description:
The SAGES Program Fundamentals in Laparoscopic Surgery (FLS) has been designed to teach and assess the knowledge, judgment, and skills fundamental to the practice of basic laparoscopic surgery. This program will review the evolution of the FLS Program from its conception to its current state as a validated educational product.

Objectives:
- To describe the vision and specific goals of the FLS Program
- To present in detail the process of developing the educational content for the program and ensuring that the material comprised the breadth of material fundamental to the practice of laparoscopic surgery
- To review the data and process required to validate FLS as a high-stakes assessment tool
- To describe the perspective of the American College of Surgeons regarding FLS as a paradigm for the introduction of innovative technology into clinical practice

Program:

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<tr>
<th>Time</th>
<th>Session</th>
<th>Faculty</th>
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<tbody>
<tr>
<td>12:30 - 12:45 PM</td>
<td>Course Welcome and Introduction</td>
<td>Gerald Fried, MD</td>
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<tr>
<td>12:45 - 12:55 PM</td>
<td>FLS: The Vision</td>
<td>Nathaniel J. Soper, MD</td>
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<tr>
<td>12:55 - 1:05 PM</td>
<td>Development of the didactic component</td>
<td>Lee Swanstrom, MD</td>
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<tr>
<td>1:05 - 1:15 PM</td>
<td>Development of the skills component</td>
<td>Gerald M. Fried, MD</td>
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<tr>
<td>1:15 - 1:30 PM</td>
<td>The Process of validation of FLS as a high stakes evaluation tool</td>
<td>Kaaren Hoffman, Ph.D.</td>
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<tr>
<td>1:30 - 1:45 PM</td>
<td>FLS: The perspective from the American College of Surgeons</td>
<td>Ajit Sachdeva, MD</td>
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<td>1:45 - 2:00 PM</td>
<td>Discussion</td>
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Technology Lunch

Robots: After the Honeymoon is Over

Location: Room C201
Lunch Course Chair: Patrick Reardon, MD

Description & Objectives:
Where Do Robots Add Value: At the conclusion of this lecture, the participants will be able to discuss specific technical aspects of surgery which are enhanced by robots, including ways that the surgeon can visualize better, become more effective or faster or safer, etc. This lecture will not address specific cases, but will focus on skills and details. Extensive video footage will be included in this lecture.

What Operations Are Made Better: At the conclusion of this lecture, the participants will gain an understanding of the types of cases that should be considered for use of the robot. Participants will be able to discuss those procedures that have been shown to be feasible versus those procedures where improved outcomes or surgeon benefit have been demonstrated. Reference will be made to scientific studies performed on this topic.

Should My Hospital Buy a Robot: At the conclusion of this lecture, the participants will be able to analyze in detail the financial aspects of purchasing a robot, including the total cost of such a purchase. The participants will also be able to discuss decision-making criteria such as cost versus patient safety.

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<td>Course Welcome and Introduction</td>
<td>Patrick Reardon, MD</td>
</tr>
<tr>
<td>12:45 - 1:05 PM</td>
<td>Where do robots actually &quot;add value&quot; to the practice of surgery?</td>
<td>Scott Melvin, MD</td>
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<td>1:05 - 1:25 PM</td>
<td>What operations in what fields are actually made better for the patient or the surgeon through the utilization of robots?</td>
<td>Mark Talamini, MD</td>
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<tr>
<td>1:25 - 1:45 PM</td>
<td>Should my hospital buy a robot?</td>
<td>Steven Schweitzberg, MD</td>
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<td>1:45 - 2:00 PM</td>
<td>Discussion</td>
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SAGES acknowledges a generous educational grant in support of this event from INTUITIVE SURGICAL.
Pediatric Lunch

Ileo-Colic Disease in Young Adults – Congenital Defects to Inflammatory Bowel Disease: Do We Do As Well As We Think?
Location: Room C207
Lunch Course Chair: Steve Rothenberg, MD

Description:
This panel will discuss new treatment options in neonatal problems including imperforate anus and Hirschsprung’s disease. The long term consequences of these diseases will also be discussed along with management issues for the young adult. Issues of Inflammatory bowel disease in the adolescent will also be discussed.

Objectives:
- Understand new minimally invasive surgical therapies for the treatment of Hirschsprung’s disease and Imperforate anus
- Discuss issues in long term management of these patients in adolescents and young adults
- Evaluate new minimally invasive treatments in Inflammatory bowel disease in adolescents

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<tr>
<td>12:30 - 12:45 PM</td>
<td>Lunch Course Welcome and Introduction</td>
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<tr>
<td>12:45 - 1:00 PM</td>
<td>Current status of the treatment of Hirschsprung’s disease and Imperforate anus - why we need minimally invasive operations</td>
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<tr>
<td>1:00 - 1:15 PM</td>
<td>Chronic constipation in the adolescent; surgical treatment options</td>
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<td>1:15 - 1:30 PM</td>
<td>Laparoscopic treatment of isolated ileal strictures in Crohn's disease</td>
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<td>1:30 - 1:45 PM</td>
<td>Total colectomy (Laparoscopic) in the adolescent with Ulcerative colitis: To pouch or not to pouch</td>
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<tr>
<td>1:45 - 2:00 PM</td>
<td>Discussion</td>
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</table>
George Berci, M.D., Surgeon, Swedish Medical Center, Colorado Health Sciences Center, Attending Professor of Surgery, University of Center, Hackensack, NJ

Mehran Anvari, M.D., Director Advanced Minimal Invasive, Robotic and Bariatric Program, John Muir/Mt. Diablo Health System, Pleasant Hill, CA

Garth H. Ballantyne, M.D., System, Pleasant Hill, CA

Horacio J. Asbun, M.D., Director, Center for Minimal Access Surgery, Swedish Medical Center, Attending Professor of Surgery, University of Center, Hamilton, Ontario, CANADA

Mehran Anvari, M.D., Director Advanced Minimal Invasive Surgery, Hackensack University Medical Center, Hackensack, NJ

Reginald Bell, M.D., Assistant Clinical Professor of Surgery, University of Colorado Health Sciences Center, Attending Surgeon, Swedish Medical Center, Littleton, CO

George Berci, M.D., Clinical Professor of Surgery, Sr. Director, Minimally Invasive Surgery Research, Cedars-Sinai Medical Center, Los Angeles, CA

Suni Bhyrul, M.D., Attending Surgeon, Scripps Clinic, San Diego, CA

Desmond H. Birkett, M.D., Clinical Professor, Chairman, General Surgery, Lahey Medical Center, Tufts University Medical, Burlington, MA

Steven P. Bowers, M.D., Clinical Assistant Professor of Surgery, Staff General Surgeon, Director Medical Student Clerkship, San Antonio, TX

Cedric G. Bremner, M.D., Professor of Surgery, Attending Professor of Surgery, University of Southern California, Los Angeles, CA

Fred Brody, M.D., Associate Professor of Surgery, The George Washington University Medical Center, Washington, DC

L. Michael Brunt, M.D., Associate Professor of Surgery, Washington University School of Medicine, St. Louis, MO

Luis E. Burbano, M.D., Professor of Surgery, Department Head of General Surgery, Hospital Metropolitano, Quito, ECUADOR

Jo Buyske, M.D., Assistant Professor of Surgery, Chief of Surgery, Director of Minimally Invasive Surgery, Presbyterian Medical Center, University of Pennsylvania, Philadelphia, PA

Mark P. Callery, M.D., Visiting Professor of Surgery, Chief, Division of General Surgery, Harvard Medical School, Boston, MA

Alberto Chousslye, M.D., Professor of Surgery, Universidad Nacional Autonoma de Mexico, Chief of the Teaching & Surgical Research Center, ABC Medical Center, Mexico City, MEXICO

Paul Cirangle, M.D., Assistant Professor of Surgery, Uniformed Services University of The Health Sciences, San Francisco, CA

Jeffrey, Cohen, M.D., Physician Lead, Division of General and Colorectal Surgery; Connecticut Surgical Group; Associate Clinical Professor of Surgery, Attending Surgeon; Hartford Hospital & Connecticut Children's Medical Center, Hartford, CT

Herbert E. Cohn, M.D., Anthony E. Narducci Professor of Surgery, V.C.H.M, Department of Surgery, Thomas Jefferson University, Philadelphia, PA

Peter F. Crookes, M.D., Associate Professor of Surgery, Director of Bariatric Surgery Program, Los Angeles, CA

Ed H. Cussati, M.D., Good Samaritan Hospital, West Babylon, NY, USA

Sir Ara Darzi, M.D., Professor of Surgery, St. Mary's Hospital NHS Trust, London, UNITED KINGDOM

Conor P. Delaney, M.D., M.Ch., Staff Surgeon, Cleveland Clinic Foundation, Cleveland, OH

Daniel Th. Dempsey, M.D., Professor and Chairman, Department of Surgery, Philadelphia, PA

Aureo L. Depaula, M.D., Setor Coimbra, Goiania, Goias, BRAZIL

Daniel Deziel, M.D., Professor Of Surgery, Rush University Medical Center, Rush-Presbyterian-St. Luke's Medical Center, Chicago, IL

Quan-Yang Duh, M.D., Professor of Surgery, Chief of Endocrine Surgery Section, University of California, San Francisco, CA

Titus D. Duncan, M.D., Morehouse School of Medicine, Atlanta, GA

Brian Dunkin, M.D., Assistant Professor of Surgery, University of Miami School of Medicine, Miami, FL

Michael Edye, M.D., Associate Professor of Surgery, Director, Division of Minimally Invasive Surgery, New York University School of Medicine, New York, NY

Thomas, Eubanks, M.D., Portland Surgical Specialists, Portland, OR

W. Stephen, Eubanks, DO, Professor and Chairman, Department of Surgery, University of Missouri Hospital & Clinics, Columbia, MO

Liane S. Feldman, M.D., Assistant Professor of Surgery, McGill University, Surgeon, McGill University Health Center, Montreal General Hospital, Montreal, Quebec, CANADA

George S. Ferzli, M.D., Professor of Surgery, Director of Laparoscopic Surgery, Sunny Health Science Center & Lutheran Medical Center, Staten Island, NY

Abe Fingerhut, M.D., Professor of Service, Centre Hospitalier Intercommunal, Poissy, FRANCE

Aaron S. Fink, M.D., Professor of Surgery, Acting Director, Surgery and Perioperative Care Service Line, Emory University School of Medicine, Decatur, GA

Samuel R. Finlayson, M.D., Assistant Professor of Surgery and of Community and Family Medicine, Surgical Staff, Dartmouth Medical School, Dartmouth-Hitchcock Medical Center, Lebanon, NH

Elliot K. Fishman, M.D., Professor of Radiology and Oncology, Director of Diagnostic Imaging and Body CT, The John Hopkins Hospital, Baltimore, MD

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Welcome Reception
Date: Wednesday, March 31, 2004
Time: 5:00 - 7:00 PM
Place: Exhibit Hall B2/C
Fee: No Fee for Registrants & registered guests
Dress: Business or casual (cowboy boots & hats encouraged)
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.

An Evening at Jillian’s and the Seventh Annual SAGES International Sing-Off
Date: Friday, April 2, 2004
Time: 7:30 PM, Buses begin loading at Hotels 7:00 PM
Place: Jillian’s
Dress: Western Casual (cowboy boots and hats strongly encouraged)
Fee: Included in Registration for SAGES Scientific Session and Guests
Additional Tickets: $75.00

SAGES gratefully acknowledges our Platinum and Gold Level meeting donors for their support of this event:
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Save the Date!!
SAGES Scientific Session & Postgraduate Course: April 13 - 16, 2005
Westin Diplomat Resort, Ft. Lauderdale, FL (will be held with AHPBA, & consecutively with the ACS Spring Mtg.)

SAGES Scientific Session & Postgraduate Course: April 26 - 29, 2006
Wyndham Anatole Hotel, Dallas, TX (will be held with IPEG, & consecutively with the ACS Spring Mtg.)

SAGES Scientific Session & Postgraduate Course: April 19 - 22, 2007
Paris Las Vegas Hotel, Las Vegas, NV (will be held consecutively with the ACS Spring Mtg.)

Related Meetings
13th Annual Congress for Endosurgery in Children, IPEG: Maui, Hawaii, May 5-8, 2004
12th EAES International Congress: Barcelona, Spain, June 9 - 12, 2004
13th EAES International Congress and 14th Annual Congress for Endosurgery in Children, IPEG: Venice, Italy, June 1 - 4, 2005
Tour 1: Art Castings in Loveland & Tastes of Boulder

Date: Thursday, April 1, 2004  
Time: 8:00 A.M.  
Length: 8 hours  
Fee: $68.00  
Includes: Transportation, tour guide, coffee & muffin mini-breakfast, bottled water, lunch and admission fees  

Come with us to Loveland at the base of the Rocky Mountains to visit one of the foremost art foundries in the nation. Art Castings of Colorado was founded in 1972. Experience the “lost wax” process that dates back thousands of years and watch as the foundry craftsmen transform the original to wax and to the finished bronze.  
Travel to Boulder for lunch at the Dushanbe Tea House, a unique teahouse and restaurant presented by Dushanbe, Tajikistan to their sister city. Its unique hand-carved and hand-painted ceiling, tables, stools and exterior reflect the artistic tradition of Persian decoration.  
Visit the Celestial Seasonings Tea Company for a special guided tour through the Celestial story. See the process of how more than 50 varieties of tea are boxed and adorned. Visit the Tea Shop and Emporium.  
Scenic return to Denver through the Flatirons.

Tour 2: Cherokee Ranch & Castle: Garden of the Gods & Lunch at the Craftwood Inn

Date: Friday, April 2, 2004  
Time: 9:00 A.M.  
Length: 7 hours  
Fee: $75  
Includes: Transportation, tour guide, lunch & admission fees  

Drive to Colorado Springs which boasts dramatic landscapes and is home to early Native American tribes. See majestic peaks that yielded massive piles of gold and silver to early pioneers.  
Visit the Cherokee Ranch & Castle, which is a Scottish style castle filled with art from all over the world as well as a working 3,000 acre cattle ranch with spectacular views.  
Drive through the Garden of the Gods, a registered national landmark of red sandstone rock formations and now a geological park.  
Lunch at the unique English Country Tudor style “Craftwood Inn,” built in 1912 originally as a coppersmith shop. The Inn represents the American Arts and Crafts movement.  
Visit Manitou Springs, Gold Rush supply town with its quaint Victorian homes, shops and newly renovated “springs.”

Tour 3: Mile High City Highlights

Date: Saturday, April 3, 2004  
Time: 9:00 A.M.  
Length: 5 hours  
Fee: $49  
Includes: Transportation, tour guide, box lunch and admission fees  

The city of Denver has a great frontier heritage which evolved into a booming metropolis.  
Drive by the Denver Public Library with its mixture of towers, rotundas and turrets, the Denver Art Museum, and The Denver Civic Center.  
Visit the Molly Brown House Museum, built in 1889, which is a symbol of the inspiring life of Margaret “Molly” Brown and the Victorian era in Denver. Molly is most widely known for her heroic efforts aboard the Titanic.  
Drive through LoDo (Lower Downtown) for a glimpse of Larimer Square and its 120-year-old buildings.  
Finally, visit Coors Field, home of the Colorado Rockies baseball team.
2005 SAGES Meeting

April 13 - 16, 2005
Ft. Lauderdale, Florida

At the fabulous Westin Diplomat Resort

About the 2005 Meeting...

What’s the Same?

• Expect the same great SAGES Meeting, including PG courses, invited lecturers, scientific sessions, Learning Center
• The exhibit hall will feature the newest, most cutting-edge technologies of interest to ALL attendees
• Classic SAGES Social Events and, of course, the Sing-Off

What’s New and Exciting?

• The American Hepato-Pancreato-Biliary Association (AHPBA) will host their Annual Meeting at The Diplomat concurrent to the SAGES Meeting.
• The ACS Spring Meeting will occur immediately following the SAGES Meeting...also at The Diplomat.

Preliminary program information will be available this summer. Check the sages website, www.sages.org often for updates.
A Guide To SAGES

The following two pages detail what SAGES has to offer...current projects, initiatives, committees, publications, courses, products, guidelines...and more!

SAGES Projects:

FLS: The Fundamentals of Laparoscopic Surgery Program (FLS) is an innovative product in surgical education and skills assessment. FLS includes a comprehensive, multi-media CD-ROM-based educational module designed to teach the basic knowledge, judgment and technical skills fundamental to the performance of laparoscopic surgery. The CD-ROM study guides cover didactics, interactive patient scenarios and manual skills training. It also includes an exam to assess cognitive knowledge and manual skills. It will be available for purchase in March, 2004. For more information, please contact Lisa Jukelevics at fls@sages.org.

Outcomes: The SAGES Outcomes Initiative is the only general surgery outcomes tracking tool available exclusively to the members of a surgical society, providing user-friendly case-specific logs that are designed to serve as your surgical diary. Participants enter in data via the web or through their PDA in one or more modules (general surgery, Gall Bladder, GERD, Hernia, Morbid Obesity and Colorectal). SAGES members may contact Jennifer Clark at jennifer@sages.org to join today.

Legislative: SAGES Legislative Review Committee is actively involved in a variety of issues affecting SAGES members including medical liability reform and the expert witness. SAGES has joined the Health Coalition for Liability and Access headed by the ACS and is part of the AMA efforts for America's Liability Reform. SAGES is a member of the AMA House of Delegates and has appointed representatives to both the RUC and CPT Advisory groups. Most recently SAGES has worked on gaining CPT codes and appropriate values (RUC) for both upper gastrointestinal endoscopy, with delivery of thermal energy to the lower esophageal sphincter and/or gastric cardia muscle, and for several laparoscopic bariatric codes including the lap band. For more information please contact Colleen Elkins at colleen@sages.org.

Corporate Council: Comprised of member companies from industry, the Corporate Council serves as a direct link between SAGES leadership and industry. General Membership meetings are attended by members of SAGES leadership and industry representatives large and small. For more information, please contact Colleen Elkins at colleen@sages.org.

Research Grants:

Every year SAGES awards research grants to select SAGES members. Grant recipients are announced at the Annual Meeting. Funded by industry support, SAGES gives on average six to nine grants per year. Grant applications are generally available over the Summer, with the deadline to apply each Fall. For more information, please contact christina@sages.org.

Video Projects:

Top 14 Project: Developed by the SAGES Educational Resources Committee and produced by Ciné-Med, the Top 14 Project is a revised collection of the top most common minimally invasive procedures performed by surgeons. To order the collection, please contact Ciné-Med at 800-515-1542 or visit www.cine-med.com.

SAGES Pearls Project: The SAGES Pearls Project is a procedure specific instructional series, concentrating on different, important steps of a given procedure, offering instructions, tips, tricks and alternatives for these steps. These procedures include Nissen, Bariatric and Colorectal. The Nissen Pearl will be available for sale in time for the Annual Meeting. The Nissen Pearl is available for sale. To order, please contact Ciné-Med at 800-515-1542 or visit www.cine-med.com.

SAGES Video Library: The SAGES Educational Video Library contains programs presented at, or submitted to, recent SAGES Scientific Sessions and/or Postgraduate Courses. Produced by Ciné-Med, videos range from $35-$75 per set for members. To order a catalog or video, please contact Ciné-Med at 800-515-1542 or visit www.cine-med.com.

SAGES Publications:

SCOPE & Mini-SCOPE: SCOPE, SAGES semi-annual newsletter, and Mini-SCOPE, a brief monthly electronic version, provide updates on SAGES projects and activities, upcoming events and general news affecting the organization. To receive a copy of SCOPE, please contact Christina Blaney at (310) 437-0544 ext. 109 or christina@sages.org.

http://www.sages.org/
RESOURCES

GUIDELINES:
SAGES offers 15 Guidelines and 7 Statements. The recently written Guidelines for Institutions Granting Bariatric Privileges Utilizing Laparoscopic Techniques addresses some of the most current issues in MIS. To order, please contact the SAGES office at (310) 437-0544, ext. 118 or you can download the guideline off the SAGES web site or contact jojce@sages.org.

SAGES CME COURSES AND OTHER PRODUCTS:
SAGES Laparoscopic Colon Surgery Video Course: Four hours of lectures & videos on DVD, including a syllabus written by SAGES faculty. CME accredited. Released in 2004.
SAGES Hernia Surgery Video Course: Four hours of lectures & videos on DVD, including a syllabus written by SAGES faculty. CME accredited. Released in 2004.
SAGES Patient Information Brochures: As a way to educate patients on certain laparoscopic and endoscopic procedures, the SAGES Educational Resources Committee has created several patient information brochures, written in both English and Spanish. To order, please visit www.sages.org.
SAGES Troubleshooting Guide: Double sided, laminated guide to hang in your OR to assist OR personnel when equipment problems arise. To order, please visit www.sages.org.
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RESIDENT COURSES:
SAGES offers courses in gastrointestinal endoscopy and laparoscopy for general surgery residents throughout the year. Basic Courses are for 2nd and 3rd year residents and Advanced Courses are open for 4th and 5th year residents. Attendees must be SAGES Candidate members to attend an advanced course. For a listing of resident courses in 2004, please visit www.sages.org, or for more information, contact Christina Blaney at (310) 437-0544 ext. 109 or christina@sages.org.

SAGES BOOKS AND JOURNAL:
The SAGES Manual: Fundamentals of Laparoscopy and GI Endoscopy is a portable, concise, richly illustrated manual from the pioneering society for minimally invasive surgery. This manual provides an authoritative synopsis of the major laparoscopic and flexible endoscopic procedures in easy-to-use, outline form. Step-by-step, the authors present the indications, patient preparation, operative techniques, and strategies for prevention and management of complications for a wide spectrum of both gold-standard and emerging procedures. The softcover, pocket-sized format makes it ideal for residents. To order a manual, please contact Spinger at 1-800-SPRINGER or visit http://www.springer-ny.com/.
Surgical Endoscopy: Surgical Endoscopy is SAGES official journal. To view articles on-line, visit www.sages.org.

SAGES COMMITTEES:
The following committees work towards the goals of the society. The best way to get involved in SAGES is to volunteer for a committee. To do so, please contact, Sallie Matthews at sallie@sages.org.

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S001

LAPAROSCOPIC SURGERY FOR COLONIC CANCER: SHORT TERM RESULTS OF A RANDOMIZED TRIAL, H J Bonjer PhD, E Kuhry MD, R Veldkamp MD, Erasmus Medical Center, Rotterdam, The Netherlands

Background: Although laparoscopic techniques have shown to be feasible to treat benign colorectal diseases, the role of laparoscopic techniques to resect malignant tumours remains controversial. To assess the value of laparoscopy in the treatment of colorectal cancer, a randomized clinical trial was started.

Methods: The COLOR trial is a randomized, international, multicentre study comparing the outcomes of laparoscopic and open surgery for colon cancer. Primary endpoint is the disease-free survival at three years. Secondary endpoints are overall survival at three and five years, 28-day postoperative mortality and morbidity, quality of life, costs, location and rates of recurrences and pathologic anatomic characteristics of the resected specimen.

Patients with a single tumour of the colon above the peritoneal deflection were included. Not included were patients with concomitant bilateral lesions or other malignancies, with malignancies in their medical history, with signs of acute obstruction or with previous ipsilateral colon surgery.

The current analysis involves the preliminary short-term results of the COLOR trial after analysing 1005 patients.

Results: From March 1997 until March 2003, 1246 patients were included and randomised into either laparoscopic or open surgery. Of these patients, 138 were excluded post-randomisation. Reasons for exclusion were: no cancer (n=52), metastases found during operation (n=69), withdrawal of informed consent (n=9) and other reasons (n=8). In almost eighteen percent of the patients that underwent a laparoscopic procedure, conversion to conventional surgery was necessary due to intraoperative difficulties. Mean postoperative blood loss was 100 ml in the laparoscopic and 175 ml in the open group (p<0.001). There were no significant differences in postoperative complications (p=0.82), reinterventions (p=0.2), readmissions (p=0.2) and mortality (p=0.42) There was a highly significant difference in recovery of bowel function (p<0.001) and hospital stay (p<0.001), both in favour of the laparoscopic procedure.

Conclusions: Within this randomized trial, laparoscopic surgery for colorectal cancer was as safe as conventional surgery and resulted in reduced blood loss during surgery, a faster recovery of bowel function and a shorter hospital stay. Long term results have to be awaited to assess oncologic outcomes.

S002

OPEN AND NOT LAPAROSCOPIC SURGERY INDUCES A DRAMATIC DECREASE IN THE LEVEL OF INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 IN PATIENTS WITH COLORECTAL CANCER, Irena Kirman PhD, Natalia Poltoratskaia MS, Vesna Cekic RN, Richard L Whelan MD, Columbia University, Department of Surgery

We have earlier shown that open (OS) but not laparoscopic surgery (LS) induces a qualitative decrease in plasma IGFBP-3 (insulin-like growth factor binding protein 3) levels on postoperative day 1 (POD1) and that POD1 open plasma stimulates in vitro tumor growth. Intact IGFBP-3 has tumor suppressive effects but its degradation products do not; ELISA inevitably measures both. In this study, using a novel combined Western Blot and ELISA analysis method, precise plasma levels of intact IGFBP-3 on POD2 after open and closed colorectal cancer resection (Stage I-III) were determined. Methods: 12 OS patients (pts), mean incision length 21.4±6.2 cm and 10 LS pts, mean incision length 5.1±1.2 cm were included. Peripheral blood was collected preoperatively (preop) and on POD2. As stated, intact IGFBP-3 levels were calculated via ELISA and Western Blot analysis. Statistical Analysis was performed with a paired Wilcoxon’s test. Results: In OS patients the mean preop concentration of intact ~40 kDa IGFBP-3 protein was 169±1774 ng/ml; it decreased dramatically on POD2 to 449±591 ng/ml (p<0.005). In the LS group, there was no significant difference noted, 1560±422 ng/ml preop vs 1369±495 ng/ml POD2 (p=0.3) Conclusions Open cancer resection, unlike its minimally invasive alternative, induces a dramatic decrease in concentration of intact IGFBP-3 which may be a risk factor for colon cancer recurrence.

S003

SURGICAL THERAPY FOR BILIARY DYSKINESIA: A META-ANALYSIS AND REVIEW OF THE LITERATURE, Todd A Ponsky MD, Fred Brody MD, The George Washington University Medical Center

Biliary dyskinesia is characterized by right upper quadrant pain, absence of cholelithiasis, and a gallbladder ejection fraction of less than 40%. Although biliary dyskinesia is treated commonly with cholecystectomy, the literature supporting this therapy is limited. A review and meta-analysis of the literature was performed to assess the efficacy of surgical therapy for biliary dyskinesia.

A Medline search from 1965 to 2003 was performed using the search strings of ?biliary?, ?dyskinesia?, ?calculation?, ?cholelithiasis?, ?cholecystectomy?, and ?therapy?. The searches returned 187 articles. To assure study design uniformity, inclusion criteria required studies with patients with acalculous, biliary colic and a gallbladder ejection fraction of <40%. In order to qualify for inclusion, each study necessitated two arms: patients with biliary dyskinesia undergoing cholecystectomy and patients with biliary dyskinesia without surgical intervention. Follow up was required to assess the degree of symptomatic improvement. A meta-analysis using multiple, independent, 2x2 tables or the Mantel-Haenszel ?fixed-effects? model was performed.

Only five studies met these simple criteria with a total of 255 patients. The meta-analysis demonstrated that surgical therapy for biliary dyskinesia significantly improves symptoms over non-operative therapy (Odds ratio = 56.08, Chi2 = 73.07, p < 0.001).

Cholecystectomy for biliary dyskinesia is an effective therapy and offers significantly more symptomatic relief over non-operative therapy based on this meta-analysis. Although previous, retrospective case series document the efficacy of cholecystectomy for biliary dyskinesia, large prospective, comparison trials are lacking. This meta-analysis verifies the current surgical dictum advocating cholecystectomy for biliary dyskinesia.

S004

AMBULATORY AND OUTPATIENT LAPAROSCOPIC ADRENALECTOMY, Tom Paluch MD, Nader Yamin MD, Michael J Clar MD, Kaiser Foundation Medical Center, San Diego

Laparoscopic adrenalectomy (LA) has become the gold standard for the treatment of diseases of the adrenal glands. Success with ambulatory laparoscopic cholecystectomy and fundoplication in our institution suggested that LA could be performed safely on an ambulatory and outpatient basis.

The records of all patients undergoing LA at our institution since 1995 were reviewed. Since 1997 all patients who underwent unilateral LA were considered for ambulatory discharge. Criteria for exclusion were pheochromocytoma, Cushing’s disease, and distance from the medical center of >50 miles. Those who failed to meet criteria for ambulatory discharge were considered for outpatient (<23 hr) discharge.

In all, 56 pts underwent unilateral LA. There were 18 males and 38 females with a mean age of 49 yrs (range 27-75), and a mean BMI of 28 (range 21-39.5). Of the 30 patients who qualified for ambulatory discharge, 29 were successfully discharged with a mean LOS of 7.8 hrs (range 5.5-9.8 hrs). The only failure was due to a conversion to open. The remaining 26 pts were all discharged the morning after operation. There were no mortalities. Two of the 55 were readmitted, one for a subphrenic abscess on POD #5 and one for unexplained fever on POD#3. All pts were contacted by telephone the morning after discharge according to a pre-established protocol. All patients with functioning tumors were seen in the office within 96 hours of discharge. Follow-up surveys disclosed a high degree of patient satisfaction with ambulatory and outpatient discharge protocols.

We conclude that LA can safely be performed on an ambulatory and outpatient basis. Patients with both non-functional and functional lesions are candidates for this approach. Early discharge does not have an adverse effect on the outcomes of patients undergoing LA.
**S006**

**LAPAROSCOPIC ADRENALECTOMY: 100 RESECTIONS AND LONG TERM FOLLOW UP**

Benjamin K Poulouze MD, Michael D Holzman MD, Oliver B Lao BS, Eric L Grogan MD, Richard E Goldstein MD, Vanderbilt University Medical Center, Nashville, TN, USA, University of Louisville, Louisville, KY, USA.

Background: Initially reserved for relatively small cortical adenomas or hyperplasia, the indications for laparoscopic adrenalectomy (LA) have expanded. LA performed by a team of two surgeons is presented with long term follow up.

Methods: One hundred resections in 94 patients (pts) were performed between 1995-2003. Clinical data and long term follow up were obtained from medical records, questionnaires, and telephone interviews under an IRB approved protocol.

Results: Diseases included Cushing’s Syndrome (CS, 30 pts), pheochromocytoma (PH, 11), Conn’s Syndrome (CON, 27) and other tumors (OT, 26). Mean age was 51±1 years (mean±SEM) with follow up of 17±2 months and length of stay 2.5±0.3 days; 92% were Caucasian and 63% women. Anti-hypertensive therapy was eliminated or reduced in 88% of PH and 74% of CON pts. Six pts underwent bilateral LA for Cushing’s Disease. Fifty-eight pts (62%) had prior abdominal operations. Operative time for the first 20 unilateral resections was 3.3±2 hours compared to 2.3±0.2 hours for the remaining procedures (p<0.05, Mann-Whitney rank sum). One intra-operative complication occurred in the CS group (diaphragmatic injury requiring conversion to open approach). Five major postoperative complications occurred including port-site hernia, Addisonian crisis, arrhythmia (2 pts), and one death. Diagnostic errors were made in 9 patients (10%); 7 non-functional tumors in patients were diagnosed as PH (6) and CON (1), and 2 functional tumors of PH (1) and CS (1) were diagnosed as non-functional.

**Conclusion:** LA is a safe, effective procedure for benign adrenal disease and can be performed well in the re-operative setting. LA can be offered to patients with benign tumors greater than 5cm in diameter and those with PH. Patients with PH and CON can expect improvement or cure of their anti-hypertensive regimen. The 10% diagnostic error, while low, may reflect preoperative constraints in the current health system.

**S007**

**INTRAOPERATIVE FLUID MANAGEMENT IN LAPAROSCOPIC LIVE DONOR NEPHRECTOMY: CHALLENGING THE DOGMA.**

S Bergman MD, L S Feldman MD, F Carli MD, M Anidjar MD, M C Vassiliou MD, C G Andrew MD, D D Stanbridge RN,G M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.

Introduction: Patients undergoing laparoscopic live donor nephrectomy (LLDN) commonly receive large amounts of fluid intraoperatively in an attempt to counter the negative effects of pneumoperitoneum on renal function. However, fluid overload can contribute to perioperative complications. Our aim is to demonstrate that a more conservative fluid management strategy does not adversely affect donor or recipient outcomes.

Methods: This is a prospective study of 48 patients who underwent LLDN between December 2000 and August 2003. Group 1 (n=25) received intravenous crystalloids intraoperatively at a rate of <10cc/kg/h, while group 2 (n=23) received >10cc/kg/h. Postoperative serum creatinine levels, length of stay, and complications were recorded in the donors and the recipients. Self-reported pain scores (0-10) at rest and with activity were recorded each morning. In the recipients, incidence of delayed graft function and acute rejection were noted. Data were analyzed using Student’s t-test and Mann-Whitney’s U test.

Results: Group 1 received less fluid (1.6±0.5L vs. 4.1±2.0L, p<0.01) and had a lower urine output intraoperatively (97±40cc/h vs. 206±196cc/h, p<0.01). There were no differences in post-op creatinine levels or complications between the two groups. Pain scores at rest were significantly lower in group 1 on post-operative days 1 and 2 (p<0.05). Group 1 donors had a shorter length of stay (3 vs. 2 days, p<0.05). There were no differences in post-op creatinine levels, incidence of delayed graft function, acute rejection, or hospital stay between the recipients in groups 1 and 2.

Conclusion: Lower volume fluid management strategies in LLDN do not worsen recipient outcomes and may be beneficial to the donors.

**S008**

**PORTAL VEIN THROMBOSIS AFTER LAPAROSCOPIC SPLENECTOMY,**

Nicholas A O’Rourke MD, George Fielding MD, Leslie K Nathanson MD, Ian Martin MD, Laurent Layani MD, Royal Brisbane Hospital, Brisbane, Australia.

**Purpose:** To examine the clinical presentation and risk factors for portal vein thrombosis occurring after laparoscopic splenectomy.

**Methodology:**

Cases of portal vein thrombosis were identified by clinical audit. All cases of laparoscopic splenectomy by the surgeons involved in the study period were examined by retrospective chart review.

**Results:**

There were 7 cases of portal vein thrombosis identified out of 136 cases with an incidence of 5.1%. Massive splenomegaly, specimen weight, myelofibrosis and postoperative thrombocytosis were all significantly associated with the development of portal vein thrombosis. Massive splenomegaly was the most important risk factor. Patients presented with abdominal pain, fever and altered liver function tests. All presented within 15 days postoperatively, and five presented after initial discharge. Diagnosis was by USS and CT. One patient died. Six were successfully treated with anticoagulation.

**Conclusions:**

Portal vein thrombosis is a potential complication of laparoscopic splenectomy associated with massive splenomegaly. It is a potentially fatal complication but when suspected can be diagnosed with non-invasive imaging and treated with anticoagulation. Prophylaxis should be considered for high risk cases.

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**S009**

**LAPAROSCOPIC PALLIATION OF POLYCYSTIC LIVER DISEASE,**

Thomas N Robinson MD, Greg V Stegmann MD, Gerg Everson MD, University of Colorado Health Sciences Center, Denver, CO.

**Background:** Laparoscopic liver cyst fenestration may relieve symptoms in polycystic liver disease (PCLD) patients. The appropriate role of laparoscopic surgery in the management of PCLD is not well defined.

**Hypothesis:** Laparoscopic fenestration for PCLD relieves symptoms caused by polycystic liver disease.

**Methods:** Between 1/95 and 7/03, all patients undergoing laparoscopic treatment of their PCLD were studied. Charts were reviewed to identify the indications for surgery, operative treatment, complications and post-operative recovery.

**Results:** Eleven patients (10 women) underwent 19 laparoscopic cyst fenestrations as treatment for symptoms of their PCLD. The most frequent symptoms leading to surgery were pain/pressure in 14 (74%), early satiety in 11 (56%) and dyspnea in 4 (21%). Operative time was 75±17 minutes and blood loss was 108±231 ml. Conversion to open surgery occurred in 1 (5%), the indication for conversion was bleeding. There was 1 (5%) post-operative bleeding complication that resolved without transfusion. Median hospital stay was 1 day (range 0 to 7). Symptoms resolved post-operatively in all patients. An additional laparoscopic fenestration was required in 6 (55%) patients for recurrent symptoms. The average time to re-operation was 18±10 months. Initial symptom resolution occurred in all patients undergoing re-do fenestration. There were no conversions or complications in the patients undergoing re-do laparoscopic fenestration.

**Conclusions:** Laparoscopic fenestration of PCLD is safe, results in minimal ?down? time and relieves the symptoms caused by PCLD. Symptomatic relief is usually temporary and repeat surgery is required for recurring symptoms in half of the patients.
So10
PREDICTORS OF SURVIVAL AFTER LAPAROSCOPIC RADIOFREQUENCY THERMAL ABLATION OF HEPATOCELLULAR CANCER: A PROSPECTIVE STUDY, E Berber MD, S Rogers MD, A E Siperstein MD, The Cleveland Clinic Foundation

Objective: Less than 30% of the patients with hepatocellular carcinoma (HCC) are candidates for hepatectomy and there is a 70% recurrence rate on long-term follow-up. Multiple studies have documented the efficacy of radiofrequency ablation (RFA) for providing local control for HCC in patients who are not candidates for resection. Nevertheless, there is no data on prognostic factors for survival. The aim of this prospective study is to determine factors effecting survival in patients with HCC undergoing RFA.

Methods: From April 1997 to September 2003, 67 consecutive patients with HCC were treated with laparoscopic RFA. These patients were not candidates for surgery because of tumor extent or severe co-morbidities. Seventy patients undergoing RFA as a bridge to liver transplantation and 2 patients with concomitant liver resections were excluded from analysis. The relationship between survival and age, gender, the time interval between the diagnosis of liver metastases and RFA, tumor size and number, serum albumin, total bilirubin and alpha fetoprotein (AFP), prothrombin time, presence of ascites, and Child's classification was assessed using Kaplan-Meier survival curves.

Results: The median Kaplan-Meier survival for all patients was 25.3 months after RFA treatment. Patients with an AFP < 400 ng/ml had improved survival compared to those with an AFP > 400 ng/ml of 25.2 versus 6.7 months, p < 0.05. Serum bilirubin of < 2 mg/dl was associated with a survival of 25.2 versus 9.9 months for > 2 mg/dl, p < 0.05. Patients without AFP or undetectable serum bilirubin had a median survival of 29 months versus 10.1 months with mild ascites, and 4.7 months with moderate/severe ascites, p < 0.001. Child A patients had a median survival of 29 months compared to 14.7 months for Child B and 10.1 months for Child C, p < 0.001. Tumor size and number showed no statistical differences on survival.

Conclusions: This study demonstrates that earlier Child's classification, lower AFP and bilirubin are associated with improved survival after RFA. Overall U.S. median survival is 7 months and up to 39 months in patients who are able to undergo resection. Our median survival of 25 months argues for the efficacy of RFA in treating, patients with resectable hepatocellular carcinoma.

So11
ROUTINE LAPAROSCOPIC INGUINAL HERNIA SURGERY: 515 CONSECUTIVE REPAIRS WITH A 97% FOLLOW-UP FOR A MEAN OF 3 YEARS, Bernt Novik MD, Susanne Haglund MD, Karin Dahlin Ulfa-Britt Mork, Per Berggren MD, As Andersson, Hans Hedelin PhD, Dept of Surgery, Skaraborg Hospital, Falkoping, Dept of Surgery, Skaraborg Hospital, Skovde, Gastro-Intestinal Center, Ersta Hospital, Stockholm, SWEDEN

INTRODUCTION: After initial enthusiasm, laparoscopic hernia surgery is not well received in Sweden. A favored opinion is that the laparoscopic approach should be restricted to recurrences and bilateral cases. On the contrary, we have persevered in believing that the totally extraperitoneal (TEP) technique is quite appropriate in all kinds of hernias, even primary unilateral ones. To evaluate this, we have now followed up a large series of unselected patients, mainly concerning recurrences, postoperative long term pain and patients' general satisfaction.

METHODS AND PROCEDURES: February 1998 ? February 2002, one of the authors (BN) performed 515 laparoscopic hernia repairs (511 TEP and 4 TAPP). All patients were prospectively registered, both in the Swedish Hernia Register and in a local database. There were no perioperative deaths, deep infections or other severe complications. At least one year postoperatively, we sent all patients a short and easy comprehensible questionnaire developed and validated by Haapaniemi and Nilsson (Eur J Surg, 2002), to disclose all recurrences and long term complaints. According to their replies, all responders with any suspicion of recurrence, chronic pain or dissatisfaction were selected for clinical investigation by independent surgeons. In cases of doubt, patients were referred for herniography. A large effort was put into minimizing the %lost to follow-up rate. The study was approved by the Ethics Committee of Gothenburg University.

RESULTS: Nine patients with 13 repairs were lost due to death, emigration or refusal to participate. The remaining 502 hernia repairs (97%) were fully evaluated, after a mean of 3 years. We found 5 recurrences (1%). Including these, 55 (11%) reported some kind of chronic discomfort, although merely 3 (0.6%) expressed this to be severe. The overall long term results were claimed good or excellent in 95%, and acceptable in an additional 4%. The last 5% patients tracked down had a higher failure rate than the first 92%. CONCLUSIONS: Even in a small public hospital, TEP may be performed in a routine setting with good results. Chronic discomfort may be a more important quality parameter than recurrence. A very high follow-up rate significantly affected the outcome figures negatively.
S014
LAPAROSCOPIC TOTAL EXTRAPERITONEAL REPAIR OF RECURRENT INGUINAL HERNIAS AFTER PRIMARY LAPAROSCOPIC REPAIR, Ghazali A Chaudry MD, Armando E Castro MD, George S Ferzli MD, Staten Island University Hospital Objective: We review our experience with TEP repairs of recurrences after TEP primary repair of inguinal hernias. It has been argued that the laparoscopic extraperitoneal approach after a primary extraperitoneal repair is virtually impossible.

Methods: We retrospectively reviewed the records of patients who had inguinal hernia repairs from September 1991 to September 2000 to identify all patients who had recurrent inguinal hernias repaired using a TEP approach after initial TEP repair. Our approach does not vary markedly from standard TEP repair of primary hernias.

Results: From September 1991 through September 2000, we repaired 1,059 inguinal hernias in 804 patients using a laparoscopic TEP approach. 549 patients had unilateral hernias, 255 had bilateral hernias. 103 patients (12.8%) were operated on for recurrent hernias including twelve recurrences after a previous TEP repair. 95 recurrences were outside referrals including four after prior TEP repairs. 686 (79.1%) patients were followed for over six months, with a range of 6-108 months and a mean follow-up of 53 months. We noted 18 recurrences (2.9%); eight were recurrent by the TEP approach, including the four outside referrals for recurrence after TEP. We performed a total of 12 TEP repairs on recurrences after a primary TEP approach. Ten of these recurrences were indirect and two were direct hernias. We also operated on eight patients who presented with primary hernias contralateral to their prior TEP repair. These eight patients underwent 13 months to 6 years after their initial, contralateral TEP repair.

One patient was converted to an open preperitoneal Lichtenstein repair. There were no complications or deaths, and no bowel or bowel injuries. No patient required transfusion or developed a preperitoneal hematoma. All hernias were discharged on the day of surgery, and none developed a re-recurrence.

Conclusion: We conclude that both TEP repair of recurrent inguinal hernias as well as repair of contralateral hernias after prior TEP repair is technically feasible.

S015
LAPAROSCOPIC REPAIR OF SUPRAPUBIC VENTRAL HERNIAS, Alfredo M Carbonell DO, Kent W Kercher MD, Brent D Matthews MD, Ronald F Sing DO, William S Cobb MD, B. Todd Heniford MD, Carolinas Laparoscopic and Advanced Surgery Program, Department of General Surgery, Carolinas Medical Center, Charlotte, NC

The complexity of dissection and the close proximity of suprapubic hernias to bony, vascular, and nerve structures make their laparoscopic repair a formidable task. The purpose of this study was to evaluate the outcomes of patients undergoing the laparoscopic repair of suprapubic ventral hernias (LRSPH).

A prospective study of patients undergoing LRSPH from July 1996 to Jan 2003 was conducted. Patient demographics, hernia and mesh size, complications, and recurrences were documented. The repair has evolved to include transabdominal suture fixation to the pubic bone, Cooper’s ligament and the iliopubic tract.

Thirty-five patients, 24 females and 9 males, with an average age of 55.6 yrs. (range, 33-76) and a mean BMI of 30.6 kg/m2 underwent LRSPH. Twenty-one (64%) of the repairs were for recurrent hernias, with a mean of 2.3 recurrences each (range, 1-11). Mean hernia size was 196 cm2 (range, 49-768), and mesh size was 492 cm2 (range, 100-1428). All repairs were performed with ePTFE. Mean OR time was 178 min (range, 95-290), with a mean blood loss of 35 cc (range, 20-100). One patient undergoing her fifth repair required conversion due to bowel mesh adhesions. Mean stay averaged 2.2 days (range, 1-7). Mean follow up was 26 months (range, 1-70). Complications (15%) included: prolonged pain greater than 6 weeks (1), trocar site cellulitis (1), ileus (1), prolonged seroma (1), and CLostridium difficile colitis (1). Hernias recurred in 2 of our first 9 patients, for an overall recurrence rate of 6.1%. Since utilizing the technique of applying multiple sutures and tacks directly to the pubis and Cooper’s ligament (in the subsequent 24 patients), no recurrences have been documented.

Although technically demanding and time-consuming, the LRSPH is safe, technically feasible and results in a low recurrence rate. It can be safely performed in large and recurrent hernias. Transabdominal suture fixation to the bony and ligamentous structures yields a durable hernia repair.

S016
TISSEEL® VS TACK STAPLES AS MESH FIXATION IN TOTALY EXTRAPERITONEAL LAPAROSCOPIC REPAIR (TEP) OF GROIN HERNIAS: A RETROSPECTIVE ANALYSIS, Philippe A Topart MD, Franck Vandenburgrooke MD, Patrick Lozac’h MD, Chirurgie generale, Centre Hospitalier Universitaire de Brest

From January 2001 to July 2003 66 patients were treated for groin hernia using a standard TEP procedure with Tisseel® fibrin tissue glue as mesh fixation. The goal was to try to substitute the fibrin tissue glue to tack staples in order to reduce the risk of nerve injury and chronic pain after hernia repair. The patients were 2 women and 64 men aged 55.6 ± 17 years with a unilateral (51) or bilateral (15) groin hernia. The prosthetic material was a 15 by 10 cm coated polyester mesh and 2cc of Tisseel® were prepared during the hernia sac dissection. The Duplot® applicator was used to apply the glue between the mesh and the abdominal wall. The operative time was 54 ± 23 mn and 53 patients (80.3%) had no complication. Eight patients had a seroma (12%), 3 an hematoma (4.5%) and 2 a small bowel obstruction (3%). There was no reoperation or postoperative death. Discharge from hospital occurred 1.5 ± 1.7 days after surgery. The patients were reviewed with a follow-up of 11.6 ± 8.5 months. Three patients still present with some pain in the groin (4.5%) and there was one recurrence on one side of a bilateral repair (1.5%). The patients of this series were compared to 102 patients from a previous experience. The TEP procedure was the same except for the mesh fixation which used 2 or 3 tack staples on the Cooper ligament. The 2 series were similar and the tacks series had slightly less bilateral hernias (1.9% vs 22% for Tisseel®). The follow up of the tacks series was 28.3 ± 10.9 months. The 2 series were compared with respect to the overall complication rate, hematomas, seromas, length of stay, recurrence and postoperative chronic pain. There was no statistical difference between the 2 series except for the rate of postoperative chronic pain which was significantly reduced in the Tisseel® series (4.5% vs 14.7% with p=0.037). The complication rate was similar (19.7% vs 24.6% in tacks) and the length of stay was not different. However the fibrin glue series had more seromas (12% vs 9.8%) but less hematomas (4.5% vs 7.8%). There were less recurrences in the most recent series (1.5% vs 2.9% in tacks) but without any significance. In conclusion the use of fibrin tissue glue in TEP appeared as a safe and reliable method and although it was not evaluated here it did not seem to modify the operative time. The risk of postoperative chronic pain was significantly reduced even if there are restrictions due to the retrospective nature of the comparison. Although a prospective randomized trial would be needed the use of Tisseel® is an efficient and cost effective method of mesh fixation in laparoscopic repair of groin hernias able to minimize the risk of chronic pain.

S017
ROUTINE USE OF TELEROBOTIC REMOTE SURGERY , M Anvari, C McKinley, Centre for Minimal Access Surgery, McMaster University, Hamilton, Ontario and North Bay General Hospital, North Bay, Ontario, Canada

Introduction: On February 28, 2003, the world’s first telerobotic surgical service was established between St. Joseph’s Healthcare Hamilton, a teaching hospital affiliated with McMaster University, and North Bay General Hospital, a community hospital 500 km north of Hamilton. The service is designed to provide telerobotic surgical care and assistance by expert surgeons to the local surgeons in North Bay to improve the range and quality of advanced laparoscopic surgeries offered there and avoid the need for patient transfer.

Description: The telerobotic surgical service uses the Zeus-TS system (Computer Motion Inc, Santa Barbara CA) and an IP-VPN (Internet Protocol-Virtual Private Network) network with 15 Mbps of bandwidth and a point to point latency of 135 ms, allowing the Hamilton surgeon to operate the three Zeus arms remotely.

Results: To date 21 telerobotic laparoscopic surgeries have taken place between North Bay and Hamilton, including 13 fundoplications, 3 sigmoid resections, 2 right hemicolectomies, 1 anterior rectal resection and 2 inguinal hernia repairs. The two surgeons are able to operate together using the same surgical footprint and interchange roles seamlessly when desired. There have been no intraoperative complications and no cases have had to be converted to open surgeries. The mean hospital stays were equivalent to those at Hamilton.

Conclusions: Telerobotic remote surgery is now in routine use providing high quality laparoscopic surgical services to patients in a rural community and providing a superior degree of collaboration between surgeons in teaching hospitals and rural hospitals. Further refinement of robotic and telecommunication technology should ensure its wider application in near future.
SAGES 2004 Abstracts

So18
THE LEARNING CURVE OF INVESTIGATIONAL SURGERY: LESSONS LEARNED FROM THE FIRST SERIES OF LAPAROSCOPIC DIAPHRAGM PACING FOR CHRONIC VENTILATOR DEPENDENCE, Raymond P Onders MD, Anthony R Ignagni, Thomas J Mortimer PhD, Departments of Surgery and Biomedical Engineering, Case Western Reserve University

INTRODUCTION: Electrical stimulation of the phrenic nerve motor point of the diaphragm through laparoscopic implantation is an option for high spinal cord injured patients with chronic respiratory insufficiency. This study assesses the operative learning curve for the initial series of patients.

METHODS: After IRB and FDA approval a series of five patients underwent laparoscopic mapping and implantation of electrodes. After each operation the entire biomedical team and surgical team met and sequentially reviewed the entire operation and implemented any changes for the next case.

RESULTS: The first case required two operations and a total of 8 hrs for surgery to be successful. The second case was unsuccessful because of a nonfunctioning phrenic nerve with an operation of 5 hrs that led to a change in the inclusion criteria. Cases 3 to 5 had a progressive decrease in operative times of 4, 3.5 and 3 hrs. Key changes during this series that helped decrease operative times include: abandonment of a software dependent mapping technique, development of grid algorithm for mapping, software improvement to increase speed of stimulation and mapping, refinement of mapping probe to maintain adequate suction on diaphragm, shortening of electrode lengths, and improvement by experience of surgeon in doing the procedure resulting in increased pace of implantations. Presently two patients are completely off of the ventilator and two others are increasing their time off of the ventilator with diaphragm conditioning.

CONCLUSION: Investigational devices in surgery require a close relationship between the surgeons and the engineers developing them. In this series it was key in developing a low risk, cost effective, outpatient diaphragm pacing system.

So19
PERITONEAL NEBULISER: AN NOVEL TECHNIQUE TO DELIVER INTRAPERITONEAL THERAPEUTICS IN LAPAROSCOPIC SURGERY, Nayar A Alkhamesi MD, Paraskevas A Paraskeva PhD, David H Peck PhD, Ara W Darzi MD, Imperial College London

Objective: The development of peritoneal metastases is a significant clinical issue in the treatment of a range of abdominal cancers and is associated with poor prognosis. Approximately 25-35% of patients that undergo potentially curative surgery will develop peritoneal disease. We have recently shown that both heparin and hyaluronan can block tumour cells adhesion in an in vitro and in vivo setting the former via an ICAM-1 pathway while the latter functioned as a barrier. We propose the use of these therapeutic modalities via a peritoneal nebulising device. This allows the delivery of a fine diffuse spray either within the laparoscopic or open surgical environment. The design of the catheter enables the surgeon to correctly target any part of the peritoneum with precise dose of chosen therapeutic.

Methods: Thirty male WAG rats were divided into 3 groups of 10. After the introduction of 1x105 C57135, syngenic rat colorectal cancer cells, either 100U/ml heparin, 0.25% hyaluronan or PBS (control) was introduced into the peritoneum using the peritoneal nebuliser.

After a recovery period of 2 weeks, the animals were sacrificed and the tumour growth was assessed macroscopically and microscopically

Preliminary Results: Heparin completely blocked tumour growth with no obvious macroscopic or microscopic invasion detected (p<0.05). Hyaluronic acid reduced tumour number and size in comparison to control but with fewer efficacies the heparin

Conclusion: Both modalities were capable of inhibiting tumor spread in vivo. The ability of the nebulised heparin to abolish tumour development with no local or systemic complications, indicates a possible therapeutic to prevent loco-regional recurrence and shows the efficacy of nebulisation within the peritoneum.

So20
ACUTE TENSILE STRENGTH ANALYSIS OF COLLAGEN SOLDER FOR MESH FIXATION TO THE PERITONEAL SURFACE, Raymond J Lanzafame MD, Barbara A Soltz PhD, Istvan Stadler PhD, Michael A Soltz, Robert Soltz, Rochester General Hospital

OBJECTIVE: Laser-assisted tissue welding to anchor mesh to peritoneum and the initial tensile strength of bonds were tested in-vitro. METHODS: Coupons of fresh porcine peritoneum were bonded together in a lap joint using laser-activated solder. Tensile strength measurements were conducted and peak force breaking strength was measured. Midline incisions were made in anesthetized New Zealand white rabbits and Yorkshire pigs. Coupons of Vicryl TM mesh were embedded in various solder formulations or non-embedded material (2.0 x 1.0cm) were fixed to the peritoneal surface using the CEE laser (2.5 W cw, set temperature 60°C) to bond an area of approximately 1cm2. Control segments were attached using 4 Endo-hernia staples (USSC, 4.8mm). The animals were euthanized by pentobarbital overdose. Segments were excised en-bloc. Tensile strength was measured.

RESULTS: Solder bond strengths in lapine and porcine models were similar in all groups. No statistical difference was noted between stapled or soldered segments.

Discussion: Acute strengths of 200-5002 cm/kgB2; for suture staple peritoneal closure have been reported in the literature and are similar to values obtained in this study. Solder fixation of mesh is feasible. Further development of this novel technology is warranted. * - Supported by NIDDK # 1R43 DK62571-01

So21
MAXIMAL “TOLERABLE” TIME DELAY Pamela Zimmerman MD, Taewan Kim MD, Carl A Weiss MD, Upstate Medical University

Introduction: Virtual surgery is currently limited by data transmission speeds, which, if distance between the console and the patient is great enough, inevitably creates time delays between the image depicted and end-effector instrumentation. The purpose of this study is to determine the maximal “tolerable” time delay for surgical task performance.

Methods: At an endoscopic skill station, a digital delay device is interposed between the surgical field and monitor that delays the transmission of information mimicking the distance effect of data transmission. Laparoscopic knot tying is performed with incrementally increasing visual time delays and time to complete the task is recorded in seconds. Data were assessed by ANOVA followed with Student-Newman-Keuls with significance at p<.05.

Results: Time to perform a single throw is recorded below in seconds for 3 subjects with advanced laparoscopic experience. Time delay and data is depicted in seconds. At 0.5 seconds the average time to perform the individual task roughly doubled. (*Significance, p<0.05).

Conclusions: Compensation mechanisms for delayed image transmission are possible, but specific thresholds exist. The threshold for all participants appeared to be in the range of 0.5 seconds suggesting that compensatory mechanisms are overwhelmed at this point. Task performance is clearly affected by this phenomenon. Diminished accuracy and dexterity as well as nausea, disorientation and fatigue represent additional performance encumbrances invoked by increasing time delay not depicted in the data. The nuances of both human and digital compensatory mechanisms must be defined and enhanced to maximize the potential for virtual surgical applications.
SO22 MODIFIED EXTRAPERITONEAL ENDOSCOPIC SEPARATION OF PARTS FOR THE TREATMENT OF ABDOMINAL COMPARTMENT SYNDROME, Gregory Barnes MD, Pavlos K Papasavas MD, Daniel J Gagne MD, Jorge Urbandt MD, Fahrenheit D Haytellian MD, Michael S O Mara MD, Douglas E Newton MD, Philip F Caushaj MD, The Western Pennsylvania Hospital, Pittsburgh, PA

Background: The standard therapy for abdominal compartment syndrome (ACS) is laparotomy with temporary closure of the abdominal wall. This is associated with significant morbidity. The components separation technique allows for difficult abdominal closure. We investigated an endoscopic extraperitoneal separation of parts technique for the treatment of ACS in a porcine model.

Methods: Anesthetized pigs were instrumented for measurement of central venous pressure (CVP), mean arterial pressure (MAP), pulmonary capillary wedge pressure (PCWP), cardiac output and intra-abdominal pressure. Intrapleural insertion of saline in a bag was used to create ACS to a pressure of 25 mm Hg. Endoscopic release of the median extraperitoneal oblique muscle followed by release of the lateral internal oblique muscle was performed on the right side. Hemodynamic parameters were measured and then similar release was performed on the contralateral side with subsequent hemodynamic measurements.

Results: Upon establishment of ACS the intra-abdominal pressure increased significantly (from 3.8 ± 0.4 mm Hg to 24.7 ± 0.5 mm Hg; p<0.001) with the following physiologic changes (CVP increased from 8.5 ± 2.1 mm Hg to 26.5 ± 7.6 mm Hg; p<0.001 and PCWP increased from 12 ± 2.4 mm Hg to 18 ± 3 mm Hg; p<0.01). Upon release of the right side abdominal muscles the intra-abdominal pressure decreased by 39% (from 24.7 ± 0.5 mm Hg to 15 ± 1.7 mm Hg; p<0.001) and decreased further with release of the left side abdominal muscles (from 15 ± 1.7 mm Hg to 11.3 ± 1.4 mm Hg; p<0.01). In addition, CVP decreased from 26.5 ± 7.8 mm Hg to 14.8 ± 4.4 mm Hg; p<0.01 and PCWP decreased from 18 ± 3 mm Hg to 14.2 ± 1.9 mm Hg; p<0.05) as well.

Conclusion: The extraperitoneal endoscopic release of abdominal wall components is feasible and provides relief of ACS in a porcine model.

SO23 LAPAROSCOPIC ULTRASOUND FOR IMAGE GUIDED LIVER SURGERY, Philip Bao MD, John Warmath MS, Robert Galloway PhD, Ravi Char MD, Alan Herline MD, Vanderbilt University Medical Center

Objective: To develop a tracked laparoscopic ultrasound that may be registered to tomographic images (CT/MRI) for interactive image-guided liver surgery. Image-guided surgery (IGS) is currently limited in its application to general surgery. It has been used extensively in neurological applications and there have been initial attempts in open hepatic procedures. Mapping laparoscopic ultrasound to pre-operative tomographic imaging optimizes information for decision-making regarding oncologic margins, resection extent, and complex anatomy.

Methods: A BK laparoscopic US probe was fitted with a rigid non-permanent configuration of infrared emitting diodes (IREDs) that are then localized by an IR camera. The ultrasound beam was modeled as a plane and its spatial relationship to the IREDs determined. The probe is tracked and the US images transformed into a common 3D coordinate system. Six fiducials and three targets 3-12 mm in size on the surface of a silicone liver model were then localized by both CT scan and the US probe. Accuracy of the US to CT registration was calculated using the targets imaged by the US probe transformed into a common 3D coordinate system. Six fiducials and three targets 3-12 mm in size on the surface of a silicone liver model were then localized by both CT scan and the US probe. Accuracy of the US to CT registration was calculated using the targets imaged by the US probe transformed into a common 3D coordinate system.

Results: Target localization by US and CT to IR camera space within 1 mm. Registration of the US to CT resulted in the following target localization errors:

- Target (size) 1 (3mm) 2 (3mm) 3 (12mm)
  - Mean (mm) 3.1 3.4 5.4
  - Max (mm) 4.7 4.8 9.6

Conclusions: These preliminary results in IGS for hepatic surgery demonstrated the feasibility of image-guided minimal invasive liver surgery. Improvements in both the liver model as well as targets should decrease the registration errors. Alternative registration techniques also need to be explored.

SO24 MINIATURE ROBOTS CAN ASSIST IN LAPAROSCOPIC CHOLECYCTECTOMY, Dmitry Oleynikov MD, Mark E Rentschler MS, Adnan Hadzialic BS, Stephen R Platt PhD, Shane Farrill PhD, University of Nebraska Medical Center, Omaha, NE, USA, The University of Nebraska, Lincoln, NE, USA

Robot-assisted laparoscopy offers distinct benefits compared to conventional laparoscopic approaches. These robots improve the ability of the surgeon to manipulate and visualize the target organs. We created miniature robots that were controlled remotely within the abdominal cavity. These in vivo robots provide the surgeon with an enhanced field of view from arbitrary angles and provide dexterous manipulators not constrained by small incisions in the abdominal wall. A micro robot with a miniature camera was inserted through a small incision into the insufflated abdominal cavity of an anesthetized pig. The robotic camera was then utilized to visualize trocar insertion and other laparoscopic tool placements. While the laparoscopic cholecystectomy was in progress, the micro robot provided a second camera angle that augmented surgical visualization and improved orientation. Several other in vivo robotic devices that can be inserted through standard ports have since been built: a mobile robot with two independently driven wheels, and a manipulator designed to assist the surgeon with high dexterity tasks. The mobile robot and manipulator have demonstrated some ability to traverse the surface of internal organs and to maneuver within the abdominal cavity. These successful prototype trials have demonstrated that it is possible to develop small, mobile robots that can be inserted into the abdominal cavity during laparoscopic surgery. A camera mounted on such a robot will help overcome some of the limitations of current rigid, single view cameras, while a mobile manipulator will provide task assistance. Future robots will be reduced in size, have increased mobility, no tethers, and will incorporate vision and other sensors. The outcome of this work will be a family of new robotic tools that can be inserted into the abdominal cavity during surgery and will enhance the capabilities of the surgeon, reduce costs, and improve patient care.

SO25 A PRELIMINARY PROSPECTIVE STUDY OF THE UTILITY OF A MAGNETIC ENDOSCOPE LOCATING DEVICE DURING COLONOSCOPY, Sheenie Ambardar MD, Richard L Whelan MD, Tracey D Arnell MD, Anish Nihalani MD, Pat Sylla MD, Kenneth A Forde MD, Department of Surgery, Section of Colon and Rectal Surgery, New York-Presbyterian Hospital (Columbia Campus), New York, New York, USA

BACKGROUND: While magnetic imaging of the endoscope to determine its position has been studied to some extent in Europe, it is a relatively new technology in the United States. This study's purpose is to assess the usefulness and accuracy of a non-radiographic magnetic locating device (Endoscope Position Detecting Unit (EPDU)) being performed by three experienced colonoscopists. Using a specialized EPDU-compatible scope or a regular double-channel scope with a special probe insert, the EPDU is used for all or part of the exam to: identify loops, determine the best site for external pressure, verify exam completion, and localize pathology. For all patients, a record of exam details and the endoscopist's opinion of the device is recorded.

PRELIMINARY RESULTS: To date, 20 colonoscopies have been performed using the EPDU. The device was useful in 15 pts (75%) because it revealed that a loop was forming and led to a rapid change in insertion approach or patient position. In 7 of these pts (35%) the device also identified an effective site to apply external pressure and, thus, limit loop formation and facilitate insertion. In 9 pts found to have polyps or lesions, the EPDU was used to identify which segment the lesion was located; in 2 patients, the predicted position was verified via surgery or fluoroscopy. The device was misleading and confusing in one patient with a tortuous colon. The dedicated specialized colonoscope was easier to use than the probe inserted into a normal scope.

CONCLUSIONS/EXPECTATIONS: It was the impression of all 3 physicians that the EPDU facilitated completion of the exam in the majority of patients by identifying loops and revealing where to externally stent. Furthermore, polyps, whose position would otherwise have remained unknown, were located. Further testing is required to better define in what ways and how often the EPDU is useful. It may obviate the need for fluoroscopy and may also prove to be a good aid in teaching.
LAPAROSCOPIC CHOLECYSTECTOMY IN CIRRHOTIC PATIENTS, J Schiff BS, M Misra BA,G Rendon MD,J Rothschild MD,S Schwallenberg MD, Tufts - New England Medical Center, Boston, MA

Background: Cirrhosis of the liver has been considered by some to be a contraindication to laparoscopic cholecystectomy (LC). However, recent trends have allowed experienced surgeons to perform LC increasingly on this high-risk cirrhotic population.

Method: Between 1996 and 2003, 1285 choles were performed. A retrospective analysis examined the number of pts with evidence of cirrhosis at the time of surgery. Further review of this high surgical risk subset looked into the patient, age, sex, length of stay, short-term complications.

Results: A total of 32 choles were performed on pts with cirrhotic liver disease. The breakdown of this subset revealed 24 LCs, 3 conversions to open, and 5 open choles. There were 14 female and 18 male pts with an average age of 53.7 (age range 39-83). The 32 choles were placed into high, N=19, (low platelets, prolonged INR), intermediate, N=5 (abnl LFTs with normal clotting), and low, N=8 (nt platelets, clotting, and LFTs) surgical risk categories for further analysis. Examination using the Childs-Turcotte-Pugh (CTP) classification of cirrhosis revealed 3 grade C and 29 grade A or grade B pts. OR time ranged from 45 to 360 min with the extent of coagulopathy correlating with the length of time to achieve satisfactory hemostasis. The median length of stay post-have been high surgical group was 2 days. (Range 0-20 days) A total of 9 choles were performed on an out-patient basis. One patient went on to receive a liver transplant 5 months post LC. There was no operative mortality. No CBD injuries were reported, nor did any pt need to return to the OR for bleeding.

Conclusions: Current classification of cirrhotic pts is normally done using the CTP score. Pre-op platelet levels and INR more accurately predict the difficulty of chole than CTP score. Surgical success in these high-risk pts can be attributed to careful surgical dissection and the use of additional modalities to control oozing from the dissection. The judicious use of the Harmonic Scalpel, mechanical compression with introduction of additional modalities to control oozing from the dissection. The judicious use of the Harmonic Scalpel, mechanical compression with introduction of additional modalities to control oozing from the dissection. The judicious use of the Harmonic Scalpel, mechanical compression with introduction of additional modalities to control oozing from the dissection. The judicious use of the Harmonic Scalpel, mechanical compression with introduction of additional modalities to control oozing from the dissection. The judicious use of the Harmonic Scalpel, mechanical compression with introduction of additional modalities to control oozing from the dissection. The judicious use of the Harmonic Scalpel, mechanical compression with introduction of additional modalities to control oozing from the dissection.

LAPAROSCOPIC RESECTION OF SPLENIC ARTERY ANEURYSMS: A CASE SERIES, Patrick R Reardon MD, Mahsa Mosaicdeh,Ese Otoh MD,Sirting Craig BS,Michael J Reardon MD,Brent Matthews MD, Department of Surgery; Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

Introduction: Splenic artery aneurysms (SAA) are the most common visceral artery aneurysms. The majority of SAA are discovered incidentally on an abdominal radiograph or a CT scan. While rupture is associated with a high mortality rate, controversy surrounds the management of clinically silent SAA. Risk factors associated with rupture include pregnancy, portal hypertension, radiographically documented enlarging aneurysms, and aneurysms larger than 1.8 cm. Therapeutic options to manage asymptomatic SAA include endovascular transcatheter embolization, splenectomy, aneurysm ligation and aneurysm resection via laparotomy. Laparoscopic techniques to manage asymptomatic SAA are increasingly being performed.

Methods: We attempted a laparoscopic splenic artery aneurysm resection in 6 patients (2 males, 4 females) with a mean age of 53.3 years (range, 39-68 years) over a 5 year period. All patients had asymptomatic aneurysms that were 2.0 cm or larger.

Results: One patient was converted to a laparotomy and splenectomy due to tear in the splenic vein. In the 5 successful laparoscopic splenic artery resections, the mean estimated blood loss was 37 cc, the mean operative time was 200 minutes, and postoperative length of stay was 1.8 days. The mean time to a clear liquid diet was 5 days and to a regular diet was 1 day. The mean duration of narcotic analgesic use was 5.4 days and the mean time to resume regular activities was 12.7 days.

Conclusions: Our series of 5 laparoscopic splenic artery aneurysm resections demonstrate the safety and efficacy of a laparoscopic approach to splenic artery aneurysm resection. Further, the lack of major complications and the high rate of successful procedures support the use of laparoscopic resection as a safe and effective approach to these lesions.
S036

ELECTRICAL SAFETY OF LAPAROSCOPY IN THE NETHERLANDS: THE INCIDENCE OF INSULATION FAILURE OF ENDOSCOPIC INSTRUMENTS IN DUTCH HOSPITALS
Yuri A Casseres MD, A Albayrak MSc, C Schot, C A V Cekic

Background: Complications from the use of laparoscopic electrosurgery are often related to the unrecognized transfer of stray current outside the surgeon’s field of view. Stray current can result from direct coupling, capacitive coupling or insulation failure. Small invisible defects, in the layer of electrical insulation of the electrode cause energy leakage during surgery. This may lead to (un)recognized thermal injuries of the intestines. Considering the fact that only 10% of the endoscopic instrument is in the surgeon’s field of view, electrosurgical injuries due to insulation failure can be missed during an endoscopic procedure. Thermal injuries is (under)reported to be responsible for injuries in 0.1-0.5% of laparoscopic operations. This study was done to determine the incidence of insulation failure in order to estimate the electric safety of laparoscopic instruments in Dutch hospitals.

Method: The incidence of insulation failure was determined by using a High Voltage Tester. A leakage in the insulation results in a visible corona and an acoustic alarm. The instruments are divided in three sections. Section 1 is the part of the instrument in the surgeon’s field of view (10% of the total length of the instrument). Section 2 is outside the surgeon’s field of view but in the abdominal cavity. Section 3 is the part of the instrument in the trocar. In this study all laparoscopic instruments in a random sample of 25% of the Dutch hospitals are tested for electric safety.

Results: A total of 1170 endoscopic instruments have been tested in 27 Dutch hospitals. Of these tested instruments 214 (18%) had an insulation failure. Of all instruments with an insulation failure nearly 40% had a defect in section 2, which is the most risky part of the instruments since defects in this section are outside the surgeon’s field of view.

Conclusion: The number of insulation defects is unacceptable high and may lead to unnecessary and easily avoidable complications. This is caused by the lack of routine maintenance and testing of endoscopic instruments. Defects of endoscopic instruments can go unnoticed because defects occur gradually and can be missed at visual inspection. Testing devices are necessary to identify defects. Dedicated quality maintenance programs and appropriate quality standards should be introduced and all instruments should be tested before every use.

S037

ABDOMINAL WALL DIMENSIONS AND UMBILICAL POSITION VARY WIDELY IN THE GENERAL POPULACE AND SHOULD BE TAKEN INTO ACCOUNT WHEN CHOOSING PORT LOCATIONS
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INTRODUCTION: Optimal port placement during advanced laparoscopic procedures is important in order to provide adequate access to target quadrants. Most surgeons rely heavily on the position of the umbilicus when choosing port locations and assume it is located midway. Similarly, strict adherence to port arrangement drawings which depict a standard body habitus in those with lengthy or broad abdomens, may result in a port scheme that does not provide adequate reach. The purpose of this study was to assess variation in abdominal wall length, breadth, and umbilical position in a sizable patient population.

METHODS: Over a 9 month-period, 205 patients at New-York Presbyterian Hospital (NY, NY) and Ben Taub General Hospital (Houston, TX) were studied; the following distances (in cm) were recorded: (1) xiphoid to umbilicus, (2) umbilicus to pubic symphysis, and (3) umbilicus to body sidewall. In addition, gender, height, and weight were noted. Most pts studied were from the general surgery service. Data analysis was performed with the GraphPad Prism statistical software package.

RESULTS: There were 91 females and 114 males. The average BMI was 26.8 (range 17.3-44.8). The xiphoid to pubis distance ranged from 19-53.5 cm (mean 33.3 cm, SD=4.7). The flank to flank distance varied from 24-70 cm (mean 34.7 cm, SD=8.2). The umbilicus was equidistant between the xiphoid and pubis (midpoint +/- 1.99 cm) in 119 patients (58%); 79 (39%) had low-riding umbilici (max 9 cm) and 7 (3%) had high-riding umbilici (max 5 cm). There was an association between morbid obesity and low riding umbilici (mean 6 cm from midpoint).

CONCLUSIONS: Abdominal wall dimensions may vary widely. Over 40% of patients have an off-center umbilicus; the vast majority are low lying and the largest deviations are seen in the morbidly obese. Pre-operatively, the patient’s abdomen should be measured to determine the true vertical midpoint and to establish overall dimensions. The surgeon should take this data into account and also estimate the anticipated cephalad and caudad dissection limits. Port locations should then be chosen with this information in mind.

S038

OBJECTIVE COMPARISON OF COMPLICATIONS RESULTING FROM LAPAROSCOPIC BARIATRIC PROCEDURES
Scott Laker MD, Matthew Weiner MD, Omid Hajiseyedjavadi MD, Christine Ren MD, NYU School of Medicine, New York, NY

Background: Several surgical treatment options for morbid obesity exist. Currently, there are no studies that compare complication rates after bariatric operations. We objectively classify and compare the complications resulting from laparoscopic gastric banding (LAGB), Roux-en-Y gastric bypass (RYGB) and biliopancreatic diversion (BPD) with duodenal switch (BPD/DS).

Method: A retrospective review of a prospective database of all patients undergoing laparoscopic bariatric surgery was performed. Complications were categorized according to severity score using a well-described classification system and compared between procedures.

Results: From September 2000 to July 2003, 697 primary laparoscopic bariatric operations were performed: 429 LAGB, 210 RYGB, 58 BPD +/- DS. Average age (45 years) and BMI (48 kg/m2) were comparable in all groups. There was one late death. Total complication rates were: 10.0% for LAGB, 29.1% for RYGB, and 27.6% for BPD +/- DS. Complications resulting in organ resection, irreversible deficits and death (grade 3 and 4) occurred at: 0.23% for LAGB, 1.91% for RYGB, and 5.17% for BPD and BPD/DS. Chi square analysis showed statistical significance in complication rates between LAGB versus both RYGB and BPD +/- DS (p < 0.05), but not between RYGB and BPD +/- DS.

Conclusion: Bariatric surgery is major surgery as reflected by complication rates ranging from 10%-29%. However, very few complications are serious. Laparoscopic adjustable gastric banding is the safest operation in terms of complication rate and severity, when compared to laparoscopic Roux-en-Y gastric bypass or laparoscopic malabsorptive operations.
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**S039**

**LAPAROSCOPIC VS OPEN TOTAL COLECTOMY:A CASE MATCHED COMPARATIVE STUDY.** Naveen Pokala, Conor P Delaney MD, Anthony J Senagore MD, Karen Brady RN, Victor W Fazio, Cleveland Clinic Foundation, Cleveland, Ohio.

**INTRODUCTION:** Open total colectomy and ileorectal anastomosis (OTC) is a major colorectal procedure which would preclude laparoscopy in many centers because of technical difficulty and the fact that laparoscopic total colectomy (LTC) takes much longer than standard laparoscopic colectomy (LPS). This study compares OTC with LTC and LPS. **METHODS:** 34 LTC (May 1999 to April 2003) were matched for age, gender, diagnosis, oncological risk and procedure with patients undergoing OTC. Patients with previous major laparotomy were excluded from the open group. Groups were compared for gender, ASA, operating time (OT), estimated blood loss (EBL), length of stay (LOS), complications and direct costs. Laparoscopic procedure was significantly faster (238 vs 187 minutes, p=0.08) with no longer operating time post OTC. Pain and nausea, as measured by VAS, demonstrated patients in the LTC group to be significantly less nauseas on day 7 postoperatively (p=0.7). There was no mortality in the OTC group but one LTC patient expired on post-operative day two due to a cardiac event. Four patients (11.8%) had complications (suture leakage) and 1 (5%) major complication (perianal phlegmon) occurred whereas in LR group 2 pts (10%) had subclinical leakage and 1 pt (5%) had pelvic abscess. Three patients (8.8%) had anastomotic leakage and 1 pt (5%) required laparoscopic ileostomy for biliary peritonitis. At mean follow-up of 48 months (36-76) in arm A 1 local failure (5%) occurred in a pt (pT2) after 6 months and he underwent laparoscopic abdominoperineal resection: the pt is still living after 15 months and disease free. Another pt (pT2) developed liver metastasis at 26 months: he died 13 months later. In arm B 1 local failure (5%) occurred in a pt (pT2) after 48 months and he died 3 months later: another pt (pT2) developed liver metastasis and died at 31 months of follow-up: Disease free survival was 85% and 80% in arm A and in arm B respectively.

**CONCLUSIONS:** The present study shows no difference in term of local recurrence and survival rate between the two arms at a follow up of 3 yrs.

**S040**

**DUTCH COLOR TRIAL RESULTS: QUALITY OF LIFE FOLLOWING LAPAROSCOPIC VS OPEN COLECTOMY FOR MALIGNANCY.** M Ghoghasei MD, JF Lange PhD, MA Cuesta PhD, EJ Spilleveld PhD, JJ Jakimowicz PhD, JHWW Meijerink PhD, DHJ Bonjer PhD, Erasmus Medical Centre, Rotterdam; MCRZ St. Clara Hospital, Rotterdam; V.U. Medical Centre, Amsterdam; Rijnstate Hospital, Arnhem; Catharina Hospital, Eindhoven; Medical Centre Leeuwarden

Laparoscopic resection of colon cancer has the potential to improve upon patient outcome. While data confirming survival to be at least equal to that of open colectomy has yet to become available, other outcome measures such as Quality of Life (QoL) are important. This RCT compared postoperative QoL following laparoscopic and open resection of colon cancer.

Dutch patients enrolled in the COLOR trial, comparing laparoscopic versus open colectomy for malignancy, were included if QoL data were available. Health status and QoL were measured using standardized validated questionnaires. The EuroQol and Short Form-36 were the generic questionnaires of choice. In addition a disease specific instrument was applied: the EORTC-CR38 form. Post operative pain and nausea was also assessed by means of Visual Analogue Scales (VAS).

For 186 patients data was available. Patients were evenly distributed over the laparoscopic and open groups.

Pain and nausea, as measured by a VAS, demonstrated patients in the laparoscopic group to be significantly less nauseas on day 7 postoperatively. There were no differences in pain.

For the generic questionnaires no differences in aggregated scores were measured. Looking more closely at each of the dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) in the EuroQol separate for the laparoscopic group performed better at their usual activities and mobility at 3 days postoperatively. Again at 14 days the laparoscopic group performed better at their usual activities. For the Short Form-36 such detailed analysis of health profiles did not yield any benefit for either procedure.

There were no differences in QoL according to the disease specific EORTC-CR38 questionnaire.

In conclusion there seems to be a very modest improvement in QoL in favour of laparoscopy. More results demonstrating benefits of laparoscopic colectomy more clearly are needed to accomplish wide spread acknowledgement of laparoscopic resection of colon cancer.

**S041**

**TRANSANAL ENDOSCOPIC MICROSCOPY (TEM) VS LAPAROSCOPIC RESECTION IN THE TREATMENT OF T2 NO LOW RECTAL CANCER: A PROSPECTIVE RANDOMIZED TRIAL.** E LEZOCHÉ MD, M Guerry MD, M FELICIOTTI MD, M BALDARELLI MD, A DE SANCITY MD, G D’AMBROSIO MD, G LEZOCHÉ MD, II Clinica Chirurgica University of La Sapienza Rome

AIMS: In 1997 a prospective randomized trial of Transanal Endoscopic Microsurgery (TEM) vs laparoscopic resections (LR) for T2-N0 low rectal cancer was started in our Institution Aim of the present study is to compare the results of two minimally invasive procedures and to evaluate the oncological outcomes with a minimum follow-up of three years.

METHODS: From May 1997 to April 2000 40 patients (pts) with T2-N0 rectal cancer were enrolled: 20 were treated with TEM (arm A) and 20 with LR (arm B). All pts underwent neoadjuvant radio-chemotherapy. Inclusion criteria were: T2-N0 tumours with diameter lower than 3 cm and located within 6 cm from the anal verge. Anagaphic data and the patients? distribution among ASA classes were similar in two groups.

RESULTS: After neoadjuvant radio-chemotherapy in arm A 13 pts (65%) were downstaged (7 pT0, 6 pT1) whereas in arm B 11 pts (55%) (7 pT0, 4 pT1). In TEM group no conversion to open surgery occurred while in arm B 2 conversion (10%) were reported and in 4 pts (20%) a protective ileostomy was performed. In TEM group 2 (10%) minor complications (suture leakage) and 1 (5%) major complication (perianal phlegmon) occurred whereas in LR group 2 pts (10%) had subclinical leakage and 1 pt (5%) had pelvic abscess. Three patients (8.8%) had anastomotic leakage and 1 pt (5%) required laparoscopic ileostomy for biliary peritonitis. At mean follow-up of 48 months (36-76) in arm A 1 local failure (5%) occurred in a pt (pT2) after 6 months and he underwent laparoscopic abdominoperineal resection: the pt is still living after 15 months and disease free. Another pt (pT2) developed liver metastasis at 26 months: he died 13 months later. In arm B 1 local failure (5%) occurred in a pt (pT2) after 48 months and he died 3 months later: another pt (pT2) developed liver metastasis and died at 31 months of follow-up: Disease free survival was 85% and 80% in arm A and in arm B respectively.

CONCLUSIONS:The present study shows no difference in term of local recurrence and survival rate between the two arms at a follow up of 3 yrs.
S044
SEALING EFFECT OF FIBRIN GLUE ON LEAKING GASTROINTESTINAL ANASTOMOSES: IMPLICATIONS FOR THE ENDOSCOPIC TREATMENT OF LEAKS. Gianluca Bonanomi MD, Giselle G Hamad MD, Jose Prince MD, Frank McSteen RN, Philip R Schauer MD, Minimally Invasive Surgery and Bariatrics - University of Pittsburgh Medical Center - Pittsburgh - PA - USA
The adoption of advanced laparoscopic techniques to perform complex abdominal procedures has raised the concern that the leak rates might be higher than in open surgery. The incidence of gastro-jejunal leaks after laparoscopic gastric bypass ranges from 0% to 6% in the larger series. However, it has been shown that the leak rate may be higher during the learning curve or when dealing with difficult cases. In this study the sealing effect of fibrin glue on leaking gastrointestinal anastomoses was evaluated in an experimental model.
Methods: A standardized gastro-jejunostomy was performed on twenty female pigs (mean weight= 47.7 ± 5.7 kg). A leak was created on the anterior surface of the anastomosis. The animals were randomized to either fibrin glue or no treatment of the leak. Clinical conditions and vitals signs including body temperature, heart rate and respiratory rate were collected three times a day. Preoperative and postoperative complete and differential blood count as well as lactate dehydrogenase levels were determined. Post-mortem analysis was performed at sacrifice.
Results: Control animals developed clinical signs of peritonitis by the 2nd or 3rd postoperative day. Findings that confirmed an anastomotic leak on post-mortem examination were either the presence of food or gastro-jejunal juices in the abdominal cavity, a localized abscess or a positive air leak test. On the contrary, fibrin glue treatment was able to prevent the development of peritonitis in all animals. Complete sealing of the leak was observed on 7th postoperative day in all treated animals, but one that developed an asymptomatic contained leak. A significant postoperative increase of the total white blood count in the untreated group (24.69 ± 5.5 vs 12.74 ± 3.7 10^3/μL; p<0.001, paired t-test), as opposed to the treated group (15.55 ± 2.4 vs 14.89 ± 2.7 10^3/μL; p= 0.24), was observed.
Conclusion: In this study, fibrin glue has shown reproducible sealing effects on leaking gastro-jejunal anastomoses. Fibrin glue application may be a valuable minimally invasive approach to prevent and/or treat gastrointestinal leaks.

S045
LAPAROSCOPIC PROCTOCOLECTOMY AND ILEAL POUCH-ANAL ANASTOMOSIS (IPAA) OFFERS BENEFITS COMPARED WITH OPEN IPAA, Tonia M Young-Fadok MD, Dieter Hahnloser MD, Mayo Clinic
Aim: To determine if benefits exist with a laparoscopic approach to the complex procedure of proctocolectomy with IPAA.
Methods: All consecutive patients undergoing laparoscopic IPAA (LAP group) were identified from the laparoscopic colectomy database. Each patient was matched to two open controls from the IPAA database, controlling for age, gender, body mass index (BMI), and date of operation. Database evaluation and chart review were performed to abstract data regarding intraoperative and postoperative parameters.
Results: There were 2 conversions in the Lap group: these were included in the Lap group in an intention-to-treat analysis. Patients were well-matched. There was no difference in age (Lap 31 y vs Open 32 y, P=1.0) or BMI (22.2 vs 22.9, P=0.2). Operative time was longer for the Lap group (271 vs 194 mins, P<.001). Overall intraoperative fluid requirements were greater in the Lap group (5230ml vs 4492 ml, P=.006), but hourly fluid input was less (1194ml/hr vs 1410 ml, P=.008).There was no significant difference in hourly urine output (138ml vs 144ml, P=0.76). The Lap group exhibited significant benefits in terms of time to clear liquids (median 1 vs 3 days, P<.001), time to regular diet (3 vs 4 days, P<.001), and time to return of bowel function (2 vs 3 days, P<.001). Narcotic use was of shorter duration in the Lap group (8 vs 11 shifts, P<.001) Length of stay was significantly reduced in the Lap group (4 vs 7 days, P<.001). There were no intraoperative complications in the Lap group.
Conclusions: The laparoscopic approach resulted in patient benefits in terms of shorter duration of ileus and reduced use of parenteral narcotics, resulting in shorter hospital stay. Intraoperatively lap patients had greater overall operative time and intravenous fluid administration, yet reduced hourly fluid requirement. Despite this the Lap patients maintained the same urine output as open cases. This suggests a possible benefit of the lap approach in terms of maintenance of renal function and fluid balance, despite known reductions in renal venous flow during pneumoperitoneum.
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S053
ITALIAN EXPERIENCE ON 3562 PATIENTS TREATED WITH THE LAP-BAND SYSTEM®: RESULTS AND COMPLICATIONS.
A. Luppa, F. Favretti, F. Furbetta, S. B Doldi, E. F. Joo-Ho Lee MD, Seoul National University Bundang Hospital

Heller-Toupet operation in experienced hands is a safe and effective procedure. Clinical improvement was observed in 97%, and all domains of the SF-36 were improved. Conclusions: Although the very low mortality rate, low morbidity, and satisfactory weight loss. Surgery and complications and results. Data were expressed as mean ± Standard Deviation (SD), except as otherwise indicated. Results: From January 1996 to June 2003, 3562 patients (2956 F/606 M; mean age: 37.9 ± 11.3 years, range: 16-74 years; mean BMI: 43.4 ± 6.5 kg/m², range 30.0-83.6 kg/m²; ± EWL: 55.1 ± 19.9, range 31-218; %EWL 87.9 ± 32.1, range 44.9-269.8) have been recruited. Mortality rate was 0.3% (%). These findings may be due to local complications (myocardial infarction, pulmonary embolism). Laparoscopic conversion rate was 1.7% (82/525) mostly due to difficult surgical anatomy (41/62, 64.2%) or complications such as bleeding and gastric perforation (14/62, 23.8%). Post-operative complications were diagnosed in 352/3562 (9.8%) patients. This patient series included 198 laparoscopic and 154 open gastric procedures (162/352, 46.1%), intragastric migration (69/352; 19.6%) and tube-port related complications (121/352, 39.3%). Most gastric pouch dilations (113/162; 69.7%) occurred among the first 50 patients at each centre; the incidence decreased with the surgical equipe’s growing experience. Gastric erosion occurred at 21 ± 12 months after surgery (range 3-43 months). Band removal was performed in 30/69 (43.4%) cases, and band deflation with strict follow-up in the remaining 39/69 cases. The majority of tube-port failures were diagnosed up until 1999, after that time technical modifications of the system dramatically reduced the complication rate. Surgical repair of complications was usually performed laparoscopically (83.7%), rarely via laparotomy (16%). Weight loss has been evaluated at the following intervals: 12, 24, 36, 48, 60, and 72 months, with BMI 35.1, 32.8, 33.1, 30.9, 29.8, and 29.7 kg/m² and % EWL: 47.7, 52.6, 52.2, 54.7, 55.4, and 57.2, respectively.

Conclusions: LAP-BAND System® implant is a surgical procedure with a very low mortality rate, low morbidity, and satisfactory weight loss. Surgery and complications can be safely performed using laparoscopic access.

S054
RESULTS OF LAPAROSCOPIC HELLER-TOUPET OPERATION FOR ACHALASIA, Juan M Perrone MD, Margaret M Frisella RN,Ketan M Desai MD,Nathaniel J Soper MD, Department of Surgery. Washington University. St. Louis, Mo.

Introduction: Laparoscopic myotomy has become the preferred treatment for achalasia. Controversy persists on the need for fundoplication and/or its type when used, most series have utilized the Dor fundoplication. We report a large series of laparoscopic Heller-Toquet procedures. Materials & Methods: Forty-seven patients, endoscopically diagnosed as EGC, were diagnosed as achalasia. All cases of group O were diagnosed on antrum and body, were included in this study during the period from November 2001 to August 2003 at Ewha Womans University Mokdong Hospital. Using a table of random numbers, 23 patients were assigned to open group (group O) and 24 patients to LAP-BAND group (group L). Radical distal subtotal gastrectomy including lymph node dissection with gastroduodenostomy was performed in all patients. The operation time, estimated blood loss, transfusion amount, postoperative recovery (the day of first flatus, starting day of diet, postoperative hospital stay), pain control (duration of administering analgesic), the number of harvested lymph nodes, and postoperative lung complications were compared between two groups.

Results: Age, sex, body weight, associated disease, history of previous abdominal surgery, location of lesion, size, gross type of EGC, and histologic differentiation were similar in both groups. On permanent pathologic examination, all cases of group O were diagnosed as EGC (m 13 cases, sm 10 cases) and in group L, 21 cases were EGC (m 14, sm 7), 3 cases were advanced cancer (pm 2 cases, s 1 case). The mean operation time was significantly shorter in group L (190.4 minutes in group O vs 319.6 minutes in group L). The mean operation time, estimated blood loss, transfusion amount, postoperative recovery (the day of first flatus, starting day of diet, postoperative hospital stay), pain control (duration of administering analgesic), the number of harvested lymph nodes, and postoperative lung complications were compared between two groups.

Postoperative global esophageal symptoms scale revealed improvement in 97%, and all domains of the SF-36 were improved. Conclusions: Although the best surgical approach to achalasia is yet to be determined, laparoscopic Heller-Touquet operation in experienced hands is a safe and effective procedure with low rates of morbidity and failure and high patient satisfaction.
AN EXTENDED PERIOD WITHOUT APPARENT ILL EFFECTS. RYGB CAUSES A SIGNIFICANT DECREASE IN CIRCULATING GHRELIN PREDICTS POSTOPERATIVE WEIGHT LOSS. ON AVERAGE, A 38% REDUCTION IN GHRELIN LEVELS 3 MONTHS AFTER SURGERY. USING A LINIUM-TECHNIQUE, WE HAVE DEVELOPED A NOVEL, DURABLE RAT MODEL FOR RYGB WITH LONG-TERM SURVIVAL. OBJECTIVE: ROUX-EN-Y GASTRIC BYPASS (RYGB) IS THE MOST EFFECTIVE TREATMENT FOR OBESITY AND TYPE 2 DIABETES. WE HAVE DEVELOPED A NOVEL, DURABLE RAT MODEL FOR RYGB AND TO DETERMINE THE EFFECT OF RYGB ON CIRCULATING LEVELS OF GHRELIN, A POTENT STOMACH-DERIVED APPETITE STIMULANT WHOSE ALTERATION MEDIATES THE WEIGHT LOSS INDUCED BY RYGB. THE AIMS OF THIS STUDY WERE: 1) TO DEVELOP A DURABLE RAT MODEL FOR RYGB AND 2) TO DETERMINE THE EFFECT OF RYGB ON CIRCULATING LEVELS OF GHRELIN. METHODS: LEVEL 1 TRAUMA REGISTRY DATA AND CHARTS OF CONSECUTIVE PATIENTS WHO UNDERWENT LAPAROSCOPY FOR ABDOMINAL INJURIES WERE REVIEWED. PATIENT DEMOGRAPHICS, INJURY SEVERITY SCORES, AND MECHANISM OF INJURY WERE REVIEWED. THE NUMBER OF THERAPEUTIC AND NON-THERAPEUTIC LAPAROSCOPIC PROCEDURES, SPECIFIC INJURIES TREATED, AND LENGTH OF STAY WERE SUMMARIZED. RESULTS: OVER A 4-YEAR PERIOD (1999-2002), 5690 TRAUMA CONSULTATIONS AND 207 LAPAROTOMIES (66% WITH ISS>17) WERE PERFORMED. FORTY-THREE PATIENTS (18 BT, 25 PT) REQUIRED OPERATIVE EXPLORE, UNDERWENT LAPAROSCOPY. AGE AND ISS WERE SIGNIFICANTLY HIGHER (P<0.05) IN BT VS PT (49+/-24 VS 27+/-9 YEARS AND 19.4+/-10.2 VS 5.1+/-3.8, RESPECTIVELY). THE UTILIZATION OF LAPAROSCOPY ALLOWED FOR THE ELIMINATION OF UNNECESSARY LAPAROTOMIES IN 19 (44%) PATIENTS. IN ADDITION, 6 (14%) PATIENTS HAD INTRA-ABDOMINAL INJURIES MANAGED LAPAROSCOPICALLY [SPLENO(3) AND LIVER(2) HERNIATIONS, DIAPHRAGMATIC INJURY(1)]. LAPAROSCOPY WAS COMPARED TO Laparotomy IN BT AND PT. LAPAROSCOPY WAS NEGATIVE OR NON-THERAPEUTIC IN 33% AND 52%, RESPECTIVELY. CONVERSION TO LAPAROTOMY WAS REQUIRED IN 18 (41%) PATIENTS (BT=9 (50%), PT=9 (36%)). OVERALL HOSPITAL STAY WAS 8.6+/-4.9 DAYS AND 3.3+/-1.7 DAYS FOR THE BT AND PT GROUPS, RESPECTIVELY. THERE WERE NO MISSED INJURIES, NO LAPAROSCOPY-RELATED MORTALITIES AND NO LAPAROTOMY-RELATED MORTALITIES. CONCLUSION: THE USE OF LAPAROSCOPY IN SELECTED PATIENTS WITH BLUNT AND PENE-TRATING ABDOMINAL INJURIES IS FEASIBLE AND SAFE. LAPAROSCOPY IN PATIENTS WITH SUSPECTED INTRA-ABDOMINAL INJURY CAN ELIMINATE UNNECESSARY LAPAROTOMIES, AND ALLOW FOR MINIMALLY INVASIVE MANAGEMENT OF SELECTED INTRAABDOMINAL INJURIES.

S063 OBJECTIVE MEASUREMENT OF THE ACQUISITION OF PSYCHOMOTOR SKILLS ON LAPAROSCOPIC CHOLECYSTECTOMY COURSES, J Hance, K Moorthy, R Aggarwal, S Undre, Y Munz MD, A Darzi MD, Dept. of Surgical Oncology and Technology, Imperial College London.

BACKGROUND: Formal courses in laparoscopic surgery have become a feature of routine. End-of-course evaluation is largely focused on knowledge assessment and feedback trainsees receive about their procedural skills. The efficacy of these courses is subjective. The efficacy of these courses to teach these skills is presumed rather than being definitively demonstrated. The aim of this study was to assess the feasibility of objective evaluation of psychomotor efficacy of trainees attending two laparoscopic cholecystectomy courses.

METHOD: A total of 23 trainees attended two separate courses (course A and B). These two-day courses include didactic lectures and practical workshops, structured according to a standardized curriculum. Pre-assessments of the trainee’s laparoscopic psychomotor skills were performed under standardized ergonomic conditions before the course began, using a validated task in a video trainer. Identical post-assessments were carried out after completion of the course. The skills were measured using a dexterity analysis system, the Imperial College Surgical Assessment Device (ICSAD) and error scoring. ICSAD consists of electromagnetic sensors placed on the dorsum of the subject hands, which are tracked in terms of their three-dimensional position. Custom-made software generates results in terms of dexterity namely, path length (centimeters), total number of movements and total time taken (seconds). The ratio of right to left hand path length (RPL/LPL) was calculated and used as a measure of bimanual dexterity. Data analysis was carried out using non-parametric tests.

RESULTS: There were no significant differences in baseline psychomotor skills of trainees across the two courses. Overall, trainees significantly improved in terms of the total number of movements made (median 637 vs 394, p=0.001) and error rate (median 14% vs 0.6%, p=0.001). The ratio of right to left hand path length (RPL/LPL) was calculated and used as a measure of bimanual dexterity.

Conclusion: Improvements in psychomotor skills acquired during laparoscopic cholecystectomy courses can be objectively assessed and quantified. These objective measures can provide formative end-of-course feedback to trainees and may be used in the future to credential surgeons.
POST OPERATIVE COMPLICATIONS ARE NOT INCREASED IN MASSIVELY OBESE PATIENTS UNDERGOING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, David S Tichansky MD, Adolfo Z Fernandez MD,John M Kellum MD,Harvey J Sugerman MD,Luke G Wolfe MS,Jill Meador RN,Eric J DeMaria MD, New Jersey Bariatrics at Univ. Medical Center of Princeton and St. Peter's Univ Hosp, Monmouth Junction, NJ; Department of Surgery, Virginia Commonwealth Univ, Richmond, VA; Department of Surgery, Wake Forest Univ, Winston-Salem, NC

It has been suggested that super-super obesity [Body Mass Index (BMI) > 60] increases risk for postoperative complications following laparoscopic bariatric surgery, as well as making laparoscopic Roux-en-y gastric bypass (LapGB) technically unfeasible. Concerns of the effects of increased operative times and the significant morbidity and mortality associated with these patients in the literature has caused some surgeons to propose a two-stage procedure to reduce complications. We hypothesize that LapGB is feasible in these patients, that greater BMI does not increase risk or mortality, and that the generally accepted belief to the contrary is not substantiated.

Postoperative complication rates for all patients with a BMI > or = 60 who underwent LapGB were compared to the postoperative complication rates for all patients with a BMI < 60 who underwent LapGB during the same period of time. The differences in postoperative complication rates between the groups were analyzed by Fisher's exact test and differences in weight loss were compared by ANOVA. Operative times were also assessed.

From 3/6/2000 through 2/10/2003, 40 patients with a BMI > or = 60 and 494 patients with a BMI < 60 underwent LapGB. There were no statistically significant differences in the following postoperative complication rates between the patient group with a BMI > or = 60 versus the patient group with a BMI < 60: anastomotic leak (0% vs. 4.3%, p=0.4), pulmonary embolism (0% vs. 0.8%, p=1.0), internal hernia (2.5% vs. 0.8%, p=0.3), marginal ulcer (5.0% vs. 4.3%, p=0.7), stomal stenosis (7.5% vs. 3.4%, p=0.2), incisional hernia (2.5% vs. 3.0%, p=1.0), and small bowel obstruction (5.0% vs. 1.2%, p=0.1).

There was zero mortality in the BMI > or = 60 group and four (0.8%) mortalities in the BMI < 60 group (p=ns). Mean weight loss in the BMI > or = 60 group was 57.2% +/- 15.6% of excess weight loss observed in the BMI < 60 group (p=0.001). However, actual pounds of weight loss was greater in the BMI > or = 60 group compared to the BMI < 60 group (139 lbs. vs. 106 lbs., p<0.0001). Median operative time was 189 minutes (control = 162 minutes).

Postoperative complication rates and mortality are not increased in super-obese patients undergoing LapGB compared to those with a BMI less than 60. Operative times were longer, but still reasonable. Acceptable weight loss can safely be achieved in the super-super obese with LapGB in a single stage procedure.

THE UTILITY OF ENDOSCOPY FOR ASSESSING CLINICAL DETERIORATION AFTER ESOPHAGECTOMY WITH RECONSTRUCTION, Mary S Maish MD,Steven R DeMeester MD,Emmanuelou Chousoulakis MD,John Briel MD,Jeffrey H Peters MD,Jeffrey A Hagen MD,Tom R DeMeester MD, The University of Southern California Keck School of Medicine

Background: Early clinical deterioration after esophagectomy and reconstruction can occur secondary to a number of causes. Radiographic contrast swallow studies are often used to assess the graft, but they can not be done in the intensive care unit to demonstrate graft stenosis or necrosis in the absence of a leak. The aim of this study was to assess the utility of endoscopy in the evaluation of patients with clinical deterioration following esophagectomy and reconstruction.

Methods: The charts of 404 patients that had esophagectomy and reconstruction between 1996 and 2002 were reviewed. Forty-six patients underwent endoscopy early in their postoperative course (< 21 days) to evaluate the graft in the setting of clinical deterioration.

Results: In 21 patients (46%) endoscopy identified a problem that explained the clinical deterioration. In 25 patients endoscopy revealed a healthy graft and an intact anastomosis, and in these patients an alternate explanation for the deterioration was sought. The endoscopic findings and management of these 21 patients with abnormal endoscopy are shown in the table. Endoscopy was performed without difficulty or complication in all patients.

GOING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Nobumi Tagaya MD, Hidetoshi Mikami MD,Keichi Kubota MD, Second Department of Surgery, Dokkyo University School of Medicine

Background: At present, it is considered that local resection with adequate margins is an effective treatment for GIMT. Although laparoscopic surgery has been reported to be a useful, minimally invasive treatment, controversy remains about the treatment strategy for GIMTs that are located close to the esophagogastric junction (EGJ).

We evaluate the criteria that indicate that a gastro-intestinal mesenchymal tumor (GIMT) is suitable for laparoscopic resection and assess the surgical techniques on the basis of clinical outcomes. Methods. We performed laparoscopic resection of GIMT in 15 patients. The criteria that were used to select cases for resection were that the tumor was more than 2 cm in diameter or that there had been a tendency for it to increase in size during the follow-up period. In 8 patients in whom the tumor was located within 3 cm of the EGJ an intragastric laparoscopic approach was used, whilst in 7 patients where the tumor was further from the EGJ an exogastric approach was used.

Results: In all 15 cases the laparoscopic resection was successful with no complications. The intragastric group had a mean age of 65.6 years, whilst the exogastric group had a mean age of 64.6 years. The intragastric group had a mean maximal tumor size of 2.9 cm, mean operation time of 168 min and a mean post-operative stay of 83 days whilst in the exogastric group these values were 3.9 cm, 121 min (p=0.0442) and 9.6 days, respectively. In both groups, there were no recurrences during the follow-up periods of 51.3 months (intragastric) and 34.7 months (exogastric).

Conclusions. The good clinical outcomes suggested that the criteria that were used as an indication for laparoscopic resection and the surgical techniques were appropriate for the resection of GIMTs.
S069  
**LAPAROSCOPIC DISTAL GASTRECTOMY WITH REGIONAL LYMPH NODE DISSECTION FOR GASTRIC CANCER**, Shinuya Taninuma MD, Masayuki Higashino MD, Yosuke Fukunaga MD, Department of Gastroenterological Surgery, Osaka City General Hospital

Recently a minimally invasive operation for gastric malignancies has been advocated. Here we have performed laparoscopic distal gastrectomy with regional lymph node dissection on 256 cases of gastric cancer between March 1998 and August 2003. The dissection of all group 1 and group 2 lymph nodes defined according to the general rules of the Japanese Gastric Cancer Association was completely carried out. Reconstruction after distal gastrectomy was made by Billroth 1 method in 189 patients, by Billroth 2 method in 56 and Roux-Y method in 11, respectively. Billroth 1 reconstruction was performed intracorporeally using the triangular suture, in which an inverted suture of the posterior wall was made by firing a laparoscopic linear stapling device and an everted suture of the anterior wall was carried out in two series of firing.

The average duration of operation of all cases was 236 min, which was significantly longer than that of conventional open surgery. The average blood loss was 140 ml, which was significantly less than that compared with an open gastrectomy. Postoperative complications from anastomosis resulted in leakage in two patient, bleeding in one patient and stenosis in one patient; all complications were treated conservatively. Postoperative periods of walking, flatus, oral feeding, and discharge were 1.1 days, 2.6 days, 3.3 days, and 12.0 days, respectively, which were all significantly sooner than those of conventional open gastrectomy patients. Recurrences were recognized only in two patients of all cases. In conclusion, his technique is not only less invasive, but similarly safe and curative compared to an open gastrectomy.

S071  
**“NIS VS. SAGES: A COMPARISON OF NATIONAL AND VOLUNTARY DATABASES”**, JM Morton MD, JA Galanko PhD,NJ Soper MD,DE Low MD,John Hunter MD, LW Traverso MD, Stanford University, Stanford, CA; University of North Carolina, Chapel Hill, NC; Washington University, St. Louis, MO; Virginia Mason Medical Center, Seattle, WA; Oregon Health & Science University, Portland, OR

Introduction: Surgical outcomes are increasingly scrutinized in an effort to improve quality and reduce medical error. The National Inpatient Sample (NIS) is a retrospective, claims-derived and population based database and the SAGES Outcomes Project is a prospective, voluntary and specialty surgeon database. We hypothesized that these two sources of outcome data would differ in regards to a single, commonly performed procedure.

Methods: Both the NIS, a national sample of all non-federal hospital discharges, and the GERD log of the SAGES Outcomes Project were queried for all fundoplications performed between 1999-2001. Analyses will assess the coding accuracy in the two databases. Expected time to publication: 2004.

Results: Analyses will compare the two databases and will also provide evidence for construct validity for the LapSim.

S072  
**INTRA- AND POSTOPERATIVE COMPLICATIONS AFTER LAPAROSCOPIC SURGERY IN SWITZERLAND - A MULTIPLE REGRESSION ANALYSIS OF THE SALTS PROSPECTIVE DATA BASE**, Isabelle Optitz MD, W Gantert MD U Giger MD,L.Krähenbühl MD, Cantonal Hospital Fribourg, St. Anna Hospital Lucern

INTRODUCTION: The aim of the underlying study was to evaluate intra- and postoperative complications of different laparoscopic procedures in a nationwide prospective multicenter study in Switzerland for a time period of 1995-2001 after the initial learning curve.

MATERIAL AND METHODS: Since 1989, SALTS has prospectively collected data from patients undergoing laparoscopic or thoracoscopic surgery at 108 surgical institutions (university, county and district hospitals, private practice). More than 130 items, including indication for surgery, intraoperative course, local as well as general complication and mortality and follow-up were recorded on a computerized data-sheet.

RESULTS: For the time period 45.000 procedures (52% cholecystectomy, 18% groin hernia repair, 12% appendectomy, 4% colorectal resection, 14% others) were evaluated and analysed. In 0.05% of the whole patient group local morbidity occurred, whereas 3.3% developed general postoperative complications. The mortality rate was 0.2%.

A multiple logistic regression analysis was performed in order to identify the following predictors for the incidence of intra- and postoperative complications: age, BMI, sex, ASA-classification, indication of the operation, intraoperative technical problems, the operator’s experience, the duration of the operation, the fact of conversion. Additionally, a trend-analysis of the complication rate over the time period of 1995-2001 was performed.

CONCLUSION: Age, the fact of conversion and the indication of operation were independently predicting factors for complication. Although laparoscopic procedures for these indications occur nowadays quite often, the rate of complications is still substantial. These results demonstrate that collection of data in form of a multicenter-study is essential for quality control. It permits to visualize and to understand the current problems in laparoscopic surgery in order to improve the quality of daily surgical practice and nationwide teaching.

S073  
**ASSESSING THE LEARNING CURVE OF LAPAROSCOPIC SKILLS ON A VIRTUAL REALITY SIMULATOR**, Vadim Sherman MD, Liane S Feldman MD, Donna Stanbridge RN, Hani A tromini MD, Rehan Kazmi, Gerald M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada

Introduction. The purpose of this study was to develop metrics and show construct validity for a virtual reality laparoscopic simulator (LapSim) by comparing the learning curves of three groups of laparoscopic surgeons.

Methods. Three groups of subjects were put through a number of iterations on 3 LapSim tasks (grasping, cutting, clipping). The NAIVE group consisted of 7 subjects (no laparoscopic procedures), the JUNIOR group consisted of 10 junior surgical residents (<25 laparoscopic procedures) and the EXPERT group consisted of 7 experienced laparoscopists (>50 laparoscopic procedures).

Formulas were developed to calculate TIME-ERROR and economy of motion (MOTION) scores from reported metrics generated by the software after each drill. Learning curves were generated based on these scores. Data (mean ± SD) were evaluated by ANOVA. P < 0.05 was significant.

Results. All three groups significantly improved from baseline to final for both the TIME-ERROR and MOTION metrics. There were significant differences between the TIME-ERROR performances of the three groups at baseline and final. Post hoc analysis revealed this to be due to higher scores in the EXPERT group. A significant difference in MOTION scores was seen only at baseline.

Conclusions. We have developed summary metrics for the LapSim that differentiate between levels of laparoscopic experience. This also provides evidence for construct validity for the LapSim.
SAGES 2004 Abstracts

S074 A VIDEO TRAINER OBSTACLE COURSE FOR LAPAROSCOPIC CAMERA NAVIGATION TRANSLATES TO THE OR, J. R. Komdorffer MD, D. J. Hayes BS, B. D. Dunne PhD, R. Sierra MD, C. L. Touchard BS, D. J. Scott MD, Tulane Center for Minimally Invasive Surgery, Tulane University School of Medicine.

Laparoscopic camera navigation (LCN) is vital for the successful performance of laparoscopic operations, yet little time is spent on training. We hypothesized that a structured videotrainer (VT) curriculum will effectively train novices for LCN.

Second-year medical students (n=20), without prior LCN experience, were enrolled in an IRB-approved, randomized, controlled, blinded protocol. Subjects viewed an instructional video and were pre-tested using a 30° laparoscope on a live porcine model during portions of a laparoscopic Nissen fundoplication. Procedures were taped, and LCN performance was scored by a blinded rater according to 1) the number of standardized verbal cues required, 2) the percent of time an optimal surgical view (%OSV) was obtained and 3) the number of errors. Subjects were stratified and randomized to training or control groups. The training group practiced on a custom-made VT LCN model which required subjects to manipulate 0° and 30° laparoscopes to appropriately visualize various targets until predetermined expert scores were achieved. The control group received no training. Both the training and control groups were post-tested on the porcine laparoscopic Nissen model after a second viewing of the instructional video. Results were compared using t-Tests.

At pre-testing, no significant differences were detected between the training and control groups. For the training group, mean time to reach competency was 34 min. (range 15-59) for the 0° model and 73 min. (range 40-185) for the 30° model. The training group demonstrated significant improvement in verbal cue (p=0.001), %OSV (p=0.001), error score (p=0.03), and operative time (p=0.001) whereas the control group showed no improvement in verbal cue (p=0.01). At post-testing, the trained group achieved significantly better scores for verbal cues (2.1 vs. 8.0, p=0.02) and %OSV (64% vs. 45%, p=0.01), compared to the control group.

These data suggest the VT model provides trainees with LCN skills which translate to the OR. Such curricula should be incorporated into medical school and hospital training. Additional studies are needed to examine the impact of LCN training on surgeon performance and patient outcomes.

S075 OBJECTIVE TESTING OF EYE MOTION PARAMETERS CORRELATES WITH LEVEL OF EXPERIENCE IN VIDEO-ASSISTED SURGERY, Ergun Kocak MD, Jan J Ober BS, Scott Melvin MD, Necip Berme PhD, The Ohio State University, Department of Mechanical Engineering and Department of Surgery, Center for Minimally Invasive Surgery.

Background: Laparoscopic skills vary with experience and training; however, objective measures to ascertain the level of training have not yet been established. Attention to visual feedback is important in video-assisted surgery. New technology allows non-interfering measurement of eye motion parameters that correlate with attention and distraction during visually oriented tasks. Our objective was to apply this new technology in the setting of video-assisted surgery to evaluate differences of eye motion parameters amongst surgeons of varying experience.

Methods: Subjects with various levels of laparoscopic experience (novice, intermediate, and specialty-trained) were fitted with a noninvasive, FDA-approved, eye-motion-monitoring device (Cyclops EyeTrak Saccadometer). The device was used to measure and record parameters of eye motion, including saccadic amplitude (SA) and the duration of gaze fixation (FD), during the performance of three basic laparoscopic tasks on a laparoscopic training station. In order to assess the effects of verbal distractions, subjects repeated the three tasks while verbally responding to basic mathematical questions. Comparisons were performed with a one-way analysis of variance (ANOVA), and taken as significant when p<0.05.

Results: A total of 24 subjects (3 groups of 8) enrolled in this study. There were significant differences in eye movement parameters between groups with different levels of training, with or without verbal distractors. In the absence of verbal distractors, SA of novice operators varied significantly with different levels of training, with or without verbal distractors (p=0.006 and 0.005, respectively). The addition of distractors in the form of basic mathematical questions varied significantly between levels of expertise, whereas the control group showed no significant differences (p=0.002). The addition of distractors in the form of basic mathematical questions did not appear to offset these inter-group differences in SA (p=0.027 and 0.036, respectively). Interestingly, FD was found to vary significantly between the intermediate and expert groups, with or without distractors (p=0.006 and 0.005, respectively).

Conclusions: The innovation of laparoscopic techniques and instrumentation requires a new approach, particularly expanding the current understanding of operator-instructor (p=0.006 and 0.005, respectively). The addition of distractors in the form of basic mathematical questions varied significantly between levels of expertise, whereas the control group showed no significant differences (p=0.002). The addition of distractors in the form of basic mathematical questions did not appear to offset these inter-group differences in SA (p=0.027 and 0.036, respectively). Interestingly, FD was found to vary significantly between the intermediate and expert groups, with or without distractors (p=0.006 and 0.005, respectively).

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**S078**

DIAGNOSTIC LAPAROSCOPY IS COST EFFECTIVE AND AVOIDS NONTHERAPEUTIC LAPAROTOMY IN HEPATO-PANCREATO-BILIARY NEOPLASMS, Kambiz Kosari MD, Ryan Ritchie BS,Timothy D Sielaff MD, Department of Surgery, University of Minnesota, Minneapolis.

INTRODUCTION: Due to a high rate of unetectable disease detected at exploration, diagnostic laparoscopy (DL) may be considered the last diagnostic test prior to therapeutic laparotomy in hepatopancreato-biliary (HPB) cancers. We tested the hypothesis that DL is accurate in preventing nontherapeutic laparotomy (NTL) in HPB patients. METHODS AND PROCEDURES: We conducted a prospective, IRB approved review in a University hospital setting, and identified 254 patients who underwent curative intent surgery for HPB cancers between October 1998 and February 2003. Appropriate disease specific preoperative evaluations were performed. Two groups were studied - DL (124 patients), laparoscopy was performed with 2 or 3 ports allowing exploration of the peritoneal surfaces, lesser sac and porta hepatis in all patients. Liver ultrasound was performed for hepatobiliary cancer patients. Main outcome measurements included rate of NTL, cost, and length of stay (LOS). RESULTS: DL identified contraindications to the planned operations. Of 38 (27%) patients. Of the 91 DL patients who underwent subsequent laparotomy, and 2 (2%) were unetectable (both patients had incomplete DL secondary to adhesions). In the LA group, the NTL rate was 23/128 (18%). The mean (median) LOS ST DL patients was 0.9 ± 0.5 (0.5) days, but for the NTL patients it was 3.0 ± 1.0 (3) days (p=0.001). Median cost of DL was less than NTL ($4391 v $7209, p=0.022). The overall costs of therapeutic procedures was not increased by laparoscopy (DL-LA $16650 v LA $11680, p=0.05).

CONCLUSIONS: Diagnostic laparoscopy saved 27% of HPB malignancy patients from nontherapeutic laparotomy and saved an average of 2 hospital days and $2800. The overall cost of hospitalization in patients undergoing the therapeutic procedure was not significantly increased. We recommend that diagnostic laparoscopy be employed in all patients undergoing curative intent laparotomy for HPB cancers.

**S079**


The introduction of lap choleys (LC) in the late 1980s was marked by an increase in CBD injuries. Analysis of 2005 choleys performed at one institution investigating trends that have contributed to zero CBD injuries in 1674 consecutive LCs. Methods: medical records of 1285 consecutive pts operated from 1996-2003 were obtained. The peer review records of an additional 720 LCs performed between 1990 and 1996 were reviewed. Results: There were no CBD injuries spanning 1674 consecutive procedures since 1990. Of the 1285 pts, 5 had a Duct of Luschka leak and 5 had a Duct of Luschka leak. IOC was performed in 20.2% of cases (n=193/954), 69 of 193 cholangiograms demonstrated a stone(s) (35.8%). If any LFT was elevated, 40.2% of the IOC's had a stone(s) (n=39/97). If all LFTs were nl, 31.3% pts had positive on IOC (n=30/96). In 40 pts (58.0%), ERCP was uniformly successful in clearing intraoperatively identified stones. 36.2% of stones were removed via LCBBDE (n=25). 5.8% of positive stones were removed via open CBE (n=4). Of the 761 pts who did not have an IOC, 290 had at least one elevated LFT and 471 had nl LFTs. 7.02% of pts in this non-IOC group returned to hospital for retained stones. 5 of these pts had elevated LFTs (1.7%), and 2 had nl LFTs (0.4%). 6.2% of LC pts (n=59) had GP, 33.9% of these pts had preop ERCP or MRCP (n=30), 52.5% of GP pts had IOC (n=31), with nine positive cholangiograms (29.0%). 20.3% of GP pts had neither preop ERCP nor IOC (n=12). All of these pts had open postop courses. Conclusions: CBD injuries can be avoided by extensive dissection of Triangle of Calot and development of a critical view of safety during LCs. If all LFTs are nl and IOC is not performed, the occurrence of clinically significant stone postop is minimal. Thus, routine IOC in the face of nl LFTs is unnecessary for a low CBD injury rate, and rarely prevents a return to the hospital for retained bile duct stones regardless of the number of time ductal stones are found on routine IOC. This implies that the significance of the stones discovered at IOC is questionable in a majority of cases, arguing against routine IOC. Preop routine ERCP in GP is unnecessary unless persistent elevations are present postop courses. The studies are usually nl otherwise. Most CBD stones can be treated by ERCP, thus avoiding the T-tube drainage associated with CBDE. The 21st century finds LC to be a mature and safe surgical procedure.

**S080**

10-YEAR TREND IN THE NATIONAL VOLUME OFBILE DUCT INJURIES REQUIRING OPERATIVE REPAIR, James P Dolan MD, Brian S Diggs PhD,Brett C Sheppard MD,John G Hunter MD, Oregon Health and Science University

OBJECTIVE: To determine the national proportions and mortality for bile duct injuries resulting from laparoscopic cholecystectomy (LC) that required operative reconstruction for repair over a 10-year period.

METHODS: Using the Nationwide Inpatient Sample (NIS) of over seven million inpatient records per year, we extracted and analyzed data for LC during the years 1990 to 2000. Procedures that involved biliary reconstructions performed as part of another primary procedure were excluded. Using the Statistical Package for the Social Sciences (SPSS), we used procedure-specific code that allowed us to calculate national estimates for LC for the time period under review. We then calculated biliary reconstruction procedures that occurred during the same hospitalization for this cohort of patients. Finally, mortality associated with biliary reconstructions was analyzed.

RESULTS: The proportion of all cholecystectomies performed laparoscopically has increased over the years for which data is available (52% in 1991 to 75% in 2000). Despite this increase, mortality for this group of patients has remained consistently low over the study period (mean mortality, 0.45%; range 0.33 ± 0.58%). Within this group of patients the average rate of bile duct injury requiring operative repair was 0.15% for the years under study. The reconstruction rates ranged from 0.09% in 1999 to 0.21% in 1991. For 2000, the most recent year for which data is available, biliary reconstruction was performed in 0.10% of all patients who underwent LC. The average mortality for patients undergoing biliary reconstruction for the years 1991 to 2000 was 4.04%. The mortality was significantly different in this group as compared to those undergoing uncomplicated LC (p<0.001).

CONCLUSIONS: These data indicate an increase in the proportion of LCs performed over the years under study and an associated low mortality. In contrast, although the proportion of bile duct injuries appears to be decreasing, these procedures continue to be associated with a significant mortality.

**S081**

CONSEQUENCES OF WAITING FOR LAPAROSCOPIC CHOLECYSTECTOMY FOR SYMPTOMATIC GALLSTONES: ONE YEAR AUDIT IN A DISTRICT GENERAL HOSPITAL, S Anwar, M H Shiwani,W Pepper, Barnsley District General Hospital, Barnsley, West Yorkshire, United Kingdom

Introduction: Symptomatic gallstones are one of the most common causes of acute hospital admission. Complications have been documented in patients waiting for elective cholecystectomy for symptomatic gallstones. Aim: The aim of this study was to assess the number of recurrent hospital admissions and complications in patients who were on the waiting list for cholecystectomy for symptomatic gallstones.

Method: Retrospective analysis of case notes of 156 (M=37, F=119) patients waiting for laparoscopic cholecystectomy during years 2000 to 2001 was performed. The median age was 50 (range 26 to 75) years. Details of recurrent admissions and complications were noted. Results: Of 156 patients, 54 (34.6%) patients had two and 12 (7.7%) patients had three further admissions. The median hospital stay of these patients was 3 (range 1-100) days. Sixty nine (44%) patients had serious complications while waiting for laparoscopic cholecystectomy which included severe cholecystitis (n=24), acute pancreatitis (n=18), acute cholangitis (n=21) and obstructive jaundice (n=6). Seventeen (11%) patients required ERCP of which two had post ERCP pancreatitis. Laparoscopic cholecystectomy in these patients although technically difficult did not lead to excessive conversion rate as only two patients had open conversions. Conclusion: The above analysis shows that a one third of patients while waiting for laparoscopic cholecystectomy for symptomatic gallstones are at increased risk of recurrent admissions and serious complications. We feel that early laparoscopic cholecystectomy will not only eliminate the risk of these serious complications but will also lessen the burden on already stretched National Health Service resources by reducing recurrent acute admissions.
LONG-TERM RESULTS AFTER LAPAROSCOPIC TRANSVERSE CHOLEDOCHOTOMY FOR COMMON BILE DUCT STONES, Emanuele Lezoche MD, Alessandro M. Paganini MD, Francesco Feliciotti MD, Mario Guerrieri MD, Jenia Sarnari MD, Department of General Surgery, University of Ancona, Ancona, Italy. *Il Clinica Chirurgica , Universitá La Sapienza, Roma, Italy.

Aim: to evaluate the long-term results of laparoscopic transverse cholecototomy (CT) during laparoscopic cholecystectomy (LC) for the management of gallstones and Common Bile Duct (CBD) stones.

Methods: from April 1991 to August 2003, CBD stones were present in 339 (130 males, 209 females, mean age 58.1 years, range 12-96 years) out of 3207 patients (pts) (10.6%) who underwent LC. Results: in 324 (95.6%) pts the procedure was completed laparoscopically. Trans-cystic CBD exploration was successful in 186 (57.4%) while a CT was deemed necessary in 138 pts (42.6%). After CT, no biliary drainage was used in 37 pts whereas a transcytic tube or a T-tube were positioned in 32 and 69 pts, respectively. Major complications were observed in 10 pts (7.3%). Mortality occurred in a high-risk elderly patient after successful emergency single stage laparoscopic treatment. This patient had previously undergone multiple failed attempts at ERCP/ES at another institution and was referred for peristent severe cholangitis. Retained CBD stones discovered at pre-dismissal biliary drainage cholangiography occurred in 6 pts (4.4%) and were treated percutaneously (2) or by ERCP/ES (4). No patient was lost to follow-up. Long-term follow-up was possible in 122 pts; 16 pts were lost from unrelated reasons with no evidence of recurrent biliary symptoms. Recurrent ductal stones occurred in 5 pts (3.6%) and were treated by ERCP/ES. One of these pts with markedly dilated bile ducts (>2 cm) developed a re-recurrent CBD stones after repeat ERCP and underwent hepaticojejunostomy. At a mean follow-up of 73.8 months (range 7.4-141 months), all pts are presently free of biliary symptoms or signs of bile stasis. No biliary stricture at the site of the transverse CT has been observed by US and/or cholangiography. Trans-cystic CBD exploration was successful in 102 (55.7) while a CT was deemed necessary in 80 pts (40.1%) respectively. Statistically significant difference was also found between responders and nonresponders in postop acid exposure (4.5±3.3 vs 7.8±3.2, p=0.034), and DeMeester score (26.3±21.2 vs 39.7±21.2, p=0.05). Paired T test was used to compare pre and postop acid exposure in each group; statistically significant difference was found only among responders: total reflux time was 7.50±2.3 preop and 4.5±3.3 postop (p<0.0001), while for nonresponders it was 8.6±3.7 and 7.2±2.3 (p=0.18). DeMeester scores pre and postop among responders were 40.0±19.7 and 26.3±20.4 respectively (p<0.01), while for nonresponders it was 50.5±14.3 and 39.7±20.2 (p=0.79).

Conclusion: Stretta is a safe, modestly effective, totally endoscopic treatment for GERD. Symptomatic improvement was correlated with correlating improvement in distal acid exposure. This exposure normalizes in nearly half the treated patients.

THE ECONOMIC IMPACT OF INCORPORATING FLEXIBLE ENDOSCOPY INTO A COMMUNITY GENERAL SURGERY PRACTICE, Abdelrahman A Nimeri MD, Shakhir A Hussein MD, Edward Panzelter MD, John Gusz MD, Peter M Chen MD, Jen Nan Yuh MD, Jeffrey M Marks MD, Huron Hospital Cleveland Clinic Health System and Case Western Reserve University Department of Surgery.

Background: Flexible endoscopy is a vital component of Gastro-intestinal (GI) surgical practice. It has and will remain an integral part of the surgical procedures now commonly performed. Flexible endoscopy, unfortunately, is not an integral part of surgical residency training based on resident operative experience as reported by the Residency Review Committee. Moreover, General Surgeons have deferred the practice of Flexible endoscopy to the Gastroenterologists due to concerns over turf battles and referral patterns. The purpose of this study was to assess the overall case load and the economic impact of Flexible endoscopy in the practice of General Surgery in a community hospital setting.

Methods: A retrospective review of the total cases and total billing of inpatient and outpatient procedures for a group practice of five general surgeons in a community hospital over a six month period were compared. Billings were the actual charges based on CPT codes for these procedures.

Results: 1154 Flexible endoscopy cases were undertaken accounting for 54% (1154/2159) of all cases performed from February 1, 2003 to July 31, 2003. The charges generated from Flexible endoscopy were $949,965 compared as to $1,286,606 for surgical procedures. Flexible endoscopy accounted for 43% of total charges.

Conclusion: In this study, Flexible endoscopy contributed to a major portion of the case load and revenue generated by this general surgery group. The overall impact of Flexible endoscopy may be even greater than reported due to the generation of future endoscopic surveillance cases or surgical interventions required based on endoscopic findings.
CAN CLINICAL AND ENDOCOSCOPIC FINDINGS ACCURATELY PREDICT EARLY STAGE ESOPHAGEAL CARCINOMA? G Portale MD, J H Peters MD, C C Hsieh MD, A P Tanhankar MD, G Almogy MD, J A Hagen MD, S R DeMeester MD, G Bremner MD T R DeMeester MD, Department of Surgery, University of Southern California, Los Angeles CA.

Introduction: The presentation and management of esophageal carcinoma are changing, with a steadily rising proportion of patients detected at an earlier stage of disease in which endoscopic treatment methods are contemplated. The aim of the study was to determine whether symptomatic and endoscopic findings can accurately predict an early stage disease in patients with adenocarcinoma.

Methods and procedures: 225 consecutive patients (187M:38F; mean age 63±11.1 yrs) with resectable esophageal adenocarcinoma, seen from 1991 to 2002, were evaluated. Patients receiving preoperative chemotherapoy or radiation therapy were excluded. Model-based probabilities of early stage disease (T1m/sm N0) were calculated for each combination of 3 factors (tumor 1-2 cm, non circumferential lesion, no dysphagia) using a multivariable model.

Results: Seventeen to 40% of patients with small but visible lesions and/or no dysphagia had nodal metastases at pathologic examination. Conclusions: Even in the setting of small non-circumferential tumors/nodules in patients without dysphagia, nearly 20% of patients will harbor node metastasis. This fact predispenses to local failure in non-resectional treatment options such as endoscopic mucosal resection and photodynamic therapy and as such should have significant bearing on treatment decisions.

INTRAOPERATIVE CO2 COLONOSCOPY DURING LAPAROSCOPIC SURGERY ELIMINATES BOWEL DISTENTION. Kiyokazu Nakajima MD, Sang W Lee MD, Toyooki Sonoda MD, Jeffrey W Milsom MD, Section of Colon and Rectal Surgery, Department of Surgery, Weill Medical College of Cornell University - New York Presbyterian Hospital, New York, New York Background: Intraoperative colonoscopy (IOC) may be a useful adjunct to localize focal colon pathologies in laparoscopic surgery (LAP), but causes persistent bowel distension associated with intraluminal air insufflation. CO2, with a faster absorptive nature than air, has been proven effective to alleviate bowel distention in ambulatory settings. Its intraoperative use during LAP, however, has yet to be studied, mainly due to concerns about systemic impacts of combined intraluminal and intraperitoneal CO2 insufflation. Our aims were to assess feasibility, safety and advantages of CO2-insufflated IOC during LAP.

Methods: 20 consecutive patients (8 males, 12 females; median age: 61 years; median BMI: 26.2 kg/m2) with indications of both colorectal and IOC were involved in the study (June - July 2003). After establishing standard CO2 pneumoperitoneum, CO2-IOC was performed using a CO2 feeding system (Olympus EGR) under meticulous cardiopulmonary monitoring with adjusting minute ventilation (MV). No upstream bowel clamping was applied prior to IOC. All intraoperative parameters including end-tidal CO2 (ETCO2) and MV, were prospectively registered before and every 5 minutes during/after IOC. Elapsed time to resolve post-IOC bowel distention was determined by laparoscopic evaluation of its degree and extent every 5 minutes after IOC.

Results: CO2-IOC successfully located all primary colon lesions with median scoring time of 17.5 minutes. During IOC, ETCO2 significantly increased compared to pre-IOC values (pre-IOC: 32 mmHg vs. during-IOC: 35 mmHg; p=0.007), however, remained clinically insignificant and rapidly returned to pre-IOC values by the conclusion of IOC with minimal hyperventilation (25% increased MV). No hypoxemia or hypercapnia was encountered during/after combined insufflation. Insufflated large and small bowel loops began shrinking before finalizing IOC and totally collapsed within 20 minutes after operation, allowing immediate initiation of subsequent LAP procedures under adequate visualization in all cases. There were no IOC-related complications.

Conclusions: CO2-IOC during LAP (under pneumoperitoneum) is feasible and safe with minimal rise of ETCO2. It eliminates bowel distention and the need for prior bowel clamping with the subsequent risk of impending LAP visualization/procedures.

S087

CAN CLINICAL AND ENDOCOSCOPIC FINDINGS ACCURATELY PREDICT EARLY STAGE ESOPHAGEAL CARCINOMA? G Portale MD, J H Peters MD, C C Hsieh MD, A P Tanhankar MD, G Almogy MD, J A Hagen MD, S R DeMeester MD, G Bremner MD T R DeMeester MD, Department of Surgery, University of Southern California, Los Angeles CA.

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Results: Seventeen to 40% of patients with small but visible lesions and/or no dysphagia had nodal metastases at pathologic examination. Conclusions: Even in the setting of small non-circumferential tumors/nodules in patients without dysphagia, nearly 20% of patients will harbor node metastasis. This fact predispenses to local failure in non-resectional treatment options such as endoscopic mucosal resection and photodynamic therapy and as such should have significant bearing on treatment decisions.

S088

COLONOSCOPY WITHOUT SEDATION: PREDICTIVE FACTORS, John C McConnell MD, R Agopian MD, J Nizin MD, M Slade MD, Valley Hospital

OBJECTIVE: The purpose of this study was to identify factors that would predict which patients could undergo colonoscopy without sedation. This procedure can be done easily and safely. Without sedation, the potential for cost saving is significant. METHODS: 1,061 consecutive patients were studied. They were prospectively studied for five variables: willingness to try without sedation, age, gender, body habitus, and previous pelvic/abdominal surgery. Endoscopists assessed the difficulty of the procedure and amount of sedation used. Patients were asked to complete a questionnaire after colonoscopy to assess pain level and preference for sedation versus no sedation for their next colonoscopy if needed.

RESULTS: Of 1,061 colonoscopies done, 54% were male and 46% were female. 98% of exams were completed. 64% of patients received sedation and 36% received no sedation. 43% of males and 27% of females received no sedation. 94% of all patients who attempted colonoscopy without sedation completed the exam without sedation. Male patients were easier to colonoscope and felt less pain. Younger patients were easier to colonoscope than older patients. Endomorphic females and ecomorphic males were easier to colonoscope. Females with previous hysterecctomy were hardest to colonoscope and felt the most pain. Previous surgery had no effect on male patients. 94% of non sedated patients would prefer no sedation for their next colonoscopy. 12% of sedated patients would prefer no sedation for their next colonoscopy.

CONCLUSION: Willingness to try colonoscopy without sedation was highly predictive of success (94%). Male gender, younger age, no previous hysterecctomy also have predictive value. Body type was less helpful. Using these parameters, a patient population can be selected for colonoscopy without sedation. Cost of colonoscopy can be significantly reduced.

S089

PHYSIOLOGIC EFFECTS OF MATERNAL CO2 INSUFFLATION ON THE PRE-TERM AND NEAR-TERM FETUS, Kenichiro Uemura MD, Rebecca J McClaine BS, Kurt A Campbell, Sebastin G de la Fuente MD, Roberto J Manson MD, Florencia Belenishi MD, W. Steve Eubanks MD, James D Reynolds PhD, Endorsurgical Research Group, Depts. Anesthesiology & Surgery, Duke University Medical Center, Durham, NC.

Introduction: Laparoscopy for non-obstetric related surgery during pregnancy is increasing in popularity despite incomplete knowledge of all its effects. Anecdotal reports suggest that the safest time to operate on a patient is during the second trimester, but this supposition has not been empirically tested. Using pregnant sheep, we explored this idea further by recording the physiologic effects of 60 min maternal CO2 pneumoperitoneum on the pre-term and near-term fetus.

Methods: Pre-term and near-term sheep (total n=6) at gestational days 90 and 120, respectively (term, 145 days), were surgically-instrumented with maternal and fetal femoral catheters. At 3+ day recovery period, each ewe was anesthetized (1.5-2.0% isoflurane in oxygen) and prepped; through out the pneumoperitoneum study ventilation was actively managed to keep end-tidal CO2 below 40 mmHg. After a baseline recording period, each ewe was insufflated with CO2 to a final abdominal pressure of 15 mmHg. Pneumoperitoneum was maintained for 60 min after which the animal was manually-deflated. Blood gas status was determined before and at 15 min intervals during and after insufflation.

Results: For both gestational ages, maternal insufflation with CO2 produced fetal acidemia and hypercarbia. However, these effects were more pronounced in the older fetus. The mean nadir for near-term fetal arterial pH was 7.09 ±0.08 compared to 7.25 ±0.05 for the pre-term animals (p < 0.05). Likewise, peak fetal arterial pCO2 was significantly higher in the near-term group (83.43 ±6.00 versus 67.70 ±7.51; p < 0.05). In contrast, maternal blood gasses exhibited only modest changes during insufflation and these did not differ between the two gestational ages.

Conclusion: These preliminary results indicate that, while insufflation of the pre-term ewe does produce fetal hypercarbia and acidemia, these effects are muted compared to the near-term fetus. While the data need to be corroborated with outcome studies, our findings do support the dictum of conducting maternal laparoscopy in the second trimester over the third trimester.

This work was supported in part by research grants from the National Institutes of Health (HD042471 and NS42664). RJMcClaine is the recipient of a Howard Hughes Medical Student Fellowship.
S090 COMPARISON OF SMALL-BOWEL ANASTOMOSIS PERFORMED LAPAROSCOPICALLY OR BY OPEN TECHNIQUE ON THE BASIS OF LOCOREGIONAL LEUKOCYTE ACTIVATION AND OXYGEN FREE RADICAL PRODUCTION, A CONFOCAL MICROSCOPY ANALYSIS.
Istvan Gal PhD, Geza Telek, B Borsitky, L Simon, Z Szabo, Dept of Surgery, Bugat Pal Univ. Teaching Hospital, Gyongyos, 3rd Dept of Surgery Semmelweis University, Budapest, Dept of Experimental Surgery University of Pecs, Hungarian National Stroke Center, Budapest, Hungary.

We have compared the healing characteristics of lap intracorporeally hand-sewn anastomoses with the ones created with traditional open technique in pigs. The local inflammatory reaction was evaluated by measuring oxygen free radical (OFR) formation in activated polymorphonuclear leukocytes (PMN) using cerium capture cytochemistry. The reaction of OFR with cerium results in laser reflecting cerium-photodestroy deposits detectable historically by reflectance confocal laser scanning microscopy (CLSM). METHODS: Animal groups underwent lap (n=10) or open (OPEN; n=5) hand-sewn, side-to-side small bowel anastomosis procedure. Sham operated controls were included. Animals were sacrificed on 1st, 3rd, 7th, 14th, or 28th postop days. Blood samples were taken from regional mesenteric veins draining the anastomoses, and cerium-cytocohmy was performed on isolated PMNs. The anastomotic segments were perfused intra-arterially by CO2 and frozen sections were immuno-labeled for vascular endothelium (PECAM). Blood and tissue PMNs were imaged by CLSM. OFR derived, cell associated cerium-deposit reflectance signals were semi-quantitatively measured by image analysis. RESULTS: There were no considerable morphological-histological differences between the two anastomosis groups. The creation of anastomosis resulted in strong OFR production by PMNs in regional blood at 24h with higher values in the OPEN group. Adherent, OFR producing PMNs were noted in the postcapillary venules in the anastomotic tissue. At 3-7 days modest leukocyte infiltration was seen. PMNs releasing OFR on the suture material and muscularis layers of the jejunum, cecum and sigmoid for 40 min, 80 min, and 120 min, respectively. The intestinal blood flow was measured utilizing colored microspheres injected directly into the left ventricle. Microspheres were injected prior, at 40, 80 and 120 minutes after establishment of pneumoperitoneum as well as 20 minutes after peritoneal desufflation. RESULTS: There were no significant differences noted in tissue blood flow between the two technique groups. The intestinal blood flow measured 120 minutes after pneumoperitoneum as well as 20 minutes after peritoneal desufflation. The OFR derived, cell associated cerium-deposit reflectance signals were semi-quantitatively measured by image analysis. CONCLUSION: lap small bowel anastomosis has similar characteristics to the open one regarding PMN responses, the rapid, strong loco-regional PMN activation declines slowly with time resulting in transient OFR associated tissue damage.

S091 EFFECT OF CO2 PNEUMOPERITONEUM AND WOUND CLOSURE TECHNIQUE ON TUMOR IMPLANTATION.
Justin M Burns MD, Eric J Hanly MD, Tiffany Edwards BS, Amy E Herrin, BS, Joshua Lamb BS, Ikechi Nwankwo BS, Michael R Marohn DO, Antonio De Maio PhD, Mark A Talamini MD, Department of Surgery, The Johns Hopkins University School of Medicine.

INTRODUCTION: Our work has demonstrated that CO2 pneumoperitoneum alters the inflammatory response in animal models of sepsis. We hypothesized that because the sepsis is a key organ in inflammation, its removal would modify this effect.

METHODS: In a series of experiments, we studied the effect of splenectomy (spx) and its means of removal (i.e., open or laparoscopically) on the acute phase inflammatory response to LPS challenge (1 mg/kg IV). A) Male rats (n=75) were randomized to received LPS alone (control) or LPS 2 days following open spx, lap CO2 spx, open sham, or lap CO2 sham. Serum was collected at 1.5, 3 and 6 hrs following LPS challenge. B) Experiment A was repeated with LPS challenge occurring 9 days following spx or sham procedure (n=50). C) Rats (n=50) were randomized to control, open spx, lap CO2 spx, lap He spx, or lap air spx. LPS challenge occurred on POD #2 and serum was collected at 1.5 and 3 hrs. Serum levels of TNF-alpha, INF-gamma, IL-10 and IL-1beta were assayed by commercial ELISA and analyzed by ANOVA.

RESULTS: Levels of TNF-alpha at 1.5 hrs were significantly higher following open sham than following lap sham (p<0.05). Splenectomy drastically reduced INF-gamma and TNF-alpha levels compared to controls (p<0.05). (TNF-alpha data shown)

CONCLUSIONS: Splenectomy dramatically reduces the TNF-alpha and INF-gamma response to LPS challenge. These data suggest that the spleen plays an important role in CO2 pneumoperitoneum-mediated attenuation of the septic inflammatory response.

S092 ROLE OF THE SPLEEN IN LAPAROSCOPY-ASSOCIATED INFLAMMATORY RESPONSE.
Sharon L Bachman MD, Daniel Sidelnik MD, Eric J Hanly MD, Tiffany Edwards BS, Amy E Herrin BS, Joshua Lamb BS, Ikechi Nwankwo BS, Michael R Marohn DO, Antonio De Maio PhD, Mark A Talamini MD, Department of Surgery, The Johns Hopkins University School of Medicine.

INTRODUCTION: Laparoscopy has demonstrated that CO2 pneumoperitoneum alters the inflammatory response in animal models of sepsis. We hypothesized that because the sepsis is a key organ in inflammation, its removal would modify this effect.

METHODS: In a series of experiments, we studied the effect of splenectomy (spx) and its means of removal (i.e., open or laparoscopically) on the acute phase inflammatory response to LPS challenge (1 mg/kg IV). A) Male rats (n=75) were randomized to received LPS alone (control) or LPS 2 days following open spx, lap CO2 spx, open sham, or lap CO2 sham. Serum was collected at 1.5, 3 and 6 hrs following LPS challenge. B) Experiment A was repeated with LPS challenge occurring 9 days following spx or sham procedure (n=50). C) Rats (n=50) were randomized to control, open spx, lap CO2 spx, lap He spx, or lap air spx. LPS challenge occurred on POD #2 and serum was collected at 1.5 and 3 hrs. Serum levels of TNF-alpha, INF-gamma, IL-10 and IL-1beta were assayed by commercial ELISA and analyzed by ANOVA.

RESULTS: Levels of TNF-alpha at 1.5 hrs were significantly higher following open sham than following lap sham (p<0.05). Splenectomy drastically reduced INF-gamma and TNF-alpha levels compared to controls (p<0.05). (TNF-alpha data shown)

CONCLUSIONS: Splenectomy dramatically reduces the TNF-alpha and INF-gamma response to LPS challenge. These data suggest that the spleen plays an important role in CO2 pneumoperitoneum-mediated attenuation of the septic inflammatory response.

S093 MICROSPOHERE INTESTINAL BLOOD FLOW ANALYSIS DURING PNEUMOPERITONEUM USING CARBON DIOXIDE AND HELIUM.

The object of this study is to measure the effect of peritoneal insufflation with carbon dioxide (CO2) and helium on intestinal blood flow in a porcine model.

Twelve pigs were anesthetized and pneumoperitoneum was created with CO2 (n=6) and helium (n=6) to a maximum pressure of 15 mm Hg. Intestinal blood flow was measured utilizing colored microspheres injected directly into the left ventricle. Microspheres were injected prior, at 40, 80 and 120 minutes after establishment of pneumoperitoneum as well as 20 minutes after peritoneal desufflation. Extensive hemodynamic monitoring was performed including cardiac output. Tissue samples were collected from the mucosa and muscularis layers of the jejunum, cecum and sigmoid for analysis. Change in intestinal blood flow from baseline with pneumoperitoneum (ml/min/g)

<table>
<thead>
<tr>
<th>Tissue</th>
<th>40 min</th>
<th>80 min</th>
<th>120 min</th>
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<tbody>
<tr>
<td>J Mc CO2/He</td>
<td>0.14/0.13</td>
<td>-0.03/-0.02</td>
<td>0.10/0.06</td>
</tr>
<tr>
<td>C Mc CO2/He</td>
<td>-0.03/-0.01</td>
<td>-0.11/-0.02</td>
<td>-0.01/-0.03</td>
</tr>
<tr>
<td>C Mc CO2/He</td>
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<td>0.09/0.08</td>
<td>-0.01/-0.20</td>
</tr>
<tr>
<td>C Mc CO2/He</td>
<td>0.30/0.07</td>
<td>0.15/0.02</td>
<td>0.12/0.02</td>
</tr>
<tr>
<td>S Mc CO2/He</td>
<td>0.93/0.31</td>
<td>0.09/0.15</td>
<td>0.00/0.17</td>
</tr>
<tr>
<td>S Mc CO2/He</td>
<td>0.16/0.10</td>
<td>0.05/0.04</td>
<td>0.09/0.05</td>
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Intestinal perfusion increases mildly after insufflation and gradually returns to baseline levels in the course of 2 hours. No significant difference was noted between CO2 and helium.
SAGES 2004 Abstracts

S094

INFLUENCE OF CARBON DIOXIDE-, HELIUM- AND GASLESS PNEUMOPERITONEUM ON PORTAL, ARTERAL AND CENTRAL VENOUS BLOODGASES IN AN EXPERIMENTAL MODEL.

Devdas Thomas Inderbitzin MD, Benoît Fellaïy PhD, Lukas Kohnbucher MD, Dep. Medicine, University of Fribourg / Dep. Surgery, Hôpital Cantonal, CH-1708 Fribourg, Switzerland

INTRODUCTION: CO2-laparoscopy leads to acidosis and hypercapnia in peripheral blood (clinical studies). This may lead to postoperative tissue-damage and locally impaired immune-function. So far, portal venous bloodgases during laparoscopy are unknown. This study investigated changes in portal, central-venous and arterial bloodgases during experimental laparoscopy. MATERIALS & METHODS: 36 male rats were randomized into 6 groups (n=6): 1 median laparotomy (LT), 2-6 laparoscopy (LS) insufflating CO2 (6 or 12mMhg) or He (6 or 12mMhg) or gasless procedure. Respiratory-frecuency was kept constant at 40-45/min. (Isoflurane/O2-inhalation). Blood was sampled 0, 45 and 90 min after setup from the portal and caval vein and femoral artery for blood-gas analysis. Results are given as means±SD; statistical significance by ANOVA for repeated measurements and post-hoc comparisons by Bonferroni test. RESULTS: Intra-abdominal acidosis and hypercapnia were severe using CO2 and high intra-abdominal pressure caused deficient mechanical respiratory-impairment (He 12mMhg). Gasless LS and low-pressure He-insufflation allowed respiratory compensation.

The pH decrease showed a similar pattern but was no lower than 6.95±0.08±0.04 (CO2 12mMhg); pCO2 was not significantly affected (O2-inh.). HCO3- displayed no significant compensatory effect. CONCLUSIONS: During CO2-pneumoperitoneum the liver is flushed by acidoic and hypercapnic portal blood which even affects the peripheral arterial blood-gases. This is mainly caused by direct intestinal CO2-uptake but also by mechanical respiratory-impairment due to high intra-abdominal pressure. Thus, using low pressures, retractorless and alternative gas (e.g. He) may ameliorate these effects and even prevent gas embolism.

S095

LAPAROSCOPIC COLECTOMY FOR COLON ADENOCARCINOMA: AN 11-YEAR RETROSPECTIVE REVIEW WITH 5-YEAR FOLLOW-UP

Brian P Jacob MD, Barry Salky MD, Mount Sinai School of Medicine. Dept. of Surgery, Division of Laparoscopic Surgery. NYC, NY

Introduction: Laparoscopic colectomy for colon cancer remains controversial especially when comparing historically accepted survival data and recurrence rates after open surgery. The purpose of this study was to evaluate mean and 5-year survival rates after laparoscopic colon resection for invasive colon adenocarcinoma. The study group included 115 patients who underwent subsequent colectomy for colon adenocarcinoma (Apr 1992 - Jul 2002) by a single surgeon. Records were retrospectively analyzed and follow-up data was obtained. Kaplan-Meier survival data with log rank test were calculated for each stage. Z statistics compared 5 yr survival rates for stage II and III. Results: 26 patients had noninvasive tumors (Tis) and were not included. Of the remaining cases, 74 (83%) were amenable to follow-up at 11 years (41 females, 33 males. mean age = 76). Sixteen ileocolic resections, 23 right and 10 left colectomies, 2 transverse, and 23 low anterior resections were performed. There was one perioperative mortality. Average number of lymph nodes harvested = 10.3 ± 6. Mean follow up was 61.2 months. There were no port site recurrences. Kaplan-Meier table:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Survival (%)</th>
<th>Survival (%)</th>
<th>Mean survival (months)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(95% confidence interval)</td>
</tr>
<tr>
<td>IA</td>
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<td>100</td>
<td>47 (44-49)</td>
</tr>
<tr>
<td>IB</td>
<td>100</td>
<td>100</td>
<td>47 (44-49)</td>
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<tr>
<td>II</td>
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<td>47 (44-49)</td>
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<tr>
<td>III</td>
<td>100</td>
<td>100</td>
<td>47 (44-49)</td>
</tr>
<tr>
<td>IV</td>
<td>100</td>
<td>100</td>
<td>47 (44-49)</td>
</tr>
</tbody>
</table>

*p=0.58

Conclusions: For this patient population who underwent curative laparoscopic colectomies for colon adenocarcinoma mean follow-up was greater than 5 years. Survival for those with stage I, II, and III colon cancer resected laparoscopically is comparable to historically acceptable open colectomy survival rates. In this group of patients, there was no statistically significant difference in 5-year survival for patients with stage II or III disease.

S096

ELECTIVE LAPAROSCOPIC SURGERY FOR BENIGN INTERNAL ENTERIC FISTULAE- A REVIEW OF 43 CASES

Naveen Pokala MD, Conor P Delaney PhD,Anthony J Senagore MD, Cleveland Clinic Foundation, Cleveland, Ohio.

INTRODUCTION: Laparoscopic surgery has been applied to the management of various colorectal conditions with shortened recovery periods compared to open surgery. This study reviews the feasibility and outcome of laparoscopic surgery for benign internal fistula. METHODS: All patients undergoing laparoscopic surgery for internal fistulas caused by diverticulitis or Crohn's disease from 1995 to 2003 were identified from a prospective laparoscopic database and retrospectively analyzed. Crohn's ileo-ileal fistulae were excluded from the study. RESULTS: 43 patients were identified. The median age was 43 (Range 22-65) years and 20 were female. The mean BMI was 24.5 and the ASA distribution was 3/3/3/0 (class 1/2/3/4). The diagnosis was diverticular in 24 (6 colovaginal, 9 colocolic, 8 coloenteric and 1 colocolic) and Crohns in 19 patients (9 ileoileal, 3 enterocolonic, 4 enteroenteric, and 3 duodenocolic). The mean operative time was 163 ± 80 (155 in completed, 180 in converted cases), the mean length of stay was 5.2 ± 4.7 days (3.9 in converted, 7.9 in converted), median was 4 (IQR 7-7) days and the mean blood loss was 271.5 ml (range 0-1700). Fourteen (32.6%) patients required conversion to open surgery for dense adhesions (n=8), duodenal involvement (n=3), multiple fistulae (n=1), fecal leak while dissecting the fistula (n=1) and the finding of additional ovarian pathology (n=1). Conversion rates when analyzed by fistula type were duodenal (100%), vallal (66%), sigmoid (27%), bladder (15.4%), enterocolic (0%) and colocolic (0%). There were 6 (14%) major complications including anastomotic leaks (n=3), intra-abdominal abscesses (n=2) and post-operative intra-abdominal bleeding (n=1). There were seven (16.3%) minor complications including post-operative ileus (n=2), transient pleural effusion (n=1), minor wound infection (n=1), transient small bowel obstruction (n=2) and brachial plexus neuralgia (n=1) that recovered spontaneously. There was no significant difference in the complication (p=0.57), re-operative (p=0.3) or re-admission (p=0.4) rates for the completed and converted patients. CONCLUSION: Laparoscopic surgery for benign internal fistulae can be performed safely with the same advantages of earlier recovery and shorter hospitalization as noted in other laparoscopic colorectal procedures. Duodenal and vaginal involvement by the fistula is associated with a higher conversion rate. A low threshold towards early conversion is useful for these cases to reduce delays in the operating room and unnecessary use of hospital resources.

S097

HAND-ASSISTED LAPAROSCOPIC COLECTOMY: A HELPING HAND OR HINDERANCE?

Yun-Jau Chang MD, Peter W Marcello MD, Lawrence C Rusin MD Patricia L Roberts MD,David J Schoetz MD, Department of Colon & Rectal Surgery, Mount Sinai School of Medicine. Dept. of Surgery, Division of Laparoscopic Surgery. NYC, NY

Introduction: The use of hand assisted laparoscopic colectomy is expanding, but whether this approach provides the same benefits as traditional laparoscopic techniques remains controversial. This study aims to determine the outcome of hand assisted laparoscopic sigmoid resection (HALSR) when matched to laparoscopic sigmoid resection (LSR). This is the largest comparative study of a single hand assisted procedure. Methods: A sequential series of patients (pts) undergoing elective, laparoscopic sigmoid/left colon resection were compared. After August 2001, pts were offered HALSR. Surgeons with minimal laparoscopic experience also participated in HALSR. Mean values (± SD) reported. Results: There were 85 LSR pts and 66 HALSR pts. There were no differences in pt demographics, medical history, or diagnosis.

<table>
<thead>
<tr>
<th>Group</th>
<th>OP (min)</th>
<th>Flatus (days)</th>
<th>LOS (days)</th>
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<tbody>
<tr>
<td>LSR</td>
<td>205 (±62)</td>
<td>2.6 (±1.0)</td>
<td>5.0 (±2.4)</td>
</tr>
<tr>
<td>HALSR</td>
<td>189 (±40)</td>
<td>2.5 (±1.3)</td>
<td>5.1 (±3.0)</td>
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</table>

P value 0.078 0.36 0.73

Conclusion: Hand-assisted laparoscopic sigmoid resection provides the same outcomes as traditional laparoscopic techniques. Novice laparoscopists performed HALSR without prolonging operative time and avoided the need for conversion. Hand-assisted laparoscopic colectomy is helpful and may expand the application of laparoscopic colectomy.
SAGES 2004 Abstracts

Saturday, April 3, 2004

S098

LAPAROSCOPIC SURGERY FOR THE PATIENT OF RECURRENT CROHN’S DISEASE. Fumihiro Uchikoshi MD, Tochinori Ito MD, Richiro Nezu MD, Masahiro Tanemura MD, Yasuyuki Kat MD, Tsunekazu Mizushima MD, Hiroshi Tamagawa MD, Hiroki A 23rd U MD, Department of Surgery, Osaka University Graduate School of Medicine

Background: Laparoscopic surgery has been accepted for the treatment of primary Crohn’s disease. However, 30-60% of the patients require re-operation due to recurrence of the disease. In the present study, we accumulated experiences in 37 patients of Crohn’s disease who underwent re-operation, and discussed the feasibility and the efficacy of the laparoscopic surgery for the recurrent diseases.

Patients: Patients with recurrent Crohn’s disease who underwent intestinal resection from September 1992 to August 2003. Patients were divided into five groups according to the type of operation as follows, Group A, patients underwent open surgery previously, and re-operated by open surgery; Group B, patients underwent open surgery, and re-operated laparoscopically; Group C, patients operated laparoscopically, and re-operated by open surgery; Group D, patients operated laparoscopically in both previous and re-operation; Group E, patients re-operated by or converted to hand assisted-laparoscopic surgery after any kind of previous surgery. Simple fistulas between the abdominal wall, intestines, urinary bladder and affected lesions are divided by endostapler. The operation is defined as open conversion, when the abdominal incision is extended more than 5 cm.

Methods: Power calculations suggested that with 10 patients in each group, there should be an 80% chance of detecting a difference of 10 cm in the wound size.

Results: 1) In all patients, adhesiomesotomy and intestinal mobilization could be performed under the laparoscopic even if they were previously operated by open surgery or had inflamed intestines and fistulas. 2) In Group B and D, 66.7% and 50.0% of patients were converted to open surgery. However, the length of abdominal incision could be reduced to 10.2 and 13.0 cm, respectively (Group A; 23.2 cm, Group C; 22.5 cm). In Group E, the wound size was 8.9 cm. 3) No operative mortality and major morbidity were observed. 4) The rise of postoperative lever of CRP was minimum in Group E. 5) Patients in Group B and D enjoyed earlier recovery and shorter hospital stay than patients in Group A and C, even if the surgery was converted to open. 5) Patients in Group E also showed early recovery that was compatible to Group B and D.

Conclusion: Laparoscopic surgery is effective for recurrent Crohn’s disease. In complicated cases with severe adhesions or fistulas, hand assisted-laparoscopic surgery might be reasonable.

S099

HORMONAL MECHANISM TO EXPLAIN EARLIER SPONTANEOUS DIURESES OF THIRD SPACE FLUIDS AFTER LAPAROSCOPIC COLECTOMY. Tonya M Young-Fadok MD, Carmen Ruiz MD, Scott Harmsen, Mayo Clinic

Background: Previous work suggests that patients undergoing laparoscopic colectomy demonstrate earlier spontaneous diuresis of peripherally administered fluids. Aim: To investigate the underlying hormonal basis of this phenomenon.

Methods: Power calculations suggested that with 10 patients in each group, and an alpha of 0.05 there should be an 80% chance of detecting a difference in mean response that is > 1.4 standard deviations from the variances on normal measurement. Ten laparoscopic colectomy patients were consecutively accrued, and 10 open patients were then accrued matching for age, gender, body mass index, and extent of colectomy. Intraoperative fluids, blood loss, and urine output were measured prospectively. Postoperative fluid inputs and outputs were measured q 6 hourly. Antidiuretic hormone (ADH), aldosterone, and urine output were recorded prospectively. Postoperative fluid inputs and outputs were measured q 6 hourly. Antidiuretic hormone (ADH), aldosterone, and urine output were recorded prospectively.

Results: The mean cumulative fluid balance (CFB) for the Lap group during the first 48 hours was 204-670ml after which diureses occurred. In the Open group the max CFB was 1340ml and the mean CFB remained positive at the end of 72 hrs (Fig 1). At 1 hr post op the ADH levels in the Lap group were mean 12.3 pmol vs open 30.2 pmol (P=.07). There were no significant differences in aldosterone levels.

Conclusion: There were trends to suggest that CFB remains lower after laparoscopic colectomy and that spontaneous diuresis occurs sooner.

S100

LAPAROSCOPIC SURGERY IN THE TREATMENT OF RECTUM CANCER. ANTONIO M. LACY PhD, SALVADORA DELGADO MD, DULCE M MOMBLAN MD, ESTHER MANS MD, RICARD CORCELLES MD, RAQUEL BRAVO MD, AMINE IBARZABAL MD, HOSPITAL CLINIC BARCELONA

Introduction: Although laparoscopic surgery for benign colorectal pathology is widely extended, it remains controversial with malignant disease. Even though there are no randomized studies comparing laparoscopic and open surgery for rectal cancer, the results of randomized studies for colon cancer suggest that both techniques ensure oncological outcomes. There are better short term results and similar survival. Laparoscopic surgery as treatment for rectal cancer is feasible, but is also surgeon-dependant and requires a large learning curve.

Objective: To analyze the short term results of consecutive patients operated on by laparoscopic surgery.

Materials and methods: Prospective study from March 1998 to April 2003, including 74 stage and obstructive intestinal patients.

Results: Two hundred twenty patients (145 males and 75 females), with a mean age of 67.3 years old were operated on for rectal cancer. Thirty-six percent of them had previous abdominal surgery and 59% received neoadjuvant therapy with chemo and radiotherapy treatment. Surgical techniques: 44 low anterior resection, 122 low anterior resection with total mesorectal excision, 42 abdominoperineal resections, 10 Hartmann intervention and 2 palliative colostomies. Positive ileostomy was done in 78 patients.

Conversion to open surgery was done in 44 patients, due to difficulties in patient dissection (61%), adjacent organ invasion (27%), haemorrhage (4.5%) and hypercarbria (7%). The average time of the surgical procedure was 182±55 minutes. Fifty-six patients (25.4%) presented postoperative complications (10.4% majors and 15.4% minors). Twelve patients (7.2% of the abdominal resections) showed postoperative ileostomy leakage, and 9 patients (5.1%) had postoperative ileostomy bleeding. The mean hospital stay was 6.8 days. Postoperative mortality was 0.9%. The distribution of tumour stage was I (19%), II (31.5%), III (26.5%) and IV (18%). In 5% of the cases there was no evidence of malignancy in the piece of resection, and median positive nodes was 13.6%.

Conclusions: Presented results suggest that laparoscopic surgery in rectal cancer treatment is safe and feasible, with quite good short term results and oncological outcomes similar to open published series, despite the short follow-up period of our patients.
LAPAROSCOPIC NISSEN FUNDOPLICATION: ANTI-REFLUX PROCEDURE IS REQUIRED

Methods: A prospectively collected database was used to compile and analyze 54 cases of laparoscopic Heller myotomy without concurrent anti-reflux procedure performed between November 1996 and June 2002. Minimal hiatal dissection was performed and intraoperative endoscopy was used to accurately identify the gastroesophageal junction thereby avoiding injury to the gastric sling fibers. Follow up included symptomatic assessment in 50 (93%) patients. Heartburn was assessed on a four point scale with clinical significance defined as the composite endpoint of positive 24h pH monitoring or esophagitis on endoscopy.

Results: Significant heartburn was reported in 15 of 50 (30%) patients. Positive 24h pH recordings were seen in 11 of 21 patients while esophagitis was seen in 13 of 20 patients. In total, objective evidence of reflux was seen in 18 of 28 (65%) patients tested. Of these 18 patients, 7 (39%) did not complain of significant heartburn. No patients without objective reflux complained of significant heartburn. Therefore, out of the 28 patients with objective testing, 7 (25%) had reflux but no heartburn.

Conclusion: Objective testing reveals an unacceptable rate of gastro-esophageal reflux in laparoscopic Heller myotomy without an anti-reflux procedure. This includes a concerning 25% incidence of silent reflux. We, therefore, recommend a concurrent anti-reflux procedure.

EFFECT OF PREGNANCY ON EFFECTIVENESS OF LAPAROSCOPIC NISSEN FUNDOPLICATION

OBJECTIVE ANALYSIS OF GASTROESOPHAGEAL REFLUX AFTER LAPAROSCOPIC HELLER MYOTOMY: AN ANTI-REFLUX PROCEDURE IS REQUIRED

S104

SHOULD LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR BE ABANDONED IN FAVOR OF THE OPEN APPROACH?

METHODS: All primary PEHR done lap or open from 1990-2002 were identified. Prospectively collected data in lap patients and medical records in open patients were reviewed. Open patients were contacted to request follow-up. Operative, short term, and long term (quality-of-life questionnaires and radiographic) outcomes were compared. Data presented as median (range). Mann-Whitney U-test or Chi squared determined significance (*p<0.05). RESULTS: Data from 26 open and 31 lap cases revealed no difference in age, ASA, or BMI. Of study patients, 18 (69%) had reflux during pregnancy. There are no reports on the effect of pregnancy on effectiveness LNF. METHODS: We surveyed 146 child-bearing age patients while esophagitis was seen in 13 of 20 patients. In total, objective evidence of reflux was seen in 18 of 28 (65%) patients tested. Of these 18 patients, 7 (39%) did not complain of significant heartburn. No patients without objective reflux complained of significant heartburn. Therefore, out of the 28 patients with objective testing, 7 (25%) had reflux but no heartburn.

Conclusion: Objective testing reveals an unacceptable rate of gastro-esophageal reflux in laparoscopic Heller myotomy without an anti-reflux procedure. This includes a concerning 25% incidence of silent reflux. We, therefore, recommend a concurrent anti-reflux procedure.

HISTOLOGIC RESULTS ONE YEAR FOLLOWING BIO-PROSTHETIC REPAIR OF PARAESOPHAGEAL HERNIA IN A CANINE MODEL

Methods: Four weeks following thoracoscopic creation of PEH, 6 dogs underwent laparoscopic PEH repair with a 4-ply U-shaped SIS mesh patch. Barium x-ray and endoscopy were performed at two weeks following repair. At sacrifice 12 months later, endoscopy/ barium x-ray was performed and biopsies of the esophagus and crura were obtained.

Results: Mean weight of dogs at one year postoperatively was identical to entry weight. No dog had gross dysphagia, evidence of esophageal stricture, or re-herniated. At sacrifice the biomaterial was not identifiable grossly, and was replaced with mature fibrovascular scar. Biopsies of the hiatal region revealed muscle fiber proliferation and regeneration within the scar. The muscle regeneration was characterized by small bundles and individual cells irregularly arranged within the tissue. Esophageal in-growth to the mesh did not occur in any dog.

Conclusions: Using this reproducible canine model of PEH formation and repair, SIS mesh did not erode into the esophagus or result in stricture formation. At one year after placement of the biologic material, native muscle in-growth was noted. SIS may provide a scaffold for muscle in-growth and provides a durable repair of PEH over the long term.
CHARACTERIZATION OF DYSPHAGIA WITH MULTI-CHANNEL INTRALUMINAL IMPEDANCE IN PATIENTS FOLLOWING ESOPHAGEAL FUNDOPLICATION

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Background: Following esophageal fundoplication (EFG), patients sometimes experience dysphagia. Standard manometry which evaluates esophageal pressure may demonstrate normal motility making the etiology of the dysphagia unclear. Multi-channel intraluminal impedance (MII) is a new modality that allows the assessment of bolus transmission synchronous with a standard motility study. The aim of this study was to characterize motility and MII patterns in those patients who presented with new or recurrent symptoms following EFG. Methods: A combined standard manometry and MII study (Sandhill Scientific, Highland Ranch, CO) was performed in 102 consecutive patients from 1998 through 2003. The 21 patients who had previous EFG all had 10 standard liquid swallows followed by 10 viscous swallows. Data was collected prospectively as part of IRB approved protocol and analyzed using standard t-test (mean; SD). Results: Of the 21 patients (13 female, 8 male), 10 complained of dysphagia (Group 1) and 11 had no complaints of heartburn without dysphagia (Group 2). By standard manometry, both groups demonstrated a similar number of peristaltic liquid swallows (7.9±3.2 Group 1 vs 8.5±3.1, p=0.8). Of the peristaltic swallows, Group 1 demonstrated more incompletely transmitted swallows (abnormal MII) than Group 2 (1.3±0.5 vs 0.5±0.25; p=0.08). When a swallow was incompletely transmitted manometrically, Group 2 was still able to pass the liquid bolus in half of the cases, whereas Group 1 could not transmit any of those boluses. Similar findings were noted with the viscous swallows. Patients experienced chest pressure during the non-transmitted swallows. The lower esophageal sphincter pressure (LES) was similar between groups (24.8±13.9 vs 21.9±8.4, p=0.27). A subgroup of patients in each group with LESP>26 mmHg was further analyzed. In group 1(n=2), only 2 of the 10 liquid swallows were completely transmitted, whereas in group 2(n=4), 9 of the 10 peristaltic swallows were completely transmitted. This further suggests a deficiency in bolus transport in patients with dysphagia after EFG. Conclusion: When compared to EFG patients without dysphagia, those with dysphagia following fundoplication demonstrate poor bolus transmission despite normal motility compared to patients without dysphagia. Combining MII and manometry allow dysphagia to be further characterized to better understand the etiology of dysphagia in this difficult population.

NATIONAL TRENDS IN UTILIZATION AND OUTCOMES OF BARIATRIC SURGERY

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INTRODUCTION: Due to the growing interest in surgery to treat morbid obesity, we examined changes in the utilization and in-hospital outcomes of bariatric surgery in the US over a 10 year period.

METHODS AND PROCEDURES: Data was obtained from the Nationwide Inpatient Sample, the largest all-payer discharge database in the United States. ICD-9 codes were used to identify all bariatric procedures performed on adults from 1990 to 2000. Population-based rates of surgery for each year were calculated by applying sampling weights and US Census data. Secular trends in annual rates of surgery, changes in patient characteristics and in-hospital mortality and complications were analyzed.

RESULTS: From 1990 to 2000, the national annual rate of bariatric surgery increased nearly 6-fold, from 2.4 to 14.1 per 100,000 adults (p<0.001). There has been a greater than 9 fold increase in the use of gastric bypass procedures (1.4 to 13.1 per 100,000; p<0.001). This represents an increase from 55% of all bariatric procedures in 1990 to 93% of procedures in 2000 (p<0.001). Rates of in-hospital mortality were low (0.4% overall), increased slightly over time (0.2% in 1990 to 0.5% in 2000, p=0.006), but this change was not statistically significant when mortality was adjusted for age and comorbidities. Rates of reoperation, and pulmonary emboli remained stable (overall rates of 1.2% and 0.3% respectively), Rates of respiratory failure associated with bariatric surgery declined from 7.7% in 1990 to 4.5% in 2000 (p<0.001). Over this time, mean length of hospital stay declined from 6.0 to 4.1 days (p<0.001). Conclusion: The annual rate of bariatric surgery in the US has increased nearly 6 fold between 1990 and 2000, and with little change in in-hospital morbidity and mortality. This appears to be largely driven by the increasing popularity of gastric bypass procedures.

BENEFITS AND COMPLICATIONS OF LAPAROSCOPIC VS. OPEN ROUX-EN-Y GASTRIC BYPASS SURGERY

Robert T Marema MD, Cynthia K Buffington PhD, Maiapur Ravindra MD, Diaz David MD, Perez Michael MD, U.S. Bariatric Objective. Over the last several years, there has been a substantial increase in numbers of individuals seeking laparoscopic surgical procedures for morbid obesity. In the present study, we compare the benefits and risks of laparoscopic vs. open Roux-en-Y gastric bypass (RYGBP) performed at the same center on a patient population exceeding 2000. Methods. The study population consisted of 1077 laparoscopic and 1198 open RYGBP procedures performed over a 3-year observational period. Measurements included: pre- and post-op anthropometrics, clinical health markers, prevalence of co-morbid diseases, psychosocial status, short- and long-term surgical complications and length of hospital stay. Results. The laparoscopic and open RYGBP groups prior to surgery were similar with regard to age, racial and gender distributions, clinical assessments, and incidence rates for medical and psychosocial co-morbidities. Operating time significantly (p<0.01) differed between the procedures, averaging 1 hr, 25 min for the Open procedure and 1 hr, 35 min for the Lap approach. There were no significant differences between the procedures with regard to frequency of anastomotic leaks, pulmonary emboli, cardiac episodes or respiratory complications. The Open RYGBP patients, however, experienced a higher frequency of splenectomy, wound infections, and mortality, while the Lap RYGBP patients had a significantly greater incidence of late internal hernias and stomal stenosis. Hospital stay was significantly (p<0.01) less for the Lap vs. Open RYGBP patients (3.4 vs. 4.3 days, respectively, p<0.01). Both procedures produced identical percentage change in body weight (42.2±0.7 vs. 43.2±0.3), but the shortened recovery period of the Lap procedure was associated with significantly (p<0.01) greater loss of body fat and preservation of lean body tissue. Weight loss with both procedures resulted in highly significant (p<0.01) and comparable improvements in medical and psychological co-morbidities. Conclusion. Individuals having RYGBP have similar preoperative characteristics, rates of surgical complications and nearly identical weight loss surgery co-morbidity improvement as compared to open surgery. Regardless of surgical access approach. However, there are differences in the type of post-surgical complications between the access procedures.

LAPAROSCOPIC SLEEVE GASTRECTOMY AS AN INITIAL WEIGHT LOSS PROCEDURE FOR HIGH RISK PATIENTS WITH MORBID OBESITY

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INTRODUCTION: Extremely high-risk patients are typically denied bariatric surgery management because of the excessive operative risk. The purpose of this study was to assess the early outcomes of a staged approach to Roux-en-Y bypass that may reduce the overall operative risk enabling such patients to be eligible for bariatric surgery.

METHODS AND PROCEDURES: All consecutive patients who had a LSG as an initial procedure between 6/01 to 7/03 were included. Patients were considered for the 2nd stage after significant weight loss (usually 6-9 months) and outcome data were collected and evaluated.

RESULTS: There were 75 patients of whom 51% were male, with a mean age of 48 ± 9.5 (range 23-72) and BMI of 68.6 (range 45 to 91). 64% were ASA III (border line ASA IV) and 34% were ASA IV. There were a mean of 10± 3.2 comorbidities per patient most commonly obstructive sleep apnea (OSA) (88%), degenerative joint disease (DJD) (60%), hypertension (HTN) (60%), asthma (18%), and coronary artery disease (CAD) (18%). Many patients (42%) had one or more life-threatening conditions: prior PE/DVT, COPD, severe CAD, pulmonary hypertension, cirrhosis, or recent history of CHF. 62% had a BMI >65. Postoperatively, there were no deaths and the major complication rate was 12% including, partial gastric obstructions (3), renal failure (2), respiratory failure (2), and a contained leak. Minor complications occurred in 16%. The mean BMI and EWL% at 6 months follow up were 49± 19 (point decrease 65± 65%), respectively. Operative risk significantly decreased in 100% of patients. All preop ASA IV patients were converted to ASA III and all preop ASA III patients were significantly improved. All life threatening comorbidities were down graded to only moderate severity. Type 2 diabetes mellitus, OSA, HTN, and asthma were improved or resolved in all patients. Nine patients thus far have successfully completed stage II (LYGB) with no mortality, no major complication, and only one minor complication (UTI).

CONCLUSIONS: These early results suggest that LSG results in significant short-term weight loss that reduces operative risk for LRYGB which may reduce overall morbidity and mortality for high-risk bariatric patients.
SAGES 2004 Abstracts

Saturday, April 3, 2004

S115
PRE-OPTERATIVE WEIGHT LOSS IMPACTS THE PERI-
AND POST-OPERATIVE COURSES OF PATIENTS
UNDERGOING LAPAROSCOPIC ROUX-EN-Y GASTRIC
BYPASS, Todd E Drassin MD,Carlos R Gracia MD,Marie Estakhri
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Interventional Technology (CASIT), David Geffen School of
Medicine at UCLA, Los Angeles, CA, USA. ValleyCare Medical
Center, Pleasanton, CA, USA.

Introduction: Bariatric surgery has become the standard of care for morbid
obesity, and the laparoscopic roux-en-y gastric bypass (LRY) is the most
commonly performed bariatric procedure in the USA. The aim of this study is to
determine whether pre-operative weight loss may be correlated with benefits to patients undergoing LRY.

Methods and Procedures: A retrospective analysis was conducted on a series of 280 LRY cases performed between March 2000 and June 2003.
At the time of initial consultation all patients had been asked to lose weight prior to their operations. Experimental groups were defined in terms of whether subjects lost more or less than 5% of their percent excess body weight (PEBW) between the time of consultation and the day of surgery. Outcome measures included: length of stay, post-operative complications, and weight loss were compared between groups. Data were analyzed using Student’s t-test and chi-
squared analysis.

Results: Subjects who lost more than 5% of their PEBW prior to surgery were found to have significantly shorter operative times, fewer non-
GI complications, and tended to lose more of their PEBW during the year fol-
lowing the procedure.

Conclusions: Patients who lost more than 5% of their PEBW prior to undergoing LRY enhanced their peri-operative and post-operative cours-
es. These results support the benefits of requiring all patients to lose weight prior to undergo LRY to lose at least 5% of their PEBW prior to undergoing the procedure.

S116
MULTIVARIATE ANALYSIS OF FACTORS RELATED TO RESOLUTION (RES) AND NON-RESOLUTION (NON-
RES) OF DIABETES MELLITUS (DM) IN MORBIDLY
OBESE PTS AFTGASTRIC BYPASS (GB), Richard A
pucci MD, Eric J DeMaria MD,Bernadette C Profeta MD,John M
Kellum MD,H J Sugarman MD,L G Wolf MS,M B Towler MS,Jill
Meador RN, Med College of VA / VCU, Dept of Surgery,
Richmond, VA.

Methods: Although GB is a highly effective method of treatment for type II DM in morbidly obese pts, all pts not all pts resolve their DM after surgery. We reviewed data on 1657 pts over a 10 year period to determine factors related to Non-Res-DM. 328 pts had DM pre-op. Follow-up was 84%. Results: Of 276 pts with DM pre-GB surgery, DM resolved at follow-up (Res-DM group) in 78% of pts. The group without resolution of DM at follow-
up (Non-Res-DM) included persistent glucose intolerance not requiring medications in 4%, DM requiring only oral agents in 12%, and 5% of pts who remained on insulin.

Comparisons of Res-DM pts to Non-Res-DM pts were made in order to determine factors associated with failure. Univariate analysis (t test) revealed that Non-Res-DM pts were older and lost a lesser proportion of their excess body weight (%EWL) than pts with Res-DM. Additionally, Non-Res-DM pts did not differ in sex, any measure of pre-op body weight or BMI, type of gastric bypass (standard limb versus long limb, or in the presence and / or resolution of hypertension. Res-DM also did not differ in racial characteristics despite the observation that African-Americans (76% resolved their DM) lost significantly less weight than Caucasians (78% resolved DM) at 51+12.6 %EWL versus 63+17.2 %EWL (P<0.0001).

Multivariate logistic regression was used to determine independent variables to determine which correlated with Res-DM. % EWL ( p = 0.0023) and hours of exercise per week ( P = 0.0167) were the only signi-
nificant independent variables which correlated with Res-DM. Only 60% of pts with poor weight loss (<33%EWL) had Res-DM. Res-DM increased to 72% in the 159 pts with %EWL between 34 and 66%. Of 102 pts with
>67%EWL, Res-DM increased to 89% (p=0.0005).

Conclusion: Poor weight loss and lack of exercise are major factors which correlate with Non-Res-DM in a large series of pts. Factors such as African-American race did not influence Res-DM despite lower weight loss. Strategies for optimizing % EWL after GB enhance Res-

S117
THE INDEPENDENT PREDICTORS OF WEIGHT LOSS FOR PATIENTS UNDERGOING LAPAROSCOPIC
ADJUSTABLE GASTRIC BANDING, Vafa Shayani MD, Steve
Creech MS Sharif Sarker MD, Loyola University Medical Center
Laparoscopic adjustable gastric banding (LAGB) continues to gain
acceptance as one of the most commonly performed surgical pro-
cedures for treatment of obesity. Attempts have been made to identify the ideal candidates and exclude others based on pre-operative predictive variables. Hereafter, we present our results based on statistical analysis of data for the first 232 patients undergoing LAGB by the same sur-
gon, in a major University.

Between November 2001 and September 2003, 232 LAGB pts were per-
formed in 177 women (76%) and 55 men (24%), ranging from 18 to 71 years of age. All procedures were completed laparoscopically. Pre-
operative BMI ranged from 38 to 60. Early post-operative complications included 1 death from MI, 2 re-hospitalizations for pulmonary embolism and 1early band erosion. In addition, there were 8 repeat operations for
band slippage, 8 others for port complications, 1 for gastric strangu-
lation, 1 cholecystectomy and 1 elective band removal (8% repeat opera-
tion). With follow-up ranging from 6 weeks to 20 months (mean: 7.6 months), weight loss expressed as %EWL lost ranged from 72% to 96%. Univariate analysis of data shows length of follow-up to be the strongest predictor of increasing weight loss (r=0.51; P<0.0001). In addition, there is significantly higher %EBW lost among men (40% vs. 32%, P=0.002). Patients with pre-operative BMI over 60 lost a smaller %EBW than those less than 60 (27% vs. 35% P=0.046). Overall, 53% of the variability in %EWL
was attributed to gender, pre-operative BMI and length of follow-up. %EBW loss is not statistically significantly associated with age.


term follow-up results suggest that LAGB is a safe and effective procedure for weight loss. Statistical models may assist in predicting outcomes for sub-population of patients based on gender and pre-operative BMI. Longer-term follow-up data are necessary to validate conclu-
sions of such statistical models.

S118
CAUSES OF SMALL BOWEL OBSTRUCTION AFTER
LAPAROSCOPIC GASTRIC BYPASS, Richard F Hwang MD,
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Introduction: Small bowel obstruction (SBO) following laparoscopic Roux-en-Y gastric bypass (LRYGB) is not a rare complication, occur-
ing in approximately 3% of patients. The goal of this study was to review the causes and timing of SBO to aid in diagnosis, treatment, and prevention.

Methods: We performed a retrospective review of the records of con-
secutive patients that underwent LRYGB at our center from 4/99 to
7/03. All patients had a laparoscopic hand sewn gastro-jejunostomy
(G-J) and a stapled jejunoojejunostomy (J-J). The Roux limbs were placed retro-colic in the first 405 patients and ante-colic in the next
1,310 patients.

Results: A total of 1,715 patients underwent totally LRYGB at our bariatric center. Fifty-five small bowel obstructions occurred in 51
patients (3%) with a median follow-up of 21 months (1-52 months).

Twenty-seven (7%) of the retro-colic patients compared to 24 (2%) of the ante-colic patients developed SBO (Chi square, P<0.001). The causes of SBO were: obstruction at the J-J from kink or narrowing (15); adhesive bands (14); internal hernia or external compression at the transverse mesocolon (11); internal hernia through the jejunal mesentery (8); incarcerated abdominal wall hernia (4); other (5).

In patients developing SBO in the first 3 weeks after bypass, bowel
resection was required in 19/24 patients compared to 4/31 patients
developing SBO after 3 weeks (Chi square, p<0.001). The
 paralyzed SBO was attributed to gender, pre-operative BMI and length of follow-up. %EBW loss is not statistically significantly associated with age.

The latter group of obstructions were usually due to adhesions or hernias which could be handled laparoscopically without bowel
resection.

The former group of obstructions were usually due to technical problems with the Roux limb and required revision of the
procedure.

The median follow-up for patients with late SBO was 9 months.

2. The position of the Roux limb, retro-colic vs. ante-colic appeared to influence the incidence of developing a small bowel obstruction. In our series, changing the position of the jejunal limb of the bypass from retro-colic to antecolic significantly decreased the overall incidence of small bowel obstruction because it eliminated one of the
most common sites for obstruction, the mesocolon.
**S119**

**LAPAROSCOPIC REVISIONAL BARIATRIC SURGERY: MYTHS AND FACTS,** Ricardo V Cohen MD, Jose S Pinheiro MD, Jose Correa MD, Carlos Schiavon MD, Center for the Surgical Treatment of Morbid Obesity, Hospital Sao Camilo, Sao Paulo, SP, Brazil

**Introduction:** Laparoscopic bariatric surgery is associated with several intra and postoperative risks. Laparoscopic revisional bariatric surgery is related with even higher risks. Should these operations be done?

**Methods:** From August 1999 to August 2003, 31 patients were submitted to a laparoscopic revisional bariatric surgery. Four patients previously submitted to a laparoscopic Roux-en-Y gastric bypass (2 from other Institutions) presented with inadequate weight loss. Diabetes was still present in two and sleep apnea in one. The average time after the first procedure was 24 months. In our own 2 cases, the length of the alimentary limb was increased (100cm from the ileocecal valve) in order to achieve malabsorption. In the 2 outside cases (Fobi procedures) the gastric pouch was reduced, the band removed, the anastomosis redone with a linear stapler (diameter: 1.3 cm), and the alimentary limb was increased. There were 27 conversions of laparoscopic adjustable gastric banding (LAGB) procedures into LRYGB. Inability to lose weight was present in 19 cases. In 4 patients the band had eroded the gastric wall. In 1 patient there was severe esophageal dilatation not responsive to band deflation. Three conversions were due to patient’s decision. The average time after the first operation was 13 months.

**Results:** In the first group of patients (failure of LRYGB), the mean OR time was 30 minutes. In the Fobi procedure cases, adhesions around the pouch band were observed. The mean length of hospital stay was 36 hours. The 2 cases with longer follow-up (12 and 36 months) have a 71% excess weight loss was present in 19 cases. In 4 patients the band had eroded the gastric wall. In 1 patient there was severe esophageal dilatation not responsive to band deflation. Three conversions were due to patient’s decision. The average time after the first operation was 13 months.

**Conclusion:** Laparoscopic reoperative bariatric surgery is safe and effective even though the potential risks are high. Surgery should be considered only by experienced laparoscopic bariatric surgeons.

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**S120**

**BRAZILIAN MULTICENTER STUDY OF THE NEW GASTRIC BALLOON,** José Afonso Sallet MD, João Cae- Tano Marchesini MD, Dyker Santos de Paiva MD, Carlos Eduardo Pizani MD, Keila Kamoto MD, Paulo Clemente Sallet MD, Clínica Sallét

**Background methods:** From November 2.000. to February 2003, 408 obesity patients were treated with this technique. There were 63.4% female and 36.6% males, mean age 38.5 years, 47.9% had BMI < 35 (grad I obesity), 35% BMI<40 (grad II obesity 20%), 25.9%, BMI 40 to 50 (morbid obesity) and 7.3 % had BMI>50 (super obese).

**Results:** The mean excess weight loss was 43.9%. In the overweight, obesity grade I and II the EWL was mean 59%, the morbid obesity group the mean excess weight loss was 39% and in the super obese group it was 25.7%. We considered the method to be successful in 78.4% and failure in 21.6% (lost less than 20% EWL) for the morbidity obesity of patients to preoperative preparation, the reduction in BMI was 1.3 to 22.6 (mean 8.7 kg/m2) the percentage of excess weight loss was 43.9% (+/-29%). Collateral effect: the most significant was nausea and vomiting (42%), predominantly in the first tree days after the placement as the balloon, epigastric pain (20%), dehydration (5%), and severe intolerance (4,1%).

**Complications:** Minor were reflux esophagitis (7%) and symptomatic gastric stasis (6%). Major complications there was in two patients (0.5%): one of them occurred impaction of the balloon against the gastric cavity (0.2%) requiring removal of gastric contents with a 50 Fr probe. There was one case of spontaneous deflation of the balloon (0.2%) with migration to the digestive tract, causing intestinal obstruction and requiring a mini laparotomy. Conclusion: Our results demonstrate that the new intragastric balloon is a transitory non surgical technique which is effective in controlling obesity, permitting the median over 40% of the excess weight loss. There is no risk to mortality and minimal risk of more serious complications.
Posters of Distinction

P001 Ali, Mohamed  “Robot-assisted Laparoscopic Roux-en-y Gastric Bypass”

P002 Cohen, Ricardo  “Comparative Study Of Two Different Linear Staplers In 800 Consecutive Cases Of Laparoscopic Gastric Bypass.”

P003 Jan, Jay  “Concomitant Cholecystectomy Is Not Necessary For Laparoscopic Gastric Bypass Or Laparoscopic Adjustable Gastric Banding - Effective Use Of Ursodeoxycholic Acid”

P004 Kendrick, Michael  “The Increasing Incidence Of Symptomatic Internal Hernia After Laparoscopic Antecolic Gastric Bypass”


P006 Lew, John  “Routine Preoperative Esophageal Manometry Does Not Affect Outcome Of Laparoscopic Adjustable Silicone Gastric Banding”

P007 Torquati, Alfonso  “200 Consecutive Laparoscopic Roux-en-y Gastric Bypasses: Lessons Learned With Three Different Gastro-jejunoanostomy Techniques”

P008 Lyass, Sergey  “Elevated Intra-abdominal Pressure Does Not Effect Small Bowel Perfusion In The Animal Model Of Mesenteric Ischemia”

P009 Novitsky, Yuri  “Decreased Activation Of Peritoneal Macrophages Following Hand-assisted Versus Open Surgery In A Porcine Model”

P010 Kawasaki, Y.  “The Assessment Of Digestive Organs Motility In Patients Undergoing Laparoscopic Colectomy With Hydrogen Breath Test And Radiopaque Marker Method”

P011 Holover, Spencer  “A Six Week Focused Training Program For Minimally Invasive Bariatric Surgery: The Mini-fellowship Concept”

P012 Jaffer, Azul  “A Comparison Of Wound Closure Techniques In Laparoscopic Surgery; Dermabond® Versus Standard Suture Techniques.”

P013 Moore, Derek  “Cost Perspectives Of Laparoscopic And Open Appendectomy”

P014 Albayrak, A  “Design Of An Ergonomic Body Support To Improve The Posture Of Surgeons During Laparoscopic And Open Surgical Procedures”

P015 Gupta, R  “Long Term Outcome Of Laparoscopic Heller’s Myotomy Without An Anti Reflux Procedure”

P016 Carbonell, Alfredo  “Do Patient Or Hospital Demographics Predict Cholecystectomy Outcomes? A Nationwide Study Of 93,578 Patients”

P017 Aggarwal, Sandeep  “Early Versus Delayed Laparoscopic Cholecystectomy For Acute Cholecystitis: A Prospective Randomized Trial”

P018 Chesworth, T  “Does Previous Failed Endoscopic Sphincterotomy Influence Laparoscopic Common Bile Duct Exploration.”

Bariatric Surgery

P025 Ali, Amjad  “Three Years Weight Loss Results Of Roux-en-y Gastric Bypass Surgery In A Bariatric Program At An Urban Public Hospital.”

P026 Assalia, Ahmad  “The Effectiveness Of Laparoscopic Sleeve Gastrectomy Staple Line Reinforcement With Bovine Pericardium: An Experimental Study In Pigs”

P027 Castro, A  “Laparoscopic Adjustable Gastric Banding: Is There A Learning Curve?”

P028 Chopra, Ajay  “Large Hiatal Hernia During Laparoscopic Roux-en-y Gastric Bypass: Should The Hernia Be Repaired?”

P029 Chousleb, Elias  “Routine Use Of Abdominal Drains After Laparoscopic Roux En Y Gastric Bypass. Retrospective Review Of 593 Patients”

P030 Christian, Derick  “A Simple Bedside Evaluation To Detect Gastroesophageal Leaks After Gastric Bypass Surgery”

P031 Court, Olivier  “The Addition Of Sleeve Gastrectomy To Vertical Banded Gastroplasty Improves Outcomes”

P032 El Atar, A  “Early Predictors Of Band Erosion: Eating Behaviour Or Weight Loss Rate?”

P033 Ewing, Douglas  “Factors That Impact Operative Times For Laparoscopic And Open Gastric Bypass”

P035 Barraghan, Bernard  “Marginal Ulceration After Gastric Bypass: Is It Secondary To Technical Error?”

P036 Gallagher, Scott  “Important Considerations In Preventing Anastomotic Failures In Laparoscopic Roux-en-y Gastric Bypass (rygb)”

P037 Gandsas, Alex  “Early Nutritional Status Following Laparoscopic Gastric Bypass”

P038 Gentileschi, Paolo  “Laparoscopic Obesity Surgery Trend In Central Italy: A Poll Of Experts”

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Po45 Kennedy, Colleen “Direct Visual Insertion Of The Primary Trocar In Patients Undergoing The Laparoscopic Roux-en-y Gastric Bypass”

Po46 Khandelwal, Anjay “Retrograde Intussusception After Laparoscopic Roux-en-y Gastric Bypass”

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Po51 Kurian, Marina “Gastrojejunal Anastomosis Using Trans Oral Technique With Flip Top 25 Mm Eea And Nasogastric Tube Combined With Oversewing With Suture.”

Po52 Lacy, A “Laparoscopic Gastric Bypass In Barcelona, Spain”

Po53 Lee, Crystine “Totally Laparoscopic Versus Hand-assisted Duodenal Switch: Results In Fewer Wound-related Complications”

Po54 Lee, Crystine “Isolated Laparoscopic Vertical Sleeve Gastrectomy For Superobese Or High-risk Patients Results In Weight Loss With Minimal Morbidity”

Po55 Lee, Crystine “Totally Laparoscopic Duodenal Switch With Hand-sewn Retrocolic Duodenoenterostomy: Experience With 52 Patients”

Po56 Li, Chris “History Of Cancer: A Contraindication To Laparoscopic Gastric Bypass?”

Po57 Lin, James “Laparoscopic Bariatric Surgery: Choosing The Right Operation”

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Po59 Maru, Sandip “Vitamin B1 Deficiency After Laparoscopic Roux-en-y Gastric Bypass”

Po60 Miranda, Fernando “Intraluminal Bovine Pericardial Strip Erosion And Obstruction After Laparoscopic Roux-en-y Gastric Bypass”

Po61 Mueller, Claudia “Incidence And Treatment Of Gastric Prolapse After Laparoscopic Adjustable Gastric Banding”

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POSTER OF DISTINCTION

ROBOT-ASSISTED LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Mohammed R Ali MD, Bobby Bhasker Rao MD, Bruce Wolfe MD, University of California, Davis

Introduction: Robotic surgery promises to extend the capabilities of the minimally invasive surgeon. We aimed to examine the role of surgical robotics in laparoscopic Roux-en-Y gastric bypass. Methods: The Zeus robotic surgical system was utilized in 50 laparoscopic gastric bypass procedures. Patients were predominantly female (94%) with a mean age of 42 years (26-56) and mean BMI of 41 (32-52). Our learning curve was staged as: closure of jejunal mesentery (JMC) (cases 1-4), JMC + posterior outer layer of gastrojejunoostomy (GJ) (cases 5-12), anterior and posterior outer layer of GJ (cases 13-16), and full GJ (cases 17-50). Robotic setup time, robotic operative time, total operative time, and operative outcomes were prospectively tracked. Results: We observed a significant decrease in the robotic setup time (15.75 min in cases 1-4 vs. 2.36 min in cases 47-50, p=0.001). Our robotic learning curve (figure) illustrates consistent improvement in technique. While not statistically significant, there was a clear trend toward decreased operative time, even as more complex tasks (GJ) were accomplished.

POSTER OF DISTINCTION

COMPARATIVE STUDY OF TWO DIFFERENT LINEAR STAPLERS IN 800 CONSECUTIVE CASES OF LAPAROSCOPIC GASTRIC BYPASS, Ricardo Cohen MD, Carlos A Schiavon MD, Manoel Galvao Neto MD, Almino C Ramos MD, Sao Camilo Hospital and Gastro Obeso Center - Sao Paulo - Brazil

BACKGROUND: Many issues are discussed about lap gastric bypass and one of them is the safety of the lap staplers. This study compares in practical field if there’s a difference between the use of two staplers from different companies in terms of suture line bleeding, digestive bleeding and leak rate.

METHODS: The experience of two Brazilian top lap bariatric surgeons was reviewed and information about possible troubles of stapler use was extracted. By the time of collecting data both surgeons didn’t know the purpose of the study.

RESULTS: In the USCC referral surgeon 400 patients group, there were 301 women (75.2%) with a mean BMI of 44 (27 follow-up, 77% EWL and a mean of 60 min operation time). Around 1600 firings of blue and 800 shots of white cartridges were performed. There were 11 (2.7%) episodes of bleeding in suture line (treated with monopolar cautery), 1 (0.25%) digestive bleeding (clinical treatment), 6 (1.5%) Gastrojejunostomy leakages (1 re-operation and 5 clinical treatments) and one death (0.25%) due to sepsis in re-op patient. In the EES referral surgeon 400 patients group, there were 285 women (69, 5%) with a mean BMI of 44,7 (27 follow-up, 74% EWL and a mean of 72min operation time). Around 1200 shots of blue and 1200 f white cartridges were fired. There were 15 (3.7%) episodes of bleeding in suture line (treated with monopolar cautery in 15 and suture reinforcement in 2), 1 digestive bleeding (clinical treatment), 4 (1%) Gastrojejunostomy leakages (1 re-operation and 3 clinical treatments) and also one death (0.25%) due to sepsis in re-op patient. The statistic show no difference between the groups, except to the numbers of shots of blue and white cartridge and operation time (P>0.05).

The USCC referral surgeon uses antecolic technique and the EES referral surgeon uses the trans meso- pre gastric technique.

CONCLUSION: This comparative study shows the safety and efficiency of both staplers from different companies in hands of experienced lap bariatric surgeons who pass through the learning curve of lap gastric bypass with low rates of complications that can be related to the use of staplers.

POSTER OF DISTINCTION

CONCOMITANT CHOLECYSTECTOMY IS NOT NECESSARY FOR LAPAROSCOPIC GASTRIC BYPASS OR LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING - EFFECTIVE USE OF URSODEOXYCHOLIC ACID, Jay C Ljung MD, Dennis Horning MD, Emma J Patterson MD, Legacy Health System; Portland, OR

Introduction: Because rapid weight loss after bariatric surgery is a known risk factor for gallstone formation, some surgeons recommend prophylactic cholecystectomy or selective cholecystectomy in the presence of cholelithiasis, regardless of biliary symptoms, at the time of weight loss surgery. Previous reports have suggested that ursodeoxycholic acid may prevent gallstone formation in this population. We report the incidence of symptomatic cholelithiasis with the routine use of ursodeoxycholic acid in bariatric surgery patients who did not undergo prophylactic or selective cholecystectomy.

Methods: The medical records of 208 consecutive patients who underwent laparoscopic Roux-en-Y gastric bypass (LRYGB) or adjustable gastric banding (LAGB) by a single surgeon over a 2.5 year period were retrospectively reviewed. Concomitant cholecystectomy was performed only for symptomatic cholelithiasis. 60 patients who had prior cholecystectomy and 8 patients who underwent concomitant cholecystectomy were excluded. The remaining patients were prescribed ursodeoxycholic acid (600 mg/d) for six months during the initial post-operative period. Post-operative development of symptomatic cholelithiasis and subsequent cholecystectomy was noted.

Results: 140 patients were at risk for gallstone formation. 83 patients underwent LRYGB and 57 underwent LAGB. Mean preoperative age and body-mass index (BMI) were 41.8 and 50.3 kg/m2, respectively. 85% were female. Mean follow-up was 55.3 weeks. Mean postoperative percent excess weight loss (EWL) was 51.8%, 8 (5.7%) patients developed symptomatic cholelithiasis (6 LRYGB, 2 LAGB); all underwent uncomplicated cholecystectomy. Age, sex, preoperative BMI, EWL, and type of procedure were not significantly different between post-operative cholelithiasis and non-cholelithiasis groups.

Conclusions: Using a policy of routine post-operative ursodeoxycholic acid and concomitant cholecystectomy only for symptomatic patients, the incidence of post-operative symptomatic cholelithiasis is low. Reserving concomitant cholecystectomy only for symptomatic patients and management with post-operative ursodeoxycholic acid is a reasonable approach to prevent symptomatic cholelithiasis in this high-risk group of patients.

POSTER OF DISTINCTION

THE INCREASING INCIDENCE OF SYMPTOMATIC INTERNAL HERNIA AFTER LAPAROSCOPIC ANTECOLIC GASTRIC BYPASS, Michael L Kendrick MD, Michel Gagner MD, William B Inabnet MD, Emilie Comeau MD, Alfons Pompe MD, Division of Laparoscopic Surgery, Mount Sinai School of Medicine

BACKGROUND: Symptomatic internal hernia after laparoscopic bariatric surgery is considered uncommon. We previously reported an incidence of 3.3% but have recently observed a dramatic increase. Our aim was to more accurately define the incidence of symptomatic internal hernia after laparoscopic antecolic gastric bypass.

METHODS: A retrospective review of all consecutive patients with symptomatic internal hernia after laparoscopic antecolic gastric bypass performed September 1998 to August 2002.

RESULTS: Of 731 patients having undergone laparoscopic antecolic gastric bypass we identified 47 occurrences of symptomatic internal hernia in 45 patients (38 female, 7 male) with a mean age of 35 (18-65) years. Mean BMI (body mass index, kg/m2) decreased from 47 (36-75) to 27 (21-38) prior to diagnosis. Mean interval to diagnosis was 485 (2-1890) days and was identified at Petersen’s defect in 37 (79%). Laparoscopic repair was possible in 41 (87%) patients. Complications occurred in 8 (17%) including 1 mortality (2%). Subsequent to our last report, 23 new occurrences were observed in this patient group in only 8 months, increasing the overall incidence from 3.3% to 6.4%. Four patients (9%) presented with internal hernia despite previous suture closure of all mesenteric defects.

CONCLUSION: Symptomatic internal hernia is more common than previously described. Suture closure of mesenteric defects is recommended but does not eliminate the occurrence of internal hernia. Maintaining a high level of suspicion and prompt intervention is imperative to reduce the morbidity and potential mortality of this complication.
ROUTINE POSTOPERATIVE BARIUM SWALLOW EVALUATION AFTER ROUX-EN-Y GASTRIC BYPASS: IS IT NECESSARY?
Stephen Kolakowski Jr. MD, Matt L Kirkland MD, Alan L Schuricht MD, Department of Surgery, Pennsylvania Hospital, Philadelphia, PA

OBJECTIVE: The purpose of this study was to evaluate the clinical utility of the routine use of postoperative barium swallow for patients undergoing open or laparoscopic roux-en-y gastric bypass to diagnose postoperative complications.

MATERIALS AND METHODS: Four hundred seventeen consecutive patients undergoing roux-en-y gastric bypass at our institution between January 2001 and December 2002 were included. Three hundred forty one open procedures and seventy six laparoscopic gastric bypasses were performed. As per existing hospital protocol, all patients received a limited postoperative fluoroscopic upper gastrointestinal series, except for patients who exceeded the weight limitation of the radiologic equipment. Radiologic findings of anastomotic complications during the study were anastomotic leak, delayed gastric emptying, gastric outlet obstruction and gastrostomy fistula. Clinical signs and symptoms were also evaluated to obtain a list of criteria suggesting these complications. Patients were stratified into two groups: those with and those without radiographic anastomotic complication. Clinical and radiologic criteria were compared using univariate and multivariate logistic regression analysis between the two groups.

RESULTS: During routine postoperative barium swallow evaluation, radiologic abnormalities were noted. Twelve leaks (2.67%), 19 delayed gastric emptying (4.56%), 4 gastric outlet obstructions (0.96%), and 7 gastrostomy fistulas (1.68%) were documented. The combination of fever, tachycardia and tachypnea was most specific indicator for a leak at 0.9971 (95% CL; 0.9907-1.0002) with a likelihood ratio positive of 298.37 (95% CL; 41.42-2149.36). Nausea combined with vomiting was the most predictive indicator for delayed gastric emptying and gastric outlet obstruction with a specificity of 0.8977 (95% CL; 0.9771-0.9984) and 0.9734 (95% CL; 0.9578-0.9889), respectively. There was no clinically significant indicator for a radiographic finding of a gastrostomy fistula.

CONCLUSION: Postoperative complication after roux-en-y gastric bypass surgery are predictable based on the patient’s symptoms. Routine postoperative fluoroscopic upper gastrointestinal series are unnecessary in asymptomatic and uncomplicated patients.

POSTER OF DISTINCTION
P006

ROUTINE PREOPERATIVE ESOPHAGEAL MANOMETRY DOES NOT AFFECT OUTCOME OF LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING, John I Lew MD, Amna Daud MD, Mary F DiGorgi MD, Daniel G Davis* DO, Marc Bessler MD, Center for Obesity Surgery, New York-Presbyterian Hospital and Columbia University, College of Physicians and Surgeons, New York, New York; and Center for Obesity Surgery, Lawrence Hospital*, Bronxville, NY

INTRODUCTION: Laparoscopic adjustable silicone gastric banding (LASGB) for morbid obesity has been provided to long-term weight loss with a low risk of operative complications. Nevertheless, esophageal dilation and dysmotility have been identified complications of LASGB. This study evaluates the clinical benefit of preoperative esophageal manometry in predicting patient outcome after LASGB. METHODS: A review of prospectively collected data on 69 morbidity obese patients who underwent preoperative esophageal manometry prior to LASGB from 02/01 to 02/03 was performed. Aberrant motility, abnormal LES pressures and other nonspecific abnormalities characterized by preoperative manometry defined esophageal dysmotility in these patients. Differences in preoperative GERD symptoms, resolution of GERD postoperatively and band intolerance characterized by moderate to severe emesis at least one time during follow up were reported. ANOVA and T-tests were performed to determine the significance of outcomes. RESULTS: Of the group studied, 14 patients had evidence of esophageal dysmotility determined by preoperative manometry. There were no significant differences in band related complications, weight loss or GERD resolution between LASGB patients with normal manometry compared to those patients with abnormal manometry during follow up.

<table>
<thead>
<tr>
<th>Group</th>
<th>Preop GERD</th>
<th>Postop GERD res</th>
<th>Band intol</th>
<th>6 mos.%EWL</th>
<th>P-Value</th>
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<tbody>
<tr>
<td>Group 1</td>
<td>36%</td>
<td>36%</td>
<td>62%</td>
<td>25%</td>
<td>0.71</td>
</tr>
<tr>
<td>Group 2</td>
<td>36%</td>
<td>36%</td>
<td>62%</td>
<td>25%</td>
<td>0.71</td>
</tr>
<tr>
<td>Group 3</td>
<td>36%</td>
<td>36%</td>
<td>62%</td>
<td>25%</td>
<td>0.71</td>
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</table>

P<0.05 was considered significant

CONCLUSION: Preoperative esophageal manometry is not predictive of outcome after LASGB. Given the cost and patient discomfort, this preoperative procedure is not indicated.

200 CONSECUTIVE LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASSES: LESSONS LEARNED WITH THREE DIFFERENT GASTRO-JEJUNOSTOMY TECHNIQUES
Alfonso Torquati MD, James McDowell MD, Hugh Houston MD, Rami E Lufti MD, William O Richards MD, Vanderbilt University Medical School

The study evaluates outcomes of LRYGB in relation to technical modifications. Methods: 200 consecutive cases were prospectively studied. Preoperative BMI was 48 kg/m² (37-67). Excess weight defined as kg above ideal body weight according to Met Life tables. Cases were divided into 3 consecutive groups (G) according to the gastrojejunostomy (G-J) technique. In G1 (n=60), G-J was made by circular EEA introducing the anvil transorally. In G2 (n=42), G-J was made by passing the anvil trouth a gastrostomy. In G3 (n=98), G-J was performed according to our present technique that involves a linear-stapler. No difference was noted in gender, age, and preoperative BMI between the groups. Results: overall mean hospital stay was 2.7±2.9 days, with no difference between groups. No death occurred. There were 5 open conversions (2.5%): 3 in G1 and 2 in G3 (P=NS). Mean OR time was 233±61 min in G1, 182±45 min in G2, and 143±49 min in G3 (P=0.001). Excess weight loss at 3-month was similar: 38.2±6.6 % in G1, 38.1±1.0 % in G2, and 37.9±7.7 % in G3. Wound infections significantly decreased in G2, 3 after discontinuing transoral passage of the anvil (GP 1). G-J stenosis was the most common complication but its incidence dramatically dropped in G3 after adoption of linear stapling.

POSTER OF DISTINCTION
P008

ELEVATED INTRA-ABDOMINAL PRESSURE DOES NOT EFFECT SMALL BOWEL PERFUSION IN THE ANIMAL MODEL OF MESENTERIC ISCHEMIA, Sergey Lyass MD, Fumihiko Fujita MD, Koji Otusuka MD, Ritu Chopra MD, Matthew Lum MD, Brian Lahmann MD, Edward H Phillips MD, Theodore M Khalili, Center for Minimally Invasive Surgery, Cedars-Sinai Medical Center, Los Angeles, CA

INTRODUCTION: Concern exists that laparoscopic procedures are not safe in patients with low flow states or mesenteric ischemia. The objective of the study was to evaluate the effect of pseudomperitoneum (PnP) on mesenteric blood flow and perfusion of normal and ischemic segments of small bowel. METHODS: Twenty pigs underwent PnP at pressures of 0, 10 and 15 mm Hg. Mesenteric blood flow was measured in the superior mesenteric artery (SMA) and vein (SMV). In the first control group of 10 animals, bowel perfusion was measured at the terminal ileum (TI) and proximal jejunum (PJ). In the second group of 10 animals, bowel perfusion was measured at two different segments of the TI. Ischemia was induced by ligation of the terminal branches of the ileocecal vein until a 50% reduction in perfusion was achieved. Normally perfused ileum was used as a control. Perfusion was measured by Laser Doppler Flowmetry. RESULTS: In the control group, increase of intra-abdominal pressure (IAP) from 0 to 10, and from 10 to 15 mm Hg did not significantly change the blood flow through the SMA and SMV. Increase of IAP from 0 to 10 to 15 mm Hg, also did not affect perfusion at the TI and PJ. In the animals with ischemic bowel segments, increasing IAP from 0 to 10, and from 10 to 15 mm Hg did not change blood flow through the SMA and SMV or perfusion of ischemic or non ischemic bowel. CONCLUSION: Elevated intra-abdominal pressure associated with pneumoperitoneum did not affect bowel perfusion or mesenteric blood flow in ischemic bowel.
Poster of Distinction

**P009**

DECREASED ACTIVATION OF PERITONEAL MACROPHAGES FOLLOWING HAND-ASSISTED VERUS OPEN SURGERY IN A PORCINE MODEL, Yuri W Novitsky MD, Gordie G Kabani MD, Donald R Czemial MD, Suzanne M Wheeler BS, Demetrius E Litwin MD, University of Massachusetts Medical School

Background: Exaggerated activation of peritoneal immunity following major abdominal surgery, as manifested by an increased production of proinflammatory cytokines by the peritoneal macrophages (PM), may lead to a rela-

tive local immunosuppression. Although laparoscopy (L) is known to elicit a significantly less severe inflammatory activation of peritoneal host defenses compared to laparotomy, the effects of the hand-assisted (HA) approach have not been investigated to date. We hypothesized that the HA approach, similarly to L, will result in a decreased activation of PM compared to open (O) surgery.

Materials and Methods: Five O, five HA and four L transabdominal left nephrectomies were performed under general anesthesia in pigs. The ani-
mals were subsequently kept under light inhalational anesthesia for 24 hours. PM were harvested at multiple time points via an intraperitoneal closed suction drain. The production of interleukin-6 (IL-6) and TNF-α by the purified macrophage cultures after ex vivo stimulation with LPS was meas-
ured using a standard ELISA technique. Data are expressed as mean con-
centration of TNF-α (mcg/ml) and IL-6 (pg/ml). Statistical comparison was per-
formed using analysis of variance (ANOVA) and two-tailed t-test, with p<
0.05 considered significant.

Results: There was a significant increase in in-vitro IL-6 and TNF-α produc-
tion by PM over the 24-hour period in all groups. PM isolated from the O group on days 12 and 24 hours produced significantly higher levels of IL-6 when compared to both HA group (104.5 vs 32.6, p=0.02 and 538.4 vs 67.9, p<0.01, respectively) and L group (104.5 vs 34.1, p=0.04 and 538.4 vs 54.1, p<0.001, respectively). Similarly, TNF-α levels were significantly higher in O group as compared to both HA group (2.16 vs 0.73, p=0.03, and 2.70 vs 0.80, p=0.01, respectively) and L group (2.16 vs 0.68, p=0.05 and 2.70 vs
1.12, p=0.03, respectively). There was no significant difference between H and L groups in production of either IL-6 or TNF-α at any time point.

Conclusion: Major abdominal surgery activates peritoneal macrophages which may lead to a local immunosuppression. For the first time, we demon-
strated that hand-assisted approach, similarly to laparoscopy, results in a significantly reduced activation of PM the in the early perioperative period. Overall, in addition to clinical benefits of minimally invasive approach, hand-
assisted surgery can confer an immunologic advantage over laparotomy.

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Poster of Distinction

**P010**

THE ASSESSMENT OF DIGESTIVE ORGANS MOTILITY IN PATIENTS UNDERGOING LAPAROSCOPIC COLEC-
TOMY WITH HYDROGEN BREATH TEST AND RADIOOPAQUE MARKER METHOD, Y. Kawasaki, T. Higuchi MD, K. Otsuka MD, K. Saito MD, Department of Surgery 1, Iwate Medical University

[INTRODUCTION] In general, Laparoscopic Colectomy (LAC) was thought to be less invasive surgery, but there has been no objective evidence about digestive organs motility in the early period after surgery. The aim of this study was to assess the postoperative digestive organs motility with hydrogen breath test (HBT) and radiopaque marker method (RMM). In addition, we investigated the relationship among digestive organs motility and kinds of diet and appropriate starting day to oral intake.

[METHODS AND PROCEDURES] We studied 17 patients who were treated with LAC between September 2002 and April 2003. The HBT to measure hydrogen in expiration was performed with TGA-2000 (TER-
AMED Inc.). Patients took lactulose (0.2g/kg) on first postopera-
tive day, then arrival time to cecum from mouth as Oro-cecal transit
time (OCTT-HBT) was calculated. On the other hand, the RMM to measure OCTT and total digestive organs passage time and large intestine passage time were performed with SITZMARK®/KONGYL Inc.17gas the radioactive rays non-transmission marker. So, these markers were swallowed with lactulose at the same time, and then abdomen X-ray photographs were taken day after day until markers were excreted all.

[RESULTS] There were no postoperative complications in all 17 cases. The median postoperative days of OCTT-HBT was the first day, and that of OCTT-RMM was the second day. The median postoperative days of the large intestine and total digestive organs passage time were the fifth and the sixth day, respectively.

[CONCLUSION] The OCTT-HBT reflected the passage of liquid type diet. On the other hand, the OCTT-RMM reflected passage of solid type diet. Therefore, these data suggested that oral intake with LAC would be able to start at the first postoperative day, in case of liquid type diet.

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Poster of Distinction

**P011**

A SIX WEEK FOCUSED TRAINING PROGRAM FOR MINI-
IMAL INVASIVE BARIATRIC SURGERY: THE MINI-
FELLOWSHIP CONCEPT, Spencer Holover MD, Daniel R Cottam MD, Samer Mattar MD, Suniti Sharma MD, George Eid MD, Ramesh Ramamuthan MD, Omar Dannem MD, Philip Schauer MD, Jeff Lord MD, U of Pittsburgh Dept of Surgery

[INTRODUCTION] We devised a six weeks hands-on training program customized to meet the needs of practicing general surgeons.

[METHODS AND PROCEDURES] We report the participants’ training experience, and the impact of the program on subsequent practice of laparoscopic bariatric sur-
ery.

[RESULTS] Ten surgeons completed training programs from 9/01 to 3/03. None of the trainees had prior experience in laparoscopic bariatric surgery. Program operative experience averaged 47 cases (range 29-66). Trainees integrated into all preoperative and postoperative hospital and outpatient care on the service, including workshops and seminars. Seven graduates are in practice performing laparo-
scopic bariatric surgery, and three are beginning to implement new bariatric surgery programs. Since completion of training, the active surgeons performed an average of 101 laparoscopic bariatric pro-
cedures (range 18-264) over a mean practice period of 10 months (range 4-18).

[CONCLUSIONS] A six week focused mini-fellowship with hands-on operative and clinical participation provides sufficient training volume for practic-
ingsurgeons to acquire the skill and experience necessary to suc-
cessfully implement a practice in laparoscopic bariatric surgery.

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Poster of Distinction

**P012**

A COMPARISON OF WOUND CLOSURE TECHNIQUES IN LAPAROSCOPIC SURGERY; DERMABOND® VERSUS STANDARD SUTURE TECHNIQUES, Azul Jafer MD, Matthew J Tierney DO, Eric Osborne DO, Robert D Fanelli MD, Surgical Specialists of Western New England, PC and Berkshire Medical Center Department of Surgery

Background: 2-Octylcyanoacrylate tissue adhesive (Dermabond®, Ethicon, Inc., Somerville, NJ) is presently being used in various clinical settings for closure of minor lacerations. Few studies have evaluated its use in closing surgical incisions such as 5-mm laparoscopic port sites.

Objective: To compare wound healing outcomes, patient satisfac-
tion, aesthetic results, and incisional pain suffered for different wound closure methods.

Methods: One hundred consecutively created 5-mm laparoscopic port sites incisions made during various minimally invasive surgical procedures were closed using either Dermabond®, a single hori-
zonatal mattress 4-0 Monocryl® (Ethicon, Inc., Somerville, NJ), or a running intracuticular closure with 4-0 Monocryl®. Wound closure methods were randomly assigned by the surgical technologist, and all wounds were dressed using Tegaderm® (3M Company, St. Paul, MN) for 5 days. A standardized data collection form was initi-
atied during surgery and data entered during each postoperative visit by the patient, a registered nurse, and the operating surgeon. Wounds were evaluated for aesthetics, pain, wound complications, and patient and staff satisfaction. Each patient served as his/her own control.

Results: Both Monocryl® closure methods were aesthetically supe-
rior to Dermabond®, according to patients, nurses, and operating surgeons. Running closures were generally ranked higher in satisfac-
tion than single mattress suture closures. Wound complications such as drainage, cellulitis, and purulence were reported more often when Dermabond® had been used. Pain was correlated with incision location and not with the method of closure.

Conclusion: Running intracuticular wound closure using 4-0 Monocryl® achieved superior aesthetic results and the best overall wound healing outcome when compared with horizontal mattress closure and Dermabond®.
Introduction: Despite hundreds of studies comparing laparoscopic (LA) and open appendectomy (OA), there are still questions as to which procedure is clinically and economically superior. We performed a cost analysis employing both institutional (IP) and societal perspectives (SP) to determine the preferred procedure economically.

Methods: Two decision-analytic models were developed to evaluate the clinical and economic outcomes of LA and OA. The IP addressed only direct healthcare costs, while the SP addressed both direct and indirect healthcare costs. Baseline values and ranges were determined from reference sources restricted to trials, meta-analyses, and Medicare databases. Sensitivity analyses were conducted to test model strength and to account for parameter variability.

RESULTS: All surgeons who used the body support considered the body support is being used.

Lack of body supports in the OR appears to play an important role in this surgery related injuries. Surgeons and scrub nurses are exposed to static body postures, which cause physical fatigue and predispose to musculoskeletal injuries. After open surgery, 30 % of surgeons have reported pain and stiffness of shoulders, neck, and lower back.

With the prototype of the ergonomic body support a study has been done. Two laparoscopic and five open surgical procedures are performed with the body support to assess its practical use. A questionnaire was used to record the value of the supports as perceived by the surgeons. Furthermore, electromyography (EMG) was done in five subjects while they performed simulated surgical tasks while using the body supports.

RESULTS: All surgeons who used the body support considered the body supports as comfortable and simple to use. The body support did not obstruct the movements of surgeons. Five out of 7 surgeons would use the supports as comfortable and simple to use. The body support did not obstruct the movements of surgeons.

EMG analysis showed that muscle activity of m. erector spinae had been reduced by 43%, m. obliquus externus by 39%, m. glutaeus medius by 35%, m. gastrocnemius by 59% while using body support.

CONCLUSION: Ergonomic designed body supports can reduce muscle activity during surgery while freedom of movements is not restricted. Further studies are necessary to assess the impact of these body supports on fatigue and occurrence of musculoskeletal injuries.
POSTER OF DISTINCTION

DOES PREVIOUS FAILED ENDOSCOPIC SPHINCTEROTOMY INFLUENCE LAPAROSCOPIC COMMON BILE DUCT EXPLORATION, T J Chesworth BS, M H Thompson MD, Department of Surgery, Southmead Hospital, Bristol, UK

INTRODUCTION

Approximately 10% of attempts at endoscopic sphincterotomy (ES) result in failure. One management option for these patients is laparoscopic common bile duct exploration (LCBDE). We therefore compared the outcome of LCBDE after failed ES with that of primary LCBDE.

PATIENTS AND METHODS

63 patients undergoing LCBDE after failed ES were compared with 213 patients undergoing primary LCBDE. Data were obtained from a prospectively collected database between April 1994 and January 2003. The influence of age, sex, bilirubin, number and size of stones was observed. Duct clearance, conversion, complication rates and post-operative stay were compared.

RESULTS

The failed ES group were older (66.5 vs. 52.9 yrs, p<0.0001) and contained more males (35 vs. 21%, p<0.01). The failed ES group had more post-operative complications (27 vs. 16%), the majority of which were patient rather than procedure related. However once the groups were adjusted for age the outcome difference between the two groups was not significant. There was no difference in duct clearance rates between the two groups (98.4 vs. 97.1%), and no difference in conversion rates or post-operative stay.

CONCLUSION

Failed ES does not influence the success rate of subsequent LCBDE. There is no significant difference in post operative complications once adjusted for age. LCBDE is a safe and effective method of clearing the bile duct after failed ES.

POSTER OF DISTINCTION

EARLY VERSUS DELAYED LAPAROSCOPIC CHOLECYSTECTOMY FOR ACUTE CHOLECYSTITIS: A PROSPECTIVE RANDOMIZED TRIAL, Surendra B Kolla MS, Sandeep Aggarwal MS, Arvind Kumar MS, Rakesh Kumar MD, Sunil Chumber MS, Rajinder Parshad MS, Vallabheru Seenu MS, All India Institute of Medical Sciences, New Delhi, India

BACKGROUND

Laparoscopic cholecystectomy (LC) for acute cholecystitis (AC) is associated with high complications and conversion rates. The aim of this prospective randomized study was to evaluate the safety and feasibility of LC for AC and to compare the results with delayed cholecystectomy.

METHODS

Between January 2001 and November 2002, 40 consecutive patients with a diagnosis of acute cholecystitis were randomly assigned to early LC with in 24 hr of admission (early group, n=20) or initial conservative treatment followed by delayed LC, 6-12 weeks later (delayed group, n=20).

RESULTS

There was no significant difference in conversion rate (early 25 percent versus delayed 25 percent), operating time (early 104 min versus delayed 93 min), postoperative analgesia requirement (5.3 days versus 4.8 days) and postoperative complications (15% versus 20%). However, early group had significantly more blood loss (226 ml versus 114ml) and shorter hospital-stay (4.1 days versus 10.1 days).

CONCLUSIONS

Early LC is safe and feasible for AC with additional benefit of shorter hospital stay. Treating patients with delayed interval cholecystectomy does not offer additional benefit. Early LC should be offered to patients of AC, provided the surgery is done within 72-96 hours of onset of symptoms.

POSTER OF DISTINCTION

CIRRHOSIS IS NOT A CONTRAINDICATION TO LAPAROSCOPIC SURGERY, William S Cobb MD, Alfredo M Carbonell DO, Brent D Matthews MD, B. Todd Heniford MD, Kent W Kercher MD, Carolinas Medical Center, Charlotte, NC

Purpose: This study evaluates the safety and efficacy of laparoscopic procedures on a series of consecutively managed patients with biopsy-proven cirrhosis.

Methods: An IRB-approved, retrospective chart review was performed for all patients with biopsy-proven cirrhosis undergoing laparoscopic surgery between January 2000 and August 2003. Results: Thirty-eight patients with biopsy-proven cirrhosis were treated with laparoscopic surgery for a variety of indications. There were 22 males and 16 females. Mean age of the study population was 52 years (26-80). Average body mass index was 30.2 kg/m2 (18.9-56.4). Classification of cirrhosis was Child’s A in 30 and Child’s B in 8. There were no Child’s C cirrhotics in this study.

Pre-operative MELD scores were 8.7 on average. Laparoscopic procedures were varied and included cholecystectomy (18), splenectomy (13), colectomy (3), diagnostic liver biopsy (2), Nissen fundoplication (1), and Heller myotomy (1). There was one conversion due to adhesions. Mean operative time was 160 minutes (59-265). Estimated blood loss averaged 171 cc (25-950) for all procedures, and 12 patients (32%) required transfusion of blood products. Two patients (5.3%) required transfusion of packed red blood cells (2 units each). Eight patients (21%) required perioperative correction of coagulopathy with fresh frozen plasma (mean 4 units). Eight patients (21%) received intraoperative platelet transfusions (mean 13 units). None experienced postoperative bleeding complications or hepatic decompensation. Post-operative complications included wound infection (5), incisional hernia (1), bacteremia (1), and atrial fibrillation requiring chemical cardioversion (1). Overall morbidity was 21%. There were no deaths. The mean length of hospitalization was 2.7 days (1-9).

Conclusions: While technically challenging due to the frequent co-existence of portal hypertension, varices, and thrombocytopenia, basic as well as advanced laparoscopic procedures can be safely performed in patients with mild to moderate cirrhosis of the liver. When carried out with judicious management of coagulopathy, low perioperative morbidity rates and rapid convalescence can be achieved in this high-risk group of patients.

POSTER OF DISTINCTION

ULTRASOUND ASSESSMENT OF BILE DUCT CLEARANCE AFTER LAPAROSCOPIC EXPLORATION: APPLICATION TO TRANSCYSTIC EXPLORATION, Ian G Finlay BA, S A Norton MD, M H Thompson MD, Department of Minimally Invasive and Upper GI Surgery, Southmead Hospital, Bristol, UK

INTRODUCTION

Laparoscopic transcystic bile duct exploration does not allow a full check choledochoscopy to be performed to detect residual stones after exploration. Laparoscopic ultrasound scanning of the bile ducts may provide a solution. This study aimed to assess its efficacy.

METHODS

Two groups of consecutive patients undergoing post exploration check choledochoscopy followed by ultrasound scanning after bile duct exploration were compared. The first group underwent transcystic exploration (n = 127), and the second a transcystic exploration (n = 41). The rates of missed duct stones were compared.

RESULTS

After transcystic exploration, 3 patients had stones missed by choledochoscopy and seen on ultrasound; a further 5 patients subsequently had stones diagnosed on follow up (negative predictive value = 95.5%). After transcystic exploration no stones were seen on post exploratory ultrasound, and none were found on later follow up (negative predictive value = 100%).

CONCLUSION

Laparoscopic ultrasound is an effective method of checking bile duct clearance, particularly after transcystic exploration.
POSTER OF DISTINCTION

P021
AN ASSESSMENT OF THE FEASIBILITY OF INTRODUCING ADVANCED LAPAROSCOPIC PROCEDURES INTO A COMMUNITY SETTING: A SURVEY OF ONTARIO GENERAL SURGEONS, Monali Meera MD, Forough Farrokhyar PhD, Daniel W Birch MD, Center for Minimal Access Surgery, St Joseph’s Healthcare, Department of Surgery, McMaster University, Hamilton, Ontario, Canada

OBJECTIVES: This study investigates the feasibility of performing advanced minimal access surgery (MAS) in the community setting. Our aim is to determine if barriers exist for the introduction of advanced MAS in community hospital practice. METHODS: We conducted a cross-sectional survey of all community general surgeons currently practicing in Ontario. Descriptive analysis is performed and chi-squared test is used for between group comparisons. RESULTS: Of 475 surveys, the response rate was 54.7%. Of 260 respondents, 203 (78%) are in active community general surgery practice (60% >10 practice), 56.7% reported acquiring their MAS skills while in surgical practice. A high volume (>20 procedures/s) of MAS procedures are completed by 84.9% (cholecystectomy), 20.5% (appendectomy), 12.4% (inguinal hernia), 4% (incisional hernia), 2% (fundoplication), 2.6% (colonectomy) and 0% (splenectomy) of respondents (no significant differences by years of practice or gender). 70% believe it is important to acquire further skills in advanced MAS procedures. The most appropriate methods for learning advanced MAS were believed to be: expert mentoring (72.7%), courses (77.2%) and a colleague mentor (63.9%). 57.6% of respondents have attended a course in MAS while in practice. The majority have access to a wide variety of minimally invasive procedures including 30% laparoscopies (90.1%), endoscopic staplers (86.6%) and video recording capabilities (57.3%). Respondents believe that 57.6% of assistants, 54.8% of nurses and 43.4% of anesthesiologists are relatively inexperienced with advanced MAS. Respondents believe that there are significant barriers to establishing advanced MAS that include: operating room access (50%), resources/equipment (45.2%) and expert mentoring (43.6%). Surgeons with <10 y of practice found trained nursing staff (7.9% vs. 4.2%, p=0.01) and experienced assistants (12% vs. 6.2%, p<0.008) to be more important barriers than those with >10 of practice, respectively. CONCLUSION: The majority of General Surgeons surveyed are self-taught and few perform a high volume of advanced MAS. Only half of general surgeons have access to skilled nursing, assistants, and anesthesiology, however, they perceive the other barriers to introducing advanced MAS procedures to be access to operating rooms, resources/equipment and mentoring. We believe this study has shown significant barriers exist to introducing MAS skills in a community setting, most of which are not easily overcome.

POSTER OF DISTINCTION

P022
THE ROLE OF LAPAROSCOPY IN PENETRATING WOUNDS OF THE ABDOMEN, Raphael S Chung MD, James Whelan MD, Naved Ahmed MD, Huron Hospital, Cleveland Clinic Health System, Ohio

Since negative exploratory laparotomy (EL) for penetrating injuries carries significant morbidity, we investigated prospectively the role of laparoscopy in a defined set of patients with abdominal penetrating wounds, and to determine if laparoscopy is safe, accurate, and more efficient compared with EL.

Method. The criteria for inclusion are: stab and gun shot wounds of the abdomen, including unilateral juxtaocular thoraco-abdominal wounds; stable vital signs; absence of contraindications for laparoscopy, and capacity for informed consent. Diagnostic end points include: identification of peritonum (pp) and or diaphragm, visceral injuries (v), retroperitoneal hematomas if any, and indications for proceeding to EL. When pp was identified, systematic examination of supra-, infra-colic compartments and pelvis was undertaken in all patients using three trocar technique. EL was undertaken for repair of v; or for exploration of unexplained findings. When pp was identified, systematic examination of supra-, infra-colic compartments and pelvis was undertaken in all patients using three trocar technique.

Results. 23 fulfilled study criteria (out of 89 consecutive patients), with Injury Severity Score (ISS) of 20.7±4 for the study group. The indications for proceeding to EL were: identifying penetration of peritoneum (pp); and or wounds, and to determine if laparoscopy is safe, accurate, and more efficient compared with EL.

Results. 23 fulfilled study criteria (out of 89 consecutive patients), with Injury Severity Score (ISS) of 20.7±4 for the study group. The indications for proceeding to EL were: identifying penetration of peritoneum (pp); and or wounds, and to determine if laparoscopy is safe, accurate, and more efficient compared with EL.

Conclusion. Laparoscopy for penetrating abdominal injuries in stable patients was safe, accurate, and reduced LOS when compared with national data base. These results support formal randomized studies comparing laparoscopy and laparotomy for similar patients.

POSTER OF DISTINCTION

P023
EFFECT OF POSITION ON ESOPHAGEAL BOLUS TRANSPORT MEASURED BY MULTICHANNEL INTRALUMINAL IMPEDANCE AND MANOFLUOROMETRY. D Blom MD, R J Mason MD, T R DeMeester MD, N S Balaji MD, J H Perlman MD, Medical College of Wisconsin, Milwaukee, WI, Midway Hospital Medical Center, LA, CA

INTRODUCTION: Various indirect modalities such as endoscopy, videofluoroscopy, manometry, and esophageal acid/bile exposure are used to evaluate esophageal function. Each of these has certain limitations. Multi-channel intraluminal impedance (MII) is a newly developed technology that can be used to directly evaluate esophageal bolus transport. The aim of this study was to use MII to evaluate the effect of body position and therefore the influence of gravity on the direct measurement of esophageal bolus transport as validated by the simultaneous measurement of manofluorometry. METHODS: Ten volunteers, 6 males, 4 females had transnasal esophageal manometry and impedance probes placed. Manometry recording segments were placed at 3, 8, 13, and 18cm, with impedance segments at 1, 3, 5, 7, 13, and 15 cm above the LES. Bolus transport was evaluated using five 5 cc swallows of liquid barium in the prone-oblique and upright positions. Bolus position and contour, as evaluated by fluorometry was synchronized to both manometric pressure and impedance changes, using a specialized impedancemanofluorometry system. Both position was correlated to bolus changes in pressure and impedance at discrete moments in time. Bolus head and tail transport times, bolus transport time (BTT), and contraction wave velocities by manometry (CWV) and impedance (CWV) were measured. The two-sample t-test was used to compare changes in pressure and impedance at discrete moments in time. Bolus head and tail transport times, bolus transport time (BTT), and contraction wave velocities by manometry (CWV) and impedance (CWV) were measured. The two-sample t-test was used to compare changes in pressure and impedance at discrete moments in time.

Conclusions: Body position only affected the speed of the bolus head, gravity influenced the bolus head to fall significantly faster in the upright position. There was no difference between CWVp or CWVh

POSTER OF DISTINCTION

P024
PREVALENCE OF NON-ACID REFLUX FOLLOWING MEDICAL AND SURGICAL TREATMENT OF BARRETT’S ESOPHAGUS, Hugh Houston MD, Alfonso Torquati MD, Rami E Lutfi MD, Joan L Kaiser MS, William O Richards MD, Vanderbilt University Medical School

Barrett’s esophagus (BE) is a major risk factor for esophageal carcinoma. Patients with both acid and nonacid gastroesophageal reflux (GER) have a higher prevalence of BE than those with reflux acid alone. Aim of the study is to evaluate prevalence of acid and nonacid GER following medical and surgical therapy for BE using a new technology: the multichannel intraluminal impedance (MII). Methods: 6 patients with biopsy proven BE were enrolled in the study. All patients underwent manometry and combined 24-h pH-MII study before (while on proton pump inhibitor therapy) and after Nissen fundoplication (off-PPI). A reviewer blinded to the treatments of the patients analyzed the data. In the presence of a liquid GER episode, a fall in pH < 4 was defined as acid GER and anything else was considered nonacid GER. Cases were analyzed for esophageal acid and nonacid exposure, number of acid and nonacid GER episodes, and symptom index (SI) for both acid and nonacid events. A + SI was defined by greater than 50% association between symptoms and GER. Results: Patients after Nissen had a significant reduction of nonacidGER episodes (P=0.001) compared with preoperative levels while on PPI therapy. Both Nissen fundoplication and PPI therapy prevent esophageal acid exposure.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Acid GER</th>
<th>Nonacid GER</th>
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</thead>
<tbody>
<tr>
<td>PreNissen (PPI)</td>
<td>85±48</td>
<td>5±4</td>
</tr>
<tr>
<td>After Nissen</td>
<td>27±26</td>
<td>5±4</td>
</tr>
</tbody>
</table>

% time pH<4.0: 5.5±6.7 vs. 0.6±0.5

Nonacid GER (<0.01) vs. acid GER

Conclusion: Laparoscopic Nissen fundoplication eliminates acid and nonacid GER in patients with BE while, PPI therapy eliminates acid reflux in 2/3 of patients and does not reduce nonacid exposure at all.
**BARIATRIC SURGERY**

**P025**

**THREE YEARS WEIGHT LOSS RESULTS OF ROUX-EN-Y GASTRIC BYPASS SURGERY IN A BARIATRIC PROGRAM AT AN URBAN PUBLIC HOSPITAL.** Amjad Ali MD, Chau Nguyen MD, Valerie Fulbright RN, Jackie Tung BS, Kuda M. Mahani MD, Thomas Augustin MD, University of Missouri Kansas City, School of Medicine.

Introduction: Roux-en-Y (RNY) gastric bypass surgery has emerged as a gold standard for surgical treatment of morbid obesity. The objective of this study is to evaluate if the possible weight loss results can be achieved in a comprehensive bariatric surgery program at RNY gastric bypass at an urban public hospital.

Methods: A prospective database is maintained on all patients undergoing RNY (open and laparoscopic) gastric bypass surgery at Truman Medical Center, a public hospital affiliated with the University of Missouri. Patients undergo extensive preoperative evaluation and psychological counseling. Patients are also strongly encouraged to make life style changes and try to lose 10 lbs before weight loss surgery. Long-term follow-up is emphasized at support group meetings and follow-up visits. Results: 192 patients underwent RNY gastric bypass surgery by a single surgeon at our institution from October 2000 to August 2003. There were 182 (95%) female and 10 (5%) male patients. Average age was 40 years with a range of 19-67 years. Average BMI at presentation was 53.4 with a range of 35-81. 123 (64%) patients underwent open RNY gastric bypass and 69 (36%) underwent laparoscopic RNY gastric bypass. Average weight loss at 3, 6, 9, 12, 18, 24 and 36 months was 30%±17, 51%±15, and 69%±13 respectively. Complications included: leaks 9 patients (4%), bleeding 4 (2%), subdiaphragmatic abscess 1 (0.5%), and death 1 (0.5%). Conclusion: A comprehensive emphasis on life style changes can achieve weight loss results comparable to the duodenal switch operation at 3 years.

**BARIATRIC SURGERY**

**P026**

**THE EFFECTIVENESS OF LAPAROSCOPIC SLEEVE GASTRECTOMY LINE REINFORCEMENT WITH BOVINE PERICARDIUM: AN EXPERIMENTAL STUDY IN PIGS.** Ahmad Assalaij MD, Kaziuki Ueda MD, Federico Cuenca-Abente MD, Tomasz Rogula MD, Michel Gagner MD, Mount Sinai Medical Center, New York, NY

INTRODUCTION: Our aim was to assess the usefulness of Bovine Pericardium strips (Peristrips®) as a buttress in the prevention of complications from the stomach resection line in laparoscopic sleeve gastrectomy (LSG).

METHODS: LSG was carried out in 18 pigs. Resection of the stomach was performed with 4.8mm/ 30mm linear stapler either without (control group - No.= 9) or with Peristrips® (buttress group - No.= 9). Intraoperative blood loss was measured together with various measures undertaken to control bleeding and the change in hemoglobin levels.Leaks were evaluated with Methylene Blue test intraoperatively and then clinically. The animals were sacrificed 2 weeks after surgery and the abdominal cavity was evaluated for fluid collections, adhesions and the burst pressure of the stomach was measured and histopathological study of the staple line was performed. Student t-test was used for statistical analysis.

RESULTS: No leaks were detected in both groups. Internal ulcers in the staple line were seen more frequently in the buttress group (6 vs. 3, Not significant). There was no significant difference between the two groups with regards of operative time (65.3± 14.2, 69.7± 12.8), intraoperative bleeding (9.6± 2.2 ml, 8.2± 1.5ml), post-operative hemoglobin levels (11.3± 1.9gr%, 11.8± 2.2 gr%), and burst pressure (152.6± 23.5 mmHg, 161.2± 15.8 mmHg) for the control and the buttress groups respectively. More intense adhesions and inflammatory response were observed in the buttress group.

CONCLUSIONS: In this experimental model in the pig, the use of Bovine Pericardium as a buttress for the staple line in LSG was feasible and safe, however, it didn’t decrease the occurrence of complications.

**BARIATRIC SURGERY**

**P027**

**LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING: IS THERE A LEARNING CURVE?** A.E. Castro MD, G. Chaudry MD, K. Shapiro MD, G. Ferzli MD, Staten Island University Hospital

INTRODUCTION: Certification for laparoscopic placement of adjustable gastric bands require that surgeons have advanced laparoscopic experience. Despite previous exposure to advanced laparoscopic techniques, there may be a learning curve specific to laparoscopic band placement.

METHODS: Sixty consecutive patients were prospectively separated into two groups: the first 30 patients in whom one surgeon placed the band, and the subsequent 30 patients. Groups were compared with respect to operative time, complications, readmissions and reoperations. RESULTS: Both groups were similar statistically in regards to gender, age and BMI. Operative time in group 1 was 79 (+/-31.1) minutes. There were eleven (37%) complications in 10 patients. Operative time in group 2 was 59 (+/-19.9) minutes. There were two complications (7%). All patients were completed laparoscopically. The learning curve specific to laparoscopic band placement is gradual. Analysis p=0.004. Complications were also significantly lower with a Chi Square analysis of p=0.005. The number of reoperations was also reduced and approached statistical significance with a Chi Square analysis p=0.054. Readmissions, although reduced, were not statistically significant. There were no deaths in either group.

CONCLUSIONS: Despite a surgeon's history of advanced laparoscopic experience, there is a learning curve associated with the laparoscopically placed adjustable gastric band.

**BARIATRIC SURGERY**

**P028**

**LARGE HIATAL HERNIA DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS: SHOULD THE HERNA BE REPAIRED?** Ajay Chopra, MD, Fernando E Miranda MD, Terry K Scarborough MD, Steven L Glorsky MD, Erik B Wilson MD, Staten Island University Hospital, The University of Texas Health Science Center at Houston, Minimally Invasive Surgeons of Texas.

Introduction: The standard approach to a patient with a large hiatal hernia and unretractable gastroesophageal reflux disease (GERD) is to repair the hernia. However, we present a morbidly obese patient with a large type I hiatal hernia and chronic reflux symptoms in whom we performed a laparoscopic Roux-en-Y gastric bypass without repairing the hernia.

Case Report: A 57 year old white female presented with morbid obesity for 10 years and a BMI of 40. Her comorbidities included GERD, hypertension, migraine headaches, osteoarthritis, venous stasis, obesity-hypoventilation syndrome, and anemia. Her reflux symptoms were controlled with proton pump inhibitors. Physical exam was unremarkable except for her morbid obesity.

Preoperative esophagram showed a sliding hiatal hernia with gross reflux. During laparoscopic Roux-en-Y gastric bypass, the gastroesophageal junction was found to be approximately 6 cm above the diaphragm and would not reduce with gentle traction. A 20 cubic centimeter pouch was created without repairing the hernia to avoid devascularizing the pouch. A 100 centimeter Roux-en-Y limb reached the gastric pouch without tension. Postoperative esophagram showed the gastric pouch to be completely above the diaphragm. The patient's GERD symptoms resolved completely after surgery off proton pump inhibitors and there were no complications at 3 month follow-up.

Conclusion: Gastroesophageal reflux disease is a common comorbiditity of morbid obesity and is often related to a hiatal hernia. Controversy exists over whether patients should undergo a hiatal hernia repair during laparoscopic Roux-en-Y Gastric Bypass. This case suggests that the creation of a small gastric pouch is more important than a hiatal hernia repair to prevent reflux in morbidly obese patients.
CONCLUSION: we recommend that bedside FCT be done in all patients seen with FCT.

METHODS: From 06/07/2002 to 9/11/2003, 60 VBG+sleeve gastrectomy (SG) procedures were performed. Highly motivated non-sweet addicted, compliant patients were selected. Data was collected retrospectively using a predetermined data form. The surgical procedure involves placement of three 5 mm ports and one 12 mm port. A standard VBG is performed, with a 7 cm lesser curve pouch, a divided gastroplasty, and a marlex mesh wrapped 1.2 cm outlet. The Greater curvature of the stomach is devascularized using the harmonic scalpel. Sequential application of the endo-GIA stapler are then used to create a lesser curvature thin gastric tube fashioned over a 60 french bougie. The antral staples are 4.8mm thick and body and fundic applications are 3.5 mm thick. Only areas of bleeding or serosal weakness are locally oversewn. No Nasogastric suction is used.

RESULTS: Patient?s mean age was 37 years (range 20 to 61 years). There were 52 women and 8 men, with a mean BMI of 43.3 (range 33.3 to 59.5). Operative time ranged from 58 minutes to 180 minutes and averaged 80 minutes. 38/60 patients were discharged either within a 23-hour observation period. 54/60 patients were discharged within 48 hours. Percent excess weight loss averaged 43%, 52%, 68% at 6, 9, and 12 months post operatively. Longer term weight loss results will require further follow-up. We experienced no staple line leaks, no hernias, no wound infections, no erosions, and no deaths. Patients report a high level of satisfaction with only 12% of patients experiencing short term (<3 weeks) post operative nausea and no increase in GERD symptoms. One patient required band removal for stricture.

CONCLUSIONS: Laparoscopic vertical banded gastroplasty with sleeve gastrectomy can be safely and rapidly performed for the treatment of morbid obesity. Significant weight loss can be observed from this procedure. Candidates for the procedure must be highly motivated. Results for the procedure must be highly motivated. Results are comparable to Gastric Bypass but avoids dumping syndrome, as well as B12 and Iron Malabsorption. Further follow-up is necessary to assess the long-term outcome of these patients.
OBJECTIVE: There is a substantial learning curve which must be overcome by surgeons learning laparoscopic gastric bypass. This learning curve may be defined in terms of mortality, morbidity or by length of operative times. The goal of this study was to compare the operative times of three surgeons performing their initial series of laparoscopic Roux-en-Y gastric bypasses (LRYGB) to each other and to those of open gastric bypass controls. Factors that impacted operative times were also identified.

Methods: Operative times were recorded retrospectively for 159 open gastric bypass, 391 LRYGBs, Surgeon 1, who had no previous experience with LRYGB, performed 393 cases, Surgeon 2, who had completed a laparoscopic fellowship, performed 57 cases, and Surgeon 3, an experienced laparoscopic surgeon, performed 44 cases. Factors that significantly affected the length of surgery were identified by univariate and multivariate linear regression analysis and step-wise logistic regression analysis.

Results: LRYGB and control patients were similar in age, height, weight, and body mass index, though more controls were male. Median operative times were initially comparable to surgeon 1’s initial experience with LRYGB. Patient age, and greater patient weight all correlated with increased operative times were significantly faster for open gastric bypass than for LRYGB. Median operative times for surgeon 1 continuously improved with each subsequent 100 operations from 190 minutes for the first 100 to 100 minutes for the fourth 100. Median operative times for surgeon 2 started significantly faster than for surgeon 1, but did not significantly improve over the course of his first 57 cases. Surgeon 3’s mean operative times were initially comparable to surgeon 1’s initial experience, but his times improved more rapidly with experience. Briefer surgical experience, earlier month in the academic year, older patient age, and greater patient weight all correlated with increased LRYGB operative times for open gastric bypass is faster than that for LRYGB regardless of operation number or patient BMI. However, the learning curve for operative times continued to improve through at least 400 cases. The learning curve for LRYGB was also truncated by laparoscopic fellowship training and previous laparoscopic experience.

CONCLUSIONS: The median operative time for open gastric bypass is significantly decreased using just a small technical adjustment: formation of smaller pouch (<30ml) not only achieves satisfactory weight loss but also significantly reduces the risk of marginal ulceration complications.
EARLY NUTRITIONAL STATUS FOLLOWING LAPAROSCOPIC GASTRIC BYPASS, Alex Gandsas MD, Katherine McIntire MD,Gina Adrales MD,Tonya Carter RN, University Of Kentucky

Postoperative protein deficiency is a significant potential late complication of gastric bypass, which, untreated, can result in severe metabolic disorder. Close biochemical nutritional monitoring and early intervention is thus recommended during the postoperative period. This study describes the postoperative nutritional status of laparoscopic gastric bypass patients at our institution.

The study group consisted of 81 patients (77 females and 4 males) with an average preoperative body mass index of 50 kg/m² who underwent laparoscopic gastric bypass between March 2001 and July 2002. Excess weight loss was recorded at 1, 3, 6 and 9 months postoperatively along with four indicators of nutritional status: serum pre-albumin, serum transferrin, serum albumin and serum total protein.

The average percent excess weight loss was 21%, 39%, 54%, and 71% at 1, 3, 6 and 9 months respectively. At all data collection time points, the largest proportion of patients were deficient in serum pre-albumin (52%, 36%, 48% and 20%) as compared to deficiencies in serum transferrin (19%, 7%, 6% and 5%), serum albumin (17%, 14%, 15% and 10%) and serum total protein (8%, 7%, 9% and 5%). The highest percentage of patients demonstrated low serum pre-albumin at the 1 month (52%) and 6 month (48%) postoperative visits. All deficiencies were successfully treated with oral protein supplementation.

In order to accomplish early detection and treatment of protein deficiency following gastric bypass, we suggest regular screening of serum pre-albumin during each postoperative visit as serum transferrin and serum albumin alone may fail to identify the patient on the road to hypoproteinemia.

LAPAROSCOPIC OBESITY SURGERY TREND IN CENTRAL ITALY: A POLL OF EXPERTS, Paolo Gentileschi MD, Pierpaolo Sileni MD,Nicola Di Lorenzo MD,Domenico Benavoli MD,Achille L Gaspari MD, Department of Surgery, University of Rome Tor Vergata

Objective: Morbid obesity in Italy is traditionally treated by gastric banding or bilipancreatic diversion. With the aim of evaluating recent trends in this field, a televoting meeting was organized with obesity surgeons from central Italy. Methods: Forty-two obesity surgeons were invited. Surgeons received a remote-control to vote. Ten questions were prepared concerning indications, personal practice, surgical approach, type of procedure, and results. Five minutes for each question were left to vote and results were commented only at the end of the meeting.

Results: Thirty-eight surgeons attended the meeting (90.5%). Surgery was recommended for BMI>40 or BMI>35 with co-morbidities by 26 surgeons (68.4%) and for BMI>35 by 12 (31.6%). Seventeen surgeons (44.7%) had a practice of more than 50 cases per year and 21 (55.3%) of more than 100 cases per year. Preferred operation was laparoscopic adjustable gastric banding (LAGB) for 10 surgeons (26.3%), laparoscopic Roux-en-Y gastric by-pass (LRYGB) for 7 (18.4%), open bilipancreatic diversion (BPD) for 5 (13.2%), laparoscopic BPD for 1 (2.6%), while for 15 surgeons (39.5%) the operation was chosen according to patient BMI. In cases of revision, the laparoscopic approach was always attempted by 15 surgeons (39.5%), while a direct open approach was preferred by 23 surgeons (60.5%). High reported variety of results with LAGB was due to a real poor effectiveness of the procedure for 22 surgeons (57.9%), to the quality and length of follow-up for 13 (34.2%), and to the different geographical eating behavior for 3 (7.9%). BPD (among the 29 surgeons who never performed it) was not considered for its high surgical morbidity and mortality by 4 surgeons (13.8%), for its technical difficulty by 2 (6.9%), for its metabolic consequences by 14 (48.3%), for all the previous reasons by 9 (31%). Finally, animal studies in obesity surgery were considered mandatory by 22 surgeons (57.9%), useful by 12 (31.6%), useless by 4 (10.5%).

Conclusions: Obesity surgery is extremely popular in central Italy, with at least 21 surgeons with a practice of more than 100 cases per year. LAGB is still the procedure of choice, with a recent increase in the use of LRYGB, previously not reported at all. Open surgery is still preferred for revision by the majority of surgeons. A further diffusion of BPD seems prevented by the fear of surgical and long-term morbidity and mortality rates.
### BARIATRIC SURGERY

**P041**

**LAPAROSCOPIC GASTRIC BYPASS WITH AND WITHOUT SILASTIC RING REINFORCEMENT; NO DIFFERENCE IN EARLY RESULTS.**

Jeffrey K Hannon MD, L. Lamar Snow MD, L. Steve Weinstein MD, Daniel R Lane MD, Forrest G Ringold MD, Raggy A Hansen MD, Department of Surgery, University of South Alabama College of Medicine and Mobile Infirmary Medical Center, Mobile, Alabama

Introduction: This study investigates the difference in early outcomes of patients with and without silastic rings placed during laparoscopic Roux-en-Y gastric bypass (LRYGBP). Placement of a restrictive band about the gastric pouch during gastric bypass has been reported to aid in maintaining weight loss in long-term follow-up. Adding this step to LRYGBP is worthwhile if not associated with increased early morbidity.

Methods: LRYGBP was performed with and without placement of a 6.5cm silastic ring determined by surgeon preference in 675 patients from March 2002 through May 2003. A retrospective chart review was performed on 516 LRYGBP without ring placement (mean age 41, mean weight 300 lbs), and 159 LRYGBP with silastic ring placement (mean age 39, mean weight 294.5 lbs.). A one-way analysis of variance (ANOVA) was used to compare differences between the two groups on the dependent variables of age, pre-surgery weight, blood transfusions, blood loss, length of surgery, length of hospital stay, blood loss, overall complications, readmissions, and post-surgery weight loss up to one year.

Results: Significant differences were found with length of surgery and number of post-op days before a readmission. The frequency of post-surgery complications and readmissions between each group were further analyzed using a Chi-square test. No other significant difference between the groups was found in this analysis.

Conclusion: In summary, the comparison of these two groups with and without silastic ring placement revealed no significant difference in patient outcome for length of hospital stay, blood loss during surgery, overall complications, readmissions, or weight loss up to one year.

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### BARIATRIC SURGERY

**P042**

**EXPERIENCE WITH 500 LAP-BAND® PATIENTS IN THE UNITED STATES.**

Mary F Hewitt MD, Elizabeth E Half MD, Spivak Hadar MD, Park-Plaza General Hospital, Houston, Texas, and San Jacinto Methodist, Baytown, Texas.

Background: This study examines the outcome of 500 patients who underwent LAP-BAND surgery in the United States with up to 30 months follow-up.

Methods: Between November 2000 and September 2003, 500 patients (432 women) underwent LAP-BAND System placement in the Houston, Texas, area. Data were collected in a prospective manner; 90% of patients received follow-up. The mean age of patients was 42 years (18-63); mean preoperative body weight was 123 kg (93-192).

Results: The mean body mass index (BMI) decreased from a baseline of 45.2 (35-68) kg/m² to 39.2 (n=228), 37.4 (n=102), 35.6 (n=29) kg/m² at 6, 12, 18, 24, and 30 months after surgery, respectively. Mean excess weight loss was 36% at 12 months and 47% at 30 months. No deaths occurred; 3 patients required conversions to open procedures and 1 procedure was aborted.

Complications: 12 (2.4%) gastric slippage and 1 (0.2%) band erosion occurred; 3 patients (0.6%) had postoperative stoma obstruction. There were 31 cases (6.2%) of gastric pouch or esophageal dilation, which were treated conservatively with short-term band deflation; 4 cases (0.8%) of atelectasis/pneumonia; and 2 cases (0.4%) of pulmonary emboli. During the early stage of this series, 25 patients (5%) required minor surgery for broken or flapped access ports. A total of 6 bands (1.2%) had to be removed due to complications; 3 of these cases were converted to gastric bypass. The mean hospital stay was 1 day (0-7). The majority of patients required more than 3 band adjustments (generally an in-office procedure) during the first year after surgery. A small amount of normal saline (a few tenths of a cc) was found to slowly and continuously escape from the bands in the majority of patients.

Conclusion: In this study (with up to 30 months of follow-up), the LAP-BAND System was found to provide weight-loss results. Complications associated with the LAP-BAND are generally minor compared with those seen with other more aggressive weight-loss procedures.

### BARIATRIC SURGERY

**P043**

**OUTPATIENT LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING: A SINGLE INSTITUTION EXPERIENCE.**

Santiago Morgan MD, Enrique Ellii MD, Garth Jacobsen MD, Lyn Knoblock MD, Marcia Edison PhD, Robert Berger MD, Minimally Invasive Surgery Center, University of Illinois at Chicago College of Medicine

Introduction: The purpose of this paper is to report our initial experience with the laparoscopic adjustable gastric banding as an outpatient procedure.

Methods: Between March 2001 and August of 2002, 125 adjustable gastric banding cases were performed, 35 (27%) cases were done as an outpatient procedure. Prospective data for complications, BMI, co-morbidities and indications for outpatient procedure were collected. Of these outpatient, thirty-one were women, the average age was 43.5 years, and the average BMI was 42 (range 36-752). Attention was paid to patient's co-morbidities; only patients with well controlled co-morbidities were selected for outpatient surgery. Specifically, patients with sleep apnea requiring CPAP, a history of multiple open procedures, BMI higher than 55, and those older than 65 years were excluded for outpatient procedures.

Results: Twenty-six patients underwent a conventional laparoscopic approach while nine were done robotically. There were no conversions to an open procedure. Total operating room time averaged 75 minutes. Complications occurred in 3 patients (8.5%); one patient was re-admitted for abdominal pain, one was admitted to the hospital for stoma obstruction, and one band was removed four months after surgery due to patient intolerance. Length of stay has averaged 0.4 days. There were no intraoperative or perioperative deaths.

Conclusions: With careful attention to patient co-morbidities, adjustable gastric banding can be done safely as an outpatient procedure with little morbidity and no mortality.

### BARIATRIC SURGERY

**P044**

**BLADELESS TROCAR USE ELIMINATES THE NEED FOR FASCIAL CLOSURE IN PATIENTS UNDERGOING THE ROUX-EN-Y GASTRIC BYPASS, Colleen J Kennedy MD, Samuel Szomstein MD, Emanuele Lo Menzo MD, David Podkameni MD, Mark A Liberman MD, Raaj J Rosenthal MD, Section of Minimally Invasive Surgery and Bariatric Institute, Cleveland Clinic Florida.

We investigated the use of 12 mm bladeless trocars in patients undergoing the laparoscopic gastric bypass to eliminate the need for fascial closure at the 12 mm laparoscopic port sites. The complication of Richter hernias at laparoscopic port sites is reported at rates of 1-3% in the literature. While the use of dilating trocars has become more popular in recent years there has been no publications to date discussing this technique in the morbidly obese population.

Methods and Procedures: 3 surgeons at two institutions performed 648 gastric bypass procedures over 3 years. 633 procedures were completed laparoscopically. The average BMI of the patients was 55 kg/m². For 619 procedures the ENDOPATH Bladless Trocar with visual entry system was used to access the abdomen. The remaining 12 mm ports were placed under direct vision with the ENDOPATH bladeless trocar. With use of the visual entry system technique, the fascia was not closed at any port sites. The total number of 12 mm ports without fascial closure was 3744. Patients were followed post op for symptoms of obstruction or pain at port sites and examined for hernias at 2 weeks, 6 weeks, 6 months, 1 year and 2 years.

Results: Follow up was from 1 to 24 months with a mean follow up of 10 months with 74% of patients retained. No patients developed a trochar site hernia.

Conclusion: The nonclosure of dilating trochar sites is a safe technique without increase incidence of incisional hernia when compared to reported incisional hernia rates of 1-3% with traditional fascial closure. Although this technique appears to eliminate the need for a difficult and time consuming fascial closure in the morbidly obese population, future follow up is warranted.
BARIATRIC SURGERY  

DIRECT VISUAL INSERTION OF THE PRIMARY TROCAR IN PATIENTS UNDERGOING THE LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Colleen I Kennedy MD, Samuel Szomstein MD, Emmanuel LoMenzo MD, David Podkameni MD, Mark A Liberman MD, Paul J Rosenthal MD. Section of Minimally Invasive Surgery and Bariatric Institute, Cleveland Clinic Florida

Obtaining access to the peritoneal cavity during laparoscopic procedures has inherent risks and difficulties. The use of the veress needle for access to the peritoneal cavity has shown to be at higher risk for bowel and vascular injuries while the open technique is time consuming and with risk of bowel injury as well as incisional hernia post operatively. These problems are amplified in the morbidly obese population. We investigated the safety and ease of using the direct visual insertion technique for insertion of the primary trocar during the Roux-N-Y gastric bypass.

Methods and Procedures: 3 surgeons at two institutions performed 648 gastric bypass procedures over 3 years. 633 procedures were completed laparoscopically. The average BMI of the patients was 55 kg/m2. For 619 procedures the ENDOPATH Bladeless Trocar with visual entry system was used to access the abdomen.

Interoperative and postoperative complications of bowel and vascular injury, wound infection, and incisional hernia were evaluated. Patients were examined at 2 weeks, 6 weeks, 6 months, 1 year and 2 years postoperatively. A review of prospectively collected data was performed.

Results: Follow up was from 1-24 months with a mean follow up of 10 months. 74% of patients There were no interoperative bowel or vascular injuries noted. The incidence of incisional hernia was 0%, wound infection 3.6 %, and hematoma at the port site 0.35%.

Conclusion: This is the first series describing the use of the direct visual access technique in the morbidly obese population. The optical access trocar allows a safe and quick technique for placement of the primary trocar in obese patients. This has become our standard method for accessing the abdomen in patients undergoing the roux-n-y gastric bypass.

BARIATRIC SURGERY

RETROGRADE INTUSSUSCEPTION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Anjay K Khandelwal MD, Justin Boccardo MD, D'arcy Duke MD, Temple University/Cornsmough Memorial Medical Center

Bowel obstruction is a known complication of Roux-en-Y gastric bypass, of which an intussusception may be the underlying pathology. Retrograde or anti-peristaltic intussusception are relatively unusual, and presentation in a patient who has undergone a Roux-en-Y gastric bypass has only been reported in several patients.

We present a 36 year old female who underwent a laparoscopic Roux-en-Y gastric bypass two years prior to presentation at an outside facility, who subsequently presented with signs and symptoms of a small bowel obstruction. A CT scan demonstrated clear evidence of a jejunojejunal intussusception with significant distal dilation of the gastric remnant. She underwent an exploratory laparotomy that revealed an 80 cm retrograde intussusception into the biliary-pancreatic limb with viable bowel, that was successfully reduced, and the biliary-pancreatic limb was plicated to the Roux limb and distal jejunum.

To our knowledge, this is the first reported case of a retrograde intussusception after a laparoscopic gastric bypass. There are several theories of the etiology of retrograde intussusceptions with altered and abnormal motility being the most accepted, as most cases have been seen in previous gastric resections with gastrojejunostomies. We speculate that this patient may have developed an intussusception secondary to the lack of an anchoring suture between the biliary-pancreatic limb and distal jejunum.

The management of these cases are surgical and include the possibility of a bowel resection. With the increased numbers of laparoscopic gastric bypasses being performed, this potential late complication must be kept in mind.

BARIATRIC SURGERY

ANTECOLIC ROUX-Y GASTRIC BYPASS FOR MORBID OBESITY IS ASSOCIATED WITH SHORTER OPERATIVE TIMES AND FEWER INTERNAL HERNIAS. Jennfer A Kieran MD, Bassem Y Safadi MD, John M Morton MD, Gloria Hsu, Myriam J Curet MD, Stanford University, Stanford,CA and VA Palo Alto Health Care System, Palo Alto, CA

Introduction: There is no consensus on the optimal technique for Laparoscopic Roux-Y. Gastric Bypass (LRYGB). There is a 3-5% internal hernia rate with retrocolic (RC) roux limb formation. Antecolic (AC) roux limb formation is thought to lead to more anastomotic tension and subsequent stricture, but that claim has not been substantiated. The purpose of this study was to compare results of LRYGB using the two different techniques.

Methods and Procedures: 109 consecutive LRYGB performed by the same surgeons at two hospitals over a 13 month period. 37% had RC roux limb and 63% had AC roux limb. Most RC operations were performed early in this series. Patient data were collected retrospectively and included: demographics, pre-operative BMI, operative times, anastomotic leak rate, bowel obstruction from internal hernia, and gastrojejunostomy stricture rate.

Results:

<table>
<thead>
<tr>
<th>Data</th>
<th>Retrocolic (n=40)</th>
<th>Antecolic (n=69)</th>
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</thead>
<tbody>
<tr>
<td>Length of Stay (LOS) (days)</td>
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</tr>
<tr>
<td>Pre-Operative BMI (kg/m2)</td>
<td>45.1</td>
<td>41.0</td>
<td>0.01</td>
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<tr>
<td>Operative Time (min)</td>
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<td>250</td>
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<tr>
<td>Anastomotic Leak</td>
<td>0</td>
<td>1 (1.5%)</td>
<td>0.03</td>
</tr>
<tr>
<td>Incisional Hernia</td>
<td>10</td>
<td>5</td>
<td>0.05</td>
</tr>
<tr>
<td>Sub-total</td>
<td>7.8</td>
<td>9.0</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Conclusions: AC construction of LRYGB led to significantly shorter operative time and fewer internal hernias without a change in stricture rate. Although the operative time reduction may have been related to surgeon learning curve, the AC LRYGB can be more feasible technically than RC LRYGB.

BARIATRIC SURGERY

PREDICTORS OF EARLY DISCHARGE AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Andrew W Knott MD, Calvin A Selwyn MD, Keith S Gersin MD, Department of Surgery, University of Cincinnati College of Medicine

Objective: With the advent of laparoscopic Roux-en-Y gastric bypass (LRYGB), the length of hospital stay has steadily decreased as compared to open procedures. The purpose of the present study was to determine the contributing factors and safety of early discharge 24 hours after LRYGB.

Methods: We retrospectively reviewed 134 consecutive LRYGB patients from February 2002 to June 2003. LRYGB was performed in an antecolic-antegastroic fashion followed by intraoperative EGD and saline submersion to assess pouch integrity. A barium swallow was performed on post-operative day one, and if normal, each patient was started on a pureed diet and transitioned to oral narcotics. Criteria for early discharge included normal EGD and barium study, adequate pain control with oral medications, sufficient mobilization and pulmonary toilet. Demographic data surveyed included length of stay, operative time, associated comorbidities, body mass index (BMI), patient age at time of operation, and post-operative complications.

Results: Over the period, average length of stay for all patients was 2.5 days. Eleven patients (8%) were discharged within 24 hours of operation. However, 91 LRYGB were performed before the first patient was offered early discharge. Thereafter, 10 of the next 43 patients (23%) were discharged on the first postoperative day. Operative time was significantly shorter in those patients discharged early (103 minutes early vs 145 minutes late, p=0.006). Although not statistically significant, patients discharged early had fewer associated comorbidities (2/7 early vs 3.3 late, p=0.2) and lower BMI (45.2 early vs 48.7 late, p=0.07).

There was no statistical difference in patient age between the two groups. No patient in the early group experienced a major complication. There were no mortalities in either group.

Conclusions: Operative time was significantly less in those patients discharged early, partly because of increased experience of the operating surgeons over the study period. BMI, age, and associated comorbidities were not statistically significant predictors of early discharge, although there was a tendency of patients with a lower BMI to have shorter LOS (p=0.07). Early discharge within 24 hours after LRYGB can be safely performed in selected patients without additional morbidity and mortality.

http://www.sages.org/
BARIATRIC SURGERY

P049
IMPACT OF FELLOWSHIP TRAINING ON LAPAROSCOPIC GASTRIC BYPASS OUTCOMES, Shanu N Kothari MD, William C Boyd MD, Christopher A Larson, Heather Gustafson, Shana Hussin, Jennifer Larson, Pamela J Lambert RN, Michelle A Mathiason MS, Department of Surgery, Gunderson Lutheran, La Crosse, Wisconsin

Introduction: Year-long fellowships in advanced laparoscopy with emphasis in laparoscopic gastric bypass (LGB) are available for obtaining experience in performing LGB. Methods: All procedures were performed by a single surgeon (SNK) upon completion of a year-long fellowship in advanced laparoscopy. All patients underwent a retrocolic, retrogastric bypass utilizing the linear stapled technique for the gastrojejunostomy. Outcomes measured included length of stay, length of operation, complications, and percentage excess weight loss. Results were compared to current benchmarks in the literature.

Results:

<table>
<thead>
<tr>
<th>Author</th>
<th>N</th>
<th>Mean IBW (lbs)</th>
<th>Mean OR time (mins)</th>
<th>Mean LOS (days)</th>
<th>Mean % Excess Weight Loss</th>
<th>Internal Hernia</th>
<th>Leak Rate</th>
<th>Mortality</th>
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<tbody>
<tr>
<td>Wittenberg</td>
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<tr>
<td>Abbo</td>
<td>91</td>
<td>60.5</td>
<td>1.1</td>
<td>0.2</td>
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<tr>
<td>Debyari</td>
<td>51</td>
<td>40.3</td>
<td>2.7</td>
<td>1.0</td>
<td>5.1</td>
<td>0.1</td>
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</tr>
<tr>
<td>Kothari</td>
<td>150</td>
<td>148</td>
<td>2.2</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusions: Fellowships in advanced laparoscopy with emphasis in LGB provide the optimal training environment for acquisition of skills necessary to safely and effectively perform LGB. Upon completion, results equal to or better than current benchmarks can be achieved without a period of higher complications (the learning curve).

BARIATRIC SURGERY

P051
GASTROJEJUNAL ANASTOMOSIS USING TRANS ORAL TECHNIQUE WITH FLIP TOP 25 MM EEA AND NASOGASTRIC TUBE COMBINED WITH OVERSEWING WITH SUTURE, Marina Kurian MD, Mitchell Roslin MD, Lenox Hill Hospital

Introduction: The gastrojejunal anastomosis remains one of the most technically challenging and least forgiving parts of laparoscopic gastric bypass. Anastomotic leakage can cause considerable morbidity and death.

Methods: Between December 2000 until present we have performed 542 laparoscopic gastric bypass operations. Insertion of US surgical 25mm flip top EEA anvil via nasogastric tube was performed in 538 of 542 cases. In four cases there was difficulty in insertion and two were performed with linear stapler and the other two with transabdominal anvil insertion. All cases after the first 19 were reinforced with a minimum of three 2-0 silk sutures. All attachments were checked by inserting an NG tube, occluding the roux limb and inserting 60cc of methylene blue. The anastomosis was visualized inspected until there was good distention of the roux limb. Further sutures were placed if there was any extravasation. The circular stapler was extracted from the port site surrounded by a plastic sheath.

Results: Trans oral placement was able to be done in 538 cases. Two anvils needed to be retrieved endoscopically, one that was stuck the other that detached. There were no esophageal injuries or perforations. Prior to overseeing we had one anastomotic leak that presented in a delayed manner. In the last 523 cases we have had no anastomotic leaks. Of significance with our circling stapling techniques we have had a 6.3 percent stricture rate requiring endoscopic dilation and 4.8 percent wound complication rate.

Conclusions: The trans oral flip anvil technique combined with overseeing provides a secure anastomosis that gives a fixed outlet diameter. The technique is safe, expedient and reproducible and we have had no incidence of esophageal trauma or perforation. Both strictures and the small port site infections are usually simply dealt with.

BARIATRIC SURGERY

P052
LAPAROSCOPIC GASTRIC BYPASS IN BARCELONA, SPAIN, A M Lacy MD, S Delgado MD, D Mombidan MD, H Rivas MD, J L Martinez MD, J Vidal MD, Obesity Surgery Unit, Department of Gastrointestinal Surgery, Institut de Malalties Digestives, Hospital Clinic, University of Barcelona.

Introduction: Morbid obesity is a major public health problem not only in the US but also throughout the world. In Spain 13% of the population is obese, and 1.5% is morbidly obese. Our aim is to evaluate the results of a large number of patients undergoing laparoscopic proximal Roux-N-Y gastric bypass (LRYGB) for the treatment of morbid obesity at the Hospital Clinic of Barcelona.

Materials and methods: From September, 1999 to May 2003, all patients who underwent a LRYGB for morbid obesity were included in our study.

Results: We performed 203 laparoscopic LRYGBs. Fifty-five patients were men and 148 women, with a mean age of 40.4 years (16-66). The mean body mass index (BMI) was 47.7 Kg/m2 (32-74.5). Thirty-two percent of patients had previous abdominal surgeries. All operations were completed laparoscopically, and only in five cases a hand-assisted technique was needed. Mean operative time (OT) was 131±39 minutes (60-285); median OT was 125 minutes. Mean postoperative stay was 3.8 days (1.5-15). Early morbidity was 16%. Fifteen patients had late complications (7.4%), and the mean follow-up time was 14 months (4-50), and mortality was 0.5%. Ten patients required re-operation (4.9%), all of which were laparoscopic. The median excess body weight loss (EBWL) was 37.5%, 53.3% and 64.6% at 3, 6, and 12 months respectively.

Conclusions: Laparoscopic R-N-Y Gastric Bypass has optimal results regarding EBWL, with a low morbidity and mortality. Results seem as good as those published in other series. LRYGB is safe and reproducible; however a long learning curve is required.

BARIATRIC SURGERY

P053
TOTALY LAPAROSCOPIC VERSUS HAND-ASSISTED DUODENAL SWITCH: RESULTS IN FEWER WOUND-RELATED COMPLICATIONS, Crystine M Lee MD, John J Peng MD, Paul T Cirangle MD, Gregg H Jossart MD, California Pacific Medical Center.

INTRODUCTION: The laparoscopic duodenal switch operation (DS) is a technically challenging operation that can be facilitated by the hand-assist technique. We hypothesized that the use of a hand-port, which requires a 7-10 cm incision, would increase the number of wound-related complications compared to the totally laparoscopic technique.

METHODS: A retrospective comparison of both preoperative and outcome data after totally laparoscopic DS (using 6-9 trocars) and hand-assisted DS (using a GelPort®) was performed.

RESULTS: Between November 2001 and August 2003, 51 LAP and 49 HAND were performed. The mean age in the LAP and HAND groups were 41±8 years and 44±9 years, respectively. Wound-related complications occurred in 0 (0%) LAP and 20 (41%) HAND patients (P<0.0001). Of the 49 HAND patients, 4 (8.2%) got cellulitis, 4 (8.2%) had seromas and 12 (24.5%) developed hernias, all at the GelPort® site.

CONCLUSIONS: The technically difficult DS operation can be facilitated by use of the hand-assisted laparoscopic technique but can result in a significant incidence of wound-related complications, which in our series occurred exclusively at the GelPort® site. Elimination of the larger Gelport® incision by performing the DS in a totally laparoscopic manner resulted in no wound complications.
**BARIATRIC SURGERY**

**P054**

**ISOLATED LAPAROSCOPIC VERTICAL SLEEVE GASTRECTOMY FOR SUPEROBESO OR HIGH-RISK PATIENTS RESULTS IN WEIGHT LOSS WITH MINIMAL MORTALITY**

Cristy M Lee MD, John J Feng MD, Paul T Cirangle MD, Gregg H Jossart MD, California Pacific Medical Center

**INTRODUCTION:** Paradoxically, the patients who most need the technically difficult laparoscopic duodenal switch (DS) to achieve adequate weight loss are superobese patients who are at the highest operative risk. Performing just the restrictive component of the DS, an isolated laparoscopic vertical sleeve gastrectomy (VSG), is a lower risk option for this group of patients.

**METHODS:** VSG was performed in either superobese patients (BMI > 60 kg/m2) or those of high operative risk (significant cardiac/pulmonary disease). By stapling along a 32 Fr bougie, a greater curvature gastrectomy is performed to create a 60-80 ml gastric tube. Bovine pericardium Peristrips® were used to buttress the staple-line for diabetic patients or if there was staple-line bleeding.

**RESULTS:** Between Nov 2002 and Sept 2003, 17 patients underwent VSG, with a mean follow-up of 4.5 months (range 1-10). Four were male and the mean age was 44 years (range 33-61). The mean preop weight and BMI was 348±82 lbs (range 221-509) and 56±12 kg/m2 (range 39-82), respectively. Of the 17 patients, 7 had a BMI > 60 kg/m2, 6 had a BMI of 50-60 kg/m2, and 4 had a BMI of < 50 kg/m2. The OR time was 70±21 mins (range 60-105) and the EBL was minimal. Length of stay was 2.5±0.6 days. No readmissions, complications or deaths have occurred in this group.

<table>
<thead>
<tr>
<th>% EWL</th>
<th>WL Loss (lbs)</th>
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<tbody>
<tr>
<td>1 Month</td>
<td>19.4%</td>
</tr>
<tr>
<td>2 Months</td>
<td>25.8%</td>
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<tr>
<td>3 Months</td>
<td>36.9%</td>
</tr>
<tr>
<td>4 Months</td>
<td>37.3%</td>
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<td>6 Months</td>
<td>47.0%</td>
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</table>

<table>
<thead>
<tr>
<th>% EWL</th>
<th>% of Excess Weight Loss</th>
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</thead>
<tbody>
<tr>
<td>1 Month</td>
<td>19.4%</td>
</tr>
<tr>
<td>2 Months</td>
<td>25.8%</td>
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<tr>
<td>3 Months</td>
<td>36.9%</td>
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<tr>
<td>4 Months</td>
<td>37.3%</td>
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<td>6 Months</td>
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**CONCLUSIONS:** Superobese and high-risk patients are at significant risk for complications with the DS operation. Isolated laparoscopic VSG can, with minimal morbidity, achieve significant weight loss. A completion laparoscopic DS may be an option for patients who do not achieve adequate weight loss.

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**BARIATRIC SURGERY**

**P055**

**TOTALLY LAPAROSCOPIC DUODENAL SWITCH WITH HAND-SEWN RETROCOLIC DUODENOSTOMY: EXPERIENCE WITH 52 PATIENTS**

Cristy M Lee MD, John J Feng MD, Paul T Cirangle MD, Gregg H Jossart MD, California Pacific Medical Center

**INTRODUCTION:** The laparoscopic duodenal switch (DS) is a technically difficult operation that has been performed in a variety of ways, including hand-assisted, antecolic and/or a CEEA-stapled duodenoenterostomy. In this abstract we describe the experience of a totally laparoscopic hand-assisted, antecolic and/or a CEEA-stapled duodenoenterostomy. In this group we describe the experience of a totally laparoscopic approach with a hand-sewn, retrocolic duodenostomy.

**METHODS:** Between Nov 2002 and Sept 2003, 52 DS operations were performed in this manner. The duodenum is divided 4 cm distal to the pylorus and is anastomosed to the distal 250 cm of the ileum with a two-layered, hand-sewn, end-to-side technique. The biliopancreatic limb is anastomosed to the distal ileum to create a 100 cm common channel and a 150 cm alimentary channel using a double-stapled technique. A greater curvature gastrectomy is formed based on patient characteristics, surgical efficacy, and risks.

**RESULTS:** After BPD-DS (mean preoperative body mass index, BMI=52.7 kg/m2), mean excess weight loss (EWL) was 54% at 6 months and 71% at 12 months. After RYGBP (mean preoperative BMI=48.5 kg/m2), mean EWL was 52% at 6 months and 64% at 12 months. After adjustable gastric banding (mean preoperative BMI=48.4 kg/m2), mean EWL was 32% at 6 months. A sub-analysis of the RYGBP patients into a long limb (150 cm Roux limb, N=114, mean BMI=52.3 kg/m2) and a short limb group (100 cm, N=93, mean BMI=44.2 kg/m2) revealed 62% and 68% mean EWL at 12 months, respectively. The BPD-DS patients had a mean of 1.3 co-morbidities versus 1.0 in RYGBP and 1.8 in adjustable gastric banding patients. The complication rate was lowest after adjustable gastric banding (0%) versus BPD-DS (21%, including 4.2% leak) and RYGBP (35%, including 3.9% internal hernias and 0.5% leak). Average length of stay was 3.9 days after BPD-DS, 2.9 days after RYGBP, and 1.1 days after adjustable gastric banding. There was one mortality in the RYGBP group (0.4%).

**CONCLUSIONS:** BPD-DS offers the best weight loss with acceptable morbidity especially in the super obese. RYGBP provides excellent weight loss with intermediate risks, whereas adjustable gastric banding offers the lowest complication rate at the expense of less weight loss.

**BARIATRIC SURGERY**

**P056**

**HISTORY OF CANCER: A CONTRAINDICATION TO LAPAROSCOPIC GASTRIC BYPASS?**

C Li MD, A Schuricht, University of Pennsylvania School of Medicine

**OBJECTIVES:** There is a paucity of literature describing whether a history of malignancy has an impact on LGB outcome. Herein is presented a single institution experience with LGB in this patient population. Methods: A retrospective review was performed on 147 consecutive LGB patients seen by a single surgeon over an 18-month period. Patients were separated into two groups based on whether their medical history was positive for malignancy or not. Patients with a history of benign tumors were assigned to the non-malignancy group. Operative outcomes, hospital courses, and post-operative courses were compared. Results: 9 of 147 (6.1%) patients had histories positive for malignancy in the past. Of the 5 women, 4 had a history of breast cancer while the other had previously been treated for cholangiocarcinoma. Two men had had colon cancer while one man had a history of leg sarcoma, and another had been treated for leukemia. All patients were at least 18 months out from initial treatment of their malignancies and had no evidence of recurrent disease. Age ranged from 32-61. Mean body mass index (BMI) was 43.5. Conversion to open gastric bypass was required in 2/9 patients in the malignancy group, compared to 8/138 in the non-malignancy group (N.S.). There were no significant differences between groups in complications, length of stay, or weight loss at routine surveillance follow-up appointments.

**Conclusions:** Morbidly obese patients who have responded to treatment for their malignancies do not have a difference in short term outcome or weight loss after LGB compared with patients without a cancer history. To date no patient has suffered adverse consequences associated with their cancer-free status. In patients who have no evidence of recurrent disease, a history of cancer is not a contraindication to LGB.
**BARIATRIC SURGERY**

**P058**
OVERSEWING THE GASTRIC STAPLE-LINES REDUCE THE INCIDENCE OF GASTRO-GASTRIC FISTULAS WITH LAPAROSCOPIC GASTRIC BYPASS, Ravindra Mallapur MD, Robert T Maren MD, Cynthia K Buffington PhD, U.S. Bariatric

Objective. Although gastric-gastric fistula formation with laparoscopic Roux-en-Y gastric (RYGBP) bypass surgery has been dramatically reduced by gastric transection and use of the linear cutting stapler, it has not been completely eliminated. Oversewing the staple-line may help to reduce the incidence of gastro-gastric fistula formation.

Methods and Procedures. In order to determine the effects of oversewing the staple-lines of the gastric pouch and remnant on the incidence of fistula formation, data from 707 patients with oversewn staple-lines were compared to similar data for 458 patients who had the identical RYGBP procedure without staple-line oversewing. Gastric staple-lines were oversewn using a continuous running lambert siltch of vicryl suture.

Results. Patient characteristics were similar for the oversewn vs. non-oversewn staple-line groups (BMI = 45.6+0.5 vs. 44.7+0.2; age = 43.4+0.7 vs. 41.9+0.34; female to male gender distribution = 84% vs. 83% to 17%; total number of co-morbidities = ~ 3.6 for both groups). Of the 458 non-oversewn staple-line cases, gastro-gastric fistulas occurred in 6 patients (incidence rate = 1.3%). 5 of whom experienced an acute leak subsequent to fistula formation. Among 707 patients who had suture-reinforced staple lines, only one patient developed a gastric-gastric fistula (0.1%), not preceded by an acute leak. The approximate 10-fold reduced incidence of gastro-gastric fistulas with staple-line oversewing required only an additional 4 to 6 minutes operating time.

Conclusion. Oversewing the gastric staple-lines during the laparoscopic RYGBP procedure helps to minimize the risk of gastro-gastric fistulas.

**BARIATRIC SURGERY**

**P059**
VITAMIN B1 DEFICIENCY AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Sandip T Maru MD, Ward Dunnican MD, John R Romanelli MD, Monmouth Medical Center, Long Branch, NJ

Background: There has been much documented about vitamin deficiency after gastric bypass operations performed for morbid obesity. There are countless articles regarding iron, vitamin B12, and folate deficiency. We encountered a patient with vitamin B1 deficiency after a laparoscopic Roux-en-Y bypass. There has been little documented about this in the past. We encountered a patient with this deficiency in the postoperative period.

Case: This was a 28 year old female who originally presented with an a BMI of 51. She underwent a laparoscopic Roux-en-Y bypass. Shortly thereafter she developed persistent nausea and emesis. Upon evaluation she was found to have optic disk edema and an elevated intracranial pressure. After extensive evaluation the patient was found to have a Vitamin B1 deficiency. Thiamine therapy was initiated. The patient eventually improved.

Conclusion: In a patient with persistent nausea and vomiting, vitamin B1 deficiency must be included as part of the differential. The restriction in energy intake and the persistent emesis coupled with the malabsorption caused by the laparoscopic Roux-en-Y gastric bypass could explain the vitamin deficiency. This indicates a need for close monitoring and systemic vitamin supplementation in those patients who undergo bariatric surgery.

**BARIATRIC SURGERY**

**P060**
INTRALUMINAL BOVINE PERICARDIAL STRIP EROSION AND OBSTRUCTION AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Fernando E Miranda MD, Terry K Scarborough MD, Steven L Glorisky MD, Erik B Wilson MD, The University of Texas Health Science Center at Houston, Minimally Invasive Surgeons of Texas

Introduction: Bovine pericardial strips have been increasingly used with laparoscopic stapling devices for the formation of the gastric pouch during laparoscopic Roux-en-Y gastric bypass procedures. These strips have been believed to reduce staple line bleeding and leaks. This study evaluates three patients who developed postoperatively pericardial strip erosion into the gastric small pouch.

Methods: Laparoscopic Roux-en-Y gastric bypass was performed on 146 morbidly obese patients with the use of bovine pericardial strips between September 2002 and August 2003. The pericardial strips were used with laparoscopic linear stapler to create an upper gastric pouch of approximately 20 cubic centimeters. Gastrojejunosotomies were performed with sutures and staples in two layers without pericardial strip. All patients were prospectively registered in a database and followed postoperatively for symptoms of gastrointestinal complaints.

Results: During postoperative evaluation, three patients developed nausea and vomiting at 1, 2, and 9 months that was progressive in nature after meals. All three patients underwent esophagogastrostomy, and were found to have intraluminal erosion of the pericardial strips. The strips in all three cases were covered with food debris and obstructed the gastrojejunal anastomosis with a ball-valve effect. The strips were removed endoscopically with flexible endoscopic scissors and forceps with complete resolution of symptoms and return to a regular bariatric diet in all three patients.

Conclusion: Bovine pericardial strips can erode in a delayed manner into the gastric pouch lumen after laparoscopic Roux-en-Y gastric bypass, resulting in obstruction of the gastrojejunosotomy. The strip erosion rate is currently 2.1% in our series. With close follow-up and surveillance endoscopy for symptoms, eroded strips can be safely removed endoscopically with complete resolution of symptoms.

**BARIATRIC SURGERY**

**P061**
INCIDENCE AND TREATMENT OF GASTRIC PROLAPSE AFTER LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING, Claudia Mueller MD, Christine Ren MD, Department of Surgery, NYU School of Medicine, New York, NY

Background: Gastric prolapse is a recognized complication after laparoscopic adjustable gastric banding (LAGB). Predisposing factors are not well identified. We examined the presentation, profile, consequences and treatment of a cohort of 17 patients who experienced gastric prolapse.

Methods: Chart review of all patients who were diagnosed with gastric prolapse.

Results: From July 2001 to July 2003, 429 patients underwent LAGB using the Lap-Band System [Inamed, Carpintiera CA]. Seventeen patients developed gastric prolapse for an incidence of 3.9%. There were 1 male and 16 females with a mean age of 38 years (range 23-57). Mean preoperative weight was 260 lbs (range 163-341), with mean BMI of 44 kg/m² (Al range 35-59). Presenting symptoms included nocturnal reflux (65%), vomiting (59%), dysphagia (18%), and pain (12%). All gastric prolapse was diagnosed by esophagogram. Average time to gastric prolapse was 11 months (range 4.5-18). Mean weight at prolapse was 207 lbs (range 110-276) and BMI 33.8 (range 19-43). Mean weight loss observed was 55 lbs (range 30-133). Seven of 17 patients (41%) underwent band revision while the remaining 10 required band replacement, all completed laparoscopically. All were performed electively, between 1-300 days after diagnosis. Mean operative time for the initial surgery was 68 minutes (range 35-193) and mean reoperative time was 140 minutes (range 68-252). No significant difference was noted between patients who had a revision vs. replacement of their prolapsed band. All patients tolerated their reoperation well with no further need for intervention. Average hospital stay was 1 day.

Conclusion: Gastric prolapse after LAGB is more frequent in women and most commonly presents with nocturnal reflux and vomiting. Revision can be successfully performed laparoscopically with minimal complications and should be done early to avoid weight regain.
BARIATRIC SURGERY

**P062**

INTRA-OPERATIVE UPPER GASTROINTESTINAL FLUOROSCOPY TO DETECT & REPAIR LEAKS IN LAPAROSCOPIC GASTRIC BYPASS SURGERY, Frank Nam MD, H. Stephen Fletcher MD, Michael J Nusbaum MD, Saint Barnabas Medical Center, Livingston, New Jersey.

Introduction: Many surgical weight loss centers use routine upper gastrointestinal (UGI) contrast studies to test the patency & integrity of gastrojejunal anastomosis after laparoscopic gastric bypass surgery. We describe a technique for using UGI fluoroscopy in the operating room at the time of initial surgery to detect and repair leaks, as well as to assess the patency and integrity of the gastrojejunal anastomosis.

Methods & Procedures: We reviewed the charts of 245 consecutive patients who received laparoscopic Roux en Y gastric bypass surgery. The procedure was performed by a single surgeon (M.J.N.) at a single institution. All procedures were performed with an ante-colic, ante-gastric Roux limb position. The gastrojejunosomy was created with a linear stapler. The gastrojejunosomy was inspected, then tested with intraoperative UGI fluoroscopy. A naso-gastric tube was passed into the gastric pouch, the Roux limb occluded, and 60 ml of Gastrografin contrast was instilled. Dynamic fluoroscopic imaging was performed. All patients next had testing of the gastrojejunosomy with 60 ml of methylene blue dye solution.

Results: Of the 245 patients tested, 3 (1.25%) were found to have a leak during the initial operation. All three were repaired at that time. Repeat UGI contrast studies documented no leak after repair. All patients next underwent testing of the gastrojejunosomy with methylene blue solution with no leaks detected. One other patient (0.4%) developed clinical signs of a leak and required re-operation on post op day 43.

Conclusion: Routine intra-operative UGI fluoroscopy can be used to effectively detect leaks at the gastrojejunosomy. By performing this contrast study at the time of the initial operation, most leaks can be repaired without the need for a second operation.

BARIATRIC SURGERY

**P063**

CONVERSION OF ADJUSTABLE LAP-BAND® TO ROUX-EN-Y GASTRIC BYPASS, J T PAIGE MD, T E KLAINER MD, P G SCALIA MD, W J RAUM MD, P O'LEARY MD, M F MARTIN MD, Department of Ob/Gyn, University of Louisville, University Health Sciences Center and the Weight Management Center at St. Charles General Hospital, New Orleans, Louisiana

Background: Laparoscopic adjustable band placement using the Bioenterics® LAP-BAND® system has become an important surgical safe means of weight loss for many patients, failures of the LAP-BAND® system do occur. The effective management of such cases continues to evolve. We have reviewed our experience of conversion of failed adjustable LAP-BAND® to Roux-en-Y gastric bypass.

Methods: A retrospective, single institution review of 145 patients undergoing placement of the Bioenterics® LAP-BAND® system from June 1995 to September 2003 was performed. In addition to examining the group as a whole, these patients were divided into two groups based on whether the band was placed prior to FDA approval (N=88, June 1995 to May 2001) or after it (N=67, June 2001 to September 2003).

Results: Thirty-one of 145 patients (21%) underwent conversion to Roux-en-Y gastric bypass. Of these, 27 conversions occurred in group A patients (30%) and 4 occurred in group B patients (6%). Overall, 8 of 31 conversions (26%) were completed successfully via laparoscopy. Seven patients in group A had successful laparoscopic conversion (26%), 1 of 4 group B conversions (25%) and 3 of 4 group B conversions (75%) were the result of gastric injury at the time of LAP-BAND® placement. None of the conversions in group A were due to concomitant gastric injury. One death occurred in group A conversions from a pulmonary embolus (PE).

Conclusion: Conversion of an adjustable LAP-BAND® to Roux-en-Y gastric bypass is feasible. It is an option in the setting of gastric injury during LAP-BAND® placement. In the patient with a prior adjustable LAP-BAND® in place, however, it can be a technically challenging laparoscopic procedure that carries a mortality risk.

BARIATRIC SURGERY

**P064**

EARLY RESULTS OF LAPAROSCOPIC SLEEVE RESECTION (WITHOUT DUODENAL SWITCH) IN THE TREATMENT OF ASIAN MORBID OBESITY, Su Kyoung Park MD, Won Woo Kim MD, Minimally Invasive Surgery Center, Seoul, Korea

Background: In Asia due to cultural background (food, life style) and environmental factors, type of obesity and also defined operative indication is different from western country. Therefore, surgical procedure also must be applied differently under pattern of obesity. In this report we are trying to introduce our early result of laparoscopic sleeve resection without duodenal switch in Asian population.

Methods: We retrospectively reviewed 52 consecutive patients who underwent laparoscopic sleeve resection between January 2003 and July 2003. Four 12 mm ports and one 15mm port are placed. The sleeve resection was done as routine fashion using ligasure (atlas) and endo-GIA stapler to create a lesser curve gastric tube over 48 to 54 French bougie.

Result: Excess weight loss was achieved in 44% during first three months post-operatively and 68% in 6 months. Body mass index was decreased average 10.3 kg/m2 during first five months post-operatively. Waist and hip circumference were decreased 18.7cm, 10.7cm during three months post-operatively and visceral fat tissue (central obesity) was decreased 78.12 cm2 in first three months by analyzing with CT. Postoperative hyper-cholesterolemic was disappeared in 87% of patient with 3 months of operation and 80% of hypertriglyceridemia was disappeared within 3 months post-operatively. Hypertension was disappeared in 60%, improved in 100% of patient with 3months post-operatively and most of them were improved by decreasing their previous drug dosage. Arthritis symptom was disappeared 50% of patient and improved in 100% of patient with 3months post-operatively.

Conclusion: Additional studies and further follow up are needed to determine the best surgical treatment for Asian morbid obesity patient. However sleeve resection without duodenal switch operation can be an effective single weight loss procedure especially in Asian country.

Management of Leaks After Laparoscopic Roux-en-Y Gastric Bypass. A Plea for Routine Drainage, Ricardo V Cohen MD, Jose S Pinheiro MD, Jose Correa MD, Carlos Schiavon MD, Center for the Surgical Treatment of Morbid Obesity, Hospital Sao Camilo, Sao Paulo, SP, Brazil

Introduction: Leaks are the most worrisome and one of the life threatening complications after a laparoscopic Roux-en-Y gastric bypass. Routine drain placement, a controversial issue, might be helpful in most cases but is not a guarantee of tranquility. The LAP-BAND® system do occur. The effective management of such cases continues to evolve. We have reviewed our experience of conversion of failed adjustable LAP-BAND® to Roux-en-Y gastric bypass.

Methods: A retrospective, single institution review of 145 patients undergoing placement of the Bioenterics® LAP-BAND® system from June 1995 to September 2003 was performed. In addition to examining the group as a whole, these patients were divided into two groups based on whether the band was placed prior to FDA approval (N=88, June 1995 to May 2001) or after it (N=67, June 2001 to September 2003).

Results: Thirty-one of 145 patients (21%) underwent conversion to Roux-en-Y gastric bypass. Of these, 27 conversions occurred in group A patients (30%) and 4 occurred in group B patients (6%). Overall, 8 of 31 conversions (26%) were completed successfully via laparoscopy. Seven patients in group A had successful laparoscopic conversion (26%), 1 of 4 group B conversions (25%) and 3 of 4 group B conversions (75%) were the result of gastric injury at the time of LAP-BAND® placement. None of the conversions in group A were due to concomitant gastric injury. One death occurred in group A conversions from a pulmonary embolus (PE).

Conclusion: Conversion of an adjustable LAP-BAND® to Roux-en-Y gastric bypass is feasible. It is an option in the setting of gastric injury during LAP-BAND® placement. In the patient with a prior adjustable LAP-BAND® in place, however, it can be a technically challenging laparoscopic procedure that carries a mortality risk.
**BARIATRIC SURGERY**

**P067**  
MANAGEMENT OF STENOSIS OF THE GASTROJEJUNAL ANASTOMOSIS AFTER LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS.  
Ricardo V Cohen MD, Jose S Pinheiro MD, Jose Correa MD, Carlos Schiavon MD, Center for the Surgical Treatment of Morbid Obesity, Hospital Sao Camilo, Sao Paulo, SP, Brazil

Introduction: There is a reasonable risk of stenosis of the gastrojejunal anastomosis in the postoperative period of laparoscopic Roux-en-Y gastric bypass. Inadequate or late treatment may lead to serious complications.

Methods and procedures: We reviewed the data of 669 consecutive patients operated from August 1999 to August 2003 in our Institution. A retrogastric retrocolic laparoscopic Roux-en-Y gastric bypass was performed in the first 120 (17.9%) cases and an antecolic antegastric approach was preferred in the other 549 (82.1%) cases. The gastrojejunostomy was created with a 21 mm circular stapler in the first 18 (2.7%) cases and with a linear stapler in the last 651 (97.3%) cases. Intraoperative endoscopy was routinely used to size and test (leaks) this anastomosis. Since this division is limited, we do not close the mesenteric defect related with the retrogastric retrocolic technique, even with the closure of the defect. In the antecolic group, we had 1 (0.14%) internal hernia through Petersen's space and 2 (0.29%) cases secondary to postoperative adhesions. There was 1 (0.14%) case of incarcerated non treated (missed) umbilical hernia and one (0.14%) case of 10 mm port site hernia. There were no operative complications or deaths.

Conclusions: Even though some large laparoscopic series in the literature report a greater incidence of bowel obstruction and mandate the closure of all defects (mesocolon, mesenteric, Petersen's space), its low incidence in our series is comparable to the open literature. We do not advocate the necessity of closure of all surgical created defects in the laparoscopic antecolic antegastric Roux-en-Y gastric bypass.

**BARIATRIC SURGERY**

**P066**  
PROPHYLACTIC CHolecystectomy DURING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS. SHOULD IT BE DONE?  
Carlos Schiavon MD, Jose S Pinheiro MD, Jose Correa MD, Ricardo V Cohen MD, Center for the Surgical Treatment of Morbid Obesity, Hospital Sao Camilo, Sao Paulo, SP, Brazil

Introduction: After Roux-en-Y gastric bypass, studies suggest an increased risk (30%) of gallstone formation due to rapid weight loss. Prophylactic cholecystectomy at time of the bariatric procedure has been advocated by some.

Methods and procedures: We reviewed the data of 669 consecutive patients operated from August 1999 to August 2003 in our Institution. We perform preoperative ultrasound in all patients. Only patients with gallstones are routinely submitted to laparoscopic cholecystectomy simultaneously to the bariatric procedure. During follow-up, an ultrasound is performed at 12 months and only if symptoms appear after that. Although some recommend, we do not employ any prophylactic drug (Ursoioli) for gallstone formation.

Results: After four years, we have a 90% follow-up with a 73.3% mean hospital stay was 24 hours. Three patients refused were submitted to laparoscopic cholecystectomy, with no complications. All patients had no symptoms. Six patients excess weight loss. There were 9 (1.34%) cases of gallstone formation after laparoscopic gastric bypass was extremely low in our population of patients. Prophylactic cholecystectomy should not be used.
Background: There are several methods of intraoperative assessment of gastrojejunal anastomosis for leak in use at present time. Some of them are expensive and time consuming (fluoroscopic gastrografin study, endoscopic air insufflation); others are cumbersome (Methylene blue instillation), or less reliable (insufflation of air with a bulb syringe). We report our experience with oxygen insufflation at 2 L/min into gastric pouch through nasogastric tube connected to endoscopically submersion of anastomosis in normal saline and gentle clamping of efferent limb distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. Therefore, it allows much more effective conformation of airtight integrity during open or laparoscopic RYGB. This technique accomplishes better reparative course in these patients.

Results: Our oxygen insufflation technique in all 140 patients demonstrated by absence of air bubble in the puddle of normal saline. For control, 50 ml submersion of anastomosis in normal saline and gentle clamping of efferent limb distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. Therefore, it allows much more effective conformation of airtight integrity during open or laparoscopic RYGB. This technique accomplishes better reparative course in these patients.

Conclusion: Oxygen insufflation technique is easy, inexpensive and reliable method of evaluation of anastomosis integrity during open or laparoscopic RYGB. This technique accomplishes better distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. Therefore, it allows much more effective conformation of airtight anastomosis. It obviates the need for gastroscopy (expensive and time consuming) or Methylene blue instillation (associated with excessive staining of the tissue and thus inability to pinpoint the site of the leak).

Key words: Gastric bypass - Anastomotic leak - Oxygen insufflation.

BARIATRIC SURGERY

CLOSURE OF INCARCERATED UMBILICAL HERNIAS ENCOUNTERED DURING LAPAROSCOPIC GASTRIC BYPASS SURGERY: HOW WE DO IT, Edward Pucci DO, Anthony Pucci DO,Rocco Tutela MD,Nicholas Bertha DO,Alexander Abkin MD,Rolando Rolandelli MD, Morristown Memorial Hospital

Objective: We present a technique for the repair of incarcerated umbilical hernias identified at the time of laparoscopic gastric bypass surgery. Multiple technical options have been discussed for repair including traditional open repair after the laparoscopic completion of the procedure, delayed repair of the defect if symptomatic in the postoperative period, and pre-operative repair of known defects. This technique also avoids the use of a mesh in a clean-contaminated wound.

Technique: The hernia margins are reduced withatraumatic bowel graspers. The hernia margins are delineated and a puncture is made in the skin with a #11 scalpel at the lower pole of the skin overlying the defect. The open loop grasper device (Granne Needle) is loaded with a #1 prolene or PDS suture. The suture is then passed through the abdominal wall 0.5 to 1.0 cm lateral and caudal to the defect through the incision. The suture is grasped intermittently with the grasper and some suture is brought into the abdominal cavity. The empty Granne Needle is then passed through the incision into the abdominal cavity again caudad to the defect but opposite the side first entered, and again approximately 0.5 to 1.0 cm lateral to the defect. At this point the suture is placed into the Granne Needle while in the abdomen and then pulled up through the incision. The end of the suture on the Granne Needle is then passed into the abdomen as had been done at the start of the procedure, however now it is passed in an angled manner to pass 0.5 to 1.0 cm lateral to the cephalad pole of the defect. Finally, the end of the suture is placed into the Granne Needle with the grasper and pulled through the incision opposite the side first entered. This completes the figure of eight suture placement. Then the suture is pulled and tied. This closes the defect under direct vision. The end of the suture is then cut above the knot and the wound is closed using steri-strips.

Results: Our preliminary results in a series of seven patients has had one recurrence.

Conclusions: Laparoscopic repair of known or unknown umbilical hernias in bariatric surgery is possible at the time of surgery. This technique avoids using a mesh, converting to an open procedure or delaying the repair. This technique provides a solution for this intra-operative dilemma.

BARIATRIC SURGERY

A TECHNIQUE FOR INTRAOPERATIVE EVALUATION OF LEAKS IN GASTROJEJUNAL ANASTOMOSIS DURING ROUX-EN-Y GASTRIC BYPASS SURGERY, Anf Ahmad MD,Collin E Brathwaite MD, Lyudmila S Pupekova MD, Center for Minimally Invasive Surgery, Department of Surgery, SUNY at Stony Brook, Health Science Center, T19-06, Stony Brook, NY 11794-8191

Background: There are several methods of intraoperative assessment of gastrojejunual anastomosis for leak in use at present time. Some of them are expensive and time consuming (fluoroscopic gastrografin study, endoscopic air insufflation); others are cumbersome (Methylene blue instillation), or less reliable (insufflation of air with a bulb syringe). We report our experience with oxygen insufflation at 2 L/min into gastric pouch through nasogastric tube connected to endoscopically submersion of anastomosis in normal saline and gentle clamping of efferent limb distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. Therefore, it allows much more effective conformation of airtight integrity during open or laparoscopic RYGB. This technique accomplishes better reparative course in these patients.

Methods: Between December 2001 and September 2003, 165 morbidly obese patients who underwent open or laparoscopic Roux-en-Y Gastric Bypass (RYGB) were studied prospectively. We assessed the techniques of air insufflation with a bulb syringe (first 25 cases), methylene blue instillation, and oxygen insufflation with our technique (last 140 cases). Gastrojejunostomy in all cases is done with EndoGIA. Gastrotomyjejunotomy is closed manually with Endostitch continuous suture at 2 L/min into gastric pouch through nasogastric tube connected to endoscopically submersion of anastomosis in normal saline and gentle clamping of efferent limb distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. We report our experience with oxygen insufflation at 2 L/min into gastric pouch through nasogastric tube connected to endoscopically submersion of anastomosis in normal saline and gentle clamping of efferent limb distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. Therefore, it allows much more effective conformation of airtight integrity during open or laparoscopic RYGB. This technique accomplishes better reparative course in these patients.

Results: Our oxygen insufflation technique in all 140 patients demonstrated absence of anastomotic leaks confirmed by subsequent methylene blue instillation study and postoperative gastrografin testing as well as uneventful postoperative course in these patients.

Conclusion: This study shows, that oxygen insufflation technique through a nasogastric tube connected to non-rebreather line of Ventilator is safe, fast, inexpensive, and reliable method of evaluation of gastrojejunal anastomosis integrity during open or laparoscopic RYGB. This technique accomplishes better distension of the gastric pouch and jejunum as compared to the use of a bulb syringe. Therefore, it allows much more effective conformation of airtight anastomosis. It obviates the need for gastroscopy (expensive and time consuming) or Methylene blue instillation (associated with excessive staining of the tissue and thus inability to pinpoint the site of the leak).

Key words: Gastric bypass - Anastomotic leak - Oxygen insufflation.

BARIATRIC SURGERY

LAPAROSCOPIC CONVERSION OF VBG TO ROUX-EN-Y GASTRIC BYPASS, Patrick R Reardon MD, Mahsa Mossadegh, Ese Otah MD, Department of Surgery; Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

Vertical Banded Gastroplasty (VBG) has been performed for many years for the treatment of morbid obesity. Late complications of this procedure include gastroesophageal reflux disease, esophagitis and obstructive symptoms secondary to narrowing at the band. We present five cases of patients with late complications of prior open VBG who were successfully converted to a Roux-en-Y gastric bypass laparoscopically. Mean patient age was 43 ± 2.1 years. Mean BMI was 47 ± 6.4 kg/m2. Mean operative time was 471.8 ± 64 min. Mean EBL was 120 ± 20 ml. There were no intraoperative complications. Mean LOS was 2.2 ± 2 days. All patients had resolution of their presenting symptoms. Follow up ranges from 4 months to one year. All patients have lost weight. Two patients had temporary symptoms compatible with dumping which resolved with diet changes.

Laparoscopic conversion of VBG to Roux-en-Y gastric bypass is the procedure of choice for the treatment of some late complications of VBG. The procedure relieves obstructive symptoms and GERD resulting from VBG without recurrent weight gain. The procedure can be performed safely and the patients accrue all of the benefits of a minimally invasive procedure.

BARIATRIC SURGERY

AN UNUSUAL COMPLICATION FOLLOWING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Patrick R Reardon MD, Mahsa Mossadeh MD, Ese Otah MD, Department of Surgery; Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

Our patient was a 38 year old woman with morbid obesity. Her body mass index was 45 kg/m2. Her pre-operative BMI was 33 ± 2.1 kg/m2. Mean BMI was 47 ± 6.4 kg/m2. Mean operative time was 471.8 ± 64 min. Mean EBL was 120 ± 20 ml. There were no intraoperative complications. Mean LOS was 2.2 ± 2 days. All patients had resolution of their presenting symptoms. Follow up ranges from 4 months to one year. All patients have lost weight. Two patients had temporary symptoms compatible with dumping which resolved with diet changes.

Laparoscopic conversion of VBG to Roux-en-Y gastric bypass is the procedure of choice for the treatment of some late complications of VBG. The procedure relieves obstructive symptoms and GERD resulting from VBG without recurrent weight gain. The procedure can be performed safely and the patients accrue all of the benefits of a minimally invasive procedure.

BARIATRIC SURGERY

AN UNUSUAL COMPLICATION FOLLOWING LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Patrick R Reardon MD, Mahsa Mossadeh MD, Ese Otah MD, Department of Surgery; Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

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DECREASED STOMAL STRicture AFTER LAPAROSCOPIC GASTRIC BYPASS WITH CIRCULAR STAPLED ANASTOMOSIS; RESULTS OF 527 PATIENTS, R E Rivera MD, J C Eagon MD, Washington University School of Medicine, Saint Louis, MO

Background: Laparoscopic gastric bypass has been associated with a higher incidence of gastrointestinal anastomotic stricture when compared to open gastric bypass.

Objectives: The purpose of this study was to compare gastrointestinal complications of laparoscopic jejunojunostomy versus open gastrojejunostomy.

Methods: Retrospective clinical review was performed on prospectively collected data of all patients who had primary Roux-en-Y gastric bypass at Washington University from 1997 to 2003. In lap cases, the GIA transection was performed with the stapler opened and the gastrojejunal anastomosis was performed retrocolic, retrogastric using 21mm EEA stapler. The anastomosis was oversewn in only selected cases. The open gastrojejunos- tomy was created retroclic, antegastric with a two layer side to side hand-sewn technique. Gastrointestinal complications included anastomotic leak, bowel obstruction, gastrointestinal anastomotic stricture, gastrointestinal bleeding and stomal ulcer. Stomal stricture was defined as inability to pass an upper endoscope through the anastomosis after symptoms of frequent postprandial vomiting prompted investigation.

Results: Gastric bypass was performed on 527 patients (Lap=302, Open=225). BMI was 55 ±11 (Mean ±SD). 87% were women and 13% with mean age of 44 years. Gastrointestinal complications occurred in 64 patients (12.1%) (Lap=33, Open=33). Stomal stricture developed in 26 patients (lap=7 (2.3%), Open= 19 (8.4%)). A typical time course was seen with both lap and open procedures with all strictures occurring at a mean postoperative period of 7 ± 3 weeks. All patients were treated successfully with endoscopic dilation. Anastomotic leaks (lap = 5 (1.7%), Open = 4 (1.8%)) and anastomotic strictures (lap = 7 (2.3%), open=6 (2.6%)) were similar for both groups.

Gastrointestinal bleeding occurred in 8 patients (lap = 7 (2.3%), open=1 (0.4%)) and anastomatic ulcer in 8 (lap=5 (1.7%), open=3 (1.3%).

Conclusion: Contrary to some other published series, stomal stricture was less frequent after laparoscopic gastric bypass using 21mm circular stapler with selective reinforcement compared with a traditional hand-sewn gastrojejunostomy. This lower incidence of stenosis was achieved without an increased anastomotic leak or other gastrointestinal complications.

ADJUSTABLE GASTRIC BANDING: A DIFFERENT APPROACH FOR APPLICATION OF THE BAND. Isaac RoiSman MD, Mohamad Hamoud MD, Bitterman Arie MD, Oleg Lefel MD, Timor Peleg MD, Zeharya Kovacs MD, Oded Cohen MD, Lady Davis Carmel Medical Center, Department of Surgery A, Haifa, Israel

Morbid obesity is one of the most important social and medical issues in Western countries. Patients with body mass indices exceeding 40 have medically significant obesity in which the risk of serious health consequences is substantial, with concomitant significant reductions in life expectancy. A National Institutes of Health Consensus Panel reviewed the indications and types of operations, concluding that the banded gastropasty is an acceptable treatment for treating seriously obese patients. Surgical treatment is associated with sustained weight loss for seriously obese patients who uniformly fail nonsurgical treatment. Following weight loss there is a high cure rate for diabetes and sleep apnea with significant improvement in other complications of obesity such as hypertension and osteoarthritis. Laparoscopic Adjustable Gastric Banding (LAGB) has become a common operation for morbid obesity in Europe and elsewhere. We used LAGB as a routine treatment for morbid obesity in 190 patients between 1998 and 2003. We agree with other authors that LAGB is the least invasive of all gastric restrictive procedures, resulting in a low perioperative mortality and morbidity. The weight loss appears to be similar to that obtained by vertical gastroplasty (VBG). However, our long-term follow-up studies, including endoscopic examinations, as well as recent data in the literature also indicate a small percentage of problems with LAGB. Our study: 190 patients, aged 13 years old to 53 - mean age 44.92% females and 18% males. 190 consecutive patients were assessed preoperatively and then after 6, 12 and 24 months. Patients filled out questionnaires for subjective appraisal of HRQL (physical well-being, mood, physical performance, perceived health, social support and coping adjustment). RESULTS: The greatest improvement in weight and HRQL (Health Related Quality of Life) was seen within 6 months of surgery. Twenty-four months after LAGB weight reduction (P < 0.05), perceived health (P < 0.05), physical performance (P < 0.05), social support (P < 0.05), and coping (P < 0.05) continued to be better than before surgery. Preoperative binge eating was the most important predictor of HRQL. Conclusion: Two years after LAGB weight loss and a significant improvement of HRQL can be found. HRQL and weight loss are not associated in terms of outcome, indicating the weight loss alone may not be enough to improve HRQL. This operation does not help in patients with hereditary morbid obesity.

IS VENOUS THROMBOSIS MORE COMMON IN THE LAPAROSCOPIC GENERATION? AND WHAT IS THE BEST WAY TO ANTIcoAGULATE. Mitchell Roslin MD, Marina Kuri MD, Lenox Hill Hospital

Introduction: Deep venous thrombosis and pulmonary embolism remain a significant concern following laparoscopic bariatric surgery. The use of insulinization combined with steep reverse trendelberg position may increase the incidence of deep venous thrombosis and mesenteric thrombosis in laparoscopic cases. Methods: Between June 2000 until present we have performed 713 gastric bypass procedures (171 open, 542 lap). 130 of the open procedures were performed in the first year of study. Average BMI was 48 lap and 54 open. All patients had vondenye anti-embolic stockings and post operative subcutaneous heparin at a dose of 5000 u sq BID. The last 75 laparoscopic cases have had preoperative subcutaneous heparin at a dose of 5,000 units sq. Results: There were no clinically significant thrombotic events in the open group. In the laparoscopic group there were 7 thrombotic events (1.3 %). These consisted of four pul- monary emboli (one with pre - operative heparin), one post op DVT without PE, one portal vein thrombosis in a patient who further work up revealed a hypercoaguable state, and one asymptomatic clot in the superior mesenteric vein. Because of difficulty in managing coumadin levels in early gastric bypass patients we elected to treat with lovenox at a dose of 80mg sq twice daily. Factor anti 7X A levels were therapeutic for all patients. Despite this judicious dosing, one patient developed a retro peritoneal hematoma. Conclusions: Our retrospective, non-randomized data suggests that thrombotic episodes may be more common with laparoscopy. Further investigation accounting for all potential variables will need to be performed to prove or reject this hypothesis. Additionally, a dose of 80mg of lovenox appears to provide successful anticoagulation in morbidly obese patients, however does not eliminate the possibility of bleeding complication. Further work is still needed to determine the best method for early post operative anticoagulation.
**BARIATRIC SURGERY**

**P078**

**INTRAGASTRIC BALLOON IN OBESE PATIENTS: RESULTS BRAZILIAN MULTICENTRIC STUDY, JOSÉ AFONSO SALLET MD, JOÃO CAETANO MARCHESINI MD, DYKER DOS SANDOS DE PAIVA MD, PAULO CLEMENTE SALLET MD, KEILA KAMOTO MD, CARLOS EDUARDO PIZANI MD, CLINICA SALLET**

Background: Intragastric balloons have been used in obese patients as a restrictive gastric procedure allowing early satiety and thus inducing weight loss. An early study has reported no benefits at 6-month follow-up with 5 morbidity obese adolescents treated with the intragastric balloon (Vandenplas et al., 1999). We performed this study to assess both safety and effectiveness of intragastric balloon in obese adolescents.

Method: Twenty one overweight and obese adolescents (15.4 ± 1.3 years, 12 males and 9 females, Weight = 106.9 ± 35.6, BMI = 37.0 ± 9.0) recruited in two Brazilian private clinics were treated with the Bioenterics Intragastric balloon. During a 6-month follow-up, patients were encouraged to take part in a multidisciplinary program involving clinical, psychiatric, physical training, and dietary approaches.

Results: Comparing to baseline values, after a 6-month follow-up and removal of the balloon, subjects showed significant reductions in weight (mean ± SD = -14.5 ± 9.0 Kg) and BMI (-5.1 ± 3.4 Kg/m2) (p < 0.000), with a percent excess weight loss of -57.0 ± 36.3 %. Main side effects were nausea and vomiting (7 cases), and epigastric pain (3 cases) in the first week after balloon placement, which were clinically controlled. There were no other complications.

Conclusion: Contrary to the above-mentioned study, our results argue for the safety and effectiveness of treatment with the intragastric balloon in obese adolescents, at least during an initial 6-month follow-up with BIB and 6 months without it. This technique seems to be quite effective in well-motivated adolescents followed by a multidisciplinary team. Our results suggest that BIB must be the first choice for treatment in obese adolescents with intensive interdisciplinary approach.

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**BARIATRIC SURGERY**

**P079**

**IMPROVED RESULTS WITH LAGB DEPENDS ON SELECTED PATIENTS? OUR RESULTS WITH 316 PATIENTS IN THE LAST 5 YEARS, JOSE AFONSO SALLET MD, MAURÉLIO RIBEIRO MD, PEDRO ARRUDA MD, ANTONIO JOAQUIM L F LEAL MD, KEILA KAMOTO MD, CARLOS EDUARDO PIZANI MD, PAULO CLEMENTE SALLET MD, CLINICA SALLET**

Background: In the last 5 years, we performed 1021 bariatric procedures. The LAGB was used in 316 patients (31%).

Methods: We consider a good patients to LAGB: Agree the change behavior, have the associate disease. The mean operative time was 42 min, 98% of these patients were female with BMI 40.2 Kg/m2. Results: The median to excess weight lost was 31% in the first quarter, 42% in the second, 51% in the third and the median EWL% in the final of the 5 years was 61.99%with Sd 10.44 (SPSS Program). We had 17% of the patients with EWL over 70% and 12% with EWL less then 50% with improve or resolution 80% of the associate disease. The mean operative time was 42 min, 98% discharge in the first 24h and 97% return to normal activity between 5th and 10th P.O. The mostly early complication was port seroma or infection in 8.8% and later complications was band erosion in the 3.6% without mortality.

Conclusion: The Lap-Band® system is a safe and effectiveness method treating morbidity obese in select cases. Our results shows better results (median 60% EWL less than literature (50% EWL). The success of this operation depends an appropriate selection process for the patients, the correct application of the technique and the post-op care by the cross disciplinary team.

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**BARIATRIC SURGERY**

**P080**

**LAPAROSCOPIC ADJUSTABLE GASTRIC BAND: THE MASSACHUSETTS EXPERIENCE, Vivian M Sanchez MD, Benjamin Schneider MD, Scott Shikora MD, John Kelly MD, Paresh Shaw MD, Daniel B Jones MD, Beth Israel Deaconess Medical Center, New England Medical Center, University of Massachusetts, Lahey Clinic**

Background: The Laparoscopic Adjustable Gastric Band (LAGB) is a new surgical treatment of morbid obesity, approved by the FDA in June 2001. The goal of this study is to determine the safety and assess surgeons? attitudes towards LAGB as a treatment modality for morbid obesity.

Methods: Surgeons in the State of Massachusetts who perform the LAGB were surveyed via telephone. The manufacturer?s database (Inamed) was also accessed. Surgeons? attitudes were rated on a Likert scale (1-10).

Results: In Massachusetts, fourteen surgeons completed the FDA-required industry-provided introductory course on LAGB placement. Of these, 10 (71%) have been formally proctored. To date, 102 LAGBs have been placed by surgeons in the State of Massachusetts. There have been no mortalities related to LAGB placement. There have been 7 reoperations and 1 band removal. Complications include: 2 gastric prolapses, 1 tube leak, and 2 port flips. Band erosion, esophageal dilation, tube disconnect, or port infection were not reported. On average, the excess weight loss is approximately 15-25% at 3 months and 40% at 1 year. Four patients have gained weight. Surgeons report 75-100% patient satisfaction. Surgeon satisfaction on the use of the LAGB as a surgical treatment for morbid obesity is an average of 7.3 on a scale of 10. Conclusions: While the LAGB experience in Massachusetts is growing rapidly to meet patient demand, the majority of operations are performed by only a few bariatric surgeons. There have been no deaths related to the LAGB. Complication rates and EWL% are similar to those reporting in the literature. Surgeon satisfaction is moderate to high. Overall, the LAGB provides a safe, effective, reversible alternative to patients with morbid obesity.

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**BARIATRIC SURGERY**

**P081**

**THE INCIDENCE AND MANAGEMENT OF BAND SLIPPAGE FOLLOWING LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING, Vafa Shayanian MD, Steve Creech MS, Sharif Sarker MD, Loyola University Medical Center**

Laparoscopic adjustable gastric banding (LAGB) has become a commonly performed surgical procedure for weight reduction over the past 10 years. One of the long-term complications of LAGB that often leads to repeat surgical intervention is band slippage. Some US bariatric centers have abandoned LAGB due to concerns regarding a high incidence of repeat operative intervention. To date, the exact incidence of band slippage and the management options for procedures performed in the United States are not well characterized. Hereafter, we present our experience with 232 band placements by a single surgeon in a major university medical center.

Between November 2001 and September 2003, 232 LAGB?ts were performed in 177 women (76%) and 55 men (24%), ranging from 18 to 71 years of age. All procedures were performed using the Pars Lucida technique with band fixation using anterior gastro-gastric sutures. All procedures were completed laparoscopically. Seven patients (5 women and 2 men) required repeat procedures (3.4%) for band slippage. The original LAGB?ts for the patients with a slipped band were performed during the first 8 months of the attending surgeon?ts LAGB experience. Two bands (25%) were removed and the remaining bands were revised. All revisions and removals were performed laparoscopically with no operative or post-operative complications. With similar starting BMI, starting absolute weight, and length of follow-up, the patients with a slipped band had higher percentage of excess body weight loss (60±10% vs. 32±19% respectively, P<0.0001), and higher absolute weight loss (101±29 vs. 50±32 lbs. respectively, P<0.0001) at the time of repeat operation as compared to the patients without band slippage. Using standard Pars Lucida technique, LAGB may be performed with a minimum incision of band slippage. Band slippage often occurs following substantial and rapid weight loss. Most slipped bands may be revised, allowing continued weight loss. Learning curve may be a contributing factor for higher incidence of band slippage. Concerns regarding repeat operative intervention for band slippage should not lead to avoidance of LAGB by bariatric surgeons.

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**SAGES 2004 Poster Abstracts**

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MINIMIZING STRUCTURES OF THE GASTROJEJUNOSTOMY IN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS, Mickey Seger MD, Robert Chastanet MD, Caroline Daigle BS, Rebecca Churchman RN, Philip L Leggett MD, University of Texas Health Sciences Center at Houston. MIST

Background: A great deal of interest has been devoted to the technical aspects of anastomosis construction in laparoscopic roux-en-y gastric bypass. Studies have reported results using hand sewn, circular stapled, and linear stapled anastomotic techniques. Stricture rate of the gastrojejunostomy has ranged from 4.7% to 31%. Frequently these require endoscopy and dilation. The performance of these anastomoses is critical in that incomplete closure can lead to a potentially devastating leak. It is our belief that a linear stapled gastrojejunostomy with a single layer closure of the stapled enterotomy yields a minimal stricture rate without a higher leak rate.

Hypothesis: Linear stapled gastrojejunostomy with hand-sewn single layer closure of the stapler enterotomy yields minimal strictures and does not lead to a higher leak rate.

Design: Retrospective chart review

Results: 55 consecutive patients underwent a laparoscopic roux-en-y gastric bypass. All of the patients had a 35mm linear stapled gastrojejunostomy with hand-sewn closure of the stapler enterotomy. Four out of the thirty-seven (10.8%) patients undergoing a two layer closure of the stapler enterotomy developed a stricture. There was one leak in this subgroup (2%). None of the eighteen patients who had a single layer closure of the stapler enterotomy developed a stricture or a leak.

Conclusions: Closure of the stapler enterotomy is an important component of the anastomosis. Two layered closure of the stapler enterotomy leads to a higher stricture rate with no benefit in leak prevention.

LOVENOX AND COUMADIN IN THE TREATMENT OF DEEP VENOUS THROMBOSIS AFTER LAPAROSCOPIC GASTRIC BYPASS, Nikhil V DeSarno MD, Marina Kurian MD, Mitchell Roslin MD, Lenox Hill Hospital, New York, New York, USA

Background: Deep Venous Thrombosis (DVT) and Pulmonary Embolus (PE) are major complications of Morbid Obesity Surgery. Most surgeons employ several modalities to prevent DVT including venous compression stockings and subcutaneous heparin injection. The question arises as to which is the best treatment modality of DVT once it occurs. After gastric bypass the absorption of warfarin is variable. The patient's unique diet may also contribute to the difficulty of keeping patient's in a therapeutic range with warfarin. This may lead to a higher incidence of bleeding with warfarin. Lovenox, an injectable low molecular weight heparin has proven useful in the treatment of DVT and PE without the difficulty of measuring frequent prothrombin times, that is inherent to the use of warfarin.

Methods: A dosing regimen of 80 mg BID of lovenox injected subcutaneously was selected for patients with DVT and PE. To ensure that the dosage of lovenox was therapeutic, we obtain anti-factor Xa levels.

Results: We identified 7 patients out of 550 that had developed DVT or PE. 5 patients were treated with lovenox and 2 with warfarin. 1 (50%) out of the group of patients treated with warfarin developed a bleeding marginal ulcer. 1 (20%) of the patients treated with Lovenox developed a retropitoneal bleed. All anti-factor Xa levels were in the therapeutic range.

Conclusion: Our dosing regimen of Lovenox is effective and results in a decreased likelihood of bleeding as a complication of anticoagulation compared to warfarin. However, further study is warranted to elucidate this question.
BARIATRIC SURGERY  P086

THE EARLY EFFECTS OF GASTRIC BYPASS ON INSULIN RESISTANCE, Rebecca C Shore MD, Donald Czerniach MD, John J Kelly MD, Richard A Perugini MD, Department of Surgery, University of Massachusetts Medical Center

INTRODUCTION: Gastric bypass has a salutary effect on insulin resistance. Possible explanations for this include loss in body weight, change in body composition, decreased caloric intake, and foregut exclusion. To better understand why insulin resistance improves, we are studying early postoperative changes in insulin resistance after laparoscopic gastric bypass. METHODS: Patients who underwent laparoscopic gastric bypass (n=10) were studied with regards to insulin resistance. Fasting insulin and glucose blood levels were drawn on day 0 and postoperative day 8-12. The patients? weight and body to mass index were determined. The homeostasis model assessment (HOMA-IR) was used to estimate insulin resistance. RESULTS: The majority of patients undergoing gastric bypass had reduced HOMA-IR (4.9 ± 1.7 vs 3.3 ± 1.5; p = 0.01) at their early follow up visit. The % excess body weight lost ranged from 1-15%. CONCLUSION: The beneficial effect of gastric bypass on insulin resistance may be seen quite early postoperatively; at this stage there is little loss of excess body weight or change in body composition. Improved insulin resistance may be a physiologic consequence of exclusion of the foregut.

Further study of these patients is warranted as improved insulin resistance may predict long-term outcomes and elucidate novel therapies for insulin resistance/diabetes.

BARIATRIC SURGERY  P088


Introduction: Since the introduction of Gastric Bypass in bariatric surgery different techniques have been described. The direction of the pouch and its size as well as the route of the Roux-en-Y limb was subject of intense debate. In addition there is controversy as to which anastomotic technique at the level of the gastrojejunostomy (hand-sewn vs circular stapler vs linear stapler) as well as the jejuno-jejunalostomy (totally stapled vs stapled and hand-sewn) might generate more anastomotic strictures. The purpose of this study was to retrospectively review the results of patients that underwent a laparoscopic antecolic antegastric Roux-en-Y gastric bypass, utilizing a vertical pouch and a linear stapled anastomosis. We specifically reviewed the incidence of strictures at the level of the gastrojejunostomy and jejuno-jejunalostomy and the incidence of internal hernias. Method: Retrospective review of 593 consecutive patients that underwent laparoscopic gastric bypass, between July 2001 and May 2003. Results: 96.6% of the cases were completed laparoscopically. Mean operative time was 89 minutes and mean hospital stay was 3.2 days. M. There was no mortality in our series. Weight loss at 1 year was 76% of the excess body weight. 24 patients (4%) developed a stricture at the gastrojejunostomy; they were all successfully dilated endoscopically. 3 patients (0.5%) developed a stricture at the jejuno-jejunalostomy they manifested at 5 weeks, 2 months and 3 months respectively and were revised laparoscopically successfully. The only patient (0.16%) that developed an internal hernia presented 18 months after surgery. The hernia was reduced and the defect in the mesentery sutured closed laparoscopically. Conclusion: Laparoscopic antecolic antegastric Roux-en-Y gastric bypass with linear stapler anastomosis in our experience appears to have a marked decreased incidence of internal hernias when compared to results reported for the retrocolic retrogastric technique. The incidence appears to be lower due to the decreased creation of potential hernia sites that can?t be reliably closed with the laparoscopic techniques. The use of a vertical pouch and combined linear stapled and hand-sewn anastomosis, allows surgeons to comfortably perform a laparoscopic antecolic and antegastric bypass with similar short term weight loss and stricture formation when compared to the retrocolic and retrogastric approach or other anastomotic techniques. A totally stapled jejuno-jejunalostomy has a very low incidence of stricture formation. While acute complications appear to be managed best with an open approach, chronic manifestations can be managed laparoscopically.
USE OF FIBRIN SEALANT TO PREVENT WOUND COMPLICATIONS IN MORBID OBESITY, S Vithiananthan MD, A Hofmann RN,C E Dias MD, Winthrop University Hospital, Mineola, NY

Introduction: Open surgery in morbid obesity is associated with increased wound complications. Fibrin has been found to stimulate fibroblast growth and collagen synthesis and increase early mechanica-l strength wounds. The purpose of this study was to test the effic-acity of fibrin sealant to prevent wound complications in morbidly obese patients.

Methods: Patients (pt) undergoing open roux-en-y gastric bypass sur-gery were selected for the study. A commercially available fibrin glue (Co-Stasis) was applied to the subcutaneous tissue of the wound edge prior to skin closure. Comparison of groups was done using Fisher’s Exact Test and unpaired T-test. Logistic regression was used to predict wound complications from independent variables.

Results: Thirty-five pts formed the fibrin glue (FN) group while 10 pts served as controls without fibrin glue(NOFN). There were 27 females (60%) and 18 males (40%) in the study population with a median age of 43 years (range 28-68) and a median BMI of 49.5. There were nine diabetics among the FN and two in NOFN The median length of the incision was 21 cm with a mean maximal thickness of 6+1 cm (range 2.5-8.5 cm). In NOFN, wound tenderness and erythema occurred in 4 pts, 1 pt had a serious discharge for 2 weeks while another developed a hematoma and purulent discharge. Superficial wound disruption occurred in 2 pts at 4 weeks of follow-up while 2 others had incisional hernias. In FN, 4 pts had a minimal serous dis-charge in the first few days after surgery and 1 had a mild serous dis-charge noted at 4 weeks of follow-up. No wound infection occurred in this group (95% confidence interval 0.0%-10.0%) as against reported infection rates in the literature of 10%. There was also no incidence of wound dehiscence or hemia in FN at last follow up (3-13 months). Fibrin glue significantly reduced all wound complications (p<0.002) including minor complications like wound erythema, tenderness and serous discharge (p<0.0001) as well as major complications like wound disruptions (p<0.007). Complications were also significantly less at 4 weeks (p<0.002) and 6 weeks follow up (p<0.05) with fibrin glue. Multivariate analysis showed that fibrin glue was the only factor preventing wound complications.

Conclusion: Fibrin glue is safe and significantly prevents all wound complications in open surgery in the obese.

THE LENGTH OF THE ROUX LIMB IN LAPAROSCOPIC GASTRIC BYPAS FOR SUPER MORBID OBESITY: DOES IT MATTER? J K Champion MD, Mike Williams MD, Emory-Dunwoody Medical Center, Atlanta Georgia, USA

Background: Debate continues over the contribution of roux limb length to percent excess weight loss (%EWL) after gastric bypass. This paper reports a retrospective review of our experience with various limb lengths in super morbid obese patients over a seven-year period.

Methods: From 1995-2001 we performed a laparoscopic gastric bypass in 262 patients with a BMI of ≥50, utilizing roux limb lengths of 100cm (group 1), 120cm (group2), or 150cm (group3).

Initial mean BMI for group 1 was 54.6±A4.5, group 2 was 55.9±A6.5, and group 3 was 60.7±A5.6. Follow-up %EWL at 12 months was available in 220 patients (84%). Statistical significance was determined by Chi square or AVONA post hoc test using Tukey least significant difference.

Results: Mean %EWL was 62.3±A16.4 for group 1, 66.1±A13.6 for group 2, and 58.0±A12.8 for group 3. There was no difference in the percent of patients losing at least 50% EWL in the 3 groups (p = .52). There was no significant difference in the mean %EWL for groups 1 and 2, or groups 1 and 3, but there was a significant dif-ference between groups 2 and 3 (p < .005).

Results: In this non-randomized review the 120cm roux limb length gave significantly better %EWL compared to 150cm, but there was no significant difference in %EWL between the 100cm and 150cm groups for super morbid obesity. This retrospective review chal-lenges previous concepts of a preferred limb length in super mor-bid obese patients, and suggests the need for further study to de-fine optimal roux limb lengths.
BASIC SCIENCE

THE USE OF ESOPHAGEAL DOPPLER MONITORING OF SYSTEMIC HEMODYNAMICS IN A PORCINE PNEUMOPERITONEUM MODEL, S Bergman MD, M C Vassiliou MD, S Feldman MD, F Carli MD, G Andrew MD, D Stanbridge RN, G M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada

Introduction: The esophageal doppler (ED), a non-invasive tool for continuous hemodynamic monitoring, has been studied only sparingly in the context of laparoscopy. Our aim was to explore the physiologic effects of pneumoperitoneum (PP), using ED, in an experimental pig model.

Methods: Six 20 kg female pigs were studied. Following general anesthesia, the internal jugular vein and the carotid artery were cannulated. An ED was inserted and used to measure stroke volume (SV), cardiac output (CO), and corrected flow time (FTc), an index of pre-load. Heart rate (HR), central venous pressure (CVP), and mean arterial pressure (MAP) were measured every 5 minutes. The pigs were studied at baseline (Pre-PP) for 10 minutes, following which CO2 pneumoperitoneum was created to 6 (PP-6), 12 (PP-12), 18 (PP-18), and 24 mmHg (PP-24) every 15 minutes, before the PP was released (Post-PP). Data were analyzed using repeated measures ANOVA with Fisher post-hoc analyses.

Results: ED measurements demonstrated an initial increase in CO and SV before falling at higher intra-abdominal pressures. When the PP was released, CO returned to baseline levels. FTc increased consistently at pressures above 6mmHg.

Conclusion: ED monitoring appears feasible in a porcine pneumoperitoneum model. Further validation using a pulmonary artery catheter is required.

BASIC SCIENCE

STRONG VEGF EXPRESSION PRESENT IN MALIGNANT CELLS RECOVERED DURING STAGING LAPAROSCOPY FOR GI CANCER, R. M Bonnor MD, Mark B Wilkieimer MD, Raheela Ashfaq MD, Jason B Feming MD, Hammon Center for Therapeutic Oncology Research and Departments of Surgery and Pathology, University of Texas Southwestern Medical Center, Dallas TX

Background: Although VEGF (vascular endothelial growth factor) has been linked to malignant ascites and death from gastrointestinal (GI) cancers, the association between VEGF expression and intraperitoneal malignant cells in GI cancer patients has not been studied. We hypothesized that malignant intraperitoneal cells in specimens obtained at diagnostic laparoscopy would express VEGF protein.

Methods: Peritoneal washing specimens were collected from 13 patients with upper GI malignancies. Pathologic examination of the washings was performed on each specimen using ThinPrepTM and CytoblockTM techniques. All cytology specimens were classified as having no malignant cells, atypical or malignant cells present. VEGF expression within the cell block specimens was determined by immunohistochemistry (IHC) and scored as: ?none?, ?weak?, ?intermediate? or ?strongly positive?.

Results: Cells sufficient for cytologic and immunohistochemical evaluation were present in 12 (92%) of specimens. Pathologic evaluation identified malignant cells in 7 of 12 specimens. IHC identified ?intermediate? or ?strong? VEGF expression in all 7 of the specimens containing malignant cells; however, VEGF expression classified as ?weak? or ?none? was found in the specimens containing normal or atypical cells.

Conclusions: In this first study examining a link between VEGF expression and intraperitoneal cytology in cancer patients, VEGF expression was present in the identified intraperitoneal malignant cells. Strong VEGF expression in intraperitoneal metastatic cells suggests a possible cause for the frequent occurrence of intraperitoneal failure and ascites in patients with upper gastrointestinal cancer.

BASIC SCIENCE

VIDEOENDOSCOPIC ENDOTRACHIAL INTUBATION IN THE RAT, J. H Hanly MD, S. Bachman MD, J. M. Fuentes MD, Michael R Marohn DO, Mark A Talamin MD, Department of Surgery, The Johns Hopkins University School of Medicine

INTRODUCTION: Acid-base conditions significantly affect the physiologic response to stress. Peritoneal absorption of CO2 during abdominal insufflation in laparoscopy disrupts acid-base equilibrium and may cause acidosis in nonventilated animals. Furthermore, in most ventilatory anesthesia rodent models, airway access is established through tracheotomy, which can induce a significant stress response. We have developed a minimally invasive animal model that does not independently incite the inflammatory response and controls for anesthesia- and pneumoperitoneum-related acid-base changes. This model provides an environment in which the biologic response to pneumoperitoneum can be studied precisely.

METHODS: Male Sprague-Dawley rats (n=35) were randomized to receive anesthesia alone, anesthesia plus CO2 pneumoperitoneum, or anesthesia plus CO2 pneumoperitoneum with intubation and mechanical ventilation. With oppositional retraction of the superior and inferior incisor teeth and lateral retraction of the tongue, a 3 mm rigid endoscope was used to videoendoscopically guide a 14g intravenous catheter into the trachea in the mechanical ventilation group. Intubated animals were ventilated with a minute ventilation of approximately 250 mL/min or 900 mL/kg/min. Immediately following anesthetic induction, heparinized saline-flushed catheters made from polyethylene tubing with an external diameter of 0.965 mm and an internal diameter of 0.58 mm were placed in the right femoral artery of each rat through a 1 cm groin incision. Arterial blood was drawn and analyzed immediately following arterial cannulation and following 30 minutes of continued intervention.

RESULTS:

<table>
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<tr>
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<th>Baseline</th>
<th>After 20 minutes</th>
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<tr>
<td>pH</td>
<td>7.39±0.06</td>
<td>7.39±0.06</td>
</tr>
<tr>
<td>pCO2</td>
<td>66±6</td>
<td>66±6</td>
</tr>
<tr>
<td>pCO2 + Veat</td>
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*p < 0.001 for pH after 20 minutes vs both Anesthesia and CO2 Pneum + Veat
*p < 0.05 for pCO2 after 20 minutes vs both Anesthesia and CO2 Pneum + Veat

BASIC SCIENCE

PERTONEAL PH CHANGES FOLLOWING HAND-ASSISTED, LAPAROSCOPIC, AND OPEN NEPHRECTOMY IN A PORCINE MODEL, G K Kaban MD, Y W Novitsky MD, D R Czerniak MD, M Taylor, S Quarfordt MD, R A Perugini MD, J K Kelly MD, LITWIN MD, Department of Surgery, University of Massachusetts Medical School, Worcester, MA

Acidosis at the level of the peritoneum after CO2 insufflation may enhance metabolic seeding of port sites following oncologic laparoscopic surgery. pH change measured at the level of the peritoneum following laparoscopic (L), hand-assisted (HA), and open (O) surgery has not been previously compared. Ten pigs underwent left nephrectomy with 4 L, 3 HA, and 3 O procedures. Pigs were kept under inhalational anesthesia for 24hrs following nephrectomy. Using a pH probe placed at the level of the peritoneum, pH and arterial blood gases were monitored over the 24 hr post-operative period. pCO2 levels in the L and HA groups (pCO2=59mmHg and 66mg Hg) were elevated compared to the O group (pCO2=52mmHg) at closure with the difference between the HA and O groups approaching significance (p=0.08). However, no difference in pCO2 levels was found one hour after closure. L peritoneal pH (pH=7.45) was significantly higher than both the HA (pH=7.72) and O group (pH=7.13) at 4 hours following closure (p<0.05). HA peritoneal pH did not significantly differ from the O group at 4 hours. No significant differences in peritoneal pH were found in the remaining 24hrs. HA surgery appears to be more similar to O than L surgery in peritoneal pH effect. Surprisingly, L surgery did not result in an acidic environment at the level of the peritoneum post-operatively. Furthermore, alteration in peritoneal pH appears short-lived, lending less support to a pH effect as a means for peritoneal metastasis.
OPEN SURGERY-RELATED DECREASE IN CIRCULATING INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 (IGFBP-3) IS LIMITED TO ABDOMINAL SURGERY, Irena Kirman PhD, Natalia Pollortaskaia MS, Vesna Cvetkovic RN, Richard L. Wielien MD, Columbia University, Department of Surgery

Open abdominal surgery, unlike laparoscopic surgery, is associated with a large decrease in the plasma levels of the tumor inhibitory protein IGFBP-3. The extent of the IGFBP-3 decrease correlated with the length of incision. This aim of this study was to determine the impact of surgery elsewhere in the body on IGFBP-3 levels. The hypothesis was that postoperative (POD) IGFBP-3 levels are limited to procedures resulting in an increase in incision length. Methods: Patients undergoing the following procedures were studied: 1) laparotomy (n=12), mean incision length 21.7±6.2 cm; 2) open joint surgery (n=9), incision 20.6±5.0 cm; 3) lung lobectomy (n=13), incision 17.2±6.5 cm; 4) retroperitoneal nephrectomy (n=6), incision 25.6±13.7 cm. A paired Wilcoxon test was used for statistical analysis. Peripheral blood was collected preoperatively (Preop) and on POD2. Levels of intact IGFBP-3 were evaluated via combined ELISA and Western Blot analysis. Statistical Analysis was performed using a paired Wilcoxon test. Results: A dramatic decrease in mean concentration of intact IGFBP-3 was observed only in patients undergoing abdominal surgery, 196±1774 ng/ml Preop vs 449±391 ng/ml on POD2 (p=0.005). The Preop vs POD2 differences for the other groups were statistically insignificant; joint surgery, 1497±726 ng/ml Preop vs 1212±526 ng/ml POD2 (p=0.25); pulmonary, 1945±1041 ng/ml Preop vs 1572±1237 ng/ml POD2 (p=0.21); renal, 1750±1254 ng/ml Preop vs 1074±1188 ng/ml POD2 (p=0.56). Conclusions: Only open abdominal surgery is associated with IGFBP-3 decrease. This decrease is not related to incision length alone. Although unproven, wide exposure of the peritoneal cavity may result in the release of factors which directly or indirectly result in IGFBP-3 proteolysis.

REGULATION OF C-MET AND ITS LIGAND HEPATOCYTE GROWTH FACTOR BY HYPOXIA, A MECHANISM FOR TUMOUR PROGRESSION, Peter W McCullough BA, Kiran Kamboj BS, Nawar A Alkhamesi MD, Andrew Ramwell BA, David H Peck PhD, Ara W Darzi MD, Imperial College London

Introduction: Hypoxia is associated with enhanced metastasis and poor prognosis within a range of tumours. Hepatocyte growth factor (HGF), a mesenchymal-derived cytokine and its ligand receptor c-met are implicated in progression within a number of cancers. Our aim was to determine the effect of hypoxia on the regulation of c-met and its ligand HGF and subsequent effects on invasive potential.

Method: Expression of cellular distribution of c-met was determined in a range of pancreatic and colorectal adenocarcinomas under acute and chronic hypoxia by flow cytometry and immunocytochemistry. Invasive potential was determined under the above conditions by transwell invasion assay and regulation of protease production determined by gelatin (MMP2&9) and casein(MMP7) zymography. Assays were repeated using antibodies to HGF and specific tyrosine inhibitors.

Results: All cell lines constitutively expressed c-met. A significant upregulation in expression was seen via FACS analysis in cell exposed to both acute and chronic hypoxia (p<0.01). Enhanced invasion was seen in response to exogenous HGF in cell exposed to hypoxia compared to control cells (p<0.01). Analysis of MMP production indicated enhanced protease activity, correlating to enhanced invasion, production being blocked by incorporation of anti-HGF antibody or utilisation of inhibitors to protein kinase C and P13K.

Conclusion: Hypoxia enhancement of c-met and its ligand HGF increases the invasive potential of tumour cells by protease-dependent mechanism. This study indicates a mechanism by which hypoxia influences tumour progression.

THE ROLE OF INTERLEUKIN 8 IN COLORECTAL CANCER: A POSSIBLE AUTOCRINE MECHANISM ENHANCING TUMOUR PROGRESSION, Navar Alkhamesi MD, A Ramwell BA, C Bailey BA, P McCullough BA, D Peck PhD, A Darzi MD, Imperial College

Introduction: Host inflammatory response to tumours has previously generally been considered to be advantageous. However, this response may actually be deleterious and provide a mechanism for enhanced tumour progression.

The CXC chemokine interleukin-8 (IL-8) has been shown to be overexpressed in a variety of tumours, but was initially characterised as a neutrophil chemoattractant. Its impact on tumour progression in other tumours however, implies direct motogenic, mitogenic and angiogenic properties.

The aim of this study was to determine expression of IL-8 and its receptors on colorectal tumours and to investigate effects in modulation of tumour progression.

Methods: IL-8 expression in a range of human colorectal cancer cell lines was assessed using ELISA. IL-8 receptor expression was determined using immunocytochemistry and flow cytometry. Chemokine, receptor and MMP production was assessed in a number of primary human colorectal specimens using ribonuclease protection assay (RPA).

The role of IL-8 in metastatic enhancement was investigated using gelatin zymography for matrix metalloproteinase (MMP) expression and correlated to invasive potential, using Transwell invasion assays.

Results: IL-8 expression was ubiquitous in all cell lines and tumour specimens examined. The production of IL-8 correlating with tumour stage. Receptor expression was observed in all solid tumour samples and cell lines tested. Increased MMP-2 and 9 production and concomitant increased invasion were seen in the presence of exogenous IL-8. This could be utilised by utilisation of IL-8 receptor blocking antibodies.

Conclusion: IL-8 and its receptors are expressed on colorectal cancer and appear to provide an autocrine mechanism of increased tumour progression via a protease dependent mechanism.
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THE IMPACT OF A LAPAROSCOPICALLY TRAINED COLORECTAL SURGEON ON THE LAPAROSCOPIC COLECTOMY EXPERIENCE OF A SINGLE ACADEMIC CENTER, Mary T Austin MD, Michael D Holzman MD,William O Richards MD, Irene D Feurer PhD, C Wright Pinson MD, Alan J Herline MD, Vanderbilt University Medical Center

OBJECTIVE: Evaluate the impact of a laparoscopically trained colorectal surgeon (LTCS) on the laparoscopic colectomy experience of a single academic center.

METHODS: Retrospective study of all laparoscopic colectomy cases performed over the past five years. Case complexity (number of prior operations, co-morbidities, obesity), operative and set-up time, and trends over time for the LTCS were analyzed. Data were compared between cases performed by the LTCS and those performed by two veteran laparoscopic surgeons (VLS). Statistical methods included analysis of variance, multiple regression, and chi-square tests.

RESULTS: The LTCS performed 49% (94/192) of the cases, the VLS 9% (16/192), so comparisons between the LTCS and VLS groups focused on the less complex cases only. Among the less complex cases, overall operative time differed for the two groups (LTCS = 220+11 vs. VLS = 152+15 min, p<0.01) but no difference was seen in co-morbidities, prior operations, obesity, or LOS (all p > 0.2). Statistical significant predictors of operative time were operative complexity (slope =0.01), surgeon group (p=0.01), and prior operations (p=0.03); obesity and co-morbidities were not associated with operative time (p=0.83, p=0.10, respectively; model R² = 0.75, p < 0.001). Overall LOS was 4.8 + 0.6 days (2 to 33). Minor complications occurred in 12 cases (21%) and major complications in 7 patients (12%). Among cases performed by the LTCS, a comparison of the first 25 cases to the second 25 demonstrated that operative time decreased in the second cohort (p=0.001), complexity was related to operative time (p=0.001), and that the reduction occurred regardless of case complexity (complexity by cohort interaction effect, p=0.45). Prep time also decreased in the second cohort (p=0.01) and was not related to case complexity (p=0.64; complexity by cohort interaction effect, p=0.96).

CONCLUSION: The addition of a laparoscopically trained colorectal surgeon has significantly impacted this center's experience with laparoscopic colectomies in both raw numbers and the complexity of cases. Although a steep learning curve is frequently noted for laparoscopic colon surgery, we have demonstrated significant improvement in operating time for both the surgeon and operating room staff over the course of a single year.

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LAPAROSCOPIC EXPERIENCE IN COMPLICATED DIVERTICULAR DISEASE, C M Bartus MD, T Lipoff MS, C M Shahbaz Sarwar MS, J C Cohen MD, K Johnson MD, W V Sardella MD, P V Vignati MD, University of Connecticut, Hartford Hospital

Introduction: Laparoscopic surgery is readily becoming the standard of care for the elective operative management of diverticular disease. We reviewed the management of diverticular disease and its complications of a single colorectal practice over a five year period.

Materials: From January 1998 through July 2003 patients with diverticular disease were prospectively entered into the database from a single colorectal practice. Patient charts were reviewed retrospectively and patient demographics as well as ASA classification and preoperative complications of diverticular disease (abscess, fistula, stricture) were noted. Intraoperative data including the type of surgery, need for conversion and operative time were recorded. Postoperatively patients were followed for complications and length of stay.

Results: There were 341 operations performed for diverticular disease on 294 patients over a five year period. Of these, 90 were emergent procedures for either perforation or hemorrhage. Elective operations included Hartmann closures and primary resection for either recurrent disease or complicated diverticulitis.

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<th>Rec Div</th>
<th>Comp Div</th>
<th>Col Closure</th>
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<tr>
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<tr>
<td>Attempted lap</td>
<td>87% (122)</td>
<td>80% (48)</td>
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<tr>
<td>Conversion</td>
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<td>OR time (min)</td>
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<td>201</td>
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<tr>
<td>Length of stay</td>
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Conclusions: Our experience demonstrates that laparoscopic management of diverticulitis, including complex disease as well as Hartmann's closure offers safe, feasible operations which result in a short hospital stay. We conclude the laparoscopic approach has rapidly become the standard of care in elective operative management.

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LAPAROSCOPIC TREATMENT OF CECAL DIVERTICULITIS, Giancarlo Basili MD, Massimiliano Dal Canto MD, Graziano Biondi MD, Enrico Prezioso MD, Christian Galatatto MD, Orlando Goletti MD, Department of Surgery - Pontedera General Hospital (Pisa) - ITALY

Introduction: Cecal diverticulitis is a rare clinical entity; the reported frequency of this disease varied from 1 to 300 to 1 in 34 appendectomies. Right-sided diverticulitis is difficult to distinguish from other sources of right-sided abdominal pain and, in particular, is frequently indistinguishable from acute appendicitis preoperatively. Because of the problems concerning preoperative diagnosis and controversies in the management, the choice of the best therapy on the surgeon's part is still open.

Methods: A total of 1150 patients with a clinical diagnosis of right acute abdomen as observed in our surgical practice over the period 1995-2003 were analyzed. Three patients had a pathologically confirmed diagnosis of cecal diverticulitis.

Results: The mean age of patients was 37 years. Right lower quadrant pain and local tenderness were the only clinical findings in 95.3%, with preoperative diagnosis of acute appendicitis in 2 of 3 patients. The operative finding was an inflammatory mass of the cecum and the presence of minimal amount of free peritoneal fluid. Two patients underwent laparoscopic ileocecectomy and one had diverticulectomy. The post-operative course was uneventful.

Discussion: Because of the difficulties in diagnosis and surgical treatment, cecal diverticulitis has received much discussion in the literature and many questions remain unanswered. Right-sided diverticulitis is easily confused with acute appendicitis because it occurs at a somewhat younger age than that in sigmoid diverticulitis. Cecal diverticulitis needs a high index of suspicion for achieving a preoperative diagnosis. Diverticulectomy should be performed in patients with small diverticulitis with limited inflammatory reaction. Right hemicolectomy should be performed in patients with perforation of the diverticulum, cecal phlegmon or abscess formation. Correct intraoperative diagnosis is therefore crucial for the selection of surgical procedure.

Laparoscopic treatment of a solitary, acutely infected colonic diverticulum is feasible in this setting. Mini invasive procedure could be achieved, therefore, in patients with right acute abdomen, allowing not only the right diagnosis but also the treatment of the comonest pathologies responsible for such a clinical picture.

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LYMPH NODE HARVEST IN ELECTIVE COLORECTAL SURGERY FOR MALIGNANCY: AN INSTITUTIONAL STUDY OF OPEN VERSUS LAPAROSCOPIC BOWEL RESECTION, Daniel W Birch MD, Catherine Gill-Pottruff BS, Mehran Anvari MD, Center for Minimal Access Surgery, St Joseph's Healthcare, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.

Introduction: Considerable controversy exists regarding the appropriate number of lymph nodes that must be retrieved from a lymph node basin in patients with colorectal cancer. Further controversy arises when considering the feasibility of adequate lymph node dissection in laparoscopic bowel resection for colorectal cancer. We reviewed a single academic center's records to compare the number of lymph nodes assessed after open and laparoscopic bowel resection for colorectal cancer.

Methods: A database is maintained for all colorectal cancer patients undergoing laparoscopic and open bowel resection from 1992-2003. Data was abstracted from these databases and analyzed for patient demographics and appropriate histopathology indices. The data was pooled and stratified according to the procedure performed both for colon and rectal cancers and assessed for variation in lymph node harvest. All comparisons were done using P values calculated using unpaired student's t test and performed with Staview 4.5 for Macintosh.

Results: Data was available for 481 open colorectal resections (OS) and 153 laparoscopic colorectal resections (LCS) performed electively for malignancy. There were no significant differences between the groups with respect to patient age or gender. The distribution of cases between colon and rectum and the specific nature of the bowel resection completed was similar in both groups. The balance of low anterior resection and abdomino-perineal resection for rectal cancer was comparable. The mean number of lymph nodes assessed for all colon resections was 7.51 +/- 5.01 (OS) and 7.40 +/- 5.32 (LCS), and for rectal cancer 6.42 +/- 5.05 (OS) and 7.26 +/- 5.69 (LCS).

There were no statistical differences in the number of lymph nodes assessed for OS and LCS when data was pooled for all cases or stratified by location of malignancy. The mean number of lymph nodes retrieved is less than current recommendations; however the cause for this variation is unclear and not clearly related to any of the parameters assessed in this study.

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LAPAROSCOPIC VERSUS OPEN TOTAL MESORECTAL EXCISION; A CASE-CONTROL STUDY, SO Breukink, JPN Pieire, AJK Grond, G Hoff, T Wiggers, WJHJ Meijerink, Department of Surgery, Medical Centre Leeuwarden, Leeuwarden, The Netherlands.

Because definitive long-term results are not yet available, oncological safety of laparoscopic surgery for treatment of rectal cancer remains unproven. The aim of this prospective non-randomised study was to assess the feasibility and short-term outcome of laparoscopic Total Mesorectal Excision (LTME) after 25-30 Gy preoperative radiotherapy and to compare the results with a historical matched-control group of open TME (OTME).

A series of 41 patients with primary rectal cancer underwent LTME for rectal cancer and were matched with a historical control group of 41 patients who underwent OTME. Surgical and pathological data were prospectively recorded. Patients in the LTME and OTME groups were matched for age, Duke's classification, and type of resection (low anterior or abdomino-perineal resection).

There was no mortality in the LTME group and 1 patient died in the OTME group. The overall postoperative morbidity was 37% in the LTME group, and 51% in the OTME group, including an anastomotic leakage of 9% and 14% in the LTME and OTME group respectively. Laparoscopic surgery resulted in a reduction of perioperative blood loss, quicker starting of solid diet and shorter hospitalisation. However, the operative time was increased in the laparoscopic group. A positive circumferential margin was found in 7% of the LTME group and in 12% of the OTME group.

This study shows that LTME is technically feasible and can be performed safely. Next to the general advantages of laparoscopic surgery we show at least a similar surgical completeness by laparoscopic technique as compared with open surgery.

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LAPAROSCOPIC TREATMENT FOR COMPLICATIONS OF COLONOSCOPY, Gyu-Seog Choi MD, Jongho Lee MD, Sangho Lee MD, Soo-Han Jun, Department of Surgery, Kyungpook National University Hospital, Daegu, KOREA

[Introduction and Aim] Colonoscopy is one of the most reliable and useful tool for diagnosis, surveillance and treatment of colorectal disease. Despite of its safety, in large series of procedures, serious complications such as perforation or bleeding of the colon are rare but inevitable. Fortunately, most of cases showed relatively clean colon due to routine preparation before colonoscopy. So, immediate therapeutic intervention can treat with minimal complication. Laparoscopically we treated patients with complications after diagnostic or therapeutic colonoscopy and evaluated its safety and usefulness.

[Materials and Method] From December, 2002 to June, 2003, ten patients (5 males, 5 females, age range: 45~76 years) were referred to us from various centers for laparoscopic surgery due to complications of colonoscopy. Types of injury were nine perforations (8 sigmoid, 2 rectum, 1 cecum by location) and one bleeding. Initial colonoscopy was performed in 4 and 6 patients therapeutically (EMR or polypectomy) and diagnostically, respectively.

[Procedures] Under the general anesthesia and pneumoperitoneum, two initial perforations were sewn by laparoscopic hand suture. In 3 subsequent patients with perforation, the lesion was roughly sutured and hanged up by percutaneous suture with straight needle which saved extra port, followed by closure with linear stapler. Simultaneous anterior resections or T-colectomy were performed for three different patients with perforation and simultaneous colorectal cancer or polyp. One extensive perforation was treated by segmental resection and end to end anastomosis. In one another perforation, laparoscopic exploration and intra-operative colonoscopy only found an anastomotic leakage of 9% and 14% in the LTME and OTME group respectively. Laparoscopic surgery resulted in a reduction of perioperative blood loss, quicker starting of solid diet and shorter hospitalisation.

This study shows that LTME is technically feasible and can be performed safely. Next to the general advantages of laparoscopic surgery we show at least a similar surgical completeness by laparoscopic technique as compared with open surgery.

COLORECTAL/INTESTINAL SURGERY  
P108  
HAND ASSISTED LAPAROSCOPIC SURGERY(HALS) WITH LAP-DISC FOR TREATMENT OF FAMILIAL ADENOMATOUS POLYPOSIS COLI PATIENTS, Gyu-Seog Choi MD, Sangho Lee MD, Jongho Lee MD, Soo-Han Jun MD, Department of Surgery, Kyungpook National University Hospital, Daegu, KOREA

[Introduction and Aim] FAP is a good candidate of laparoscopic surgery, but because of complexity of procedure itself and frequent association of overt cancer, laparoscopic surgery for FAP patient need experiences, skill and meticulous. Many institutes use hand assisted laparoscopic surgery method for these complicated operations. Sometimes, unnecessary introduction of a hand into peritoneal cavity might cause poor visual field. Therefore we applied hand assisted laparoscopic surgery (HALS) with LAP-Disc for treatment of FAP patients. LAP-Disc is a new and minimal invasive tool for treatment of FAP patients. We reported the feasibility and safety of this new tool.

[Materials and Methods] From May, 1998 to May, 2003, thirteen FAP patients (8 males; 5 females) underwent total proctocolectomy with ileal J-pouch anal anastomosis by HALS method with Lap-Disc. Age ranged between 23 and 53 years (mean=33 years).

[Procedures] Operations were conducted in following order. 1) IMA and IMV ligation and division, mobilization of left colon and rectum. 2) mobilization of ascending colon and terminal ileum. 3) Conversion to HALS method with Lap-Disc for mobilization of cecum and ascending colon and ileostomy. 4) formation of J-pouch through suprapubic mini incision. 6) J-pouch anal anastomosis and diversion ileostomy.

[Results] Mean operative time was 402 min (300-610 min). Patients could start oral intake 3 to 5 days after surgery, and discharged at 10th post-operative day (7~16 days). No complication occurred. An anal leak occurred in three different FAP patients. Anastomotic leakage rates are not statistically significant between HALS and Lap-Disc methods.

[Conclusions] HALS with Lap-Disc for treatment of FAP patients is technically feasible and oncologically acceptable. Introducing one hand through Lap-Disc in appropriate time during the operation was very helpful to secure safe and quick mobilization of the colon and rectum.

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CONSERVATIVE TREATMENT OF THE ANASTOMOTIC LEAKAGE IN RECTUM NEOPLASMS, SALVADOR DELGADO MD, ESTHER MANS MD, DULCE M MOMBLAN MD, RAQUEL BRAVO MD, RICARD CORCELLES MD, AINIZE IBARZABAL MD, ANTONIO M LACY PhD, HOSPITAL CLINIC BARCELONA

[Introduction] Low rectal resection with total mesorectal excisions is the elective technique in the treatment of the middle and inferior rectal cancer. The anastomotic leakage is the most important complication and the main cause of postoperative morbidity and mortality. Anastomotic leakage rates vary from 3 to 11% with a postoperative mortality of 25%. The management of the anastomotic leakage is to remove the anastomosis and perform a terminal colostomy. This may suppose a risk of permanent ostomy from 10 to 100% of cases. Laparoscopic anterior resection of the rectum offers all the advantages of the laparoscopic surgery, being at least as feasible and safe as open surgery and it has an anastomotic leakage rate similar to open surgery.

Minimally invasive approach can be a good alternative to laparotomy in treating the anastomotic leakage.

[Objective] To assess the treatment of anastomotic leakage in patients operated on laparoscopically for an inferior and medium rectal cancer.

[Materials and methods] Prospective analysis of consecutive patients operated on from March 1998 to April 2003 for low and medium rectal carcinoma. Results: The study period includes 220 patients, with a mean age of 67.3 years old. Tumours were located in 70.9% of the cases in medium and inferior rectum. Patients received chemo and radiotherapy in 59% of the cases. So, the anastomotic preservation was possible in more than 75% of the patients. Lateral ileostomy was performed in 47% of patients in which a low anterior resection with total mesorectal excision was realized. Anastomotic leakage was diagnosed in twelve patients, five of them with ileostomy and 7 of them received neoadjuvant therapy. Conservative treatment was tried in 4 patients (transanal drainage of presacral collection or percutaneous drainage). The 8 remaining patients required surgery. In 5 cases an ostomy by laparoscopic approach and peritoneal lavage was done. In 1 patient we resected the colostomy anastomosis by laparoscopic approach and only in one case conversion to open surgery was necessary. The closure of the ostomy was made in 9 patients (75%).

Comments: Anastomotic leakage rate after laparoscopic low anterior rectal resection was 7.2%. This rate is similar to the published series in open rectal surgery. The attitude front the anastomotic leakage was conservativeness with laparoscopic approach. This way we saved 91% of anastomoses and we closed lateral ileostomy in 75% of the cases.
LAPAROSCOPIC COLORECTAL RESECTIONS FOR ENDOMETRIOSIS, Francesco Feliciotti MD, roberto campagnacci MD, angelo de sanctis MD,silvana perretta MD,pamela zenobi MD,francesca crosta MD, clinica di chirurgia generale e metodologia chirurgia università di ancona

Background: The rectosigmoid colon is affected by deep pelvic endometriosis in 3-37% of cases. In the past the treatment of the affected gastrointestinal tract has generally required conversion to conventional surgery.

Aim: To describe our experience with complete laparoscopic management of deep pelvic endometriosis with bowel involvement.

Patients and methods: From march 1995 to march 2003 29 consecutive patients with endometriosis requiring laparoscopic intervention were evaluated. In 7 patients (24%) colorectal involvement was identified prior to the operation. A low anterior resection was performed in 4 patients(57%), a sigmoid resection in 3 (43%). In all cases colonoscopy showed a normal mucosa. In all cases treatment consisted of resection of the bowel involved together with the excision of all other implants Data analysis included age, previous abdominal operations, previous history of endometriosis, operative time, complications, length of stay, pain relief.

Results There were 7 patients whose median age was 32.8 years (range 28-40), with history of previous abdominal operation in 2 (28%), Preoperative symptoms were as follow: dysmenoreara 4 patients (57%), dyspareunia 4(57%), pelvic pain 7 (100%), rectal bleeding 1 (14%), tenesmus 5 (71%).

Mean operative time was 190 min (range 165-230). Length of stay was 8,3 days (7-11). There were no anastomotic leak and no major post-operativTinal complication. One patient had temporary urinary retention (14%). At a median follow-up of 38.7 months (1-94) complete relief of pelvic symp- toms was achieved in 5 patients (71%), improvement in 1 patient (14%). In one patient (14%) complaining of persistent pain a new colonic implant was diagnosed two years after the surgery requiring reoperation.

Conclusions: These results show that, provided that the surgeon is highly skilled in laparoscopy, laparoscopic resection of deep pelvic endometriosi- s with rectosigmoid involvement is feasible and effective in nearly all patients.

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SOLO-SURGERY IN LAPAROSCOPIC-ASSISTED COLEC TOMIES FOR COLO-RECTAL CANCER USING A VOICE-CONTROLLED ROBOTIC ARM, Shoichi Fuji MD, Hideyuki Ike MD,Shigeru Yamagishi MD,Shuji Sakai MD,Yasushi Ichikawa MD,Shigenori Chihiki MD, Hiroshi Shinomiya MD, University Postgraduate School of Medicine, the Department of Gastroenterological Surgery

(BACKGROUND)We had recommended a new technique in laparoscopic-assisted colectomies for colon and rectal cancer, which is lifting of the colon using a thread. It requires a few staffs and trocars and is able to perform without deterioration in curability.

(AIM) To report on our experience with a voice-controlled robotic arm (AESOP) in laparoscopic colorectal surgery for solo-surgery.

(SURGICAL TECHNIQUE) The trocar that was 12mm in the diameter was inserted at the navel and pneumoperitoneum was performed. Another trocars were placed at the opposite site to the lesion. A laparoscope was handled by AESOP, which was controlled only by the identified operator’s voice. A 2-0-nylon thread was inserted into the abdominal cavity and passed through the mesocolon. The colon was retracted to the frontal side by pulling the thread that was fixed at the abdominal wall by forces. The pulling site of the mesocolon was set at 10cm and more over distance from the tumor in order not to disarrange cancer cell. Then, the feedting artery was stretched in the mesocolon, lymph node (LN) dissection was easily performed. This method does not require a first assistant, because of fixing the colon to abdominal wall. Another thread was added at the other place of the mesocolon in case of the elongated tumor in order to ensure the visual field.

(RESULTS) This method was performed for 6 patients. The mean number of the dissected LNs was 26(13-65). Two patients had positive LN metastases (33.3%). One patient had hepatic metastasis. All patients are alive.

(DISCUSSION) Some benefits accrued by a use of the robotic arm, which save handling patients and can provide greater stability of view, wider extra corporeal operative field and more curatively maneuver by non-touch technique to tumor. The robotic arm movement was fine except inadequate setting of the lower limit area and bad pronunciation. No complications related to the moving of robotic arm and the lifting of the colon using the nylon thread occurred.

(CONCLUSIONS) 1. The lifting colon method using the robotic arm was able to perform solo-surgery without deterioration of curability in laparoscopic operation for colorectal cancer.

2. Using the robotic arm is advantageous in saving medical costs and maintaining greater stability of operative field.

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LAPAROSCOPIC SURGERY FOR RIGHT COLONIC DIVERTICULITIS, Masaki Fukunaga MD, Akio Kidokoro MD,Toshiaki Iba MD,Kazuysuke Sugiyama MD,Tetsu Fukunaga MD,Kunihiko Nagakari MD,Masaru Suda MD,Seichiro Usokawa MD,Department of Surgery, Juntendo Urayasu Hospital, Juntendo University

At our institution, laparoscopic surgery (LAP) has been used actively in diseases of the colon, including diverticular diseases of the colon. Thus, LAP has been performed on 631 patients with diseases of the colon. Of these, 402 patients had colon cancer, 246 had acute appendicitis, and 24 had diverticular disease. Thus, diverticular disease was the third most common disease. Of the 24 patients with diverticular disease, 7 had the left colonic type, while 14 had the right colonic type. The breakdown of the left and right types therefore clearly differs in Japan from that in Europe and America. Patients of the right colonic type diverticulitis are more common than left colonic type.

In 14 patients, diagnostic laparoscopy was performed due to acute abdominal complaints such as right lower abdominal pain, and an emergency operation was performed in three patients; elective surgery was performed.

Diverticulotomy was performed on three patients, cecal resection on one patient, ileocolic resection on six patients, right colectomy on five patients, transverse colectomy on one patient, appendectomy on two patients, and conversion to open surgery on one patient. Following a thorough examination by diagnostic laparoscopy, under the guidance of laparoscopy, the colon was mobilized from the retroperitoneum. In some cases, the right colon was pulled out by the trocar and body through a small incision to permit appropriate treatment. In all patients with right-colonic-type diseases, the surrounding adhesion was mild, and detachment was relatively easy. As for surgical methods, the medial retroperitoneal approach, in which retroperitoneal detachment is performed first, was employed; then, an inspection of the uterus on the medial side, in which the inflammation was mild, the subsequent procedures were performed. We have not experienced intraoperative complications such as ureteral injury. Open surgery was performed following diagnostic laparoscopy when the diagnostic laparoscopy was performed improperly. The incidence of postoperative complications has been lower than with open surgery, with only two patients experiencing wound infections. None of our patients experienced postoperative ileus.

These findings suggest that the right colonic type is accompanied by acute abdominal complaints, that LAP is particularly useful in the differential diagnosis of acute appendicitis, and that LAP enables proper subsequent treatments.

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A DECADE OF EVOLUTION IN THE OPERATIVE MANAGEMENT OF COLORECTAL DISEASES, Rodrigo Gonzalez MD, C. Daniel Smith MD,Kota R Venkatesh MD,Edward Mason MD,Titus Duncan MD,Russell Wilson MD,Bruce J Ramshaw MD, Endosurgery Unit, Emory University School of Medicine, Division of General Surgery, Department of Surgery, Atlanta Medical Center, Atlanta, GA

BACKGROUND: Over the past decade, with the introduction and development of laparoscopy, there has been a significant change in the practice of general surgery. Although the laparoscopic approach has become the standard of care for most common general surgical diseases, laparoscopic colorectal resection (LCR) has not realized widespread acceptance. This study’s objective is to review factors that have played an important role in the introduction of LCR and the evolution of operative management of colorectal diseases over the past decade. METH-ODS: Retrospective review of 881 colorectal resections (392 open and 489 laparoscopic) performed at a teaching hospital between 1992 and 2001. Demographics, indications for surgery, type of procedure, and perioperative outcomes were reviewed. Data were analyzed by year to assess changes in care and outcomes. Results were analyzed using linear regression, Fisher’s exact test, or ANOVA. RESULTS: Over the past decade, the use of laparoscopy in colorectal disease has increased, except during the time when concern was raised in the literature about port-site metastases (p=0.02; 95%CI:0.19 to 0.99). There was a significant correlation between year in which the LCR was performed and increased body mass index (p=0.02; 95%CI:0.03 to 0.32) and decreases in operation time (p=0.04; 95%CI:0.00 to 0.61), length of hospitalization (p=0.007; 95%CI:0.34 to 0.70), percentage of patients requiring transfusion (p=0.03; 95%CI:0.17 to 0.01), intraop-erative complications (p=0.03; 95%CI:0.09 to 0.71), and postopera-tive complication rate (p=0.02; 95%CI:0.27 to 0.70). CONCLU-SIONS: The use of LCR is increasing despite earlier concerns regarding its use in colorectal cancer. Outcomes after LCR have improved as surgeons have gained confidence and experience, and larger and more complicated patients are now managed laparoscopically. It is expected that the use of LCR will continue to increase.

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LAPAROSCOPIC COLORECTAL CANCER RESECTION WITH CONCOMITANT OTHER ORGAN EXCISION: AN EXPERIENCE WITH 15 PATIENTS, Yong-Geul Joh MD, Seon-Han Kim MD,Kyung-Yul Hur MD,Dong-Keun Lee MD,Hyun-Hoe Kim* MD, Laparoscopic Surgery Center, Department Surgery, Hansol Hospital, Seoul, and *Department of Urology, Seoul National University, Seoul, Korea

Purpose: When a colorectal cancer patient has another intraabdominal disease that needs resection, open procedure usually requires a long laparotomy incision and may be associated with significant morbidity. The aim of this study was to evaluate the feasibility and the safety of synchronous laparoscopic resection in these patients.

Methods: Between March 2001 and July 2003, 297 laparoscopic colorectal cancer resections were performed. Among them, 15 patients had a concomitant disease which simultaneously removed using a laparoscopic manner. Resection of the adjacent organs due to direct cancer invasion or simple biopsy was excluded in this study. The type of operations and combined diseases, conversion, operation time, blood loss, hospital stay, and complications were analyzed.

Results: Laparoscopic procedures for colorectal cancer were 10 low anterior resections, 3 anterior resections, 1 right colectomy, and 1 abdominoperineal resection. TNM stages were 0 in 2 patients, 1 in 3, II in 6, III in 3, and IV in 6. Concomitant diseases were as follows: tumors (2 GI GISTs in the stomach, 1 colon adenoma, 1 colon inflammatory mass, 1 adrenal cortical adenoma, 1 uterine myoma, 2 ovarian cysts, 1 ovarian leiomyoma, and 1 liver eosinophilic abscess), 4 malignant tumors (3 early gastric cancers and 1 renal cell carcinoma), and 2 gallbladder stones. Combined operations were 4 oophorectomies, 3 subtotal gastrectomies, 2 gastric wedge resections, 2 right colectomies, 2 cholecystectomies, 1 right radical nephrectomy, 1 left adrenalecetomy, 1 hysterectomy, and 1 liver wedge resection. Operation time was variable from 140 minutes to 535 minutes according to the procedures. Median blood loss was 100 (50~200) ml and median hospital stay was 140 minutes to 535 minutes according to the procedures. Median blood loss was 100 (50~200) ml and median hospital stay was 9 (8~22) days. Conversion was required in no patients. Postoperative complications occurred in 3 patients; 1 anastomotic bleeding, 1 intraabdominal abscess, and 1 wound seroma.

Conclusion: Laparoscopic colorectal cancer resection with concomitant other organ removal is feasible and safe. Laparoscopy with experienced hands seems specifically suitable for managing these patients because it avoids a long laparotomy incision.
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LAPAROSCOPIC RESTAURATIVE PROCTOCOLECTOMY FOR ULCERATIVE COLITIS, Hermann P Kessler MD, Hohenberger Werner MD, Department of Surgery, University of Erlangen, Germany

INTRODUCTION: With increasing experience, laparoscopic techniques have been applied even to extended colorectal operations as reconstructive proctocolectomy in ulcerative colitis and familial adenomatous polyposis.

METHODS: After initial medial transection of the three main vascular pedicles, the colon is dissected free laterally, from the sigmoid orally towards the ileum. The rectum is mobilized down to the pelvic floor and transected at the level of the dentate line. A Pfannenstiel incision is made. After transection of the ileum, a J-pouch is created. The anastomosis is performed laparoscopically in double-stapling technique.

RESULTS: Within 26 months, 12 patients have been operated on. The median age was 25.5 years (22 ? 45), the median time of operation was 425 min (330 ? 510). There was no conversion to an open procedure. The mean length of hospital stay was 12 days (8 ? 65). There was no postoperative mortality. Major complications occurred in 2 patients. In one case, a pouch-vaginal fistula developed on postop. day 17 demanding secondary laparoscopic loop ileostomy. In another patient, pelvic abscess originating from a small leak of the pouch-anal anastomosis had to be treated by reoperation and suction drainage.

CONCLUSIONS: In restorative proctocolectomy, laparoscopic techniques prove to be safely feasible. They have the potential to become an appealing alternative to open surgery.

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THE LAPAROSCOPIC COMBINATION APPROACH FOR COLON CANCER, Yukihiro Kobukawa MD, Yoshimasa Otani MD, Takatoshi Nakamura MD, Takao Sato MD, Kazuhiko Nemoto MD, Koshi Sato PhD, Kitasato East Hospital

We have performed laparoscopic surgery for colon cancer for over 10 years now. We will report on a technique that was devised to avoid contact with the cancer while performing a completely safe intestinal mobilization and lymphnode resection. Techniques: The instruments used for laparoscopic surgery do not provide soft and protective contact with the cancer and instead are destructive. Performing a protective technique during laparoscopic surgery in advanced cancer including colon cancer is difficult. Therefore to avoid touching the cancer area we decided that it was necessary to devise a new approach. For this, lymphnode resection is performed before the intestines are mobilized. Lymphnode resection is performed from both the retro-peritoneal and peritoneal sides. By approaching from the retro-peritoneal side injury is avoided. Approach from these 2 sides makes lymphnode resection safe and precise. The intestines are pushed down and separated from the sub-peritoneal fascia they are viewed horizontally and at eye level. They are then peeled away starting from the caudal side. This combination approach was devised after performing 186 lateral, medial and retro-peritoneal approaches. Results and Conclusion: LAP was performed on 405 colon disease cases. Of those, 9 were cancer and 102 were non-cancerous. The above mentioned approach was performed on 117 cancer patients. This approach can be used on any area, especially on right side colon cancer patients. With the combination approach the laparoscopic surgeon can perform a safe and precise surgery.

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A DECADE OF LAPAROSCOPIC APPENDECTOMY-PRESENTATION OF 1026 PATIENTS, Konstantinidis K, Anastassakou M, Voriatis I, Sambalis M, Georgiou T, Theodoropoulos, Department of General and Laparoscopic Surgery, Athens Medical Center, Athens, Greece

Aim: The aim of this study is to present our experience with laparoscopic appendectomy for appendicitis in the last decade. Patients and Methods: During the last decade 1026 patients with suspected appendicitis were approached laparoscopically in the Department of General and Laparoscopic Surgery of the Athens Medical Center. There was no group of open appendectomies to compare outcome, as laparoscopy was the treatment of choice since our department was founded. The few patients approached by open technique from the start were exceptions, and were not included in this study. The indication for laparoscopy was suspected acute appendicitis in most cases, but there were some patients with chronic recurrent symptoms. Data were collected retrospectively on a data base and analyzed. There were 557 female and 469 male patients. The mean age was 27 years.

Results: Conversion rate was 0.5 %. The mean operating time was 26 minutes. Overall complication rate was 5.7%, consisting mostly of minor complications. There were no major intraoperative complications. Wound infections and intra-abdominal abscesses were reviewed separately and were 1.1% and 0% respectively.

Diagnosis could be established in 89% of all patients.

Postoperative pain was measured on the basis of analgetics required postoperatively. Mean time until bowel movements was 24 hours. The mean time until intake of solid food was 48 hours and the mean length of hospital stay was 30 hours. Patients returned to full activity after 7 days on the average. There was no mortality.

One patient had to be reoperated. Follow up lasted four weeks.

Conclusion: Laparoscopic appendectomy is a well justified procedure in the treatment of acute and chronic appendicitis. If there is enough experience, patients can profit from a quicker return of bowel habits, less postoperative pain, shorter hospital stay, and a faster return to normal activities than is reported for the open procedure. In addition we have a much better visualization of the abdominal cavity, a higher diagnostic accuracy, and probably less postoperative adhesion formation. Especially fertile women can profit from these advantages.

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OBJECTIVE: Increasing data show that laparoscopic colectomy for cancer is feasible in experienced hands. To gain experience, laparoscopic colon resection (LCR) for colonoscopically unresectable polyps (CUPs) has sometimes been employed as a learning case. This is due to the benign nature of most polyps and therefore decreased concern for nodal harvest and tumor seeding. To assess the appropriateness of this approach, we sought to determine the incidence of invasive cancer in a series of LCRs for polyps. Methods: A retrospective review was performed of 55 consecutive patients with CUPs seen over a 35-month period. All patients had polyps in either the right, left, or sigmoid colon. Patients with adenocarcinoma on preoperative biopsy were excluded. Data from colonoscopy, final colon pathology, and patients’ hospital courses were reviewed. Results: 30 males and 25 females, with a mean age of 66.3 years underwent operation. Lesions were localized to the cecum (26), right colon (13), hepatic flexure (4), left colon (2), and sigmoid (10). 52 laparoscopic procedures were completed; 3 cases were converted to open. Major complications included one anastomotic leak and one stroke (2/55, 3.6%). Median length of stay was 4 days. 18.2% (10/55) patients had documented invasive adenocarcinoma on final pathologic examination. On average 8.3 lymph nodes were harvested in these patients. Four of the ten patients with cancer had one or more positive lymph nodes. Patient age, sex, indication for colonoscopy, polyp size, poly location, poly characteristics, colonoscopic biopsy pathology were not predictive of adenocarcinoma on final pathology. Conclusions: We were not able to identify any accurate predictor of carcinoma in polyps. A significant number of CUPs harbor adenocarcinoma. This mandates a formal lymphadenectomy for all LCRs, whether for polyps or for cancer. Caution should be exercised when using the LCR as a “novice” or “learning” case.

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LAPAROSCOPIC COLON RESECTION FOR POLYPS: A GOOD NOVICE CASE? G Li MD, J Rosenthal BA, F Foght MD, J Kessler BA, H M Ross, University of Pennsylvania School of Medicine

CLINICAL OUTCOME OF LAPAROSCOPICALLY-ASSISTED RECTAL CANCER SURGERY, Takeshi Naiho MD, Takashi Tsuchiya MD, Satoshi Akaishi MD, Hiroshi Honda MD, Akiko Hashimoto MD, Fumie Ikezawa MD, Masao Kobari MD, Department of Surgery, Sendai City Medical Center

SAGES 2004 Poster Abstracts

BACKGROUND: Conventional surgery for rectal cancer contains some difficulty in maintaining a wide precise view of surgical fields. This is sometimes become a cause of severe complications such as uncontrollable hemorrhage or anastomotic leakage. Autonomic nerve injury following wide nodes dissection is also a major issue of this surgery. Laparoscopically-assisted rectal cancer surgery is recently approved by the National Insurance system and rapidly expanding in Japan. Theoretical advantages of laparoscopic surgery are less invasive and better cosmetic results. Besides magnified precise and angled view would yield excellent results for this surgery. We here report our experience of laparoscopically-assisted rectal cancer surgery and assess the clinical outcome retrospectively. [Patients and Methods] During Sept. 2000 and Aug. 2003, we operated 56 cases of rectal cancer. Of those 33 patients underwent laparoscopically-assisted anterior or low anterior resection of the rectum. No abdomino-perineal resection was performed laparoscopically. We assessed an operative time, estimated blood loss, postoperative complications, duration of hospitalization, and clinical outcome, retrospectively. [Results] Male to female ratio was 24:12 and mean age of the patients was 61.3 years old. According to the Japanese classification of colorectal cancer, 10 tumors were localized in Rs which is rectosigmoid region, 20 in Ra which is rectum above the peritoneal reflection, and 3 in Rb which is rectum below the peritoneal reflection. T numbers of the tumor according to the UICC classification were as follows; 20 cases of T1, 12 cases of T2, 1 of T3. Nine cases of them were node-positive. Mean operative time was 191 min., and mean estimated blood loss was 51 ml. Postoperative complications were identified in 4 cases, of those 2 cases represented an anastomotic leakage. No excretory malfunction was observed in these patients. Mean postoperative hospitalization was 14 days. Mean follow-up time was 14 months. No patient died of rectal cancer, but one patient represented a solitary liver metastasis which required right hepatic lobectomy 4 months after rectal surgery. [Conclusion] Although further evaluation is mandatory, laparoscopically-assisted rectal cancer surgery is safe and would be oncologically adequate procedure.
Atilla Ertan MD, John F Sweeney MD, Michael DeBakey MD, Glenn Parker MD, Wendy Shertz MD, Monmouth Taro Higuchi MD, Akira

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**COLORECTAL/INTESTINAL SURGERY**  
**P127**  
**COLONIC LIPOMAS**, Robert J Obermeyer MD, Eric M Knauer MD, Michael P Millie MD, Herminio Ojeda MD, Michael B Peters MD, Attila Ertan MD, John F Sweeney MD, Michael DeBakey Department of Surgery, Baylor College of Medicine

A 62 year old female presented with a history of intermittent abdominal pain and bloating for five years. On physical exam there were no abnormalities and her stool was hemocult negative. Laboratory work up was normal with no evidence of microcytic anemia. An abdominal CT scan with oral contrast was obtained revealing a round, well-demarcated, 3.8 cm homogeneous tumor with low attenuation located in the colon near the hepatic flexure. (Figure 1) A colonoscopy with tissue biopsies was performed demonstrating pathology consistent with a benign colonic lipoma. A surgical consult was obtained and a laparoscopic colon resection was recommended. She tolerated this procedure well and was discharged home on postoperative day three tolerating a soft mechanical diet. Gross and microscopic pathologic examination confirmed the diagnosis of a benign colonic lipoma. (Figure 2)

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**LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER**, Junji Okuda MD, Tetsushiya Yamamoto MD, Keitaro Tanaka MD, Koji Nishiguchi MD, Keisaku Kondo MD, Keiji Sugita MD, Yoshiaki Tatsumi MD, Nobuhiko Tanigawa MD, 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 post site recurrence. Through August 2003, we did laparoscopic resection on 422 patients with colorectal cancers. To accurately identify the vascular anatomy of each patient, we have applied Integrated 3D-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 and mortality rate after laparoscopic surgery were 10.5%(major:3.3%, minor:7.2%) and 0.4%. The mean follow-up period is 29 months. Recurrence(liver metastasis) was identified in 11 patients (stage I: 8, II: 2, III: 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.

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**OBJECTIVE ASSESSMENT OF PHYSICAL ACTIVITY AND SURGICAL INVASIVENESS FOLLOWING LAPAROSCOPY-ASSISTED COLECTOMY VS. OPEN COLECTOMY**, Koki Otsuka MD, Taro Higuchi MD, Akira Sasaki MD, Tetsuya Itabashi MD, Hiroshi Aasai MD, Kazuyoshi Saito, Department of surgery, Iwate medical university.

In laparoscopy-assisted colectomy (LAC), lymphadenectomy can be performed in a comparable manner to open colectomy (OC), and since postoperative recovery is quicker, LAC is considered minimally invasive surgery and is being widely performed in clinical settings. However, when assessing surgical outcomes, parameters such as first day of ambulation, first day of oral intake, first passage of flatulence, and length of hospitalization are used, but these parameters lack objectivity. Therefore, in the present study, postoperative physical activity and surgical invasiveness were objectively compared between LAC and OC. Postoperative physical activity was quantified using an acceleration sensor (AC210), while postoperative surgical invasiveness was assessed by measuring the levels of WBC, CRP, IL-6 and IL-1ra in peripheral blood. The results of AC210 analyses showed that physical activities with regularity were seen quicker with LAC, thus clarifying that postoperative recovery in physical activity is faster with LAC. Moreover, low surgical invasiveness of LAC was objectively proven based on the levels of WBC, CRP and IL-1ra.

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**RECTAL AND ANAL GASTROINTESTINAL STROMAL TUMORS(GIST): A REPORT OF TWO CASES**, Gregory V Pakonis MD, Glenn Parker MD, Wendy Sertz MD, Monmouth Medical Center

CONTEXT: Gastrointestinal Stromal Tumors (GIST) are mesenchymal tumors of the GI tract. They are most often found in the stomach and small intestine, and rarely in the rectum or anus. Over the past few years, much attention has been given to the diagnosis and treatment of GIST. It has been shown that a large majority of these tumors are immunoreactive for c-kit (CD117), and it has therefore been used as a marker to diagnose GIST.

PURPOSE: To study GIST, specifically focusing on anal and rectal tumors.

DESIGN: Case reports of two patients, one with anal GIST and one with rectal GIST. They were both diagnosed using the c-kit immunoreactive stain, and treated with curative surgery.

DISCUSSION: We will discuss the case history of these two patients, as well as performing a literature review of GIST. Included in this review will be the diagnosis with c-kit staining and treatment with adjuvant therapy using an inhibitor of kit, called STI571.
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Background: Laparoscopic colon resection has become the procedure of choice for the majority of colon resections performed at our institution over the past four years. The conversion to the laparoscopic approach to colon resection has been driven by both patient preference and the belief by the operating surgeons that it is a viable alternative to the open approach. The purpose of this study is to report the experience of one group of surgeons at our institution in their first 200 laparoscopic colon resections.

Methods: This is a retrospective review of the first 200 cases of laparoscopic colon resections performed at our institution by one group of surgeons. We collected the following data on each patient: age, sex, +/- ureteral stent placement, operating room time, indication for surgery, number of ports used, rate of conversion to open procedure, intra-operative complications, length of stay, pathology of resected segment, margins and number of nodes taken for colon carcinoma cases, and post-operative complications, and the length of disease free follow-up.

Results: We report the above data points and compare the data according to the indication for surgery.

Discussion: We will discuss our results, complications, and the viability of laparoscopic colon resections in the treatment of both malignant and non-malignant disease processes based on our experience.

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TOTAL AND SUBTOTAL LAPAROSCOPIC COLON RESECTION FOR BENIGN AND MALIGNANT DISEASE, Petachia Reissman MD, Yaron Armon MD, Alexander Mintz MD, Ram M Spira MD, Joseph Alberton MD, Shaare-Zedek Medical Center, Jerusalem, Israel.

Background: Laparoscopic total and subtotal colectomy was until recent years considered to be associated with relatively high morbidity and conversion rates. This was well reflected in the literature with the lack of reports on this procedure for several years. However, after gaining more experience with various colorectal and other advanced procedures, along with the development of new technologies and instrumentation, such procedures were re-introduced and recently reported with good results. The aim of this study was to assess the outcome of laparoscopic total and subtotal colon resections in our institute after having performed other colorectal and other advanced procedures for several years.

Patients and Methods: All consecutive patients with indication for total or subtotal colectomy were attempted laparoscopic or laparoscopic assisted procedure, between 2001-2003. Parameters including: demographics, indication, type and length of procedure, conversion, morbidity, and outcome were recorded and analyzed.

Results: 17 patients (7 female, 10 male, 17-84 years of age) underwent: total proctocolectomy with ileoanal pouch ? 6, total proctocolectomy with permanent ileostomy ? 2, subtotal colecotmy with ileo-rectal anastomosis ? 9. Indications included: ulcerative colitis ? 9 (2 of which were operated urgently in acute state), tumors and polyps ? 4, Crohn’s colitis ? 3, and bleeding diverticulosis ? 1. Mean length of procedure was 232+ 36 (180-270) min, length of stay 9.8+4 (6-22) days. There was 1 conversion (6%), and 2 complications (12%): postoperative myocardial infarction-1 and anastomotic leak-1.

Conclusions: Laparoscopic total and subtotal colectomy is safe and effective after gaining sufficient experience with other colorectal less complicated procedures. The length of procedure, morbidity and outcome are comparable to open similar procedures, while the length of stay according to this study is not shorter. Further large scale studies are needed to establish the superiority of such laparoscopic procedures.

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ACUTE SMALL BOWEL OBSTRUCTION SECONDARY TO ENDOMETRIOSIS OF THE TERMINAL ILEUM: CASE REPORT AND LITERATURE REVIEW, Jeffrey R Ridha MD, Sebastiano Cassaro MD, Department of Surgery, Cabrini Medical Center, Mount Sinai School of Medicine, New York, NY.

Background: Endometriosis refers to the presence of ectopic foci of benign functional endometrial tissue. It is quite common in menstruating young women with a prevalence of up to 15%. Endometriotic foci are most commonly located in the pelvis, but have been described in extra-pelvic sites including large and small bowel, pleura, lung, umbilical, subarachnoid space, and inguinal canal. Although gastrointestinal endometriosis is common, the majority occurs in the rectum and sigmoid colon. Endometriosis of the small bowel is rare, and symptomatic small bowel involvement is very unusual. A clinical picture of obstruction may be caused by stenosis or kinking as a result of adhesions or fibrosis. Intestinal intussusception and volvulus have also been described. We present a case of acute small bowel obstruction secondary to endometriosis of the terminal ileum and review the literature on this topic.

A 36 year old nulliparous caucasian woman presented to the emergency department with a one day history of diffuse, severe cramping abdominal pain most prominent in the left lower quadrant, nausea, and vomiting. Her medical history was noncontributory. Her family history was significant for Crohn’s enteritis. Her abdomen was diffusely tender, and pelvic examination was unremarkable. Laboratory studies included a white blood cell count of 14,000/mL, and abdominal radiographs revealed an acute small bowel obstruction, which progressed over the next day. A CT scan revealed no distinct mass lesion but indicated an acute ileal obstruction. The patient underwent an exploratory laparotomy the next day. A complete small bowel obstruction was found involving the terminal ileum. The obstruction had the gross appearance of an endometrioma. A small bowel resection with end-to-end anastomosis was performed. The final histopathologic diagnosis revealed extensive endometriosis. The patient’s recovery was unremarkable.

Ileal endometriosis is a rare condition which may cause acute small bowel obstruction. The diagnosis is extremely difficult to make pre-operatively due to the vagueness of symptoms and similarity in presentation to other causes of obstruction, and is based on a high index of suspicion. However, the diagnosis should be considered in female patients of child-bearing age who present with symptoms of obstruction. Definitive treatment includes resection of the involved segment with primary anastomosis, and adjuvant hormonal therapy may prevent recurrence.

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LOW INCIDENCE OF ADHESION ILEUS AFTER LAPAROSCOPIC COLORECTAL SURGERY, Danny Rosin MD, Oded Zmora MD, Aviad Hoffman MD, Marat Khailkin MD, Barak Bar Zakai MD, Moshe Shbatli MD, Amram Ayalon MD, Department of General Surgery and Transplantation, Sheba Medical Center, Tel Hashomer, Israel.

Background: Post operative adhesions are a major cause of morbidity and medical expenses, accounting for 4 percent of re-admission of surgical patients. Bowel obstruction is attributed to adhesions in nearly 40 percent of cases, many of which are after colon and rectal surgery. Laparoscopic surgery has the potential advantage of reducing adhesion formation, due to attenuated surgical trauma, less tissue handling and smaller scars. The aim of this study is to assess the rate of adhesion ileus after laparoscopic colon and rectal surgery.

Methods: Data regarding laparoscopic colon and rectal surgery was prospectively collected. Information about the patients, the procedures and the follow up was analyzed, and patients who were readmitted for bowel obstruction were identified.

Results: Over a period of 7 years, 238 patients, at a mean age of 66.5 years, had laparoscopic colon and rectal operation in our department, 95 for benign conditions and 143 for malignant disease. Mean follow-up time was 14 months. 9 cases of re-admission due to bowel obstruction were identified. However, only in 4 patients (1.7%), adhesions were the presumed etiology, and all resolved with conservative management. One of these patient underwent a laparotomy after the laparoscopic procedure. In two others the obstruction was early, occurring within 2 weeks of surgery. Obstruction was caused by recurrent disease in four patients, and by incarcerated incisional hernia in the extraction-site scar in one case.

Conclusions: The incidence of adhesion ileus after laparoscopic colon and rectal surgery appears to be very low. This long term benefit of laparoscopic surgery, with its related economic consequences, should be considered, in addition to the short term advantages, when comparing this technique to its open counterpart.
**LAPAROSCOPIC COLON AND RECTAL SURGERY WITHOUT MECHANICAL BOWEL PREPARATION**

**Objective:** Mechanical bowel preparation prior to colorectal surgery is aimed to (1) reduce the rate of post operative infectious complications (2) facilitate tumor palpation and localization (3) allow intraoperative colonoscopy if required. Recent data suggest that mechanical bowel preparation may reduce infectious complications. In laparoscopic colectomy, palpation is blunted, which may specifically compromise tumor localization. The aim of this study is to assess the use of mechanical bowel preparation in laparoscopic colectomy.

**Methods:** A retrospective chart review of a prospectively entered database of patients who underwent laparoscopic colectomy was performed. Patients were divided into two groups: Group A had mechanical bowel preparation prior to surgery, and Group B had their surgery without mechanical bowel preparation. Data relative to operative and post operative course were reviewed.

**Results:** 200 patients underwent laparoscopic colectomy, of which 88 (34%) received preoperative mechanical bowel preparation, and 132 (66%) had not. Sixteen (8%) patients required intraoperative colonoscopy for localization, which was evenly distributed between the two groups (9% Group A, 7% Group B). A conversion to laparotomy was slightly more common in Group B (14% Vs. 9%) compared to Group A patients, but this difference did not statistically significant. There was no significant difference in post operative complication rate between the two groups.

**Conclusions:** Subtotal colectomy may be safely performed without mechanical bowel preparation, although difficult localization may lead to a slightly higher conversion rate. Appropriate patient selection for laparoscopic colectomy without mechanical bowel preparation is essential, and preparation should be considered with small and nonpalpable lesions.
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SHOULD LAPAROSCOPIC COLORECTAL SURGERY BE PERFORMED IN A COMMUNITY HOSPITAL SETTING?

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PURPOSE: In recent years, the use of the laparoscopic approach to perform colorectal surgery has been the subject of active debate. Many studies demonstrating the efficacy and safety of the laparoscopic approach in tertiary care centres have been published. The aim of this study was to examine the results of laparoscopic colorectal surgery performed in a community hospital setting.

METHODS: Between August 1999 and September 2003, a prospective study was performed in a 200 bed acute care community hospital 400 km away from the nearest tertiary care center. All of the cases were performed by two community surgeons who transitioned themselves from an open to a laparoscopic approach. This study includes 88 consecutive patients (mean age 64 years, 49 women and 39 men) who underwent laparoscopic bowel resections for benign and malignant disease. Patient demographics as well as short and long term outcomes are presented.

RESULTS: The conversion rate to an open procedure was 11%. There was no intra-operative mortality and one 30 day mortality (1 patient who presented with post-operative mesenteric ischemia secondary to peripheral vascular disease). There was one intra-operative complication (splenic laceration requiring splenectomy), 10 non-post-operative complications (1 wound infection), 10 minor and 10 major post-operative complications (1 pneumonia, 2 intra-abdominal bleeds, 2 small bowel obstructions, 2 anastomotic leaks, 1 colovaginal fistula and 1 anastomotic stricture). The median operating time for this laparoscopic colorectal surgery was 185 minutes (range 75 min to 350 min). The median length of stay was 4 days (range: 2-45 days). Thirty seven patients underwent colorectal resections for malignancy. At 10 months mean follow-up, there was no local-regional or trocar site recurrence noted. The mean length of the distal margin was 3 cm and the mean number of lymph nodes retrieved was 10.

CONCLUSIONS: Laparoscopic colorectal surgery for benign and malignant disease can be performed in a community hospital setting with acceptable morbidity and mortality. Furthermore, community surgeons experienced in open colorectal surgery can safely transition themselves from an open to a laparoscopic approach.

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USE OF A STERILIZED SANDWICH BAG TO REDUCE WOUND INFECTIONS IN LAPAROSCOPIC COLON SURGERY, Mickey Seger MD, Robert Chastanet MD, Caroline Daigle BS, Rebecca Churchman RN, Philip L Leggett MD, University of Texas Health Science Center Houston. MIST

Background: Wound infection rates in laparoscopic surgery have consistently been used to compare outcomes with open procedures. The reported wound infection rate in colon surgery typically ranges from 6-12%. Many laparoscopic bags and devices have been utilized for specimen extraction. It has been postulated that these devices may allow for less contamination at specimen extraction sites which in turn should allow for lower infection rates. Hypothesis: Use of a sterilized sandwich bag to facilitate the extraction of resected colon decreases wound infection rates in laparoscopic colon surgery.

Methods: Heavy duty quart sized sandwich bags are sterilized and used as a liner of the abdominal wall at the extraction site. Any anastomoses or manipulation of the colon is done inside the mouth of the bag. The fascia is then closed in layers. All patients underwent a preoperative modified nichols bowel preparation and received preoperative intravenous antibiotics.

A retrospective chart review was performed of 100 patients who underwent laparoscopic colon resection. All wound related complications were documented.

Results: There were 4 wound infections and 1 seroma in the study group. Two of the infections were at a site remote from the colon extraction. Discussion: Reports of wound infection in laparoscopic surgery have generally been in the range of 6-12%. The preponderance of these infections are at the specimen extraction site. Our data suggest that the use of a sterilized sandwich bag to aid in specimen removal can significantly decrease the rate of wound infection at the extraction site. Our data suggest that the use of a sterilized sandwich bag to aid in specimen removal can significantly decrease the rate of wound infection at the extraction site. The use of a sterilized sandwich bag is an inexpensive and easy way to reduce wound related complications in laparoscopic colon surgery.

COLORECTAL/INTESTINAL SURGERY P141

UTILIZATION OF LAPAROSCOPIC COLECTOMY: CAN IT BECOME ROUTINE? Anthony J Senagore MD, Conor PDelaney MD, Cleveland Clinic Foundation

Purpose: Fewer than 3% of all colonic resections are performed using laparoscopic techniques which conveys the perception of certain selection bias for use of the laparoscopic (LAP) approaches to colorectal pathology. We reviewed the impact of liberal selection criteria for laparoscopic colon resection on the use laparoscopic (LAP) and open (OPEN) approaches in a colorectal surgical practice.

Methods: A consecutive series of colorectal surgical patients operated by two surgeons from 10/02-9/03 were evaluated. Criteria for an attempted laparoscopic colon resection were BMI<35, absence of multiple prior major abdominal surgical procedures, absence of known pathologic mass >15cm, and proctectomy for cancer. All minor and nonresectional abdominal surgical procedures, and emergent procedures were excluded from analysis. Data collected included: resection type; pathology; complications; mortality; duration of stay (LOS); and readmission rate within 30 days.

Results: 368 major colorectal resections were performed during the study period with 177 (48%) via laparotomy and 191 (52%) via laparoscopic resection. Conversion was required in 7.5% of cases. The median and mean LOS were significantly less for the LAP group (LAP 3.0/ 3.1 ± 1.9 days vs OPEN 5.0/5.9 ± 4.2 days). Fewer postoperative complications occurred in the LAP group (LAP-3.7%/OPEN-7.8%). The readmission rate was similar between the groups (LAP-6.3%/OPEN-6.8%).

Conclusions: The data indicate that laparoscopic colorectal resection can be offered and successfully delivered to a large percentage of patients with a variety of colonic pathology. The benefits of reductions in hospital complications and a shortened length of stay are significant benefits particularly in an era of increasingly constrained hospital resources.

COLORECTAL/INTESTINAL SURGERY P142


Introduction: Numerous series have described laparoscopic fecal diversion. However, no series has compared laparoscopic ileostomy to laparoscopic colostomy. We hypothesized that there would be no significant differences between the two procedures.

Methods: A consecutive series of patients undergoing laparoscopic fecal diversion was reviewed. Analysis was by intent to treat. Two cohorts were formed based on the operative procedure performed, ileostomy (Group A) or colostomy (Group B). Indications, demographics, length of stay (LOS), ASA classification, body mass index (BMI), operative times, direct cost and morbidity were analyzed. Statistical analysis included student’s t test and chi square analysis where appropriate. All statistics were calculated using Microsoft Excel.

Results: From March, 2000 through May, 2003, 28 laparoscopic fecal diversions were attempted. There was one conversion in Group B due to a shortened mesentery. 16 patients were in Group A and 12 were in Group B. Indications included chronic fistulas (10), pelvic/anal malignancies (6), incontinence (7), radiation proctitis (2), sacral decubitus (2) and a motility disorder (1). Significant differences were found in age (A=39 yrs vs B=62 yrs; p<0.001), ASA (A=2 vs B=3; p=0.01), LOS (A=4 vs B=10; p=0.03) and direct cost (A=$3,060 vs B=$9,266; p<0.05). Operative times (A=2 vs B=38 minutes), BMI (A=24 vs B=24) and gender were insignificant. Morbidity was comparable between the groups. Group A had a stomal prolapse, SBO and pelvic abscesses and Group B had a parastomal hernia. Conclusion: Laparoscopic ileostomy is more likely to be performed in younger, healthier patients, allowing for decreased LOS and cost when compared to laparoscopic colostomy. Prospective randomized trials are required to definitively determine which procedure is safer and more cost effective.
The laparoscopic approach for patients undergoing intestinal resections is gaining popularity and now becoming widely utilized. However, the role of laparoscopy in complex intestinal surgery is more controversial and only infrequently described. Over the past three years we have developed a technique to incorporate a minimal access approach to perform a total proctocolectomy with ileal pouch anal anastomosis (IPAA).

A retrospective review of 25 patients undergoing a laparoscopic-assisted ileal pouch anal anastomosis (LIPPA) between June 2000 and July 2003 was conducted. Twenty-one patients had ulcerative colitis and four had familial adenomatous polyposis. Mean operative time was 303 minutes with no conversions. In each case the colon was mobilized and resected laparoscopically while the rectal dissection and pouch formation were performed through a Pfannenstiel or minimal lower midline incision. All patients were diverted with an ileostomy. There were no deaths or intraoperative complications. Median length of hospital stay was six days (range, 5-20 days). Four patients developed complications within 30 days of surgery: one exploration for suspected pouch leak (no leak was found), one small bowel obstruction requiring operative correction, and two intraabdominal abscesses. With a maximum of three years follow-up one pouch leak was successfully treated with surgery and a second patient developed a pouch vaginal fistula ultimately being diagnosed with Crohn’s disease.

During the study period, 70 patients underwent total proctocolectomy with IPAA of which 36% were performed laparoscopic-assisted. The decision to perform a minimal access approach was based on surgeon preference. Selection criteria expanded as experience was gained. This initial large experience has shaped our belief that this procedure in selected patients offers a similar complication rate with this technique. This initial large experience has shaped our belief that this procedure in selected patients offers a similar complication rate with this technique. The advantages of rapid postoperative recovery and the reduced pain are evident.

Laparoscopic assisted colectomy for advanced cancer with disseminated tumor: A case report. Mari Tsukamoto MD, Hitoshi Inagaki MD, Tsuyoshi Kurokawa MD, Hiroshi Nagata MD, Yoshihiro Owa MD, Ichiro Horikoshi MD, Katsuhiko Kotake MD, Nobuhiro Ito MD, Toshihiko Nonami MD, Department of Surgery, Aichi Medical University, Aichi, Japan

We report a case of effective laparoscopic surgery for advanced colon cancer. A 44-year-old Japanese female who presented with a right lower abdominal tumor was admitted to Aichi Medical University hospital. Lower intestinal series showed stricture of the ascending colon, and computed tomography showed invasion of the tumor to the abdominal wall. However no metastatic lesions were found in an imaging series. Surgical treatment through open laparotomy, not laparoscopy, was thought to be indicated in this case. The patient strongly preferred for laparoscopic surgery, however, and this technique was chosen after we received sufficiently informed consent. Intraoperative findings revealed disseminated tumors in Douglas pouch. We performed right hemo-colectomy with lymph node dissection and resection of all visual disseminated nodules in the Douglas pouch by laparoscopic surgery. There were no surgical complications. After surgery, the patient received chemotherapy with 5-fluorouracil and leucovorin. She was satisfied with the comfortable post-operative course.

Laparoscopic assistance for recurrent hemorrhage of an unknown origin. K Konstantinidis MD, G Theodoropoulos MD, G Spanomihos MD, G Sabalis MD, M Vorias MD, M Georgiou MD, K Anastassakou MD, Department of General and Laparoscopic Surgery, Angiology Department, Athens Medical Center, Athens, Greece

Laparoscopy can provide cases of digestive bleeding of obscure origin with the diagnosis and the possibility of simultaneously correcting the problem in a minimally invasive fashion. A 62-year-old was suffering recurrent painless episodes of melena and undiagnosed chronic anemia for 4 years. Despite the extensive evaluation during his three hospitalizations, the origin of the hemorrhage could not be identified. At his last admission visceral angiography revealed an area of hypervascularity at the beginning of the jejunal containing irregular, corkscrew vessels coming from the first jejunal branch of the superior mesenteric artery. Under general endotracheal anesthesia, a 10-mm trocar, for the introduction of the 30 degree laparoscope, was inserted subumbilically using the open Hasson technique. Two 5-mm trocars were also used suprapubically and at the left iliac fossa. A 2.5 cm smooth, hypervascular tumor was easily appreciated on the jejunal wall, 10 cm from the Treitz ligament. The small bowel segment was laparoscopically mobilized and was brought through the subumbilical trocar site, that was extended for 1 additional cm. A limited small bowel resection and a stapled anastomosis were easily performed laparoscopically. Histopathologic examination diagnosed a benign GIST (leiomyoma). The patient was discharged on the second postoperative day.

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Laparoscopic assisted colectomy for advanced cancer with disseminated tumor: A case report. Mari Tsukamoto MD, Hitoshi Inagaki MD, Tsuyoshi Kurokawa MD, Hiroshi Nagata MD, Yoshihiro Owa MD, Ichiro Horikoshi MD, Katsuhiko Kotake MD, Nobuhiro Ito MD, Toshihiko Nonami MD, Department of Surgery, Aichi Medical University, Aichi, Japan

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INTRODUCTION: The incidence of ureteric injury during pelvic surgery is up to 2.2%. While prophylactic ureteric catheters may lessen the incidence of ureteric injury, their use remains controversial. The aim of this study was to assess the efficacy of ureteric catheters in preventing ureteric injury. METH- ODS: We performed a retrospective review of all laparoscopic procedures between January 2002 and June 2004. Fifty elective laparoscopic colorectal surgeries were performed. Patients with ureteric catheters were retrospectively analyzed for demographics, body mass index (BMI), prior abdominal surgery, diagnosis, procedure, duration of catheter placement, duration of surgery, insertion site, complications, conversion, and mortality. Results: Fifty-two patients were evaluated. The mean age was younger in the ST group (54.3±19.3 years) than the NS group (58.7±18.0 years) group (p=0.039); mean BMI was 26.4±4.4 and 25.0±5.5 (p=0.556), respectively. There were no significant differences in history of prior colorectal resection (p=0.286) or other abdominal surgery (p=0.074). Crohn's disease or diverticulitis were more common in the ST than the NS group (38.3% vs 20.7%; p=0.001 and 31.5% vs 11.0%, respectively; p=0.0001). Concomitant intraabdominal fistula or abscesses was present in 29 (19.5%) patients in the ST vs 14 (8.5%) in the NS group (p=0.005). Duration of surgery was longer in the ST (200.2±72.0 minutes) vs the NS (147.2±59.9 minutes) group (p=0.005). There were no significant differences in conversion (p=0.593), duration of bladder catheter placement (p=0.983) or length of hospital stay (p=0.258). Urinary tract infection occurred in 3 (2.0%) patients in the ST and 4 (7.3%) in the NS group (p=0.267) and urinary retention in 3 (2.0%) patients in the ST vs 11 (6.7%) in the NS group (p=0.045); no intraoperative ureteric injuries occurred in either group. CONCLUSION: Ureteric stent placement was successful in 99.3% of patients, required a mean of only 11 minutes and was not associated with any catheter placement or intraoperative injuries. The increased length of surgery in patients with ureteric catheters is likely to reflect the increased severity of pathology in these patients.

COLORECTAL/INTESTINAL SURGERY  P148
LAPAROSCOPIC RIGHT COLECTOMY FOR CANCER: AN ONCOLOGICAL APPROACH. Paolo Uibli MD, General surgical dept. Alzano lombardo Hospital Italy

The aim of this work is to describe a laparoscopic technique for right colectomy in case of cancer, that allows to obtain a final specimen and number of lymphonodes similar to the open approach as guarantee of correct oncological results. A correct operations, from the oncological point of view, means the ablation of cecum, ascending colon and proximal transverse colon, along with the right portion of the omentum, ligating the ileocolic and the ileocecal arteries at their origin from the superior mesenteric artery as well as the corresponding veins at the confluence in the major vessels. Moreover the right branch of middle colic vessels must be interrupted. The final result should be a complete and wide lymphadenectomy. We have performed this procedure more than 100 times, with no major complications. To perform such operation the surgeon needs just 3 or 4 trocars in proper place. The dissection must be in the correct avascular plane, initially just below the ileocolic vessels, afterwards in the plane between the Transversus and Gerota's fascia, maintaining the colon in place, from the anterior surface of the II and III part of duodenum and the head of pancreas. The right ureter and the gonadic vessels are identified in first phase behind the ileocolic vessels, if the surgeon maintains the dissection in abovementioned avascular plane. The colon is moved from the right parietocolic gutter in final step. A complete en-bloc resection is obtained. The terminal ileum is stapled and divided and the specimen extracted via the upper right trocar site, where a conventional anastosis is made. The mesentry of the intended sigmoid colon specimen was incised close to the bowel; the sigmoid vessels were divided close to the bowel preserving the superior rectal artery; bowel resection was performed at a minimum, as the sigmoid colon was not mobilized. Median operating room time was 180 (120-330) min, suprapubic incision length 5 (3-7) cm, estimated blood loss 150 (50-500) ml, specimen length 20 (12-45) cm, solid food resumption 3 (1-6) days, and length of stay 4.5 (2-7) days. Thirty-day complications (pneumonia, urinary infection, urinary retention, wound infection) were not related to anastomosing and occurred in 20% of the patients. Median follow-up was 34.1 (18-48) months. One patient had a recurrence. Conclusion: Although the evidence provided by the present study may suggest that sparing SRA has a favorable impact on anastomotic leak rates, these nonrandomized results need further evaluation. The division of the mesorectum at the rectosigmoid junction seems not necessary, and its sparing should therefore be considered as it may contain anastomotic leak rates.

COLORECTAL/INTESTINAL SURGERY  P149
PRESERVING THE SUPERIOR RECTAL ARTERY IN LAPAROSCOPIC SIGMOID RESECTION FOR COMPLETE RECTAL PROLAPSE, Miro Uchal MD, Kari Lovik MD, Ronald Marvik MD, Roberto Bergamaschi MD, Department of Research and Development, Health System, Norway.

Purpose: Sigmoid resection is indicated in the treatment of complete rectal prolapse (CRP) in patients with prolonged colorectal transit time (CTT). Its use however has been limited due to fear of anastomotic leakage. This study challenges the current practice of dividing the mesorectum by prospectively evaluating the impact of sparing the superior rectal artery (SRA). We investigated the division of the SRA in aggressive patients with prolonged colorectal transit times and the impact on anastomotic leak rates after laparoscopic sigmoid resection (LSR) for CRP. METHODS: During 30 months data on 33 selected patients with CRP were prospectively collected. Three patients were withdrawn from the analysis, as they had neither resection nor anastomosis. Twenty-nine women and one man (median age 55 range 21-83 years) had a median CTT of 8 (3-15) cm. There were 20 ASA I and 10 ASA II patients. Ten patients had undergone previous surgery. Four patients complained of dyschezia, whereas incontinence was present in 26 patients. Anal ultrasound showed isolated internal sphincter defects in two patients. Four young adults (21-32 years) had normal CTT, whereas 26 older patients had a median CTT of 5 (4-6) days. Defecography demonstrated 10 enteroceces, two sigmoidoceces, and one rectal hernia through the levator ani muscle. LSR with preservation of SRA included: The mesorectum was dissected off the posterior rectal wall along a 4-5 cm length at approximately 14 cm from the anal verge at intra-operative rigid proctoscopy on a fully mobilized rectum; the bowel was transected with an endoscopic stapler; then the rectum was not divided; the visceral pedicle of the mesorectum of the intended sigmoid colon specimen was incised close to the bowel; the sigmoid vessels were divided close to the bowel preserving the superior rectal artery; bowel resection was performed at a minimum, as the sigmoid colon was not mobilized. Median operating time was 180 (120-330) min, suprapubic incision length 5 (3-7) cm, estimated blood loss 150 (50-500) ml, specimen length 20 (12-45) cm, solid food resumption 3 (1-6) days, and length of stay 4.5 (2-7) days. Thirty-day complications (pneumonia, urinary infection, urinary retention, wound infection) were not related to anastomosing and occurred in 20% of the patients. Median follow-up was 34.1 (18-48) months. One patient had a recurrence. Conclusion: Although the evidence provided by the present study may suggest that sparing SRA has a favorable impact on anastomotic leak rates, these nonrandomized results need further evaluation. The division of the mesorectum at the rectosigmoid junction seems not necessary, and its sparing should therefore be considered as it may contain anastomotic leak rates.

COLORECTAL/INTESTINAL SURGERY  P150
LAPAROSCOPIC BENEFITS IN SUB-ACUTE INTESTINAL OBSTRUCTION, Surendra Ugale MS, Neeraj Gupta MD,Vishwas Naik MS, Kiforskar Hospital, Hyderabad, India

Introduction: Laparoscopy is being applied as the technique of choice in various abdominal procedures. We have extended its applicability in conditions requiring surgery for intestinal obstruction due to various causes. We conclude that laparoscopically anastomosed bowel has a diagnostic as well as therapeutic potential in conditions of intestinal obstruction. Material & Method -: Since starting laparoscopic surgery in 1991, we have diagnosed & treated 226 patients with intestinal obstruction. Females had a higher incidence - 70% of the cases. Most have been patients with previous surgeries; appendectomy in 75% of cases, cholecystectomy in 50% cases. Most had a history of repeated attacks of colicky abdominal pain and distension were also laparoscopic. We used 3-4 5mmports & 5mm telescope for visualization. In case of any abdominal pain and distension were also laparoscoped. We used 3-4 incision), Hystrectomies- 20% ( Lower midline), G.J.Vagotomies 2% (upper midline scars) Others - Tuberculum of small bowel, tubercular strictures of small bowel, Congential band to umbilicus, intussusceptions (ileoileal), Leiomyomata of small bowel, Post operative, Foreign body inside bowel lumen.Patients with acute abdominal distension were con- served till the distension reduced and abdomen became softer. Baseline investigations, X-ray of abdomen were done. The earliest signs esp. in patients developing ileus was the presence of fluid levels on ultrasound. The diagnosis was confirmed by diagnostic laparoscopy, which was performed when there were no bowel sounds on auscultation of abdomen. Patients with history of repeated attacks of colicky abdominal pain and distension were also laparoscopic. We used 3-4 5mm ports & 5mm telescope for visualization. In case of any abdominal obstruction scan, first port was taken in the left subcostal region by first inserting the scope and viewing the abdomen. The rectal portion was sharp cutting, using scissors or harmonic scalpel. Energy was used sparingly only if a big vessel was cut. After diagnosis, if bowel requires resection, it is brought out via a small midline or paramidline incision & resection. Anastomosis done inside the abdomen. Results of 90% of cases could be treated successfully by laparoscopy alone 5% required a small incision for bringing out the small bowel for resection & anastomosis 3% had to be converted because of matted bowel and mass formation. 2 patients developed intestinal fistulae, which healed on conservative treat- ment. Time taken range was 45-120 mins. Benefits of laparoscopy can be extended to diagnose as well as treat conditions causing subacute intestinal obstruction. Proper technique and expertise makes the procedure very safe and worthwhile.

The aim of the present study was to perform a retrospective study of our experience in performing laparoscopic colon surgery after 9 years experience. PATIENTS: From June 1994 to July March 2003, 309 patients underwent colorectal laparoscopic surgery using the retroperitoneal approach method. The patient average age was 65.6 (range: 18-96). Tumor depth were from M to SE.

RESULTS: The short- and long-term outcomes of the laparoscopic surgical procedure were then reviewed. Ten cases (3.2%) were converted to laparotomy, and 9 of these were in the first 100 cases (9%). Two cases with ureter trauma were experienced before the introduction of the retroperitoneal approach. One case was converted to laparotomy after the first 100 cases (0.5%). This case involved difficulty in hemostasis due to damage to the internal iliac vein in the obturator lymph node dissection. With regard to postoperative complications, there were 17 cases of ileus (5.5%). Two of these were treated surgically and the remaining 15 cases improved conservatively. Suture failure was experienced in 6 cases (1.9%) and all of these had been subjected to low anterior resection for a rectal lesion (one Ra and 5 Rb cases). In terms of the long-term outcome of our laparoscopic surgery for colon cancer, the 5 year survival rate was 93.4% in the Cur A cases with a median of 4.8 years. The 5 year survival rates by depth of invasion were 100% for m, sm, and mp, and 85.7% for ss, se, a1, and a2. The 5 year survival rates by Cur A stage were 100% for stages 0 and I, 89.7% for stage II, 85.5% for stage III, and 72.9% for stage IIb. There were 8 deaths due to cancer in the Cur A cases: 2 Stage II cases, 3 stage IIIa cases, and 3 stage IIb cases. There were no cases of port site recurrence.

This report presents a laparoscopic colectomy technique by the retroperitoneal approach that we have developed and established as an approach to blood vessels for the treatment of colon cancer. This technique allows the ablation and exposure of the urinary ducts and blood vessels irrespective of patient factors (e.g. obesity and adhesions) without any disturbance of the visual field by the small intestine. The short- and long-term outcomes of the laparoscopic surgery we have conducted for colon cancer were good.
COLORECTAL/INTESTINAL SURGERY P155
TOTAL ABDOMINAL COLECTOMY FOR COLONIC INERTIA- LAPAROSCOPIC-ASSISTED VERSUS HAND-ASSISTED, William T Chen MD, Kuang-Hong Haiao MD, Jau-Jie You MD, Chang-Hua Christian Medical Center
Total abdominal colectomy (TAC) with ileorectal anastomosis is currently the choice of procedure for colonic inertia (CI), and reported success rate of more than 90%. Currently, there are no comparative studies between laparoscopic total abdominal colectomy (L-TAC) and hand-assisted total abdominal colectomy (H-TAC) for patients with CI whom required colectomy. The Aim of this study is to determine the feasibility and outcome of a L-TAC compared with a H-TAC in patients with CI required of TAC and ileorectal anastomosis.
Patient and method: All patients diagnosed to have CI after complete clinical and anorectal physiologic studies received either pure laparoscopic TAC or hand assisted TAC for CI was included for the study. The patients were divided into two groups, group I were the patients who received L-TAC, and group II were patients who had H-TAC. All data were prospectively collected regarding the patients age, gender, body mass index (kg/m2) length of operation, length and type of incision, number of ports, and postoperative course. The intra-operative time, blood loss, postoperative ileus recovery, duration of hospitalization and complications were recorded.
Results: Twenty female patients found to have CI; ten underwent L-TAC (mean age of 3.1) and Ten (mean age of 29.6) underwent H-TAC. There were significant improvements in the stool frequency, need for assisted evacuation and abdominal distension after both procedures; were fully satisfied with the resulting bowel function. Intra-operative time for LTC was significantly longer by a mean 60 min (P < 0.000). Wound length for L-TAC was significantly shorter than H-TAC (P < 0.008). Postoperative blood loss, complication, recovery of bowel movement and length of hospital stay were the same in both groups. There were no deaths.
Conclusion: Both L-TAC and H-TAC improve bowel function for CI; however, L-TAC gives a better cosmetic result, but takes longer to perform.

COMPLICATIONS OF SURGERY P156
GAS EMBOLISM DURING LAPAROSCOPIC CHOLECYSTECTOMY, William S Cobb MD, Henry A Fleishman MD,Kent W Kercher MD,Brent D Matthews MD,B. Todd Heniford MD, Carolinas Medical Center, Charlotte, NC
Background: The advancements in laparoscopic surgery have resulted in decreased length of hospitalization, improved pain control, and better cosmesis following general surgical procedures. As surgeons improve on minimally invasive techniques, the applica-
tions of laparoscopy increase. The laparoscopic surgeon must be cognizant of the potential complications of the technique to best weigh the risks and benefits for individual patients. Carbon dioxide gas embolism is a rare occurrence that can induce an adverse, and potentially fatal, outcome. We report a case of venous gas embolism during laparoscopic cholecystectomy.
Case Report: A 63-year-old woman presented with right upper quadrant pain and an abdominal ultrasound suspicious for a gall-bladder polyp. A laparoscopic cholecystectomy was planned. A closed, Veress needle technique was used to gain entry into the abdominal cavity. Shortly after carbon dioxide insufflation, the patient’s hemodynamic status deteriorated and oxygen saturation dropped. Gas insufflation was immediately stopped and the patient resuscitated. She stabilized quickly, and the procedure was performed without further event. Visualization of the liver revealed a small puncture site due to the Veress needle. She did well postoperatively and was discharged home the next day.
Conclusion: Carbon dioxide embolism during laparoscopy, albeit rare, can be a fatal complication of the procedure. Whenever sudden changes in hemodynamic stability occur, venous gas embolism should be considered. As laparoscopic techniques improve and the applications are expanded, surgeons and anesthesia colleagues must be aware of this entity.

COMPLICATIONS OF SURGERY P157
ROLE OF PERCUTANEOUS CATHETER CHOLANGIOGRAPHY IN THE EVALUATION OF IATROGENIC BILE DUCT INJURIES, Fahim Habib MD, Danny Sleeman MD,Peter Lopez MD,Berta Montalvo MD,Javier Cassias MD,Joe Levi MD, University of Miami
Introduction: Advancements in endoscopic and radiological techniques have minimized the role of percutaneous catheter cholangiography (PCC) in the work-up of iatrogenic bile duct injuries. Our experience with four patients demonstrates the continued usefulness of this technique.
Methods: The diagnostic work-up for patients seen at our institution with iatrogenic bile duct injury was analyzed. In four patients, the diagnosis could only be established by PCC. Details of this cohort of patients are presented.
Results: Case 1: ERCP fills the distal duct but fails to demonstrate the proximal anatomy. MRCP was inconclusive. PCC opacifies the common hepatic duct without filling of the distal duct, consistent with a ductal transaction. Case 2: CT shows a large fluid collection extending inferiorly from the gallbladder fossa. The biliary system was drained percutaneously. A PCC performed shows filling of the common hepatic duct and intrahepatic right bile ducts. Case 3: ERCP shows an intact CBD, CHD and a normal bifurcation of the biliary system. PCC filled an accessory right hepatic duct that was not visualized on ERCP. Case 4: This patient had a bilia, which was drained percutaneously. PCC fills the residual cavity and a transected right hepatic duct. All patients underwent successful intervention based on the PCC results.
Conclusion: In the subset of patients with a post-operative bile leak and an apparently normal or inconclusive ERCP, PCC accurately identified the ductal injury. Management decisions could be made on the basis of the PCC. PCC, hence, continues to remain a useful diagnostic modality in this subset of patients.

COMPLICATIONS OF SURGERY P158
Purpose: to define the most common causes of the conversion of the laparoscopic cholecystectomy into open cholecystectomy, authors have brough their experience with the procedure.
Material and methods: They performed retrospective study of laparoscopic surgeries performed during September 1999 - December 2002 at the Laparoscopic Center ?Prince Sultan? of the Kosova University Clinical Center at Pristhina. Al procedures have been completed using laparoscopic equipment of the ?Wolf? company and employing ?American? four ports technique.
Results: During the study period 1526 laparoscopic surgeries were performed. 1135 (74.37%) of the patients were female. The mean age of the patients was 45.85 yrs. for women and 47.19 yrs. for men (interval 14-82 yrs). All together 11 (0.72%) conversions of the laparoscopic into open cholecystectomy were registered. In one case the reason for conversion was of the technical nature (lost of CO2 during the procedure), in 3 cases inability to identify structures within the Calot triangle due to the gangnous cholecystitis and in 2 cases lesion to the common bile duct. All other conversion have happen due to the preoperative diagnostic failures? in 2 patients to recognize Mirizi syndrome, in other 2 to detect coexist- ent choleddohcholithiasis and in 1 patient because of liver heman- gioma falsely declared choleolithiasis.
Conclusion: Performed by a trained team of surgeons laparoscopic cholecystectomy is safe and in many aspects superior to open cholecystectomy.
COMPLICATIONS OF SURGERY

LAPAROSCOPIC ABDOMINAL SURGERY IN PATIENTS WITH HEPATIC CIRRHOSIS, Jay Kuhn MD, David B Earle, Baystate Medical Center

Introduction: Ascites leak and decompensation of liver function after abdominal operations in patients with cirrhosis are potential complications. Abdominal operations, particularly ventral hernia repair using minimally invasive techniques affords these patients smaller incisions which may decrease the risk for postoperative ascites leak and allow more effective management if a leak occurs. The required use of a general anesthetic may still promote decompensation of liver function postoperatively.

Methods: Prospectively collected data was reviewed in 9 patients with cirrhosis who underwent laparoscopic abdominal surgery, 8 for repair of abdominal wall hernias and 1 for a gastric wedge resection of a bleeding submucosal gastric mass.

Results: None of the port site fascial incisions were closed. One case (gastric resection) was converted to a laparoscopic-assisted case using a small midline epigastric utility incision. There were 2 primary incisional hernias (one associated with bilateral inguinal hernias), 4 recurrent incisional hernias, and 2 primary umbilical hernias (one was associated with epigastric diastasis). Two (22%) of the patients were Child’s A, three (33%) were Child’s B and four (44%) were Child’s C. For hernia patients, mean defect and mesh sizes were 89 cm2 and 529 cm2 respectively. The average operative time was 157 minutes and the average postoperative length of stay was 2 days. Four of the nine (44%) patients had a postoperative ascites leak from port sites. All of these were easily, and immediately controlled by suturing the skin closed. There was no mortality, but one patient expired almost two years after his hernia repair secondary to progression of his liver disease, unrelated to his operation. Another patient who is also HIV positive developed progressive liver failure over 15 months of postoperative follow up, and now receives regular large-volume paracentesis. This patient also had a post-op ascites leak. There were no infectious complications.

Conclusion: It appears that laparoscopic abdominal surgery can be safely undertaken in patients with cirrhosis and poor liver function. The complication of leaking ascites, when it does occur can be easily addressed by suturing the skin closed, unlike wounds from conventional laparotomy.

COMPLICATIONS OF SURGERY

BILE DUCT INJURY WITH ROBOTIC ChoLECYSTECTOMY, Amit Kumar MD, William H Chapman MD, Strong Memorial Hospital, University of Rochester, Rochester, NY, USA and Brody School of Medicine, East Carolina University, Greenville, NC, USA

Background: Major bile duct injury is amongst the most feared of complications of cholecystectomy. Most of the injuries during laparoscopic cholecystectomies have been shown to occur early in the operative career of a surgeon. We have attempted to analyze if a similar pattern is found with cholecystectomies performed with a robot.

Methods: A total of 52 patients underwent robotic cholecystectomies over a two year period. These were performed using the da Vinci surgical robot. 75% of the cases were performed for symptomatic gallstones. All cholecystectomies were performed by the top down method. More than a third of the operations were performed with the resident as the console surgeon. Follow up was for duration of 4-26 months.

Results: No bile duct injuries were noted in our series. There was no associated morbidity or mortality. Our conversion rate was 1.9% each, to open cholecystectomy and laparoscopic cholecystectomy. These operations were performed in a mean duration of 63.67 minutes.

Conclusions: It is concluded based on our early experience that the incidence of bile duct injury during robotic cholecystectomy is much lower than that cited for laparoscopic cholecystectomy during the initial years of its use. The operative times were comparable to that for laparoscopic cholecystectomy. Enhanced visualization is a major factor in this lowered incidence of bile duct injuries.
A NEW EFFECTIVE TECHNIQUE FOR LONG-TERM POSTOPERATIVE GASTRO-INTESTINAL DRAINAGE - PERCUTANEOUS TRANS-ESOPHAGEAL GASTRO-TUBING (PTEG), Hideto Oishi MD, Noriyasu Shirotani MD, Hiroshi Shindo MD, Noriyasu Niiyasu MD, Kameoka MD, Department of Surgery, University of Mississippi Medical Center

INTRODUCTION: India ink has been thought to be a safe agent with few adverse effects. However, the ink sometimes caused severe inflammation and adhesion around the ink. The purpose of this case study is to report a case of postoperative large bowel obstruction caused by India ink.

Method and Result: A 51-year-old man with early transverse colon cancer underwent laparoscopy-assisted resection of transverse colon. Prior to the operation, colonoscopy marking with India ink was useful for identifying the location of the lesion. India ink has been thought to be a safe agent with few adverse effects. However, the ink sometimes caused severe inflammation and adhesion around the ink. The purpose of this case study is to report a case of postoperative large bowel obstruction caused by India ink.

Aim: We report here the case of a patient who suffered from postoperative abdominal pain resulting in ileus, and massive adhesion around India ink was revealed to cause the ileus.

Conclusion: India ink can cause severe inflammation and adhesion when it leaks into the peritoneum.

A COMPLETE LARGE BOWEL OBSTRUCTION AFTER A LAPAROSCOPIC CHOLECYSTECTOMY: A RARE COMPLICATION, Robert J Pares MD, Sandip Maru MD, Thomas Lake MD, John Romanelli MD, Monmouth Medical Center

Laparoscopy has proved to be a boon to surgical technique, especially its extremely successful application to the surgical management of biliary diseases. With the wide acceptance of laparoscopic cholecystectomy in the treatment of gallbladder disease there is the potential to miss intra-abdominal pathology compared with standard laparotomy. We present a rare case of a patient who developed a complete colonic obstruction after a laparoscopic cholecystectomy. The purpose of this case study is to: 1) report a previously unreported cause of obstruction after a laparoscopic cholecystectomy 2) review the literature on the differential diagnosis with intestinal obstruction after laparoscopic cholecystectomy 3) review the literature on the risk of missed pathology with laparoscopic cholecystectomy.

Conclusion: India ink can cause severe inflammation and adhesion when it leaks into the peritoneum.
COMPLICATIONS OF SURGERY P167
MANAGEMENT OPTIONS OF COLONOSCOPIC SPLENIC INJURY, David V Shatz MD, Luis A Rivas MD, James Doherty MD, University of Miami/Jackson Memorial Hospital; Christ Hospital
Injury to the spleen during routine colonoscopy is an extremely rare injury first reported in 1974, with 28 cases now reported in the world literature. Diagnosis and management of the injury has evolved with technological advances and experience gained in the management of traumatic splenic injuries. We report a case of an unusual injury to the spleen, and the unsuccessful use of current day nonoperative techniques.
A 75 year old woman underwent an uneventful screening colonoscopy, developing shoulder pain hours after the procedure. Failure of resolution of the pain led to CT evaluation, where a perisplenic fluid collection was identified. Because of her stability, serial CT evaluations were done over the ensuing months, showing the progressive enlargement of the collection.
Four months after colonoscopy, the cyst was collapsed when 360cc of old blood was drained percutaneously. However, the patient experienced return of pain within days, and CT done 5 days after drainage showed an accumulation of fluid around the collection. She underwent an uneventful splenectomy 2 days later. Of the 28 reported cases of colonoscopic splenic injury, 8 have had a history of prior surgery or a disease process suggesting the presence of adhesions. Only 6 have noted difficulty during the procedure, and 16 have experienced shock or hemoglobin drop as the indication of splenic injury. Since 1998, 12/16 patients have been diagnosed initially using contrasted CT. Overall, only 25% have retained their spleens. None have experienced as long a delay as our patient, nor have any had an attempt at percutaneous control of the injury. This report presents an unusual case of a rare complication of colonoscopy, and reviews the experience reported in the world literature.

EDUCATION/OUTCOMES P169
EFFICACY OF LAPSIM AND MISTELS IN IMPROVING LAPAROSCOPIC SKILLS IN NOVICE SURGEONS, Hani A Al-Qadhi MD, Vadim Sherman MD, Liane S Feldman MD, Donna Stanbridge RN, Gerald M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.
Introduction: Whether skills acquired in a simulator transfer to the operating room remains under investigation. The purpose of this study was to evaluate how practice in a virtual reality trainer (LapSim) compares to a physical trainer (MISTELS) in improving complex laparoscopic skills in inexperienced surgical residents.
Methods: 16 surgical residents (PGY1-3) were randomly assigned to 3 groups: LapSim (n=6), MISTELS (n=5) or control (n=5). The speed and security of an intracorporeal stitch performed in a pig model was measured in all subjects at baseline. The LapSim group performed the cutting and clipping task until a predefined expert level was reached. The MISTELS group performed the peg transfer and intracorporeal suturing tasks until expert levels were reached. All participants were then restested in the pig model (?final score?). Results are expressed as mean +/- SD.
Baseline final scores were compared with ANOVA.
Results: There were no significant differences at baseline between the three groups (p=0.16). The final suturing scores for the MISTELS and LapSim groups were significantly higher than controls (p=0.02). There was no difference between the final scores in the two practice groups.

EDUCATION/OUTCOMES P170
EVALUATION OF THE IMPACT OF COMPREHENSIVE COURSES IN ADVANCED MINIMAL ACCESS SURGERY ON SURGEON PRACTICE, Daniel W Birch MD, Cliff Sample MD, Rohit Gupta MD, Center for Minimal Access Surgery, St Joseph's Healthcare, Department of Surgery, McMaster University, Hamilton, Ontario, Canada.
Introduction: Surgeons in practice need an effective means for acquiring skills and learning new procedures in advanced Minimal Access Surgery (MAS). Available educational methods include traditional continuing medical education symposia (one-day courses), instructional videos, mentoring and comprehensive courses combining lectures, skills labs and live surgery.
Methods: We completed a survey of all attendees of comprehensive courses in advanced gastrointestinal MAS held at the Center for Minimal Access Surgery (CMSAS) in Hamilton.
Results: Of 158 course attendees, 77 responses were received (response rate 48.7%). There were 66 male and 11 female respondents with a mean age of 44.9y in practice for a mean of 11.7y. 87% of respondents are community-based surgeons. Respondents attended the following CMSAS courses: colorectal (36), anti-reflux (38), solid organ (9) and morbid obesity (7). Additional courses outside of CMSAS were also attended by respondents: colorectal (6), anti-reflux (9), solid organ (3) and general MAS (14).
Conclusions: As a result of attending CMSAS courses, respondents believe that they experienced a substantial improvement in knowledge in 6 of 9 areas surveyed including operating room set-up, required MAS skills, surgical approach, instrumentation, staff support and evidence supporting an MAS approach. Respondents improved their skills in MAS in 3 of 6 areas assessed, including general MAS skills, suturing and use of the Harmonic scalpel. For respondents attending a colorectal course at CMSAS, laparoscopic appendectomy was adopted by 51.9%, laparoscopic colectomy by 80.6% and laparoscopic rectal surgery by 48.3%. Of those attending an anti-reflux course, laparoscopic fundoplication was adopted by 64.9% and para-esophageal hernia repair by 3.6%. For respondents attending a solid organ course, laparoscopic splenectomy was adopted by 85.7% and adrenalectomy by 71.4%. The mean overall impact of a CMSAS course on a surgeon's practice (with respect to patient referrals, procedural armamentarium and personal satisfaction) was rated by respondents at 3.92 ± .71 (Likert scale 1-5, 1: negative, 5: positive).
Conclusions: A comprehensive course in advanced MAS has a positive impact on knowledge and skills for attendees. Ultimately, surgeons attending MAS courses will begin to introduce these procedures into their surgical practice. These courses play a distinct role in the teaching of MAS to surgeons in practice.

http://www.sages.org/
IN-VIVO LAPAROSCOPIC EXPERIENCE INFLUENCES THE RESULTS OF EX-VIVO LAPAROSCOPIC SKILLS TESTING, Michael Black MD, Jon Gould MD, University of Wisconsin

INTRODUCTION: Basic laparoscopic skills can be attained through practice and repetition. A surgeon’s laparoscopic skill level can be roughly assessed by performance on skills drills in a video trainer (VT). In surgical trainees without experience in a VT, those who have performed more laparoscopic surgical cases should perform better than trainees with less experience.

METHODS/RESULTS: Twenty-three general surgery residents, clinical year pgy-1 to pgy-5, were tested for the first time using 5 basic skills drills in a VT. All watched a video demonstration of each skill prior to testing. No practice was allowed prior to testing. Tests were timed. Skills included rope pass, peg drop, peg exchange and drop (Peg D), peg pulling (Peg P), sutureting (Needle), and knot tying. Resident laparoscopic experience was quantified by counting the number of laparoscopic cases performed prior to testing.

Results were analyzed with a two-sided Kendall’s rank correlation test. Correlation P<0.05=significant correlation between in-vivo laparoscopic experience and the time needed to complete a drill. Rope pass is the only skill that failed to correlate significantly with experience.

CONCLUSIONS: Residents with more in-vivo laparoscopic experience performed better on baseline laparoscopic skills testing when compared to residents with less experience. We hope that this study helps to validate our belief that baseline skills times in a VT are a reflection of the skill level of the trainee. With practice, skills times of our residents have improved. We believe that this translates into improved in-vivo laparoscopic skill. We also believe that basic skills can and should be learned first in a dry-lab setting.

EDUCATION/OUTCOMES

THE PREVALENCE OF HELICOBACTER PYLORI INFECION IN PATIENTS WITH DIABETES MELLITUS TYPE 2 AND ITS RELATIONSHIP TO DYSPEPTIC SYMPTOMS AND GLYCEMIC CONTROL, Niessr E Daryani MD, Hossein Bahrami MD, Babak Haghpanah MD, Mehdi Djalili MD, Tehran University of Medical Sciences

Background: Patients with diabetes mellitus (DM) are susceptible to different types of infection and dyspeptic symptoms, with various mechanisms, are among their frequent complaints. These premises resulted in some studies of the association of Helicobacter pylori (HP) infection, as the most common cause of nonerosive nonspecific gastritis and DM. Our objective was to determine the prevalence of HP infection in patients with DM type 2 and its relationship to dyspeptic symptoms and glycemic control.

Materials and Methods: 137 patients with DM type II (40 male and 97 female; mean age 55.0±10.7 years) were compared to 195 age-, sex-, and socio-economic status-matched nondiabetic controls with dyspepsia. HP infection was determined by C14 urea breath test and dyspepsia was defined as the presence of nausea, bloating, belching, epigastric distress, pyrosis, and halitosis. Data regarding complications of diabetes and lab data with a special emphasis on glycemic control were gathered for all patients. All HP positive patients with DM received quadruple antibioc regimen, including amoxycillin, metronidazole, omeprazole and bismuth subcarbrylate.

Results: 82 diabetic patients (59.9%) and 120 nondiabetic patients (81.5%) had HP infection (p value: 0.76). In patients with DM type 2, 73.2% of HP positive and 69.1% of HP negative patients had dyspepsia, which shows no significant association between HP infection and dyspeptic symptoms. Mean duration of DM was significantly higher in HP positive comparing to HP negative patients (11.5±10.6 vs 6.8±5.1 years, p value<0.001). Among common complications of DM, autonomic neuropathy was the only one which had a significant association with HP infection. HP infection was significantly lower in patients with good glycemic control. HP infection was successfully eradicated in 79.6% of diabetic patients comparing to 90.3% of nondiabetics (p<0.01). Eradication of HP infection resulted in a significant improvement of dyspeptic symptoms in diabetic patients, while there was no significant change in dyspeptic symptoms of nondiabetic diabetic patients. The glycemic control situation was improved after HP eradication.

Conclusion: Although there was no significant relation between HP infection and DM or dyspeptic symptoms of diabetic patients, the prevalence of infection would be augmented with poor control and duration of diabetes and its eradication is of some value in improvement of dyspeptic symptoms and glycemic control.

EDUCATION/OUTCOMES

TRANSFERENCE OF SKILL BETWEEN ROBOTIC AND STANDARD LAPAROSCOPIC SKILL SETS, Todd E Drasin MD, Carlos R Gracia MD, Center for Advanced Surgical and Interventional Technology (CASIT), David Geffen School of Medicine at UCLA, Los Angeles, CA, USA

Introduction: Adoption of minimally invasive procedures is rapidly expanding across surgical specialties. These procedures involve standard endoscopic (SE) and, more recently, robotic (R) techniques. To date, there is no conclusive evidence demonstrating transference of skill (TOS) between these 2 minimally invasive modalities. A pilot study was conducted to determine whether TOS takes place, and if so, to quantify the magnitude of transference. Identification of TOS between SE and R modalities may have profound implications for surgical education.

Methods and Procedures: Seven medical students naive to minimally invasive surgery (MIS) were recruited to participate, and over a period of 3-12 weeks were trained to perform the following 5 MIS tasks: rope pass, cup drop, triangle transfer, intracorporeal knot tying, and intracorporeal running suture. All subjects were scored performing the tasks on both the SE and R modalities initially. Then each subject was randomized to practice for 2 hours on either the SE or R modality. Each individual was scored hourly during the training, and after the 2 hours was complete, s/he was then scored performing comparable tasks on the alternate modality. Thereafter, each subject practiced for 2 hours on the alternate modality, again scored after each hour of training. Data were analyzed using Student’s t-test.

Results: There was evidence of TOS. Subjects who trained with the SE modality first were found to have improved by 7% (p<0.02) when they were retested on the robotic modality. Subjects who trained on the robotic modality first were found to have improved by a striking 31% (p<0.001) when their initial SE scores were compared to their SE scores after only robotic training. The TOS from the SE to R SE modality was found to be significantly greater than the TOS from SE-R SE modality. (p<0.01)

Conclusions: Our results support the perception that individuals experienced with SE techniques acquire the R skill set more rapidly. Despite the small sample size, the data demonstrate a significantly greater improvement in SE performance with R training than vice versa. These results support the inclusion of both robotic and laparoscopic surgical simulators in the educational process. Each type of simulator can simulate more complex and minimally invasive tasks, and can enable individuals with a limited MIS background to perform MIS tasks but also accelerate their learning curves with respect to acquiring SE skill sets.
EDUCATION/OUTCOMES  
P175  
ASSESSMENT OF SURGICAL ABILITY ? APITUDE TESTING IN LAPAROSCOPIC SURGERY, K Dyas, K M Maude MD,M J McMahon PhD, Academic Unit of Surgery, Leeds General Infirmary, Leeds, UK.  
Aim: Assessment of surgical competence is necessary to correlate objective assessment of skills training with clinical performance. Laparoscopic appendicectomy (LA) is a procedure routinely performed by all surgical trainees and video evidence of the surgical technique is readily available. We aimed to develop and validate a scoring system based on LA to assess technical surgical performance.  
Methods: A retrospective review of 38 archived videotapes of LA performed between February 2001 and July 2002 in a major teaching hospital were used to select representative video clips. Five key stages of the procedure; port insertion, control of mesentery, endoloop application, appendix amputation and appendix removal, were identified as suitable for assessment. A scoring system was devised comprising a checklist of global rating scores.  
Results: Key stages of the operation demonstrated good agreement between different assessors and by the same assessor over time. Appendix amputation and appendix removal were identified as stages with high intra-rater reliability. Kappa score 0.9328 and 0.9308 respectively and high inter-rater agreement, Kendall? coefficient 0.7107 and 0.6795 respectively with lower agreement and association of the marks have been subsequently modified.  
Conclusion: This scoring system can be successfully and reliably applied to laparoscopic appendicectomy to assess surgical trainee ability and competency. A prospective study is underway to assess construct validity with the aim to identify surgeons requiring further training.

EDUCATION/OUTCOMES  
P176  
Background: Simulation is the most effective and safe way to train laparoscopic surgeons in an era of limited work hours, lack of funding and increasing malpractice costs. The costs associated with the use of virtual reality simulators are significant and, although technically very sophisticated, they still lack realistic tactile and visual laparoscopic feedback. We therefore evaluated several virtual reality simulators, the LTS2000, as a reliable and effective alternative to traditional reality. This study was carried out to establish how accurately the simulator was able to differentiate between different levels of laparoscopic experience and to analyze the detection of skill improvement after clinical training.  
Methods: This study was carried out between July 2003 and August 2004, in the departments of Surgery and Obstetrics and Gynecology at two separate institutions. Forty individuals were enrolled with experience ranging from PGY-1 to full time faculty level. Five PGY-3 residents were subsequently retested after rotating on clinical services performing advanced laparoscopic procedure to assess if the simulator was able to detect improvements of laparoscopic skills at the intermediate level. Six tasks were included and they were scored for speed and precision using the McGill system. Two scores were obtained: coordination score and suturing score combined in a total score. Other variables analyzed were: hand-dexterity, specialty, number of laparoscopic procedures performed and hours spent on the simulator.  
Results: A total of 45 tests were performed. The number of subjects in each group based on level of experience was equally distributed. There was no difference in scores between institutions, specialties and right or left handed surgeons. There was a significant increase in the all three scores with increasing experience in each group (p < 0.05). Furthermore we detected significantly higher scores in subjects that had been trained on the simulator before the total score compared to their pairs never exposed to the simulator (p < 0.05). The scores of the five PGY-3 doubled when tested, without reaching statistical significance due to the small sample size.  
Conclusions: Our study shows that the LTS2000 can reliably detects different levels of laparoscopic expertise and progression of the learning curve. LTS2000 as a model of physical reality simulation should be considered a reliable and cost effective alternative to virtual reality.

EDUCATION/OUTCOMES  
P177  
INTRODUCTION: The majority of the of experimental training models of video surgery uses pigs and dogs. The use of laboratory animals in the training of the video surgery can solve these inconveniences. The Research Nuclear of Experimental Surgery of the Bahia School of Medicine and Public Health has developed video surgery models in laboratory animals, as much in rats as in rabbits. In rats, were developed the models of diagnostic video laparoscopy, pneumoperitoneum open and closed, esophagogastroscopy, fundoplication, vagotomy, hepatectomy, splenectomy, video assisted enterectomy, inguinal hernia repair, nephrectomy and an original model of orquidectomy. To evaluate the training model, this prospective study was design.  
OBJECTIVE: To evaluate the efficacy of specific training model in video laparoscopic surgery, in comparative way, when applied to medical students and doctors with basic experience in laparoscopic method. METHODS: 63 participants divided in two groups. Group 1 (36 doctors) and Group 2 (27 medical students). They participate in same theoretical training with theoretical training in simulators and accomplishment of laparoscopic surgical procedure (orquidectomy) in wistar rats using regular 10 and 5mm trocars and laparoscopic instruments with no adaptation in a closed pneumoperitoneum. The training was evaluated by a protocol specifically elaborated for this end, and the results were compared and statistically analyzed (statistical significance = P<0,05). RESULTS: Difference was evidenced in the phase of the simulator training, where group 2 was better (p=0.00192). Group 1 was better in the laparoscopic procedure in the phases of pneumoperitoneum and laparoscopy (p=0.0148) and laparoscopic surgical procedure (p=0,000019). All participants of the study completed the phases of pneumoperitoneum. In the other variables evaluated, the groups had similar results. CONCLUSION: The group of medical students got better in one of the phases of the training in simulator. The group of doctors got better utilization in the laparoscopic surgical procedure. The training model adopted was validated by its results and by the elevated acceptance by two groups of the teaching method. The evaluation model of the training, specifically developed for this end, allowed adequate interpretation of the results. In the conditions presented, medical students and doctors can be trained to accomplish laparoscopic surgical procedure in laboratory animal.

EDUCATION/OUTCOMES  
P178  
Introduction: Laparoscopic Roux-en-y gastric bypass is a technically challenging operation with a steep learning curve and is usually performed by a team of experienced surgeons in high volume centers. Surgical residents have minimal exposure to laparoscopic bariatric surgery. Materials and methods: We present our experience with consecutive 100 patients who underwent laparoscopic Roux-en-Y gastric bypass at our institution between August 2001 and March of 2003. All data was collected prospectively.  
Results: All operations were completed laparoscopically by an attending surgeon (PG) with the active assistance of surgical residents (PGY 1-5). The mean operating time was 219 min (115 - 453 min) and the mean blood loss was 69 cc (5 - 300 cc). There were no intraoperative complications and no postoperative mortality. The mean hospital stay was 3.4 days (1-10). There were two major postoperative complications requiring reoperation (GI hemorrhage, 1, leak from gastroenterostomy - 1), and 9 minor complications (wound abscess - 4, ileus - 1, urine tract infection - 1, ileus - 1). Late complications consisted of stricture of gastroenterostomy - 7, all managed with endoscopic balloon dilatation. The mean 1 year excess BMI loss was 76.3%. The average postoperative weight loss and BMI were as depict:

<table>
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<tr>
<th></th>
<th>BMI (kg/m2)</th>
<th>Weight (Lbs)</th>
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<tbody>
<tr>
<td>Initial</td>
<td>49.3</td>
<td>298.3</td>
</tr>
<tr>
<td>1 month</td>
<td>44.6</td>
<td>265.2</td>
</tr>
<tr>
<td>3 months</td>
<td>39.8</td>
<td>242.4</td>
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<tr>
<td>6 months</td>
<td>35.8</td>
<td>211.8</td>
</tr>
<tr>
<td>12 months</td>
<td>30.7</td>
<td>185.8</td>
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</table>

Conclusion: Laparoscopic gastric bypass can be safely performed within the residency program. Resident exposure to laparoscopic bariatric surgery may constitute an important part of resident training in the near future.
**SAGES 2004 Poster Abstracts**

**EDUCATION/OUTCOMES**

P179  **TEACHING AND TESTING SURGICAL SKILLS ON A VR ENDOSCOPY SIMULATOR: LEARNING CURVES AND IMPACT OF PSYCHOMOTOR TRAINING ON PERFORMANCE IN SIMULATED ENDOSCOPY, Teodor P. Grantcharov MD, Andrea EversBusch MD, Peter Funch-Jensen MD, Department of Surgical Gastroenterology, Copenhagen University, Glostrup Hospital & Department of Surgery L, Aarhus University Hospital**

Purpose: The study was carried out to analyse the learning curve on the GI Mentor II and to assess whether psychomotor training can contribute to improvement of performance on virtual colonoscopy. Methods: Twenty-eight subjects were divided into three groups according to their experience with GI endoscopy: experienced (group 1, performed >200 endoscopic procedures, (n=6)) residents (group 2, performed <50 endoscopies, (n=10)) and medical students (group 3, never performed GI endoscopy, (n=10)). The participants were tested on the GI Mentor VR simulator 10 consecutive times. Assessment of the learning curve was based on three parameters: time used, number of punctured balloons and number of wall collisions.

In the second part of the study 20 novices in GI endoscopy were included. After performing a virtual colonoscopy they were randomised to a group, who received psychomotor training, and a control group. Finally, all subjects performed a virtual colonoscopy. Assessment of endoscopic skills during the colonoscopy was based on 9 parameters registered by the simulator. Results: The learning curve regarding time reached plateau after the 2nd repetition for group 1 (Friedman’s test, p<0.05), after the 5th repetition for group 2 (p<0.05) and after the 7th repetition for group 3 (p<0.05). Experienced surgeons did not improve their scores regarding number of balloons punctured or number of wall collisions (p>0.05). Group 2 improved their scores up to the 4th and 5th repetition, respectively (p<0.05) and group 3 up to the 5th and 7th repetition, respectively (p<0.05).

In the second part of the study, no differences in baseline assessments were found (t-test, p>0.5). Surgeons, who received psychomotor training performed the second virtual colonoscopy significantly faster than the control group (Mann-Whitney’s test, p<0.001) and made significantly greater improvement in all other parameters as well.

Conclusion: Different learning curves existed for surgeons with different endoscopic background. The familiarization rate on the simulator was proportional to the endoscopic experience of the surgeons. The present work demonstrates a significant effect of psychomotor training on performance in simulated colonoscopy.

**EDUCATION/OUTCOMES**

P180  **CONSTRUCT VALIDITY FOR SOUTHWESTERN VIDEO-TRAINER TRAINERS, J R Kerntoffter MD, R Sierra MD, W C Brunner MD, J B Dunne PhD, J D Scott, Tulane Center for Minimally Invasive Surgery, Tulane University School of Medicine**

The ?Southwestern? videotrainer (VT) stations have demonstrated concurrent validity. The purpose of this study was to evaluate the Southwestern stations for construct validity. Randomly selected subjects, including medical students (n=19), surgery residents, R1-R5 (n=35), and expert surgeons (n=3), were enrolled in an IRB-approved protocol. No subjects had prior VT exposure except for one expert surgeon. All participants performed three repetitions on each of five stations. Scores were based on completion time and were compared for novice (medical students and R1), intermediate (R2-R4), and advanced (R5 and experts) groups using One Way ANOVA and Pairwise Multiple Comparisons. Laparoscopic experience, determined from the residency database and expert surgeon caselogs, was compared to VT scores using a Pearson Correlation. Scores (seconds) are shown below (p<0.05 for comparisons between all groups for all values).

<table>
<thead>
<tr>
<th>Task</th>
<th>Novice</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
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<tbody>
<tr>
<td>Bean Drop</td>
<td>62 +/- 27</td>
<td>47 +/- 17</td>
<td>28 +/- 9</td>
</tr>
<tr>
<td>Rope Drill</td>
<td>63 +/- 26</td>
<td>55 +/- 15</td>
<td>31 +/- 9</td>
</tr>
<tr>
<td>Checkerboard</td>
<td>130 +/- 71</td>
<td>116 +/- 31</td>
<td>82 +/- 22</td>
</tr>
<tr>
<td>Block Move</td>
<td>63 +/- 50</td>
<td>41 +/- 13</td>
<td>23 +/- 11</td>
</tr>
<tr>
<td>Suture Foam</td>
<td>94 +/- 61</td>
<td>53 +/- 25</td>
<td>29 +/- 15</td>
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</table>

The mean number of laparoscopic cases was 0 for novices, 30 for intermediates and 360 for the advanced group. All 5 task scores significantly correlated with laparoscopic experience (p<0.02).

These data suggest that differences in laparoscopic ability are detected by performance on the Southwestern stations; thus, construct validity is demonstrated. Moreover, scores accurately reflect laparoscopic experience. Extensive validation will allow such simulators to be used for testing laparoscopic skills and establishing competency.

**EDUCATION/OUTCOMES**

P181  **RANDOMIZED TRIAL OF TRAINING METHODS FOR LAPAROSCOPIC SKILLS, Alul K Madan MD, Constantine T Frantzides MD, Christopher L Tebbit MD, William Partk BA, Nadav Dujovny MD, Mark A Carlson MD, University of TN-Memphis & Rush University**

Introduction. Training methods for laparoscopic skill acquisition include virtual reality and box trainers. We hypothesized that virtual reality and/or box trainers would lead to better laparoscopic skill acquisition compared to no training.

Methods. Preclinical medical students with no prior operative experience were randomized to 4 groups: (A) virtual reality (VR) training with the MIST (Minimally Invasive Surgery Training System)?VR; (B) inanimate box trainer with the LTS (Laparoscopic Training Simulator) 2000; (C) combination of both, and (D) no training. (Except D) All the groups were trained for 20 minutes, twice, for a total of 60 minutes training time (ten 20 minute sessions). All students were tested pre- and post-training in the porcine laboratory on 4 skills: (1) placement of a piece of bowel in a bag; (2) liver biopsy; (3) placement of a stapler on a loop of bowel; and (4) ‘running’ the bowel. Each task was scored subjectively, by time, and by errors. Nonparametric tests (Kruskal-Wallis Test with Dunn multiple comparison post test) were utilized for statistical analysis.

Results. A total of 65 students participated in this study (A = 17, B = 14, C = 18, and D = 16). There were no differences among any of the pre-training scores (p > 0.05). Post-training times are shown in the Table. Post hoc analyses revealed statistically significant differences (p < 0.05) between Group C and D in Tasks 2 and 4. Subjective scores demonstrated no differences except lower scores for Group D for the Task 4 in both tissue handling (p < 0.005) and overall scores (p < 0.03).

<table>
<thead>
<tr>
<th>Task</th>
<th>Novice</th>
<th>Intermediate</th>
<th>Advanced</th>
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</thead>
<tbody>
<tr>
<td>Time (seconds)</td>
<td>108.3</td>
<td>50.2</td>
<td>105.9</td>
</tr>
<tr>
<td>Novice</td>
<td>69.4</td>
<td>45.1</td>
<td>58.6</td>
</tr>
<tr>
<td>Intermediate</td>
<td>158.0</td>
<td>58.6</td>
<td>104.5</td>
</tr>
</tbody>
</table>

**EDUCATION/OUTCOMES**

P182  **A SURVEY OF MINIMALLY INVASIVE SURGERY FELLOWSHIP PROGRAMS, Alul K Madan MD, Constantine T Frantzides MD, Daniel J Deziel MD, University of TN-Memphis & Rush University**

Introduction: Since there is no accrediting body for minimally invasive surgery fellowships, there is no standard experience for fellows. This investigation performed to characterize the minimally invasive surgery fellowships.

Methods: All minimally invasive surgery fellowships that were noted on the SAGES website in July were sent a survey. Only those fellowships that had fellows for the year 2001-2002 were included in the survey. All programs were contacted twice if the survey was not returned. Incomplete responses were not included in the data.

Results: There were 78 fellowships listed with 16 which had not had a fellow in 2001-2, 1 which was not a minimally invasive surgery fellowship, and 1 which was actually listed twice. Out of the 60 fellowship programs, 19 (32%) responded. There were an average of 1.3 clinical fellows per program (range 1-3). All clinical fellowships were of one year duration. There were an average of 3.2 attendings for each program. 32% of the programs had a program director that had fellows for the year 2001-2002 were included in the survey. All programs were contacted twice if the survey was not returned. Incomplete responses were not included in the data.

Conclusions: Minimally invasive surgery fellowships seem to be competitive for surgical residents. Although a majority of the programs did not respond, minimally invasive surgery fellowships vary in both research and clinical experience. Some type of standardization may be helpful to ensure a complete experience for surgeons desiring additional minimally invasive surgery training.
EDUCATION/OUTCOMES

P183

A STRUCTURED CURRICULUM-BASED APPROACH FOR TEACHING COMPLEX LAPAROSCOPIC SKILLS USING VIRTUAL REALITY SIMULATORS, Y Munz MD, K Moorthy MD A Almohoritar BA A Dosis MSc, A Darzi MD, IMPERIAL COLLEGE LONDON

Objective: Intra corporeal knot tying is regarded as one of the most complicated laparoscopic skills surgeons need to acquire and takes a long time to master. The aim of this study was to objectively assess the effectiveness of Virtual Reality (VR) simulators in teaching intra corporeal knot tying skills.

Methods: 20 novice surgeons underwent baseline intra corporeal knot tying skills assessed using a video trainer. All subjects then underwent a curriculum based structured training programme. This consisted of training on a basic psychomotor skills trainer (MIST-VR) for three sessions followed by four sessions on a task-based simulator for the acquisition of endoscopic suturing skills (LapSim). Upon completion of training they were reassessed. Assessment of performance included ICSAD (Imperial College Surgical Assessment Device), which is comprised of an electromagnetic hand tracking device and a custom designed software for analysing positional data and generating results in terms of dexterity parameters (number of movements, path length and time taken) and a video-based checklist, which was carried out blindly by two observers.

Non-parametric tests were used for statistical analysis and p<0.05 was deemed significant. Cronbach’s Alpha test was applied for evaluating inter-observer reliability.

Results: Upon completion of VR training, 100% of the participants completed a correct knot as compared with only 25% before VR training. There was a 45% average increase in knot quality. Time to completion of a knot was 66% faster after VR training. A significant improvement in performance was noted across all the VR sessions. Motion analysis, using the ICSAD system, revealed a significant reduction in the total number of movements (p<0.006) and total distance travelled (p=0.000) by both hands after VR training.

Conclusions: A complex laparoscopic task such as intra corporeal knot tying can be effectively taught to novices using curriculum-based structured learning sessions on VR simulators. Furthermore, these skills are transferable to actual reality as measured by ICSAD.

EDUCATION/OUTCOMES

P184

THREE DIMENSIONAL VISUALIZATION ACCELERATES LEARNING PROCESS USING DAVINCI™ SURGICAL SYSTEM

Allison DiMartino BS, Lawton Verner BS, Dmitri Oleynikov MD, Department of Surgery, University of Nebraska Medical Center

INTRODUCTION: The purpose of this study is to objectively evaluate laparoscopic surgical skill acquisition in a 2D vs 3D visual environment with the da Vinci™ surgical system. Learning complex laparoscopic tasks is difficult and time consuming. The addition of 3D visual feedback has been shown to accelerate the learning process.

METHODS: Nine surgical residents and two expert surgeons performed a simple knot tie task using forceps. Each subject completed two trials using the da Vinci™ system set in a 2D visual mode. The procedure was then repeated with the da Vinci™ system in a 3D visual mode. Real-time tele-manipulator data from the da Vinci™ surgical system was acquired during each trial. The data captured included elapsed time, position of the forceps, orientation, and grip and corresponding velocities of the left and right surgical arms.

RESULTS: The velocity data was analyzed by performing an analysis of variance (ANOVA). The resident ANOVA revealed that all velocities of the robotic arms significantly differed (p<0.05) between the 2D and 3D settings in both hands (Table 1). Elapsed time was analyzed graphically. A plot of mean task completion times (2D and 3D) as a function of surgical expertise showed that the learning curve for 2D visual mode is steeper than for 3D. The flight path of the forceps through space was graphed for each trial. The flight paths were analyzed by visually comparing trials with 3D visualization and 2D visualization. There was a notable visual disparity of the tool tips was much more sporadic for the 2D trials than the path for the 3D trials.

CONCLUSION: The addition of a 3D visual output in a surgical system enhances performance by providing better visual feedback to novice and intermediate surgeons. All residents performed significantly better on the 3D system, due to the increased sensory information provided to the operator.

EDUCATION/OUTCOMES

P185

MINIMIZING THE LEARNING CURVE IN LAPAROSCOPIC COLECTOMY, Tom Paluch MD, Michael J Clair MD, Kaiser Foundation Medical Center, San Diego

Introduction: The end point of a learning curve for a laparoscopic procedure is facility with that procedure, resulting in no significant variability in performance over time or rate of conversion to open. Traditional training models for laparoscopic colectomy (LC) result in learning curves of 20 to 60 cases. This has been seen as prohibitive and a major factor in the lack of widespread acceptance of LC. We describe a non-traditional model (two surgeons for each case, one as the operating surgeon, and one as the camera operator) for training in LC which, when adopted virtually eliminated the learning curve.

Methods: Two experienced laparoscopic surgeons (vanguards) underwent traditional training in LC. After completion of their training, they performed LC together as a team alternating the roles as surgeon and camera operator. Once the learning curve for the vanguard surgeons had been overcome, these two functioned as assistants in the camera operator position for other surgeons in the group who had undergone didactic and laboratory instruction in LC. 255 cases of LC over a 5-year period were reviewed. Demographic data, site of operation, indication for operation, as well as operative times, conversion rates, length of stay, time to 1st meal and complication rates were collected by chart review, and the resultant data analyzed.

Results: The learning curves of the vanguard surgeons? with respect to operative times and conversion rates were similar to published results. Analysis of data from these subsequent cases demonstrated no significantly different site-specific operating times or conversion rates for each surgeon analyzed.

Conclusions: The use of surgeons skilled in LC as assistants in the camera operator position resulted in rapid development of facility with LC, virtually eliminating a demonstrable learning curve for these procedures. The facility developed under the supervision of the vanguards persisted after other surgeons were substituted as assistants. We recommend this approach for the training of surgeons in LC.

EDUCATION/OUTCOMES

P186

TEACHING SUBFASCIAL ENDOSCOPIC VEIN SURGERY, Francesco Rulli MD, Gregorio Cina MD, Gabriele Galata MD, Attilio M Fannin MD, Dip. of Surgery, University of Rome "Tor Vergata"

Objective. We describe a training method with objective evaluation to enhance video-assisted surgical skills in subfascial endoscopic perforator veins surgery (SEPS). Training was scheduled during a two-days intensive course.

Methods. Hands-on exercises were performed: 1) on a simulator for and assess wether specific training exercises were helpful in attainment of skillness in the video-assisted surgical technique; 2) on a known animal model that uses the swine abdominal wall and allows practice in endoscopic dissection and perforator veins surgery (PVs) using appropriate instrumentation in an environment that is a reasonable surrogate for the human calf; 3) assisting a senior surgeon performing SEPS.

Thirty surgeons without experience in SEPS were trained to perform a sequence of standardized drills connected with the SEPS technique. The SEPS simulator consisted in an artificially constructed subfascial space of the leg in wich false perforator veins had to be localized, and cut. The participants performed the sequence of drills for three times in order to improve their dexterity. The same exercises were then performed on a swine model. Trainees were required to achieve operative space in the animal subcutaneous fat, to reach and identify the ?perforating? subcutaneous vessels, and to interrupt some of them with a 5-mm clamp coagulator ultrasonic scalpel. The time required to perform each dexterity drill was recorded in seconds. Finally, the day after, trainees were asked to drive the senior operator during clinical SEPS performed on 8 patients.

Results. All the trainees showed a steady improvement in skill acquisition on the SEPS simulator (p < .001), and on the animal model with the single port technique (p < .001).

Conclusions. The two-days course validity was demonstrated by measuring significant improvement in performance with increasing skillness on the training models, and with clinical practice.
EDUCATION/OUTCOMES P187

SELF-APPRAISAL OF SENIOR SURGEONS USING OBJECTIVE STRUCTURED ASSESSMENT OF TECHNICAL SKILL IN LAPAROSCOPIC CHOLECYSTECTOMIES, Sudip K. Sarker MD, Avrili Chang MD, Charles Vincent PhD, Ara Dzoyem MD, Department of Surgery, University College London, Imperial College, University of London, London U.K.

Objectives: There has been little research on technical surgical skill assessment (TSSA) on live operating by unsupervised senior surgeons. With increased media and public scrutiny of surgical errors, preventing or reducing such errors is of paramount importance in healthcare. We aim to assess the implementation of a self-appraisal method of TSSA by senior surgeons on laparoscopic cholecystectomy (LC) in the aim to reduce errors and increase technical skill performance. Methods: All participants (100%) could identify one or more features of each component (0.0% for PE, RUQE, LUQE, and SPDE). Following practical training, participants could identify any salient anatomic structures on any of the FAST exam components (7/83.3% had prior experience performing US examinations). The mean score on the 10 question didactic pre-test was 46.3%. The mean score on the 10 question didactic post-test was 75.7% (range 0-100). A total of 24 Medical Element personnel participated in the training sessions. A portable, hand-held US device (SonoSite) was used. The course consisted of a demographic questionnaire and pretest, followed by a十分钟 didactic lecture covering basic US physics, features of the portable US device, and an introduction to the Focused Assessment for Sonographic Examination of the Trauma Patient (FAST) exam. An hour-long practical training session allowed participants to practice the FAST exam with the portable US device. Afterward, participants completed a practical examination entailing identification of salient anatomic structures in a normal FAST exam. This criterion included identification of: 1) heart and pericardium for the pericardial sac test (PE), 2) liver, right kidney, and diaphragm for the right upper quadrant exam (RUQE), 3) spleen, left kidney and diaphragm for the left upper quadrant exam (LUQE), and 4) bladder for the suprapubic/pouch of Douglas exam (SPDE). Finally, participants took a didactic post-test. Data were analyzed with ANOVA or contingency table techniques. Statistical significance was set at p < 0.05.

Conclusion: No surgeon physicians and military allied health personnel should be offered trauma US training. This skill is an excellent force multiplier.

EDUCATION/OUTCOMES P189


Introduction: Laparoscopic Roux-en-Y gastric bypass (LRYGB) is quickly replacing the open technique in the morbidly obese patient who presents for surgical treatment. In the past, many general surgery residencies lack enough advanced laparoscopic procedures for each resident to become proficient in their first training year. LRYGB is now becoming one of the most common major gastrointestinal operations performed in general surgery programs. This operation enables the upper year residents to gain advance laparoscopic skills that can be used for other procedures.

Methods: 174 consecutive LRYGB procedures between January 2002 to September 2003 were performed by a single surgeon with over 5 years experience in LRYGB. All other laparoscopic and open bariatric operations were excluded. Three patients (1.8%) were converted to an open gastric bypass due to a severely enlarged liver. 164 LRYGB were performed with either a 3rd, 4th or 5th year surgical resident assisting with no other attending or fellow present. Residents were first taught laparoscopic suturing techniques with a pelvic trainer. The operation was then divided into 7 steps for the resident to master over the one to two weeks while on service.

Results: At the end of one month all residents were able to first assist, perform intracorporeal suturing and divide the stomach into a 20cc lesser curve vertical pouch. By the end of two months all the 4th and 5th year residents were able to competently perform the jejunojejunostomy. Those with pre-existing advanced laparoscopic skills and those who had prior service for two months months were able to perform the gastropexy, and increase their skills in all 7 steps of the operation. The average age was 39.9 years, 95% female, with an average preoperative weight of 293 lbs. (range 197-472) and a BMI of 49 kg/m2 (range 29-69). Average operating time was 269 minutes. An average excess weight loss at 3, 6 and 12 months was 38%, 48% and 70%, respectively.

Conclusions: LRYGB is quickly becoming one of the most common performed gastrointestinal procedures in general surgery residency programs in the United States. A systematic approach to teaching residents this complex laparoscopic operation will assist them in gaining advanced laparoscopic skills by the end of their residency.

EDUCATION/OUTCOMES P188

TRAUMA ULTRASOUND TRAINING FOR HEALTH CARE PROFESSIONALS AT JOINT TASK FORCE-BRAVO, REPUBLIC OF HONDURAS, Michael A Sawyer MD, CPT Elizabeth M Sawyer MD, MAJ Tarak H Patel MD, JTF-Bravo, Republic of Honduras, the University of Hawaii, Tripler Army Medical Center, and Kaiser Permanente Medical Center, Honolulu, Hawaii

Objective: The objective of this educational study was to test the effectiveness of didactic and practical trauma ultrasound (US) training for non-surgeon members of the Medical Element, Joint Task Force-Bravo, Republic of Honduras. Methods: A didactic and practical trauma US training course was offered to Medical Element personnel. Four slots were available for each of the six weekly training sessions. A portable, hand-held US device (SonoSite) was used. The course consisted of a demographic questionnaire and pretest, followed by a thirty minute didactic lecture covering basic US physics, features of the portable US device, and an introduction to the Focused Assessment for Sonographic Examination of the Trauma Patient (FAST) exam. An hour-long practical training session allowed participants to practice the FAST exam with the portable US device. Afterward, participants completed a practical examination entailing identification of salient anatomic structures in a normal FAST exam. This criterion included identification of: 1) heart and pericardium for the pericardial sac test (PE), 2) liver, right kidney, and diaphragm for the right upper quadrant exam (RUQE), 3) spleen, left kidney and diaphragm for the left upper quadrant exam (LUQE), and 4) bladder for the suprapubic/pouch of Douglas exam (SPDE). Finally, participants took a didactic post-test. Data were analyzed with ANOVA or contingency table techniques. Statistical significance was set at p < 0.05.

Results: A total of 24 Medical Element personnel participated in the training course. These included physicians (n=5), physician’s assistants (n=2), registered nurses (n=10), and technicians (n=7). Twenty (83.3%) had prior US training. Two (8.3%) had prior experience performing US examinations. The mean score on the 10 question didactic pre-test was 46.3%. The mean score on the 10 question didactic post-test was 92.9% (p < 0.01). Prior to practical instruction no participants could identify any salient anatomic structures on any of the FAST exam components (0.0% for PE, RUQE, LUQE, and SPDE). Following practical instruction all participants (100%) could identify one or more features of each FAST exam component. All salient anatomic features were identified by 83.3% on PE, 70.8% on RUQE, 50.0% on LUQE, and 75.0% on SPDE (p < 0.01 for all). Conclusions: No-surgeon physicians and military allied health personnel should be offered trauma US training. This skill is an excellent force multiplier.
RESIDENCY-WIDE COMPETENCY USING LAPAROSCOPIC SIMULATORS, Rafael Sierra MD, William C Brunner MD, James R Komdorff MD, J Bruce Dunne PhD, Daniel J Scott MD, Tulane Center for Minimally Invasive Surgery, Tulane School of Medicine. Basic laparoscopic skills can be effectively taught on virtual reality (VR) and videotrainer (VT) systems, but data concerning their use as a standard part of residency programs are lacking. The purpose of this study was to determine the feasibility of a residency-wide laparoscopic competency initiative based on VR and VT training. R1-R5 general surgery residents n=36, with no previous VR or VT experience were enrolled in an IRB-approved curriculum over a six-month period. All residents were scheduled to attend mandatory one hour weekly sessions for sequential practice of 12 tasks from Core Skills 1 (CS1) and 2 (CS2) on 3 MIST VR systems and 5 validated VT tasks until previously reported competency levels were achieved. Implementation of the curriculum required over 500 man-hours by 2 faculty, 2 research fellows, and 1 lab tech. Due to software and hardware problems, the MIST VR systems were unavailable for 6% of training time. No VT problems occurred. Overall attendance for trainees was 73% (range 26%-100%). At six months, 75% (27/36) of residents achieved competency on CS1, 65% (25/36) on CS1 and CS2, and 44% (16/36) on CS1, CS2, and VT; 100% of R5’s, 36% of R2-R4’s, and 35% of R1’s completed the entire curriculum. Mean time to achieve competency was 2.8hrs (range 1.0-6.4) for CS1, 2.4hrs (range 0.8-5.8) for CS2, 1.7hrs (range 0.5-3.5) for VT, and 5.7hrs (range 2.8-5.8) for the entire curriculum. Compared to baseline performance, residents who achieved competency demonstrated a 57% improvement for CS1 (p<0.001), and a 72% improvement for VT (p<0.001). After training, 100% of residents felt more comfortable with their laparoscopic skills, 100% thought that the curriculum should be part of residency, 50% thought that 1 hr per week was too little, and 70% preferred VT to VR. Implementation of a residency-wide training curriculum is feasible and beneficial, but requires significant resources. Six months may not be adequate time and we are continuing our training protocol. Further validation is needed so that implementation of such curricula on a broader scale may be possible.

IMPACT OF CYBER VISUAL TRAINING USING A NEW CONCEPT TO MASTER ENDOSCOPIC SURGERY, Shuji Takagiuchi MD, Mitsuaki Sekimoto PhD, Masayoshi Yasui MD, Hiroshi Miyata PhD, Fujiwara Yoshiyuki PhD, Takashi Yasuda PhD, Masahiko Yano PhD, Morito Monden PhD, Osaka Graduate School of Medicine. We propose a new concept of training program for endoscopic surgery. We hypothesized that cyber visual training to watch the procedure video programmed with repeating the same scene will be effective for image training and skill up. This paper will present the impact of the cyber visual training on mastering the endoscopic knot tying. Method: The cyber visual training video for mastering knot tying was programmed in ten minutes including normal, slow, rapid and still video of the same scene. 36 medical students and residents who had no experience of endoscopic surgery were divided into three groups. First of all, all participants received simple lesson of endoscopic knot tying. Group A was only training with the instructor for 15min. Group B was training with the instructor for 15min and self training for 10min. Group C was watching the cyber video beforehand and training with the instructor for 15min. As to all participants, the duration of endoscopic knot tying was measured and the endoscopic skill before and after the training was assessed by virtual reality system (MIST VR) on three parameters: time, errors, economy of hands. The Steel Dwass test was used to evaluate the differences in task performance among the three groups. Results: Group C was shorter than group B in the duration of tying with statistical difference (p=0.0375), but no significance between A and B, B and C. There was no significance in the measurements by the MIST VR. Conclusion: Our new concept of cyber visual training effective for mastering endoscopic knot tying. This will be widely applicable to other procedure such as dissection, clipping, hemostasis.

A REGIONAL NETWORK INITIATION OF SURGICAL TELEMENTORING FOR PROJECTION OF SURGICAL EXPERTISE IN THE WWAMI, Yoon Sang Kim PhD, Helen B Pasieka BS, Lily Chang MD, Blake Hannaford PhD, Mike N Simanian MD, University of Washington. INTRODUCTION: In the Pacific Northwest, concentration of subspecialty expertise in the only major medical school servicing the WWAMI (named after 5 states: Washington, Wyoming, Alaska, Montana, and Idaho) region offers a compelling opportunity for developing a surgical telemedicine program. The aim of this study is to evaluate the feasibility and effectiveness of surgical telementoring through a regional network initiative of the WWAMI based on a robot-assisted telecollaborative system. METHODS AND PROCEDURES: The SOCRATES, a surgically dedicated telementoring device cleared by FDA was placed in one of the WWAMI region (between Mayo Clinic) Medical Center in Rochester, Minnesota, and the Grays Harbor Community Hospital in Aberdeen, Washington) with four ISDN T1 lines. Through the surgical telementoring, the expert surgeons mentored the operative surgeons while performing open and endoscopic operations in the 36-bed acute care hospital and the 36-bed tertiary care hospital in Idaho, respectively. Twelve novice surgeons mentored the operative surgeons while performing open and endoscopic surgery. We hypothesized that cyber visual training to watch the procedure video programmed with repeating the same scene will be effective for image training and skill up. This paper will present the impact of the cyber visual training on mastering the endoscopic knot tying. Method: The cyber visual training video for mastering knot tying was programmed in ten minutes including normal, slow, rapid and still video of the same scene. 36 medical students and residents who had no experience of endoscopic surgery were divided into three groups. First of all, all participants received simple lesson of endoscopic knot tying. Group A was only training with the instructor for 15min. Group B was training with the instructor for 15min and self training for 10min. Group C was watching the cyber video beforehand and training with the instructor for 15min. As to all participants, the duration of endoscopic knot tying was measured and the endoscopic skill before and after the training was assessed by virtual reality system (MIST VR) on three parameters: time, errors, economy of hands. The Steel Dwass test was used to evaluate the differences in task performance among the three groups. Results: Group C was shorter than group B in the duration of tying with statistical difference (p=0.0375), but no significance between A and B, B and C. There was no significance in the measurements by the MIST VR. Conclusion: Our new concept of cyber visual training effective for mastering endoscopic knot tying. This will be widely applicable to other procedure such as dissection, clipping, hemostasis.

OBJECTIVE IDENTIFICATION OF HIGH RISK ZONE IN LAPAROSCOPIC SURGERY BY OBSERVATIONAL CLINICAL HUMAN RELIABILITY ASSESSMENT (OCHRA), B Tang MD, GB Hanna PhD, P Joice MSc, A Cuschieri MD, Department of Surgery and Molecular Oncology, Surgical Skills Unit, Ninewells Hospital & Medical School, University of Dundee, Scotland. Aim: All operations have crucial steps that determine success or failure of the procedure. The aim of this study was to identify high-risk zone in laparoscopic cholecystectomy (LC). Methods: A direct observational analysis of the dissection tasks in 200 LCs was undertaken using unedited, intra-operative video recordings. The hierarchical task analysis involved the division of LC into three component task zones. The first task was the division of adhesions involving the gall bladder and adjacent organs/ omentum in right upper quadrant. The second task involved dissection of cystic pedicle and division of the cystic artery and duct and the third task consisted of separation of the gall bladder from liver bed followed by extraction. An observational clinical human reliability assessment technique was developed to identify committed errors. The error probability for each task was calculated as: the total number of enacted errors within the task / number of steps performed to complete the task x 100%. Student t-test was used for analysis. Significance was set at 0.05. Results: Analysis of 38,062 constituent errors of the 200 LCs identified 1,242 errors. The overall error probability was 3.5%. Twelve incidences of cystic duct and 7 incidences of cystic artery damage were recorded within the second task of operation. Two cases were converted to open approach due to uncontrolled bleeding from the cystic artery and perforation of the small bowel encountered within the second task. The second task of the operation (dissection of the structures of Calot’s triangle) was associated with more total errors (6.5 + 5.4) compared to the first (2.9+2.8, p<0.0001) and third tasks (5.1 + 3.9, p<0.05). This translated to a higher error probability (6.9%) compared to the first and third tasks (3.5%, 5.5%). Conclusion: High risk zone can be identified using OCHRA for a specific laparoscopic procedure. Dissection of Calot’s triangle was identified as the high-risk zone for laparoscopic cholecystectomy, as this task was found to have the highest error rate and error probability.

CONCLUSIONS: Analysis of the data suggested that high-risk zones in laparoscopic surgery were the dissection of Calot’s triangle and the division of the cystic artery and cystic duct. These areas may be targeted for further training and improvement.
EDUCATION/OUTCOMES

LEARNING CURVES IN MINIMALLY INVASIVE ROBOTICALLY ASSISTED SURGERY, Daniel G Tang MD, Denise G Canonizado, Ted Schwartz MD, JoAnne S Wilson RN, William Kelley MD, Abe DeAnda MD, Timothy J Broderick, Medical College of Virginia Hospital / Virginia Commonwealth University.

INTRODUCTION: As the practice of minimally invasive surgery expands, the complexity of the operations attempted has increased. Robotic technology has the potential to facilitate such operations by offering increased degrees of freedom, better visualization, and motion scalability. The objective of this study was to assess learning curves on two commercially available robotic surgery systems.

METHODS: 15 subjects with no prior surgical experience were given endoscopic anastomotic suturing and knot tying tasks to learn. They were assessed in task performance at baseline with 3 systems: 1) Intuitive Surgical System?dA Vinci robotic system; 2) Computer Motion?s Zeus robotic system; and 3) hand endoscopic tools. They were then randomized into 1 of 3 training groups: 1) dA Vinci robot, 2) Zeus robot, and 3) hand instruments. Subjects had 4 training sessions at their assigned training station where they practiced the two tasks. Subjects were then reassessed again in task performance using all 3 systems.

RESULTS: ANOVA was used to make intergroup comparisons. At initial and final assessment following training, both robotic assisted systems performed the suturing task significantly better than hand instruments (p<0.0001 for both time points). The dA Vinci group did better than the Zeus. For the knot tying task, the dA Vinci did better than the Zeus and hand instruments (p=0.002). Repeated measures analysis demonstrated a significant improvement over time for the suturing task in the dA Vinci group, but minimal to no improvement in the Zeus and hand instrument training groups. All groups demonstrated significant improvement over time in the knot tying task.

CONCLUSIONS: Robotic technology offers significant potential to enhance endoscopic surgical skills. Two robotic systems were compared and a learning curve is associated with use of each system.

EDUCATION/OUTCOMES

VALIDATION OF A PHYSICAL INANIMATE MODEL FOR ACQUISITION OF LAPAROSCOPIC MOTOR SKILLS, Yannis Raftopoulos MD, Miro Uchal MD, Roberto Bergamaschi MD, Allegheny General Hospital, Division of Minimally Invasive Surgery, Pittsburgh, Pennsylvania.

Objective: To validate a 6-task simulation module (6-TSM) for the acquisition of laparoscopic motor skills. Methods: Voluntary PGY-1, 2 and 3 surgical residents were prospectively randomized to either a 6-TSM or to a conventional model. Block randomization generated the allocation. Its concealment was separated from executor. Tasks were clip & cut a duct, endoscopic anastomotic suturing and knot tying (TT), tissue damage (TD), knot strength (KS), water leak (WL), task time (TT) and dangerous actions (DA). Five experts set gold standards for each task. Task advancement was allowed when gold standards were met. After completion of task 6 both arms were evaluated by MIST-VR. Criterion-related, construct validity and responsiveness measured the model?s ability to assess skills improvement, distinguish between surgeons? level of experience, and detect changes in performance over time, respectively. Test-retest and interrater reliability were measured for each participant?s repetitive performances or among all participants? performances of the same task, respectively. Statistician and two assessors were blind to participant identity and arm assignment. ANOVA, Kruskal-Wallis, Pearson's Corbach?s tests were used for criterion-related and construct validity, responsiveness, test-retest and interrater reliability, respectively. Results: 17 participants performed tasks as allocated. Study arms were well matched for PGY.Criterion-related validity was proven by finding skills improvement in the 6-task-model study arm as compared to the control arm (MIST-VR mean scores; p=0.02). Construct validity was proven finding skills superiority in experts as compared to 6-task-model study arm (baseline tests; TT task 5 p=0.002; TT task 6 p=0.0001; KS task 5 p=0.001; WL task 6 p=0.003). Responsiveness was shown comparing baseline to final tests in the 6-task-model study arm (time task 1-6 p=0.05, AE task 1 p=0.002, AE task 3 p=0.02, WL task 6 p=0.0001). Test-retest reliability was shown comparing each participant?s repetitive final tests in 6-TSM arms (Cronbach?s á 0.92 and 0.72 for TT and AE, respectively). Interrater reliability was high (Pearson?s r 0.86-1.0). Training cost per resident was $770. Conclusion: A 6-TSM is a valid learning tool for surgical residents? acquisition of laparoscopic motor skills.

EDUCATION/OUTCOMES

THE EFFECT OF ESCALATING FEEDBACK ON ACQUIRING PSYCHOMOTOR SKILLS FOR LAPAROSCOPY, Kent R Van Sickle MD, Anthony G Gallagher PhD, David Smith MD, Emory Endosurgery Unit, Emory University School of Medicine, Atlanta, GA.

Background: When acquiring new skills that are difficult to master, such as in laparoscopy, feedback is a crucial component of the learning experience. Optimal, feedback should accurately reflect the task performance that is to be improved, and be proximal to the training experience. In surgery, feedback is typically in vivo however, the development of virtual reality (VR) training systems now offers new training options. In this study we investigated the type and quality of feedback on laparoscopic skills acquisition.

Methods: Thirty-two (32) laparoscopic novices were prospectively randomized to four training conditions (n = 8 each); Group 1 (Control) had no feedback, Group 2 (Buzzer) had an audio feedback when the edges were touched, Group 3 (?Error?) had an examiner voice the word ?error? each time the walls were touched, and Group 4 (Both) received both audio buzzer and examiner voice ?error?. All subjects performed a maze-tracking task with a laparoscopic stylus inserted through a 5mm port to simulate the fulcrum effect in MIS. A computer connected to the stylus scored an error each time the edge of the maze was touched, and subjects were made aware of the error in the manners described above. Ten two-minute trials were performed by subjects while viewing a monitor. On completion of training, all subjects were tested by completing a two-minute trial on a simple laparoscopic cutting task, and the number of correct incisions (CI) and incorrect incisions (ICI) made were recorded. Results: Group 4 (Both) made significantly more correct incisions than the other 3 groups (F (df = 3, 28) 12.13, p<0.001) and also made significantly fewer errors or incorrect incisions (F = 14.4, p<0.001). Group 4 also made three times more CI and 7.4 times fewer ICI than the control group. Conclusions: The type and quality of feedback during psychomotor skill acquisition for MIS has a large effect on the strength of skills generalization to a simple MIS task and should be given serious consideration in curriculum design for surgical training using simulation tasks.

EDUCATION/OUTCOMES

MISTELS IS A RELIABLE TOOL FOR MEASURING LAPAROSCOPIC SKILL, Melina C Vassiliou MD, Gabriella A Ghitulescu MD, Liane S Feldman MD, Donna Stanbridge RN, Gerald M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.

INTRODUCTION: MISTELS (McGill Inanimate System for Training and Evaluation of Laparoscopic Skills) is a series of five structured tasks with an objective scoring system that rewards efficiency and precision. The purpose of this study was to assess interrater and test-retest reliability.

METHODS: To determine interrater reliability, two trained observers scored ten subjects, either live or on tape. Test-retest reliability was assessed by having fourteen subjects perform two tests, the second immediately following the first. Intraclass correlation coefficients were used to calculate the interrater and test-retest reliabilities for each task and for the total scores.

RESULTS: The interrater and test-retest reliabilities for the total scores were excellent at 0.98 and 0.85 respectively. The reliability of each task is shown in the Table.

<table>
<thead>
<tr>
<th>Reliability</th>
<th>Task</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interrater</td>
<td>0.99</td>
<td>0.88</td>
</tr>
<tr>
<td>Test-retest</td>
<td>0.78</td>
<td>0.83</td>
</tr>
</tbody>
</table>

CONCLUSION: MISTELS has excellent interrater reliability, which is well above the threshold level of 0.7 required for high-stakes evaluations.
**EDUCATION/OUTCOMES**

**P199**

**DEVELOPMENT OF A GLOBAL ASSESSMENT TOOL FOR EVALUATION OF INTRAOPERATIVE LAPAROSCOPIC SKILL,** M C Vassiliou MD, L S Feldman, C Andrew MD, S Bergman MD, H Al-Qadhi MD, D Stanbridge RN, G M Fried MD, Steinberg-Bernstein Centre for Minimally Invasive Surgery, McGill University, Montreal, Canada.

**INTRODUCTION:** There is a pressing need for an intraoperative assessment tool that meets high standards of reliability and validity to use as an outcome measure for different training strategies. The aim of this study was to develop a global assessment tool (GAT) specific for evaluation of laparoscopic skill in the operating room and to assess its reliability and construct validity.

**METHODS:** A global assessment tool consisting of 5 items (scored from 1 to 5) was developed in consultation with expert laparoscopists and an educator. 10 subjects (5 novice and 5 experienced surgeons) were evaluated by the attending surgeon, two trained evaluators and themselves during dissection of the gallbladder from the liver bed. The interrater reliability was calculated using the intraclass correlation coefficient. Mean trained observer scores for novice and experienced subjects were compared using the Student’s t-test.

**RESULTS:** The interrater reliability for the overall score between trained observers was 0.88. Between observers and attending surgeons was 0.87 and between subjects and attendings was 0.94. The mean total score by the trained observers for novice subjects was 15±3, compared to 21±3 for experienced subjects (p<0.05).

### Table 1

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novice</td>
<td>15±3</td>
</tr>
<tr>
<td>Expert</td>
<td>21±3</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Preliminary data suggest that this GAT is feasible, reliable and valid. The data support its use for intraoperative assessment of laparoscopic skill by attending surgeons and perhaps by residents themselves.

**EDUCATION/OUTCOMES**

**P200**

**NURSES’ EXPERIENCES AND SATISFACTION WITH ORIENTATION AND EDUCATION TO MINIMALLY INVASIVE SURGERY,** Shirley Yeung RN, David R Urbach MD, Toronto Western Hospital, Toronto, Ontario, Canada.

**Objective:** We sought to determine operating room nurses’ attitudes about education/orientation in laparoscopic surgery, and their satisfaction with their education/orientation.

**Methods:** We surveyed operating room nurses at the Toronto Western Hospital in Toronto, Canada, where a minimally invasive surgery program was introduced in July 1, 2000. We inquired about demographic factors, whether nurses had any orientation or educational activities related to minimally invasive surgery, and how satisfied they were with their education and orientation activities.

**Results:** 17/20 nurses returned completed questionnaires (85% response rate). 29.4% of nurses were aged 30 years or younger, and 94.1% were women. The average length of time nurses had been working was 17.1 years. The average time they had worked in the OR was 13.5 years, and the average time spent involved in any type of laparoscopic surgery was 8.8 years (range 0-30). 76.5% had some orientation to laparoscopic surgery (95% CI, 56.3 to 96.6), 88.2% (72.9 to 100) had some orientation to laparoscopic procedures, 94.1% (82.9 to 100) had some orientation regarding laparoscopic instruments, and 82.4% (64.2 to 100) had some orientation regarding MIS suites. 100% of nurses felt some orientation was important, 88.2% of nurses felt that their education/orientation was helpful, 82.4% were satisfied with their education/orientation, and 100% enjoyed participating in laparoscopic surgery.

**Conclusion:** Most nurses felt orientation and education regarding laparoscopic surgery was important, and most found that their orientation/education was helpful. All nurses we surveyed felt that orientation/education was important, and all enjoyed working in minimally invasive surgery.
ERGONOMICS/INSTRUMENTATION P203

COMPARISON OF REAL VERSUS VIRTUAL SURGICAL TRAINING MODELS, Caroline Cao PhD, Sarah Wexberg, Brian Park, Steven D Schwartzberg MD, Dept of Mechanical Engineering, Tufts University and Tufts-New England Medical Center

The purpose of this study was to compare the MIST-VR (Minimally Invasive Surgical Trainer-Virtual Reality) with a real (physical) surgical skills training system, modelled after the MISTELS (McGill Inanimate System for Training and Evaluation of Laparoscopic Skills), in order to assess their relative potential effectiveness as training models. A controlled experiment was conducted with 10 medical students/interns, 13 residents (PGY 2/3/4), and 2 fellows in general surgery and gynecology. A mixed design was used to compare their motor skill performance on various basic laparoscopic tasks. Contrary to earlier reports (Gallagher et al, 2001), our analyses of variance showed that the MIST-VR system was not able to differentiate skill levels of the subjects based on scores, errors, time, or economy of motion. In particular, the task of manipulation diathermy did not reproduce reported results. The only parameter to suggest superior performance as a function of increasing experience was the decreasing variance in the performance measures. On the other hand, the physical system was able to differentiate experience levels based on performance scores (F=3.49, df=5, p=0.02). Post-hoc analysis showed that some tasks were more sensitive than others. For example, in the peg transfer task, the medical student/interns, and PGY 2 were not significantly different from one another; the PGY3, PGY4, PGY5, and fellows performed equally well, but significantly better than the medical students/interns, and PGY 2 residents. This could be due to a ceiling effect as a result of the low task difficulty. These results suggest that further investigation is needed before adopting either system as a standard evaluation tool in surgical competency, and in particular, a virtual training system. Despite the potential for training, the evaluation metric used may be inadequate to assess the skill acquisition in the VR system. In addition, the simulated tasks, while useful for training purposes, may or may not be appropriate for clinical performance evaluation.

ERGONOMICS/INSTRUMENTATION P204

CLINICAL DIFFERENCES BETWEEN CUTTING, RADII-ALLY EXPANDING AND TISSUE SEPARATING TROCARS, Yashodhan S Khajanchee MD, Dennis Hong MD, Paul D Hansen MD, Lee L Swanstrom MD, Legacy Health System, Department of MIS, Portland, OR

Background: Currently three types of access ports are commonly used in laparoscopic surgery: traditional cutting-trocars (CT), radially expanding-trocar systems (RE) and more recent tissue-separating trocars (TS).

Benefits of the RE and TS over traditional CT are claimed to be the smaller port-site defect that does not require closure and a lower chance of trocar site herniation. However, other factors such as lower insertion force and a better port retention during surgery are also important by clinical standpoint. The objective of the current study was to compare the port site defect size, insertion force, and retention force of these three trocar systems.

Methods: Five 12 mm diameter trocars with different tip designs (two CT, two TS and one RE) were tested. Ports were placed off midline in eight pigs after insufflation. Peak insertion force and removal force were measured with a tensiometer. Functional fascial-defect sizes were measured by passing a specially designed sizing-device having calibrated bullets of increasing size. The actual (net) port site defect size for each trocar was measured by excising the different layers of the abdominal wall and overlapping the defects in various layers maintaining original orientation. All the values were expressed as means (SD). Comparisons were done using one-way ANOVA test.

Results: The insertion force for both TS and RE were significantly higher than the CT (p<0.01). Mean functional fascial-defect sizes for all the trocars were larger than their actual indicated diameter. CT created significantly larger functional fascial defects (14.8 [0.64] mm, & 15 [0.75] mm than TS (13.3 [0.51] mm and 14.1 [0.64] mm) and RE (13.1 [0.35] mm). The net abdominal wall defect sizes were significantly smaller (~50% of the indicated trocar diameter, p<0.001) for one TS (5.6 [1.1] mm) and RE (5.4 [0.5] mm). Both CT and one of the TS produced relatively larger port-site defector injuries were observed.

Conclusions: Tissue-separating tip designs and radially expanding systems create significantly smaller abdominal wall defects than cutting tips. However, the higher insertion force required to insert these trocars may pose increased risk of injury to the visceral organs leaving the scope for a perfect tip design wide open.

ERGONOMICS/INSTRUMENTATION P205

LAPAROSCOPIC SURGICAL PERFORMANCE USING A HEAD-MOUNTED DISPLAY, Shishir K Maithel MD, Leonardo Villegas MD, Nicholas Stylopoulos MD, Steven Dawson MD, Daniel B Jones MD, Harvard Center for Minimally Invasive Surgery; Boston, MA

Background: The direction of visual gaze may be an important ergonomic factor affecting operative performance. Objective: The aim of our study is to determine whether a head-mounted display (HMD) worn by surgeons improves task performance and/or reduces muscle fatigue on a laparoscopic task compared to using a traditional video monitor display (VMD). Materials and Methods: Surgical residents (N=30) were enrolled in the study. A Junior group consisting of 15 PGY 1s with no previous laparoscopic experience and a Senior group consisting of 15 PGY 4s & 5s with experience completed a laparoscopic task repeated four times using a Computer Enhanced Laparoscopic Training System (CELTS). Groups alternated between using (1) the HMD with the task placed in a downward frontal position and (2) the VMD with the task at a 30 degree lateral angle. CELTS assessed task completion time, depth perception, path length of instruments, response orientation, motion smoothness, and generated an overall score. EMG recorded sternocleidomastoid muscle activity. Display preference was surveyed. Multivariate between-subjects and univariate within-subjects MANOVA was performed. Results: The Senior residents performed better than the Junior residents overall on all parameters (p<0.05) except for motion smoothness, where there was no difference. HMD significantly improved motion smoothness when compared to VMD in both groups (p<0.05). All other parameters were equal. There was less muscle fatigue when using the VMD (p<0.05). 66% of the Junior residents, while only 20% of the Senior residents preferred the HMD (p<0.05). Conclusions: CELTS is a valid measure of task performance. By aligning the surgeon's visual gaze with the instruments, HMD improved smoothness of motion. Experienced residents preferred the traditional monitor display. Although the VMD produced less muscle fatigue, inexperienced residents preferred the HMD, possibly because of improved smoothness of motion.

ERGONOMICS/INSTRUMENTATION P206

ABDOMINAL ADHESIONS TO THREE DIFFERENT PROSTHETIC MESHES EVALUATED BY LAPAROSCOPY, W Marcondes, FAFM Herbelle, J Matone, H Noujaum, A Goldenberg, None

The aim of these study were to analyze the effects of polypropylene mesh with tissue barrier to prevent adhesions into abdominal cavity of New Zealand white rabbits. The kinds of mesh used were: polypropylene mesh (PPL), polypropylene mesh with sodium hyaluronate-carboxymethylcellulose (PPL/HSC) and polypropylene mesh with expanded polytetrafluoroethylene (PPL/e-PTFE). Those were inserted in 24 rabbits, laparoscopically and fixed to anterior abdominal wall with staples. After 28 days all animals underwent diagnostic laparoscopy, adhesions were graded from 0 to III and findings were recorded. All meshes were removed and histologic analysis were done. All PPL, 10 PPL/HSC and 21 PPL/e-PTFE meshes had adhesions. There was static difference among the 3 groups (p=0.0011). The grade of inflammatory response did not differ between PPL group and PPL/e-PTFE group, however the PPL/HSC group presented higher degree of inflammation.

In conclusion all meshes induced adhesions, nevertheless PPL/HSC mesh had less adhesions and more inflammation others. The peritoneal incorporation was similar among 3 meshes.
ERGONOMICS/ INSTRUMENTATION P207

OPTIMIZING INSTRUMENT UTILIZATION TO IMPROVE THE COST-EFFECTIVENESS OF LAPAROSCOPIC CHOLECYSTECTOMY, Carl A Ong MD, Christopher W Juergens MD, The Jewish Hospital, Cincinnati, OH

Hospital are focused on cutting cost of procedures while not impeding the care of the patients. Laparoscopic cholecystectomy (LC) has proven to be more cost-effective in multiple aspects of patient care than open cholecystectomy (OC). How cost-effective a LC can be is based on the preference card of the surgeon and what has been agreed upon as the standard operative set by the hospital staff. The basic LC set was reviewed because is was felt to be cumbersome by the operating room (OR) staff. Upon review, the operative instruments included a laparoscopic set of instruments as well as a complete set of instruments for an OC. The instruments for an OC were always opened for the possibility of a LC having to be converted to an OC. A review of LC converted to OC from 2000-2002 was performed. The conversion of LC to OC at a community hospital with resident education was 3.6% (1329 LC with 48 conversions to OC). With a conversion rate of less than 5%, the operative set for a LC has been altered to include the surgeon’s preference card for a LC and a few basic instruments that would allow the surgeon to convert to an OC in the case of an emergency. By limiting the number of instruments for a LC, the time for OR set-up, room turnover time, and instrument cleaning would allow the surgeon to convert to an OC in the case of an emergency. Nursing staff recorded perceived comfort of the patient on the standard 1-10 scale of pain. Clinicians recorded viewing difficulty on a three point scale 3=able to visualize to 1=unable to visualize. All patients were diagnosed clinically with acute surgical abdomen prior to laparoscopy.

Conclusions: Micro-laparoscopy was sensitive in diagnosing intraabdominal pathology. Negatives include; lack of technically experienced staff, disbelief in findings, and sedation issues in awake patients. This procedure requires significant dexterity with laparoscopic techniques.
ERGONOMICS/INSTRUMENTATION

EVALUATION OF A HIGH-DEFINITION CAMERA AND DISPLAY IN LAPAROSCOPIC TASK PERFORMANCE, M Yasui MD, S Takiguchi MD, M Sekimoto PhD, H Fukunaga MD, K Okada MD, H Yamamoto PhD, M Ikeda PhD, M Ohue PhD, M Monden PhD, Department of surgery and clinical oncology, Graduate school of medicine, Osaka university

Backgrounds: High-definition camera and display system are used in high resolution television, but they have been tried only recently in laparoscopic surgery. The aim of this study was to evaluate whether a High-Definition camera and display system would improve a laparoscopic surgical task performance.

Methods: The resolution, contrast, color smear, etc. of the High-Definition and conventional systems were compared. Five surgeons with various laparoscopic experience participated in the experiment. They performed laparoscopic suture knots in an experimental model using High-definition and conventional display systems at random. Task completion time served as the measure of performance and the results were analyzed.

Results: The image displayed by the High-definition system is superior to that of the conventional system in resolution measure. The average performance time of all surgeons with High-definition system did not differ from conventional viewing system. The performance time of a surgeon with plenty experience with High-definition viewing system was significantly less than the time with standard viewing system.

Conclusions: A High-definition viewing system provided experienced surgeon better task performance than the conventional viewing system in this experiment.

ESOPHAGEAL/GASTRIC SURGERY

LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL HERNIATES: A SHORT AND INTERMEDIATE-TERM OUTCOME ANALYSIS, Robin P Bousshey MD, Steve Burpee MD, Deepa Kumar MD, Eric C Poulis MD, Christopher M Schlachta MD, Joseph Mamuzza MD, The Centre for Minimally Invasive Surgery, St. Michael’s Hospital, University of Toronto

BACKGROUND: The surgical approach to paraesophageal hernias (PEH) has changed dramatically with the advent of laparoscopic techniques over the past decade. Despite this increasing trend, considerable variation in both perioperative outcomes and hernia recurrence rates have been reported in the literature. The objective of this study was to evaluate our early and intermediate outcomes with laparoscopic PEH repair.

METHODS: A retrospective review of patients undergoing laparoscopic repair of PEH in our institution between June 1998 to September 2002 was performed. Only patients with greater than 1 year follow-up were included in this analysis.

RESULTS: Elective laparoscopic repair of a PEH was performed in 58 consecutive patients with a mean age of 60 years. These included type II (13), type III (43), and type IV (1) PEH. The most common symptoms included epigastric pain (57%), dysphagia (40%), heartburn (31%), and vomiting (28%). Laparoscopic procedures included 56 Nissen fundoplications and 2 gastropexies. All crural defects were closed primarily with or without pledges, while 2 patients required the use of mesh. One laparoscopic procedure was converted to open due to intra-operative bleeding secondary to a consumptive coagulopathy, but no other major intraoperative emergencies were observed. Minor or major complications occurred in 15 patients (20%). Early postoperative complications included 2 postoperative leaks, 1 ileus, 3 pulmonary and 2 cardiac complications. Late post-operative complications included 1 umbilical hernia. Median length of hospital stay was 3.8 +/- 2.5 days. Nineteen patients were completely asymptomatic following surgery, while the majority of the remaining subset of patients (83%) described marked improvement with a mean follow-up of 24 months. UGI series performed in symptomatic patients identified 5 recurrent paraesophageal hernias (8.6%) and 5 small sliding hernias (8.6%). CONCLUSIONS: Laparoscopic repair of PEH is associated with improved long-term symptom relief, low morbidity, and acceptable recurrence rates when performed in an experienced centre.

ERGONOMICS/INSTRUMENTATION

ONE BRAIN OR TWO: VIDEO ANALYSIS OF AN ENDOSCOPIC CUTTING TASK PERFORMED BY ONE VERSUS TWO OPERATORS, Bin Zheng, Farah Verjee, Alan J Lomax MD, Christine L MacKenzie PhD, School of Kinesiology, Simon Fraser University

Objective: To perform intricate endoscopic tasks, one can ask whether to share the load between two operators or between the hands of one operator. We hypothesized that, for a given task, a team of two operators would perform better than one operator binmanually. Further, the benefits of teamwork would be greater when the displayed image was misaligned.

Method: The task was to reach, grasp and lift a thread from a synthetic organ with an endoscopic grasper held in one hand, and to cut the thread with a pair of endoscopic scissors held in the other. The task was performed by two groups: 8 individuals binmanually, and by a different 16 unimanually, in 8 pairs. The image was displayed on a monitor vertically or superimposed by a mirror over the image. A different camera was equipped vertically or horizontally over the viewing system. The image was divided into subtasks. Durations of subtasks were analyzed using 2 (groups) X 2 (displays) X 2 (camera rotation) X 5 (trials) mixed design ANOVAs, with a = .05.

Results: As predicted, significantly shorter task times were revealed for dyads than for individuals who performed binmanually. Contrary to our hypothesis, rotation of the camera increased the task time spent in all subtasks, for both binmanual and dyad groups. The significant display by trial interaction for reaching time suggests that the superimposed image display facilitated learning, compared to the vertical image display.

Conclusions: Results indicate that performance by a dyad team is superior to a single operator for this intricate endoscopic task, the team possesses larger capacity for processing information than one operator. Implications are discussed for the design of optimal endoscopic procedures and layout.

ESOPHAGEAL/GASTRIC SURGERY

HAND ASSISTED MODIFIED SUGIURA'S PROCEDURE FOR BLEEDING ESOPHAGOGASTRIC VARICES — CASE REPORT, Kuo-Hsin Chen MD, Shih-Horng Huang PhD, Department of Surgery, Far-Eastern Memorial Hospital, Taipei, Taiwan

The treatment of bleeding esophagogastroduodenal varices is challenging. Surgery is considered if endoscopic treatment is not feasible. We report a 61 y/o diabetic woman with HCV related cirrhosis of liver who was complicated with several bleeding episodes from esophago- gastroduodenal varices. Endoscopic treatment failed to control her condition for extensive gastric varices. Hand assisted modified Sugiuira’s procedure including proximal esphagogastroduodenal devascularization and distal esophageal transection were performed.

Under general anesthesia, the patient was placed in modified lithotomy position and the operator stood between the patient’s legs. A 7 cm upper midline incision was made and pneumoperitoneum set up. Devascularization was achieved by Harmonic Scalpel and LigaSure. The splenic hilum was controlled by EndoGIA. Another 2.5 cm incision was made by extending the subcostal port and 25 mm CEEA was introduced through a gastrotomy. Ligate around the anvil was achieved by the surgeon’s left hand and instrument in his right hand then distal esophageal transection was performed. Finally, the gastrostomy was closed. The patient recovered smoothly after the surgery and remained free of bleeding episode during a follow-up of 18 months. Modified Sugiuira’s procedure through abdominal approach is challenging especially in obese patient. The prominent collateral vessels and poor exposure usually caused massive bleeding during operation. Laparoscopic approach improves the exposure, especially in left subphrenic region and retroperitoneal space and new hemostatic instruments help to control intraoperative bleeding. The hand assisted method further improves tissue retraction and control bleeding during dissection and makes this procedure safer.

Hand assisted modified Sugiuira’s procedure is feasible and found to improve surgical field exposure. Wound complications may be less frequent by this approach.
ESOPHAGEAL/GASTRIC SURGERY  P215


Introduction: Esophagogastrectomy failure for cancer is an important complication due mainly to gastric ischemia. We hypothesize that a first stage laparoscopic gastric devascularization and partial transection could enhance, after three weeks, the vascular flow of the fundus from neovascularization.

Material and Method: Eight 50kg female pigs were involved in the study. Measurement of the vascular flow to the fundus was done with a laser-doppler (endoscopic probe). The stomach was devascularized, leaving the gastroepiploic artery intact. The stomach was partially transected. Three sequential endoscopic linear staplers, starting from the GE junction and heading towards the antrum, were fired. The vascular flow to the fundus was re-measured at this point. After three weeks, we measured once again the vascular flow to the gastric fundus and samples of it were sent for histopathologic evaluation.

Results: The gastric fundus showed, in all the animals, signs of neovascularization after macroscopic evaluation. These findings correlated with laser doppler measurements and histopathologic findings. The number of vessels between normal - 5.2 +/- 0.83 and neovascularized tissue - 11.2 +/- 1.92 - showed a significantly increase, p < 0.0002. Analysis of laser doppler measurements showed, between measurement 1 (21.61 +/- 2.85 P.U.) -normally vascularized tissue- and measurement 2 (4.84 +/- 0.76 P.U.) -vascularization immediately after gastric vessels ligation-, p < 0.01, and between measurements 2 and 3 (17.89 +/- 6.75 P.U.) -vascularization after 3 weeks-, p value < 0.001. We had no complications and the animals were able to be fed normally from the first post-operative day until the end of the follow-up.

Conclusion: This study demonstrates that after an optimal gastric devascularization, a significant increase of vascular flow after three weeks can be expected. Laparoscopic gastric devascularization and partial transection is a safe and feasible procedure. This two-step procedure can potentially decrease the risk of fistula formation after an esophageal resection.

ESOPHAGEAL/GASTRIC SURGERY  P216

LAPAROSCOPIC REMOVAL OF A GIANT GASTRIC TRICHOSZEOAR, Ward J Dunnican MD, Hansraj Sheth MD, Frank Borao MD, Saad A Saad MD, Monmouth Medical Center. Long Branch, NJ

INTRODUCTION: Laparoscopic approach is the treatment of choice for gastric bezoars.

METHODS AND PROCEDURES: The authors present a case with multiple illustrations in which laparoscopic technique was used to remove a giant gastric trichobezoar in a 12-year old girl.

CONCLUSION: There are many therapeutic modalities for managing gastric bezoars. These include nasogastric lavage or suction, the use of prokinetic agents, enzymatic dissolution, endoscopic fragmentation and retrieval, and surgical removal. Laparotomy has been the procedure of choice for the removal of large bezoars. With the advent of laparoscopic surgery, it became feasible to manage such lesions without the necessity of a large upper abdominal incision. This approach can well be a treatment of choice, and should be used more often when surgery is indicated.

ESOPHAGEAL/GASTRIC SURGERY  P217

LAPAROSCOPIC MANAGEMENT OF INCIDENTAL GASTROINTESTINAL STROMAL TUMORS, Gregory G Fedorcik MD, Andrew Larson MD, Frank Borao MD, Monmouth Medical Center, Department of Surgery

Objective: Gastrointestinal stromal tumors (GIST) of the stomach can be treated successfully with laparoscopic wedge resection or formal laparoscopic resection.

Methods: We performed one sleeve gastrectomy and one wedge resection of GIST's found incidentally during other laparoscopic procedures. One patient had a laparoscopic cholecystectomy and one had a laparoscopic Roux-en-Y gastric bypass. Both patients had stapled resections of the tumors at the time of their planned surgeries after frozen section biopsies confirmed GIST.

Results: The tumors were resected with negative margins and final pathology confirmed the diagnosis of benign gastrointestinal stromal tumors. The tumors stained positive for CD 117 and CD 34. Both patients made an uneventful recovery and were discharged home within three days.

Conclusion: Gastrointestinal stromal tumors of the stomach can be managed successfully as an incidental finding during laparoscopy for another operation. Therefore, thorough laparoscopic surveillance of the abdomen is recommended during every procedure, and biopsy should be performed if any pathology is identified.

ESOPHAGEAL/GASTRIC SURGERY  P218

LAPAROSCOPIC SURGERY IN ESOPHAGEAL ACHALASIA. THE EXPERIENCE IN ONE ESPECIALIZED CENTER, Arnulfo F Fernandez MD, Miguel A Martinez MD, Rafael Torres MD, Julian Ruiz MD, Barbara Faife MD, Julio R Torres MD, Carlos M Escoto MD, Centro Nacional de Cirugia Endoscopica, Hospital Universitario Calixto Garcia.

We show the experience of eight years in laparoscopic surgical therapeutic of the esophageal achalasia, making use of the Heller-Dor and Heller-Toupet operation with transoperative control endoscopy.


We studied operative time separating in esophagocardiomyotomy time, transoperative control endoscopy time and antireflux procedure time. We analyzed too the relation between the kind of surgical techniques associated. We have done clinic, radiological and manometric follow-up.

The mean surgical time of the intervention is 128 minutes, include perioperative 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 144 patients and 4 good, 2 regular and 2 bad in accordance to Vantrappen classification. Mortality ratio is about 0, 6 %.

We indicate that surgical procedure like an alternative of first line in the treatment of esophageal achalasia. It is necessary to have special care in early diagnostic of later evidences of injury by electro-surgery.
ESOPHAGEAL/GASTRIC SURGERY

P219

TIMING OF SURGICAL INTERVENTION DOES NOT INFLUENCE RETURN OF ESOPHAGEAL PERISTALISM AND OUTCOME IN PATIENTS WITH ACHALASIA.
Carlos A. Galvani MD, Maria V Gorodner MD, Pierro M Fisichella MD, Marco G Patti MD, UCSF.

Background: It has been suggested that the motility abnormalities in patients with achalasia progress from an initial phase of vigorous achalasia to complete absence of esophageal peristalsis. Furthermore, it has been proposed that early elimination of the resistance at the level of the gastroesophageal junction by surgical intervention could result in return of peristalsis.

Aims: To assess if the timing of surgical intervention affects the return of esophageal peristalsis and the outcome in patients with achalasia.

Patients and Methods: Between January 1991 and May 2003, 173 patients had minimally invasive surgery for treatment of esophageal achalasia. Forty one patients (24%) had pre and postoperative esophageal manometry. Based on the duration of symptoms, these patients were divided into 3 groups: Group A, 10 patients, duration of symptoms < 12 months; Group B, 19 patients, duration of symptoms 12-60 months; Group C, 12 patients, duration of symptoms > 60 months.

Results:

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex duration (months)</th>
<th>Vag. achalasia</th>
<th>Peristalsis</th>
<th>Surgid results</th>
<th>Median Survival (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8±4</td>
<td>40%</td>
<td>0%</td>
<td>90%</td>
<td>15±8±4 months</td>
</tr>
<tr>
<td>B</td>
<td>35±16</td>
<td>21%</td>
<td>5%</td>
<td>95%</td>
<td>17*</td>
</tr>
<tr>
<td>C</td>
<td>15±8±4</td>
<td></td>
<td></td>
<td>92%</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions: These results show that: (a) the presence of vigorous achalasia is independent from the duration of symptoms; (b) the timing of surgical intervention does not influence return of peristalsis; (c) clinical outcome is independent from the duration of symptoms. Therefore, early elimination of the resistance at the level of the gastroesophageal junction by surgical intervention does not result in return of peristalsis and does not affect outcome.

ESOPHAGEAL/GASTRIC SURGERY

P220

ROBOTIC GASTRIC SURGERY,
PierCristoforo Giulianotti MD, Edoardo Gentile MD, Marta Angelini MD, Andrea Coratti MD, Simone Cecconi MD, Tommaso Balestracci MD, Fabio Sbrana MD, Giuseppe Caravaglios MD, General Surgery, Misericordia Hospital - Grosseto-Italy

Objective of the study. To examine feasibility and safety of minimally-invasive robotic gastric surgery using the da Vinci Surgical System (Intuitive Surgical Inc., USA).

Description of the methods. Between November 2000 and September 2003, 30 patients underwent a robotic gastric resection, 12 males and 18 females, with a mean age of 66.1 years (range 39-89). The indications for surgery included 23 carcinomas, 1 lymphoma, 1 GIST (gastrointestinal stromal tumor), 1 carcinoid, 1 leiomyoma, and 3 unresponsive peptic ulcer. We performed 13 total gastrectomies, 15 subtotal gastrectomies, and 2 partial resections. The patients with malignant neoplasms received a D2 lymphadenectomy.

The upper gastrointestinal continuity was restored by Billroth II gastro-jejunal anastomosis in 9 cases (robotic anastomosis), and by a Roux-en-Y anastomosis in 19 cases (stapler anastomosis).

Preliminary results. The mean operating time was 320 minutes (range 120-480): in the first fifteen cases the mean time was 340 minutes, and in the others the mean time was 290 minutes. We had two conversions to laparoscopic surgery (1 splenic injury; 1 robot-system failure), and three conversions to open surgery (advanced carcinoma). The mean number of nodes removed in D2 lymphadenectomy was 36 (range 19-80). Perioperative morbidity was 13% (4/30) and postoperative mortality was 3.3% (1/30).

Conclusions. Our preliminary experience shows that robotic gastric resections are feasible and safe. The robot allows to achieve a convincing D2 lymphadenectomy and improves the quality of dissection and suturing. Further randomized trials will be necessary to evaluate the long-term and oncological results.

ESOPHAGEAL/GASTRIC SURGERY

P221

LAPAROSCOPIC RESECTION OF GASTRIC STROMAL TUMORS, Ronit Grinbaum MD, Rami M Spira MD, Aviram Nissan MD, Oded Zamir MD, Moshe Rubin MD, Herbert R Freund MD, Nahum Beglaiber MD, Department of Surgery, Hadassah University Hospital Mount Scopus, Jerusalem, Israel

Introduction: Gastrointestinal stromal tumors (GIST) are rare tumors of the gastrointestinal tract (<2% of gastric tumors) that arise from primitive mesenchymal cells. GISTs occur throughout the GI tract but are most commonly located in the stomach. Surgical resection remains the mainstay of therapy. The purpose of this study is to review our experience with various techniques of laparoscopic resections of gastric stromal tumors.

Methods: We recently performed 9 laparoscopic gastric wedge resections and one esophageal wedge resection using various techniques. Special precautions were taken to avoid the operative dissemination of the tumors.

Results: Eight of the nine procedures were accomplished laparoscopically. The procedures (wedge resection, enucleation, partial gastrectomy) were tailored specifically according to tumor location and size. One attempted laparoscopic resection was converted to an open procedure due to invasion of the tumor into the transverse colon. In one patient due to the malignant nature of the GIST a second laparoscopic wider resection was performed. The operative and postoperative course was uneventful. Operating time ranged from 180 to 310 min. Oral feeding commenced on days 5 to 20. Postoperative hospital stay ranged from 6 to 45 days.

Conclusion: various surgical techniques should be considered for resection of GISTs. The specific application of a certain technique will be determined intra-operatively according to the location of the tumor. Special care must be taken to assure complete resection due to the malignant potential of some of these tumors.

ESOPHAGEAL/GASTRIC SURGERY

P222

FINDINGS AT STAGING LAPAROSCOPY IDENTIFY PATIENTS WHO WILL RECEIVE SURVIVAL BENEFIT FROM SURGICAL RESECTION OF GASTROESOPHAGEAL CANCER, Jason J Hall MD, Mark B Wilkemeyer MD, Ricardo M Bonnor MD, Jason B Fleming MD, Hammon Center for Therapeutic Oncology Research and Departments of Surgery and Pathology, University of Texas Southwestern Medical Center, Dallas, TX, USA.

In our initial study, we demonstrated that staging laparoscopy alone is superior to peritoneal cytology in identifying patients with occult intraperitoneal disease from gastroesophageal malignancy. We hypothesize that findings at laparoscopy (lap) will predict which patients will benefit from an attempt at curative resection more accurately than cytology (cyto).

Methods: Patients with gastroesophageal cancer underwent staging laparoscopy and cytology. Resection of the primary tumor was performed or omitted at the surgeon's discretion. Results of laparoscopy (presence of intra-abdominal metastases) and cytology (presence of malignant cells) were recorded. Patients were followed prospectively with cancer-related death as the primary endpoint. Survival based on lap and cyt results with or without subsequent surgical resection was then statistically analyzed (Kaplan-Meier). Results: Forty patients were studied (24 lap positive; 16 lap negative; 13 cyto positive; 17 cyto negative). There were no cyto positive and lap negative patients. During a 12.9 (1.4-48) month follow-up, 25(62%) patients died of disease. Median survival based upon lap or cyt results is shown below.

<table>
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<th>Median Survival (months)</th>
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<td>Laparoscopy</td>
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*p<0.001

Of the 16 lap negative patients, 14 (85%) underwent tumor resection resulting in an 80% actuarial survival at three years; no lap positive patient who received surgery (n=5) survived 5 months.

Conclusions: Regardless of cytology, intra-abdominal metastases identify patients staging laparoscopy predict a rapid cancer-related death; tumor resection in the face of these findings fails to generate a survival benefit. However, negative laparoscopic findings predict a durable survival benefit after gastroesophageal tumor resection.
ESOPHAGEAL/GASTRIC SURGERY  P223

LAPAROSCOPIC EXCISION OF GASTROINTESTINAL STROMAL TUMOR (GIST) IN THE STOMACH: A SERIES WITH 20 CASES, A.Hindmarsh MD, G.Lee MD,B.Koo MD,M.Lewis MD,M.Rhodes MD,Norfolk & Norwich University Hospital, UK Aim: To review the surgical outcomes for all patients undergoing laparoscopic excision of gastric GIST in our unit.


Results: 20 cases of laparoscopic excision of gastric GIST were performed by 2 surgeons during the study period. The mean age and weight of the patients was 60.7±15.3 years and 78.2±14.5 kg respectively. The mean diameter of the tumour was 4.7±1.9cm. Initial diagnosis was by endoscopy and biopsy. 9 patients had a combined laparoscopy and gastroscopy to locate the tumor. Laparoscopic excision was completed successfully in 15 out of 20 patients with a mean operating time of 93.4±40.6 minutes. Five procedures were converted to open; two because the tumour was deemed too large for laparoscopic resection, one for dense peritoneal adhesions, one due to bleeding and one because the tumour could not be found. The mean haemoglobin fall after the procedure was 0.8±0.8 g/dl and the median hospital stay was 5 (2-11) days. To date there have been two cases of distant recurrence presenting at 16 and 17 months after the initial resection, one of which was converted to an open procedure due to the tumour size. In both cases the initial histology reports were for malignant stomach tumours.

Conclusion: In the authors' experience laparoscopic excision is an effective and safe method of managing gastric GIST that is comparable to open resection with minimal morbidity to the patients.

ESOPHAGEAL/GASTRIC SURGERY  P224

TECHNIQUES AND RESULTS OF LAPAROSCOPIC ANTIREFLUX SURGERY IN GERMANY, Thomas P Hüttl MD, Matthias Hohle,Tanja K Geiger MD,Friedrich-Wilhelm Schildberg MD,Karl-Walter Jauch MD,Günther Meyer MD, Department of Surgery, Klinikum Grosshadern, University of Munich, Germany

Background: Aim of this study is the evaluation of development and outcome of laparoscopic antireflux surgery in Germany in a nationwide representative survey.

Methods: A written questionnaire including 34 detailed questions and 288 structured items about diagnostic and therapeutic approaches, number of procedures, complications and mortality was sent to 546 randomly selected German surgeons (33% of the registered general surgeons) at the end of 2000.

Results: The response rate was 72% and a total of 2540 antireflux procedures were reported. 81% of all procedures were performed laparoscopically, 0.1% thoracoscopically. 65% were total fundoplications and 31% partial fundoplications, 4% others. 29% of the surgeons have experience with laparoscopic antireflux techniques. 71% of these prefer a 5-trocar-technique and 91% use the harmonic scalpel for dissection. There were significant technical variations (e.g. use and size of a bougie, length of the wrap, additional gastroscopy, fixation of the wrap) within the surgical procedures. The overall complication rate for laparoscopic fundoplication was 7.7% (6.7 surgical, 2.0 nonsurgical complications), including 0.6% esophageal perforations and 0.6% splenic lesions. The conversion rate was 2.9%, the reoperation rate 1.6% and the overall hospital mortality rate 0.13%.

We observed a striking learning curve regarding complication rates when comparing hospitals performing fewer than 10 with hospitals with more than 10 fundoplications per year (14.0% vs. 5.1%, p < 0.001). Following total fundoplications long-term dysphagia and interventions caused by dysphagia occurred significant more often than after partial fundoplications (dysphagia: 6.6% vs. 2.4%; p < 0.001).

Similar findings were reported for Nissen versus Floppy-Nissen fundopli-

ESOPHAGEAL/GASTRIC SURGERY  P225

INTRAOPERATIVE TUMOR LOCALIZATION USING LAPAROSCOPIC ULTRASOUND DURING LAPAROSCOPIC ASSISTED GASTRECTOMY FOR EARLY GASTRIC CANCER, Woo Jin Hyung MD, Jee Ho Cheong MD,Junuk Kim MD,Seung Ho Choi MD,Sung-Hoon Noh MD, Department of Surgery, Yonsei University College of Medicine

Background: The therapeutic option for early gastric cancer (EGC) is gastric resection with an adequate resection margin and perigastric lymph node dissection. However, EGC cannot be identified by inspection and it is extremely difficult to palpate due to its shallow invasion depth and small size. During the laparoscopic assisted gastrectomy, the inability to palpate the lesions, it makes more and more difficult and is impossible to identify the lesions. Therefore, precise localization technique is needed to decide on an adequate gastric resection range even in laparoscopic assisted gastrec-

ESOPHAGEAL/GASTRIC SURGERY  P226

LAPAROSCOPIC REPAIR OF LARGE PARAESOPHAGEAL HERNIA WITH ANTERIOR FUNDOPLICATION, Hitoshi Ikada MD, Masahiko Mura MD, Tomoya Yoshitaka MD, Takashi Ishikawa MD,Tatsuaki Ishii MD,Masahiko Maruyama MD,Shinichiro Watanabe MD,Hitoshi Kin MD, Fukuyma Municipal Hospital

Introduction: Laparoscopic repair of large paraesophageal hernia is very difficult because of dense peritoneal adhesions, which may cause technical problems. During the laparoscopic assisted gastrectomy, the inability to palpate the lesions is very difficult and is impossible to identify the lesions. Therefore, precise localization technique is needed to decide on an adequate gastric resection range even in laparoscopic assisted gastrec-

Results: There were no operative mortalities. The procedure was converted to open surgery in one patient because of adhesion due to previous colon resection, one patient. The outcome of the operation was evaluated with symptom score (chest pain, abdominal pain, dysphagia, heart burn, regurgitation, none to severe: 0-4).

Conclusions: Until now, no unique technique is accepted and a number of different antireflux procedures with numerous modifications are reported. The morbidity and mortality rates reported here compare very well with the literature and 1-year-follow-up results are promising.
LAPAROSCOPIC-ASSISTED DISTAL GASTRECTOMY: REPORT OF A CASE, Misunobu Imasato MD, Syuji Takiguchi MD, Hiroshi Yano MD, Takushi Monden MD, Department of surgery, NTT west osaka hospital.

Benign tumors of the stomach are rare, their incidence being about 5%-7% of all gastric tumors. Lipomas are slow growing benign tumors of the gastrointestinal(GI) tract. Their occurrence in the GI tract is most common in the colon, but they can be found very rarely in the stomach, where they account for only 3% of benign gastric tumors. The treatment for gastric lipomas has not yet been established. We herein describe a case of large gastric lipoma successfully treated by laparoscopic intragastric surgery. A 45-year-old female with no complaint was incidentally diagnosed with a submucosal gastric tumor, about 3 cm in diameter, in the prepyloric antrum by upper GI endoscopy. Pathological findings of biopsy specimens showed no evidence of malignancy. Computed tomography showed an ovoid and well-circumscribed intramural mass, measuring 35 mm, reveals to be of fat density. From these findings, the tumor was strongly suggestive of a lipoma that we thought should be treated, because large lipomas could become the origin of GI bleeding. We performed a laparoscopic intragastric enucleation for this tumor. Under general anesthesia three trocars were placed in the stomach through the ventral to the gastric wall. The stomach was insufflated with carbon dioxide gas through a trocar, maintaining a maximum pressure of 10 mmHg during the surgery. The laparoscope was introduced into the stomach through the central trocar, and operative instruments were introduced into the stomach through the others. By cutting the mucosa with the ultrasonically activated device, this tumor was completely enucleated. The operative time was 148 min and intraoperative blood loss was negligible. There was no intra and postoperative complication. Postoperative diagnosis of the tumor was pathologically confirmed to be a lipoma of the stomach. The patient was discharged on the 8th postoperative day. This laparoscopic procedure for benign nonepithelial gastric tumors such as lipomas we have presented is technically feasible, safe, and lower stress than gastrectomy.


PURPOSE With the technical advances of recent years, operative manipulations in the abdominal cavity by laparoscopic surgery are now considered to be equal to those using classical open surgery. Laparoscopic-assisted distal gastrectomy (LADG) is also considered as less invasive than classical open distal gastrectomy (ODG), but this has not been adequately evaluated based on assessments of objective parameters. We have already reported that measurement of physical activity using an accelerometer after operation was useful to evaluate the condition of convalescence of laparoscopic-assisted colectomy. This study was done in order to demonstrate that LADG is actually less invasive than ODG, objectively and quantitatively. MATERIALS AND METHODS: We compared postoperative course, such as the day of first mobilization, the day of initial food intake, the length of postoperative hospital stay, and physical activity for 7 days postoperatively measured by accelerometer between LADG(n=10) and ODG(n=10). RESULTS: Operation time of LADG was significantly longer than that of ODG, blood loss during operation was significantly less in LADG than in ODG. Clinical postoperative course was comparable because all were managed according to our protocol. Physical activity expressed as cumulative acceleration was significantly higher in the LADG than in ODG from 5th to 7th postoperative day. Recovery time defined as the day that cumulative acceleration recovered to 90% of the preoperative level, was significantly shorter in LADG (5.4±2.1 days) than in ODG (6.8±3.2 days). CONCLUSION: Our results showed that the duration of convalescence in LADG was significantly shorter than ODG. We may conclude that LADG is less invasive than ODG.
Background: Patients with laryngeal symptoms of gastroesophageal reflux disease are treated with high dose medical therapy or esophageal/gastric fundoplication (EGF). Although patients improve symptomatically, the ability of these treatments to decrease reflux is unknown. Multichannel intraluminal impedance (MII), a new modality to evaluate presence of volume in the esophagus, combined with standard pH allows quantification of acid and non-acid reflux.

Methods: Eighteen patients (9 female, 4 male) were studied with proximal and distal pH/MII study on medical treatment (MED, n=7) or following EGF (SURG, n=6) as part of a prospective IRB-approved study. All had standard 24 hour pH study with 1 probe 5 cm above the lower esophageal sphincter and the other probe 2 cm above the upper esophageal sphincter with a bifurcated probe that also had MII channels allowing the evaluation of bolus movement through the esophagus. Reflux episodes were noted if volume could be seen travelling in an aboral fashion through the esophagus. Simultaneous pH monitoring allowed determination of acid or non-acid contents. Data was analyzed using Mann-Whitney (mean±SD).

Results: The number of acid reflux episodes to the proximal (MED 3.3±2.6, SURG 2.6±1.9, p>0.5) and distal probes (MED 13.6±13.6, SURG 9.8±13.6, p>0.5) was not different between groups. Johnson-DeMeester scores were normal (MED 6.3±4.9, SURG 11.2±13.2, p>0.5). However, the number of non-acid reflux episodes was significantly different at the distal probe (MED 45±26.7, SURG 23±12, p<0.05) and at the proximal probe (MED 17.3±13.7, SURG 4.2±2.7, p<0.05). High correlation between patient symptoms and both acid and non-acid reflux episodes was noted in both groups.

Conclusion: EGF more effectively controls both acid and non-acid reflux, whereas medical treatment affects acid reflux alone.
ESOPHAGEAL/GASTRIC SURGERY

LAPAROSCOPIC APPROACH FOR GERD: OUR EXPERIENCE, K. Konstantinidis, K. Anastassakou, M. Vorias, G. Sambalis, M. Georgiou, G. Thedoropoulos, Department of General and Laparoscopic Surgery, Athens Medical Center, Athens, Greece

Aim: Of this study is to present and analyze our experience with laparoscopic Nissen and Toupet fundoplication for gastroesophageal reflux disease in the last decade.

Methods: A total of 231 patients with documented GERD were approached laparoscopically in our department between February 1993 and November 2002. There were 139 men and 92 women. The mean age was 47 years. Data were collected retrospectively on a data base and reviewed and analyzed. 192 patients received a Floppy Nissen, 21 patients a Nissen Rossetti and 18 patients a Toupet fundoplication. Routine preoperative investigations included barium esophagogram, upper gastrointestinal endoscopy, esophageal manometry 24-h ambulatory pH-metry and upper abdominal ultrasound. We also routinely performed Gastrografin swallow on postoperative day one.

Results: There were no conversions. Mean operative time was 86 minutes. There were no major intraoperative complications such as esophageal perforation, injury of the diaphragm, mediastinal pleura laceration or splenic injury. Intraoperative blood loss was minimal. There were minor complications in 6.1% of all patients. Postoperative pain was measured on a verbal rating scale. Most patients received a soft oral diet at the first postoperative day. The mean length of hospital stay was 2.5 days. Patients were discharged after 10 days, 1-month and 6-months follow up.

Refux symptoms could be controlled in all cases, but they did reappear in 3 patients (1.3%). In the first 4 weeks following the operation dysphagia with solids could be observed in 17.3% of all patients. After the first postoperative month dysphagia persisted in 2.1% of patients. Postprandial epigastric fullness was reported by 10 patients (4.3%). One patient had to be reoperated after a car accident, that resulted in rupture of the sutures at the diaphragmatic hiatus.

Conclusion: Laparoscopy is effective and safe in controlling GERD. Furthermore it is associated with less complications than the open procedure, less postoperative pain, shorter hospital stay and higher patient satisfaction.

ESOPHAGEAL/GASTRIC SURGERY

LAPAROSCOPIC VERSUS OPEN RESECTION OF GASTRIC CANCER, IS THERE AN ADDED RISK TO CONVERSION? Deepa Kumar MD, Robin P Boushey MD, Joseph Maramzza MD, Eric C Poulin MD, Christopher M Schlachta MD, The Centre for Minimally Invasive Surgery, St. Michael's Hospital, University of Toronto

BACKGROUND: The management of gastric cancer using laparoscopic techniques remains controversial. The effect of conversion on outcomes has not been fully explored. The purpose of this study was to assess perioperative and cancer related outcomes in patients with gastric adenocarcinoma undergoing open (OR) and laparoscopic (LR) resection, as well as assess the role of conversion on these outcomes.

METHODS: Thirty consecutive patients with gastric cancer treated from 1998-2002 who underwent LR or OR were reviewed. Outcomes assessed as intent-to-treat included blood loss (EBL), transfusion requirements, operative time, conversion rate, length of stay, final pathologic staging, survival and recurrence. RESULTS: Fifteen patients each underwent LR and OR. The two groups were similar for sex distribution, age and BMI. Conversion rate for LR was 33%, 1 for bleeding, 4 for unclear planes. Mean operating time was significantly longer in patients treated with LR vs. OR (284min +/-69 vs. 192min +/-53, p<0.001). There was no significant difference in median blood loss (LR 400cc vs. OR 450cc) or transfusions (LR 27% vs. OR 33%). The mean number of nodes retrieved (8.4 +/- 5.6 vs. 9.5 +/-5.9), clear margin rate (87% vs. 67%) and stage distribution was similar for LR compared to OR. Median length of stay was significantly shorter in LR vs. OR (7 vs. 9 days, p<0.05). Complication rates were similar. Median follow-up was equivalent (LR 17 months vs. OR 13.5 months). There were no early postoperative deaths. At last follow up, 40% of patients treated with OR vs. 13% of LR had died of their disease. Three patients (20%) in the LR group were alive with disease. Subgroup analysis revealed that patients requiring conversion had longer operating time than OR and significantly higher EBL than either OR or successful LR. Median length of stay was 7 days after conversion and 5 days with successful LR (p<0.05).

CONCLUSION: Laparoscopic surgery offered shorter length of stay but with significantly longer operative times. Conversion rates were associated with significantly higher blood loss but not increased length of stay. Cancer related outcomes were not altered by approach or conversion.

ESOPHAGEAL/GASTRIC SURGERY

EFFECT OF SURGEON ON OUTCOME OF ANTIREFLUX SURGERY, Pavli S Kundhal BA, Julie L Hamish MS, David R Urbach MD, University Health Network, Toronto, Ontario, Canada

Objective: To determine whether outcomes 1 or more years after antireflux surgery are affected by operating surgeon.

Methods: We reviewed records of patients who had antireflux surgery from June 2000-2002, and mailed a 19-item survey that focused on current medication use, postoperative symptom improvement and satisfaction with surgery. We estimated 95% CI for all measures, and tested the significance of predictor variables using chi-square tests (categorical) and ANOVA (continuous).

Results: We mailed the survey to 74 patients (mean age [SD] 51.9[17.2], 42% Male), 91% of the operations were initiated laparoscopically, with 5 (7%) subsequently converted. 95% of patients were taking PPIs pre-operatively. Surgeons (n=7) were grouped into 4 groups, including 3 surgeons who performed the majority of operations, and the remaining 4 (who did 2 or fewer procedures) combined into one group. Mean duration of follow-up was 2.1 [0.46] years. Over 50% of patients returned surveys from the first mailing. 40% of patients were taking medications for GERD at time of survey completion. Table I summarizes the factors that were most influenced by operating surgeon.

ESOPHAGEAL/GASTRIC SURGERY

UNCOMPLICATED LAPAROSCOPIC NISSEN FUNDOPPLICATION WITHOUT NASOGASTRIC TUBE PLACEMENT REDUCES HOSPITAL STAY, Grace Lee MD, Andrew Hindmarsh MD, Michael Rhodes MD, Norfolk and Norwich University Hospital, Norwich

Background: Routine use of nasogastric tubes in patients undergoing elective abdominal operations is associated with increased morbidity. The placement of a nasogastric tube for at least 24 hours following laparoscopic antireflux surgery is common practice. The aim of this study was to determine the impact of this on duration of inpatient stay.

Method: Outcomes for 117 patients who underwent Nissen fundoplication were analysed retrospectively. At the time of operation, patients were randomly assigned to one of two groups in which, either the nasogastric tube was removed intra-operatively or the tube remained in-situ for at least 24 hours. Length of hospital stay was recorded.

Results: Patients who had early removal of nasogastric tube (n=51) had a mean hospital stay of 1.61 days while those who had the usual placement for 24hours (n=65) had a mean stay of 2.58 days, p<0.0001. Respiratory tract infection occurred in 4 patients in whom a nasogastric tube had been retained whereas there were no similar findings in patients who had not had nasogastric tube placement.

Conclusion: Omission of nasogastric tube placement post-operatively significantly reduces hospital stay in patients who have undergone Nissen fundoplication.
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PREOPERATIVE SIMULATION OF VASCULAR ANATOMY BY THREE-DIMENSIONAL COMPUTED TOMOGRAPHY IMAGING IN LAPAROSCOPIC GASTRIC CANCER SURGERY, Sang-Woong Lee MD, Hisashi Shinohara MD,Mitsuru Matsuki MD,Junji Okuda MD,Eiji Nomura MD,Hideaki Mabuchi MD, Kanji Nishiguchi MD,Hisashi Katunabane MD,Isamu Narabayashi MD, Nobuhiko Tanigawa MD, Departments of General and Gastroenterological Surgery and Radiology
BACKGROUND: Laparoscopic surgery (LS) has various limitations, which are derived from the lack of tactile feedback and a two-dimensional display of the operative field. Therefore, LS requires a more detailed understanding of local anatomy than conventional open surgery does. The purpose of this study was to evaluate the value of three-dimensional computed tomography (3D-CT) imaging in the preoperative simulation of laparoscopic gastric cancer surgery (LGCS).
METHODS: Multi-detector-row helical CT was preoperatively performed in 49 patients who underwent LGCS. 3D-CT images were reconstructed using the volume-rendering technique. Surgeons performed the procedures under the guidance of preoperative 3D-CT images. In all patients, vascular anatomy identified during surgery was compared with 3D-CT images. The number of retrieved lymph nodes, blood loss and the rate of conversion to laparotomy due to uncontrollable bleeding were evaluated. The data were compared with a historical control group consisting of 34 patients who underwent LGCS without preoperative 3D-CT imaging.
RESULTS: 3D-CT imaging could depict the stomach, arterial and venous anatomy with the ability to identify important vascular variants. The number of retrieved lymph nodes was similar between the two groups. However, the surgical duration was significantly reduced in the simulation group. The blood loss and rate of conversion tended to be lower in the simulation group, but the difference was not significant. Preoperative information concerning the right gastric artery effectively led us to the site of its branching and facilitated the dissection of suprapyloric lymph nodes. The left gastric artery furnishing the aberrant left hepatic artery was successfully revealed and this information enabled us to avoid accidental hemorrhage and ischemic liver damage. Preoperative confirmation of the drainage routes of the left gastric vein was also useful to accomplish secure lymphadenectomy.
CONCLUSIONS: 3D-CT imaging provides a vascular #66884:oad map #12539: which is critical for surgical guidance, and hence prevents the risks involved in surgery. Preoperative 3D-CT imaging may be an informative device to overcome the disadvantages of LGCS.

ESOPHAGEAL/GASTRIC SURGERY  P240
SURGICAL TREATMENT OF SECONDARY ACHALASIA: LESSONS LEARNED, Rami E Lufti MD, Alfonso Torquati MD, Michael D Holzman MD,William O Richards MD, Vanderbilt University Medical School
Dysphagia is common after Nissen fundoplication (NF). The cause is usually edema or improperly constructed wrap. Rarely, dysphagia develops from an achalasia-like physiology. We analyzed our experience with these patients to determine their optimal management.
Methods: We retrospectively reviewed patients with dysphagia and identified those with achalasia-like pattern on their postop manometry. These were prospectively followed under an IRB protocol after Heller myotomy (HM) to determine the fate of this abnormal motility after distal high resistance is relieved, and whether it can be reversed with appropriate treatment.
Results: Four cases were identified. All first presented with GERD without dysphagia. All underwent NF and developed dysphagia at different intervals (2 days to years). Postop manometry was attempted in all; 2 had typical Achalasia, 1 had >80% Aperistalsis on 2 different studies, with low amplitude waves (mean of 33 mmHg), and complete failure of relaxation of his LES. Last patient had severely narrowed LES and refused to complete the study as multiple attempts to pass the GE junction failed. First patient had his NF taken-down and reconstructed as a 270° Toupet wrap. His symptoms did not improve; he went back to dilation with no response. Subsequently he went on TPN for malnutrition. He finally underwent HM which relieved his symptoms. Second patient had 3 previous NF for recurrent reflux. He had severe dysphagia with 27 Kg weight loss that necessitated TPN. Three attempts for dilation failed. His NF was eventually revised to a Toupet wrap. He had persistent dysphagia, and underwent 1 dilation (4 yrs after last revision), but is tolerating diet, and maintaining weight. The last 2 patients failed also multiple dilations (1 & 4). As their manometry showed Achalasia-like pattern, they underwent revision that included HM. Currently all are tolerating a bio-minimal dysphagia. All had postop manometry; two had 100% peristalsis with normal amplitudes, one had 90%, and last one had 36% peristalsis.
Conclusion: Manometry is integral in evaluating post Nissen dysphagia unresponsive to dilation. If it shows achalasia-like pattern, take-down of the NF and Heller myotomy with a partial wrap is the optimal approach. This can, in some patients, restore a normal motility pattern; indicating that those motility changes are more likely to be reflections of the excessive effort to overcome the distal obstruction, and are potentially reversible.

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FACTORS INFLUENCING THE DURABILITY OF LAPAROSCOPIC NISSEN FUNDOPICATION, Matt B Martin MD, Central Carolina Surgery, PA., Moses Cone Health Care System, Greensboro, NC
Followup data was examined on 216 patients operated upon by a single surgeon since 1994. Average length of followup was 1.5 years (max 8 years). Eleven patients (5%) who initially had laparoscopic Nissen fundoplication have been identified radiographically that have an intact wrap that has migrated above the diaphragm. Six patients underwent reoperation and an intact wrap was found herniated into the chest. Mechanical forces that may have contributed to the herniation have been identified in 8 of the eleven wrap hernias (vomiting, fall, heavy lifting, asthmatic coughing). In the beginning of this series, patients without a demonstrable hiatus hernia did not have any sutures placed in their diaphragm. In more recent years, all patients got a least one suture approximating the crura posteriorly. All but two of the eleven had at least one suture placed to approximate the crura. In this series of 216, there were 24 patients who had teflon pledges placed in a multi suture closure of the diaphragm and to date, none of these patients have had wrap herniation. This observation supports more frequent teflon pledget use especially in patients whose occupations or comorbid conditions place greater forces on their hiatus closure (e.g. heavy lifters or patients with chronic coughs).

ESOPHAGEAL/GASTRIC SURGERY  P242
LAPAROSCOPIC HIATAL HERNIA REPAIR USING ACELLULAR DERMS TO REINFORCE THE CRUROPLASTY, Fernando E Miranda MD, Terry K Scarborough MD,Steven L Glorsky MD,Erik B Wilson MD, The University of Texas Health Science Center at Houston, Minimally Invasive Surgeons of Texas
Introduction: The repair of hiatal hernias has classically been performed by primary closure of the diaphragmatic crura. Due to a relatively high incidence of recurrence, crural repair has been increasingly performed with prosthetic mesh reinforcement. The primary concerns regarding this approach are infection and erosion of the mesh into the esophagus or stomach. The use of a bioprosthetic graft presents the possibility for the prevention of these complications. This study reports twelve patients receiving laparoscopic hiatal hernia repair with acellular dermis reinforcement.
Methods: Patients with symptomatic hiatal hernias received laparoscopic surgical repair. The crural fascial edges were apposed using non-absorbable, interrupted sutures, followed by suturing a bio-prosthetic graft of acellular dermis over the repair. Data was registered prospectively in a database and reviewed for demographics and symptoms including reflux symptoms, dysphagia, abdominal distension, diarrhea, anti-reflux medication use, and quality of life.
Results: Twelve patients were identified. The average age was 55 years, with a 1:2 male to female ratio. There were eight patients operated for type I hiatal hernia, two for type II, and two for type III. The mean follow up time was 2.32 months. Reflux symptoms were resolved in all patients with either type I or III hiatal hernia. Eight of these patients (80%) completely discontinued anti-reflux medications while two continued medications due to a history of Barrett’s esophagus. Preoperative symptoms of two patients with Type II hiatal hernia were abdominal and chest pain which both resolved completely. At two month follow-up, one patient (8%) had moderate dysphagia. There were no complications attributable to the use of acellular dermis.
Conclusion: Laparoscopic hiatal hernia repair reinforced with acellular dermis was safe and effective in early evaluation. However, longer term follow-up is necessary to determine if this technique will affect recurrence or show improvement over primary repair or synthetic mesh repair.
ESOPHAGEAL/GASTRIC SURGERY

THE EFFECT OF LAPAROSCOPIC NISSEN FUNDOPICATION ON GALLBLADDER MOTILITY, J R Monzon MD, L A Goudas MD, R S Zuckerman MD, S J Heneghan MD, Bassett Healthcare

Introduction: Gallbladder emptying is delayed after vagotomy. While performing laparoscopic Nissen fundoplication both branches of the vagus nerve are at risk of injury by dissection and suturing. The aim of this study was to assess pre and post-operative gallbladder emptying in patients undergoing laparoscopic Nissen fundoplication.

Patients and Methods: Nine patients were enrolled in a 12 month period. All patients were over 18 years of age, appropriately diagnosed with gastroesophageal reflux disease (GERD) without any other chronic evidence of gallbladder disease. Preoperative abdominal ultrasound was performed to rule out cholestasis. Before and after surgery (8-12 weeks) CCK-HIDA (99Tcm hepatic inminodiacetic with cholecystokinin) scans were performed to evaluate gallbladder motility in all patients. Laparoscopic Nissen fundoplications were performed by the same surgeon without any intra or postoperative complications. A CCK-HIDA scan was considered abnormal if the ejection fraction was less than 35%.

Results: There were no significant changes in the pre and postoperative ejection fraction of the CCK-HIDA scans performed in all nine patients. Two patients (22%) had abnormal pre-operative (15% and 21%) and post-operative (27% and 10%) CCK-HIDA scan ejection fractions, without any pre or postoperative biliary symptoms and without any complaints during the intravenous infusion of CCK. Seven patients (78%) had normal pre-operative (mean 73%) and post-operative (mean 76%) CCK-HIDA scan ejection fractions.

Conclusions: Performing a laparoscopic Nissen fundoplication does not change the gallbladder motility in the early postoperative period. Twenty percent of the patients in this study had symptomatic GERD and an abnormal CCK-HIDA scan, with biliary symptoms.

ESOPHAGEAL/GASTRIC SURGERY

PHARMACEUTICAL COST SAVINGS FOLLOWING LAPAROSCOPIC NISSEN FUNDOPICATION, Prakash R Paragi MD, Anthony T Petrick MD, Geisinger Medical Center

BACKGROUND: The value of antireflux surgery in reducing the costs associated with the management of acid reflux has been controversial. The objective of this study was to assess the effect of laparoscopic Nissen fundoplication (LNF) on the pharmaceutical costs (PC) associated with the management of gastroesophageal reflux disease (GERD).

METHODS: Retrospective data from 76 consecutive patients with GERD who underwent LNF by a single surgeon from January 2001 to June 2003 were analyzed. All patients were on acid suppressive therapy prior to surgery and one patient was lost to follow up. Student’s t-test was used to estimate the statistical significance of PC savings.

RESULTS: The mean follow up was 98.7% (75/76) and 81.6% (62/76) at 1 and 3 months. The mean age of the patients were 49.3 (23-71 years) and the male: female ratio was 1:1.8 (28/51). Average monthly cost of antireflux medications preoperatively was $195.2±86.9. Following surgery, 94.7% (71/75) and 90.3% (56/62) of the patients required no further acid suppressive therapy at 1 and 3 months respectively. PC’s resulting from new post op symptoms (table #1) averaged $44.69 ± 30.84 and $7.54 ± 19.24 at 1 and 3 months.

The average monthly PC savings at 3 months post op for all patients was 179.4±86.1 (p < 0.001). PC savings were an average of $136.41 ± 77.26 (p < 0.001) and $173.56 ± 69.19 (p < 0.001) at 1 and 3 months follow up in the 46.7% (35/76) and 48.4% (30/62) of patients requiring new medications and or antacid therapy. All patients requiring postoperative acid suppressive therapy were in this group.

CONCLUSIONS: LNF for GERD leads to PC savings at end of 1 and 3 months thereby reducing the economic burden for patients and payors. Most PC’s incurred due to postoperative symptoms were self-limited and rarely requires long-term treatment. These savings need to be evaluated long term and further compared to procedural and hospital costs.

ESOPHAGEAL/GASTRIC SURGERY

CHOICE OF FUNDOPICATION TECHNIQUE DURING LAPAROSCOPIC HELLER MYOTOMY, Ashish R Patel MD, Eric Makhni, Daniel B Jones MD, Jonathan Critchlow MD, Harvard Center for Minimally Invasive Surgery, Beth Israel Deaconess Medical Center, Boston, MA

OBJECTIVE: A fundoplication procedure is commonly added to Heller myotomy to prevent reflux after achalasia. We hypothesized that the choice of fundoplication technique affects recurrence of dysphagia.

METHODS: A retrospective analysis of all laparoscopic Heller myotomies performed at our medical center by a single surgeon with respect to fundoplication technique categorized as 1) Anterior Dor fundoplication, 2) Posterior Toupet fundoplication, and 3) Partial posterior fundoplication. Endpoint was recurrence of dysphagia necessitating re-exploration.

RESULTS: Between 1997 and 2003, eighty-two patients underwent laparoscopic Heller myotomy for achalasia. Five had received an anti-reflux procedure. Of the remaining 77, fifteen (19%) received anterior Dor fundoplication, nineteen (25%) received posterior Toupet fundoplication, and 43 (56%) received partial posterior fundoplication. Of the eighty-two patients, five (6%) patients required re-explorations for dysphagia and all five had received Dor fundoplication. One of these five patients was referred as a redo-myotomy at the first operation while two of the five had suffered mucosal laceration at the first operation. Average time to re-exploration was 31 months (range 18-54). There was no recurrence of dysphagia among patients with posterior Toupet and partial posterior fundoplication.

CONCLUSION: Anterior Dor fundoplication is associated with higher return of symptoms of dysphagia requiring re-explorations. Posterior Toupet or partial posterior fundoplication is recommended during Heller myotomy.

ESOPHAGEAL/GASTRIC SURGERY

LAPAROSCOPIC NISSEN FUNDUPLICATION FOLLOWING ENDOSCOPIC ENTERYX INJECTION AS TREATMENT FOR GERD. (1) J H Peters MD, (1) G Portale MD, (2) D Canal MD, (2) G A Lehman MD, (1) Department of Surgery, University of Southern California, Los Angeles CA, (2) Department of Surgery, Indiana University School of Medicine, Indianapolis IN.

Introduction: Enteryx (ethylene vinyl alcohol) is a biocompatible polymer recently approved for the endoscopic treatment of gastroesophageal reflux disease (GERD). It is injected at the gastroesophageal junction and intended to modify the distensibility of the LES, resulting in a reduction of reflux events. Ideally patients who fail treatment should remain candidates to undergo the conventional surgical therapy including Nissen fundoplication.

Methods and procedures: The study population consisted of 3 patients undergoing Nissen fundoplication from a cohort of 85 treated in a U.S. multicenter clinical trial of Enteryx. Patient inclusion and exclusion criteria, specifics of endoscopic technique, and outcomes for the entire cohort have been previously published (Am J Gastro 2003;99:250). Indications for surgery included: atypical GERD symptoms not alleviated by medication or Enteryx (n=2), typical GERD symptoms with short term PPI/Enteryx relief (n=1).

Results: Median GERD HRQL scores were 33.5 off PPI pre-Enteryx, 11 on PPI pre-Enteryx and 24 six months post-Enteryx. Median % time pH less than 4 was 10.8 pre-Enteryx and 6.4 post-Enteryx. Enteryx implant to surgery was 8, 13 and 16 months. Mean operative time was 129 minutes (106-141). Signs of previous implantation were minimal and did not impair fundoplication.

Conclusion: Enteryx is injected into the muscle of the lower esophageal sphincter and does not impair the subsequent performance of Nissen fundoplication.
EXPERIENCE WITH LAPAROSCOPIC GASTRIC RESECTIONS; RESULTS AND OUTCOMES IN 37 CASES, R E Rivera MD, J C Eagon MD,N P Soper MD,M Klingensmith MD,L M Brunt MD, Washington University School of Medicine, Saint Louis, MO

Aims: The purpose of this study was to review our technique, results and outcomes of laparoscopic gastric wedge and segmental resections in patients with benign gastric diseases.

Methods: Retrospective clinical chart review was performed on all patients who underwent laparoscopic gastric resection at Washington University Medical Center from 1997 to 2003. The surgical approach, operative results, complications and subsequent clinical course were analyzed. Data are expressed as mean and ± standard deviation.

Results: Laparoscopic gastric resection was attempted in 37 cases. There were 22 women and 15 men with a mean age of 61 years. Indications for surgery included gastric stromal tumor or carcinoma (N=26), benign gastric outlet obstruction (N=6) and nonhealing peptic ulcer (N=5). Segmental resections with gastroenteric anastomosis ± vagotomy was performed in 14 patients, wedge resections in 22 patients, and laparoscopic snare resection in 1 patient. Resection was totally laparoscopic in 25 cases and lap assisted (with an accessory incision) in 11 cases. Mean operative time was 166 ± 56 min, and blood loss 98 ± 106 ml. Two patients were converted to open resection. Intraoperative gastroscopy was performed on 16 cases (44%) to aid in the resection. Regular diet was resumed at a mean of 2.5 ± 1 days and the mean length of stay was 4 ± 2.6 days. Major complications occurred in 4 patients (11%) including, subphrenic abscess (N=1), pneumonia with respiratory failure (N=1), splenic vein injury requiring splenectomy (N=1) and gastric outlet obstruction (N=1) that required reoperation one year later.

Minor complications included, intraabdominal fluid collection (N=1), post operative gastroparesis (N=1), urinary retention (N=1) and incisional hernia (N=1).

Conclusions: Laparoscopic gastric resections can be performed safely in patients with a variety of benign gastric disorders. The use of an accessory incision for reanastomosis and specimen extraction facilitates the procedure in difficult cases.

LAPAROSCOPIC GASTRECTOMY FOR GASTRIC MALIGNANCY, Danny Rosin MD, Oded Zmora MD,Marat Khaikin MD,Barak Bar Zakai MD,Yuri Goldes MD,Moshe Shabtai MD,Amram Ayalon MD, Department of General Surgery and Transplantation, Sheba Medical Center, Tel Hashomer, Israel

Background: The use of laparoscopy to resect gastric cancer is still controversial, being a demanding procedure with no hard data to support its oncological safety. However, increasing number of reports show that this procedure is feasible and safe, and allows for oncologically appropriate gastric resection.

We present our initial experience with laparoscopic gastric resections for malignant gastric tumors.

Patients and methods: Over a 3 years period, 25 patients underwent gastric resections for malignant tumors. There were 13 males and 13 females, at a mean age of 67.5 years. The procedures performed were 9 total gastrectomies, 2 proximal gastrectomies and 14 distal subtotal gastrectomies.

Results: 22 procedures were completed laparoscopically (88%). The 3 converted cases were all total gastrectomies. Mean operative time was 357 minutes, ranging between 246 to 690 minutes. Mean number of harvested lymph nodes was 19 (range 6-61). There were 6 anastomotic leaks (5 of which after total gastrectomy) and 2 duodenal stump leaks. Re-operation was required in 5 cases. Post operative mortality occurred in 2 patients.

Follow up time is up to 33 months. During this period 4 patients died of disease progression, 2 died of unrelated causes and 17 are still alive.

Conclusions: Laparoscopic gastric resection is still a procedure under examination. Laparoscopic subtotal gastrectomy is feasible and safe. Laparoscopic total gastrectomy is especially challenging, due to technical difficulties in constructing the esophago-jejunal anastomosis. Oncological resection is possible.

KYPHOSCOLIOSIS AND PARAESOPHAGEAL HERNIA, Boaz Sagie MD, Arye Blachar MD,Amir Szold MD, Endoscopic Surgery Service, Department of Surgery B, and the Department of Radiology, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel

OBJECTIVE: Paraesophageal hernia (PEH) mandates surgical repair to avoid potentially life-threatening complications. The diagnosis is commonly made in old women. We noticed that many patients with PEH suffer from significant kyphohypothysis and hypothesized that there could be a causal relationship between the two pathologies. The objective of this study was to evaluate the relationships between paraesophageal hernia and kyphoscoliosis.

METHODS: We retrospectively examined the imaging files of all patients who underwent laparoscopic PEH repair. Controls were patients who underwent laparoscopic cholecystectomy (LC) during the same time frame and were matched for age and gender. Control selection of LC patient was performed randomly out of a larger group of matched patients. The imaging files of the patients were evaluated by the same radiologist who was blinded to the patient's operation.

RESULTS: Of the 90 patients who underwent PEH repair in the past 6 years 56 (62%) imaging files were available for the study. The average age was 73.5 (49-91) in the PEH group and 73.7 (50-91) in the LC group. There were 46 women and 10 men in both groups. The incidence of kyphoscoliosis was more than 3 times common in the PEH group; 22 patients (39%) in the PEH group and 7 (12%) patients in the LC group. All 22 patients with kyphoscoliosis in the PEH group were women. Only one man with kyphoscoliosis was found in the LC group. The average age of the scoliotic patients was 6 years older than non-scoliotic patients (77 Vs. 71 respectively).

CONCLUSIONS: Kyphoscoliosis is a major risk factor in the evolution of paraesophageal hernia. Patients with PEH and kyphoscoliosis are older and more commonly women. Kyphoscoliosis may be the cause for the evolution of paraesophageal hernia by displacing the anchoring points of the stomach and diaphragm to the spine and by stretching the ligaments around the gastro-esophageal junction.

REVISION OF FAILED ENDOLUMINAL ANTIREFLUX PROCEDURES: THREE DIFFICULT CASES, Mickey Seger MD, Robert Chastanet MD,Erik B Wilson MD,Caroline Daigle BS,Rebecca Churchman RN, Lip L Lee MD, University of Texas Health Sciences Center at Houston MIST

Background: Recently there has been a significant amount of interest in endoluminal antireflux procedures. Two of the most common are the endoluminal gastric plication (EGLP) and the radiofrequency modification of the LES (stretta). These procedures have achieved variable rates of success. The question remains as to the options available to patients who experience failure of their endoluminal intervention. We have revised three such patients with a laparoscopic antireflux procedure and have had frustrating results.

Case 1: A 44 year old man underwent laparoscopic nissen fundoplication for a failed EGLP. He had refractory post operative dysphagia which was unresponsive to 3 attempts at dilation. He was converted to a toupet fundoplication and required 5 subsequent dilations before his symptoms improved.

Case 2: A 59 year old woman underwent a laparoscopic nissen fundoplication for a failed strepta procedure. She required post operative dilation.

Case 3: A 26 year old man underwent a laparoscopic fundoplication for a failed ELGP. He was referred to our office with dysphagia that was refractory to several attempts at dilation. We performed a dilation and endoscopic removal of the suture. His dysphagia persisted requiring conversion of the nissen to a toupet fundoplication. The dysphagia did not improve and he was dilated twice without much improvement. He was subsequently lost to follow up.

Conclusions: These individuals represent a difficult subset of reflux patients. With the growing popularity of endoluminal antireflux procedures, this situation promises to arise more frequently. In our practice the revision of these patients with a laparoscopic nissen has been fraught with difficulty. Physicians should not assume that a failed endoluminal antireflux procedure can be easily salvaged with a laparoscopic nissen fundoplication.
ESOPHAGEAL/GASTRIC SURGERY  P251
LAPAROSCOPIC WAISTCOAT PROSTHETIC REPAIR OF LARGE HIATAL DEFECTS, Garett S. Smith MD, Royal North Shore Hospital

The primary repair of large hiatal defects is associated with high recurrence rates. The use of various prosthetic materials at the in the repair of large hiatal defects has been suggested to improve repair durability. The author presents a novel and safe technique for prosthetic reinforcement of primary hiatal closure. The hernia sac is dissected from the mediastinum and the crural pillars are exposed. A large, waistcoat shaped, Dual Mesh polytetrafluoroethylene patch is used to perform a posterior cruroplasty. Prior to repair, the patch is halved and shaped to enable passage of the oesophagus. Needle-holes are placed in the patch to enable ease of suturing. The patch is then incorporated into the hiatal repair. The hiatal margins of the patch are sutured to prevent direct contact with the oesophagus. The peripheral margins of the patch are fixed to the diaphragm using laparoscopic staples or tissue glue. A fundoplication is then performed. Operative and post-operative results are presented.

ESOPHAGEAL/GASTRIC SURGERY  P252
EVALUATING PTFE PROSTHESIS IN A PORCINE HIA-TUS HERNIA MODEL, Garett S. Smith MD, Royal North Shore Hospital

Background: The repair of large hiatal defects is associated with an unacceptably high recurrence rate. Numerous prosthetic materials have been used to reinforce hiatal closure. Various prosthetic materials have been evaluated in closing fascial defects in the animal model, however none have been evaluated at the gastro-oesophageal junction.

Aim: The aim of this study was to evaluate the behaviour of the prosthetic hiatal closure in a poor sign model of a large hiatal defect.

Methods: Hiatal defects were created in a porcine model. The defects were either 4 x 3 cm in size or 4 x 5 cm in size. An Arc de Triomphe shaped patch was used to repair all defects. A control group underwent primary hiatal closure. The animals were sacrificed at 1 month or 6 months. At post mortem each model was inspected for (1) Erosion of patch into stomach or oesophagus, (2) visceral adhesions to the patch, (3) diaphragmatic integration of patch and (4) hernia recurrence. Patch integration and neo-mesothelialisation were evaluated microscopically.

Results: Five animals underwent primary closure of a small defect, seven underwent patch prosthetic repair of a small defect and six had prosthetic repair of a large defect. There were no intra-operative deaths. There were two deaths in the early post-operative period. There was one death at day 25 due to repair failure and bowel strangulation in a large defect model. No prosthesis erosion was demonstrated in any of the models. There were less adhesions associated with prosthetic repair than with primary closure. Four of the ten prosthetic repaired models showed some degree of repair failure. Three of the five primary repaired closures showed evidence of repair failure.

Conclusion: The absence of prosthetic erosion and adhesion at the gastro-oesophageal junction provides encouragement for its use in repairing large hiatal defects.

ESOPHAGEAL/GASTRIC SURGERY  P253
PET SCANNING IN OESOPHAGEAL CANCER - A USEFUL STAGING ADJUNCT OR A WASTE OF TIME AND MONEY, Lisa Osgood MD, Hayley Berry, Garett S. Smith MD, Royal North Shore Hospital

Aim: The aim of this study was to assess the utility of PET scanning in the pretreatment staging of patients with cancer of the oesophagus and gastro-oesophageal junction. Methods: All patients deemed fit for oesophagectomy underwent CT, EUS, and PET scanning. Those patients whose scans showed metastatic disease were referred for medical management. Surrogate outcome measures of resection rate and histopathology were measured in two groups of patients, those treated prior to and those treated after the routine use PET Scanning.

Results: A total of 44 consecutive patients were seen with oesophageal cancer over a seventeen month period. There were 6 patients in whom PET scanning revealed disseminated disease, which was not demonstrated on routine staging. There was a total of 19 Ivor Lewis Oesophagectomies (ILO), 5 of 12 patients referred before the introduction of PET scanning and 14 of 32 patients referred after its introduction. In those patients selected for ILO, there was a significantly higher rate of complete excision in the group that underwent PET scanning, with resection margins < 1 mm in 80% vs 21% (p = 0.038). There was a difference in the nodal stage between the two groups, 100% vs 50% node positive disease, however this failed to reach significance (p = 0.1). Conclusion: PET scanning can be used to more accurately assess the patients with oesophageal cancer that are most suitable for ILO, allowing exclusion of patients with advanced disease.

ESOPHAGEAL/GASTRIC SURGERY  P254
THE EXPERIENCE OF THORACOSCOPIC ESOPHAGEAL RESECTION AND INTRA-THORACIC ANASTOMOSIS, Hisashi Usuki MD, Shinichi Yachida MD, Masanobu Hagiike MD, Kunihiko Izuishi MD, Fuminori Goda MD, Setsuo Okada MD, Hajime Maeta MD, Kagawa Medical University

In most of the cases that received thoracoscopic esophageal resection cervical anastomosis has been used for reconstructive. In the other hand, intra-thoracic anastomosis is performed for the patients whose cancers are exist in lower esophagus, and the postoperative complaint concerning swallow in the patients having intra-thoracic anastomosis was lower frequent than in the patients having cervical anastomosis. In our department of surgery, thoracoscopic intra-thoracic anastomosis has been performed for the patients with esophageal cancer existing in lower esophagus. For the patients whose esophageal cancers were judged to be resectable preoperatively, intra-peritoneal lymph node dissection and making gastric tube were preceded. Following esophagectomy, intra-thoracic lymph node dissection and esophago-gastric anastomosis were performed thoracoscopically. It was not necessary to use cervical skin incision, but mini thoracotomy was required for removing resected esophagus and inserting the anastomotic instrument for reconstruction.

Five cases were undergone this surgical procedure in our department of surgery. The average time for thoracoscopic procedure, including the resection and reconstruction, was 4 hours, and that for thoracoscopic anastomosis were 1.5 hours. The most difficult point in the thoracoscopic procedure was at tightening the purse-string suture of esophageal stump. It was incomprehensible whether the string suturing the esophageal stump was tightened enough. In these days the endoscopic binding instrument Endoloop is used for additional tightening. It is useful for binding the esophageal stump certainly.
ESOPHAGEAL/GASTRIC SURGERY P256

LAPAROSCOPIC MANAGEMENT FOR LOCAL RECURRENCE OF EARLY GASTRIC CANCER AFTER ENDO-SCOPIC MUCOSAL RESECTION: REPORT OF 6 CASES, Hiroshi Yano MD, Takushi Monden MD, Department of Surgery, NTT West Osaka Hospital

In Japan, endoscopic mucosal resection (EMR) is a widely accepted surgical technique for early gastric cancer because it is minimally invasive; however, incomplete resection with subsequent cancer recurrence in the remnant remains a difficult problem. Generally, the margins of the local recurrence lesions are unclear and an additional EMR is difficult to perform. Because of artificial ulcer formation after the previous EMR. During the period from March 1997 to August 2003, we performed laparoscopic treatments on six patients with local recurrence lesions after EMR and reviewed the safety and efficacy of these treatments. The mean age of the patients was 65.5 years (5 males, 1 female). Cut end of the specimen resected by initial EMR was positive in 5 of 6 cases. Local recurrence lesions after EMR for early gastric cancer were confirmed by follow up endoscopic examination and pathological analysis of biopsy specimens. Laparoscopic management consisted of two types of techniques, which included laparoscopic wedge resection (LWR) with a lesion-lifting method and laparoscopy-assisted distal gastrectomy (LAGD) with mini-laparotomy. A median period between initial EMR and laparoscopic management was 2-2 months (1-6 months). Three lesions, located on the anterior in the body of the stomach, were treated by LWR and other lesions were treated by LAGD. Depth of cancer invasion of all the resected specimens was pathologically confirmed to be limited to mucosal layer of the stomach. In all cases, histologic type was differentiated tubular adenocarcinoma of the stomach and lymphatic/venous invasion was negative. Cancerous lesions were completely resected with sufficient surgical margins horizontally and vertically. Mean operative time, mean estimated blood loss, and mean length of hospital stay were 171 min, 16.5 g, 13.5 days, respectively. There were no intra- and postoperative complications, no conversion to open surgery, and no recurrence after surgery. No patient died of gastric cancer during a median follow-up period of 53.5 months (31-77 months). Laparoscopic resection for local recurrence lesions of gastric cancer after EMR were safe, effective, and minimally invasive procedures, by which completely curative resection could be expected.

ESOPHAGEAL/GASTRIC SURGERY P256

LAPAROSCOPIC TRANS-GASTRIC ESOPHAGEAL MUCOSAL RESECTION, Constantine Y Frantzides MD, Atul K Madani MD, Ronald Horeczko MD, Ali Keshavarzian MD, John G Zografakis MD, Department of Surgery, Minimally Invasive Surgery Program, Rush University

Background: High-grade dysplasia of the esophageal mucosal has been shown to be a precursor to adenocarcinoma. In addition to esophagectomy, multiple ablative endoscopic techniques have evolved for the management of this condition. One surgical alternative to esophagectomy, we describe for the first time, a new option in the treatment of high grade dysplasia.

Case Reports: Two patients with a history of gastroesophageal reflux disease underwent upper gastrointestinal endoscopy which demonstrated high-grade dysplasia of the distal esophagus. The first patient had a short segment (0.5-1.0 cm.), and the second patient had a longer (2 cm.) segment of dysplasia.

Technique: The patient is placed in the modified lithotomy position. Five trocars are placed as if to perform a fundoplication. A complete circumferential mobilization of the esophagus is performed. The short gastric vessels are divided, with the harmonic scalpel, to free up the fundus of the stomach. An anterior horizontal gastrotomy is performed three to four centimeters below the gastroesophageal junction. A solution of epinephrine and normal saline (1:100,000) is injected into the mucosa at the “z-line” and utilizing specially designed “hook” electrocautery, the mucosa is incised circumferentially (1:1) from the anterior horizontal gastrotomy to the fundus of the stomach. An ear stapler, and a 360 degree fundoplication is performed around a 50 french bougie. Using blunt dissection the mucosa is undermined, and a complete circumferential (1:1) incision is performed around a lighted bougie. At the time of endoscopy demonstrated lapomatosous tissue. A 10-year course of surveillance ensued until the patient became symptomatic, presenting with hematochezia and intermittent abdominal pain. Colonoscopy showed a 6 cm pedunculated lapomatosous polyp 30 cm from the anal verge that, because of its size, was not amenable to endoscopic resection. The patient developed obstructive symptoms and underwent laparoscopic-assisted resection of the sigmoid colon.

The literature suggests that patients are likely to develop symptoms from gastrointestinal lipomas when they grow to sizes greater than 2 cm. Such large lipomas are often difficult to remove endoscopically, and are associated with a relatively high risk of intestinal perforation when resected endoluminally. The risk of perforation during interventional endoscopy in patients with colonic lipomas is typically due to: 1) the increased power required to cut electrocautery current through fat, 2) cutting through a pseudo-pedunculated base containing muscularis mucosa and even serosa. Given the potential for morbidity related to complicated endoscopic resection of large (2-5 cm) colonic lipomas, and the frequent need for surgical management of very large (>5 cm) lipomas, we challenge the current standard practice of observation of these lesions in asymptomatic patients. Conservative management should be reconsidered in an age where endoscopic resection of small (<2 cm) lipomatous polyps is relatively easy and safe. Early endoluminal resection of the lipomatous polyp in this patient would have avoided sigmoid resection. In patients with very large (>5 cm) colonic lipomas, and large (2-5 cm) lipomas that can no longer be safely removed endoscopically, laparoscopic colonic resection is the treatment of choice.

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY P257

APPROPRIATE MANAGEMENT OF LIPOMATOUS COLONIC POLYPS, Alexander Aurora MD, Eric J Hanly MD,Annie O Lidor MD,Mark A Talamini MD,Susan D Gearhart MD, Michael R Marohn DO, Department of Surgery, The Johns Hopkins University School of Medicine

Current management of asymptomatic patients with gastrointestinal lipomatous polyps consists primarily of endoscopic surveillance. While rare and almost always benign, large gastrointestinal lipomas can hemorrhage, may serve as lead points for intussusception, and may cause obstruction from mass effect. Management can range from surveillance to endoscopic, laparoscopic or open resection.

A 52-year-old asymptomatic male patient with a family history of colon cancer was diagnosed with a small (<2 cm) polypl of the sigmoid colon on screening colonoscopy. Histologic analysis of biopsy specimens obtained at the time of endoscopy demonstrated lipomatous tissue. A 10-year course of surveillance ensued until the patient became symptomatic, presenting with hematochezia and intermittent abdominal pain. Colonoscopy showed a 6 cm pedunculated lipomatous polyp 30 cm from the anal verge that, because of its size, was not amenable to endoscopic resection. The patient developed obstructive symptoms and underwent laparoscopic-assisted resection of the sigmoid colon.

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY P258

INTRAOPERATIVE UPPER ENDOSCOPY SHOULD BE ROUTINELY PERFORMED TO EVALUATE THE GASTROJEJUNOSTOMY IN LAPAROSCOPIC GASTRIC BYPASS, Diego Cunhaenberg MD, Farshad Amin MD, Robert L Bell MD, Department of Surgery, Yale University School of Medicine, New Haven, CT, USA

Background: While some surgeons performing Roux-Y gastric bypass have used intraoperative upper endoscopy, its routine use has not been fully assessed. Methods: A prospective analysis of 90 patients undergoing laparoscopic gastric bypass was conducted. Intraoperative endoscopy visually confirmed the patency and diameter of the gastrojejunal anastomosis. Additionally, anastomotic integrity was investigated by insufflating the gastric pouch while the anastomosis was submerged in saline. On postoperative day one, an upper gastrointestinal (UGI) contrast study was performed to re-evaluate the anastomosis. We recorded each patient’s age, gender, body mass index (BMI), need for anastomotic revision, UGI study, and all postoperative complications. Comparisons were made between those patients who did NOT require intraoperative anastomotic revision (Group I) and those patients who did (Group II). Results: Zero patients in Group I had a postoperative leak, but one patient in Group II had an asymptomatic radiographic anastomotic leak that resolved spontaneously.

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<th>Group</th>
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<td>BMI (kg/m2)</td>
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<td>Group I</td>
<td>51.5 +/- 1.3</td>
<td>Group II</td>
<td>49.4 +/- 3.3</td>
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<td>OR time (min)</td>
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<td>Group I</td>
<td>172 +/- 4</td>
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Conclusions: Intraoperative endoscopy allows for direct inspection of the gastrojejunal anastomosis, proving its patency, structural integrity, and if necessary, allows for immediate revision. The need for intraoperative anastomotic revision is not related to BMI, but does increase operative time. The routine use of intraoperative endoscopy during gastric bypass helps to ensure a low rate of postoperative complications and may obviate the need for postoperative UGI contrast evaluation.
FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY
THE ROLE OF INTRAOPERATIVE CHOLEDOCHOSCOPY FOR DIAGNOSIS AND TREATMENT IN BILIARY SURGERY, Ho-Seong Han MD, Seog Ki Min, Seoul National University Bundang Hospital

Introduction: The choledochoscopy is useful in the treatment of stone disease in biliary tract. In the era of laparoscopic surgery, it was widely used. Intraoperative choledochoscopy may aid not only for the treatment of disease, but also for the differential diagnosis and the decision of the operative method. The aim of this study was to elucidate the role of intraoperative choledochoscopy in biliary surgery.

Method: This study was prospective analysis for 186 cases of biliary surgery in which choledochoscopy were used at Ewha Womans University Mokdong Hospital and Seoul National University Bundang Hospital from June, 1999 to July, 2003. We tried to find whether the use of choledochoscopy changed the pre-operative diagnosis, added another diagnosis and influenced the operative method. And we also evaluated the frequency of remnant stones in biliary stone disease, and the complications related with this procedure.

Result. The male to female ratio was 1 : 1.24. The mean age was 60.4 years. The choledochoscopy was used in 105 cases (56.4%) in open surgery, 78 cases (42%) in laparoscopic surgery. In 40 cases (21.5%), the diagnosis was changed by choledochoscopy. In 9 cases (4.8%), new finding that were not recognized in preoperative state were added with the use of choledochoscopy. The malignancy was confirmed in only 4 cases(28.6%) among the 14 patients in whom malignancy was suspected in preoperative study. The operative method was influenced by the use of choledochoscopy in 51 cases (27.4%). The remnant stones in the patients with intrahepatic duct stone and common bile duct stone were detected in 8 cases and 3 cases, respectively. The respective clearance rate of stone were 90.9% (80/88) and 95.5% (64/67).

Conclusion: Intraoperative choledochoscopy provided useful information not only for the treatment of disease, but also for the differential diagnosis and the decision of the operative method. And we also evaluated the frequency of remnant stones in biliary stone disease, and the complications related with this procedure.

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY
ENDOSCOPIC MANAGEMENT OF SUPERIOR MESENTERIC ARTERY SYNDROME, Sarbbeet Kumar MD, Northcrest Medical center, Springfield, TN

Superior Mesenteric Artery Syndrome (SMAS) is caused by a narrowing of the angle between the abdominal aorta and the superior mesenteric vessels due to rapid weight loss, postural deformity and other causes. A compressive effect of these vessels, as they cross the duodenum, leads to distal duodenal obstruction.

Two adult males who developed SMAS were successfully treated by endoscopic placement of a naso-jejunal feeding tube that passed through the area of duodenal obstruction. The cause of SMAS in these patients was rapid weight loss associated with inflammatory bowel disease and intestinal surgery. Upper GI Barium studies were diagnostic. Conservative treatment included naso-gastric suction, small frequent feeds if tolerated and lying in a lateral decubitus knee-chest position to increase the angle between the aorta and the SMA.

Length of feeding required was 7-10 days. The duodenal obstruction resolved and did not recur since the weight loss was reversed.

We conclude that, in selected subjects, SMAS can be treated non-operatively by careful placement of a naso-jejunal tube and feeding, when conservative treatment fails.

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY
STRUCTURED TRAINING AND THE OBJECTIVE ASSESSMENT OF SKILL IN LOWER GI ENDOSCOPY: AN INNOVATIVE APPROACH, Krishna Moorhy MS, Julian Hance, Tim Orchard MD, Yaron Munz, Tim Rockall MD, Julian Teare MD, Ara Darzi MD, Imperial College, London, UK

Introduction: Existing short intensive courses in lower GI endoscopy allow participants to acquire skills solely on real cases and there is also no objective evaluation for skill improvement. In addition to their training potential, Virtual Reality (VR) simulators, also provide an objective feedback of performance. The aim of this study was to design an innovative course combining VR based learning with real cases and to objectively assess participants end-of- course skills.

Methods: The first day of a two-day course for novices consisted of didactic teaching followed by a 4-hour session dedicated to training on four VR simulators using a structured curriculum. Participants received one-to-one instruction from four faculty members. The second day consisted of performing procedures on real cases under the supervision of two faculty members. Evaluation of learning on the course consisted of pre-course and post-course assessments. These consisted of performing a standardized case on the flexible sigmoidoscope module of the VR simulator in a “virtual endoscopy suite”. This is an objective test that integrates a VR simulator with a simulated patient (SP). These sessions were recorded and then played back to one expert who assessed performance using a validated blind objective method- Imperial College, Assessment of Skills in endoscopy (iCASE). The simulator’s measures of time, percentage of mucosal visualized, percentage time spent in red-out were also used to assess learning.

Results: 8 novices who had performed an average of 14 flexible sigmoidoscopy and 5 colonoscopy procedures in the last 18 months performed the test in 105 cases. The simulator’s measures revealed that there was a significant improvement in the percentage of mucosal visualized (p=0.02) and in the iCASE score (p=0.01). 3 of the 8 participants achieved an iCASE score of 30, which denotes competence, after the course. Non-significant improvements were also noted in depth of scope insertion, time taken and time spent in red-out.

Conclusions: This study has described the use a structured VR based curriculum for the acquisition of basic skills in endoscopy. The results demonstrate an objective improvement over the course, but in most cases post-course proficiency was still short of competence. This study suggests that a short course integrating VR simulators with real cases can teach novices endoscopy skills. It also demonstrates the importance of objective post-training evaluation in helping participants reflect on their skills and in helping course organizers assess the efficacy of their course in order to identify appropriate curriculum changes for subsequent courses.

FLEXIBLE DIAGNOSTIC & THERAPEUTIC ENDOSCOPY
THE ROLE OF OBJECTIVE FEEDBACK IN THE ACQUISITION OF SKILLS IN A VIRTUAL REALITY UPPER GASTROINTESTINAL Simulator, Krishna Moorhy MS, Yaron Munz MD, Andrew Holder, Julian Hance,Ara Darzi MD, Imperial College, London, UK

Introduction: Existing short intensive courses in upper GI endoscopy allow participants to acquire skills solely on real cases and there is also no objective evaluation for skill improvement. Previous studies have shown that there is no learning on VR simulators without objective feedback. This study aims to compare the effect of feedback based on a simulator’s metrics with tutor-based feedback on the learning of skills in upper gastrointestinal (GI) endoscopy.

Methods: 23 novices were initially assessed on a VR upper GI simulator and trained in six sessions over a 4 weeks period. Group A received feedback from a tutor and viewed the simulator metrics and Group B’s feedback consisted only of the simulator’s metrics. The assessments were based on a combination of the simulator’s metrics and a validated blinded expert assessment using video playback-video endoscopic score (VES) and count of dangerous manoeuvres. The simulator’s measures used were time taken and percentage of mucosa visualized. The point of plateau on the learning curves was estimated by comparing the simulator’s metrics for each attempt with the score from the last. Variability in performance was assessed by comparing the standard error of mean on error-free curves.

Results: There were 12 subjects in group 1 and 11 in group 2. There were no differences between the groups for time (p=0.08), percentage of mucosa visualized (p=0.16), VES (p=0.97) and for the number of dangerous manoeuvres. Both groups made significant improvements after the training sessions. However, post-assessment scores revealed that group A took longer (p=0.001) but scored higher for mucosa visualization (p=0.02) and VES score (p=0.001). Group B made a larger number of dangerous manoeuvres as compared to their pre-training session and in comparison to group A. Comparison of learning curves revealed that group A subjects achieved a plateau for mucosa visualization by the third attempt while group B did so only by the 6th attempt. In addition there was great variability in performance in group B by the last attempt as compared to group A.

Conclusions: This study has shown that the simulator’s feedback is effective in improving the skills of novices. However, the tutor feedback group achieved a greater improvement in the important measures of accuracy and procedural quality but at the cost of time. Of greater concern is the finding that there was a significant increase in the number of dangerous manoeuvres in the group that did not receive tutor feedback.
DEBRIDEMENT (EPPD) OF PANCREATIC NECROSIS

Patients with PN who require debridement have traditionally been managed by laparotomy and repeated explorations or wide drainage. These approaches are necessary when the extent of the inflammatory process is uncertain, but imaging techniques now provide definition of the process and access to the necrosis. Percutaneous and transenteric drainage is reported, but the nature of pancreatic debris often frustrates these methods. We describe our experience with an alternative, minimally invasive approach.

METHOD: When infected PN is documented, 12F pigtail drains are placed into the necrotic areas in a manner to provide direct access to the space. An Amplatz renal dilation system (Cook) is used to exchange these drains for a 26-30F sheath that allows access to the lesser sac and retroperitoneum via a Karl Storz rigid nephroscope with operating channel. Under video magnification, purulent fluid is irrigated and carefully debrided. Large suction drains are left in place and flushed postoperatively to maintain patency. CT scans are repeated to confirm the adequacy of the drainage and debridement, which is repeated until necrosis is no longer evident. RESULTS: 5 patients with PN were treated, ages 30-78y. One had undergone multiple laparotomies elsewhere and had an extensive horseshoe abscess and residual necrosis. The others progressed to infected PN and were treated primarily by EPPD. From 1 to 4 sessions were required to clear sepsis. ICU stays were limited for most patients, hospital discharge usually came within 10 days of the final EPPD session, and the most common long-term complication was self-limited pancreatic fistulae.

CONCLUSIONS: EPPD is an effective a minimally invasive means to adequately debride infected pancreatic necrosis in select patients.

HEPATOBILIARY/PANCREATIC SURGERY P266

ASSESSING RESECTABILITY OF PANCREATIC HEAD ADENOCARCINOMA IN THE ERA OF MULTIDETECTOR-ROW COMPUTED TOMOGRAPHY: DOES LAPAROSCOPY STILL HAVE A ROLE?

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Introduction: We hypothesized that the high quality images from multidetector-row computed tomography (MDCT) would lead to improved sensitivity and specificity for predicting resectable pancreatic head adenocarcinoma, diminishing the value of staging laparoscopy.

Methods: 44 consecutive patients underwent a thin-section dual-phase MDCT to stage their tumor followed by an attempted pancreaticoduodenectomy. Four radiologists who were blinded to the operative outcome reviewed the scans and graded the presence of distant and nodal metastases (0-1), and the degree of arterial and portal involvement (1-5). The radiologic criteria for resectability were: no distant metastasis, patent portal vein and <$50% arterial involvement.

Results: The overall resectability for this cohort was 52% (23/44). The 21 unresectable cases, included: 5 liver metastases, 3 peritoneal metastases and 13 locally invasive tumors. The negative margin resection rate was 34% (15/44). There were no portal vein resections. The sensitivity and specificity of MDCT for predicting resectability were: 96% (22/23) and 33% (7/21). In this cohort, the positive and negative predictive values were 61% (22/36) and 87.5% (7/8). From univariate logistic regression, only the degree of arterial involvement was significant predictor of resectability (p=0.02). From multivariate logistic regression using both arterial and portal involvement, arterial involvement was predictive (p=0.03) but portal vein involvement was not (p=0.45).

Conclusions: Despite the improvements in image quality with multidetector-row technology, CT imaging remains a relatively non specific test for predicting resectability in patients with adenocarcinoma of the head of the pancreas. In this cohort of surgically explored patients, resectability was dependent on the degree of arterial involvement. Laparoscopy continues to have an important role in staging pancreatic head adenocarcinoma.

HEPATOBILIARY/PANCREATIC SURGERY P267

LAPAROSCOPIC CHOLEDOCHOLITHOTOMY FOR CHOLEDOCHOLITHIASIS (PRIMARY BILE DUCT CLOSURE), Furuta Kazunori, Department of Surgery, Kitasato University School of Medicine

We show the treatment policy of cholelithiasis and choledocholithiasis. All cases of choledocholithiasis over 50-years old underwent endoscopic sphincterotomy or papillary dilation to remove stones. If successful, this was followed by laparoscopic cholecystectomy. But in unsuccessful cases, we perform choledochotomy & cholangioscopy to remove the stones followed by laparoscopic cholecystectomy. We choose primary bile duct closure if the CBD diameter is more than 8 mm. But if the CBD diameter is less than 8 mm, we retain a T-tube in the CBD. 13 cases were performed primary bile duct closure. We have experienced two kinds of complications in two patients which were related to the procedure. One was a stricture of the CBD and the other an abscess formation due to biliary leakage. These two patients were adequately treated and they recovered shortly. The advantage of primary CBD closure are shorter periods of hospitalization and cost benefit, on the other hand, it is a technically difficult procedure with relatively higher incidence of complications.
HEPATOMOBILIARY/PANCREATIC SURGERY P268
PATTERN OF CEA DROP FOLLOWING LAPAROSCOPIC RADIOFREQUENCY ABLATION OF LIVER METASTASIS FROM COLORECTAL CARCINOMA, M Ghanamah MD, E Berber MD, A Siperstein, Department of General Surgery, The Cleveland Clinic Foundation

INTRODUCTION: Laparoscopic Radiofrequency ablation (RFA) is being increasingly used for local control of hepatic metastasis from colorectal carcinoma (CRC). After surgical resection of colorectal liver metastasis, carcinoembryonic antigen (CEA) values fall within 2 weeks, making this a useful parameter to follow shortly after surgery. Little is known, however, about the expected pattern of the CEA drop following RFA.

METHODS: From September 1998 to October 2002, RFA to CRC liver metastasis was performed on 144 patients. A subset of 18 patients were studied who had no evidence of extra-hepatic disease preoperatively, had all detectable tumor ablated intra-operatively, and who, on long term follow up, had no evidence of recurrent disease. Serum CEA was determined preoperatively, on the first postoperative day, at one week and every three months afterwards. CT scan of the abdomen and pelvis was obtained every three months postoperatively.

RESULTS: 11 patients (61%) showed an increase in CEA on postoperative day one. This rise for the entire patient group averaged 43% compared to preoperative values. CEA then fell to 50% of preoperative value, on average, on day 7 postoperatively and only reached its nadir at 3 months.

CONCLUSIONS: Unlike resection patients, those undergoing ablation show an initial rise in CEA, probably due to release from the ablated tissue. Although the heating of RFA would be expected to destroy CEA, the initial rise and slow drop postoperatively argue for a release of immunoreactive CEA from the ablated zone. This slow decline in CEA indicates that several months should pass before assessing the extent of potential residual disease.

HEPATOMOBILIARY/PANCREATIC SURGERY P269
NONTRAUMATIC PERFORATION OF BILE DUCT TREATED WITH LAPAROSCOPIC SURGERY, Ho-Seong Han MD, Seoul National University Bundang Hospital

Nontraumatic perforation of bile duct (NPB) is a disease entity in which the extrahepatic duct (EHD) or IHD is perforated spontaneously without traumatic or iatrogenic injury. It has been also reported as spontaneous perforation of bile duct. NPB in adult is extremely rare. We have treated two patients with NPB using laparoscopic technique. One patient was found to have subhepatic abscess with common bile duct stone, which resulted from the perforation of the left intrahepatic duct. The other patient had a multiple subhepatic and intraabdominal abscess with common bile duct stone due to perforation of the right intrahepatic duct (B5 segment). Laparoscopic common bile duct exploration and abscess drainage were performed with T-tube drainage. The patients were recovered without any problems. Although, the NBP is rare disease, it could be treated with laparoscopic procedure successfully.

HEPATOMOBILIARY/PANCREATIC SURGERY P270
INITIAL EXPERIENCES OF LAPAROSCOPY-ASSIST AND TOTAL LAPAROSCOPY IN ANATOMICAL LIVER RESECTION, Ho-Seong Han MD, Seog Ki Min MD, of Surgery, Seoul National University Bundang Hospital, Seongnam-si, Korea.

Background: Although the laparoscopic surgery has become popular, its technical difficulty has retarded the development of this technique in the liver. We report upon our experience of hepatic resection using laparoscopy-assisted (Lap-Assist) and total laparoscopic (Total-Lap) methods. Method: From April 2001 to June 2003, a total of 20 laparoscopic anatomical resections of the liver were retrospectively reviewed. These were comprised of 10 Lap-Assist methods, performed during the early period and 10 Total-Lap during the late period. Results: In Lap-Assist group, the following resections were performed: 7 cases of left lateral sectionectomy, a case of left hemihepatectomy, a case of right hemihepatectomy, and a case of open conversion. And, in the Total-Lap group; 6 cases of left hemihepatectomy and 4 cases of left lateral sectionectomy were performed. The respective sizes of the incision were 8.7cm and 4.6cm (p = 0.000). There were no differences in the operation time, transfusion amount, starting day of diet, complication rates or the duration of hospital stay between the two groups. Conclusion: Both the laparoscopy-assisted method and the total laparoscopic method are feasible for anatomical liver resection.

HEPATOMOBILIARY/PANCREATIC SURGERY P271
LAPAROSCOPIC DISTAL PANCREATECTOMY - WHICH PANCREATIC REMNANT CLOSURE TECHNIQUE IS BEST? George H Hopkins MD, Nicholas A O’Rourke MD, Michael Ghhusn MD, Leslie K Nathanson MD, George Fielding MD, Royal Brisbane Hospital, Brisbane, Australia

Laparoscopic Distal Pancreatectomy (LDP) has been shown to be a safe, effective, reliable procedure with reproducible results in several published series. Post-operative pancreatic leaks continue to be a major cause of post-operative morbidity for both laparoscopic and open distal pancreatectomy. Debate continues over the most appropriate form of pancreatic remnant closure.

Methods:
A retrospective analysis of consecutive LDP performed over 5.5 years from June 1997 to December 2002 was undertaken. Patient demographics, type of pancreatic remnant closure, histology, and post operative morbidity and mortality were collated. The operations were performed by 3 consultant surgeons at a tertiary referral hospital.

Results:
14 cases were performed over this period. These were performed for a variety of pancreatic neoplasms. Closure methods included stapling alone, stapling with oversew and harmonic shears with continuous suture. There were 5 pancreatic leaks. There were no deaths.

Conclusions:
Post-operative pancreatic leaks continue to be major cause of morbidity for LDP. An ideal closure is yet to be recognized. Careful search for the pancreatic duct and suture closure is recommended.
HEPATOBILIARY/PANCREATIC SURGERY  P272
LAPAROSCOPIC-ASSISTED LIVER RESECTION UNDER COMPLETE GASLESS CONDITION : A NEW TECHNIQUE FOR SAFE AND SMOOTH DIVISION OF LIVER PARENCHYMA, Takanobu Hoshino MD, Fumitaka Ozawa MD,Hirofumi Yamada MD,Daljo Hashimoto MD, Department of Surgery, Saitama Medical Center, Saitama Medical School
Laparoscopic-assisted liver resection has not yet been well established because of its technical difficulty in controlling blood loss. This is particularly true under gasless method, which is considered to be necessary to avoid air embolism. To resolve this dilemma, we have developed a new technique for safe and smooth division of liver parenchyma under complete gasless condition : a combination of “Forceps Fracture Method (FFM)” and “Bipolar Scissors (BS)”.

Materials and Methods : Our technique is as follows. 1) Abdominal wall lifting by “Double Subcutaneous Wiring Method” is set for subsequent laparoscopic maneuvering. 2) Small incision, 5 to 8 cm (minimal length to be required for the retrieval of liver specimen later) is made. 3) Blood flow into the liver segment is controlled at the origin of the segmental branch. 4) Liver parenchyma is carefully divided by FFM via the small abdominal incision. 5) Vascular and biliary structures are divided by BS unless the diameter of the structure is over 2mm (in which clipping is added).

Results : We have performed ten cases (HCC 4, metastatic liver cancer 6) of laparoscopic-assisted liver resection by this method for the past twelve months. Performed operations were segmentectomy (four cases), caudate (Spiegel) lobectomy (one case), and partial hepatectomy (five cases). All cases were successfully completed without conversion to open surgery. Mean operating time was 260 (128 ? 350) minutes, blood loss 420 (225 ? 860) ml in average, without requirement of blood transfusion except for two cases. BS was easy to handle and provided sufficient coagulation ability even in cirrhotic liver.

Conclusions : Gasless laparoscopic-assisted liver resection by this method appears to be safe and technically feasible, and may well contribute to the reduction of blood loss and sugeons? fatigue.

HEPATOBILIARY/PANCREATIC SURGERY  P273
LAPAROSCOPIC ASSISTED HEPATECTOMY FOR METASTATIC LIVER TUMOR. Hitoshi Inagaki MD, Tsuyoshi Kurokawa MD,Yoshihiro Owa MD,Ichiro Honkoshi MD,Katsuhiko Kotake MD,Nobuhiro Ito MD,Mari Tsubamoto MD,Toshiaki Nonami MD, Department of Surgery, Aichi Medical University
As laparoscopic surgery has come into more widespread use in recent years, attempts have been made to apply this technique in hepatectomy. We have performed laparoscopic surgery in 49 cases of hepatic tumor, including 6 patients with metastatic liver tumors. In this report, we evaluate the benefits and pitfalls of laparoscopic surgery for metastatic liver tumor through these six experiences. The primary tumors were colorectal cancer in 5 patients and cancer of the parotid gland in one patient. The metastatic tumors of the liver were solitary and located relatively near the surface of the liver. In 4 patients who had undergone laparotomy for the primary tumors, we had to make a small incision to confirm the extent of intra-abdominal adhesion and divide it, and in 3 of these 4 patients we used hand-assisted laparoscopic surgery. For the other two patients, we performed hepatic resection with a full laparoscopic technique. All procedures were completed successfully without intraoperative complications. The median operative time, blood loss and hospital stay after operation were 170 min, 153 ml and 11 days, respectively. Although the indications for laparoscopic hepatic resection need to be strictly determined, we believe that laparoscopic surgery is one useful strategy for metastatic as well as primary liver tumors.

HEPATOBILIARY/PANCREATIC SURGERY  P274
CLIPLESS LAPAROSCOPIC CHOLECYSTECTOMY: 629 CASES, Euung Kook Kim MD, Sang Kuon Lee MD, Department of Surgery, St. Mary’s Hospital, The Catholic University of Korea
Introduction: During laparoscopic cholecystectomy the cystic duct and artery are generally clipped with metallic clips; however, when a cystic duct is severely inflamed and thickened, the use of the clips is not only difficult but also risky because of the possibility of clip slippage or migration. In these cases, ligation is a better method, but the conventional ligaing methods are cumbersome and time-consuming. The authors designed a modified Roeder’s extracorporeal pre-tied slip knot with an absorbable suture in order to make a more reliable, more secure and faster ligation.

Methods: Six-hundred and twenty-nine patients with gallbladder disease who underwent laparoscopic cholecystectomy from Aug. 1998 to Sept. 2001 were included in this study. Cystic duct and artery ligation was performed using a modified Roeder’s extracorporeal slip knot with an open-end absorbable suture which was entered through one of the trocar, passed around the tissue to be ligated and brought out through the same trocar and pierced through a Teflon tube over which 4 half knots were pre-made with the same suture. This device had a built-in pushrod, the end of which was snapped off to release the tail of the suture. The pushrod was pushed toward the tissue to be ligated after pulling both the suture pierced through the Teflon tube and the tail of the released suture. When suturing was necessary, a suture needle was added to the open-end absorbable suture. Two ligations were done at the initial cystic duct and one, distally. In all cases, no clip was used.

Results: Among 629 patients, acute gangrenous cholecystitis or empyema of gallbladder was found in 47 patients (7.5%) and cancer of gallbladder, in 11 (1.8%). Mean operation room time was 77.2 ± 31.4 min, ranging from 25 to 245 min. The time consumed for ligation was less than 1 min for each one. Complications were observed in 9 patients (1.4%) including bile leaks, bleedings, atlectasis, and port site infection, among others. Five patients (0.8%) had to be converted to open surgery. In a median follow-up period of 38 months, cholechocholithiasis was found in 2 patients; however, biliary sticture was not observed in any patients.

Conclusions: The modified Roeder’s extracorporeal slip knot is a reliable and fast ligation method for the cystic duct and artery with low early and late complication rate. It is particularly useful when the cystic duct is inflamed and thickened precluding a safe clipping.

HEPATOBILIARY/PANCREATIC SURGERY  P275
TORSION OF GALL BLADDER OPERATED BY LAPAROSCOPIC CHOLECYSTECTOMY, Fumito Kuranishi PhD, Yoshinori Kuroda PhD,Yuzou Okamoto PhD,Kazuhiko Toyota PhD,Masahiro Nakahara PhD,Shuichi Wada PhD,Yuji Takakura,Manabu Shimomura,Masataka Banshoudani, Onomichi General Hospital
(INTRODUCTION)In the childhood, torsion of gall bladder showing acute abdomen is rare. Without the knowledge about this disease, it is impossible to diagnose preoperatively. We have experienced a case diagnosed preoperatively and operated by laparoscopic cholecystectomy(LC).We report the detail about it.

(CASE)The patient was 13 years old male. He complained epigastralgia sudden onset after breakfast. Drip infusion could not improve his symptom in near doctor. So he was introduced and admitted to the pediatrics.Laboratory data showed mild inflammation(WBC 12400,CRP 0.43).We could not diagnosed by US,CT and G.I.Next day it was impossible to reduce his pain by pain killer only several hours. Therefore we tried HRC T and US again. HRC T showed gall bladder swelling and enhanced ring structure. US showed partially stenotic cystic duct. From these findings we diagnosed torsion of gall bladder and performed operation(LC) as emergency.

(METHOD)We performed LC by combined method(abdominal wall lifting and pneumoperitoneum :4mmHg,4 liter/min).Gall bladder was almost necrotic. We put it normal position by clockwise rotation and performed LC. The contact area between gall bladder and liver was very small. Gall bladder clearly demarcated by necrosis. So the procedure(LC) was very easy.

(CONCLUSION)Torsion of gall bladder in the childhood is very rare. Preoperative diagnosis is difficult. If the time of operation is appropriate, the operation is very easy,post operative course is smooth without any complication. Laparoscopic approach should be done for torsion of gall bladder.

http://www.sages.org/
The Tweed Hospital, Tweed Heads, New South Wales and John Flynn Medical Centre, Tugan, Queensland, Australia.

Purpose: Since the introduction of laparoscopic cholecystectomy, debate has arisen regarding the most effective approach to the management of common bile duct stones (CBDS). The potential time and cost savings, reduced morbidity and mortality make the management of CBDS in one setting desirable. Since 1999 our centre adopted an intention to treat all gallstones policy using laparoscopic techniques. We review our 3 year experience with laparoscopic common bile duct exploration (CBDE).

Methodology: All patients who had undergone laparoscopic CBDE over a 3 year period were identified retrospectively from surgeon and hospital databases. Inpatient files and surgeon files were reviewed to determine demographics, mode and urgency of presentation, operative techniques, operative times, length of stay, morbidity, mortality, successful clearance of CBDS on intraoperative cholangiography or cholecdochoscopy and the incidence of post operative ERCP.

Results: From 1999 to 2002 we identified 76 (7.6%) patients with evidence of CBDS on routine intraoperative cholangiography from 1023 laparoscopic cholecystectomies. 45 (59.2%) were emergency admissions and 31 (40.8%) were elective. Laparoscopic CBDE techniques used were; transcutaneous flushing of the CBD (17.1%), transcutaneous exploration (54%), choledochotomy (26.3%) and transcytic patency of the sphincter of Oddi (4%). Conversion to open choledochotomy was required in 2 (2.6%) patients. Successful stone clearance on check cholangiography or cholecdochoscopy was possible in 85.5%. Mean operative time and postoperative length of stay in hospital were 100.8 min and 4.9 days respectively. Postoperative ERCP to manage irretrievable bile duct stones was required in 9 (11.8%) patients. 2 (2.6%) patients required postoperative ERCP to manage bile leaks. Morbidity occurred in 14.5% and there were no mortalities.

Conclusions: One setting definitive management of CBDS in a regional centre with minimally invasive laparoscopic techniques is possible in the majority of patients with acceptable morbidity.

Spleen and Splenic Vessels Preserving Laparoscopic Distal Pancreatectomy, Seog Ki Min MD, Ho-Seong Han MD, Hyeon Kook Lee MD, Ewha Women's University, Mokdong Hospital

(Purpose) Laparoscopic distal pancreatectomy is one of the benevolent operative method for the patient with benign and borderline malignancy in distal pancreas. Recently, spleen-preserving laparoscopic distal pancreatectomy has attempted with the development of skill, equipment and instruments. Ideally, the splenic artery and vein should be preserved in order to save the full function of spleen. We report upon our experience 5 cases of spleen and splenic vessels preserving laparoscopic distal pancreatectomy.

(Methods) From May 2000 to July 2003, total 5 cases of spleen and splenic vessels preserving laparoscopic distal pancreatectomy were performed at Ewha Women’s University Mokdong Hospital, and medical records were reviewed retrospectively. The inclusion criteria of this operation were benign tumor or borderline malignancy. The cases composed of 4 cystadenoma and a case of solid and papillary epithelial tumor.

(Results) There were a man and 4 women. The mean age was 47.6 years old. The range of tumor was 1.5-7cm. We used 4 trocars (10-15mm) and a laparoscopic linear stapler for transection of the pancreas. The mean operation time was 348 minutes. The intraoperative transfusion was performed in only one case with 2 units of packed red blood cell. The mean resectional margin was 1.4 cm apart from the tumor. The additional incision for extraction of resected specimen was made by extension of 12 or 15 mm trocar site. The mean length of these incisions was 3.6 cm. The mean duration until normalization of amylase level through drain was 1.6 days. The mean starting day of postoperative diet was 4th day and the mean postoperative hospital stay was 10.4 days. Analgesic drugs was administrated until postoperative 2 days. There was no complication or mortality. In follow up, all cases have no recurrence of disease and symptoms.

(Conclusion) The spleen and splenic vessels preserving laparoscopic distal pancreatectomy is relatively safe and feasible option for management of tumor of benign or borderline malignancy in body or tail of the pancreas.

Laparoscopic Staging for unresectable Pancreatic Cancer, Rockson C Liu MD, L William Traverso MD, Virginia Mason Medical Center

Introduction: Our goal was to evaluate the role of staging laparoscopy in patients with pancreatic cancer where computed tomography (CT) showed no liver involvement, but local extension to involve major vessels, i.e. unresectable by CT. These patients are candidates for chemoradiation therapy.

Methods: Between April 2000 and July 2003, 53 patients were shown by high quality pancreas protocol CT to have locally unresectable pancreatic cancer and no CT evidence of distant disease (41 head, 12 body/tail). They underwent outpatient staging laparoscopy and preoperative lavage for potential cystic lymphocystitis (PLC). Ultrasound, Liver and peritoneal lesions suspicious for metastasis were biopsied (Bx). Differences between groups were evaluated using Chi-square analysis; a priori, p < 0.05 was considered significant.

Results: The average operative time was 50 min (range 20 to 116). Overnight observation was required in 4% (2/53). Unsuspected metastases were found by Bx and/or +PLC in 36% (19/53 patients). Bx’s were + in 11/53 (21%) from the liver (n=8) and peritoneum (n=3). PLC was + in 28% (12 malignant and 3 suspicious). Of the 19 patients with + results 42% were PLC+ only, 37% were both PLC+ and Bx+, and 21% were Bx+ only. Body/tail tumours were twice as likely to be tumors in the head to have unsuspected metastasis (58% vs 27%, p < 0.05).

Conclusions: Even the best CT is not adequate for accurate staging of locally extensive pancreatic cancer. Therapy had to be redesigned as 36% were ?upstaged? by laparoscopy and PLC. The accuracy of laparoscopy was improved by PLC as +PLC was the only finding in almost half of the positive cases. Well over half of the lesions in the body/tail were upstaged.

Hepatobiliary/Pancreatic Surgery P278 Is Laparoscopic Cystgastrostomy Posterior Approach Better Than The Anterior One for Pancreatic Pseudocyst? Eldo E Frezza MD, Lance Love MD, John Griswold MD, Bernard Barragahan, MD, Texas Tech Health Sciences Center

Laparoscopic approach for pancreatic pseudocyst is an alternative to the open surgical technique, since it allows for definitive drainage with faster recovery. Many papers reported the anterior approach both through an endoscopic and a laparoscopic approach and few by the posterior one. In this paper we would like to define the laparoscopic approach and compare the two techniques offering analysis of the potential benefits and pitfalls for each one.

METHODS. Six patients (five female, one male) underwent laparoscopic cystgastrostomy secondary to large symptomatic pancreatic pseudocysts. The patients were operated by two different surgeons. The anterior approach was performed by opening the stomach anteriorly. The pseudocyst was localized with intraoperative ultrasound and aspirated with a needle. Through the same passage the cystgastrostomy was performed with a stapler. The posterior approach was performed by dissecting the greater omentum and visualizing the posterior gastric wall and the pseudocyst. Stapler was used for the posterior anastomosis and intracorporeal stitches for the anterior wall anastomosis under direct vision.

RESULTS. All of the patients had pancreatitis secondary to gallstones. Two patients underwent cystgastrostomy via the anterior approach. Three patients underwent cystgastrostomy utilizing the posterior approach. One patient had an attempted posterior cystgastrostomy which was converted to an anterior approach cystgastrostomy due to dense adhesions. The average age was 38 +/- 20 in the anterior group and 42 +/- 2 years in the posterior one. The hospital days were 6 +/- 3 and 3 +/- 1 days respectively. Co-morbidities were: Hypertension, Diabetes Type II and COPD in the anterior group and Hypertension and Diabetes type II in the posterior group.

CONCLUSION. Despite the fact that both the anterior and posterior techniques had good results with no complications and short hospital stays, they differ greatly with respect to the safety of dissection. Cyst visualization and dissection is more precise with the posterior approach, allowing for a generous biopsy of the cyst wall for pathologic evaluation. The larger anastomosis created with the posterior approach may have a lower incidence of occlusion, a common complication in the anterior approach. The posterior approach is easier to learn, it requires opening of the anterior stomach, the usage of the ultrasound, a blind drainage and can also be done endoscopically.
HEPATOBILIARY/PANCREATIC SURGERY  P280

EFFICACY OF LAPAROSCOPIC LIVER RESECTION FOR HEPATIC CANCER, Hiroyuki Nitta MD, Akira Sasaki MD,Tomohiro Fujita MD, Masahiro Takahasi MD, Hidenobu Kawamura MD, Hiroshi Asahi MD, Kazuyoshi Saito MD, Department of Surgery 1, Iwate Medical University School of Medicine

[Aim] To investigate the efficacy of laparoscopic liver resection for the treatment of hepatic cancer. [Materials and Methods] Subjects were 21 patients who underwent laparoscopic partial liver resection (LPLR: S2 or S3, n = 9; S6, n = 10; S7, n = 2) and 9 patients who underwent laparoscopy-assisted liver resection (LALR: right lobectomy, n = 3; left lobectomy, n = 2; anterior segmentectomy, n = 3; posterior segmentectomy, n = 1) for the treatment of hepatic cancer at our department. The cause for hepatectomy was hepatocellular carcinoma in 20 patients, metastatic hepatic cancer in 9 patients, and hepatic carcinoid tumor in 1 patient. Nineteen patients also had liver cirrhosis. LPLR was performed on patients with a tumor less than 5 cm in diameter occupying the lateral segment or protruding from the surface of the liver, while LALR was performed on patients with a tumor less than 10 cm in size with tumor infiltration to other organs. Right lobectomy was performed using the liver-hanging maneuver. Operation time, blood loss, surgical margin and postoperative stay were analyzed. [Results] Mean operation time, blood loss, surgical margin and postoperative stay for LPLR were 255.3 minutes, 383.6 g, 11.3 mm and 10.0 days, respectively, while those for LALR were 355.0 minutes, 1442.5 g, 8.9 mm and 13.3 days, respectively. Two patients who had recently undergone right lobectomy were favorable at 235.0 minutes, 524.5 g, 11.5 mm and 12.0 days. Only one of the 30 patients experienced complications; bile spillage during laparoscopic partial liver resection. None of the patients in either group experienced wound pain that restricted body movements. [Conclusions] LPLR performed within the indications described above was safe and associated with a favorable postoperative clinical course. In addition, LALR did not induce any complications, but mean operation time and blood loss for anterior segmentectomy and posterior segmentectomy tended to be higher, an issue that needs to be addressed further. Right lobectomy utilizing the liver hanging maneuver was performed safely and assuredly.

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GRANULOMATOUS LESION OF UMBILICAL PORT- AN UNUSUAL COMPICATION AFTER LAPAROSCOPIC CHOLECYSTECTOMY, Anisur Rahman MD, M Ahmed MD, Bangladesh Medical College

Port site infection after laparoscopic cholecystectomy is a known post operative complication. Most of these infections response to regular dressing and in some instances may require systemic antibiotics. In this retrospective study we present 6 patients out of 2000 laparoscopic cholecystectomies, who required repeated debridement for chronic umbilical port site infection (of more than 4 weeks duration) and in whom the histological diagnosis were granulomatous infection compatible with TB. One of these patients was previously treated for pulmonary TB. None had any clinical feature of tuberculous infection. All these 6 patients received 6 months multi-drug anti TB therapy and had complete cure of the infection.

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MIRIZZI SYNDROME: EVALUATION WITH MAGNETIC RESONANCE CHOLANGIOPANCREATOGRAPHY, David E Rivadeneira MD, Hong Meng MD, Martin S Karpeh MD, Stony Brook University Hospital From the Division of Surgical Oncology and Radiology

The Mirizzi syndrome refers to benign obstruction of the common hepatic duct by a stone impacted within the neck or cystic duct of the gallbladder, which causes extrinsic compression of the common hepatic duct and obstructive jaundice. Although a rare cause of obstructive jaundice, it remains a clinically and surgically challenging problem. Preoperative diagnosis is often established with invasive endoscopic and radiological modalities, such as endoscopic retrograde cholangiopancreatography (ERCP) and percutaneous transhepatic cholangiography.

We present a case of Mirizzi syndrome diagnosed preoperatively with magnetic resonance cholangiopancreatography (MRCP). MRCP provides a noninvasive alternative to ERCP and percutaneous transhepatic cholangiography in the diagnosis of Mirizzi syndrome.

The combination of non-invasive MRCP and T2-weighted image can be counted on to replace conventional invasive modalities of diagnosing Mirizzi syndrome without any loss of diagnostic accuracy.

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LAPAROSCOPIC DISTAL PANCREATECTOMY, Alexander Lebedyev MD, Oded Zmora MD, Danny Rosin MD, Marat Khaikin MD, Moshe Shabtai MD, Barak Bar Zakai MD, Amram Ayalon MD, Department of Surgery and Transplantation, Sheba Medical Center, Tel Aviv, Israel

Objective: Laparoscopic pancreatic surgery is technically demanding and has not yet gained widespread acceptance. The aim of this study is to review our preliminary experience with laparoscopic distal pancreatectomy for benign and malignant pancreatic pathologies.

Methods: A retrospective chart review of consecutive patients with benign and malignant pancreatic tumors who underwent laparoscopic distal pancreatectomy between 1997 and 2003 was performed. Data relative to demographic and clinical characteristics, indications for surgery, surgical procedure, and postoperative course were recorded.

Results: Laparoscopic distal pancreatectomy was attempted in 12 patients with benign (n=8) and malignant (n=4) pancreatic tumors and successfully completed laparoscopically in 75%. Early postoperative complications occurred in three patients, who developed six complications (two abscess, two diabetes mellitus, two pancreatic leak); the spleen was successfully preserved in 58% of cases.

Conclusions: This preliminary experience suggests that laparoscopic distal pancreatectomy is a feasible and safe procedure with a morbidity rate comparable to the conventional open procedure; however, laparoscopic surgery for malignant pancreatic tumors remains controversial. Larger series with longer periods of follow up are necessary to determine the role of laparoscopic surgery in the treatment of pancreatic pathologies.
HEPATOBIILIARY/PANCREATIC SURGERY P284
EXPERIMENTAL AND CLINICAL EVALUATION OF COMMON BILE DUCT REPAIR BY TITANIUM CLIP, Kazuyuki Shimomura MD, Tomoyuki Tamada MD, Katsuyuki Takahashi, Eiichi Tsujii MD, Junji Ishiyama MD, Akihiko Tachibana, Tadashi Suda MD, Nobuyoshi Miyajima, Shigeru Sakai MD, Nobu Murata MD, Department of Surgery, Teikyo University Mizonokuchi Hospital
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. If to simplify CBD closure technique and to reduce hospital stay, we applied VCS titanium clip to repair CBD. VCS is a clip system made for vascular anastomosis, and this time we applied to CBD closure after exploration (XL: 3mm). We evaluated efficacy and safety of this method experimentally and clinically. (Experiment) Six pigs (male: body weight 25–40 kg) were used. Under general anesthesia a 1 cm incision made in resected CBD system, and was closed by VCS clips in every 4 mm, 2 mm, 1 mm and 0.5 mm. Pleated pressure test by saline injection (1ml/sec) was performed by monitoring bursting pressure of CBD. Results are 18.1 ± 6.9 mmHg (4mm stitch), 84.8 ± 15.4 mmHg (2mm stitch), 130.0 ± 14.6 mmHg (1mm stitch) and 202.9 ± 39.3 mmHg (0.5mm stitch) respectively, and we found 0.5–2.0 mm stitches appropriate for clinical cases. (Method) Before closing CBD, we performed intra-operative cholangiogram or choledochoscope to neglect outflow obstruction of papilla Vater. After lithotripsy, we applied VCS clips (3mm) to repair CBD. We applied clips every 0.5 mm ± 2mm. No bile drainage was attempted to place. (Results) We have 11 clinical cases (8 male, 3 female) performed by single surgeon. Size of CBD exploration was 5 ~ 20mm, mainly according to the size of largest stone. And the number of applied VCS clip was 10 ~ 20. All the 11 patients were evaluated ready for discharge around 3 or 4 postoperative days if not associated with general diseases like DM or history of apoplexy. There was no case of bile leakage after POD 1, CBD stenosis or stone recurrence. Average period of observation was 37.6 months. (Conclusions) VCS clip was useful to simplify CBD repair technique and to reduce hospital stay as short as basic laparoscopic cholecystectomy.

HEPATOBIILIARY/PANCREATIC SURGERY P285
REOPERATIVE LAPAROSCOPIC BILIARY SURGERY, M H Thompson MD, S A Norton MD, Department of Surgery, Southmead Hospital, Bristol, UK
Introduction
Recurrent biliary problems after previous surgery may need further surgery. We report our experience with excision of gallbladder remnants and bile duct exploration after previous biliary surgery. A variety of diagnostic modalities was required for diagnosis. A combination of transabdominal ultrasound and MRCP were most commonly used but CT and EUS also had a role.

Patients, methods and results
Four patients, average age 52 had gallbladder remnants with stones causing pain or pancreatitis: three re-excisions were completed laparoscopically and one converted to open operation: all were cured. Eleven patients aged 65 presented with bile duct stones. 8 had failed ERCP. All had the bile duct cleared laparoscopically without conversion. One patient developed a chest infection and one PUO. Postoperative stay was 4 days. All were cured of their symptoms. One further patient had a gallbladder remnant and duct stones: he underwent curative excision of the remnant and transcystic clearance of the bile duct.

Conclusion
Reoperative laparoscopic surgery of the biliary tract is safe and effective.
HEPATOBILIARY/PANCREATIC SURGERY  P288
THE EFFECTS OF LAPAROSCOPIC CHOLECYSTECTOMY ON HEPATIC FUNCTION TESTS, Ali Uzunkov MD, Harran University School of Medicine Department of Surgery, Sanliurfa, Turkey

Objective: There are a lot of studies about laparoscopic cholecystectomy. But it is not clear enough for the effects of laparoscopic approach on hepatic function tests. In this study, the aim was to investigate the effect of laparoscopic and open cholecystectomy on hepatic function tests.

Methods and Procedures: 148 patients, who have not hepatic diseases and have hepatic functions in normal ranges, underwent cholecystectomy. 114 cases were operated on open method and 24 cases laparoscopic method. Intra-abdominal pressure was 12-14 mm Hg during laparoscopic cholecystectomy and monopolar electrocautery was used for gallbladder dissection. Venous blood samples were collected in the 1st hour preoperatively, and in the 24th, 48th and 72nd hours postoperatively and SGOT, SGPT, total bilirubin, direct bilirubin and albumin were evaluated. The results were evaluated by Wilcoxon and Friedman Two Way Anova Test.

Results: In laparoscopy group, SGOT and SGPT levels were increased significantly in the 24th and 48th hours rather than pre-operative values (p<0.05). The increasing levels of SGOT and SGPT were statistically significant laparoscopic surgery group rather than open surgery group at the 24th and 48th hours (p<0.05). The differences of other parameters between preoperative and postoperative values and in both groups were not statistically significant.

Conclusion: Laparoscopic approach for cholecystectomy affects temporarily hepatic function tests. Pneumoperitoneum caused using monopolar electrocautery may be responsible for these results. For this reason using excessive monopolar electrocautery and higher pressure pneumoperitoneum must be avoided during laparoscopic cholecystectomy.

HEPATOBILIARY/PANCREATIC SURGERY  P289
LASSO TECHNIQUE FOR LAPAROSCOPIC DISTAL PANCREATECTOMY, Vic Velanovich MD, Henry Ford Hospital

Background: Laparoscopic distal pancreatectomy with or without splenectomy is becoming an acceptable alternative to open resection for selected pancreatic lesions. One of the difficulties with this approach is manipulating the pancreas with laparoscopic instruments to avoid unnecessary injury to the pancreas, yet obtain adequate margins. The technique described here accomplished these goals.

Technique: The patient is placed in the a 45 degree right lateral decubitus position with the operating table flexed to open the space between the left costal margin and left iliac crest. The abdomen is entered using the open technique in the midline superior to the umbilicus. 11 mm ports are placed in the epigastrium and left posterior or auxiliary line. A 12 mm port is placed in the left midclavicular line. The greater curvature of the stomach, including the entire gastroplenic ligament is divided to expose the lesser sac. The retroperitoneum is divided at the inferior border of the pancreatic body. The retropancreatic space is developed. The retroperitoneum at the superior border of the pancreatic body is divided. A Penrose drain is then passed around the body of the pancreas. This is the "lasso" which is used for manipulation of the pancreas. The dissection is carried toward the spleen, with the peritoneal splenic attachments that last to be divided. The pancreas with the splenic vein and artery are divided, with a margin from the tumor, using a laparoscopic vascular linear stapler. A closed suction drain is placed next to the pancreatic remnant.

Results: Ten patients have undergone laparoscopic distal pancreatectomy with splenectomy using this technique. Two were converted to open: One due to bleeding, and the other due to local invasion by a pancreatic adenocarcinoma. The average operating time was 162 +/-39 minutes. Average length of stay was 3 days. There were 2 pancreatic leaks, both of which were treated conservatively with resolution. Pathology found included 6 cystic neoplasms, 2 islet cell tumors, 1 chronic pancreaticitis, and 1 ductal adenocarcinoma.

Conclusions: The lasso technique simplifies intraoperative manipulation of the pancreas during laparoscopic distal pancreatectomy. This technique allows for safe manipulation of the pancreas and may expand the indications for this approach to pancreatic resection.

HEPATOBILIARY/PANCREATIC SURGERY  P290
A STONE EXTRACTION FACILITATION DEVICE TO ACHIEVE AN IMPROVED TECHNIQUE FOR PERFORMING LCBDE, Donald E Wenner MD, James C Rosser, Jr, MD, Syed Hashmi MD,Paul Whitwam MD,Donald E Wenner III, Eastern New Mexico Medical Center

Introduction: LCBDE (laparoscopic common bile duct exploration) has been shown to be a safe, cost effective way to treat CBD stones. Despite this, LCBDE has not gained widespread adoption by surgeons. The technique has proven difficult to master, and damage to the fragile cholecdochoscope by grasping forceps and passage through the port valves has been problematic. Cases involving large, impacted, and/or multiple stones have required conversion to open CBD.

Method: The Multiple Instrument Guide (MIG) is introduced as a solution for these problems. The MIG is a J-shaped plastic extrusion with three lumens. It is flexible and can be straightened for insertion through a 10mm port. The MIG facilitates insertion of a flexible 2.8-3.2 mm cholecdochoscope into the CBD. At the same time, additional tools such as balloon or irrigation catheters and lithotripters can be introduced into the CBD. These can be manipulated under video guidance via the choledochoscope. This procedural multi-tasking allows for a more efficient LCBDE. We describe our initial experience using the MIG in 23 patients.

Results: Of the 23 patients who had LCBDE procedures, 20 had stones present in the CBD. 24th and 48th hours were present in 48% of the patients and impacted stones were present in 26% of the patients. Large stones, greater than 1 cm, were present in 26% of the patients. A 95% stone clearance rate was achieved. Difficult cases with large, impacted and/or multiple stones were resolved using the MIG. Two scopes were damaged, one during surgery and one during cleaning and storage.

Conclusion: Use of the MIG has demonstrated significant advantages over previously described techniques. The device secures biliary tract access and allows procedural multitasking while at the same time protecting the delicate and expensive equipment. A simplified technique algorithm can be followed that may encourage more surgeons to adopt the routine performance of LCBDE.
HERNIA SURGERY

THE ECONOMIC IMPACT OF LAPAROSCOPIC INGUINAL HERNIA REPAIR: A DOUBLE BLINDED, PROSPECTIVE, RANDOMIZED TRIAL, Ralph E Butler MD, Rachel Burke MD, Harpreet Brar MD, Paul Lucha DC, Naval Medical Center Portsmouth, General Surgery Department, Portsmouth, Virginia

Introduction: A prospective randomized double-blinded trial comparing Totally Extraperitoneal (TEP) and Transabdominal preperitoneal (TAPP) against the Lichtenstein open repair. The variables examined include postoperative pain, lost workdays and hospital costs.

Methods: Males with primary hernias were randomized into one of the three groups. The patients were blinded to procedure type and reported their postoperative pain via visual analogue scales (VAS). All patients were evaluated on a weekly basis by a blinded investigator. The VAS were analyzed using repeated measures ANOVA.

Results: Preliminary data (33 pts) failed to show a significant difference in lost workdays between TEP and open repairs; however the TAP approach resulted in a greater number of lost workdays. Operative times for the TEP and open approaches were equivalent with the TAP having significantly shorter operating times. The material cost for the open repair was lower than either of the Laparoscopic approaches. The postoperative pain scales were comparable in all groups.

Conclusions: With these data no one approach appears to be superior in producing less postoperative pain; however lost workdays were higher in one of the Laparoscopic approaches and warrants further study. Higher material costs were not offset by shorter operative times or lost workdays.

HERNIA SURGERY

INVESTIGATING A POSSIBLE CAUSE OF MESH MIGRATION DURING TEP REPAIR, A Castro MD, G Chaudry MD, K Shapiro MD, G Ferzli, Staten Island University Hospital

Introduction: Laparoscopic inguinal hernia repair has a low rate of recurrence when performed by an experienced surgeon. Recurrence is still a concern, and several possible causes have been identified. Mesh migration or dislocation in the early postoperative period caused by patient position has been proposed as a possible cause. We examined how hip flexion affects mesh and staple position in totally extraperitoneal (TEP) repair of inguinal hernia.

Methods: After completion of dissection, hernia reduction and mesh placement in 32 consecutive patients, the operating table was flexed and extended from 720 to 90 degrees to simulate a patient's sitting position. Mesh position and migration was investigated. The mesh was then stapled, the table was again flexed and extended, and mesh migration and staple dislodgement investigated.

Results: The mesh was not found to have migrated either prior to or following fixation in any of the patients, nor had any of the staples been dislodged.

Conclusions: Patient position immediately after surgery does not appear to be a contributing factor to mesh migration which may later lead to hernia recurrence.

HERNIA SURGERY

INCIDENCE OF PARAESOPHAGEAL LIPOMAS IN PARAESOPHAGEAL HERNIAS, Robert J Chastanet MD, Mickey Seger MD, Phillip L Leggett MD, University of Texas at Houston, Minimally Invasive Surgeons of Texas (MIST)

Background: The discovery of a paraesophageal lipoma is a rare finding during the repair of a paraesophageal hernia. The true incidence of a paraesophageal lipoma is not reported. We routinely remove this lipoma when it is found.

Hypothesis: There is an association with paraesophageal lipoma with paraesophageal hernias.

Design: Retrospective chart review of all paraesophageal hernias repaired by a single surgeon over the past 8 1/2 years.

Results: Between January 1994 and September 2003, 59 cases of laparoscopic paraesophageal repair were done at Houston Northwest Medical Center by a single surgeon. Twelve instances of associated paraesophageal lipoma were identified based on operative reports and/or pathology review, giving an incidence of this association of 20.7%.

Discussion: Paraesophageal hernia repair is associated with a high incidence of recurrence. Surgeons have cited many reasons for such recurrence. We have documented a 20.7% association of what we term paraesophageal lipoma. This lipoma represents a retroperitoneal fat herniation into the mediastinum and may serve as a lead point for herniation and thus recurrence. We believe they should be routinely sought and removed during the dissection before crural closure. We postulate this is a common and under appreciated finding during paraesophageal repair.

HERNIA SURGERY

TOTALLY EXTRAPERITONEAL (TEP) REPAIR OF OBUTOR RATOR HERNIA: A RARE HERNIA WITH HIGH MORTALITY, Ghazali A Chaudry MD, Armando E Castro MD, Samir Patel MD, Kenneth Shapiro MD, George S Ferzli MD, Staten Island University Hospital

Objective of the study: A distinct advantage of the laparoscopic repair of inguinal hernia is the opportunity for clear visualization of the direct, indirect, femoral and obturator spaces, which should be routinely inspected. Obturator hernia accounts for as little as 0.73% of all hernias, yet the mortality rate when acutely incarcerated can reach as high as 40% because treatment is delayed due to the difficulty in making timely diagnosis. There is only one previous report of a totally extraperitoneal (TEP) repair for obturator hernia. Here, we present an account of five such procedures.

Methods and Procedures: A retrospective review was undertaken to evaluate one surgeon's experience with the TEP repair of obturator hernias over a 4-year period. Of the five cases discussed, only one procedure required conversion to an open procedure.

Results: Of the five procedures, three hernias were on the right side, while the others were on the left side. One patient presented with an acutely incarcerated obturator hernia, and underwent a small bowel resection for strangulated bowel within the obturator space. The other four hernias were found during TEP repair and were discharged several hours later. A midline wound infection in the patient with strangulated bowel presented a complication, which was treated with dressing changes. No other complications ensued, and there was no recurrence at 48 months follow-up.

Conclusion: The laparoscopic TEP approach allows inspection and repair of direct, indirect, femoral, and obturator hernias. We have found that it is feasible, safe, and highly effective to diagnose and to repair obturator hernias with this procedure.
The repair of large flank incisional hernia is challenging. We present the use of laparoscopic totally extraperitoneal (TEP) repair of a large flank incisional hernia in a 65 y/o woman.

The operation procedure includes modified left decubital position. A 1.5 cm incision is made at the midline of the low abdomen and preperitoneal dissection follows. After initiating pneumopreperitoneum, further dissection includes the whole right abdominal wall musculature, a large polypropylene mesh is placed in the preperitoneal space and fixed from right flank until the retrorectal space. The patient recovered smoothly and the abdominal wall deformity disappeared. After follow-up of 6 months, no recurrence is noted. The TEP approach avoids the potential danger to GI tract and the use of ordinary polypropylene mesh decreases the cost. The place of mesh in the preperitoneal and retrorectal space helps to hold it under abdominal pressure. The laparoscopic TEP approach for incisional hernia after flank incision is feasible and may have some potential advantages when compared with traditional repair.

Hernia Repair of Concomitant Spigelian and Inguinal Hernia

We report a unique case of concomitant Spigelian and indirect inguinal hernia in an adult repaired laparoscopically. Spigelian hernia is perceived to be a congenital defect in the transverse aponeurosis fascia. Its occurrence is rare, comprising about two percent of all abdominal wall hernias. Concomitant inguinal hernia is even more uncommon. Review of the MEDLINE literature from 1966 to April 2003 did not yield any English report on concomitant Spigelian and inguinal hernia in an adult. Our patient is an 83-year-old female who presented with painless abdominal mass of several months duration. She was found to have a soft, reducible, non-tender mass over the right lower quadrant as well as a separate mass over the right inguinal area. A clinical diagnosis of right Spigelian and inguinal hernia was made and the patient was later taken to surgery. The diagnosis was confirmed during laparoscopy and she underwent repair using a pre-peritoneal polypropylene mesh.

A Comparative Study Between Praxistat Adhesive and Sutures for Mesh Fixation

BACKGROUND: Following hernia repair, tissue ingrowth occurs within 2 weeks of mesh implantation. Sutures used to hold the mesh may cause postoperative pain through nerve injury or tissue tearing during healing. An adhesive product may provide the advantage of holding the mesh in place, avoiding the potential for postoperative pain. We compared tissue ingrowth characteristics between sutures and a new adhesive product, using two commonly used prosthetic materials.

METHODS: We used 10x10 cm2 mesh pieces of polyester (PE) (n=16) or polypropylene (PP) (n=16). Four meshes were fixed to the fascia of the abdominal wall in 8 swine using Praxistat adhesive (PA) (Promethian Surgical Devices, Boston, MA) or interrupted polypropylene sutures (PPS). A necropsy was performed after 3 months for evaluation of mesh contraction. Using a tensiometer, tissue ingrowth was assessed by measuring the force needed to detach the mesh from the fascia. Histologic evaluation included inflammatory and fibroblastic reactions, scored according to a 0-4 point scale. Results were analyzed using Student’s t-test or Mann-Whitney U-test.

RESULTS: Overall, PA resulted in similar mean mesh area (74±4.3 vs 78±3.9 cm2) and tissue ingrowth force (150±11 vs 179±11 N) when compared with PPS. However, PA resulted in higher inflammatory (1.17±0.2 vs 0.59±0.15) and fibroblastic (2.23±0.2 vs 1.47±0.2) reaction scores than PPS. With regards to mesh type, PA resulted in similar mesh area (77±6 vs 70±2 cm2), tissue ingrowth force (150±16 vs 134±1 N), and inflammatory (1.33±0.3 vs 0.78±0.3) and fibroblastic (2.38±0.2 vs 1.89±0.4) reaction scores in both, PE and PP meshes.

CONCLUSION: PA is an excellent alternative to PPS for mesh fixation. It results in better tissue integration, evidenced by higher inflammatory and fibroblastic reactions. There are no differences when using PA for fixation of PE and PP, two of the most common meshes used for inguinal hernia repair.

Laparoscopic Herniorrhaphy of Bilateral Inguinal Hernia and Incisional Hernia: A Case Report

Laparoscopic herniorrhaphy has merit in the case of bilateral or recurrent inguinal hernia. It has also been used in incisional hernia. We report a case of bilateral inguinal hernia and incisional hernia which was repaired by laparoscopic technique at the same time. A 77-year-old male with history of cervical disc herniation admitted our hospital with complaint of mass in the right groin. He was operated cervical posterior fusion with right iliac crest grafting 20 years ago. Physical examination showed a hen-egg-size mass in right inguinal lesion and a thumb size mass in right iliac operated scar. These masses were easily released into peritoneal cavity by hand. In addition, we found that the left groin abdominal wall was very fragile. We diagnosed bilateral inguinal hernia and incisional hernia. Laparoscopic herniorrhaphy for these three hernias was scheduled. Under laparoscopic examination, hernia defects were observed in the right and left internal inguinal ring, and in the right lateral abdominal wall. The size of right inguinal hernia defect was 3.0 cm and left was 1.0 cm in diameter. The size of right lateral incisional hernia defect was 4.0 cm in diameter. We covered widely bilateral inguinal hernia defect with 3 Dimensional Mesh (polypropylene mesh) and fixed to preperitoneal layer. This Mesh has merit of easy positioning by re-expanding due to reinforced edge. We also covered right lateral incisional hernia with 2-layer Composix Mesh (polypropylene mesh with ePTFE sheet). As this mesh is covered by ePTFE sheet, we do not have to cover polypropylene mesh by peritoneum. Postoperative course was uneventful. Laparoscopy is a useful diagnostic tool in the evaluation of groin mass. It enables the surgeon to visualize and define accurately a variety of hernia defects. In addition, it is a significant repairing tool of hernia defect. Though laparoscopic herniorrhaphy need high cost, long operation time and skillful technique, in some cases this is very useful operation. Laparoscopic technique has advantage of minimum invasive surgery, it should be applied to appropriate cases.
Evaluation of Mesh Fixation Strength, Tissue Ingrowth and Adhesion Formation After Placement of EPTFE Mesh to the Abdominal Wall Using Titanium Spiral Tacks, Nitinol Anchors, and Polypropylene or Polyglactin 910 Suture

Introduction: Abdominal wall hernias after orthopedic procedures are an uncommon cause of incisional abdominal wall hernias. The use of a metal fixation device is required. The new Salute fixation device (Onyx Medical, Inc.) has been used by this author since 11/01/01 in 60 patients. The age range was from 33 to 88 years. There were 39 male patients. Various hernias included incisional (37), inguinal (13), umbilical (6) Spigelian (2), and parastomal (2). In this initial follow-up of nearly two years, there have been no adverse events related to the use of this construct to fix any biomaterial. No complications or recurrences have been seen. The use of this device appears to be effective for the laparoscopic repair of various hernias. Other advantages include the fact that the instrument is reusable and the construct can be removed with the available instrument that is designed for that purpose.
SELECTIVE COLONOSCOPY IN THE PREOPERATIVE EVALUATION OF PATIENTS UNDERGOING LAPAROSCOPIC VENTRAL HERNIA REPAIR, Kim G Mendelson MD, John S Roth MD, University Health Systems of Eastern Carolina, Greenville, NC, USA

BACKGROUND: Controversy exists concerning the need for colonoscopy evaluation prior to placement of prosthetic mesh. The purpose of this study was to determine the incidence of pathologic findings during colonoscopy in symptomatic patients undergoing ventral hernia repair.

METHODS: A retrospective review of the database was performed to identify patients undergoing peritoneal colonoscopy in relation to laparoscopic ventral hernia repair during the period 1999-2003. All hernia repairs were performed by a single surgeon. Records were reviewed to determine the patients’ initial abdominal operation, indication for hernia repair, performance of preoperative colonoscopy, and postoperative course.

RESULTS: Of the 78 cases reviewed, 67 (86%) had previous operations.

CONCLUSIONS: In the pig model, PCO had fewer and less severe adhesions than ePTFE and PPM. ePTFE experienced more shrinkage than PCO or PPM. There were more filmy adhesions with PCO (100%) than ePTFE (62.5%) or PPM (12.5%) (p=0.004). There was more force required to separate adhesions from PPM (12.5%) (p=0.004) and ePTFE (8.8 N; p=0.03). PCO had a lower peak force required to peel adhesions than ePTFE (p=0.009). Filmy adhesions required a lower peak force required to separate the adhesions from mesh than dense adhesions (5.0 N vs 15.8 N; p=0.001). The mean mesh area of explanted mesh was smaller for ePTFE (94.4 cm²) than PCO (118.6 cm²) and PPM (140.7 cm²) (p<0.01).

Selective colonoscopy was used preoperatively in 11 patients (3 men and 8 women aged 71-90 years) for complaints of change in bowel habits (n=10) or heme positive stool (n=1). Benign results were found in 10 patients (hyperplastic polyps n=4, diverticulosis n=1 and no pathology n=5). The remaining patient had a polyp removed which revealed in situ adenocarcinoma adequately treated by endoscopic resection. 8 patients (3 men and 3 women, aged 45-66 years) presented preoperatively having undergone colonoscopy within 5 years for reasons of past history (n=3), change in bowel habits (n=2) or heme positive stool (n=1). The results in these patients were negative (n=1), hyperplastic polyps (n=3), diverticulosis (n=1), and hemorrhoids (n=1). On postoperative follow-up of 1-30 months (average 6.5 months), 8 patients (4 men and 4 women, aged 40-84) underwent colonoscopy for reasons of past history (n=2), change in bowel habits (n=2) and heme positive stool (n=4). Results of colonoscopy were negative (n=2), hyperplastic polyps (n=2), diverticulosis (n=3), and hemorrhoids (n=3). No patients required laparotomy as a result of colonoscopic findings, either pre or postoperatively.

CONCLUSIONS: Pathology requiring laparotomy was not identified in patients presenting with intestinal complaints during preoperative evaluation for ventral hernia repair, or during postoperative follow-up. In all cases, colonoscopy was sufficient for diagnosis and treatment. Even in symptomatic patients, it may not be necessary to perform colonoscopy prior to hernia repair.
HERNIA SURGERY

FIBRIN GLUE FOR SECURING THE MESH IN LAPAROSCOPIC TEP INGUINAL HERNIA REPAIR - A PILOT STUDY, Bengt Novik MD, Susanne Hagedorn MD, Depts of Surgery, Skaraborg Hospital, Falkoping and Skovde, SWEDEN
INTRODUCTION: There has been concern about potential complications by anchoring the mesh in laparoscopically transperitoneal (TEP) inguinal hernia repair with tacks/staples. Although some authors claim that fixing the prosthesis is unnecessary, results from few and small studies are conflicting. Animal studies have shown that securing the mesh with fibrin glue is feasible and sufficiently strong. This is an initial report of a small group of human patients, with short and long term evaluations.

METHODS AND PROCEDURES: In December 2000, nine groin hernias in six patients were operated with our standardized TEP procedure, except for substituting the spiral tacks with fibrin glue (Tissueal).

All patients were assessed after one month by the operating surgeon and 16 months by an independent surgeon. Due to a complication probably not related to Tissueal, one patient was seen several times in between at the outpatient clinic.

RESULTS: Operative time was 25-60 min (mean 49 min/patient, 33 min/groin). The glueing was slightly less expeditious than tacking. At the initial fixation points, the hardening reaction had to be awaited, which prolonged the procedure with up to a few minutes.

There were no recurrences. Five patients were discharged the same day. They resumed their work and normal daily activities within a few days, at the most a week. Surgeons and the five patients all graded both short and long term results as excellent.

The 6th patient was 76 years old. He had a bilateral repair and stayed overnight due to temporary urinary retention. Later, he developed a funicular syndrome, probably due to excessive dissection of a large ?lipoma? of the cord. It turned into a chronic hydrocele and was subsequently excised.

CONCLUSIONS: This small series indicates that fibrin glue may replace tissue penetrating tacks/staples in TEP hernia repair. While obviating the risks of tack-related complications, beneficial outcome was comparable to when using tacks. The patient with postoperative unilateral seroma had Tissueal applied in both groins, precluding that the exsudation was caused by hyper-sensitivity to the glue.

The encouraging results need to be confirmed in a larger, randomized study.

HERNIA SURGERY

LAPAROSCOPIC INGUINAL HERNIA SURGERY. PATIENTS OUTCOMES AFTER GENERAL ANESTHESIA WITH PARAVERTEBRAL NERVE BLOCK, Jose S Pinheiro MD, Ricardo V Cohen MD, Carlos Schiavon MD, Jose Correa MD, Steve Ebanks MD, Hospital Sao Camilo, Sao Paulo, SP, Brazil and Duke University Medical Center, Duke University, Durham, NC, USA
Introduction: Laparoscopic inguinal hernia surgery is safe, effective, with less post-operative pain when compared to open procedures. The ease of handling and possible benefits of the TAPP technique have made this approach attractive to surgeons. We describe our initial experiences in laparoscopic inguinal hernia repair using general anesthesia and paravertebral nerve block (PVB)

METHODS AND PROCEDURES: In December 2000, nine groin hernias in six patients were operated with our standardized TEP procedure, except for substituting the spiral tacks with fibrin glue (Tissueal).

All patients were assessed after one month by the operating surgeon and 16 months by an independent surgeon. Due to a complication probably not related to Tissueal, one patient was seen several times in between at the outpatient clinic.

RESULTS: Operative time was 25-60 min (mean 49 min/patient, 33 min/groin). The glueing was slightly less expeditious than tacking. At the initial fixation points, the hardening reaction had to be awaited, which prolonged the procedure with up to a few minutes.

There were no recurrences. Five patients were discharged the same day. They resumed their work and normal daily activities within a few days, at the most a week. Surgeons and the five patients all graded both short and long term results as excellent.

The 6th patient was 76 years old. He had a bilateral repair and stayed overnight due to temporary urinary retention. Later, he developed a funicular syndrome, probably due to excessive dissection of a large ?lipoma? of the cord. It turned into a chronic hydrocele and was subsequently excised.

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The encouraging results need to be confirmed in a larger, randomized study.
HERNIA SURGERY

P312

MINIMALLY INVASIVE APPROACH FOR MANAGEMENT OF STRANGLATED SMALL HERNIA OF THE BROAD LIGAMENT, Alan A Saber MD, Maureen A Kidd MD, Lisa A Miller MD, Deborah B Lloyd MD, Omar A Mubarak MD, Michigan State University/Kalamazoo Center for Medical Studies

Introduction: Internal hernias are quite rare, comprising 0.5-1% of all hernias. Hernia through a defect in the broad ligament is extremely rare, constitutes only 4-5% of all internal hernias. Sixty eight cases of intestinal obstruction in hernias of the broad ligament have been reported. We herein present the first reported case of minimally invasive resection and repair of strangulated small bowel in a hernia of the broad ligament.

Methods and Procedures: A 57 year-old woman with no previous surgery who presented with a acute small bowel obstruction of undetermined etiology by CT scan. A hernia of the broad ligament was diagnosed laparoscopically. Minimally invasive resection of strangulated small bowel with primary anastomosis, and repair of the broad ligament hernia was performed. A laparotomy was avoided and the patient had uneventful postoperative course.

Conclusion: This report illustrates the utility of laparoscopy as a safe and effective minimally invasive modality for both diagnosis and treatment of such a rare clinical entity.

Five figures in our complete manuscript will illustrate the management of this patient. These figures include a preoperative CT scan, an intraoperative laparoscopic view of the strangulated bowel, the defect, the laparoscopic repair of the defect as well as the postoperative picture for the trocar sites.

We would like to present this as an oral or poster presentation.

HERNIA SURGERY

P313

EFFECTS OF THE POLYPROPYLENE MESH IN THE TESTICLE, EPIDIDIMUS AND DUCTUS DEFERENS OF DOGS, Alberto Goldenberg PhD, Jacques Matone MD, Wagner Marcondes MD, Gustavo Focchi MD, Vladimir Schraibman, Federal University of Sao Paulo - Sao Paulo - Brazil

The aim of this study was to investigate the effects of the synthetic mesh on the ductus deferens and testicle of dogs. Ten adult male dogs were anesthetized and a 2.5X3.5 cm2 polypropylene mesh was fixed in the inguinal region in direct contact with the ductus deferens and testicle. After 30 days the animals were submitted to a bilateral inguinotomy where the procedure was the same, but without the use of prosthesis, serving as a control. After 30 days the animals were submitted to a laparoscopy and a macroscopic evaluation was done. Biopsies of the inguinal region were done in order to record histological alterations of the two inguinal regions. Three animals presented adhesions in the local of the polypropylene prosthesis. No animal presented adhesion in the local without prosthesis. The microscopic alterations in side A (with prosthesis) were characterized by the proliferation of dense fibrous conjunctive tissue and few giant multinuclear cells showing a light inflammatory reaction.

Based on the present results we can consider that the prosthesis of polypropylene induces the formation of adhesions besides the desired creation of a fibrous layer, when placed in the pre-peritoneal space of dogs, even in short periods. This effect is similar to the one caused by laparoscopic prosthetic fixation in the inguinal region. By these findings we can speculate that the pre-peritoneal placement of polypropylene prosthesis may contribute to future clinical complications.

HERNIA SURGERY

P314

PRE-PERITONEAL PLACEMENT OF POLYPROPYLENE PROSTHESIS BY INGUINOTOMY? DOES IT PRODUCE PERITONEAL ADHESIONS? Roberto Melo MD, Alberto Goldenberg PhD, Edson Lobo MD, Vladimir Schraibman, Federal University of Sao Paulo

With the aim of observing the effects produced by the prosthesis of polypropylene in the pre-peritoneal space, 10 adult cross-breed dogs (n=10) have been submitted to a bilateral inguinotomy where the prosthesis was fixed on one of its sides. In the contra-lateral region the procedure was the same, but without the use of prosthesis, serving as a control. After 30 days the animals were submitted to a laparoscopy and a macroscopic evaluation was done. Biopsies of the inguinal region were done in order to record histological alterations of the two inguinal regions. Three animals presented adhesions in the local of the polypropylene prosthesis. No animal presented adhesion in the local without prosthesis. The microscopic alterations in side A (with prosthesis) were characterized by the proliferation of dense fibrous conjunctive tissue and few giant multinuclear cells showing a light inflammatory reaction.

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HERNIA SURGERY

P315

MINIMALLY-INVASIVE, OPEN GROIN HERNIA REPAIRS, Phillip Shadduck MD, Durham Regional Hospital & Duke University Medical Center; Durham, NC, USA

INTRODUCTION: The change from sutured groin hernia repairs to mesh techniques has been rapid and near complete. The Lichtenstein (Lich) and laparoscopic (lap) repairs have been widely studied. The newer mesh techniques, minimally-invasive open repairs (plug & patch 1993, PHS 1999, & Kugel 1999) have been less well studied.

PURPOSE: To review all published studies of the minimally-invasive open repairs, to summarize the data from the methodologically best available studies, and to compare these to the Lich/lap data in a recent systematic review (AnnRCoilSurg 1998).

METHODS: Using standard literature search techniques (PubMed, related articles, references, reviews, and hand searching of journals/texts/meeting abstracts), >200 citations were identified. All available manuscripts and abstracts were evaluated for study methodology and reporting. Studies selected for this review were: (1) all randomized clinical trials (RCT); (2) all prospective (prosp) studies with >100 patients, 90% follow-up @ 1 yr, and good reporting of variables; and (3) other prosp & retrospective (retro) studies containing necessary data. Studies were evaluated for 15 variables: # patients, % hernias, % complicated hernias (recurrent/scro-tal/incarcerated), anesthetic, operative time, length of stay, major & minor complications, postoperative pain, return to ADL/work/full activity, % follow-up, duration of follow-up, and hernia recurrence.

RESULTS: The data from all selected studies will be presented, summarized, and compared. Some apparent differences were noted:

<table>
<thead>
<tr>
<th>Lich</th>
<th>Lap</th>
<th>Plug&amp;patch</th>
<th>PHS</th>
<th>Kugel</th>
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<tr>
<td>% gen anes</td>
<td>58%</td>
<td>100%</td>
<td>0-11%</td>
<td>0%</td>
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<tr>
<td>OR time (min)</td>
<td>49</td>
<td>58</td>
<td>17-39</td>
<td>26</td>
</tr>
<tr>
<td>chronic pain</td>
<td>0-8%</td>
<td>0</td>
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CONCLUSION: Evaluating outcomes for the newer, minimally-invasive open repairs (plug & patch, PHS, & Kugel) and comparing these outcomes to those of the Lichtenstein and laparoscopic repairs is hindered by the limited amount of RCT/prosp data currently available for the newer techniques.

http://www.sages.org/
THE TWO PORT MINIMALLY INVASIVE APPROACH FOR VENTRAL HERNIA REPAIR, Sunil Sharma BA, Frank Borao BA, Monmouth Medical Center and U. of Pittsburgh Dept of Surgery

Objective: Laparoscopic ventral hernia repair described in recent literature utilizes between three and five port sites with a mesh onlay repair. The four instrument ports are used for lysis of adhesions, reduction & dissection of the hernia sac and placement of tacking of the mesh. We believe that these tasks can easily be performed with only two ports. This should decrease the number of new fascial defects, reduce the intraoperative time involved in creating and closing additional port sites, improve the abdominal cosmetic result and decreases the risk of morbidities associated with fascial defects.

Method: Seventy consecutive patients underwent laparoscopic ventral and incisional hernia repair using a ‘two port technique’ with a 30 degree laparoscope, composite dual mesh with trans fascial suture fixation, and tacking sutures.

Results: From July 1, 2000 to August 31, 2003, seventy patients underwent the two-port laparoscopic hernia repair. There were 24 male and 46 female patients with a mean age of 57.38 years (range 21 ? 73 years). Sixty one patients had incisional hernias; nine patients had a primary ventral hernia. The mean defect size was 103.38 cm2 (range 59.12 ? 500 cm2). The mean size mesh used was 267.00 cm2 (range 48 ? 750 cm2). The mean LOS was 1.58 days (range = 0.5 - 5). The mean operating room time was 150 minutes (range 80 ? 290 minutes). Three patients required an additional third port. There were two hernia recurrences (one wound seroma, one enteric fistula, two port site infections and two port site chronic pain.

Conclusion: The two-port laparoscopic technique is a viable alternative for experienced laparoscopic surgeons to repair ventral and incisional hernias. This ‘two port’ technique makes the operation less invasive, reduces the number of iatrogenic fascial defects created during surgery, and can be accomplished without compromising the safety of the operation.

LAPAROSCOPIC REPAIR OF RETROSTERNAL HERNIA OF MORGAGNI, Mahesh Subramaniam MD, David M Brams MD, Desmond H Birkett MD, Tufts University School of Medicine, The Lahey Clinic

INTRODUCTION: Morgagni first described congenital anterior diaphragmatic hernia in 1761. The defect occurs through small triangular region on either side of the inferior margin of the sternum, at the anterior aspect of the diaphragm. These small gaps permit passage of the superior epigastric vessels and the hernia sac. The defects tend to be small and asymptomatic, but if more prominent can cause a variety of symptoms. Due to the potential for incarceration, surgical repair is indicated. Management has included a variety of approaches. Herein we describe a simple, elegant, and minimally invasive approach in the repair of a symptomatic Morgagni hernia.

CASE REPORT: A 77-year-old woman with history of rheumatoid arthritis, hypertension, and congestive heart failure presented with a three day history of nausea, vomiting and abdominal pain. Clinical examination revealed a distended and mildly tender abdomen. Plain radiographs revealed adistended stomach and the presence of colon in the right hemi-thorax. Computed tomography confirmed a large right hemi-thorax. Radiographs revealed adistended stomach and the presence of colon in the right hemi-thorax. Computed tomography confirmed a large right hemi-thorax. Following separation of adhesions such as bowel obstruction. We present a technique of placing transfascial sutures without any intrabdominal clips or knots.

Methods: Between April 2001 and March 2003, 28 patients underwent a laparoscopic repair of one to three incisional hernias. Primary entry is most often at the left or right costal arch with an open entry and distant to the laparotomy scar. Following separation of adhesions larger hernia sacks were obliterated by means of argon-beam. Then an adjusted Gore-Tex Dual Mesh was introduced and fixed through the abdominal wall with 4 or more prepared nonabsorbable sutures. Subsequently the sutures were drawn over from intraabdominally by a Suture Passer® through the mesh and fascia (oversewing the mesh margin) to the adjacent edge. At this point the suture was knotted with the other thread end extracorporeal.

Results: All operations have been finished laparoscopically. Operation time ranged from 55 to 210 minutes. Local pain disappeared mostly within 3 days. In one patient persistent pain was permanently treated by infiltration of Lidocaine. There were no severe complications. Seroma have been seen in 25 patients by ultrasound (up to 4 months) and with clinical symptoms in six patients (up to 7 weeks); in one case intervention aspiration was performed. Limited short term follow up has revealed no recurrences or infections.

Conclusion: The technique described here appears to be an effective means of securing the mesh in an intrabdominal location without the use of tacks. Short term follow up appears comparable to the standard technique, and to date no bowel obstructions have occurred.
Hernia Surgery

Exploratory Laparoscopy: An Excellent Modality for the Diagnosis and Treatment of Internal Hernias, Thang Nguyen MD, Sergio Huerta MD, Daniel Marcus MD, Department of Surgery, Kaiser Permanente, University of California Irvine Medical Center

Introduction: The signs and symptoms of internal hernias are insidious and represent a diagnostic challenge for both clinicians and radiologists. Delayed intervention may lead to serious sequela. We report a case of a patient with classical presentation of internal hernia that was diagnosed and treated laparoscopically.

Methods and Procedures: A 38-year-old woman with history of endometriosis total abdominal hysterectomy and a C-section presented to the hospital with a 30-hour-history of sharp, intermittent epigastric and right lower quadrant pain accompanied by nausea and dry heaves. She had had similar, but less intense complaints for the past two years requiring a myriad of diagnostic tests including UGI series, EGD, multiple abdominal x-rays and CT scans, all of which were nonrevealing.

Physical exam revealed a well-developed, well nourished woman in moderate distress secondary to abdominal pain. Her temperature was 99.9 °C, pulse 78, BP 130/70. Her abdomen was soft, and non-tender. There was moderate RLQ tenderness but rebound tenderness. Her laboratory tests included a hemogram, which demonstrated a WBC count of 14.4 with a left shift. Peritoneal fluid was drained from the pelvic and pelvis CT after two hours of oral contrast revealed a 3cm ovarian cyst with small amount of free fluid, but no inflammation at the RLQ. Interestingly, no contrast was seen distal to the ileo-cecal junction. A follow up CT one hour later found no progression after 12 hours of observation without improvement, she underwent a diagnostic laparoscopy.

Findings: Laparoscopic inspection of the abdomen revealed an adhesional band at the level of the ileo-cecal junction. The ileum was found entrapped by the adhesions forming a complete obstruction. After 12 hours of observation without improvement, she underwent a diagnostic laparotomy.

Conclusion(S): The diagnosis of internal hernias remain a diagnostic challenge and require a high index of suspicion. Laparoscopy is an excellent diagnostic modality for evaluation of an abdomen with a concerning, but unclear etiology. In this case, an internal hernia at the RLQ presented a diagnostic conundrum to both the surgeon and radiologist. Laparoscopic exploration afforded the opportunity for both diagnosis and treatment.

Minimally Invasive Other

Transperitoneal vs. Retroperitoneal Access for Laparoscopic Surgery, Randal A. Aaberger MD, Mark S Yamamura MD, Kaiser Moanalua Medical Center, Honolulu, HI, USA

Introduction: Retropertoneal pathology can be approached laparoscopically using a transperitoneal or retroperitoneal approach. Although the transperitoneal approach is common, the advantages of a retroperitoneal approach include the elimination of bowel related complications and direct initial access to the great vessels, great vessels, and adrenal.

Methods: All patients undergoing laparoscopic surgery for retroperitoneal pathology between January 2002 and June 2003 were reviewed. The transperitoneal approach was utilized in 20 patients (nephrectomy = 15, partial nephrecty = 4 and renal cystectomy = 1). The retroperitoneal approach was utilized in 16 patients (nephrectomy = 9, partial nephrectomy = 1, pyeloplasty = 4, adenectomy = 1 and ligation of the IMA and lumbar arteries = 1). Results: Comparing the transperitoneal and retroperitoneal laparoscopic approaches, there were no significant differences with regards to patient age, ASA score, analgesic use or hospital stay. Mean operative blood loss for the transperitoneal group was 379 ml and the retroperitoneal group 80 ml (P<0.05). Mean OR time for the transperitoneal group was 252 min and for the retroperitoneal group 220 min (P=0.14). Comparing nephrectomy only, operative time transperitoneal was 238 min and retroperitoneal 205 min (P=0.28). Mean renal tumor diameter measured by pathology was 6.2 cm in both groups (transperitoneal 2.0 to 11.0 cm and retroperitoneal 2.3 to 8.2 cm). No patient required open conversion and there were no intra-operative complications. One patient required angiographic embolization for hematoma 2 weeks post partial nephrectomy.

Conclusions: The retroperitoneal approach is now our preferred direction of access for retroperitoneal pathology due to the initial arterial access and avoidance of bowel and adhesions. There is also a trend towards shifting the surgical approach towards the retroperitoneal approach in the future.

Minimally Invasive Other

Demonstration of Concurrent Validity of a Laparoscopic Virtual Reality Simulator, R Aggarwal, K Moorthy, J Hance, S Undre, A Darzi MD, Department of Surgical Oncology & Technology, Imperial College of Science, Technology & Medicine, St. Mary's Hospital, London, UK

Introduction: Efforts to validate laparoscopic virtual reality simulators have been limited, largely because of the difficulties of measuring such tasks. The ability to perform a task with poor image quality. Operating with a poor image on the monitor can lead to movement of the surgeon's hands and make the task more difficult and more time consuming. The aim of this study was to determine whether the virtual reality simulator LapSim provides a realistic training experience for laparoscopic suturing tasks.

Methods: Five expert (>100 laparoscopic sutures), five intermediate (10-100 sutures) and five novice surgeons (0 sutures) were recruited to the study. The real task was performed on a video trainer using standard instruments and suture material and assessed using Imperial College Surgical Assessment Device (ICSA D). A previously validated motion analysis system. This consists of an electromagnetic tracking device to record hand movement. The measurements were performed on the basis of the operator's hands. Custom-made software provides data on time taken and path length for each hand. LapSim simulates an intracorporeal suture, providing time taken and path length for each hand. Data analysis was carried out with Spearman's rank correlation coefficient and Kruskal-Wallis non-parametric test.

Results: There were significant correlations on performing intracorporeal sutures on the real and simulated tasks for time taken (r=0.676, p=0.011), path length for both hands (r=0.555, p=0.049) and for the right hand (r=0.577, p=0.039). Path length for the left hand did not reveal a significant correlation (r=0.440, p=0.133). Interestingly, differences in path length on the real and virtual tasks between the three groups of surgeons did not demonstrate construct validity.

Conclusion: This study has demonstrated the concurrent validity of performing intracorporeal sutures on LapSim. Furthermore, there is a lack of evidence to confirm construct validity of the simulator, suggesting that greater experience is not associated with improved skill. We suggest that concurrent validity should be the standard for further validation of virtual reality simulators.

Minimally Invasive Other

Quality Assessment of Light Guide Cables and Endoscopes in Dutch Hospitals, A Albyakir MSc, Y A Casseres MD,D W Meijer PhD,C Schot,C A Grimberg PhD,H J Bonjer PhD, Erasmus Medical Centre, Rotterdam, The Netherlands

Background: As tactile feedback and degree of freedom for instrument movement are restricted in laparoscopic surgery, the video image plays the most crucial role in giving the surgeon information about performance of the operation. Since this video image is the only visual interface between the surgeon and the operative field, a high image quality is required to perform safe endoscopic procedures. This image quality depends on several components of the imaging chain. Both light guide cables and endoscopes contain glass fibers to transmit light which makes them the most vulnerable components of this imaging chain. Defective light guide cables and endoscopes transmit less light which renders the operative field darker with a consequently loss of visual detail. An unclear image of the operative field predispose to surgical error which decreases quality and safety of the surgical intervention.

Evaluation of light guide cables and endoscopes is difficult because of the lack of objective standards for performance. The aim of this study is to assess the quality of light guide cables and endoscopes in Dutch hospitals and to develop safety guidelines.

Methods: To evaluate the quality of the light guide cables a digital lightmeter is used which gives the percentage intact fibers. A digital luxmeter was used for measuring the luminous intensity of the endoscopes. The optical light loss is measured by percentage of the light intensity on the distal tip of the endoscopes and that of the distal tip of the light guide cable. Light guide cables with less than 70% intact fibers and endoscopes with more than 50% light loss are considered as deficient.

Results: Of the 195 measured light guide cables, 126 (65%) had an intact fiber percentage between 70-100% and 69 (35%) had less than 70% intact fibers. Of the 126 tested endoscopes, 87 (69%) endoscopes had a light loss of more than 50% and 39 (31%) had less than 50% light loss.

Conclusion: The luminous intensity is one of the essential components of the imaging quality. The preliminary results show that the quality of light guide cables and endoscopes in Dutch hospitals are less optimal, which means that surgeons perform the procedure with poor image quality. Operating with a poor image quality predisposes to surgical error which puts the safety of the patient at risk. The results of this study provide a basis for developing quality maintenance programs for the hospitals concerning the light guide cable and endoscopes.
MINIMALLY INVASIVE OTHER

P324

LAPAROSCOPIC FIXATION OF INFRA-RENAL AORTIC ENDOGRAFTS: AN EXPERIMENTAL FEASIBILITY STUDY, Ahmad Assalai MD, Shafir Ellozy MD,Kazuuki Ueda MD,Tomasz Roguia MD,Wori Woo Kim MD,Michel Gagner MD, Mount Sinai Medical Center, New York, NY

INTRODUCTION: Migration of grafts for abdominal aortic aneurysm (AAA) exclusion is a recognized complication, leading to potentially serious consequences. The aim of the present study was to evaluate the feasibility and short to mid-term results of laparoscopic fixation of infra-renal aortic endografts with U-Clips®.

METHODS: Self-expandable endografts were placed through the femoral arteries in the infra-renal Aorta in 10 adult sheep (mean weight 24.7 Kg). A laparoscopic procedure using 4 trocars technique followed. With left lateral decubitus position, the infra-renal Aorta was exposed and under fluoroscopic guidance, 2-3 clips were used to fix the endograft to the arterial wall. The first 4 animals were included in an acute non-survival group and were immediately sacrificed and tested for the efficacy of clips application. The remaining 6 animals were followed for 4 months. Upon sacrifice, the endografts were tested for migration using fluoroscopy and the effectiveness of the clips application was evaluated.

RESULTS: All procedures were completed laparoscopically and no complications were seen. The mean length of the intervention was 82.9± 12.6 minutes and 58.6± 10.2 minutes for the vascular and the laparoscopic procedures respectively. The mean blood loss was 46.7± 12.5 ml. One clip in each group didn’t pass through the endograft accounting for 93% of clip application success rate (26/28). In the survival group, the inflammatory reaction around the clips was minimal and no migration was detected.

CONCLUSIONS: Laparoscopic fixation of Aortic endografts is feasible. The use of U-Clips® for this purpose may provide a short to mid-term stable fixation. Further studies are required for the long term evaluation of this procedure in the setting of AAA.

MINIMALLY INVASIVE OTHER

P325

PRACTICE PATTERNS FOR DVT PROPHYLAXIS IN ONTARIO GENERAL SURGEONS FOLLOWING MINIMAL ACCESS SURGERY, Richard Beekman MD, Forough Farrokyar PhD,Mark Crowther MD,Daniel W Birch MD, St Joseph’s Healthcare, McMaster University, Hamilton, Ontario, Canada.

Objectives: There are no comprehensive guidelines for deep vein thrombosis (DVT) prophylaxis in patients undergoing minimal access surgery (MAS). To determine current prophylaxis strategies in patients undergoing MAS we performed a cross-sectional survey. Methods: A cross-sectional survey of General Surgeons practicing in Ontario, Canada. Descriptive analysis is performed and chi-squared test is used for between group comparisons.

Results: Of 599 surveys, the response rate was 57.3% (343). 267 respondents have active General Surgery practices, with an average duration of practice of 15.4y. 64.6% of respondents practice outside of an academic center. For β1 minor cases or outpatient MAS, 73.8% of respondents would not consider DVT prophylaxis for laparoscopic cholecystectomy (LC) and 63.7% of respondents would not consider DVT prophylaxis for inguinal hernia repair (LIHR). Mechanical prophylaxis would be considered by 12.0% (LC) and 15.7% (LIHR) of surgeons, and pharmacological prophylaxis with heparin or low molecular weight heparin (LMWH) would be considered by 22.5% (LC) and 28.2% (LIHR) of surgeons. Surgeons in practice for ≤15y were more likely to offer DVT prophylaxis for LC (p=0.05), there was no significant difference when comparing academic or community surgeons (p=0.34).

DVT prophylaxis was considered for open cholecystectomy significantly more often than LC (p=0.002). In β1 major or inpatient MAS, 4.1% and 13.6% of respondents would not consider DVT prophylaxis for laparoscopic colorectal surgery (LCS) or splenectomy (LS), respectively. Mechanical prophylaxis would be considered by 7.9% (LCS) and 16.2% (LS) and pharmacological prophylaxis by 46.6% (LCS) and 21.5% (LS) of respondents. Combined mechanical and pharmacological prophylaxis would be considered by 42.3% (LCS) and 64.1% (LS) of surgeons. Pharmacological prophylaxis would be considered post-operatively by 4.9% (LCS), 11.4% (LIHR), 16.1% (LC) and 17.7% (LS) of respondents. LMWH would be considered by respondents in 4.0% (LC), 0.7% (LIHR), 10.1% (LC) and 8.7% (LS) of procedures. 13.9% of all respondents would consider continuing pharmacological DVT prophylaxis after discharging a patient from hospital.

Conclusions: There is substantial variability in the current practice of General Surgeons surveyed with respect to DVT prophylaxis for MAS. Considerable benefit may be derived from clinical trials that would provide data to clarify DVT prophylaxis guidelines in minor and major MAS procedures.

MINIMALLY INVASIVE OTHER

P326

CASE REPORT: SEPARATE LEFT THORACOABDOMINAL CAVITY BY LAPAROSCOPIC MESH IMPLANTATION, Yi-Chen Chang MD, Kuo-Hsin Chen MD, Department of Surgery, Far Eastern Memorial Hospital, Taipei, Taiwan

Objective: Endoscopic surgery can do more things when technology and technique advance. We describe a case of severe left side diaphragmatic elevation that had severe postprandial chest tightness. We use laparoscopy and fix marlex mesh by silk sutures and Protack to create a new septum between thoracic and abdominal cavity.

Methods: A 74 year-old male received left side pneumonectomy 30 years ago because of trauma. He was doing well until one year ago when he began to have postprandial chest tightness. Chest CT showed gastric bulb at left pleural cavity. Chest CT showed visceral organ herniated into left pleural cavity and compressed mediastinum. We tried laparoscopic approach. We use 10 mm, 30 ° telescope as usual. No remnant diaphragm was found. At first, the herniated organs were reduced. The esophagogastric junction and diaphragm cruises were identified. The marlex mesh was tailored to suitable size and then introduced into abdominal cavity. We fixed the mesh by 1-0 silk suture and Protack. The first fixed point was EG junction and diaphragmatic cruises followed by anteromedial aspect. Then the lateral corners were fixed by interrupted silk suture. We do 8 silk sutures totally and the remaining edges were fixed by pro-tack. Drain tube was placed in abdominal cavity.

Result: The patient’s symptom improve much after operation. However, he complained chest wall shooting pain sometimes when he did deep breathing. He was followed up for 6 months and no recurrence of hernia.

Conclusions: Absence of diaphragm is rare. We tried to create a new septum between thoracic and abdominal cavity by laparoscopic surgery. Short term result was satisfactory. But we are afraid that the tacks are not powerful enough to hold the mesh. Long term follow-up is necessary.

MINIMALLY INVASIVE OTHER

P327

LAPAROSCOPIC TOTALLY EXTRAPERITONEAL DRAINAGE OF AN EXTENSIVE PELVIC RETROPERITONEAL ABSCESS — CASE REPORT, Shih-Hong Huang PhD, Department of surgery, Far-Eastern Memorial Hospital, Taipei, Taiwan

Retroperitoneal abscess is usually treated with open drainage. However, large wound is usually necessary and wound complications are common. We report a 49 y/o woman who complained of left buttck pain and fever weeks after femoral central line insertion. Pelvic computed tomography revealed an extensive retroperitoneal abscess which involved the left psoas muscle, left retrorectal space and left gluteal region. To avoid large wound, laparoscopic totally extraperitoneal dissection was performed through a 1.5 cm incision at left flank and several different abscess spaces were identified. After drainage and saline irrigation, two drains were placed in the abscess cavities. The patient responded well to this procedure and fever subsided after the surgery. Subsequent pelvic CT scan 3 weeks after surgery revealed completely resolution of the abscess.

Laparoscopic totally extraperitoneal approach to the retroperitoneal abscess is feasible and allows drainage of extensive abscesses in different cavities. A large wound and its potential complications are avoided and sooner patient recovery could be expected.
MINIMALLY INVASIVE OTHER  P328

DOES FLUID IRRIGATION DURING LAPAROSCOPIC COMMON BILE DUCT EXPLORATION AFFECT CORE TEMPERATURE?  T. J. Chesworth BS, M. H. Thompson MD, N. Koehill, Department of Surgery, Southmead Hospital, Bristol, UK

INTRODUCTION: During Laparoscopic Common Bile Duct Exploration (LCBDE) large volumes of fluid are often used for bile duct irrigation to allow visualisation and clearance of the bile duct. Much of this fluid traverses the peritoneal cavity. This study was performed to examine the effect of this fluid irrigation on core temperature.

PATIENTS AND METHODS: Ten consecutive patients attending for laparoscopic bile duct exploration were included in the study (Group A). Core temperature was measured using a naso-pharyngeal thermometer from arrival in the operating room and at five-minute intervals thereafter. All patients were covered with a Bairhugger warming blanket. All fluid used for irrigation was 0.9% saline kept incubated at 37.0°C prior to use. The volume irrigated, and subsequently recovered via suction was measured to the nearest 50mLs. Volumes of CO2 used and total duration of pneumoperitoneum were also recorded. Ten patients attending for cholecystectomy alone were also included in the study as a comparative group (Group B).

RESULTS: There was no significant change in core body temperature during the procedure in either group. The mean fluid volume used for irrigation was 2640mLs (1000-5000) in Group A and 915mLs (400-1750) in Group B. The mean volume of fluid unaccounted for at the end of the procedure was 515mLs in Group A and 225mLs in Group B. Mean Gas Volume used was 163L in Group A and 73L in Group B. The mean duration of pneumoperitoneum was 121min in Group A and 66min in Group B.

CONCLUSION: The use of large volumes of fluid irrigating the peritoneal cavity during laparoscopic exploration of the common bile duct has no effect on core temperature. Measures currently in place are sufficient for maintenance of core temperature.

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DO IT YOURSELF: THE ANSWER TO AVOIDING ESOPHAGEAL INJURIES DURING BOUGIE DILATOR PASSAGE.  S. Cook MD, M. Tansey MD, D. Crawford MD, R. Josloff, University of Illinois at Chicago, College of Medicine at Peoria, Peoria, IL, USA and R. Josloff, M.D., Department of Surgery, Abington Memorial Hospital, Abington, PA, USA

AIMS: As the minimally invasive treatment of gastroesophageal reflux disease (GERD) has become more prevalent, so have its intraoperative and postoperative complications. The postoperative complication of prolonged (>8 weeks) dysphagia has prompted surgeons to assure their wrap is not too tight by performing it with a large (>50 French) bougie dilator in place. Perforation of the esophagus during bougie dilator passage is a well reported complication. This has led some surgeons to abandon sizing their wrap or to insist on another physician (Anesthesiologist) doing it as proposed to the nurse anesthetist. Another argument used against passing a bougie to size the wrap is that it is too time consuming. The authors feel that sizing the wrap is critical to a satisfactory outcome so they continued to use dilators but now do it themselves.

METHODS: To assess this technique, data were prospectively collected regarding: time required for bougie passage, number and size of dilators used, complications, and risk factors such as strictures, paraesophageal and large hiatal hernias that might predict a difficult passage.

RESULTS: Between March 1998 and April 2003, a total of 100 procedures for the treatment of GERD were performed at the study institutions. The mean procedure time was 182 (110-290) minutes, mean number of dilators used 2 (1-6), mean time required to pass dilators 7 (3-20) minutes. The maximum size dilator in place during creation of the fundoplication ranged from 48-60 French. There were no complications of perforation and three patients experienced prolonged (>8 weeks) dysphagia.

CONCLUSIONS: It is both safe and time efficient to pass your own bougie during minimally invasive antireflux procedures.
MINIMALLY INVASIVE OTHER
P332
LAPAROSCOPIC EXCISION OF A GIANT OMPHALOMENTERIC CYST ASSOCIATED WITH A MECKEL’S DIVERTICULUM, John H Eason MD, Fort Sanders Loudon Medical Center 1125 Grove Street Loudon, TN 37774
As surgeon’s become more experienced with laparoscopic technique, some consideration should be given to doing a procedure laparoscopically prior to almost any customarily open operation. A case is reported of the laparoscopic removal of a giant cyst containing 19.9 liters of a thick brown sterile fluid and the meckel’s diverticulum associated with the cyst in a 49 year-old male. This procedure was done using standard laparoscopic techniques, with 6 trocars. One of the trocar incisions was enlarged to a 3 cm incision in order to get the decompressed cyst out of the abdomen. This case demonstrates how the anterior anatomy of an omphalomesenteric duct malformation lends itself to laparoscopic excision. A review of the recent world literature reveals no omphalomesenteric cyst of this size, nor the laparoscopic excision of such a cyst.
Key Words: Laparoscopy
Omphalomesenteric duct malformation
Meckel’s diverticulum
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MINIMALLY INVASIVE OTHER
P333
SAFETY, PITFALLS AND EARLY COMPLICATIONS OF LAPAROSCOPIC VENTRAL HERNIA REPAIR, Sameh A Fayeck MD, Department of Surgery, Fairview Hospital, Cleveland Clinic Health System
Background: Ventral hernia repairs, particularly with large defects, are plagued by a significant incidence of recurrence and frequent wound infections. Laparoscopic ventral hernia repair (LVHR) potentially offers a minimally invasive, tension-free technique with less morbidity and fewer recurrences [1]. This study addresses safety, technical pitfalls and early complications associated with LVHR.
Methods: Clinical data of patients undergoing LVHR at a large community teaching hospital were collected and analyzed for intraoperative and early postoperative complications.
Results: Thirty-six patients had 41 hernias. Sixteen women and 20 men with a mean age of 60 years (36-78) and a mean BMI of 33 (24-44) underwent LVHR. There were 27 incisional, 7 recurrent incisional, 6 primary and 1iatrogenic hernias. Mean operative time was 2 hours (1-4). Mean hospital stay was 2.4 days (1-10). Two cases underwent concomitant procedures. Two cases (5.5%) were converted to an open procedure. Open re-exploration was required in another 2 cases (5.5%). Complications included 3 cases (8.3%) of bowel injury, 22 cases (68.7%) with wound morbidity including 17 seromas, 4 hematomas, 2 infections and 2 with wound discharge. None of the wound complications needed operative intervention. Pain was the most common reason delaying patient discharge. Mean follow up time was 2 months (2 weeks-9 months) with 2 (7.14%) recurrences.
Conclusions: LVHR is safe, however, rarely it may be associated with significant morbidity, in part preventable by proper patient selection especially in early cases, plus the use of meticulous technique and liberal conversions. The justification for LVHR is that it generally allows proper repair of all defects, without long incision or extensive abdominal wall dissection. Although wound morbidity seems common, most are minor and resolve spontaneously.

MINIMALLY INVASIVE OTHER
P334
SINGLE TROCAR LAPAROSCOPIC ASSISTED PLACEMENT OF CNS-PERITONEAL SHUNT, David Ferraro MD, Pavlos K Papasavas MD, Daniel J Gagne MD, David Goitein MD,Bruce Wilder MD,Philip F Caushaj MD, The Western Pennsylvania Hospital, Pittsburgh, PA.
Introduction: Lumbar- and Ventriculovenous Peritoneal Shunts (LPS, VPS) are used in the management of hydrocephalus. In the past, the abdominal portion of these procedures required a mini-laparotomy. We report our experience with laparoscopic-assisted placement of the distal catheter.
Technique: 9 patients (4 male; 5 female) with a mean age of 56 years (range 30-78 years) underwent 9 procedures (6 LPS, 2 VPS and one meningo(myelo)cele-peritoneal shunt). The abdominal portion of the procedure was performed using one 5 mm trocar for the insertion of a laparoscopic camera and a disposable 10 Fr introducer for catheter insertion using the Seldinger technique. These access punctures did not require fascial closure and caused minimal pain and limitation. Abdominal insufflation was initiated immediately after cerebrospinal fluid drainage was achieved, thus avoiding any possible deleterious effects of the pneumoperitoneum on intracranial pressure. No intra- or post-operative complications were encountered.
Conclusions: Single-trocar laparoscopic assisted placement of CNS-peritoneal shunts is a safe, simple and inexpensive method and should be considered the procedure of choice. This technique is also suitable for repositioning of migrated catheters and other necessary catheter tip manipulations.

MINIMALLY INVASIVE OTHER
P335
LITHOTOMY VS SUPINE POSITION FOR LAPAROSCOPIC ADVANCED SURGERIES, Eldo E Frezza MD, Bernard Barraghan, MD, Texas Tech University Health Sciences Center
Introduction: Laparoscopic advanced surgery has been taught in many American institutions. Proctoring for the laparoscopic technique was done, initially, by European surgeons and therefore, the lithotomy position was suggested as the preferred approach. Many American and now European surgeons have adopted the supine position. In this abstract, we would like to support the supine position. In this abstract, we would like to support the supine position.
History: Laparoscopy initially entered the clinical realm in the field of gynecology. Albert Decker, from Knickerbocker and Gouverneur Hospital in New York, performed culdoscopy as early as 1928. This was done in the “knee-chest” position without the use of pneumoperitoneum. Raoul Palmer, from Hospital Broca in Paris, popularized “colposcopie,” utilizing pneumoperitoneum with the patient in the lithotomy position. From here, laparoscopy advanced in Europe to the general surgery arena. As a result, patient positioning for laparoscopic procedures in Europe tends to be done in what is now referred to as the “French” position (i.e. lithotomy). Many of these procedures are modified to a side approach, or “American” position, when performed in the United States.
Discussion: According to a recent study at Emory University, there is a clear association between the dorsal lithotomy position and the development of postoperative compartment syndrome. Compartment syndrome occurs when elevated pressure in an osteofascial compartment compromises local perfusion, and often results in neurovascular damage and permanent disability. Many centers have adopted the lithotomy position for their laparoscopic advanced procedure. At our institution, we prefer all procedures be performed in the “American” position (patient supine and the surgeon at the side of the patient), since this resembles the position used for other open surgeries. The advantages to this approach would be to eliminate the risks associated with placement of the patient in the lithotomy position. We will illustrate patient position, trochar placement, and ergonomics of operating room personnel with the patient in the American position versus the French position, and their respective risks and benefits.
POSTOPERATIVE PHRENIC NERVE PALSY, LAPAROSCOPIC DIAPHRAGMATIC PLICATION FOR MINIMALLY INVASIVE OTHER P337

This study demonstrates a novel minimally invasive technique for treatment of phrenic nerve injury presenting with symptomatic elevation of the diaphragm after cardiothoracic surgery (n = 3) and after laparoscopic fundoplication (n = 1). It also presents long- and short-term results of 4 patients treated with this operation between 6/1994 and 1/2003.

Methods: Cholecystectomy was performed first left diaphragm in all patients. Patient 1 and 4 suffered from progressive dyspnea caused by increasing left-sided diaphragmatic elevation and underwent surgery two years after cardiac surgery (patient 1) and 4 months after lap. Nissen (patient 4). Patient 2 and 3 required treatment due to prolonged respirator therapy/assisted ventilation for 4 weeks after cardiac surgery. In all cases, a minimal invasive abdominal approach was chosen. During surgery the diaphragm was pulled down via three percutaneously inserted retention stitches. This resulted in two or three folds of the diaphragm with a volume reduction of about 2-fold (p<0.05) compared to controls. Further, permanent adhesion of leukocytes (number of stickers) in postinsudosal venules and the number of rolling leukocytes in sinusoids increased from 434 +/-51 /mm2 and 345 +/- 15 /mm2 to 399 +/-86 /mm2 and 34+/-18 /mm2 (p<0.05), respectively. Moreover, blood flow was reduced in venules to about 20% of controls from 313,5+/-81 mm3/sec to 62+/-12 mm3/sec (p=0.015) while phagocytosis of fluorescent latex beads (1 µm) by Kupffer cells increased about 2.5-fold (p<0.05) indicating their activation.

These results demonstrate that pneumoperitoneum disturbs the hepatic microcirculation most likely via mechanisms including activated Kupffer cells which induce injury in both the later graft and the remnant liver tissue.

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Changes in Respiratory Mechanics Influenced of Pneumoperitoneum and Patient Positioning, Michihiro Kawada MD, Hideo Yamada PhD, Juri Kondo MD, Hofu institute of gastroenterology, Yamaguchi, Japan

Study Object: To evaluate the effect of pneumoperitoneum and patient positioning during laparoscopic surgery on respiratory mechanics.

Design: Prospective, single blind trial

Patients: 20 patients of ASA 1 were scheduled for general laparoscopic surgery.

Interventions: GOS anesthesia was performed. After induction of anesthesia and orotracheal intubation, the lungs were ventilated and maintained mechanically. The tidal volume and ventilator frequency were kept unchanged throughout operation. Gas mixture oxygen and N2O 1.1 were used without positive end expiratory pressure. The dynamic compliance (Cdyn) was monitored with CATO respiratory system.

Measurements: Measurements were made in three intervals: “a” after creation of pneumoperitoneum with an intraabdominal pressure (IAP) of 10mmHg, “b” 10mmHg pneumoperitoneum in the head-down position of 8 degree, “c” 10mmHg pneumoperitoneum in the head-up position of 8 degree. The blood pressure (BP), heart rate (HR), saturation (SAT) and PCO2 were monitored.

Main Results: During all intervals, BP, HR, Sat and PCO2 were altered. The Cdyn decreased by 15.08% in “a”, by 17.99% in “b” and by 15.7% in “c”.

Conclusions: We conclude that there are not clinically important changes in respiratory mechanics affected by the pneumoperitoneum at 10mmHg and patient positioning of +8-8 degree.
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BILIARY CASTOTOMY: THINK OUT OF THE BOX,
Kourosh Kojouri MD, Paramjit Chopra MD, Howard Sankary MD, Rush - Presbyterian St. Luke's Medical Center AND University of Illinois at Chicago

Biliary cast formation is a notorious complication after liver transplantation. Unlike biliary sludge this is a solid rubbery material which causes biliary tract obstruction. If conventional percutaneous measures fail, open surgical removal of the cast is indicated to prevent recurrent cholangitis and gradual loss of graft function. We describe a liver graft recipient who developed biliary cast shortly after transplantation. His biliary reconstruction was with roux-en-y hepaticojejunostomy. The cast was growing in size and was resistant to all percutaneous measures used. Patient had multiple hospitalizations for cholangitis and developed resistant enterococcal infection.

As a rescue attempt before open surgery a Simpson's endarterectomy catheter was used. This is originally designed for shaving intravascular atheromatous plaques. The catheter was introduced through the percutaneous biliary drain tract and the cast was sliced in thin layers using the device's lateral blade. These small pieces were flushed into the bowel or removed by balloon extraction under fluoroscopy guidance. Patient responded well to the treatment and 9 months later he is still free of cholangitis with no further hospitalization.

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NEEDLESCOPIC APPENDECTOMY, Fumito Kuranishi PhD, Yoshinori Kuroda PhD, Yuzou Okamoto PhD, Toyota Kazuhiro PhD, Masahiro Nakahara PhD, Shuichi Wada PhD, Yuji Takakura, Manabu Shimomura, Masataka Banshoudani, Onomichi General Hospital

(INTRODUCTION) The merit of laparoscopic appendectomy is still not clear. In our hospital we have introduced laparoscopic appendectomy from 1996. At first we have tried three trocar method (Group A: trocar size 12, 12, 5). To perform minimally invasive surgery, we have introduced needlescopic appendectomy (Group B: trocar size 12, 3, 3). We compared Group A and B. We report the detail about it.

(METHOD) Laparoscopic appendectomy was performed by three trocar method under pneumoperitoneum (6 mmHg, 6 liter/min). Needlescopic appendectomy was performed 3 mm apparatus and 3 mm scope. 3 mm scope was used only to appendix by ENDO GIA. Group A was performed 40 cases, Group B was performed 14 cases. We compared several aspects of both Groups.

(RESULT) About post operative pain from standpoint of analgesics, there was no difference (Group A: 3.75 times, Group B: 3.28 times, p value=0.43). Oral intake, first flatus and post operative complication was not significant between both Groups. As for cosmetic outcome needlescopic appendectomy was a little bit better than laparoscopic appendectomy.

(CONCLUSION) This is not randomized but historical study. Our hospital is situated in rural city. Most operation was carried out as an emergency operation. Therefore randomization was impossible. The merit of needlescopic appendectomy was shortening of hospitalization.

MINIMALLY INVASIVE OTHER  P342

TECHNIQUES FOR LAPAROSCOPIC RESECTION OF RARE NEUROGENIC TUMORS OF THE RETROPERITONEUM, Kenneth A Larson MD, Frank Borao MD, Monmouth Medical Center

Introduction

Collectively, the rare neurogenic tumors of the retroperitoneum possess several features favoring a laparoscopic approach to resection. Most are clinically benign tumors that may nonetheless cause local or systemic symptomatology due to mass effect or occasionally due to intrinsic endocrinologic activity. These tumors do not typically invade adjacent structures. It is not necessary to obtain wide surgical margins. Due to their typical postero-medial retroperitoneal location, resection of these tumors using open surgical technique often requires a large incision with attendant morbidity.

Methods

We present cases illustrating two techniques for laparoscopic resection of these tumors. In one case an aortic ganglioneuroma is resected using hand-assisted laparoscopy and in another case a neurilemmoma (Schwannoma) is resected using totally laparoscopic technique. In both situations recovery is rapid and lasting symptom control is achieved.

Conclusion

Benign rare neurogenic tumors located in the retroperitoneum can be safely resected laparoscopically.

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LAPAROSCOPIC RESECTION OF AN INTERNAL IliAC ARTERY ANEURYSM, Eung Kook Kim MD, Sang Kuon Lee MD, Department of Surgery, St. Mary's Hospital, The Catholic University of Korea

Isolated internal iliac artery aneurysms are rare, but they are associated with significant morbidity and mortality. Surgical management is warranted when they are greater than 3.0 cm in diameter because when ruptured, mortality of 58% is reported. Traditionally, surgical treatment consisted of proximal ligation, combination of resection and grafting, distal revascularization or oblitative endoaneurysmorraphy, being this last one, the method of choice. However, the role of minimally invasive methods, such as the radiologically guided embolization recently gained popularity. However, laparoscopic resection is a good alternative to the open and interventional methods because it is minimally invasive, while the mass effect of the aneurysm is completely eliminated. We performed a successful laparoscopic resection of an isolated internal iliac artery aneurysm in a 69-year old male patient who presented with a retroperitoneal tumor of 4.0 cm in diameter. The patient had an uneventful recovery and was discharged from hospital on postoperative day 3. In a follow-up period of 12 months, he is doing well without evidence of any complication. We believe that this might be the first successful laparoscopic attempt in a patient with internal iliac artery aneurysm in the literature.
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P344  

COMPARISON OF VARIOUS ASPECTS OF COST DIFFERENCE BETWEEN LAPAROSCOPIC AND OPEN SURGERY IN UNILATERAL ABDOMINAL AND BILATERAL INGUINAL HERNIA REPAIR, J Liauw MS, J So MS, W K Cheng MS, Davide Lomanto PhD, Minimally Invasive Surgical Centre, Department of Surgery, National University Hospital, Singapore  

Introduction: To compare various aspects of cost difference between laparoscopic and open surgery for unilateral adrenalectomy and bilateral inguinal hernia repair.  

Methods: Data collected retrospectively from hospital bills of patients who had undergone laparoscopic surgery and patients who had the same operation by open approach between 1998 and 2003. Data analyzed as average intraoperative time, clinic visits, medical consumables, room charges and length of hospital stay and theatre facility charges.  

Results: 16 laparoscopic adrenalectomy patients were compared with 13 patients who had undergone open surgery. There were no significant difference in total cost (p<0.47), or theatre facility charges (p<0.52). However, the cost for consumables were significantly higher in the laparoscopic surgery group (p<0.0069) but the room charges and length of hospital stay were significantly less (p<0.0025) and (p<0.0035) respectively. The consumables made up about 16.4% of the total laparoscopic bill but only 3.3% in the open group.  

30 patients underwent bilateral inguinal hernia repair laparoscopically and 19 underwent mesh repair. There were no significant differences in total charges (p<0.10) or theatre facility charges (p<0.57). The consumables used were more expensive in the laparoscopic group (p<0.001) but the converse was true for room charges (p<0.032); length of stay is similarly significantly less (p<0.033). Laparoscopic consumables made up 24.2% of the total bill but this was only 6.2% in the open hernia repair group.  

Conclusion: There is no significant difference in total cost between laparoscopic and open surgery in either adrenalectomy or bilateral inguinal hernia repair in our unit. The cost benefit gained from shorter hospital stay is offset by the high equipment costs. If efforts are focused at reducing the cost of consumables, laparoscopic procedures can be made more cost effective with the potential of wider acceptance and will ultimately benefit more patients.

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A BENCH MODEL COMPARISON OF THE PERPENDICULAR AND AXIAL HOLDING STRENGTHS OF FIVE COMMERICALLY AVAILABLE LAPAROSCOPIC CLIPS, D A McClusky, III MD, R Gonzalez MD, K R Van Sickle MD, B J Ramshaw MD, Endosurgery Unit, Emory Univ. Hosp, Atlanta, GA.  

Background: Excessive bleeding, bile leakage, and re-operation are all potential consequences of clip dislodgement during and after laparoscopic surgery. A clip with superior holding strength is ideal in this setting as it is less likely to dislodge over the course of a procedure. The aim of this study was to compare the holding strength of five available laparoscopic clips.  

Methods: Five different clips were tested in two separate bench-top experiments: two 10 mm crush clips (US SSC), a 5 mm closed bias spring clip (Surgicon, Stratford, CT), Ethicon Endo-Surgery, Cincinnati, OH), a 5 mm crush clip (US SSC), a 5 mm suture spring clip (Ethicon), and a 5 mm closed bias spring clip (Surgicron, Stratford, CT). In the first experiment, 30 sets from each of the five clip types were randomly placed on three sets of tubing (0.125 inch outer diameter (O.D.) latex, 0.078 in. O.D., silastic, 0.030 in. O.D. silastic). Subsequently, loops of 2-0 nylon, held in the clip’s inner corner during application, were pulled perpendicularly by an IMADA DPS-11 digital force gauge (IMADA, Northbrook, IL). To test axial pull-off strength, 20 application, were pulled perpendicularly by an IMADA DPS-11 digital force gauge (IMADA, Northbrook, IL). To test axial pull-off strength, 20

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BRONCHOGENIC CYST OF THE GASTRIC FUNDUS PRESENTING AS A GASTROINTESTINAL STROMAL TUMOR: A CASE REPORT, Nicholas Melo MD, Martha B Pitman MD, David W Rattiner MD, Massachusetts General Hospital, Department of Surgery, Department of Pathology, Harvard Medical School.  

GIST tumors of the stomach are being recognized with increasing frequency. The diagnosis is usually made on the basis of CT appearance, and excision is recommended for GIST tumors larger than 5 cm. We report a 39 year old woman referred for resection of a presumed GIST tumor of the gastric fundus diagnosed by CT scan and UGI series. A laparoscopic resection was performed, but upon pathologic examination the mass proved to be a bronchogenic duplication cyst of the stomach. Bronchogenic and esophageal duplication cysts usually arise in the chest or mediastinum. On rare occasions bronchogenic cysts may lose their connection to the tracheobronchial tree and migrate to a subcutaneous position in the neck or descend into the retroperitoneum. The importance of this case is that it demonstrates a rare yet essential component to the differential diagnosis of lesions of the stomach.

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LAPAROSCOPIC OMENTECTOMY FOR SALVAGE OF PERITONEAL DIALYSIS CATHETERS, Christopher J Mutrie MD, Michael Goldstein MD, Leonard Stern MD, John C Lantis MD, Division of Vascular Surgery, Presbyterian Hospital of New York, Columbia-Presbyterian Medical Center, New York, NY, USA.  

I. Background: Chronic peritoneal dialysis (PD) is used as renal replacement therapy (RRT) in over 115,000 patients world-wide and 30,000 patients in the United States. These figures are projected to double by 2010. Few studies have examined the role of laparoscopic omentectomy for the salvage of obstructed PD catheters. We present four cases and review the literature.  

II. Methods: Operative reports and discharge summaries were reviewed. The indication for procedure was sudden obstruction of dialysate subsequent to placement. In all cases, the abdomen was entered through an open infraumbilical 1 cm incision, followed by bilateral upper quadrant 5 mm incisions. Utilizing a harmonic scalpel and 5 mm laparoscope, a total omentectomy was performed along the transverse colic and gastric attachments. Fascia was closed separately with figure of eight 2-0 prolene sutures.

III. Conclusion: A review of the literature revealed an 88 percent success rate (29/33) at an average of 8 months. Among our institution’s four patients, there were no catheter failures after an average of 18 months. The two catheters removed were functioning at the time of removal. Our report constitutes the longest follow-up reported in the reported literature. These results support our belief that using the harmonic scalpel and strict fascial closure is a valuable adjunct to maintenance of PD catheter function.

Summary of PD Catheter Function

<table>
<thead>
<tr>
<th>Patient</th>
<th>Follow-up (mos)</th>
<th>Failure</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>None</td>
<td>Functioning</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
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</tr>
<tr>
<td>3</td>
<td>23</td>
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</tr>
<tr>
<td>4</td>
<td>28</td>
<td>None</td>
<td>perforlons*</td>
</tr>
<tr>
<td>Average</td>
<td>16</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

* cause of removal

Conclusion: The Surgicron closed-bias spring clip exhibited superior perpendicular and axial pull-off strengths in two bench analysis models. Although this is an adequate model for direct clip comparison, clinical correlation with animate tissue is still required.
MINIMALLY INVASIVE OTHER

P348
HOW TO BUILD YOUR OWN LAPAROSCOPIC TRAINER, Marc A Neff MD, Crozer-Chester Medical Center

The application of laparoscopic surgery has far exceeded the imagination of those pioneering surgeons in the early 1980’s and 1990’s with just about every procedure known to be performed open, being attempted or performed in a minimally invasive fashion. The limit has not been the surgeon’s imagination however, nor has it been patient interest. The limit has been the surgeon’s ability to perform complicated and advanced laparoscopic skills. These skills cannot be acquired during a “live” operation. These skills require practice. That practice doesn’t begin with an animal lab; it begins with exercises on a laparoscopic trainer.

Several techniques/designs for building a home/office laparoscopic trainer will be presented. These will be compared to trainers currently available from various surgical supply companies. The first trainer took under an hour to complete using a household video camera, an inexpensive TV, a UPS box, and several disposable instruments “borrowed” from a friendly instrument rep. Cost and time data for several “designs” will be presented.

MINIMALLY INVASIVE OTHER

P349
UTILIZATION OF LAPAROSCOPIC CHOLECYSTECTOMY FOR CHOLELITHIASIS AND ACUTE CHOLECYSTITIS IN THE LAPAROSCOPIC ERA, Mahbod Paya MD, C. M Stevens BS, Kambiz Zainabadi MD, Ninh T Nguyen MD, University of California, Irvine Medical Center

Laparoscopic cholecystectomy is the preferred approach for management of cholelithiasis and chronic/acute cholecystitis. This study characterized the utilization of laparoscopic vs open cholecystectomy at academic centers.

Clinical data of patients with cholelithiasis, chronic or acute cholecystitis who underwent cholecystectomies from 1999-2002 were obtained from the University HealthSystem Consortium. This database contains data from all major teaching hospitals in the US. The data were reviewed for demographics, number of procedures performed by laparoscopy and open cholecystectomy, mortality rates, and expected (risk-adjusted) vs. observed in-hospital mortality.

A total of 46,867 cholecystectomies were performed at 126 institutions; 30% were male and 57% were Caucasian. Cholecystectomy was performed for cholelithiasis or chronic cholecystitis in 60% and for acute cholecystitis in 40% of patients. The percentage of cases performed by laparoscopy was 83% for cholelithiasis or chronic cholecystitis and 67% for acute cholecystitis.

<table>
<thead>
<tr>
<th>Cholecystitis</th>
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<th>Cholecystitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lap (N)</td>
<td>Open (N)</td>
<td>Lap (N)</td>
<td>Open (N)</td>
</tr>
<tr>
<td>obs vs exp mort</td>
<td>obs vs exp mort</td>
<td>obs vs exp mort</td>
<td>obs vs exp mort</td>
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<tr>
<td>23.255</td>
<td>4.794</td>
<td>12.705</td>
<td>6.113</td>
</tr>
<tr>
<td>0.15% vs 0.24*</td>
<td>0.71% vs 1.32*</td>
<td>0.35% vs 0.26</td>
<td>1.44% vs 1.52*</td>
</tr>
<tr>
<td>*p&lt;0.05; observed vs expected mortality</td>
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</table>

The number of laparoscopic cholecystectomies performed for chronic cholecystitis or cholelithiasis was four-fold greater than the number of open cholecystectomies. The number of laparoscopic cholecystectomies performed for acute cholecystitis was two-fold greater than the number of open cholecystectomies. In the laparoscopic era, open cholecystectomy is reserved for high-risk patients.

NEW TECHNIQUES/TECHNOLOGY

P350
UTILIZATION OF LAPAROSCOPIC ANTIREFLUX SURGERY FOR GASTROESOPHAGEAL REFLUX, Jeffrey Root BS, Mahbod Paya MD, Melinda Stevens BS, Ninh T Nguyen MD, University of California, Irvine Medical Center

Laparoscopic antireflux surgery is now the preferred approach for management of gastroesophageal reflux. This study examined annual trends in the use of laparoscopic antireflux surgery from 1998-2001.

Clinical data of 111,849 adult patients with gastroesophageal reflux who underwent an antireflux operation were obtained from the Healthcare Cost and Utilization Project. This database contains in-hospital data from an approximate 20% stratified sample of U.S. community hospitals. Data were recorded using ICD-9-CM codes to identify all hospitalizations during which an antireflux procedure was performed on adults. The data were reviewed for demographic, number of antireflux procedures performed yearly, percentage of laparoscopic cases, hospital charges, and in-hospital mortality. We also applied sampling weights and the U.S. Census data to calculate the population-based rates of antireflux procedures for each year.

The population-based rate of antireflux surgery showed a plateau at 13-14 procedures annually per 100,000 adults from 1998-2001. During this period, hospital charges increased while length of stay and in-hospital mortality remained stable. The percentage of laparoscopic antireflux procedures peaked at 76% in 2001.

NEW TECHNIQUES/TECHNOLOGY

P351
THE USE OF A “HYBRID” TRAINER IN AN ESTABLISHED LAPAROSCOPIC SKILL DEVELOPMENT PROGRAM, James C Rosser Jr. MD, Brian Colsant BS, Nick Gabriel DO, Liza Eden Giammaria MD, Beth Israel Medical Center, University Hospital and Manhattan Campus for the Albert Einstein College of Medicine

Introduction: Tablettop inanimate trainers have been the mainstay of skill acquisition in the laparoscopic environment. They have proven to be safe, inexpensive, and offer easy deploy ability for convenient practice opportunities. The use of time as the main measure of excellence has been a shortcoming. Errors when recorded are mainly subjectively based. The second group of trainers is virtual reality simulators. These devices have more objective data generation capability. They can dynamically set parameters and evaluate economy of motion. But, these appliances still represent a technology in its infancy. The lack of haptic feedback, optimal instrument pathway evaluation, expense, reliability and realism deficiencies are a few of the areas in need of improvement. There is a need for a new generation of “hybrid” inanimate trainers that combines the strengths of both systems. This study reviews a “hybrid” device, the Gabriel-Rosser Inanimate Proctor(GRIP) and its initial performance in an established skill development program.

Methods: A device was designed around the Rosser Laparoscopic Skill Trainer and the Bean Drop drill, 22.6% with the Terrible Triangle drill, and 36.7% with the Burst Drill drill. The performance of surgeons that had previously taken the course. The participants in the course collectively scored in the 18.3% with the Bean Drop drill, 22.6% with the Terrible Triangle drill, and 36.7% with the Burst Drill drill.

Results: The data was taken from six courses given from July 2001 to June 2003. There were a total of 171 participants. Seventy-four participants had data captured within the course regulation. Twenty-nine were tested with inaccuracy and breaching of the rules of the task. A buzzer and flashing light serve as a proctor to alert the student to inaccuracy and breaching of the rules of the task.
New Techniques/Technology

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LAPAROSCOPIC RESECTION OF PRESACRAL SCHWANNOMAS, K Konstantinidis MD, M Voriais MD, G Sabalis MD, M Georgiou MD, K Anastassakou MD, G Theodoropoulos MD, Department of General and Laparoscopic Surgery, Athens Medical Center, Athens, Greece

Presacral (retrorectal) tumors are particularly rare in the adult. Schwannomas (neurilemmomas) are neurogenic neoplasms, rarely occurring in the retroperitoneum and pelvis, usually characterized by vague or, even, absent symptomatology. Those tumors have traditionally been treated at laparotomy, which might present operative difficulties due to poor visualization and limited access in a narrow pelvis. Presented herein are the cases of two female patients, aged 40 and 46 years, who were referred with chronic, progressively worsening dull pelvic pain and pressure sensation, exacerbated at defecation. Thorough work-up, including magnetic resonance imaging (MRI), led to the discovery of two similar space-occupying, extraperitoneal, presacral- left pararectal masses which were pushing without invading the rectum and the internal genital organs. Under general endotracheal anesthesia, a 10-mm trocar, for the introduction of the 30 degree laparoscope, was inserted subumbilically using the open Hasson technique. Three 5-mm trocars were also used suprapubically at the right and left iliac fossa. The left lateral avascular attachments of the rectosigmoid were divided and, following division of the posterior peritoneal reflection, the retrorectal space was entered. Mobilization of the upper and mid-rectum was done between the rectal fascia propria and the Waldeyer’s retrorectal fascia. The masses were visualized and dissected carefully free, with special attention to the nervous and presacral venous plexuses. They were removed after extension of the suprapubic trocar site. The patients had excellent recovery. Histopathology confirmed the presence of schwannomas without evidence of malignancy. Laparoscopy is a safe and efficient option in approaching benign pelvic tumors and might offer the advantage of better visualization of structures due to the magnification of laparoscopic view, especially in narrow anatomical spaces. Four cases of retroperitoneal and one case of pelvic schwannomas, managed successfully by minimally invasive surgery, also exist in the international literature.

New Techniques/Technology

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LAPAROSCOPIC CHOLECYSTECTOMY: EXPERIENCE IN A SINGLE CENTER, Kostas Tsalis PhD, Emmanouil Zacharakis MD, Nikolaos Sapidis MD, Ioannis Lambrou MD, Emmanouil Christoforidis PhD, Dimitrios Botsios PhD, Dimitrios Betis PhD, 4th Department of Surgery, Aristotle University of Thessaloniki, Greece

INTRODUCTION: The aim of this study is to demonstrate the results after laparoscopic approach for cholecystectomy, performed in a single center.

MATERIALS AND METHODS: From 1992 to 2002, 742 patients underwent laparoscopic cholecystectomy in our Department. They comprised 460 women and 282 men with mean age 50.1 (24-76) years.

The laparoscopic approach was applied to patients with symptomatic cholelithiasis confirmed by ultrasound without common duct stones.

RESULTS: Eleven patients (1.5%) required conversion to open cholecystectomy; 6 had severe cholecystitis with dense intra-abdominal adhesions and unclear anatomy, 4 intra-operative bleeding and 1 procedure was converted due to iatrogenic perforation of right colic flexure. The overall mortality was 0%. The morbidity reached 1.2 % as minor or major complications were present in 9 out of 742 patients. Complications consisted of a common hepatic duct injury, which was treated with excision of the damaged duct and Roux-en-Y hepaticojejunostomy. Two patients presented mild bile leakage which subsided within two weeks. Two patients presented bleeding immediately after the operation, which was treated with re-operation in both of them, as accidental injury of the mesentery vessels in one case and bleeding from a trocar site in the second had occurred. Two patients presented superficial thrombophlebitis in the early post-operative period. One patient experienced fever in the sixth post-operative day due to sub-hepatic abscess formation and percutaneous ultrasound drainage was adequate treatment in this case. Finally, one patient suffered from intracapsular hematoma formation in the post-operative period which was treated conservatively.

The mean operation time was 45 min, while the median post-operative hospital stay was 1.9 (17) days.

CONCLUSION: Laparoscopic cholecystectomy is a safe procedure as it is accompanied by low morbidity. Properly trained laparoscopic surgeons with adequate experience in open biliary surgery is essential, in order the complication rates to be maintained low.

New Techniques/Technology

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LAPAROSCOPIC APPENDICECTOMY DURING THIRD TRIMESTER PREGNANCY, W. Matthew Vassy MD, Gregory J Mancini MD, Matthew L Mancini MD, The University of Tennessee Medical Center, Knoxville, Tennessee

Acute appendicitis is a common surgical emergency during pregnancy. Although acute appendicitis is commonly managed laparoscopically in the non-pregnant patient, concerns for uterine damage, preterm labor, and difficult visualization due to uterine size have prevented this method from becoming the standard of care for the pregnant patient. Laparoscopic procedures have been performed during all three trimesters, but become increasingly difficult during the third trimester due to the large gravid uterus. We describe a laparoscopic appendectomy technique tailored to overcome the anatomic difficulties present during late pregnancy, including safe trocar placement. Several case reports of our successful use of this technique as well as pertinent literature are presented.

New Techniques/Technology

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ROBOTIC THYMOMECTOMY WITH ZEUS IN A PIG MODEL, David W Quick PhD, Chris Johnson BS, Margaret Rankin BS, Tracy Weigel MD, University of Wisconsin

ROBOTIC THYMOMECTOMY WITH ZEUS? IN A PIG MODEL, David Quick Ph.D., Chris Johnson B.S., Margaret Rankin B.S., Tracy Weigel M.D., University of Wisconsin, Madison, Wisconsin.

Background: During the 1990’s thoracoscopic revolutionized surgical resection by providing the benefits of minimally invasive surgery. Having previously used robotics to perform lung resection in a pig, we are now evaluating the efficacy of performing thymus resection. We hypothesize that the same benefits seen in robotic lung resection, namely the advantages of minimal invasion and the highly precise and stable characteristics of surgical robotics, will also prove beneficial for thymectomy. As such, the goal of this study is to demonstrate the feasibility of using the Zeus? surgical robotics system (Computer Motion Inc., Goleta, CA) to perform thoracoscopic thymectomy in a pig model.

Methods: Five pigs underwent robotic thymectomy. Of these 5 pigs, 3 were utilized to evaluate different port placements, pig weights, instrumentation, and other variables to determine the optimal experiment set-up. Based on those 3 animals, 2 pigs underwent the following protocol.

Two pigs (60 kg) were anesthetized and placed supine. Two 5 mm thoracoscopic ports were placed in the left chest wall to insert a robotic grasper and a J-hook electrocautery. A third 5 mm port was placed median and between the two instrument ports for insertion of a 5 mm 30 degree endoscope to be held by the robot. The Zeus? surgical robotics system was then set-up and isolated right lung ventilation initiated. The thymus was then resected and removed through an instrument port after being sectioned.

Results: Three pigs were utilized to determine the optimal experimental set-up. In 1 of 2 subsequent animals, thymectomy was completed in approximately 90 minutes. Blood loss was minimal and the procedure was completed totally endoscopically through the three ports.

Conclusion: Robotic thymectomy with Zeus? is feasible. The robot allowed for precise dissection as well as excellent visualization. However, the pig is not an ideal model due to their narrow chest.
NEW TECHNIQUES/TECHNOLOGY
MINIMALLY INVASIVE APPROACH TO SMALL BOWEL CARCINOID, Oliver C Whipple MD, Steven T Brower MD, Memorial Health University Medical Center, Savannah, Georgia
The surgical management of small bowel carcinoid encompasses three major areas of focus: resection of the primary tumor, evaluation and resection of regional lymph nodes, and treatment of hepatic metastatic disease. We describe the effective treatment of these disease stages using various minimally invasive techniques. The histopathology of carcinoid tumors often leads to presentation with scirrhous bulky extension into the mesentery requiring small bowel resection and lymphadenectomy. In addition, progression of disease and palliation of carcinoid syndrome may require resection and or ablation of hepatic metastases. To effectively treat this disease laparoscopically, the surgeon must be able to utilize multiple laparoscopic modalities. In this series of twelve patients, small bowel carcinoid presented at various stages of progression. Laparoscopic sentinel lymph node biopsy was used to evaluate early disease for nodal involvement with surprising results, hand assisted laparoscopy was used to perform lymphadenectomy for bulky disease guiding the dissection along negative gross margins deep into the mesentery, and hepatic metastases that have a propensity to recur were treated using minimally invasive ultrasound guided radio frequency ablation. Laparoscopic wedge resection of the liver was also performed to control metastatic disease. Small bowel carcinoid at any stage can be effectively treated using the full gamut of minimally invasive techniques. We have demonstrated that a MIS approach for carcinoid is ideal due to the multiple procedures that are often required to treat a single patient through out the disease course. Thus, a MIS approach to the management of carcinoid spares the patient from repeated laparotomies.

NEW TECHNIQUES/TECHNOLOGY
LAPAROSCOPIC EXCISION AS STANDARD OF TREATMENT OF URACHAL SINUS, Lutz Wilhelm MD, Bernhard MD, Kaja Ludwig MD, Maciej Patrzyk, Claus D Heidecke, Dept. of Surgery, University of Greifswald and Krankenhaus Rostock Suedstadt
Background: Persistent urachal sinus is an uncommon disease, but in some cases it results in a long course of symptoms and repeated operations. The standard surgical approach involving a lower midline incision to expose the entire tract along the median umbilical ligament and the excision of the infected umbilicus, operated upon between 1997 and 2002. In one patient we performed fistulography to establish the diagnosis; the other cases were clinically evident. The excision of the urachus was carried out exclusively in a laparoscopic three-trocar technique, whereas the infected site of the navel has not been touched.
Results: In all five cases the navel wound healed within one week without any complications. To date, there were no recurrences of fistula or infection.
Conclusion: Urachal sinuses can often result in multiple operative procedures for effective cure. The laparoscopic approach described here appears to be both a successful and more effective treatment, with less morbidity to the patient.

NEW TECHNIQUES/TECHNOLOGY
ROBOTIC ASSISTED TRANSTHORACIC ESOPHAGECTOMY, Scott J Bellesly MD, Joseph J DeRose MD, Cliff Connery MD, James M McGinty MD, Oliver Q Rothschild BS, Robert C Ashton MD, St. Luke’s - Roosevelt Hospital
Introduction: The objective of our study is to evaluate the applicability of robotic techniques for esophagectomy. Minimally invasive techniques of esophagectomy for both malignant and benign indications continue to evolve. Robotic assistance may facilitate this procedure due to the increased dexterity and visualization of the robotic system.
Methods and Procedures: A retrospective analysis of 5 patients in a prospectively maintained database was performed. Operations consisted of esophagectomies utilizing transhiatal mobilization of the esophagus with the da Vinci Surgical System. Via a right thoracotomy position, ports were placed in the posterior axillary line in the fourth, sixth and eighth interspaces. An auxiliary port was placed anterior in the eighth interspace. The thoracic esophagus was mobilized from the diaphragm to the thoracic inlet. Wide excision with nodal dissection was performed along the entire esophagus. The stomach was mobilized through a laparotomy incision and used as a conduit for the Anastomosis which was performed in the left neck.
Results: Three esophagectomies were performed for squamous cell cancer and two were performed for benign indications. Average age of patients was 57 ± 17 years (Range 34 to 76), ASA Class was 2.2 (Range 1 to 3), Anesthesia time was 9.75 ± 0.9 hours (8.3 to 10.8). Total surgical time was 7.4 ± 0.4 hours (Range 6.7 to 7.8). Average time for robotic mobilization was 2.56 ± 0.28 hours (Range 2.23 to 2.91). There were no intra-operative complications.
Conclusion: Transthoracic robotic assisted esophagectomy is the first step toward a complete minimally invasive approach to esophagectomies. Robotic assistance may prove to be easier than thoracoscopic approaches for the transthoracic portion of the operation. Esophagectomies carry significant morbidity and mortality. Robotic and minimally invasive techniques may improve outcomes by decreasing the physiological stress.

NEW TECHNIQUES/TECHNOLOGY
STEEP LEARNING CURVE OF EARLY EXPERIENCE FOR ROBOTIC ASSISTED GASTRIC BYPASS SURGERY, Robert A Berger MD, Garth Jacobsen MD, Fernando Eili MD, Marcia Edison PhD, Santiago Horgan MD, Minimally Invasive Surgery Center, University of Illinois at Chicago
Introduction: We review the early experience and steep learning curve realized while employing a robotic surgical system to facilitate learning to perform the hand sewn gastro-jejunostomy anastomosis of a roux-en-y gastric bypass.
Methods: A prospectively maintained database of the initial experience of robotic-assisted bariatric surgeries performed by a single surgeon was reviewed in a retrospective manner.
Results: Robotic-assisted roux-en-y gastric bypass was performed 39 times by a single surgeon at one institution from September 1, 2002 to September 1, 2003. The average length of stay was 2.1 days. The patient’s body mass index averaged 47.2 kg/m2. One case was converted from robotic to open in the first two months of the program. Twelve cases occurred in the first six months and 27 cases in the second six months. There were 4 incidences of complications that may relate to implementation of robotic technology occurring in the first 18 cases and none in the last 21 cases. Complications include two strictures and one marginal ulceration at the gastro-jejunostomy anastomosis. One patient required a blood transfusion for a dropping hemoglobin from a bleeding site which spontaneously resolved prior to identification of its exact location.
Conclusions: We conclude from this early experience the implementation of robotic surgical technology for assistance in performing the complex task of a hand sewn gastro-jejunostomy is safe, practical and comparable to other current techniques. Larger studies of prospectively randomized techniques will further illuminate significant advantages or shortcomings realized by employing robotic-assisted surgical techniques.
NEW TECHNIQUES/TECHNOLOGY  P360
BANDED ROUX-EN Y GASTRIC BYPASS AS A REVISIONAL PROCEDURE AFTER FAILED LAPAROSCOPIC ADJUSTABLE SILICONE GASTRIC BANDING, Marc Bessler MD, Anna Daud MD, Center for Obesity Surgery, New York Presbyterian Hospital and Columbia University, New York, NY. Background: Laparoscopic Adjustable Silicone Gastric Banding (LASGB) has become a popular surgical technique for treatment of morbid obesity. Failure to achieve and maintain adequate weight loss may require revision to gastric bypass, which has been associated with increased complications. We evaluated banded gastric bypass as a revisional procedure in such patients. Methods: We report on 3 patients who failed LASGB and were revised to gastric bypass with the band left in place but deflated and the gastric transection performed inferior to the band. All patients had a 75 x 150 cm Roux limb bypass in the retrocolic/retnogastric position. Percent excess BMI lost, percent excess weight lost and complications to date were assessed. Results: Mean age and Body Mass Index (BMI) at the time of revision was 43 (34-51) years and 48.7 (36-86) kg/m2 respectively. Patients lost 57%, 49%, and 49% of excess weight in a follow up of 7, 8, and 41 months respectively. Patients lost an average of 61.5% (53.2%-77.3%) of excess BMI. The patient who lost 49% of her excess weight at 41 months still has BMI>40 and band adjustment is now being undertaken to increase restriction. There were no peri-operative or long-term complications or mortality. No patients were lost to follow up. Conclusions: These results indicate that Banded Roux-en-Y Gastric Bypass performed below a previously placed LASGB may be an attractive strategy for revision in patients who fail LASGB.

NEW TECHNIQUES/TECHNOLOGY  P361
LAPAROSCOPIC REVISION OF GASTRIC PACING WIRES, Fred Brody MD, Eddy Soffer MD, Bipand Chand MD, The George Washington University Medical Center, The Cleveland Clinic Foundation Currently, electrical stimulation is utilized to treat morbid obesity, gastroparesis, and diabetic paralytic gastroparesis. Although this technology is in its infancy, numerous case reports and small series appear throughout the literature. Furthermore, electrical stimulation is not relegated to only academic centers and tertiary referral centers. As these technologies continue to evolve and alter the treatment of several different pathophysiologic processes, the general surgeon needs to understand the technical aspects of these devices and their potential complications. The management of a gastroparetic patient with chronic abdominal pain following the successful placement of gastric pacing wires is presented. A 45-year-old female with idiopathic gastroparesis underwent laparoscopic placement of pacing wires without complications. Four months post-operatively, she presented with chronic left upper quadrant abdominal pain. Her nausea and vomiting had dissipated and she was tolerating a regular diet. Abdominal and pelvic computed tomography was normal except for the presence of the generator and pacing wires. Ultimately, she required a diagnostic laparoscopy and an upper endoscopy. The upper endoscopy was normal. A diagnostic laparoscopy was performed and showed a wide adhesive band from the seromuscular tunnel of the pacing wires to the abdominal wall in left upper quadrant. The band was lysed and an omental patch was sutured over the insertion site of the wires. On post-operative day one, the patient was pain free and discharged to home on a regular diet. This case presents a unique complication of electrical pacing wires. This patient experienced somatic pain due to an adhesive band from her pacing wires to the abdominal wall. Based on the unique findings of this case, we now place an omental patch on top of the seromuscular, electrode tunnel in order to prevent adhesions and potentially persistent abdominal wall pain.

NEW TECHNIQUES/TECHNOLOGY  P362
LAPAROSCOPIC INSERTION OF GASTRIC PACING WIRES, Fred Brody MD, Eddy Soffer MD, Bipand Chand MD, The George Washington University Medical Center, The Cleveland Clinic Foundation The medical treatment of gastroparesis includes oral medications and strict management of associated comorbidities. Despite this regimen many gastroparetic patients remain symptomatic. Recently, gastric electrical stimulation is utilized to provide symptomatic relief. Traditionally, these pacing wires are placed through a midline laparotomy. This paper describes in detail the laparoscopic technique for successful gastric deployment. Eighteen consecutive patients from March 2000 to September 2003 underwent laparoscopic insertion of gastric pacing wires for gastroparesis. Three to four ports were utilized to insert a pair of electrodes. Anterior, cephalad retraction of the gastric wall is critical for accurate seromuscular placement of gastric leads. Seromuscular placement is verified with intraoperative endoscopy. Both leads are secured to a subcutaneous generator. Pacing parameters are instituted immediately in the operating room. Patient demographics, operative details, and postoperative morbidities are recorded. Sixteen patients are female. All procedures were completed laparoscopically. The mean operative time was 151.9 minutes. No mortalities occurred. Two patients developed cellulitis at the generator site postoperatively. Subsequently, oral antibiotics were required for one week postoperatively. No hardware was removed. Vomiting has resolved in all patients. Gastric electrical stimulation is an effective modality in patients with diabetic and idiopathic gastroparesis. This technique is accomplished safely utilizing a laparoscopic technique. Laparoscopic insertion is successful even in patients with prior surgery and intact gastrointestinal tubes. Long-term follow-up and a prospective, multicenter trial continue to verify the efficacy of this treatment modality.

NEW TECHNIQUES/TECHNOLOGY  P363
STAPLED PYLOROPLASTY, INITIAL CLINICAL EXPERIENCE WITH A FAST AND SAFE TECHNIQUE, Steven R DeMeester MD, Mary S Maish MD, Usha Desai RN, Jeffrey A Hagen MD, Tom R DeMeester MD, The University of Southern California Keck School of Medicine Objective: Pyloroplasty is generally considered necessary after vagotomy, and accompanies most esophagectomies. However, suture-line leaks can occur, and the closure can disrupt the process of pushing the stomach up for esophago-gastric anastomosis. Further, minimally invasive pyloroplasty can be a time-consuming and difficult procedure. We endeavored to develop a fast and safe stapling technique for pyloroplasty that would be applicable to both open and laparoscopic procedures including esophagectomy and gastric pull-up. Methods: After making a small gastrostomy an EEA stapler with the anvil in the open position is passed into the stomach. The anvil is introduced through the pylorus while the base is kept in the stomach. The stapler is then closed and fired to excise a portion of the pyloric valve. The gastrostomy is either closed or excised as part of gastric tubularization for esophageal reconstruction. Results: Seven patients underwent pyloroplasty during either open or laparoscopic esophagectomy with a 21 (n=4) or 25 mm (n=3) EEA stapling device. Both excised a portion of the pyloric musculature in all cases, but the 21 mm stapler was significantly easier to pass through the pylorus. In every patient the staple line was internal and deep to the serosa of the stomach. Post-operative barium swallow showed no leak in 6 patients, and upper endoscopy in the 7th patient demonstrated a widely patent pylorus with an intact staple line. This last patient remains on a ventilator with pneumonia but the other six are tolerating a soft diet without difficulty. There was no functional difference between the 21 and the 25 mm stapled pyloroplasty. Conclusions: An EEA stapled pyloroplasty is safe, easy to perform, and applicable to laparoscopic procedures. Further, since the staple line is completely internal the potential for leak is reduced. Initial clinical experience has demonstrated good early gastric emptying, and no complications related to the procedure have occurred.
NEW TECHNIQUES/TechNoLOGY

THE SAFETY AND EFFICACY OF LAPAROSCOPIC DELIVERY OF RADIOFREQUENCY ENERGY TO THE GASTROESOPHAGEAL JUNCTION IN A PORCINE MODEL. Ketan M Desai MD, Sergio Diaz MD, Ian G Dorward BA, Thomas A Meiningter, Nathaniel J Soper MD, Washington University School of Medicine and Institute for Minimally Invasive Surgery

Objective: Endoluminal delivery of radiofrequency energy (RFE) to the gastroesophageal junction (GEJ) may be an effective treatment option for a highly select group of patients with gastroesophageal reflux disease. The laparoscopic delivery of RFE to the GEJ using the TissueLink Floating Ball device (Dover, NH) was investigated, and its effects on lower esophageal sphincter pressure (LESP), gastric yield pressure and histology were assessed.

Methods: Sixteen pigs underwent esophageal manometry and endoscopic injection of botulinum toxin (Botox; 100 units) into the lower esophageal sphincter. After one week, animals were randomized to radiofrequency energy treatment (150J of the GEJ (n=10)) or no further treatment (control, n=6). Prior to sacrifice at 8 weeks, animals underwent esophagoscopy, manometry, and gastric yield pressure determination. Specimens of the GEJ were evaluated histologically.

Results: While mean (+/- SD) LESP was reduced by Botox in the control group, RFE treatment maintained LESP at 8 weeks (Table, mean +/- SD). Mean gastric yield pressure was 9.5 +/- 6.5 (control) compared with 24 +/- 5.5 (RFE) (p<0.01). Histologically, RFE resulted in a mucosa-sparing lesion with minimal cellular injury, moderate fibrosis and no evidence of stricture.

Conclusions: The laparoscopic delivery of RFE using the TissueLink Floating Ball leads to collagen denaturation and submucosal fibrosis at the GEJ, while sparing the mucosa from injury. Laparoscopic delivery of RFE effectively augments LESP and gastric yield pressure following Botox injection in the pig model.

NEW TECHNIQUES/TechNoLOGY

TRACHEAL HOOK RETRACTION OF ANTERIOR FASCIA SAFELY FACILITATES INSUFFLATION IN THE MORBIDLY OBESE PATIENT, Rebecca Evangelista MD, Joe C Northup MD, Evren Benboumin MD, Bruce Schimmer MD, University of Virginia Department of Surgery

Objective: Creating a pneumoperitoneum in the morbidly obese patient is particularly challenging. Hassan trocar placement is difficult due to abdominal wall thickness; alternatives involve placement of an optical port or Veress needle into the non-insufflated abdomen. We have adopted a technique first observed in use by Higa and Boone using a standard tracheal ring hook to lift the anterior fascia to facilitate safer Veress needle placement.

Methods & Procedures: A retrospective chart review was performed of all laparoscopic gastric bypass procedures done at our institution from January 2002 through August 2003. Technique: After standard skin preparation, a 10mm incision is made 1-2 finger-breathds below the left costal margin in the mid-clavicular line. The tracheal hook is imbedded into the anterior fascia and retracted anteriorly while a Veress needle is passed parallel to the tracheal hook through the abdominal wall at the point of maximal retraction. Intra-abdominal position is verified. If the initial pressure is greater than 10mm Hg with a small volume of CO2, the Veress needle is removed and reinserted without changing position of the tracheal hook.

Results: A total of 307 laparoscopic gastric bypasses were done during the stated time period using this technique. In all cases, the abdomen was successfully insufflated without the need for additional methods. There were no intra-abdominal injuries caused by the tracheal hook. Liver puncture sites from the Veress needle were seen in 3 patients. These did not result in significant bleeding or require conversion to an open procedure.

Conclusion: The use of a tracheal hook to facilitate retraction of the anterior abdominal fascia during Veress needle insertion is a safe and effective technique for creating a pneumoperitoneum in the morbidly obese patient.

NEW TECHNIQUES/TechNoLOGY

LAPAROSCOPIC HARVEST OF OMENTAL FREE FLAPS FOR CRANIOFACIAL RECONSTRUCTION, Douglas R Ewing MD, Peyman Soliemanzadeh MD, Kamran Jafri MD, Joseph D Mangone BS, Peter D Costantino MD, Jerald Wrisner MD, The Department of General Surgery and The Department of Otolaryngology - Head and Neck Surgery, St. Luke’s - Roosevelt Hospital Center, New York, NY and the Department of Surgery, Hackensack University Medical Center, Hackensack, NJ

Objective: While the use of laparoscopically harvested omental flaps has been reported for the treatment of soft tissue defects of the trunk and extremities, it has not previously been described for the reconstruction of craniofacial defects. The use of an omental free flap has several proven advantages over the more commonly used latissimus dorsi and radial forearm flaps. However, use of omental free flaps has fallen out of favor with craniofacial reconstructive surgeons because of the morbidity associated with laparotomy. We report the first series of laparoscopic omental free flap harvests for craniofacial reconstruction.

Method: Five patients underwent laparoscopic omental harvest for craniofacial reconstruction. Four ports were used. A 12mm umbilical port was used for the camera, a 5mm left upper quadrant port was used for retraction, and a 5mm and a 12mm port were used as operating ports in the right upper quadrant. Ultrasonic shears were used for adhesiolysis and dissection of the omentum off of the transverse colon and the greater curvature of the stomach. The right gastroepiploic artery was divided using a linear stapler. The omentum was delivered out of the abdomen by extending the umbilical incision to 4cm and was subsequently used for craniofacial reconstruction utilizing microvascular techniques.

Results: None of the patients suffered any abdominal complications. The omentum proved to be particularly well suited to the demands of craniofacial reconstruction. It was thin, abundant, pliable, well vascularized, durable, and comparatively resistant to atrophy over time. Donor and recipient site cosmesis were excellent.

Conclusions: Despite its advantages in craniofacial reconstruction, the omental free flap has fallen out of favor because of the morbidity associated with laparotomy. Laparoscopic harvest of the omentum has been previously demonstrated to be safe for reconstruction of soft tissue defects of the trunk and extremities. Laparoscopic harvest of the omentum may once again allow craniofacial reconstructive surgeons to utilize the considerable advantages of the omentum when dealing with complex craniofacial defects.

NEW TECHNIQUES/TechNoLOGY

FEASIBILITY OF ROBOTIC-ASSISTED LAPAROSCOPIC PANCREATICOJEJUNOSTOMY, Takeshige Doi, MD, Naoto Koyama MD, Kazuhiko Hiduki MD, Hidetoshi Ohtsuki MD, Koji Kikuchi MD, Takashi Baba MD, Satoru Ueta MD, Yuji Yoshida MD, Showa University School of Medicine, SENDAI, JAPAN and Division of Laparoscopic Surgery, Mount Sinai Medical Center, New York, New York, USA

Objective: We have undertaken a study using robotic instrumentation and voice-controlled camera guidance to determine the feasibility and the efficacy of performing robotic-assisted laparoscopic pancreaticojejunostomy and compare it with conventional laparoscopic pancreaticojejunostomy in acute porcine models.

Methods: Using the robotic surgical system, we performed robotic-assisted laparoscopic pancreaticojejunostomy (RALPJ) for 6 animals and compared with conventional laparoscopic pancreaticojejunostomy (CLPJ) for 5 animals. Several variables were measured including, total operation time, anastomosis time, robotic set-up time, complications, surgeon’s fatigue (none, mild, moderate or severe) and leaks.

Results: The average of total operation time in RALPJ group was 215±38.2 minutes and that in CLPJ group was 152±12.9 minutes and there was no significant difference between two groups. However, the anastomotic time in RALPJ group and CLPJ group were statistically different. They are 105±18.0 minutes and 55.4±5.0 minutes individually (p<0.05). The average of the robotic set-up time in RALPJ group was 20.8 minutes. The complication in RALPJ group was one liver laceration and that in CLPJ group was one spleen laceration. Both incidents were treated laparoscopically. The extent of fatigue of the surgeon in RALPJ group was moderate to severe, and that in CLPJ group was moderate. Anastomoses were immediately watertight in 1 of 6 robotic and 2 of 5 conventional pancreaticojejunostomy.
INTRODUCTION: The pace at which new technology is revolutionizing the field of surgery frequently leaves experienced surgeons feeling left behind. Does the use of new surgical technology (e.g. surgical robotics) require a paradigm shift too great for older surgeons? The objective of this study was to determine if differences exist in the initial robotic surgery learning curve among surgeons of varying levels of surgical experience. Secondary objectives included comparing the performance of different surgical robots and determining the inter-robot transferability of skills acquired on a surgical robotic system.

METHODS: A multi-institutional group of 38 surgeons and 28 surgeons-in-training were evaluated using three surgical skill tests: ?paper cut, ?ring swap, and ?thread the needle.? Every participant was timed on each of two robots, Intuitive Surgical?s daVinci Surgical System and endoVia?s Laparotek System. The order in which the participants were tested on each of the two robots was determined at random. Composite scores representing participant performance on each of the two robots and overall performance were calculated.

RESULTS: Scores on the daVinci robot were significantly better among current surgical residents than among surgeons who had been practicing for up to 15 years (p<0.05). However, surgeons with 0-5 years in practice scored significantly better than residents on the Laparotek robot (p>0.05). A trend toward better overall performance on both robots among young surgeons was found compared to older surgeons. The ?paper cut? test took participants twice as long and the ?ring swap? test took over three times as long on the Laparotek robot than on the daVinci robot (p<0.0001 for both). However, when corrected for robot cost ($1.25M for daVinci and $250K for Laparotek), scores were significantly better on the Laparotek robot for both tests (p<0.0001 for both). Participant times were significantly faster on each of the two robots among participants who had used the other robot first (p<0.01).

CONCLUSIONS: Among surgeons with little or no previous surgical robotic experience, young surgeons acquire basic surgical robotic skills faster than their more experienced colleagues. While basic surgical tasks are easier to perform using the daVinci robot than using the Laparotek robot, the cost of daVinci must be carefully considered. Basic surgical robotic skills acquired on one robot are transferable to use on a second robot.

INDICATORS FOR PERFORMING HOLMIUM LASER ON RETAINED HEPATO-BILIARY TREE STONES, Vitus S Hobayan MD, Maita Theresa P Rigoz MD, Dept. of Surgery, Cardinal Santos Medical Center, *Section of HBP Surgery,Dept. of Surgery,Jose R. Reyes Memorial Medical Center - Department of Health, Manila, Philippines

Introduction: The study conducted intends to evaluate the indications and procedure-associated outcome of laser lithotripsy advocated among post-operative patients with residual duct calculi.

Methods and Procedures: Design: prospective, analytic cohort study. Thirty consecutive patients evaluated of initial t-tube tract cholangiography (Olympus CHF P 10, 20, 20Q) from February 01 to October 31, 2002, followed by biliary exploration. Stratification was based on sex, locality, form of surgery, endoscopic procedure, stone feature, and duct configuration. Eighty-three percent (N=25) with 3.1 5 cm or impacted calculi received laser (30-watt Omnipulse model 1234-30 Trimedyne, 365ì fiber) lithotripsy (pulse energy: 1.5-2.4kJ). Indications, difficult features, number of sessions and difficult extractions were analyzed. Outcomes: stone fragmentation, duct clearance, and procedure-related complication rates. Minimum follow-up was 3 months.

Results: The male to female ratio was 1:2 with a mean age of 41 years. Only 1 underwent bypass with t-tube. Intrahepatic calculi comprised 67%, majority from sectoral ducts. There were equal number of patients with multiple and single stones. Strictures accounted for 23%. The span of sessions were: initial- 10 min to 2 hr and subsequent- 30 min to 1 1/2 hr. Seventy-seven percent had incomplete follow-up. Laser Group. All complied with prescribed sessions: 64%/ 1-2 and 36%/ 3-5. For difficult extractions, the averages of sessions follow: normal ducts- 4.5, acute-angled ducts- 3.5, impaction- 2.0, and 3 1.5 cm stone- 1.5. While 12% required dilation, the rest were adequately dealt by basket. The 6 difficult features (scope were: Duct- angulation (right), deformity, and Stone- impaction, 3 1.5 cm, multiple, and intrahepatic. Laser enabled 100% success rate in fragmentation and facilitated complete clearance. Transient low-grade fever, the only complication (minor) noted in 28%, resolved with conservative care.

Conclusion: Evaluation of other significant clinical outcomes (like stone recurrence) has been constrained by the limited follow-up period. Projected in this interim study as a low-morbidity and a high-clearance therapeutic option, laser is indicated in post-operative patients with retained calculi identified to have difficult features on cholangiography.

ROBOTIC MYOTOMY FOR ACHALASIA IS SUPERIOR TO TRADITIONAL LAPAROSCOPIC MYOTOMY IN PATIENTS HAVING UNDERTAKEN PREOPERATIVE BOTULINUM TOXIN INJECTION, Santiago Horgan MD, Garth Jacobsen MD, Enrique Ellii MD, Jason Harris MD, Adam Goldstein DO, Marcia Edison PhD, Robert Berger MD, Minimally Invasive Surgery Center, University of Illinois at Chicago College of Medicine

Introduction: The purpose of this study was to assess the impact of robotic assisted myotomy on mucosal perforation rates. Previously published data have shown that preoperative botulinum toxin injection results in a 15% mucosal perforation rate during traditional laparoscopic Heller myotomy. When repaired intraoperatively, this complication mandates a delay in feeding of the patient and a postoperative upper GI radiologic study to confirm that there is no clinically significant leak.

Methods and Procedures: Between 9/2000 and 8/2003 preoperative, operative and postoperative characteristics data were prospectively collected for patients undergoing robotically assisted myotomy for achalasia. The operation was undertaken laparoscopically and the robotic surgical system was used for the myotomy portion of all cases.

Results: A total of 41 robotic myotomies were performed, 10 patients had botulinum toxin exposure. Of the 10 patients, 5 were male. The mean patient age was 53 years (range: 24-75). Six of the patients had preoperative endoscopic dilation in addition to botulinum toxin injection. Intraoperative blood loss averaged 20 mL (range: 5-40). Operative time averaged 170 minutes (range: 130-220), which is significantly longer than similar patients operated on during the same time period with no history of botulinum toxin injection. No intraoperative mucosal perforations were observed or found postoperatively.

Conclusions: Robotic assisted and traditional laparoscopic approaches to Heller myotomy in patients with a history of botulinum toxin exposure are similar in regards to increased operative times; however, robotic technology allows the surgeon to perform the operation without the complication of esophageal mucosal perforation and its clinical implications (increased length of hospital stay and radiologic studies needed).
NEW TECHNIQUES/TECHNOLOGY P372
ROBOTICALLY ASSISTED HELLER MYOTOMY FOR IDIOPATHIC ACHALASIA IN 41 PATIENTS AT A SINGLE INSTITUTION, Santiago Horgan MD, Garth Jacobsen MD, Enrique Ell MD, Jason Harris MD, Adam Goldstein DO, Maricia Edisson PhD, Robert Berger MD, Minimally Invasive Surgery Center, University of Illinois at Chicago

Introduction: This report represents a single institution experience with robotically assisted Heller myotomy.

Methods and Procedures: Between 9/2000 and 8/2003 preoperative, operative and postoperative characteristics data were prospectively collected for patients undergoing robotically assisted myotomy for achalasia. The operation was undertaken laparoscopically and the robotic surgical system was used for the myotomy portion of all cases.

Results: A total of 41 patients have undergone robotically assisted myotomy for achalasia at our institution. Of the 41 patients, 22 were male. The mean patient age was 43 years (range: 14-75). Twenty-four of the 41 patients had a preoperative history of either endoscopic dilation (n=14), botulimum toxin injections (n=4), or both (n=6). Total operative time, regardless of preoperative intervention, averaged 182.4 minutes (range: 60-210), including robot setup time. Intraoperative blood loss averaged 24 mL (range: 10-80) for all patients. No intraoperative mucosal perforations were observed or found postoperatively. One patient developed recurrent dysphagia. Average length of hospital stay was 1.5 days (range: 0.8-4). There have been no deaths. Our current average follow-up is 521 days (range: 10-1197).

Conclusions: Robotically assisted Heller myotomy has proven to be a safe and effective operation in the treatment of achalasia, with the advantage of diminishing mucosal perforation to 0%.

NEW TECHNIQUES/TECHNOLOGY P373
ENDOSCOPIC NO STICH TECHNIQUE FOR MANAGEMENT OF VAGINAL HYDROCELE:A NEW TECHNIQUE, Sudhir K Jain MS, R.C. M Kaza MS, Dept. Of Surgery, Maulana Azad Medical college, B.S.Zafar Marg, New Delhi, India

INTRODUCTION: Hydrocele is a frequent condition which we encounter in India. Most of these patients belong to lower socioeconomic status and conventional surgery means absence from work for 2-3 weeks & financial loss to patient.

We have devised a new technique for management of Hydrocele by Endoscopic method which does not involve insertion of any stitch. PATIENTS: All patients of Primary Hydrocele who are fit for regional or General Anaesthesia are suitable for this technique. Patients with secondary hydrocele, or primary hydrocele with calcified sac, or with infected fluid or haematocoele are not suitable for this technique. All patients with negative transillumination test preoperatively were not taken for this procedure.

PROCEDURE: Operation is performed under general or spinal anaesthesia with patient supine. For this procedure we need two 5 mm trochar with ports, one 30 degree /0 degree telescope, one endoscissor, one endograsper, one endohook.

After cleaning and draping, two 5mm ports are inserted directly in to the hydrocele sac, one at superior pole of hydrocele and second at lower pole of hydrocele. During port insertion we make the hydrocele tense and transilluminate the sac to avoid injury to any blood vessel or testis. Through the upper port we insert a 30 degree telescope which is connected to a video monitor via an endocamera. Through the lower port hand instruments are inserted. For a small to medium size hydrocele a fenestration is made in the lateral wall of hydrocele sac. Size of fenestration varies from 4-8 cm. For a large hydrocele of size of a thick walled hydrocele a window is created in the lateral wall of hydrocele sac of the size of 5cm diameter. After obtaining haemostasis, fluid of hydrocele is drained & ports are removed & pressure bandage is applied. If fluid of hydrocele is opaque and vision is not clear we drain the hydrocele fluid in the beginning and fill the sac with either carbon dioxide or sterilised water. We prefer fluid instead of gas as working media because fluid has advantage of absorbing any heat generated during use of cautery, thus avoiding possible thermal injury to surrounding structures.

So far we have done 10 such cases and all are doing well in post operative follow up. All patients resumed their work next day.

Conclusion: Endoscopic management of hydrocele is a feasible alternative to conventional method.

NEW TECHNIQUES/TECHNOLOGY P374
FEASIBILITY OF SMALL BOWEL SEALING COMPARING LIGASURE ATLAS DEVICE WITH ENDOGIA-II STAPLING, J F Smulders MD, M P Schijven MD, J Jakimowicz PhD, Catharina Hospital, dep. of Surgery, Eindhoven, The Netherlands

Background: Safe use of the LigaSure sealing system in small bowel surgery has not yet been reported and is still controversial. To seal a bowel resection, also, it is unclear which power setting of the LigaSure Atlas device is to be preferred when used to seal and transect small bowel. Our study compared LigaSure Atlas device with EndoGia stapler device for a porcine small bowel pressure model. Parameters of interest were leakage and optimal power setting of the LigaSure Atlas device.

Methods: A porcine model, using thirty small bowel segments harvested from three pigs, was used. One side of the bowel segment, a stapled transection was created using a 30-mm EndoGia stapling cartridge (blue). On the other side of the same segment, a sealed transection was created using the LigaSure system. For each pig, thirty segments were prepared with on either side the EndoGia transection and on the other side the LigaSure transection. The LigaSure Device was set at power level 1 to 3 bar, ten times per power setting, being visualized on the display of the system. Following sealing and stapling, the segments of bowel were inspected and tested for leakage and/or bursting pressure: using the Datex Cardiocap System with pressure transducer of B-D PM 1D7-X01ROSE Barton-Dickson. Data were analyzed using SSPS version 9. Results: Using Kruskal-Wallis testing, it appears not to be valid to assess with thirty specimens a difference at 1 bar (P-value 0.000; X2seal 7.629, P-value 0.02). This result is constant and independent from the power setting of the LigaSure. On paired T-test analysis, there is no significant difference between occurrence of leakage for the seal side and the staple side, using the one or two bar power settings on the LigaSure system (P-value 0.25 and P-value 0.89, respectively). Empowering the LigaSure system with 3 bar, however, seems to provide a better seal. Microleakage is observed when the pressure for the stapling side is 215 mm Mercury, versus leakage/bursting occurring on the LigaSure side at pressures of 246 mm Mercury (P-value of 0.01).

Conclusions: It seems feasible to seal the porcine small bowel using the LigaSure Atlas system, at least temporarily. The porcine small bowel model indicates that the seal achieved by sealing at 3 bar powered LigaSure Atlas sealing system might compete with well-known stapled transection. In this particular setting, significantly less leakage was observed. Investigations concerning quality and permanency of the LigaSure Atlas sealing are mandatory.

NEW TECHNIQUES/TECHNOLOGY P375
NOVEL METHOD OF LAPAROSCOPIC TYING AND SUTURING WITH PRE-TIED ROEDER’S KNOT, Eung Kook Kim MD, Sang Kuon Lee MD, Department of Surgery, St. Mary’s Hospital, The Catholic University of Korea

Introduction: Laparoscopic surgery demands to the surgeons the mastery of laparoscopic tying and suturing. Many of the methods described are specific to the surgeon with this purpose; however, the classical Roeder’s knot is still in wide use because of its simplicity and economical advantage. When a structure in continuity, such as a cystic duct, must be ligated, an extracorporeal suture is made, which is cumbersome and time-consuming. An alternative is the creation of a Roeder’s knot with an open end. This concept was taken by the authors to devise a modified Roeder’s extracorporeal pre-tied slip knot with an absorbable suture in order to make a more reliable, more secure and faster ligation. Methods: Ligation of structure in continuity such as the cystic duct or artery was performed using a modified Roeder’s extracorporeal slip knot with an open-end absorbable suture which was entered through one of the trocar, passed around the tissue to be ligated and brought out through the same trocar and then, pierced through a Teflon tube over which 4 half knots were pre-made with the same suture. This device had a built-in pushrod, the end of which was snapped off to release the tail of the suture. The pushrod was pushed toward the tissue to be ligated after pulling both the suture pierced through the Teflon tube and the tail of the released suture. When suturing was necessary, a suture needle was added to the open-end absorbable suture. As this device is made of absorbable suture material, no foreign body is left after the absorption. More than 2500 laparoscopic procedures were performed using this device during an 8-year period, including laparoscopic cholecystectomies, choleodochotomies, appendectomies, spleenectomies, adrenalectomies, gastrectomies, colectomies and hysterectomies, among others. Results: Time consumed for ligation was less than 1 min for each knot. Complications observed inherent to this device were bleeding from the ligated splenic artery, for which reoperation was necessary; bile leak from bile duct after cholecodocholithotomy, for which endoscopic placement of nasobiliary catheter was performed; however, failure rate of this device per se was very low. Conclusion: This kind of laparoscopic tying and suturing device is easy to perform ligation and safe. Another advantage is that no foreign body is left in the body, once absorbed. It would be very useful for almost all type of laparoscopic surgery.
ROBOTIC ADRENALECTOMY? A BETTER ALTERNATIVE TO LAPAROSCOPIC ADRENALECTOMY? Amit Kumar MD, William H Chapman MD, Strong Memorial Hospital, University of Rochester, Rochester, NY, USA and Brody School of Medicine, East Carolina University, Greenville, NC, USA

Introduction: To evaluate the utility of robotic adrenalectomy in the current environment of laparoscopic adrenalectomy, we review our experience of this procedure. The study includes two year experience of robotic adrenalectomies for benign adrenal neoplasms. In our research this is the largest series published to date on robotic adrenalectomies.

Methods: A retrospective review of charts records of all patients operated on for benign adrenal neoplasms over the last two years was performed. Seven of these had undergone robotic adrenalectomy. All surgeries were performed using the da Vinci system. The same general indications and contraindications as those for laparoscopic adrenalectomy were applied.

Results: A total of fifteen adrenalectomies (laparoscopic or robotic) were performed over two years. Seven of these underwent robotic adrenalectomy. Their mean age was 43 years, with a range of 32-52 years. All patients were female. Selection was made only for non malignant disease. Six patients had left sided masses. The lesions ranged from 1.5-8 cm. Operative times ranged from 1.05 hours to 2.3 hours, with an average of 1.42 hours. Estimated blood loss for each of the procedures was less than 50 ml. All excised patient were discharged within 23 hours. The surgical pathology of patients undergoing robotic adrenalectomies was Cushing’s (2), Conn’s (1), Pheochromocytoma (1) and Incidentaloma? (3). None of the patients have shown any clinical sign of recurrence or of remnant disease.

Conclusions: Laparoscopic adrenalectomy is currently the preferred method of treatment of benign adrenal tumors. We propose that in lieu of the reduced operative time, reduced blood loss, reduced complication rate, as well as a reduced length of stay, robotic adrenalectomy is an advancement from laparoscopic adrenalectomy.

CONCLUSIONS: This system of rating the actual degree of difficulty involved in performing adhesiolysis has greater relevance to the laparoscopic community than past scaling systems. Risk of complications from such techniques, a principle concern when dealing with reparative surgery, is more accurately and uniformly rated. The authors propose that this classification system be forwarded for review by SAGES, in an effort to eventually adopt and endorse such a system for uniform use in laparoscopic surgical research. Clinical reoperative findings evaluated with the use of a single, relevant adhesion-scoring system will be important in determining the comparative effectiveness of new techniques, new energy sources, and new materials designed to prevent the formation of visceral adhesions.

OBJECTIVE MULTI-MODAL SURGICAL PERFORMANCE ANALYSIS, Joanne Lim BS, Catherin Urguadard BS, Antony Hodgson PhD, Alex Nagy MD, Karim Qayumi MD, University of British Columbia

Objective measures of surgical performance in minimally invasive surgery are of interest for students, surgeons and the public. The goal of this project is to use a multi-faceted approach to surgical assessment in the operating room, and to compare these measures to performance in analogous tasks on surgical simulators.

The operating room assessment will use performance measures such as time, tool tip forces and torques (newly added), and tool kinematics. A commercial 3-D load cell mounted on a laparoscopic tool measures the forces and torques. Strain gauges are mounted onto the tool handle to measure surgeon grip levels. Kinematics data is gathered using both optical and magnetic sensors and the resulting data streams are fused to improve accuracy and reliability.

This data fusion will be done using a simple yet effective algorithm we have recently developed. The optical sensor data is regarded as extremely accurate, but it is subject to occlusion and has a comparatively low sampling rate. The magnetic data is acquired more frequently and is never occluded, so we fuse the magnetic data to the optical data for the entire data stream. This gives a complete set of data even when there are optical data gaps. As shown in the figure, the fused estimate is roughly 6-8x more accurate when optical data is missing than an estimate based on interpolating across the gap with optical data alone.

The novelty and uniqueness of this research lies in the multi-pronged approach to quantitatively assessing surgical performance in the operating room. Although some of these measures have been used individually in previous work, to our knowledge they have not previously been combined in this fashion, nor have tool tip forces been measured throughout a live surgery.
NEW TECHNIQUES/TECHNOLOGY

**P380**

**COMPARISON OF SKIN CLOSURE USING ABSORBABLE SUBCUTICULAR SUTURE VESUS INDERMIL® SKIN ADHESIVE,**

Dean J Mikami MD, Matthew E Newlin MD, Virginia A McGrath MD, Bradley J McDermott MD Dshnamar G Karlowicz RN, John M Dundon, W. Scott Melvin MD. Center for Minimally Invasive Surgery, The Ohio State University Medical Center

Introduction: In laparoscopic surgery, skin adhesives present a novel way of closing trocar sites. We compared the closure of skin incisions in patients undergoing minimally invasive bariatric surgery utilizing two different techniques. Incisions were closed using either absorbable subcutaneous suture or a new technique utilizing a skin adhesive composed of a N-Butyl-2-cyanoacrylate monomer (Indermil®, U.S. Surgical, Norwalk, CT).

Methods: Fifty patients undergoing laparoscopic Roux-en-Y gastric bypass were prospectively randomized. The control group underwent standard closure with 4-0 absorbable interrupted subcuticular sutures. The study group underwent skin closure utilizing Indermil® adhesive. There were three 5-mm incisions, two 10-12 mm incisions, and one 30-mm incision. Steri Strips were applied over the 30-mm incisions in both groups. The patients were then evaluated at their 2-week follow-up visit. Results were statistically analyzed with the ANOVA test. A p<0.05 was considered significant.

Results. There was no significant difference in patient age (43.2 ± 43.3), closure time (280 vs. 264 seconds) or BMI (51.9 vs. 52.9) in the adhesive vs. the suture group respectively. There were 14 out of 108 (13.0%) skin dehiscences. Ten of the dehiscences were less than 3 mm in length and required no additional treatment. Of the remaining four dehiscences, three were in incisions 12 mm or greater. There were no wound infections during the study period. In the suture group, there were two wound infections requiring treatment in the adhesive group and one in the suture group. All wound infections occurred at the 30 mm site. There were no significant differences in the adhesive vs. the suture group as far as wounds requiring treatment in incisions less than 12 mm (0.9% vs. 0%) or incisions 12 mm or greater (2.7% vs 0.8%) respectively.

Conclusion: Skin adhesives are an effective method of skin closure. Incision sites 12 mm or less can be sealed with a low incidence of failure or infection. For incisions 30 mm or greater, closures with or gres were superior to wounds closed with adhesives. Wounds closed with adhesive had no post-operative leakage and required no sharp instruments.

NEW TECHNIQUES/TECHNOLOGY

**P381**

**OBJECTIVE COMPARISON OF THE LEARNING CURVES OF LAPAROSCOPIC AND ROBOTIC SURGERY USING MOTION ANALYSIS,**

Krishna Moorthy MS, Varon Munz MD, Alex Liddle Aristotelis Datta, Shirley Martin, Tim Rockall MD, Ara Darzi MD, Imperial College, London, UK

Introduction: Previous studies have shown that the features of tremor elimination, motion scaling and stereoscopic vision lead to enhancement of dexterity in computer-assisted surgery (CAS) as compared to laparoscopic surgery (LS). It is also believed that the learning curve for CAS is shorter than LS but this has never been objectively demonstrated.

Methods: Two groups of novices repeatedly performed intracorporeal suturing using Motion Analysis (OMI). The learning curve was generated by objective measures of surgical dexterity in CAS, as compared to LS, it is also characterized by a significantly shortened learning curve. This may render to complex minimal access procedures, with the likelihood of reduced complications rates and perhaps reduced variability in patient outcome.

NEW TECHNIQUES/TECHNOLOGY

**P382**

**THE VIRTUAL CHAPERON: A MEDICOLEGAL AID**

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Purpose: In medical litigation, there is often a significant discrepancy between the practitioner’s recollection of the consultation(s) and the patient’s recollection. Human chaperons provide an independent witness of a consultation but their use is inefficient and may not provide adequate medicolegal protection. The Virtual Chaperon is a portable audio/video system designed for use in all consultations, as an encrypted database, in real time. Through a series of studies we have explored the pattern of use of human chaperons in general surgical practice, and have also explored patients’ and physicians’ attitudes to the Virtual Chaperon.

Method: A dedicated questionnaire was sent to every general surgeon within six hospitals (four metropolitan and two rural) to explore their use of human chaperons during the informed consent process as well as during physical examinations. Questions were asked regarding their documentation of this.

To assess patients’ acceptability to the concept of the Virtual Chaperon, an initial qualitative study was performed with 28 patients followed by a pilot study at a busy private hospital in the UK. A fully functional prototype of the Virtual Chaperon was installed in the consultation room. The system comprised of a data entry/screen terminal, CPU and two dome cameras (one mounted in the consultation room and the other in the examination room) fitted with integral microphones.

Results: In the questionnaire, 60 surgeons were surveyed with a response rate of 85%. A chaperon was used at least some of the time by 63% of respondents during the consent process and 80% during the examination. Of those who used a chaperon, 34% (consent) and 41% (examination) never documented that fact.

In the pilot study, 86% of patients consented to the use of the Virtual Chaperon. 76% of patients felt that it would improve the patient/clinician relationship. 88% of patients felt comfortable whilst the Virtual Chaperon was recording.

Conclusion: The use of human chaperons in surgical practice is common. The medicolegal protection it gives is questionable, particularly with poorly kept records. The Virtual Chaperon is a valuable “risk management” tool in the avoidance of unwarranted claims against clinicians and equally in resolving quickly justifiable claims, particularly where opposing recollection of events is at the heart of the claim.

NEW TECHNIQUES/TECHNOLOGY

**P383**

**EVALUATION OF A NEW CUTTING-SEALING BIPOLAR INSTRUMENT,**

Ravi Nagubandi MD, Lawrence W Way MD, Roger A de la Torre MD, Sherry Wren MD, Bassem Safadi MD, Duncan J Turner MD, University of California San Francisco; De Paul Hospital, Missouri; Veteran’s Hospital, Palo Alto; Santa Barbara Obstetrics & Gynecology associates

Objective of the technique: To evaluate a novel sealing and cutting instrument that effectively and efficiently welds and cuts blood vessels and soft tissues while minimizing the disadvantages associated with thermal coagulation devices. These disadvantages include collateral thermal damage, sticking and charring, arcing and sparking, excessive smoke, and unreliable seals.

Description of the methods: The EnSeal was used for the first time in 9 human cases performed in open and laparoscopic settings. A variety of soft tissues and vessels were treated using the EnSeal vessel sealing and hemostatic mechanism.

The uniqueness of this instrument is attributed to two distinctive features: a temperature coefficient matrix that controls the RF current delivered through the tissue, and a high-compression, Y-shaped cutting blade. This bipolar configuration welds and cuts tissue in a single step. A dedicated generator is not required.

Preliminary results if available: Tissues successfully treated included vessels ranging from 2mm to greater than 7mm in diameter. Tissues successfully treated included vessels ranging from 2mm to greater than 7mm in diameter. Tissues successfully treated included vessels ranging from 2mm to greater than 7mm in diameter. Tissues successfully treated included vessels ranging from 2mm to greater than 7mm in diameter.
NEW TECHNIQUES/TECHNOLOGY P384
INITIAL EXPERIENCE WITH THE FOUR ARM TELEROBOTIC DEVICE IN FOREGUT SURGERY, Matthew E Newlin MD, Dean J Mikami MD,Douglas R Ewing MD,Alessio Pigazzi MD,Garth H Ballantyne MD,W. Scott Melvin MD, The Center for Minimally Invasive Surgery, The Ohio State University Medical Center, Columbus, Ohio Hackensack University Medical Center, Hackensack, New Jersey

Introduction: The DaVinci robotic system (Intuitive Surgical, Sunnyvale, CA) has been used effectively and with good results. Previously, the surgeon could manipulate three arms on the robot ? one camera port and two working ports, which required a second surgeon for most general surgical procedures. Recently, the robotic device has been modified to include a fourth arm. This adds another computer-assisted instrument that the surgeon can manipulate. In this report, we describe our experience with the DaVinci robot with a 4th arm modification for the performance of foregut surgical procedures.

Methods: A total of sixteen patients were prospectively enrolled and underwent surgery by one of two teams using the modified DaVinci robot. The patients? average age was 53 years. Ten patients underwent cholecystectomy, five patients underwent Nissen fundoplication, and one patient underwent Heller myotomy. Operative time, defined as the time from incision to completed skin closure, as well as the robotic time, defined as the time during which the robot was being used, were recorded. Intra-operative and peri-operative complications were also recorded.

Results: Average operative time and robotic time for cholecystectomy were 78 and 50 minutes, respectively. Average operative time and robotic time for Nissen fundoplication was 135 and 85 minutes, respectively. Operative and robotic time for the Heller myotomy was 118 and 70 minutes. All patients tolerated the procedure well and experienced no peri-operative complications.

Conclusions: The telerobotic surgical device with the addition of the 4th arm results in an efficient and safe operation and allows the surgeon to perform additional maneuvers without the use of an assistant surgeon.

NEW TECHNIQUES/TECHNOLOGY P385
LAPAROSCOPICALLY ASSISTED TOTAL GASTRECTOMY WITH JEJUNAL POUCH INTERPOSITION, Takeshi Omori MD, Toshihru Nishida MD,Syuji Takiguti MD,Fumihiro Uchikoshi MD,Masahiro Tanemura MD,Kiyokazu Nakajima MD,Toru Kitaigawa MD,Toshinori Ito MD,Hikaru Matsuda MD, Department of Surgery, Osaka University Graduate School of Medicine

Background: Despite recent improvement of optics, instrumentation and surgical techniques, laparoscopically-assisted total gastrectomy (LATG) has still remained one of the most challenging laparoscopic procedures. LATG may become further technically demanding when reconstructed with jejunal pouch out of the peak, and pneumoperitoneum was re-established using a wound sealing device (Lap Disc, Ethicon Endosurgery). The stapled pouch-out jejunojejunostomy and pouch-duodenostomy, were accomplished in a usual manner near the ampulla, and the 2nd patient had a carcinoid tumor in the 2nd portion of the duodenum with primary hand-sewn end to end anastomosis. Both patients went cholecystectomy, five patients underwent Nissen fundoplication, were accomplished in a usual fashion under direct vision.

Results: All cases were completed laparoscopically without any intraoperative complications. Mean operating time was 400 minutes and blood loss was 279 ml. The SurgiASSIST device markedly enhanced the surgical exposure around the pouch and facilitated the connection of the anvil with the center rod, resulted in easier and safer pouch-jejunostomy anastomosis. No anastomotic leaks and/or strictures were noted postoperatively. All jejunal pouches were satisfactorily functioning. There was no mortality in our series. Conclusions: LATG/JPI is technically feasible. With technical modifications and use of new devices, LATG/JPI becomes a safer procedure.

NEW TECHNIQUES/TECHNOLOGY P386
ASSESSMENT OF APPLICATIONS OF A NEW MASTER-SLAVER COMBINED MANIPULATOR BY EXPERIENCED SURGEONS Soji Ozawa MD, Yasuhide Morikawa MD, Toshiharu Nishida MD, Sukao Nakazawa PhD, Makoto Jinno PhD, Nobuto Matsuhiro PhD, Department of Surgery, Keio University, Department of System Design Engineering, Faculty of Science and Technology, Keio University, Corporate R&D Center, Toshiba Corporation

Introduction> Minimally invasive surgery has been widely adopted throughout the world, but some laparoscopic surgery procedures are difficult to perform, and new technology, such as robotic surgery, is eagerly anticipated. Recently, we developed a new master-slaiver combined manipulator (MCM) (Advanced Robotics 17: 523 - 539, 2003) in which the master grip and slave hand are combined in the manipulator body so that the surgeon can use the tool near the patient. The slave hand is controlled electrically by the master grip, and its position is directly controlled by the surgeon. We have successfully used it for laparoscopic Heller and Dor operation in 2002, and we submitted questionnaires to obtain surgeons? comments to assess the possibility of its future adoption by surgeons. <Methods> Fifty-four experienced surgeons tried using the MCM for 30 min and answered questionnaires with their comments. The need to use the MCM in 63 surgical procedures was rated from 1 (unnecessary) to 5 (absolutely necessary). <Results> Thirty-seven surgeons (69%) succeeded in skillful manipulations, and 38 surgeons (70%) wanted to use the MCM in the future. Procedures rated 4 and 5 by more than 50% of the surgeons were fundoplication surgery, achalasia surgery, repair of gastric or duodenal perforation, and surgery for common bile duct stone. The only procedures rated 4 and 5 by less than 10% of the surgeons were cholecystectomy. <Conclusions> The MCM is useful for laparoscopic procedures, especially for suturing and knot tying procedures, and it shows a promise of being adopted as a tool in the near future.

NEW TECHNIQUES/TECHNOLOGY P387
LAPAROSCOPIC RESECTION OF BENIGN PERI-AMPULLARY TUMORS: REPORT OF 2 CASES, Joseph B Petelin MD, Christopher S Prueitt MD, John G Touliaitos MD, University of Kansas School of Medicine

Introduction: Benign peri-ampullary tumors present a challenging clinical situation for gastroenterologist and surgeons. Treatment options historically include observation, local endoscopic resection, local resection, or pancreaticoduodenectomy via laparotomy. The authors present a case report of their experience with two patients who underwent laparoscopic resection of these tumors.

Methods: Both patients were referred by their gastroenterologist to our service after undergoing esophagogastroduodenoscopy in February, 2002. The 1st patient was documented to have a tubulovillous adenoma near the ampulla, and the 2nd patient had a carcinoid tumor in the same location. The 1st patient underwent duodenotomy and excisional biopsy of the tumor with primary hand-sewn closure of the duodenum. The 2nd patient underwent sleeve resection of the 2nd portion of the duodenum with primary hand-sewn end to end anastomosis. Both patients underwent GastrografinTM UGI series to confirm the patency and integrity of the duodenum on the 4th postoperative day prior to resumption of oral intake.

Results: Both patients underwent successful laparoscopic resection of their lesions, and no recurrent tumors have presented in the follow-up period through August, 2003. Operative time for the 1st case was 3 hrs 24 min, and for the 2nd case was 3 hrs 21 min. Estimated blood loss was 300 cc and 200 cc respectively. Length of stay was 6 days and 5 days respectively. Patients were allowed clear liquids on the 4th postop day and full liquids on the 5th postop day. Neither patient experienced intraoperative or postoperative complications.

Conclusions: This study demonstrates that peri-ampullary tumors in the 2nd portion of the duodenum can be safely managed with a laparoscopic approach that includes local resection of the tumor. However, because of the location of these lesions, reconstitution of the duodenal integrity requires surgeon expertise with laparoscopic suturing techniques. Further study is suggested.
THE TEXAS SADDLE, Patrick R Reardon MD, Mahsa Mossadegh MD, Ese Otah MD, Department of Surgery; Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

Post operative or recurrent hiatal hernia remains the Achilles heel of laparoscopic 360° fundoplication and hiatal hernia repair. Recurrence rates have been reported as high as 46%. The use of prosthetic mesh has been reported to lower the rate of post operative hiatal hernia by a factor of 10. We describe our technique for the creation of a "saddle" of Gortex mesh as a bolster for the cural closure in laparoscopic 360° fundoplication and hiatal hernia repair.

TELEPROCTORED LAPAROSCOPIC CHOLECYSTECTOMY IN A SURGICAL TRAINING PROGRAM: A PROSPECTIVE TRIAL, Michael A Sawyer MD, Tarak H Patel MD, Elizabeth M Sawyer MD, Catherine F Uyehara PhD, Paul T Cirangle MD, John H Payne MD, The University of Hawaii, Tripler Army Medical Center and Kaiser Permanente Medical Center, Honolulu, Hawaii

Objective: The objective of this study was to test the efficacy and efficiency of teleproctored laparoscopic cholecystectomy (TLC) in a surgical training program.

Methods: Study (S) patients (n=20) underwent TLC with surgical staff supervising from the Surgical Telementoring Suite, which provided two-way real time annotated audiovisual communications to the operating room. Control (C) patients (n=21) had standard laparoscopic cholecystectomies with staff in the operating room. Demographic data, total operating time (TOT), intraoperative benchmarks (IB), and complications were compared. IB included the time to 1) establishment of pneumoperitoneum, 2) placement of all trocars, 3) clipping and division of the cystic duct, and 4) gall bladder (GB) extraction. Data were analyzed with ANOVA or contingency table techniques. Statistical significance was set at p<0.05.

Results: Mean age (S=35.1±11.4, C=37.9±12.5, p=0.75), and female prevalence (S=17/20 female, C=16/21 female, p=0.69) were similar. Two patients in each group had acute cholecystitis (p=0.85). There was no difference in preoperative duration of symptoms (S=9.3±13.3 months, C=12.1±26.3 months, p=0.66). Body mass index was similar (S=28.7±5.4, C=29.7±7.2, p=0.62). The incidence of significant comorbidities (e.g. COPD, MI, chronic renal insufficiency, hypertension and morbid obesity) was comparable (p=0.77). TOT was 89.1±19.7 m in the S group and 78.1±29.8 m in the C group (p=0.09). Two minor intraoperative bleeding complications occurred in the S group that were easily controlled. No intraoperative complications occurred in the C group (p=0.07). No postoperative complications occurred in either group.

Conclusions: TLC is safe and efficient in a surgical training program. There is no decrement in patient outcomes. The time to trocar placement and cystic duct clipping and division is longer with TLC. Staff may be more conservative in TLC before participating in TLC.

TELEMANIPULATOR-ASSISTED RESECTION OF ABDOMINAL AORTIC ANEURYSMS-EARLY EXPERIENCES, T.C. Schmandra MD, R. Ritter MD, F. Adili MD, T. Schmitz-Rixen MD, Department of General and Vascular Surgery, JW Goethe University Hospital; Frankfurt am Main, Germany

Objective: The safety and feasibility of laparoscopic surgery using a surgical telemanipulator system have been demonstrated in laboratory experience and recently in clinical practice for a wide range of surgical procedures in the abdomen. Instead, only little experience exists using telemanipulator systems in vascular surgery. We report here our first experiences in telemanipulator-assisted transperitoneal resection of abdominal aortic aneurysm.

Patient and Methods: In two patients elective abdominal aortic aneurysm resection was performed with the assistance of a telemanipulator system (Intuitive Surgical, Mountain View CA, USA). Patients were positioned in a modified right lateral Anti-Trendelenburg position to properly expose the left flank. After port placement and attachment of the telemanipulator system transperitoneal dissection of the abdominal aneurysm was performed under CO2 pneumoperitoneum. For aortic clipping specially designed reusable laparoscopic clamps (Aesculap, Tuttingen, Germany) were used.

Results: In both cases exposition of the infrarenal aortic aneurysm was achieved using exclusively the telemanipulator system. Proximal and distal aortic clipping as well as aneurysm incision and control of backbleeding lumbar vessels was successfully performed. In both patients the proximal and distal anastomosis was performed via a para- median mini laparotomy in the line of the left-sided trocar incisions. Mean operation time was 360 minutes, clamping time of the aorta was 120 min. Convalescence and wound healing was uneventful.

Conclusion: We report for the first time the technical feasibility of laparoscopically-assisted resection of abdominal aortic aneurysms using a telemanipulator system. Locally laparoscopic resection with the robot was not intended by now but seems to be possible. The main advantages of the system in comparison to conventional laparoscopic surgery is the improved visualization by using a stereo camera and the ease of precise dissection by micromechanical instruments directed by masterslaves from a distant console. The current technology might enable and facilitate a wider range of laparoscopic vascular procedures. Its actual usefulness for the patient treatment has to be established by prospective clinical trials.
NEW TECHNIQUES/TECHNOLOGY

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BILIARY AND VASCULAR ANATOMICAL VARIATIONS IN A NEW VIRTUAL REALITY SIMULATOR FOR ENDOSCOPIC SURGERY TRAINING, Amir Szold MD, Boaz Sagie MD, Endoscopic Surgery Service and the Department of Surgery B, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel.

Objective: Virtual Reality (VR) simulators for endoscopic surgery are still deficient in presenting the trainee with a realistic picture of a surgical procedure. In addition, tasks are not aimed at specific skills required to perform laparoscopic surgery. A new surgical VR simulator was designed to address these requirements.

Methods: A new VR simulator (LapMentor®, Simbionix, Israel) was designed. The simulator has two domains; the first is a skill domain, with tasks that teach camera manipulation, 2-dimensional space orientation, tissue handling and clipping. The second is a ‘virtual patient’ domain, in which the trainee can perform a laparoscopic cholecystectomy (LC). In the skill domain, the tasks are performed in a ‘video game’ environment. In the ‘virtual patient’ domain the procedures are performed in a virtual anatomy derived from videos of human LC. One of four anatomical variations of the biliary tree and four of the vascular anatomy are randomly presented to the trainee, thus each virtual procedure is performed in a different anatomical setting. Simulator feedback includes errors, efficiency of movement, time of performance and task-specific feedbacks. The LapMentor®, is used in a ‘dry’ training center in the Tel Aviv Sourasky Medical Center. Residents are given the opportunity to learn and improve basic skills, and perform a virtual LC before performing the procedure on an actual patient.

Results: The LapMentor® was accepted well by the trainees. It is now included in a structured basic training program for laparoscopic surgery.

Expectations: Objective validation of the value of VR training using the LapMentor® is studied. Future features will include a virtual patient媲美 patient-specific anatomy derived from pre-operative imaging.

NEW TECHNIQUES/TECHNOLOGY

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LAPAROSCOPIC SURGERY USING A NEW STEREO-SCOPIC CAMERA: RESULTS OF TASK PERFORMANCE ANALYSIS AND A MULTI-CENTER CLINICAL STUDY, Amir Szold MD, Boaz Sagie MD, Endoscopic Surgery Service and Department of Surgery B, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel.

Aim: Monocular vision was shown to be the most restricting factor on task performance in laparoscopic surgery. A study comparing task performance using a new stereoscopic camera (VS1) and a standard laparoscopic camera was performed. In addition VS1 was tested in a variety of laparoscopic procedures to test the efficacy and user side effects.

Methods: The camera consists of a single-chip CCD and a lens array enabling picture acquisition of a true stereoscopic image. The image is displayed on commercially available stereoscopic display systems. Task performance study: A task consisting of capping a syringe needle three times was performed in a laparoscopic trainer, by 8 experienced and 8 inexperienced subjects, who were randomly assigned to use a standard laparoscopic camera or VS1 first, and performed the task using both cameras. Average time for task completion, errors, and a subjective assessment of user comfort and side effects were recorded. Clinical study: VS1 was used in 9 academic centers for performing laparoscopic procedures. The operative course, surgeon comfort and side effects such as dizziness, headache and nausea were recorded using a standard questionnaire.

Results: Task performance study: Task performance was significantly better using the stereoscopic camera (8.37 vs. 25.5 seconds), with no reported user side effects for VS1. Clinical study: During 21 months 106 laparoscopic procedures were performed. The surgeons reported improved understanding of the anatomy and subjective improvement in performance, mostly noted in suturing. Following early improvements in the system, the system was technologically mature and there were no user side effects reported.

Conclusion: stereoscopic vision improves performance in laparoscopic surgery. The current camera enables stereoscopic vision without notable side effects to the user. Additional studies should be undertaken to further assess the camera.

NEW TECHNIQUES/TECHNOLOGY

P394

NEW ASPECTS IN LAPAROSCOPIC CHOLECYSTECTOMY, Mohammad M Talebpour PhD, Moossa Zargar, Laparoscopic surgical ward, Sina Hospital, Tehran University.

Aim: Increasing the safety of laparoscopic cholecystectomy technique.

Method: In this prospective study on 150 cases, four important points used as a new technique to increase the safety of operation; including:

- choosing the place of trocars based on ergonomic law of 120 degree angle between telescope and two hands with at least 7 to 10 cm distance and 15 to 20 cm distance between telescope trocar and end point (Different points in different cases).
- starting dissection from Hartman Pouch at first and after encirling Hartman Pouch, continuing it to cystic duct and cystic artery in this aim to decrease unavoidable risk of ductal iatrogenic trauma.
- ligating cystic duct and cystic artery by intracorporeal suturing to decrease the risk of bile leak, ductal trauma, cystic artery bleeding or inversion of clips into duct.
- removing gallbladder from umbilical trocar to reserve size of trocars in three 5mm and one 10 mm.

Result: 12 out of 150 cases were impossible to use one or some of above points due to short cystic duct, acute cholecystitis, bleeding during dissection and so on. Cystic duct knot were loose in five cases and resuturing performed. Mean time of operation was 52 min (sem= 11 min) but ductal trauma and leak of bile was zero even in acute cases. Cosmetic results for patient are excellent because there is not any sub xyphoid 10 mm trocar in this method.

Conclusion: Using above points is effective to decrease risk of ductal trauma or bile leak, better cosmetic results but longer time and more hard operation.

NEW TECHNIQUES/TECHNOLOGY

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EARLY EXPERIENCE WITH ROBOTIC GASTROINTESTINAL SURGERY, Donovan D Teel MD, David L Crawford MD, James D Hursey RN, University of Illinois at Peoria - St. Francis Hospital.

Background: In August of 2002 Peoria Surgical Group purchased Intuitive Surgical’s, DaVinci robotic assistant. This device received FDA approval for general surgical applications in 2000. The purpose of the device is to facilitate the completion of advanced laparoscopic procedures by providing a high resolution three dimensional image, motion scaling and tremor reduction and additional degrees of freedom (internal pitch and yaw) to the laparoscopic instruments.

Methods: This is a review of our initial experience using the robotic assistant. Data were prospectively collected and entered into a computerized database.

Results: Seventy-one advanced laparoscopic cases were attempted using the robotic assistant. These procedures included 9 jejunoileal bypass (16), right colectomy (9), Roux-en-Y gastric bypass (8), cholecystectomy (7), esophagomyotomy (5), hiatal hernia repair (5), splenectomy (5), sigmoid colectomy (4), adrenalectomy (3), gastric resection (2), removal of posterior pleural mass (2), and single cases of esophagectomy, left colon resection, diaphragmatic hernia repair and gastric mobilization / pyloroplasty prior to esophagectomy. Complications have included a regional visceral injury during a sigmoid colectomy, anastomotic leak after right colectomy, conversion to open technique due to hemorrhage and to traditional laparoscopy secondary to stapler failure during splenectomy. A marginal ulceration following Roux-en-Y gastric bypass resolved with medical management. There have been no deaths. The robot set up, port placement, robot operative and total case times have consistently decreased as experience increased.

Conclusions: This early experience suggests that robotic surgery is a safe and effective alternative to conventional laparoscopic surgery. In our limited series the robot set up, port placement, robot operative and total case times have generally decreased as experience increased.
NEW TECHNIQUES/TECHNOLOGY

EVALUATION OF THREE NEW PRINCIPLES FOR MONO-INCLUSION IN ENDOSCOPIC SURGERY, Martine A van Veelen PhD, Johan F Lange PhD, Minke S Hansma MSc, Paul Breedveld PhD, GerJan Kleinrensink PhD, Richard H Goossens PhD, Delft University of Technology, Faculty Industrial Design Engineering, The Netherlands

Background: The limited abdominal wall trauma in endoscopy can be further reduced by limiting the number of incisions to one. The devices that are currently available for operating through a single incision have several problems: an unstable image due to the construction of the device, a considerable reduction of depth perception due to the parallel direction of endoscope view and the instrument shaft, and an incomplete image due to the instrument tip that is in front of the lens. To solve the above mentioned problems a new device was developed at the Delft University of Technology that supports the use of an endoscope and a grasping instrument at the same time, without enlarging the incision (12mm). Both instruments can be moved independently to afford a stable image.

Three principles are available to use the new device together with an endoscope and grasper. The aim of this study is to evaluate these three principles and to select the best out of three.

Methods: 14 surgeons used the new device during a simulated surgical task in a pelvis trainer. Three principles together with the new device were compared:

1. A 5mm 0° endoscope, a 5mm grasper and a manual zoom camera
2. A 5mm 45° endoscope, a 5mm grasper and a standard camera
3. A 5mm 0° endoscope, a 5mm curved grasper and a standard camera

The following variables were measured during and after the experiment:
time, errors, stability of image, judgement and preference of the subjects.

Results: The time was significantly shorter for the principles 1 and 2 compared to the principle 3 (resp. P=0.02 and P=0.04). For the variables of error, stability of image, and the judgement of the subjects no significant differences were found between the two versions. Most of the subjects (6 out of 14) preferred principle 2.

Conclusions: The results of the time measurements and the preference of the subjects indicate that a 45° endoscope together with a standard endoscopic grasper and camera seems to be the best combination in the newly developed mono-incision device. Further studies that eliminate the learning curves of the manual zoom camera, the 45° endoscope and the curved grasper should be performed to support this outcome.

NEW TECHNIQUES/TECHNOLOGY

LAPAROSCOPIC ASSISTED - INTRAOPERATIVE ULTRASOUND GUIDED - SINGLE HOLE CHOLECYSTECTOMY (LAIOUSC) : ITS EVOLUTION THROUGH AN EXPERIENCE OF OVER 2300 CASES, MANMOHAN VARMA MS, PRIVATE, KANPUR, INDIA (FORMERLY ASSISTANT PROFESSOR STATE MEDICAL COLLEGE SERVICES - email: manmo-hanvi@yahoo.com)

Laparoscopic surgery is the procedure of choice for cholecystectomy, but incidence of bile duct injury & complications unique only to laparoscopic cholecystectomy are of concern. In an effort to develop an alternative technique of minimally invasive cholecystectomy without the above drawbacks “laparoscopic assisted intraoperative ultrason sound guided single hole cholecystectomy (LAIOUSC)” has evolved through an experience of over 2300 cholecystectomies in 11 years.

METHODS & PROCEDURES: From November 1991 to May 1996 minilap cholecystectomy (3 to 3.5 cm muscle splitting incision, 4 cm in bulky patients) was done in all 1035 single hole cholecystectomies from May 1996 to October 2000 (microlap: 3 to 3.5 cm muscle splitting incision, 4 cm in bulky patients). During October 2000 to August 2003 consecutively in 768 patients undergoing IOUS guided single hole cholecystectomy (LAIOUSC) initially efforts were made to keep the incision around 3 cm (3.5 cm in bulky patients). Subsequently through this hole 0°, 30° & 45° endoscopes or sinuscopes were used to assist in surgery as & when needed to perform LAIOUSC. All the 1803 patients after May 1996 were discharged 6 to 24 hours after surgery. RESULTS: None of the 1803 patients undergoing IOUSC or LAIOUSC suffered bile duct injury compared to stated 0.2 to 1.4% or more incidence in laparoscopic cholecystectomy.

CONCLUSION: Bile duct safety in early discharge after surgery made IOUSC a viable alternative to laparoscopic cholecystectomy. Evolution of LAIOUSC makes this method gas-less, direct 3D viewing, minimally invasive & with laparoscopic assistance available. It does not have the complications unique only to laparoscopic cholecystectomy. LAIOUSC has not been reported from elsewhere in the world.

NEW TECHNIQUES/TECHNOLOGY

IMPACT OF DELAYED VISUAL FEEDBACK ON PATTERNS OF MOTION DURING ADVANCED LAPAROSCOPY Pamela Zimmerman MD, Taewan Kim MD, Joseph Dirrco MD, Carl A Weiss III MD, Upstate Medical University, Syracuse, New York

Introduction: Long distance data transmission inevitably contributes to visual delay between an image depicted and end effector function. We have previously shown that the time to perform an individual task is prolonged with increasing time delay. However, simple depiction of time to complete a specific task does not assess other aspects of movement such as accuracy and precision that also contribute to advanced laparoscopic technique.

The object of this study is to characterize the influence of time delay on the performance of an individual task focusing on accuracy and dexterity.

Methods: At an endoscopic skills station, 2 experiments were performed. Three surgeons with advanced laparoscopic experience placed a curved needle through two adjacent circles and the time to perform this task was recorded. Six surgeons with varying laparoscopic experience displayed dexterity by passing a small tube side-to-side through a larger tube. A simulator imposed incremental time delays to mimic the effect distance data transmission. Time to complete the tasks was measured in seconds and data were analyzed by ANOVA followed by Student-Newman Keuls test to assess significance at p<0.05.

Results: The maximum tolerable time delay to accurately perform a task roughly doubled at 0.65 seconds compared with controls with no delay (p<.05). Dexterity data is shown in chart with * significance (p<0.05). A move and wait strategy was adopted beyond that time. Overshoot and undershoot became a problem at that time with that
SOLID ORGAN REMOVAL

LAPAROSCOPIC SPLENECTOMY FOR THE SPLENIC NEOPLASMS, Tatsuru Akashi MD, Hideaki Andoh MD, Ouki Yasui MD, Toshiaki Kurokawa MD, Takao Hanako MD, Division of Surgery, Akita University School of Medicine

[INTRODUCTION] Laparoscopic splenectomy was undergone for ITP, safely but there are some problems to apply for the splenic neoplasms, such as tumor dissemination or port site recurrence. From 1995, we applied laparoscopic splenectomy for splenic neoplasms.

[PURPOSE] To examine the result of the laparoscopic splenectomy for the splenic neoplasm and analyze the complication and efficiency, we consider the indication of the laparoscopic treatment. [patients] Eight patients were applied laparoscopic splenectomy, from 1995 to 2002. Laparoscopic splenectomy were six cases, laparoscopic assisted splenectomy were two cases because of its big size. Five cases were lymphoma, including one case malignant lymphoma, and one case of leukemia, splenic cyst, and metastatic splenic tumor (colon cancer).

[methods] Under pneumoperitoneum method from 8 to 6 mmHg of carbonic gas pressure, dissection was performed with ultrasonic scapel, and splenic artery and vein were cut with Endocutter. The surgical specimens were removed from the trocar site with the bag. In six cases, spleen was teared into pieces in the bag and removed from 12mm port.

[results] Average operation time and bleeding were 193 minutes, 103ml. No complication such as postoperative bleeding and gas embolization were detected after operation. Three patients were malignant disease, but there was no influence for the prognosis of these cases such as early recurrence, dissemination and port site recurrence.

[conclusion] Laparoscopic splenectomy may provide an alternative approach with conventional surgery in the treatment of splenic neoplasms.
SOLID ORGAN REMOVAL  P404

COMBINED LAPAROSCOPIC SPLENECTOMY AND CHOLECYSTECTOMY IN CHILDREN WITH SPLENOMEGALY AND CHOLELITHIASIS, Andre Hebra MD, Beverly McGuire RN, Claudia Botero MPA, Gail Ray MD, Richard Harmel MD, All Children's Hospital, University of South Florida

Purpose: Pediatric patients with chronic hemolytic anemia and splenic sequestration are frequently found to have associated cholelithiasis. Such patients are considered excellent candidates for laparoscopic surgery because of their increased risk for postoperative complications. Simultaneous laparoscopic cholecystectomy and splenectomy is feasible but considered a challenging operation due to the presence of massive splenomegaly. Methods: Retrospective review of our experience with 10 pediatric patients (age range: 5 ? 14 years of age; average weight of 30 Kg) with history of splenic sequestration, splenomegaly, and cholelithiasis (6 patients with sickle cell disease and 4 with spherocytosis) treated with combined laparoscopic splenectomy and cholecystectomy. Cholelithiasis was confirmed by preoperative ultrasound. Splenectomy was also used to evaluate spleen size. In this group of patients, the spleen size was determined to range between 4 ? 8 times normal values for age/weight. The procedure was accomplished using 6 trocars and a Steiner electromagnetic morcellator for intracorporeal fragmentation of the spleen. An endobag was utilized to remove fragments of the spleen. The laparoscopic cholecystectomy was performed in supine position and patients were re-positioned in partial right-lateral decubitus for the laparoscopic splenectomy. No patient required conversion to open surgery. Operating time ranged from 90 to 245 minutes (average of 135 minutes for the last 5 cases). There were no complications and no patient required postoperative transfusion. Average length of stay was 2.5 days. All patients were followed with liver-spleen nuclear scans which did not demonstrate any residual or accessory splenic tissue. Conclusions: Safe and complete laparoscopic removal of very large spleens can be accomplished, even in small children, simultaneously with laparoscopic cholecystectomy. This offers an expedient recovery and diminishes postoperative pain and scarring.

SOLID ORGAN REMOVAL  P405

LAPAROSCOPIC RESECTION OF A PERINEPHRIC PARAGANGLIOMA, Ese Otah MD, Mahsa Mosaadegh MD, Patrick R Reardon MD, Department of Thoracic and Cardiovascular Surgery; The University of Texas Health Science Center at Houston; The Methodist Hospital, Houston, Texas

Paragangliomas are rare tumors arise form the sympathetic nervous system. These tumors may originate anywhere from the cervical region to the pelvis. These tumors may be functional secretors of catecholamines or nonfunctional. We present the case of a 15 year old female who was diagnosed with a 4 X 4.5 cm left adrenal mass on abdominal and pelvic CT scan performed for evaluation of right lower quadrant pain. Preoperative functional testing was negative. At laparoscopy, the patient was found to have a left perinephric mass adjacent to the aorta and overlying the left renal vascular pedicle. The patient underwent laparoscopic resection of the mass as well as resection of a Meckle’s diverticulum. The procedure and paragangliomas are discussed.

SOLID ORGAN REMOVAL  P406

LAPAROSCOPIC RESECTION OF RETROPERITONEAL TUMORS, Petachia Reissman MD, Ram M Spira MD, Dimitri Gimireich MD, Joseph Alberton MD, Department of Surgery, Shaare-Zedek Medical Center Jerusalem, Israel

Background: The laparoscopic approach for retroperitoneal tumors is uncommon and there is very little literature on this subject. However, with the increasing experience in advanced laparoscopic procedures in the retroperitoneal area like adrenalectomy, nephrectomy and lymph node dissection, and based on the oncologic safety and good results as reported in the urology literature when these procedures were performed for malignancy, we have applied the laparoscopic technique for resection of retroperitoneal tumors in selected patients.

Patients and Methods: Three consecutive patients (2 male 1 female, age 23-77 years) were incidentally diagnosed with retroperitoneal mass after having abdominal sonography for urinary tract disorders. Further imaging including CT and MRI revealed well encapsulated tumors with no invasion to major vessels or adjacent organs. All patient underwent trans peritoneal approach in the lateral “kidney” position using 3 to 4 ports. The specimen was removed in a bag through enlargement of one of the ports similar to laparoscopic adrenal or kidney resection.

Results: The length of stay was 2, 7, and 3 days respectively. There was no morbidity or conversion. Pathology revealed schwannoma of lymph node, follicular lymphoma and ganglioneuroma respectively. All tumors were completely excised with intact capsule and clean margins in the retroperitoneal fat. Follow up was 5-12 months.

Conclusion: The laparoscopic approach in selected cases of retroperitoneal tumors may be feasible and safe but further experience with long term follow up is needed.

SOLID ORGAN REMOVAL  P407

SURGICAL AUDIT OF FIRST 25 LAPAROSCOPIC SPLENECTOMIES, Mohammad m Talebpour PhD, Godrat m Tooghe PhD, Ali m Yagooob, Department of Surgery, Sina Hospital, Tehran, Iran

Aim: To assess the safety and clinical outcome of laparoscopic splenectomy.

Method: All consecutive patients referred for laparoscopic splenectomy to a tertiary centre were included in the audit. Open splenectomy was carried out on those with huge spleen. Patient were positioned at 60 degrees semi-supine. Exploration of upper abdomen was carried out routinely for presence of accessory spleen. Homeostasis of vessels performed by intracorporeal suturing routinely and in some conditions by clips. Spleen put in a bag after emptying of its blood by cutting hilar vein and removed from bag by splitting.

Results: During 18 months 25 laparoscopic splenectomies were performed; 19 ITP, 1 splenectomy with gallstone and 5 moderate splenomegaly with hypersplenism. Mean splenic size was 115±3.5 cm, with the biggest spleen measured at 30 x 12 x 9 cm. Splenic vessels were tied using intra-corporeal suturing (20 cases) or clips (5 cases). There was one case of conversion to open surgery. Two cases of ITP did not respond ideally to splenectomy. In cases of moderate splenomegaly, spleen was divided into 3 parts prior to use of bag. Mean operative time was 78min; and mean length of hospital stay was 3.2 days. All patients discharged from hospital without any morbidity or mortality.

Conclusion: Laparoscopic splenectomy including moderate splenomegaly is safe, with good patient outcome.
SOLID ORGAN REMOVAL

P408

RISKS AND COMPlications IN LAPAROSCOPIC SpleNECTOMY, Rosario Vecchio MD, Luigi Sambataro MD, Giuseppe Lipari MD, Chiara Polino MS, Valeria Privitera MS, DEPARTMENT OF SURGERY - UNIVERSITY OF CATANIA, ITALY

Laparoscopic splenectomy has recently gained an increasing interest among surgeons when surgical removal of the spleen is indicated. This operation, however, is associated with serious intra- and post-operative complications. Among post-operative complications some, such as hemorrhage, pancreatic fistula and portal vein thrombosis, are more related to the laparoscopic approach, while others, like pancreatitis, broncopneumonia, pulmonary embolism, sub-diaphragmatic abscess and overwhelming post-splenectomy sepsis, are probably less common than in open surgery. If post-operative complications are usually reported in literature series with an incidence ranging from 0-18.2%, intra-operative accidents and complications are less known since they are often not indicated by the surgeons. However, some indirect data are of help to understand their gravity and to approximately define their incidence. Based on literature review and on personal experience after 25 laparoscopic splenectomy, in this article the Authors analyse factors responsible for the most common intra-operative complications and suggest technical measures to prevent their occurrence. In addition, therapeutic strategy for prevention of peculiar complications after splenectomy, especially portal vein thrombosis and overwhelming post-splenectomy sepsis, is pointed out.

SOLID ORGAN REMOVAL

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Introduction: Laparoscopic donor nephrectomies (LDN) have been shown to be a safe and effective alternative in renal transplantation. We sought to determine how older donors recuperated after the operation and whether age affected allograft function.

Methods: We retrospectively reviewed the charts of all patients undergoing laparoscopic donor nephrectomies by one surgeon at a single institution from January 2000 through July 2003. A totally laparoscopic technique was employed for the dissection, and a Pfannenstiel incision was used for organ extraction. One kidney was lost to recipient related factors. During the study period sixty-eight patients underwent LDN. Patients were divided into two groups those less than age 50 (n=80, median age=53) and those age 50 or greater (n=11, median age=55). Recipient creatinine values were collected at 1, 2, 3 and 6 months post-operatively. Data analyzed by Student's t-test.

Results: Both donor groups were comparable in regards to medical history, surgical history, operative time, pre-operative creatinine and creatinine clearance. When average donor length of stays were compared they were 3 days and 2.5 days respectively (P=0.10).

Conclusion: Older donors undergoing LDN recover as well as their younger counterparts. The kidneys from older donors perform as well as those donated by younger donors. Age is not a contraindication for kidney donation as long as the donor is without significant co-morbidities.

SOLID ORGAN REMOVAL

P411

ISOLATED SPLENIC SARCOIDOSIS, Hassan Zia MD, Fred Brody MD, Alan Lichtin MD, The George Washington University Medical Center, The Cleveland Clinic Foundation.

Sarcoidosis is a granulomatous disease of unknown etiology. Over 90% of patients have pulmonary findings at the time of diagnosis. Extra-pulmonary involvement is common including the liver, central nervous system, lymph nodes, and joints. However, isolated granulomatous splenic disease is rare. This report documents an uncommon case of isolated granulomatous disease of the spleen diagnosed and treated laparoscopically.

A 47 year old female presented to her internist with nausea and mild, right upper quadrant abdominal pain. Laboratory evaluation revealed a slightly elevated bilirubin and liver function tests with neutropenia. An abdominal ultrasound found normal biliary and pancreatic anatomy and multiple splenic lesions. These findings prompted a computed tomogram (CT) of the abdomen confirming multiple hypodense lesions within the spleen. A CT of the chest was normal. The differential diagnosis at this time included neoplasm, infection, and autoimmune etiologies. Subsequently, the patient underwent a diagnostic laparoscopy with splenectomy for the isolated lesions. No other intra-abdominal pathology was found and the splenectomy was completed laparoscopically. Pathology revealed multiple non-caseating, splenic granulomas and the patient was discharged to home on Prednisone.

Sarcoidosis rarely presents with isolated splenic lesions and only 7% of all cases present with extra-pulmonary manifestations. Currently, the literature documents only two prior cases presenting with isolated splenic sarcoidosis. Primary management consists of medical therapy with prednisone, methotrexate, and/or antimalarial drugs. Indications for surgery include symptomatic splenomegaly, severe hypersplenism, prophylaxis for splenic rupture, and neoplastic exclusion. Our patient required a laparoscopic splenectomy for diagnostic purposes and neoplastic exclusion. Once diagnosed, patients require continual follow-up for systemic manifestations and associated complications of sarcoidosis.

SOLID ORGAN REMOVAL

P412

LAPAROSCOPIC REMOVAL OF LARGE POLYCYSTIC KIDNEYS: AN ALTERNATIVE TO OPEN LAPAROTOMY, Dilip Kittur MD, Howard Simon MD, Taewan Kim MD, Pamela Zimmerman MD, Upstate Medical University, Syracuse, New York.

Introduction: The benefits of laparoscopic nephrectomy have been well documented but there is less experience with laparoscopic removal of large polycystic kidneys. Most are removed by open procedures due to the difficulty in dissecting the entire kidney and in extracting it from small incisions employed for laparoscopic or lap-assisted procedures. Although the management of larger polycystic disease has traditionally been approached using open laparotomy, a laparoscopic approach should be considered as an alternative methodology for patients requiring surgical intervention. We report laparoscopic removal of large polycystic kidneys with minimal morbidity and with significantly better post-operative recovery.

Methods: Seven large polycystic kidneys in 4 patients were subjected to lap-assisted nephrectomy. After initial visualization and dissection of the overlying colon, kidneys were dissected with a combination of laparoscopic and hand assisted technique. Vascular staplers were utilized to divide the hilar structures, and the kidneys were extracted through the small hand port incision after in situ drainage of the majority of the cysts.

Results: All 7 kidneys were removed without a significant blood loss. operative times ranged from 70 to 185 minutes, kidney weight varied from 234 to 1475 grams. Length of stay was three to six days. Two trocars and a 3-inch incision were sufficient for unilateral nephrectomies; 3 trocars were necessary for bilateral nephrectomies. There were no complications.

Conclusions: Laparoscopic removal of large polycystic kidneys is feasible with minimal morbidity and, after a short learning curve, with shorter operative times and length of stay than open nephrectomy. We conclude that, in experienced hands, laparoscopic removal of large polycystic kidneys is preferred over the open technique.
MANAGEMENT OF PRIMARY SPONTANEOUS PNEUMOTHORAX BY MINISCOPY: ENDOSCOPIC SUTURE INSTEAD OF ENDO-STAPLER, Yi-Chen Chang MD, Kuo-Hsin Chen MD, Department of Surgery, Far Eastern Memorial Hospital.

Purpose: VATS are effective for treatment of spontaneous pneumothorax. Endo-staplers are safe and time-saving methods for blebs resection. However, the endo-stapler is not paid by health insurance in Taiwan. We use miniscopy and endoscopic suture instead of endo-staplers to do blebs resection. The results including hospital stay and recurrence rate are compared with that by endo-staplers.

Materials and methods: From Jan 2001 to Dec 2002, 53 cases of primary spontaneous pneumothorax received operations in our hospital. Four patients were excluded because they received minithoracotomy. The 49 patients were grouped into A: endoscopic suture and B: endo-staplers according to the patients’ economic status and their decisions after full explanation. We used miniscopy (Olympus 3 mm, 0°) for both groups. Apical partial resection were done by electrocautery pad abrasion for all patients. Chest tubes were removed the next day for all patients. Chest tubes were removed when the lung expanded completely and no air leak for more than 24 hours. The intervals to removal of chest tube were recorded and were compared between two groups. All patients were followed up at outpatient department and chest film was taken when necessary. The following intervals were from 9 months to 33 months. Student t test was used to analysis the result.

Result: Twenty seven patients received endoscopic suture (group A) and 22 patients received endo-staplers (group B). The interval between operation and removing chest tube were from 2 days to 7 days. The average interval between operation and removing chest tube was 3.06 days in the group A and 2.81 days in group B. The average interval between operations and removing chest tubes of two groups had no significant difference. No recurrence of pneumothorax for both groups.

Conclusions: The results of surgical intervention for primary spontaneous pneumothorax were good either by endo-staplers or by endoscopic suture. Miniscopy endoscopic suture is cost saving for the patients, and the results, surgical and cosmetics, are satisfactory.

THORACOSCOPY

THORACOSCOPY

COMPARISON OF NEEDLESCOPIC, SINGLE-PORT AND STANDARD THORACOSCOPIC SYMPATHECTOMY FOR TREATMENT OF PALMAR HYPERHYDROSIS, Shridhar G Iyer MD, Wei-Keat Cheah MD, Davide Lomanto PhD, Bok Yan J So MD, National University of Singapore


Methods: 79 consecutive patients underwent bilateral sympathetomy (158 procedures) for palmar hyperhidrosis by Needlescopic, single-port and standard thorascopic (3 three-port) approaches between March 1996 August 2003. 45 patients underwent needlescopic sympathectomy, 22 patients underwent single-port and 12 patients underwent standard 3 -port thorascopic sympathectomy. The operative time, analgesia requirement, post-operative stay and complications were evaluated in retrospective-prospective manner review of hospital charts and follow up assessments in the clinic.

Results: 79 consecutive patients presenting with palmar hyperhidrosis were evaluated. Statistical tests were done using paired t test and ANOVA to calculate difference between the groups (SPSS 11). The mean operative time in minutes was 47.14 for singleport, 57 minutes for needlescopic and 74.50 min for standard thorascopic techniques. The average overall length of stay was 1.45 days (1 to 4 days). Most patients required mild to moderate analgesia. 18 patients reported bothersome and two patients reported severe compensatory hyperhidrosis. 74 patients reported good results, 2 patients had satisfactory results and 3 considered treatment to be a failure. Two patients required chest drains for post-operative pneumothorax and twenty had asymptomatic mild pneumothorax. Two had persistent neuralgia. There was no significant difference in the operative time, hospital stay, analgesic requirements or complications between the groups.

Conclusions: Thorascoscopic sympathectomy by various approaches seems to have similar outcomes in terms of duration, hospital stay, analgesic requirements, and complications although there was a trend to shorter operative time and less asymptomatic pneumothorax in the single-port group.

THORACOSCOPY

THORACOSCOPIC SYMPATHECTOMY FOR PRIMARY HYPERHYDROSIS, Manuel I Rodriguez MD, Texas Tech University Health Sciences Center, Amarillo, TX, USA.

Thoracoscopic Sympathectomy is an effective technique for the treatment of Primary Hyperhidrosis. Some of the potential complications of the procedure particularly compensatory sweating has restrained physicians from recommending the operation.

50 Sympathectomies were performed in 25 patients suffering from Hyperhidrosis either palmaris, axillaris, or cranio-facial, with excellent results. T2 ganglion identification was done following a self develop technique. 3 patients developed compensatory sweating, in all of them the resection of the sympathetic chain was carried beyond the level of the T4 ganglion.

Correct identification of the T2 ganglion and its removal is essential for the success of the operation. Limiting the resection to T2 and T3 ganglia, maybe only T2 ganglion, will be all that is needed and may prevent the development of compensatory sweating.

HERNA SURGERY

EXPLORATORY LAPAROSCOPY: AN EXCELLENT MODALITY FOR THE DIAGNOSIS AND TREATMENT OF INTERNAL HERNIAS, Thanh Nguyen MD, Sergio Huerta MD, Daniel Marcus MD, Department of Surgery, Kaiser Permanente, University of California Irvine Medical Center

INTRODUCTION: The signs and symptoms of internal hernias are insidious and represent a diagnostic challenge for both clinicians and radiologists. Delayed intervention may lead to serious sequela. We report a case of a patient with classical presentation of internal hernia that was diagnosed and treated laparoscopically.

METHODS AND PROCEDURES: A 38 year-old woman with history of endometriosis total abdominal hysterectomy and a C-section presented to the hospital with a 30-hourhistory of sharp, intermittent epigastric and right lower quadrant pain accompanied by nausea and dry heaves. She has had similar, but less intense complaints for the past two years requiring a myriad of diagnostic tests including UGI series, EGD, multiple abdominal x-rays and CT scans, all of which were non revealing.

Physical exam revealed a well-developed, well nourished woman in moderate distress secondary to abdominal pain. Her temperature was 98.9 oC, pulse 78, BP 130/70. Her abdomen was soft and non-distended. There was moderate RLQ tenderness but rebound tenderness. Her laboratory tests included a hemogram, which demonstrated a WBC count of 14.4 with a left shift. An abdominal and pelvis CT after two hours of oral contrast revealed a 3cm ovarian cyst with small amount of free fluid, but no inflammation at the RLQ. Interestingly, no contrast was seen distal to the ileo-cecal junction. A follow up CT one hour later found no progression of contrast. After 12 hours of observation without improvement, she underwent a diagnostic laparoscopy.

FINDINGS: Laparoscopic inspection of the abdomen revealed an adhesive band at the level of the ileo-cecal junction. The ileum was found entrapped about this band causing local obstruction. The band was lysed and the normal appearing appendix was also removed. The patient’s symptoms resolved. She was discharged home on postoperative day one.

CONCLUSION(S): The diagnosis of internal hernias remain a diagnostic challenge and require a high index of suspicion. Laparoscopy is an excellent diagnostic modality for evaluation of an abdomen with a concerning, but unclear exam. In this case, an internal hernia at the RLQ presented a diagnostic conundrum to both the surgeon and radiologist. Laparoscopic exploration afforded the opportunity for both diagnosis and treatment.
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The MIS Fellowship Council is an association of MIS and Surgical Gastrointestinal Endoscopy fellowship directors formed to address the unique needs of fellowship directors and applicants. The MIS Fellowship Council provides a communication forum for disseminating information about fellowship issues and communicating the Council's positions to other organizations. The Council's primary goals are creating a fellowship program registry and standardizing the fellowship application and selection process for the upcoming application cycle. Residency program directors, fellowship directors and upcoming fellowship applicants are encouraged to stop by this booth to learn more about the organization and its goals.

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