



# IPEG's 21<sup>st</sup> Annual Congress for Endosurgery in Children

Held in conjunction with the Society of American  
Gastrointestinal and Endoscopic Surgeons (SAGES)

**March 6-10, 2012**

**San Diego Convention Center • San Diego, CA**

**Final Program**



*This year, IPEG will offer Spanish translation throughout the General Sessions (Thursday-Saturday). Headsets will be provided on site to access translation.*

# IPEG's 21st Annual Congress for Endosurgery

**March 6-10, 2012**

## The San Diego Convention Center

111 W. Harbor Drive • San Diego, CA 92101

**PHONE:** +1-619-525-5000

## Headquarters Hotel

### Manchesters Grand Hyatt

One Market Place • San Diego, CA 92101

**PHONE:** +1-619-232-1234



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## IPEG 2012 Corporate Supporters

### DIAMOND LEVEL

Karl Storz Endoscopy  
Stryker Endoscopy

### PLATINUM LEVEL

Ethicon Endo-Surgery, Inc.

### SILVER LEVEL

Covidien  
Olympus America Inc.

# General Information

## Meeting Hours

### Exhibits and Posters

**Wednesday, March 7, 2012**

*SAGES/IPEG Opening Reception*

*Location: Exhibit Hall C*

5:30 pm - 7:30 pm

**Thursday, March 8, 2012**

*Poster Tours (Posters 1-76)*

9:30 am - 3:30 pm

12:30 pm - 1:45 pm

**Friday, March 9, 2012**

*Poster Tours (Posters 77-153)*

9:30 am - 3:30 pm

12:30 pm - 1:45 pm

**Saturday, March 10, 2012**

*Free Lunch for All Attendees*

10:00 am - 1:00 pm

12:00 pm - 1:00 pm

### Registration Hours

**Tuesday, March 6, 2012**

12:00 pm - 5:00 pm

**Wednesday, March 7, 2012**

6:30 am - 6:00 pm

**Thursday, March 8, 2012**

6:30 am - 5:30 pm

**Friday, March 9, 2012**

6:30 am - 5:30 pm

**Saturday, March 10, 2012**

7:00 am - 2:00 pm

### Speaker Ready Room Hours

*Location: Room 10*

**Tuesday, March 6, 2012**

8:00 am - 5:00 pm

**Wednesday, March 7, 2012**

5:30 am - 5:00 pm

**Thursday, March 8, 2012**

5:30 am - 5:30 pm

**Friday, March 9, 2012**

5:30 am - 5:30 pm

**Saturday, March 10, 2012**

5:00 am - 4:00 pm



**The IPEG General Sessions will be translated in Spanish.**

*Presenters, to ensure optimum translation of your presentation, please make sure you turn in your presentation 24 hours before your schedule time.*



*Crystal Pier, San Diego, CA*

# General Information

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## Why IPEG?

Now is an excellent time to become an IPEG member. Join IPEG now and receive a substantial discount on the meeting registration by being an IPEG member! Your dues also include a subscription to the *Journal of Laparoendoscopic & Advance Surgical Techniques* and *Part B: Videoscopy*, the journal's on-line video component (a \$1200 value is yours for FREE with your paid IPEG membership.)

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## Who Should Attend?

**The 21<sup>st</sup> Annual Congress of the International Pediatric Endosurgery Group** (IPEG) has elements that have been specifically designed to meet the needs of practicing pediatric surgeons, urologists, and other related specialties, physicians-in-training, GI assistants, and nurses who are interested in minimally invasive surgery in children and adolescents. The IPEG Program Committee recommends that participants design their own attendance schedule based on their own personal educational objectives.

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## 2012 Meeting Objectives

The objectives of the activity are to educate pediatric surgeons and urologist about developing techniques, to provide a forum for discussions about the management principles regarding minimally invasive surgical techniques and to reveal scientific developments that will affect their patient population.

### Specific Objectives include:

1. Presentation of new and developing minimally invasive surgical techniques in a scientific environment.
2. Interaction with experts in the fields of minimally invasive pediatric surgery and urology via panel discussion and audience response systems.
3. Debates about controversial issues regarding minimally invasive surgery in infants and children.
4. Encourage international networking in the management and minimally invasive surgical interventions for infants and children.

At the conclusion of the activity, pediatric surgeons and urologists will be more familiar with developing techniques and increase their competence in the area of minimally invasive surgery in infants and children.

## Best Science Award

The Best Science Award will be a cash prize of US \$1,000 to be presented on Saturday during the Awards Presentation Session. The Program Committee will select the Award recipient. The IPEG Executive Committee is committed to education and feels that this is a very concrete way to express that commitment.

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## IRCAD Award

As a result of a generous grant provided by Karl Storz Endoscopy, the best resident abstract presenters will be selected by the IPEG Program Committee to receive the 2012 IRCAD Award. The Award recipients will travel to Strasbourg France to participate in a course in pediatric minimally invasive surgery at the world famous European Institute of Telesurgery. This center at the University of Strasbourg is a state-of-the-art institute for instruction in all aspects of endoscopic surgery that is now providing a series of courses in pediatric surgery.

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## IPEG Member Benefits

IPEG exists to support excellence in Pediatric Minimal Access Surgery and Endoscopy through education and research; to provide a forum for the exchange of ideas in Pediatric Minimal Access Surgery and Endoscopy; and to encourage and support development of standards of training and practice in Pediatric Minimal Access Surgery and Endoscopy. Benefits of membership include:

- Online subscription to the *Journal of Laparoendoscopic & Advanced Surgical Techniques & Videoscopy* and *Part B: Videoscopy* (A \$1200 value is yours for FREE with your paid IPEG membership.)
- Significant discounts on registration fees for the Annual Congress for Endosurgery in Children. (Note: registering for the IPEG Scientific Session, as a member, will save you the equivalent of one year's dues.)
- Access to our Video Library with Archived Presentations from previous meetings.
- Affordable dues for surgeons and surgeons-in-training in any country.
- Opportunities to meet and discuss pediatric minimally invasive surgery with leaders and innovators in the field.

For more information and applications, please go to:

**[www.ipeg.org/whyjoin.php](http://www.ipeg.org/whyjoin.php)**



## Event Dress Code

*Please note that the dress code for the entire conference is West Coast Casual!  
(Feel free to bring your surf board!)*

# 2012 Program Chairs

## Todd A. Ponsky, MD

Program Chair, Cleveland Heights, Ohio, USA



Todd Ponsky is currently Associate Professor of Surgery and Director of The Minimally Invasive Pediatric Surgery Center at Rainbow Babies and Children's Hospital, Case Western Reserve University. He attended Medical School at Case Western Reserve University in Cleveland, Ohio from 1995-1999, Residency in General Surgery at The George Washington University in Washington, DC from 1999-2005, Pediatric

Surgery Fellowship at Children's National Medical Center in Washington, DC from 2005-2007, and an Advanced Minimally Invasive Pediatric Surgery Fellowship at The Rocky Mountain Hospital for Children in Denver, CO from 2007-2008. Dr. Ponsky has a particular interest in pediatric minimally invasive surgery and "Single Port Surgery". He has trained over 100 surgeons in Single Port Surgery. He has written over 39 manuscripts and 9 book chapters. He has a strong focus on surgical education and virtual education and has directed 4 national / international courses. He has won numerous teaching awards including "The Faculty Teaching Award" at Case Western Reserve Department of Surgery in his first year as faculty. He is a reviewer for over five medical journals and is on the editorial board of The Journal of Laparoendoscopic and Advanced Surgical Techniques. He has a wife, Diana, 4 year old daughter, Sasha, and 1 year old daughter, Josie.

## Miguel Guelfand, MD

Program Co-Chair, Santiago, Chile



Dr. Miguel Guelfand is a Consultant Paediatric Surgeon at the Exequiel Gonzalez Cortes Hospital for Children and Clinica Las Condes in Santiago, Chile. He is a Paediatric Surgeon with interests in Minimal Access Surgery, Neonatal Surgery and Surgical Oncology.

He did his medical and paediatric surgical training in Chile. He did a 2 years fellowship as post graduate training in Neonatal Surgery at Great Ormond Street Hospital with Professor Spitz and Mr. Kiely in London, England in 1999 and 2000. His Minimally Invasive training was done at the Mother's and Children's Hospital with Professor Hock Tan in Adelaide, Australia and at the Rocky Mountain Hospital with Steve Rothenberg in Denver, USA.

He was appointed as Consultant Paediatric Surgeon at the Exequiel Gonzalez Cortes Hospital for Children in 1998 and head of Neonatal Surgery since 2001. He also was appointed as Assistant Professor in Paediatric Surgery at the University of Chile in 2007.

The past 10 years he has had a passion and a strong focus for neonatal and minimally invasive surgery and has attained recognition in the use of laparoscopy and thoracoscopy in neonates.

Dr. Guelfand is one of the current World at Large Representatives at IPEG and member of the Educational Committee. He also is a member of the Paediatric Editorial Board of the Journal of Laparoendoscopic & Advance Surgical Techniques.

He lives in Santiago, Chile with his wife Paula and his 2 daughters, Isidora and Fernanda.

## John J. Meehan, MD

Program Co-Chair, Seattle, Washington, USA



Dr. John J. Meehan, MD, FACS is an Associate Professor of Surgery at the University of Washington and Seattle Children's Hospital. After graduating from Washington University – St. Louis with an engineering degree, he began his professional career as an electrical engineer for McDonnell Douglas and worked on the design of military fighter aircraft including the F/A-18, F-15, and the AV-8B. Although he

loved the engineering, he eventually decided to go back to school at the University of Iowa College of Medicine and graduated in 1993. He completed residencies in general surgery at the University of Alabama at Birmingham, surgical critical at Children's Mercy Hospital in Kansas City, and pediatric surgery at Children's Hospital – Los Angeles. Dr. Meehan then returned to Iowa and began investigating the applications of new technologies in pediatric surgery including robotic surgery and robotic simulation. He has written more than 30 first author publications on robotic pediatric surgery and authored dozens of book chapters on the subject. He is considered one of the world's leading authorities in pediatric robotic general surgery. Although semi-retired from elite level racing, he is also extensively involved with USACycling, international professional cycling, and remains active with the US based Bissell Pro Cycling Team.

## Holger Till, MD, PhD

Program Co-Chair, Leipzig, Germany



Professor Holger Till is currently Chair Professor of Pediatric Surgery and Director of the Division of Pediatric Surgery at the University of Leipzig, Germany. He attended Medical School at the University of Goettingen and the University of California in San Diego (UCSD). He also participated in a student exchange program with the Harvard Medical School and got fascinated by pediatric surgery while working with Professor

Patricia Donahoe at the Massachusetts General Hospital in Boston. After graduation in 1989 he completed his residency in General Surgery and his fellowship in Pediatric Surgery at the Ludwig-Maximilians University of Munich. His career as a Pediatric Surgeon started at the Dr. von Hauner Children's Hospital of the University of Munich. In 2004 he became an Assistant Professor of Pediatric Surgery at the Chinese University of Hong Kong with Professor Yeung. In 2006 he returned to Germany and accepted the Professorship for Pediatric Surgery in Leipzig.

Professor Till has a special interest in pediatric minimal invasive surgery and is the present director of the Single-Portal Laparoscopic Surgery (SPLS) training course at the IRDC (International Reference and Development Center for Surgical Technology) in Leipzig. He also chairs the training academy of the German Society of Pediatric Surgery. His present research introduces modern techniques like metabolomics and proteomics to malformations of the newborn as well as morbid obesity. He has published more than 130 scientific articles in national and international indexed journals and presented over 100 abstracts. Professor Till is a member of several professional societies and serves on the Editorial Board of many prestigious journals.

# SAGES/IPEG 2012 Exhibitors

3-Dmed  
Acell Inc.  
Advanced Endoscopy Devices, Inc.  
Aesculap, Inc.  
Afcell Medical  
Allergan  
Ambry Genetics  
American College of Surgeons Bariatric  
Surgery Center Network (ACS BSCN)  
Accreditation Program  
Apollo Endosurgery, Inc.  
Apollo Surgical Industries, Inc.  
Applied Medical  
Atrium Medical Corporation  
Automated Medical Products Corporation  
Bariatric Times  
Bârrx Medical, Inc.  
Baxter Healthcare Corporation  
BG Medical  
Boston Scientific  
Cadence Pharmaceuticals, Inc.  
Calmoseptine, Inc.  
Carefusion  
Cine-Med, Inc.  
Cleveland Clinic – CSITE  
Compview Medical  
Conmed  
Cook Medical  
Coopersurgical  
Covidien  
Crospon  
Davol Inc., A Bard Company

Elsevier  
Encision Inc.  
Endochoice  
Endoevolution, LLC  
Endogastric Solutions  
Ethicon Endo-Surgery  
General Surgery News  
Gore & Associates  
H & H Surgical Technologies  
HRA Healthcare Research & Analytics  
Integra  
Intouch Health  
Intuitive Surgical, Inc.  
IMDS  
Karl Storz Endoscopy-America, Inc.  
Lagis Enterprise Co., Ltd.  
Lexion Medical, Inc.  
Lifecell A KCI Company  
Market Access Partners  
Mederi Therapeutics Inc.  
Mediflex Surgical Products  
Medspace Exploration  
Mercy Clinic Physician Recruitment  
Microline Surgical  
Mimic Technologies, Inc.  
Nashville Surgical Instruments  
New Wave Surgical Corporation  
Novartis Oncology  
Olive Medical  
Olympus America Inc.  
Pacira Pharmaceuticals, Inc.  
Paré Surgical

Perkins Healthcare Technologies  
Pikeville Medical Center Inc.  
Plus Diagnostics  
Practice Partners In Healthcare, Inc.  
Richard Wolf Medical  
Instruments Corp.  
Robard Corporation  
Sandhill Scientific  
Salix Pharmaceuticals, Inc.  
Symbionix USA Corp.  
Simsurgery  
Springer  
Stryker Endoscopy  
Surgical Innovations  
Surgical Products Magazine  
Surgical Science, Inc.  
Surgiquest, Inc.  
Suture Ease LLC  
Synovis Surgical Innovations  
Teleflex  
Transenterix  
University of Tennessee  
Physician Executive MBS Program  
Vectec  
Viking Systems, Inc.  
Vision-Sciences, Inc.  
Xodus Medical, Inc.

***For Exhibitor Floor Plan  
and Profiles, see pages 28-36.***

## Social Programs

### **Welcome Reception: A Slew of Equipment Debuts in the Exhibit Hall!**

**Wednesday, March 7, 2012 • 5:30 - 7:30 pm**

**PLACE:** San Diego Convention Center - Exhibit Hall C • **FEE:** No Fee for Registrants & registered guests • **DRESS:** Business Casual  
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.*

### **IPEG/SAGES Dinner, Ship Tours and Sing-Off**

**Friday Evening, March 9, 2012 • 7:30 - 11:00 pm • Historic USS Midway Aircraft Carrier Museum**

**PLACE:** 910 Harbor Drive, San Diego

**DRESS:** Fun-Casual, wear dancing shoes

**FEE:** Included in your IPEG Registration

**TICKETS:** \$150.00 (for each additional guest, children under 14 free)

Ticket includes Wednesday Welcome Reception.

Imagine experiencing life at sea aboard one of America's longest-serving aircraft carriers. Join us on this floating city at sea and walk in the footsteps of 225,000 Midway sailors who served on this tour-de-force. Premium open bar, fabulous buffet and the best band in San Diego will make for an unforgettable evening.

The evening will conclude with an International Sing-Off.



# Accreditation and CME Worksheet

The Activity has been planned and implemented in accordance with the Essentials and Standards of the Accreditation Council for Continuing Medical Education. Through the joint sponsorship of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and IPEG. SAGES is accredited by the ACCME to provide medical education for Physicians.

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) designates this live activity for a maximum of **28.5 AMA PRA Category 1 Credit(s)**<sup>™</sup>. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

TIME	ACTIVITY	CREDITS AVAILABLE	HOURS ATTENDED
<b>Tuesday, March 6, 2012</b>			
5:00 pm - 9:00 pm	Postgraduate Lecture: MIS in Infants and Neonates	3.5	_____
	<b>Total Credits Available for Tuesday</b>	<b>3.5</b>	_____
<b>Wednesday, March 7, 2012</b>			
8:30 am - 11:30 am	MIS in Infants and Neonates Hands On Lab (Animate)	3.0	_____
1:00 pm - 5:00 pm	Simulator Hands On Lab (Inanimate)	4.0	_____
	<b>Total Credits Available for Wednesday</b>	<b>7.0</b>	_____
<b>Thursday, March 8, 2012</b>			
7:30 am - 8:45 am	Morning Scientific Video Session: Coolest Tricks & Extraordinary Procedures	1.25	_____
8:45 am - 8:50 am	Welcome Address	0	_____
8:50 am - 10:00 am	Scientific Session: Clinical & Basic Science	1.0	_____
10:30 am - 12:00 pm	IPEG/SAGES Joint Panel: "My Way is Better Than Yours"	1.5	_____
12:00 pm - 12:30 pm	Presidential Address & Lecture: "Pediatric Endosurgery; A Brief History"	0.5	_____
12:30 pm - 1:45 pm	Poster Tours (Poster 1-76)	0	_____
1:45 pm - 2:15 pm	Guest Lecturer: "Pushing the Envelope" - New Ideas in Pediatric Endoscopic Surgery "What Can We Learn from Animals?"	0.5	_____
2:15 pm - 3:15 pm	Scientific Session: Gastrointestinal & Hepatobiliary - Part I	1.0	_____
3:15 pm - 3:30 pm	Lifetime Achievement Award	0	_____
4:00 pm - 4:30 pm	Karl Storz Lecture: "The Impact of Advanced Technologies on the Future of Surgery"	0.5	_____
4:30 pm - 5:30 pm	Panel: Inguinal Hernias	1.0	_____
	<b>Total Credits Available for Thursday</b>	<b>7.25</b>	_____
<b>Friday, March 9, 2012</b>			
7:30 am - 8:30 am	SAGES/IPEG Great Debates in Pediatrics Bariatric Surgery	1.0	_____
8:30 am - 9:30 am	Morning Scientific Video Session: Unexpected Findings, Troubles and Complications	1.0	_____
10:00 am - 11:00 am	Scientific Session: Gastrointestinal & Hepatobiliary - Part II	1.0	_____
11:00 am - 12:00 pm	Scientific Session: Robotics and Alternative Technologies	1.0	_____
12:00 pm - 12:30 pm	Keynote Lecture: "Remote Presence, Telemedicine, and Healthcare Delivery"	0	_____
12:30 pm - 1:45 pm	Poster Tours (Posters 77-152)	0	_____
1:45 pm - 2:45 pm	Panel: Difficult Situations in MIS	1.0	_____
2:45 pm - 4:00 pm	Scientific Session: Urogenital MIS	1.25	_____
4:30 pm - 5:30 pm	Panel: Chest Wall Deformities	1.0	_____
	<b>Total Credits Available For Friday</b>	<b>7.25</b>	_____
<b>Saturday, March 10, 2012</b>			
7:00 am - 8:15 am	Scientific Session: Miscellaneous	1.25	_____
8:15 am - 8:45 am	General Assembly	0	_____
8:45 am - 9:00 am	Awards	0	_____
9:00 am - 9:15 am	2011 Research Grant Presentation	.25	_____
9:45 am - 10:45 am	IPEG Panel: IBD	1.0	_____
10:45 am - 11:45 am	Scientific Session: Thorax	1.0	_____
11:45 am - 12:00 pm	Closing Remarks & Presentation of the IPEG 2013 President	0	_____
12:00 pm - 1:00 pm	Free Lunch in Exhibit Hall	0	_____
	<b>Total Credits Available For Saturday</b>	<b>3.5</b>	_____
	<b>TOTAL POSSIBLE CREDITS</b>	<b>28.5</b>	_____

This is **NOT** your CME credit form. Please use the worksheet to track the number of CME hours you attend for each activity.

To receive a CME Certificate for this meeting, please complete the online **CME Request Form** by visiting [www.svy.mk/IPEG2012](http://www.svy.mk/IPEG2012)



# IPEG's 22nd Annual Congress for Endosurgery in Children

**SAVE THE DATE**  
**June 17-22, 2013**

Call for abstract opens in July!



Held at the JW Marriott Beijing, China

83 Jian Guo Rd., China Central Place, Chaoyang District, Beijing 100025, PRC

[WWW.IPEG.ORG](http://WWW.IPEG.ORG)

2013

# IPEG Annual Meeting Commercial Bias Reporting Form

## You are encouraged to ...

1. Document (on this form) any concerns about commercially-biased presentations/ materials during educational sessions, and
2. Immediately take your completed form to the IPEG staff at Meeting Registration Desk

Your feedback will be shared with a members of the Educational Committee and IPEG CME Chair, who will make the faculty and course chair(s) aware of these concerns.

## COMMERCIAL BIAS

The International Pediatric Endosurgery Group (IPEG) has an obligation to the medical profession and society as a whole to elucidate bias in order to protect the objectivity, scientific integrity and quality of its continuing medical education (CME) programs and to provide CME in an ethical and impartial manner. **Bias is defined** when a preference or predisposition exist toward a particular perspective or result that interferes with an individual's ability to be impartial, unprejudiced or objective in order to further personal gain and disregard for data. Particular preferences may be favorable or unfavorable. When bias exists, impartial judgment and neutrality may be compromised. Bias may be minimized through a declaration of conflict of interest or commercial interests, an evaluation of peer-reviewed evidence-based medicine with an integration of clinical expertise and/or experience, and an assertion of published sources for evidence-based reporting. IPEG requires presenters at all educational events to specifically avoid introducing bias, commercial or otherwise, into their presentations.

### Presentation:

(eg session name, etc)

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### Commercial Bias by:

(ie faculty name, company rep)

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### Promotion via:

(eg handouts, slides, what they said, actions)

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### Commercial Bias about:

(check all that apply)

- Patient treatment/management recommendations weren't based on strongest levels of evidence available.
- Emphasis was placed on one drug or device versus competing therapies, and no evidence was provided to support its increased safety and/or efficacy.
- Trade/brand names were used.
- Trade names versus generics were used for all therapies discussed.
- The activity was funded by industry and I perceived a slant toward the grantors.
- The faculty member had a disclosure and I perceived a slant toward the companies with which he/she has relationships.
- Other (please describe): \_\_\_\_\_

Please return this form to IPEG Meeting Registration or fax to 310-437-0585.

# *IPEG Policy on Conflict of Interest*

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## **A. Identifying Conflicts of Interest**

IPEG has implemented the following approach towards identifying potential conflicts of interest.

1. Members of Program Committees involved in the planning of CME activities, including the Executive Committee, must provide a financial disclosure. These disclosures are sent to the committee in advance of each committee meeting. Attendees are reminded about the disclosure policy at each committee meeting, and any committee member with a conflict is asked to recuse him or herself from the discussion of any CME activities.
2. Course Directors for CME activities must provide their financial disclosures along with their suggested course outline and faculty. This information is forwarded to the IPEG appointed CME Chair, who then determines whether or not a potential conflict exists and makes suggested edits, before forwarding for final review to IPEG CME provider.
3. Invited faculty for CME activities must provide their financial disclosures upon invitation to serve as faculty.
4. For abstract submissions for the scientific session, the presenting and senior authors must provide disclosures. Abstracts are peer reviewed in a blinded fashion by multiple reviewers and are selected for presentation based on scientific merit. All disclosures are provided to the Program Committee and CME Chair, to review before "Putting the Program Together" during which the final abstracts are selected for presentation.
5. All speakers at IPEG CME activities must display a list of financial disclosures on the first slide of their presentation.

## **B. Managing Potential Conflicts of Interest**

1. IPEG has implemented several mechanisms to manage conflicts of interest prior to an educational activity.
2. Self-management, such as the committee member recusing him or herself from discussion of CME activities.
3. The IPEG CME Chair reviews all Course Director's disclosures, proposed course outlines and faculty lists. He or she will make edits to the course outline or faculty list if necessary. The IPEG disclosure form requires faculty to provide management suggestions if there is a relationship with a commercial entity. This information is forwarded to the IPEG CME Chair and Education Committee, who are then responsible for determining whether or not a conflict exists and if so, how to manage this conflict.
4. If a conflict is determined, then a letter is sent to the faculty member, requiring them to adhere to the management technique or else recuse him or herself from the presentation.
5. During the session, the Course Director are instructed to observe the presentations and makes note of commercial bias. If any is perceived, this is immediately reported to the staff.
6. All attendees of CME activities are requested to make note of perceived commercial bias in activity evaluations and bias report forms. The Education Committee and/or the IPEG CME Chair will investigate substantive concerns.

# 2012 Meeting Leaders and Faculty

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## Executive Committee

**PRESIDENT:** Carroll M. Harmon, MD, PhD - Birmingham, AL, USA  
**PRESIDENT-ELECT:** Tadashi Iwanaka, MD, PhD - Tokyo, Japan  
**1ST VICE PRESIDENT:** Benno Ure, MD, PhD - Hannover, Germany  
**2ND VICE PRESIDENT:** Mark L. Wulkan, MD - Atlanta, GA, USA  
**SECRETARY:** Maria Marcela Bailez, MD - Buenos Aires, Argentina  
**TREASURER:** Marc A. Levitt, MD - Cincinnati, OH, USA  
**EDITOR:** Daniel J. Ostlie, MD - Kansas City, MO, USA

## AMERICA'S REPRESENTATIVE:

Timothy D. Kane, MD - Washington, DC, USA

**EUROPEAN REPRESENTATIVE:** Juergen Schleeff, MD - Trieste, Italy

## WORLD-AT-LARGE REPRESENTATIVES:

Aayed R. Al-Qahtani, MD - Riyadh, Saudi Arabia

Miguel Guelfand, MD - Santiago, Chile

## PAST-PRESIDENT:

Gordon A. MacKinlay, OBE - Edinburgh, Scotland

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## Program Committee

### CHAIR:

Todd A. Ponsky, MD - Cleveland Heights, OH, USA

### CO-CHAIRS:

Miguel Guelfand, MD - Santiago, Chile

John J. Meehan, MD - Seattle, WA, USA

Holger Till, MD, PhD - Leipzig, Germany

Aayed R. Al-Qahtani, MD - Riyadh, Saudi Arabia

Maria Marcela Bailez, MD - Buenos Aires, Argentina

Alan W. Flake, MD - Philadelphia, PA, USA

James D. Geiger, MD - Ann Arbor, MI, USA

Keith E. Georgeson, MD - Spokane, WA, USA

Anna Gunnarsdóttir, MD - Lund, Sweden

Munther J. Haddad, MD - London, UK

Carroll M. Harmon, MD, PhD - Birmingham, AL, USA

Ronald B. Hirschl, MD, FACS - Ann Arbor, MI, USA

George W. Holcomb III, MD - Kansas City, MO, USA

Ciro Esposito, MD, PhD - Naples, Italy

Satoshi Ieiri, MD - Fukuoka, Japan

Saleem Islam, MD - Gainesville, FL, USA

Tadashi Iwanaka, MD, PhD - Tokyo, Japan

Pablo Laje, MD - Philadelphia, PA, USA

Marc A. Levitt, MD - Cincinnati, OH, USA

Long Li, MD - Beijing, China

Gordon A. MacKinlay, OBE - Edinburgh, UK

Sean S. Marven, MD - Sheffield, UK

Philippe Montupet, MD - Jouy en Josas, France

Oliver J. Muensterer, MD - New York, NY, USA

Olivier Reinberg, MD - Lausanne, Switzerland

Fred Rescorla, MD - Indianapolis, IN, USA

Steven Rothenberg, MD - Denver, CO, USA

Atul J. Sabharwal, MD - Glasgow, UK

Shawn D. St Peter, MD - Kansas City, MO, USA

Benno Ure, MD, PhD - Hannover, Germany

Jean-Stéphane Valla, MD - Nice, France

Philipp O. Szavay, MD - Tuebingen, Germany

C.K. Yeung, MD - Hong Kong, China

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## IPEG Past Presidents

Gordon A. MacKinlay, OBE (2011)

Marcelo H. Martinez Ferro, MD (2010)

George W. Holcomb III, MD (2009)

Jean-Stéphane Valla, MD (2008)

Atsuyuki Yamataka, MD (2007)

Keith E. Georgeson, MD (2006)

Klaas (N) M.A. Bax, MD (2005)

C.K. Yeung, MD (2004)

Craig Albanese, MD (2003)

Vincenzo Jasonni, MD (2002)

Peter Borzi, MD (2001)

Steven Rothenberg, MD (2000)

Juergen Waldschmidt, MD (1999)

Hock L. Tan, MD (1998)

Takeshi Miyano, MD (1997)

Steven Rubin, MD (1996)

Gunter-Heinrich Willital, MD (1995)

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## Faculty

Hossein Allal, MD - Montpellier, France

Aayed R. Al-Qahtani, MD - Riyadh, Saudi Arabia

Georges Azzie, MD - Toronto, Canada

Maria Marcela Bailez, MD - Buenos Aires, Argentina

Katherine A. Barsness, MD - Chicago, IL, USA

Raul Bignon, MD - Buenos Aires, Argentina

Karen A. Diefenbach, MD - New Haven, CT, USA

Sherif Emil, MD - Montreal, Canada

Edward Esteves, MD - Goiania, Brazil

Alan W. Flake, MD - Philadelphia, PA, USA

Michel Gagner, MD - Montreal, Quebec, Canada

Carlos García-Hernandez, MD - Mexico City, Mexico

James D. Geiger, MD - Ann Arbor, MI, USA

Keith E. Georgeson, MD - Spokane, WA, USA

Ted Gerstle, MD - Toronto, Canada

Michael J. Goretsky, MD - Norfolk, VA, USA

Miguel Guelfand, MD - Santiago, Chile

Anna Gunnarsdóttir, MD, PhD - Stockholm, Sweden

Munther J. Haddad, MD - London, UK

Carroll M. Harmon, MD, PhD - Birmingham, AL, USA

George W. Holcomb III, MD - Kansas City, MO, USA

Celeste Hollands, MD - Mobile, AL, USA

Thomas H. Inge, MD - Cincinnati, OH, USA

Joseph A. Iocono, MD - Lexington, KY, USA

Satoshi Ieiri, MD - Fukuoka, Japan

Saleem Islam, MD - Gainesville, FL, USA

Tadashi Iwanaka, MD, PhD - Tokyo, Japan

Bruce Jaffray, MD, MB, ChB - Newcastle, UK

Timothy D. Kane, MD - Washington, DC, USA

Arielle Kanters, MD - Cleveland, OH, USA

Selvarajan Krishnaswamy, MD - Coimbatore, India

Pablo Laje, MD - Philadelphia, PA, USA

Jacob C. Langer, MD - Toronto, Canada

Marc A. Levitt, MD - Cincinnati, OH, USA

Long Li, MD - Beijing, China

Manuel Lopez, MD - Saint Etienne, France

Tobias Luthle, MD - Germany

Gordon A. MacKinlay, OBE - Edinburgh, UK

Marcelo H. Martinez Ferro, MD - Buenos Aires, Argentina

Sean Marven, MD - Sheffield, UK

Milissa A. McKee, MD - New Haven, CT, USA

John J. Meehan, MD - Seattle, WA, USA

Martin L. Metzelder, MD - Hannover, Germany

Juan M. Moldes Larribas, MD - Buenos Aires, Argentina

Oliver J. Muensterer, MD - New York, NY, USA

Fraser D. Munro, MD - Edinburgh, UK

Thanh Liem Nguyen, MD - Hanoi, Vietnam

Matthijs W.N. Oomen, MD - Amsterdam, The Netherlands

Daniel J. Ostlie, MD - Kansas City, MO, USA

Dariusz Patkowski, MD - Wroclaw, Poland

Jeffrey Ponsky, MD - Moreland Hill, OH, USA

Todd A. Ponsky, MD - Cleveland Heights, OH, USA

Giovanna Riccipetoni, MD - Milan, Italy

Michael Rosen, MD - Cleveland, OH, USA

Steven S. Rothenberg, MD - Denver, CO, USA

Ramesh Santhanakrushnan, MD - Karnataka, India

Klaus Schaarschmidt, Prof., - Berlin, Germany

Juergen Schleeff, MD, PhD - Trieste, Italy

C. Daniel Smith, MD - Jacksonville, FL, USA

Shawn D. St. Peter, MD - Kansas City, MO, USA

Henri Steyaert, MD - Nice, France

Philipp O. Szavay, MD - Tuebingen, Germany

Yuk Him Tam, MD - Hong Kong, China

Holger Till, MD, PhD - Leipzig, Germany

Michele Ugazzi, MD - Quito, Ecuador

Benno Ure, MD, PhD - Hannover, Germany

David C. van der Zee, MD, PhD - Utrecht, The Netherlands

Patricio J. Varela, MD - Santiago, Chile

Daniel Von Allmen, MD - Cincinnati, OH, USA

John H.T. Waldhausen, MD - Seattle, WA, USA

Kenneth Wong, MD - Hong Kong, China

Mark L. Wulkan, MD - Atlanta, GA, USA

Atsuyuki Yamataka, MD - Tokyo, Japan

C.K. Yeung, MD - Hong Kong, China

Suzanne M. Yoder, MD - San Diego, CA, USA

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# IPEG Meeting: Schedule-at-a-Glance



## PRE-MEETING COURSES

### Tuesday, March 6, 2012

5:00 pm - 9:00 pm

**Postgraduate Lecture: MIS in Infants and Neonates**

**CHAIR:** George W. Holcomb III, MD

*Manchester Grand Hyatt Hotel - Douglas Pavilion A*

### Wednesday, March 7, 2012

8:30 am - 11:30 am

**MIS in Infants and Neonates Hands On Lab (Animate)**

**CHAIR:** Katherine Barsness, MD

**CO-CHAIRS:** Maria Marcela Bailez, MD & Milissa McKee, MD

*UCSD - Center for the Future of Surgery*

1:00 pm - 5:00 pm

**Simulator Hands On Lab (Inanimate)**

**CHAIR:** Philipp O. Szavay, MD

**CO-CHAIRS:** Karen Diefenbach, MD & John J. Meehan, MD

*Manchester Grand Hyatt - Manchester DE Ballroom*

5:30 pm - 7:30 pm

**Welcome Reception**

*San Diego Convention Center - Exhibit Hall C*

## IPEG's 21<sup>ST</sup> ANNUAL CONGRESS

### Thursday, March 8, 2012

*General Sessions are at the San Diego Convention Center - Room 6C*

7:30 am - 8:45 am

**Morning Scientific Video Session: Coolest Tricks & Extraordinary Procedures**

**MODERATORS:** Carroll M. Harmon, MD, PhD, Tadashi Iwanaka, MD, PhD, & Timothy Kane, MD

8:45 am - 8:50 am

**Welcome Address: Carroll M. Harmon, MD, PhD, 2012 IPEG President**

8:50 am - 10:00 am

**Scientific Session: Clinical & Basic Science**

**MODERATORS:** Daniel Von Allmen, MD, Carlos Garcia-Hernandez, MD, & Benno Ure, MD, PhD

9:30 am - 3:30 pm

**Exhibits Open**

*San Diego Convention Center - Exhibit Hall C*

10:00 am - 10:30 am

**Break**

10:30 am - 12:00 pm

**IPEG/SAGES Joint Panel: "My Way is Better Than Yours"**

**CHAIR:** Todd A. Ponsky, MD

**CO-CHAIR:** Jeffrey Ponsky, MD

12:00 pm - 12:30 pm

**Presidential Address & Lecture: "Pediatric Endosurgery; A Brief History"**

Carroll M. Harmon, MD, PhD

**INTRODUCTION BY:** Todd A. Ponsky, MD

12:30 pm - 1:45 pm

**Lunch Break (on own) and Exhibit Viewing**

12:30 pm - 1:45 pm

**Poster Tours (Posters 1-76)**

**CHAIR:** Miguel Guelfand, MD

**MODERATORS:** Celeste Hollands, MD, Joseph Iocono, MD, Saleem Islam, MD, Martin Metzelder, MD, Juan Moldes Larribas, MD, Sherif Emil, MD, Michele Ugazzi, MD, Patricio Varela, MD, & Suzanne Yoder, MD

*San Diego Convention Center - Exhibit Hall C*

1:45 pm - 2:15 pm

**Guest Lecturer: "Pushing the Envelope"- New Ideas in Pediatric Endoscopic Surgery  
"What Can We Learn from Animals"?**

Jeffrey J. Runge, DVM, DACVS

**INTRODUCTION BY:** Todd A. Ponsky, MD

2:15 pm - 3:15 pm

**Scientific Session: Gastrointestinal & Hepatobiliary - Part I**

**MODERATORS:** Alan Flake, MD, Thanh Liem Nguyen, MD, & Juergen Schleeff, MD, PhD

3:15 pm - 3:30 pm

**Lifetime Achievement Award: Thom E. Lobe, MD, FACS, FAAP**

**PRESENTED BY:** Carroll M. Harmon, MD, PhD

3:30 pm - 4:00 pm

**Break**

4:00 pm - 4:30 pm

**Karl Storz Lecture: "The Impact of Advanced Technologies on the Future of Surgery"**

Richard M. Satava, MD

**INTRODUCTION BY:** Carroll M. Harmon, MD, PhD

4:30 pm - 5:30 pm

**Panel: Inguinal Hernias**

**CHAIR:** Holger Till, MD, PhD

**CO-CHAIRS:** Dariusz Patkowski, MD & C.K. Yeung, MD

# IPEG Meeting: Schedule-at-a-Glance



## Friday, March 9, 2012

General Sessions are at the San Diego Convention Center - Room 6C

- 7:30 am - 8:30 am **SAGES/IPEG Great Debates in Pediatric Bariatric Surgery**  
**CHAIR:** Thomas H. Inge, MD  
**CO-CHAIR:** Janey Pratt, MD
- 8:30 am - 9:30 am **Morning Scientific Video Session: Unexpected Findings, Troubles and Complications**  
**MODERATORS:** Gordon A. Mackinlay, OBE, Fraser Munro, FRCS, & Mark Wulkan, MD
- 9:30 am - 10:00 am **Break**
- 9:30 am - 3:30 pm **Exhibits Open** *San Diego Convention Center - Exhibit Hall C*
- 10:00 am - 11:00 am **Scientific Session: Gastrointestinal & Hepatobiliary – Part II**  
**MODERATORS:** Munther J. Haddad, FRCS, Mark A. Levitt, MD, & Long Li, MD
- 11:00 am - 12:00 pm **Scientific Session: Robotics and Alternative Technologies**  
**MODERATORS:** John J. Meehan, MD, David C. van der Zee, MD, & Kenneth Wong, MD
- 12:00 pm - 12:30 pm **Keynote Lecture: “Remote Presence, Telemedicine, and Healthcare Delivery”**  
Yulun Wang, PhD  
**INTRODUCTION BY:** Todd A. Ponsky, MD
- 12:30 pm - 1:45 pm **Lunch Break (on own) and Exhibit Viewing**
- 12:30 pm - 1:45 pm **Poster Tours (Posters 77-152)** *San Diego Convention Center - Exhibit Hall C*  
**CHAIR:** Shawn D. St. Peter, MD  
**MODERATORS:** Katherine Barsness, MD, Raul Bignon, MD, Karen Diefenbach, MD, Anna Gunnarsdóttir, MD, Pablo Laje, MD, Sean Marven, MD, Milissa McKee, MD, Oliver Muensterer, MD, Ramesh Santhanakrushnan, MD, & Yuk Him Tam, MD
- 1:45 pm - 2:45 pm **Panel: Difficult Situations in MIS**  
**CHAIR:** Keith E. Georgeson, MD  
**CO-CHAIRS:** Jacob Langer, MD, Henri Steyaert, MD, & Atsuyuki Yamataka, MD
- 2:45 pm - 4:00 pm **Scientific Session: Urogenital MIS**  
**MODERATORS:** Maria Marcela Bailez, MD, Satoshi Ieiri, MD, & Philipp O. Szavay, MD
- 4:00 pm - 4:30 pm **Break**
- 4:30 pm - 5:30 pm **Panel: Chest Wall Deformities**  
**CHAIR:** Marcelo H. Martinez Ferro, MD  
**CO-CHAIRS:** Michael J. Goretzky, MD, Klaus Schaarschmidt, MD, & Patricio Varela, MD
- 7:30 pm - 11:00 pm **IPEG/SAGES Main Event!** *Historic USS Midway Aircraft Carrier and Museum*

## Saturday, March 10, 2012

General Sessions are at the San Diego Convention Center - Room 6C

- 7:00 am - 8:15 am **Scientific Session: Miscellaneous**  
**MODERATORS:** Manuel Lopez, MD, Daniel J. Ostlie, MD, & Yuk Him Tam, MD
- 8:15 am - 8:45 am **General Assembly**  
**MODERATOR:** Carroll M. Harmon, MD, PhD
- 8:45 am - 9:00 am **Awards:** Coolest Tricks – **PRESENTED BY:** Carroll M. Harmon, MD, PhD  
Basic Science – **PRESENTED BY:** Shawn D. St. Peter, MD  
IRCAD – **PRESENTED BY:** Todd A. Ponsky, MD  
2012 Research Grant – **PRESENTED BY:** Shawn D. St. Peter, MD
- 9:00 am - 9:15 am **2011 Research Grant Presentation: “Long-Gap Pure Esophageal Atresia: Development of a Survival Rabbit Model and Minimally Invasive Repair Techniques”**  
Todd A. Ponsky, MD, University Hospitals Case Medical Center
- 9:15 am - 9:45 am **Break**
- 9:45 am - 10:45 am **Panel: IBD**  
**CHAIR:** James D. Geiger, MD  
**CO-CHAIRS:** John H.T. Waldhausen, MD & Bruce Jaffray, MD
- 10:00 am - 1:00 pm **Exhibits Open** *San Diego Convention Center - Exhibit Hall C*
- 10:45 am - 11:45 am **Scientific Session: Thorax**  
**MODERATORS:** Maria Marcela Bailez, MD, Giovanna Riccipetioni, MD, & Steven S. Rothenberg, MD
- 11:45 am - 12:00 pm **Closing Remarks & Presentation of the IPEG 2013 President: Tadashi Iwanaka, MD, PhD**  
**MODERATOR:** Carroll M. Harmon, MD, PhD
- 12:00 pm - 1:00 pm **Free Lunch in Exhibit Hall for all IPEG & SAGES attendees** *San Diego Convention Center - Exhibit Hall C*

# Complete Schedule

## PRE-MEETING COURSE

**Tuesday, March 6, 2012**

5:00 pm - 9:00 pm

**Postgraduate Lecture: MIS in Infants and Neonates**

*Manchester Grand Hyatt Hotel - Douglas Pavilion A*

**CHAIR:** George W. Holcomb III, MD

**Description:** MIS was first developed in adults in the late 1980s. Its use was slower to evolve in children and even slower to be utilized in neonates and infants. This session will review the current use of MIS in neonates and infants and discuss how to utilize this approach safely and effectively for a variety of surgical conditions.

It is felt that the use of MIS is more difficult when a small abdominal cavity is present. Thus, the safe and effective use of MIS in neonates and infants should be the most difficult patient population to employ MIS. There are a small number of pediatric surgeons around the world who utilize MIS in neonates and infants safely, effectively, and routinely. However, a larger subset of pediatric surgeons may not be utilizing this approach in this patient population. Therefore, this course will discuss the safe and appropriate use of MIS in neonates and infants. The lectures will be presented by acknowledged experts from around the world. The day after this lecture series, the attendees will be able to utilize this knowledge that they have received through this lecture session in a skills session.

**Objectives:** The session objectives are a classical application of educational principles to adult learning. The problem is a lack of knowledge about the use of MIS in neonates and infants. Participants will increase their confidence by learning about the safe and appropriate use of MIS in neonates and infants and strategies to reduce errors in its application in this patient population. When they return to practice, they will be equipped with the ability to apply this knowledge to their youngest patients. They will be able to understand which operations are suitable and which are not for the use of MIS in neonates and infants. They will be able to recognize that performing MIS procedures in neonates and infants may be more difficult than in older patients and devise methods to prevent these injuries when they are applied in their practice.

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

- List 3 advantages and disadvantages of MIS for duodenal atresia repair.
- List 3 advantages and disadvantages of MIS pull-through for Hirschsprung's disease and anorectal atresia.
- List 3 advantages and disadvantages of MIS esophageal atresia repair.
- List 3 advantages and disadvantages of MIS single port surgery.
- List 3 advantages and disadvantages of MIS for NEC operations.

TIME	TOPIC	FACULTY
5:00 pm	Thoracoscopic Esophageal Atresia	Steven S. Rothenberg, MD
5:30 pm	Q & A	
5:40 pm	Laparoscopy in NEC	Marcelo H. Martinez Ferro, MD
6:10 pm	Q & A	
6:20 pm	Break	
6:50 pm	Laparoscopy for Duodenal Atresia	George W. Holcomb III, MD
7:20 pm	Q & A	
7:30 pm	Laparoscopic Pull-through for Hirschsprung's and Imperforate Anus	Keith E. Georgeson, MD
8:00 pm	Q & A	
8:10 pm	Single Port vs. Mini-laparoscopy in Infants	Carroll M. Harmon, MD, PhD
8:40 pm	Q & A	
8:50 pm	Group Discussion	

*IPEG acknowledges our Diamond and Platinum Level Donors for their support of this course.  
Diamond: Karl Storz Endoscopy, Stryker Endoscopy • Platinum: Ethicon Endo-Surgery, Inc.*



***This year, IPEG will offer Spanish translation throughout the General Sessions (Thursday-Saturday). Headsets will be provided on site to access translation.***

# Complete Schedule

## PRE-MEETING COURSE

### Wednesday, March 7, 2012

8:30 am - 11:30 am

#### MIS in Infants and Neonates Hands On Lab (Animate)

UCSD - Center for the Future of Surgery

**CHAIR:** Katherine Barsness, MD, **CO-CHAIRS:** Maria Marcela Bailez, MD & Milissa McKee, MD

**Description:** The lab will be animate advanced minimally invasive pediatric surgical procedures. The lab will focus on intracorporeal suturing (fundoplication, enteroenterostomy, esophagoesophagostomy), anatomic considerations for advanced thoracic procedures (esophageal fistula ligation and lobectomy) and techniques to improve single site laparoscopic approaches to common laparoscopic procedures (appendectomy, cholecystectomy, splenectomy). (Lab Ratio is 3:1)

**Objectives:** Attendees and participants will increase technical performance and cognitive knowledge and competence by learning and practicing several advanced surgical procedures in animate models. The hands on course provides a safe environment to learn and practice these advanced techniques. Faculty provides state-of-the-art teaching.



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

- Develop strategies for suturing in a small contained space without damaging adjacent organs or tissues (competence)
- Perform intracorporeal sutured anastomoses of gastrointestinal tissue (competence and performance)
- Recognize and discuss anatomic variability encountered during thoracic procedures in infants and children (competence)
- Recognize and overcome instrument limitations encountered during single site laparoscopic procedures (competence and performance)

**FACULTY:** Edward Esteves, MD, James Geiger, MD, Miguel Guelfand, MD, George W. Holcomb III, MD, PhD, Thomas H. Inge, MD, PhD, Timothy Kane, MD, Daniel J. Ostlie, MD, Shawn St. Peter, MD, Philipp O. Szavay, MD, Holger Till, MD, PhD, Mark Wulkan, MD, David van der Zee, MD, & C.K. Yeung, MD

**FLOATERS:** Carroll M. Harmon, MD, PhD, Keith E. Georgeson, MD, & Steven S. Rothenberg, MD

*IPEG acknowledges educational grants in support of this course from Applied Medical, Ethicon Endo-Surgery, Inc., Karl Storz Endoscopy and Stryker Endoscopy.*

*IPEG acknowledges contributions in-kind in support of this course from Applied Medical, Covidien, Davol Inc., a Bard Company, Ethicon Endo-Surgery, Ethicon Inc., Karl Storz Endoscopy, Olympus America Inc., and Stryker Endoscopy.*

1:00 pm - 5:00 pm

#### Simulator Hands On Lab (Inanimate)

Manchester Grand Hyatt - Manchester DE Ballroom

**CHAIR:** Philipp O. Szavay, MD, **CO-CHAIRS:** Karen Diefenbach, MD & John J. Meehan, MD

**Description:** The session addresses pediatric surgeons from all over the world, with different expertise in minimally invasive pediatric surgery, varying from country to country and institution to institution. Aim of the session is to disseminate knowledge and allow hands-on experience with MIS approach to intracorporeal suturing in children and neonates, laparoscopic pyloromyotomy, esophageal atresia repair, single site and single port surgery in children, the potential use of robotic surgery in children, morbid obesity surgery, and the use of flexible endoscopy in pediatrics. Participants will get the opportunity to get acquainted with and practice several endoscopic techniques in a safe environment. (Lab Ratio is 2:1)



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

- Improve technical performance, cognitive knowledge and competence by learning and then practicing several surgical techniques as well as specific procedures in different inanimate models.
- List the advantages and disadvantages of numerous MIS approaches to surgery in children.

STATION	FACULTY
Basic Suturing	Matthijs Oomen, MD & Krishnasamy Selvarajan, MD
Single Incision	Oliver Muensterer, MD & Yuk Him Tam, MD
Gastric Banding	Thomas H. Inge, MD, PhD & Aayed Al-Qahtani, MD
Fundamentals	Georges Azzie, MD & Ted Gerstle, MD
Neonatal Trainer	Milissa McKee, MD & Suzanne Yoder, MD
Pylorus Model	Joseph Iacono, MD & Timothy D. Kane, MD
TEF Trainer	Hossein Allal, MD & Dariusz Patkowski, MD
Lobectomy/Nuss/Hernia	Celeste Hollands, MD & Arielle Kanters, MD
Urology Trainer	Tobias Luithle, MD & Martin Metzelder, MD
Single Incision	George W. Holcomb III, MD & Steven S. Rothenberg, MD

**FLOATERS:** Keith E. Georgeson, MD & Jeffrey Runge, MD

*IPEG acknowledges educational grants in support of this course from Applied Medical, Karl Storz Endoscopy, and Stryker Endoscopy.*

*IPEG acknowledges contributions in-kind in support of this course from Aesculap, Applied Medical, Covidien, Ethicon Endo-Surgery, Ethicon, Inc., Karl Storz Endoscopy, Olympus America Inc., and Stryker Endoscopy.*

*Additional trainer boxes provided by Katherine A. Barsness, MD, Montpellier, Todd A. Ponsky, MD, University of Kentucky, and University of Toronto.*

5:30 pm - 7:30 pm

#### Welcome Reception

San Diego Convention Center - Exhibit Hall C

# Complete Schedule

## IPEG's 21<sup>ST</sup> ANNUAL CONGRESS

Thursday, March 8, 2012

General Sessions are at the San Diego Convention Center - Room 6C

7:30 am - 8:45 am

### Morning Scientific Video Session: Coolest Tricks & Extraordinary Procedures

**MODERATORS:** Carroll M. Harmon, MD, PhD, Tadashi Iwanaka, MD, PhD, & Timothy Kane, MD

- 7:30 am: **V001** LAPAROSCOPIC MEDIAN ARCUATE LIGAMENT RELEASE – [Ryan M. Antiel, MA](#), Joseph B. Lillegard, MD, PhD, Rachel L. Garness, RN, CNP, Yassar Hashim, MBBS, Abdalla E. Zarroug, MD, Mayo Clinic
- 7:37 am: **V002** LAPAROSCOPIC TREATMENT OF OBSTRUCTED UTERINE DUPLICATIONS IN PEDIATRICS – [Maria M. Bailez, MD](#), Lucila Alvarez, MD, Paula Flores, MD, Pediatric Surgery, Garrahan Children's Hospital, Buenos Aires Argentina
- 7:44 am: **V003** THORACOSCOPIC DIVISION OF A VASCULAR RING IN A CHILD – [Curt S. Koontz, MD](#), Robert J. Vandewalle, MD, University of Tennessee College of Medicine, Chattanooga, TC Thompson Children's Hospital at Erlanger
- 7:51 am: **V004** USE OF THE CYSTOSCOPE AS A UTERINE MANIPULATOR AND THE SCROTAL INCISION OF THE DARTHOS POUCH AS A TROCAR SITE. TRICKS TO AVOID ACCESSORY PORTS IN RESECTION OF MULLERIAN REMNANTS AND BILATERAL ORCHIDOPEXY IN A 46 DSD MALE – [Maria M. Bailez, MD](#), Lucila Alvarez, MD, Javier Ruiz, MD, Mariana Costanzo, MD, Garrahan Children's Hospital Buenos Aires Argentina
- 7:58 am: **V005** LEFT LATERAL SEGMENTECTOMY USING SINGLE SITE SURGERY-PLUS-ONE FOR THE MANAGEMENT OF A COMPLEX LIVER CYST – [Robert Baird, MSc, MDCM](#), Jean-Martin Laberge, MDCM, Montreal Children's Hospital, McGill University Health Center
- 8:05 am: **V006** LAPAROSCOPIC RESECTION OF A HEPATIC TUMOR – [Gaston Elmo](#), Silvana Prodan, Lizia Toselli, Anahi Salomon, Santiago Calello, Julia Udaquiola, Daniel Liberto, Mauricio Urquizo, Miguel Ciardullo, Juan Pekolj, Pablo Lobos, Hospital Italiano de Buenos Aires
- 8:12 am: **V007** LAPAROSCOPIC AND ROBOTIC COMBINED TECHNIQUE FOR TOTAL PROCTOCOLECTOMY ON PEDIATRIC PATIENTS – [Gaston Elmo](#), Silvana Prodan, Luzia Toselli, Anahi Salomon, Santiago Calello, Joaquin Larrabide, Daniel Liberto, Mauricio Urquizo, Pablo Lobos, Hospital Italiano de Buenos Aires
- 8:19 am: **V008** LAPAROSCOPIC EXCISION OF A CHOLEDOCHAL CYST WITH TOTAL INTRACORPOREAL RECONSTRUCTION – [Shannon L. Castle, MD](#), Bindi J. Naik-Mathuria, MD, Dean M. Anselmo, MD, Manuel B. Torres, MD, Nam Nguyen, MD, Children's Hospital Los Angeles
- 8:26 am: **V009** SINGLE-INCISION PEDIATRIC ENDOSURGICAL (SIPES) MORGAGNI DIAPHRAGMATIC HERNIA REPAIR – [Arul S. Thirumoorathi, MD](#), Alejandro Garcia, MD, Florencia Beleniski, MD, Oliver Muensterer, MD, Gudrun Aspelund, MD, Division of Pediatric Surgery, Morgan Stanley Children's Hospital of New York-Presbyterian, Columbia University Medical Center, New York, NY
- 8:31 am: **V010** SUCCESSFUL ENDOSCOPIC TREATMENT OF A WINDSOCK DUODENAL WEB IN AN INFANT – Ufuk Ates, MD, Gonul Kucuk, MD, Halise Babayigit Akpınar, MD, Gulnur Gollu, MD, Berkutug Bahadır, MD, [Meltem Bingol-kologlu, MD](#), Huseyin Dindar, MD, Ankara University School of Medicine Department of Pediatric Surgery

8:45 am - 8:50 am

### Welcome Address: Carroll M. Harmon, MD, PhD, 2012 IPEG President

8:50 am - 10:00 am

### Scientific Session: Clinical & Basic Science

**MODERATORS:** Daniel Von Allmen, MD, Carlos Garcia-Hernandez, MD, & Benno Ure, MD, PhD

- 8:50 am: **S001** LAPAROSCOPIC SLEEVE GASTRECTOMY AND ROUX-Y GASTRIC BYPASS IMPROVES HYPERURICEMIA IN EXTREMELY OBESE CHILDREN FOLLOWING 12 MONTH OF TREATMENT – [Andreas Oberbach, MD, PhD, MPH](#), Thomas Inge, MD, PhD, Martin Wabitsch, MD, PhD, Holger Till, MD PhD, University of Leipzig
- 8:59 am: **S002** CHANGES IN KILLING OF INTERNALIZED BACTERIA ON PERITONEAL MACROPHAGE AFTER LAPAROSCOPIC AND OPEN ABDOMINAL SURGERY IN A MOUSE MODEL – [Jian Wang, professor](#), Qi Zhang, PhD, Dept. of Pediatric Surgery, Affiliated Children's Hospital of Soochow University
- 9:06 am: **S003** ALLOMETRIC SCALING DETERMINES CO<sub>2</sub> HANDLING DURING INSUFFLATION – [Thane A. Blinman, MD](#), Children's Hospital of Philadelphia
- 9:13 am: **S004** INDIVIDUALIZED IMAGE IMPROVES EFFICIENCY IN LAPAROSCOPIC SURGERY – [Rajan K. Thakkar, MD](#), Shaun A. Steigman, MD, Jeremy T. Aidlen, MD, Francois I Luks, MD, Hasbro Children's Hospital and Alpert Medical School of Brown University
- 9:19 am: **S005** FETOSCOPIC BAG PLACEMENT OF GASTROSCHISIS IN A LAMB MODEL - PRELIMINARY RESULTS – [Thomas F. Krebs, MD](#), Katarina Wenke, MD, Bergholz Robert, MD, Kurt Hecher, MD, Department of Pediatric Surgery, UKE Medical School, Hamburg University, Hamburg, Germany
- 9:20 am: **S006** PECTUS EXCAVATUM AND MASS PHENOTYPE: AN UNKNOWN ASSOCIATION – Francesca Tocchioni, MD, Marco Ghionzoli, MD, Aurora Mariani, MD, Caterina Morelli, MD, Stefania Ragozzino, MD, Alessandro Pane, MD, Alessandra Martin, MD, Roberto Lo Piccolo, MD, Guglielmina Pepe, MD, [Antonio Messineo, MD](#), Department of Pediatric Surgery, Children's Hospital A. Meyer, Florence, Italy
- 9:29 am: **S007** SUTURE CHOICE MATTERS IN RABBIT MODEL OF LAPAROSCOPIC, PRE-PERITONEAL, INGUINAL HERNIA REPAIR – [Katherine B. Kelly, MD](#), David M. Krpata, MD, Jeffrey A. Blatnik, MD, Todd A. Ponsky, MD, University Hospitals of Cleveland Rainbow Babies and Children's Hospital, Case Western Reserve University
- 9:36 am: **S008** PERITONEAL CHANGES DUE TO PNEUMOPERITONEUM IN LAPAROSCOPY: THE EFFECT OF CARBON DIOXIDE (CO<sub>2</sub>) INSUFFLATION ON PREPUBERAL RATS – [Alfonso Papparella\\*, MD](#), Domenico Donniccono\*, MD, Miriam Andrade Barrientos\*, MD, Fabiano Nino\*, MD, Sandra Coppola\*, MD, Alessandro Costagliola°, DVM, Orlando Paciello°, PhD, DVM, \*Second University of Naples - Faculty of Medicine - Pediatric Surgery °Federico II University of Naples - Faculty of Veterinary Medicine - Department of Health and Animal Pathology

 = TRANSMITIDO EN ESPAÑOL

# Complete Schedule

9:42 am: **S009** EVALUATING SURGICAL PERFORMANCE OF TRAINEE SURGEONS USING CONSTRUCTIONISM IN COLLABORATIVE VIRTUAL GESTURE TRAINING – [Shabnam Parkar, Dr.](#), Dean Mohamedally, Dr., Simon Copsey, Mr., Nicholas Chemin, Mr., Chris Child, Mr., Munther Haddad, Dr., Chelsea & Westminster Hospital, London, Uiversity College London, City University

9:49 am: **S010** DEVELOPMENT OF AN OBJECTIVE ENDOSCOPIC SURGICAL SKILL ASSESSMENT SYSTEM FOR PEDIATRIC SURGEONS: SUTURE LIGATURE MODEL OF THE CRURA OF THE DIAPHRAGM IN INFANT FUNDOPLICATION – [Satoshi Ieiri, MD, PhD](#), Ryota Souzaki, MD, PhD, Hiroyuki Ishii, PhD, Noriyuki Matsuoka, PhD, Morimasa Tomikawa, MD, PhD, FACS, Atsuo Takanishi, PhD, Makoto Hashizume, MD, PhD, FACS, Tomoaki Taguchi, MD, PhD, Department of Peditric Surgery, Kyushu University

9:30 am - 3:30 pm **Exhibits Open**

San Diego Convention Center - Exhibit Hall C

10:00 am - 10:30 am **Break**

10:30 am - 12:00 pm **IPEG/SAGES Joint Panel: "My Way is Better Than Yours"** 

**CHAIR:** Todd A. Ponsky, MD

**CO-CHAIR:** Jeffrey Ponsky, MD

**Description:** This session will address common surgical problems that are treated by both pediatric surgeons and adult surgeons. The management of these problems are very different between these two groups so both groups will present their method of therapy and debate which is "better".

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

- Understand when either the adult or pediatric technique for hernia repair may be relevant for their patients
- Understand when either the adult or pediatric technique for nissen may be relevant for their patients
- Understand when either the adult or pediatric technique for biliary reconstruction may be relevant for their patients
- Understand when either the adult or pediatric technique for Gtube placement may be relevant for their patients

TIME	TOPIC	FACULTY
10:30 am	Gastrostomy Tube Placement (Fundo: Holcomb vs. Hunter) 25 min (Biliary: Liem/Rothenberg vs. Gagner) 25 min	Todd A. Ponsky, MD & Jeffrey Ponsky, MD
10:45 am	Inguinal Hernia Repair in Young Adults	C.K. Yeung, MD & Michael Rosen, MD
11:10 am	Fundoplication	George W. Holcomb III, MD & C. Daniel Smith, MD
11:35 am	Biliary Reconstruction	Thanh Liem Nguyen, MD, Steven S. Rothenberg, MD, & Michel Gagner, MD

12:00 pm - 12:30 pm **Presidential Address & Lecture: "Pediatric Endosurgery; A Brief History"** 

Carroll M. Harmon, MD, PhD

**INTRODUCTION BY:** Todd A. Ponsky, MD



Mac Harmon is a Professor of Surgery at the University of Alabama at Birmingham and an active pediatric surgeon at The Children's Hospital of Alabama. He has a longstanding interest in the application and teaching of minimally invasive endosurgical techniques in infants and children.

Mac received his undergraduate education at the University of Alabama and received his doctorates in medicine and in physiology at Vanderbilt University. After completing his general surgery training at Vanderbilt, he completed his pediatric surgery training at Children's Hospital of Philadelphia. His initial practice in academic pediatric surgery was at the University of Michigan followed by a move back to Birmingham, Alabama where he has worked and served for the past 12 years.

Mac has had a passion for minimally invasive surgery that dates to his years at Vanderbilt where, as a resident, he was a local witness to the booming start of adult general surgery MIS as the first laparoscopic cholecystectomies in the USA were being performed in Nashville. He then initiated the first laparoscopic operations performed at CHOP and continued to advocate MIS for children in Ann Arbor. Joining Keith Georgeson in Alabama provided the opportunity for continued innovations in pediatric endosurgery. Mac has been very active over the past 17 years in training many pediatric surgery fellows and other pediatric surgeons in advanced pediatric Endosurgery.

12:30 pm - 1:45 pm **Lunch Break (on own) and Exhibit Viewing**

12:30 pm - 1:45 pm **Poster Tours** (Posters 1-76)

San Diego Convention Center - Exhibit Hall C

**CHAIR:** Miguel Guelfand, MD

**MODERATORS:** Celeste Hollands, MD, Joseph Iacono, MD, Saleem Islam, MD, Martin Metzelder, MD, Juan Moldes Larribas, MD, Sherif Emil, MD, Michele Ugazzi, MD, Patricio Varela, MD, & Suzanne Yoder, MD

*IPEG acknowledges our Diamond and Platinum Level Donors for their support of this activity.*

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# Complete Schedule

1:45 pm - 2:15 pm

## Guest Lecturer: "Pushing the Envelope"- New Ideas in Pediatric Endoscopic Surgery "What Can We Learn from Animals"?

Jeffrey J. Runge, DVM, DACVS, **INTRODUCTION BY:** Todd A. Ponsky, MD



Dr. Jeffrey J. Runge is a lecturer of small animal surgery at the University of Pennsylvania, School of Veterinary Medicine. He is a Diplomate of the American College of Veterinary Surgeons specializing in companion animal surgery as well as various exotic, zoo and aquarium species. He focuses primarily on laparoscopic and thoracoscopic minimally invasive surgery, and has lectured internationally on single port and multiport laparoscopic surgery alike.

Through ongoing collaboration with leading human laparoscopic surgeons, Dr. Runge and the School of Veterinary Medicine have become one of the leaders in veterinary reduced port surgery. By utilizing newer human laparoscopic single site techniques.

Dr. Runge's group continues to minimize minimally invasive surgery for today's companion animals. Dr. Runge is an active member of the veterinary endoscopy society, as well as three human laparoscopic surgical societies, SAGES (Society of Gastrointestinal Endoscopic Surgeons, and the RPSG (Reduced Port Surgical Group), and more recently, IPEG (International Pediatric Endosurgery Group). Dr. Runge has helped The University of Pennsylvania, School of Veterinary Medicine become a world leader in veterinary reduced port and single site laparoscopic surgery.

Dr. Runge graduated from Dickinson College in Carlisle PA, and then received his Doctor of Veterinary Medicine from Ross University. Following his internship at the Animal Medical Center in New York, Dr. Runge went on to do his advanced surgical training at the University of Pennsylvania, School of Veterinary Medicine, which included a one year fellowship and a three year small animal surgical residency. His current research interests include applying single site surgery or reduced port surgery clinical human techniques to small animals.

2:15 pm - 3:15 pm

## Scientific Session: Gastrointestinal & Hepatobiliary – Part I

**MODERATORS:** Alan Flake, MD, Thanh Liem Nguyen, MD, Juergen Schleeff, MD, PhD

- 2:15 am: **S011** LONG TERM RESULTS OF LAPAROSCOPIC SUBTOTAL >90% SPLENECTOMY FOR HAEMOLYTIC ANAEMIA IN 53 EXCESSIVELY TRANSFUSION DEPENDENT PRESCHOOL CHILDREN 2002-2010 – [Klaus Schaarschmidt, Prof., MD, PhD](#), Michael Lempe, MD, Uwe Jaeschke, MD, Weon Park, Susanne Polleichtner, Jan Patino Mayer, MD, Helios Centre of Pediatric and Adolescent Surgery Berlin-Buch, Germany
- 2:23 pm: **S012** EARLY AND INTERMEDIATE OUTCOMES OF 400 LAPAROSCOPIC OPERATIONS FOR CHOLEDOCHAL CYST IN CHILDREN – [Nguyen Thanh Liem, MD, PhD](#), Le Anh Dung, MD, Tran Ngoc Son, MD, PhD, Pham Duy Hien, MD, Vu Manh Hoan, MD, National Hospital of Pediatrics
- 2:31 pm: **S013** LAPAROSCOPIC MANAGEMENT OF CHOLEDOCHAL CYST - OUR EXPERIENCE OF 49 CASES – [Ravindra Ramadwar, MCh, DNB, FRCS](#), Kishore Adayanthaya, MCh, Snehalata Dhayagude, MD, Bombay Hospital, Hinduja Hospital
- 2:37 pm: **S014** LAPAROSCOPIC VERSUS CONVENTIONAL KASAI PORTOENTEROSTOMY DOES NOT FACILITATE SUBSEQUENT LIVER TRANSPLANTATION IN INFANTS WITH BILIARY ATRESIA – [Joachim F Kuebler, MD](#), Thomas Becker, MD, Christina Oetzmann Von Sochaczewski, MD, Frank Lehner, MD, Claus Petersen, MD, Benno M. Ure, MD, Hannover Medical School, Departments of Pediatric Surgery and Abdominal Surgery
- 2:43 pm: **S015** LAPAROSCOPIC MANAGEMENT OF ABDOMINAL LYMPHATIC CYST IN CHILDREN: EXPERIENCE WITH 47 CASES – [Son N. Tran, MD, PhD](#), Nguyen T Liem, MD PhD, National Hospital of Pediatrics, Hanoi, Vietnam
- 2:49 pm: **S016** SURGICAL MANAGEMENT OF GALLSTONE PANCREATITIS IN THE PEDIATRIC POPULATION; MAYBE THEY ARE JUST LITTLE ADULTS – [Erol M. Knott, DO, PhD](#), Alessandra C. Gasior, DO, Jai Bikhchandani, MD, Janine P. Cunningham, MD, Shawn D. St. Peter, MD, Children's Mercy Hospitals and Clinics
- 2:55 pm: **S017** LAPAROSCOPIC TREATMENT FOR PEDIATRIC SMALL INTESTINAL OBSTRUCTION: IS IT THE GOLD STANDARD? [Neil Featherstone, MD, PhD](#), Zahid Mukhtar, MD, Nada Sudhakaran, MD, Stefano Giuliani, MD, PhD, St. George's Hospital, London, UK
- 3:01 pm: **S018** ERCP CAN PREVENT RE-OPERATIONS FOR BILIARY COMPLICATIONS AFTER LIVER RESECTION IN CHILDREN – M. Steen, MD, [R. Bakx, MD, PhD](#), M. Tabbers, MD, PhD, J. Wilde, MD, K. Van Lienden, MD, PhD, M. Benninga, MD, PhD, H. Heij, MD, PhD, E. Rauws, MD, PhD, Pediatric Surgical Center Amsterdam
- 3:07 pm: **S019** INITIAL EXPERIENCE WITH EXPANDABLE ESOPHAGEAL STENTS FOR BENIGN ESOPHAGEAL STRICTURES IN PEDIATRIC PATIENTS – [Haroon Patel, MD](#), Driscoll Childrens Hospital

3:15 pm - 3:30 pm

## Lifetime Achievement Award: Thom E. Lobe, MD, FACS, FAAP

**PRESENTED BY:** Carroll M. Harmon, MD, PhD



Thom E. Lobe, MD, FACS, FAAP, a native of Baltimore, he obtained a bachelor's degree in 1971 from George Washington University before attending medical school at the University of Maryland School of Medicine. He earned his medical degree in 1975, graduating cum laude and with special honors in pediatrics. He then moved to Columbus, Ohio where he continued his training at The Ohio State University Hospital in general surgery and at The Children's Hospital in pediatric surgery.

After completing his training he became the Chief of the Pediatric Surgery Service at the University of Texas, Galveston Medical Branch. He made national news as a leader on the team to successfully separate a particularly difficult type of conjoined twins and perform a complex reconstruction of the airway. In 1988 he was selected to start the first pediatric surgery training program in the mid-south at the University of Tennessee and LeBonheur Children's Medical Center.

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# Complete Schedule

While there, Dr. Lobe distinguished himself by leading the world in the advancement of laparoscopic and thoracoscopic surgery in children and wrote the first textbook on the subject and pioneered many novel surgical techniques. He also founded the first medical journal dedicated exclusively to advanced surgical techniques in children, for which he is now Pediatric Editor Emeritus

In 2004 Dr. Lobe joined Blank Children's Hospital in Des Moines, Iowa. In this role he continued to pioneer advances in minimally invasive surgery. With his associates in Des Moines, he became the first to develop an advanced technique to perform major head and neck surgery through a set of small incisions in the armpit, leaving patients with no visible scars and virtually no pain or discomfort.

Dr. Lobe is respected as a world leader in innovative surgical techniques and has written over 200 books, book chapters and peer-reviewed articles in his field.

He was a founding member of IPEG and the first \$1000 contributor to its research fund. He has served on nearly every major IPEG committee including Program Director and as Editor of the Journal, served on the Executive Committee from its inception through 2011.

Dr. Lobe took a sabbatical from his regular practice last year to pursue studies in stem cell research and innovative ways to solve the problem of teenage obesity.

He currently practices full time at Advocate Hope Children's Hospital in Oak Lawn, IL, USA as its Medical Director for Pediatric Surgery

3:30 pm - 4:00 pm **Break**

4:00 pm - 4:30 pm **Karl Storz Lecture: "The Impact of Advanced Technologies on the Future of Surgery"**   
Richard Satava, MD, **INTRODUCTION BY:** Carroll M. Harmon, MD, PhD



Richard M. Satava, MD FACS, is Professor of Surgery at University of Washington Medical Center (Seattle), and Senior Science Advisor at US Army Medical Research and Materiel Command in Ft. Detrick, MD.

Prior positions include Professor of Surgery at Yale University, military appointment as Professor of Surgery (USUHS) Walter Reed Army Medical Center and Program Manager at Defense Advanced Research Projects Agency (DARPA). Undergraduate training was Johns Hopkins University, medical school at Hahnemann University of Philadelphia, internship at Cleveland Clinic, surgical residency at Mayo Clinic with a Master of Surgical Research. During 23 years of military surgery he has been an active flight surgeon, an Army astronaut candidate, MASH surgeon for the Grenada Invasion, and a hospital commander during Desert Storm, all the while continuing clinical surgical practice.

He has served on the White House Office of Science and Technology Policy (OSTP) Committee on Health, Food and Safety. He is on numerous committees of the American College of Surgeons (ACS), is past-president of many surgical societies, on the editorial board of numerous surgical and scientific journals, and active in numerous engineering societies. He has been continuously active in surgical education and surgical research, with more than 200 publications and book chapters in diverse areas of advanced surgical technology, including Surgery in the Space Environment, Video and 3-D imaging, Plasma Medicine, Telepresence Surgery, Virtual Reality Surgical Simulation, and Objective Assessment of Surgical Competence and Training.

4:30 pm - 5:30 pm **Panel: Inguinal Hernias**   
**CHAIR:** Holger Till, MD, PhD  
**CO-CHAIRS:** Dariusz Patkowski, MD & C.K. Yeung, MD

Room 6C

**Description:** This activity is designed to facilitate a discussion of the techniques and outcomes between the protagonists and antagonists of laparoscopic inguinal hernia repair. A panel of international experts will present the current evidence and provide a forum for the exchange of ideas in pediatric minimally invasive hernia surgery.

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

- List 3 general advantages and disadvantages of MIS inguinal hernia repair (knowledge)
- List 3 different surgical techniques of MIS inguinal hernia repair (knowledge)
- List 3 EBM conclusions to support MIS and open inguinal hernia repair (competence)

TIME	TOPIC	FACULTY
4:30 pm	Laparoscopically Assisted Extracorporeal Suturing, the Z-Stitch	Dariusz Patkowski, MD
4:40 pm	Laparoscopically Assisted Extracorporeal Suturing, the Hook Technique	C.K. Yeung, MD
4:50 pm	Evidence in the Literature: Open versus Lap Hernia Repair	Holger Till, MD, PhD
5:00 pm	Laparoscopic Inguinal Hernia: How Does It Work?	Todd A. Ponsky, MD
5:10 pm	Panel Discussion	

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# Complete Schedule

**Friday, March 9, 2012**

*General Sessions are at the San Diego Convention Center - Room 6C*

7:30 am - 8:30 am **SAGES/IPEG Great Debates in Pediatric Bariatric Surgery**   
**CHAIR:** Thomas H. Inge, MD  
**CO-CHAIR:** Janey Pratt, MD

**Description:** This course will cover current controversies in pediatric obesity surgery through a debate style format between experts. A true debate format will be used to discuss in an engaging manner which operations and what age surgery should be offered for pediatric patients. The debaters will "aim" and "fire" probing questions at their opponents within the context of the debate.

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

- List three types of weight loss procedures that may be applicable to morbidly obese teenagers
- Discuss technical differences performing various procedures in adolescents compared to adults
- Discuss short and long-term effectiveness and risks of the three most common weight loss procedures as applied to adolescents

TIME	TOPIC	FACULTY
7:30 am	The Best Operation Is The Band	<b>For</b> - Christine Ren-Fielding, MD, <b>Against</b> - Mary Brandt, MD
7:40 am	Rebuttals	
7:45 am	The Best Operation Is The Bypass	<b>For</b> - Samer Mattar, MD, <b>Against</b> - Jeffrey Zitsman, MD
7:55 am	Rebuttals	
8:00 am	The Best Operation Is The Sleeve	<b>For</b> - Thomas Inge, MD, <b>Against</b> - Janey Pratt, MD
8:10 am	Rebuttals	
8:15 am	Pediatric Obesity Surgery Should Be Done At Any Age	<b>For</b> - Aayed Al-Qahtani, MD, <b>Against</b> - Marc Michalsky, MD
8:15 am	Rebuttals	

8:30 am - 9:30 am **Morning Scientific Video Session: Unexpected Findings, Troubles and Complications**   
**MODERATORS:** Gordon A. Mackinlay, OBE, Fraser D. Munro, FRCS, & Mark L. Wulkan, MD

- 8:30 am: **V011** LAPAROSCOPIC COMPLETION RIGHT ADRENALECTOMY AFTER OPEN LEFT ADRENALECTOMY AND PARTIAL RIGHT ADRENALECTOMY FOR PHEOCHROMOCYTOMA – [Charles M. Leys, MD, MSCI](#), George W. Holcomb III, MD, MBA, Children's Mercy Hospital
- 8:38 am: **V012** LAPAROSCOPIC REPAIR OF RECTO BLADDERNECK FISTULA AND HIGH RECTO PROSTATIC URETHRAL FISTULA - HOW THE PSARP MAKES IT BETTER – [Marc A. Levitt, MD](#), Andrea Bischoff, MD, Alberto Peña, MD, Cincinnati Children's Hospital Medical Center
- 8:45 am: **V013** LAPAROSCOPIC GRAHAM PATCH FOR A PERFORATED MARGINAL ULCER AFTER ROUX-EN-Y GASTRIC BYPASS – [Michael V. Tirabassi, MD](#), Beverly Haynes, MD, Carroll M. Harmon, MD, University of Alabama at Birmingham Medical School Children's Hospital of Alabama
- 8:52 am: **V014** POST-TRAUMATIC DIAPHRAGMATIC LACERATION WITH INTRATHORACIC STOMACH: LAPAROSCOPIC REPAIR – [Felix C. Blanco, MD](#), Mark B. Slidell, MD, Mikael Petrosyan, MD, Timothy D Kane, Sheik Zayed Institute for Pediatric Surgical Innovation, Children's National Medical Center
- 8:59 am: **V015** DOUBLE ESOPHAGEAL ATRESIA: RESOLUTION BY A DOUBLE THORACOSCOPIC ANASTOMOSIS – [Gaston Elmo](#), Silvana Prodan, Luzia Toselli, Anahi Salomon, Daniel Liberto, Mauricio Urquizo, Roberto Vagni, Pablo Lobos, Hospital Italiano de Buenos Aires
- 9:06 am: **V016** LAPAROSCOPIC PARTIAL NEPHRECTOMY FOR WILMS TUMOR WITH INTRAOPERATIVE ULTRASOUND GUIDANCE – [Katherine P. Davenport, MD](#), Marion C. Henry, MD, Philip C. Guzzetta, MD, Timothy D. Kane, MD, Sheikh Zayed Institute for Pediatric Surgical Innovation, Children's National Medical Center
- 9:13 am: **V017** EX-VIVO MODEL FOR TEF REPAIR AND LOBECTOMY – [Katherine A. Barsness, MD, MSCI](#), Shar Mayerson, MD, Northwestern University, Children's Memorial Hospital
- 9:19 am: **S020** MAGNET COMPRESSION ANASTOMOSIS FOR MINIMALLY INVASIVE COLORECTAL SURGERY – [J. Wall, MD](#), M. Diana, MD, J. Leroy, MD, V. Deruijter, MD, K. D. Gonzales, MD, V. Lindner, MD, J. Marescaux, MD, M. Harrison, MD, Department of Surgery, Stanford University, Palo Alto, CA, Department of Surgery, University of California, San Francisco, San Francisco, CA

*IPEG acknowledges our Silver Level Donor for their support of this session: Covidien*

9:30 am - 10:00 am **Break**

9:30 am - 3:30 pm **Exhibits Open**

*San Diego Convention Center - Exhibit Hall C*

10:00 am - 11:00 am **Scientific Session: Gastrointestinal & Hepatobiliary – Part II** 

**MODERATORS:** Munther J. Haddad, FRCS, Mark A. Levitt, MD, & Long Li, MD

- 10:00 am: **S021** MENTORING COMPLEX LAPAROSCOPIC SURGERY IN CHILDREN: LESSONS LEARNT FROM LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION – Bin Wang, MD, Jian-xiong Mao, MD, Qi Feng, MD, Jian-yao Wang, MD, Lei Liu, MD, [Kenneth K. Wong, MD, PhD](#), Shenzhen Children Hospital & The University of Hong Kong

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- 10:09 am: **S022** LAPAROSCOPIC PURSE STRING CLOSURE WITH SAC DISCONNECTION FOR PEDIATRIC INGUINAL HERNIA WITH INTERNAL RING DIAMETER ABOVE 2 CM: 3 YEARS EXPERIENCE – Sherif M Shehata, MCh, CST, MD, PhD, [Ashraf A. El Attar, MD, MRCS](#), Mohamed A. Attia, MD, Alhassan M. Hassan, MCh, Department of Pediatric Surgery, Tanta University Hospital, Tanta, Egypt
- 10:15 am: **S023** SURGICAL MANAGEMENT OF PEDIATRIC ADHESIVE BOWEL OBSTRUCTION – [Justin Lee, MD](#), David B. Tashjian, MD, FACS, FAAP, Kevin P. Moriarty, MD, FACS, FAAP, Baystate Children's Hospital, Tufts University School of Medicine
- 10:21 am: **S024** SINGLE SURGEON EXPERIENCE WITH LAPAROSCOPIC SURGERY IN PEDIATRIC PATIENTS WITH INFLAMMATORY BOWEL DISEASE – [Renee Huang, MD](#), Issam Koleilat, MD, Edward C. Lee, MD, Albany Medical College
- 10:27 am: **S025** LONG TERM OUTCOMES AFTER PARTIAL VERSUS TOTAL FUNDOPLICATION IN NEUROLOGICALLY NORMAL CHILDREN – [Edward Esteves, PhD](#), Humberto B. Souza-filho, MD, Calebe P. Souza, Juliana V. Gomes, Enf, Amilson M. F. Borges, MD, Paulo Sergio S. Costa, PhD, Fatima Maria L. Silva-lima, PhD, Pediatric Surgery Division, University of Goias, Goiania, Brazil, Amparo Hospital and Saint Helen Hospital, Goiania, Brazil
- 10:33 am: **S026** LAPAROSCOPIC CHOLECYSTECTOMY FOR BILIARY DYSKINESIA: INCIDENCE INCREASING – [Martin Lacher, MD](#), Charles J. Aprahamian, MD, Donna Bartle, RN, Sonia S. Talathi, Ramanath N. Haricharan, MD, Carroll M. Harmon, MD, PhD, Division of Pediatric Surgery, Department of Surgery, Children's of Alabama, University of Alabama at Birmingham, Birmingham, Alabama, USA
- 10:39 am: **S027** COMPARATIVE EVALUATION OF THE FUNCTIONAL RESULTS OF TREATING HIGH FORMS OF THE ANUS AND RECTUM ATRESIA OF THE CHILDREN OPERATED TRADITIONALLY AND LAPAROSCOPICALLY – Igor V. Kirgizov, MD, Prof., Iliya A. Shishkin, PhD, [Alexey A. Gusev, PhD](#), Artyom Shahtarin, PhD, Scientific Centre of Children Health of RAMS, The first Moscow Medical University named after I. M. Sechenov
- 10:45 am: **S028** MAJOR COMPLICATIONS AFTER LAPAROSCOPIC-ASSISTED PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE – [Bo Xiang, MD](#), The Pediatric Surgery, West China Hospital
- 10:51 am: **S029** THE ANALYSIS OF CONVERSION TO OPENING SURGERY ON THE LAPAROSCOPIC EXCISION FOR CHILDREN WITH CHOLEDOCHAL CYST – [Liu Jiang Bin, MD, PhD](#), Zhen Shan, MD, PhD, Xiao Xian Min, MD, PhD, Surgical Department of Children's Hospital, Fudan University, Shanghai, China

11:00 am - 12:00 pm

## Scientific Session: Robotics and Alternative Technologies

**MODERATORS:** John J. Meehan, MD, David C. van der Zee, MD, & Kenneth Wong, MD

- 11:00 am: **S030** TOTALLY TRANSANAL LESS PULLTHROUGH COLECTOMY - A NOVEL APPROACH AVOIDING ABDOMINAL WALL INCISION IN CHILDREN WITH LONG SEGMENTAL INTESTINAL AGANGLIONOSIS – [Mohammad Reza Vahdad, MD](#), Hamidreza Foroutan, Professor, Department of Pediatric Surgery, Faculty of Medicine, Ruhr-University Bochum, Germany, Department of Pediatric Surgery, Nemazee Hospital, Shiraz University of Medical Sciences, Shiraz, Iran
- 11:09 am: **S031** SINGLE INCISION PEDIATRIC ENDOSURGERY SPLENECTOMY: A CASE CONTROL STUDY – [Lena Perger, MD](#), Charles J. Aprahamian, MD, Oliver J. Muensterer, MD, PhD, Albert J. Chong, MD, MPH, Martin Lacher, MD, Govardhana R Yannam, MD, Carroll M Harmon, MD PhD, Children's of Alabama and University of Alabama at Birmingham, Scott & White Hospital and Texas A&M College of Medicine, Weil-Cornell Medical College, Kaiser Oakland Medical Center
- 11:17 am: **S032** TRANSLUMENAL ESOPHAGOSOPHAGEAL ANASTOMOSIS FOR NOTES: AN EX VIVO FEASIBILITY STUDY – [Tetsuya Ishimaru, MD](#), Tadashi Iwanaka, MD, PhD, Akira Hatanaka, MD, Hiroshi Kawashima, MD, Department of Pediatric Surgery, The University of Tokyo Hospital
- 11:23 am: **S033** A NOVEL TECHNIQUE FOR MAPPING/LEVELLING BIOPSIES DURING PRIMARY LAPAROSCOPY ASSISTED TRANS-ANAL SOAVE ENDORECTAL PULLTHROUGH FOR HIRSCHSPRUNG'S DISEASE – [Ashok Daya Ram, MBBS](#), Ashwin Pimpalwar, MD, Division of Pediatric Surgery, Michael E. Debakey Department of Surgery, Baylor College of Medicine and Texas Children's Hospital, Houston, Texas
- 11:29 am: **S034** ROBOT-ASSISTED THORACOSCOPIC THYMECTOMY FOR TREATING MYASTHENIA GRAVIS IN CHILDREN – [Joseph E. Hartwich, MD](#), Jean Teasley, MD, Claudio Oiticica, MD, Sanjeev Tyagi, BS, David A. Lanning, MD, PhD, Children's Hospital of Richmond, Virginia Commonwealth University
- 11:35 am: **S035** USING TRACTION FOR THE SAFE DIVISION OF THE PULMONARY VESSELS AND BRONCHUS DURING THORACOSCOPIC PULMONARY LOBECTOMY IN CHILDREN WEIGHING LESS THAN 15KG – [Hiroyuki Koga, MD](#), Kenji Suzuki, MD, Tadaharu Okazaki, MD, Geoffrey L. Lane, MD, Go Miyano, MD, Atsuyuki Yamataka, MD, Juntendo University School of Medicine
- 11:40 am: **S036** SINGLE-INCISION LAPAROSCOPIC ROUX-EN-Y HEPATICOJEJUNOSTOMY USING CONVENTIONAL INSTRUMENTS FOR CHILDREN WITH CHOLEDOCHAL CYSTS – [Long Li, Professor](#), Mei Diao, Doctor, Ning Dong, Doctor, Qi Li, Doctor, Hui Ye, Doctor, Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing, P. R. China
- 11:46 am: **S037** IMPACT OF BODY HABITUS ON SINGLE SITE LAPAROSCOPIC APPENDECTOMY FOR NON-PERFORATED APPENDICITIS: SUBSET ANALYSIS FROM A PROSPECTIVE, RANDOMIZED TRIAL – Shawn D. St. Peter, MD, [Erol M. Knott, DO, PhD](#), Alessandra C. Gasior, DO, George W. Holcomb III, MD, Daniel J. Ostlie, MD, Children's Mercy Hospitals and Clinics

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12:00 pm - 12:30 pm

## Keynote Lecture:

**"Remote Presence, Telemedicine, and Healthcare Delivery"**  This session is not accredited for CME.

Yulun Wang, PhD, **INTRODUCTION BY:** Todd A. Ponsky, MD



Yulun Wang, PhD, is the Chairman and CEO of InTouch Health based in Goleta, CA. In 2002, Dr. Wang founded InTouch Technologies (d.b.a. InTouch Health), a company which pioneers remote presence robot systems that enable healthcare professionals to provide more effective and efficient healthcare by allowing them to "be in two places at once". In 2008, InTouch Health received Deloitte's Technology Fast 500 Award of the fastest growing technology companies in North America, ranking number 39. Also in 2008, InTouch Health received Inc Magazine's Inc 500 award ranking 289 of the 500 fastest growing companies in America and was also ranked number 18 in the Top 100 Health Companies on the list.

In 1989, Dr. Wang founded Computer Motion, the company which pioneered surgical robotics. He was the principal architect and inventor of the voice-controlled robotic arm called AESOP, the first FDA-cleared surgical robot, as well as the ZEUS robotic surgical system, which performed the world's first transatlantic surgery. Computer Motion went public in 1997 and merged with Intuitive Surgical in 2003 for one third of the resulting company.

In 2000, the National Academy of Engineers selected Dr. Wang as one of the nation's top young engineers to participate in the Frontiers of Engineering program and in 2011, Dr. Wang was elected to the prestigious ranks of the National Academy of Engineering, an achievement earned through a career dedicated to improving healthcare delivery through science and engineering. Dr. Wang was further honored in June 2005 when Ernst & Young named him Finalist for their Entrepreneur of the Year award and again in 2007 when UCSB awarded him with the Venky Narayanamurti Entrepreneurial Leadership Award.

Dr. Wang has more than 50 publications and over 90 patents in the areas of robotics and computers. Dr. Wang is a member of the University of California Santa Barbara's Electrical & Computer Engineering and Mechanical Engineering Advisory Board, the Hoag Memorial Hospital Presbyterian Board of Directors, and the American Telemedicine (ATA) Board of Directors. He is frequently invited to speak at noteworthy meetings and events, has appeared on the Today Show, CNN, and various other televised interviews. Dr. Wang has a PHD in Electrical Engineering specializing in Robotics from the University of California at Santa Barbara.

*IPEG acknowledges our Diamond Level Donors for their support of this lecture: Karl Storz Endoscopy and Stryker Endoscopy.*

12:30 pm - 1:45 pm

## Lunch Break (on own) and Exhibit Viewing

12:30 pm - 1:45 pm

## Poster Tours (Posters 77-152)

*San Diego Convention Center - Exhibit Hall C*

**CHAIR:** Shawn D. St. Peter, MD

**MODERATORS:** Katherine Barsness, MD, Raul Bignon, MD, Karen Diefenbach, MD, Anna Gunnarsdóttir, MD, Pablo Laje, MD, Sean Marven, MD, Milissa McKee, Oliver Muensterer, MD, Ramesh Santhanakrushnan, MD, & Yuk Him Tam, MD

1:45 pm - 2:45 pm

## Panel: Difficult Situations in MIS

*Room 6C*

**CHAIR:** Keith E. Georgeson, MD, **CO-CHAIRS:** Jacob Langer, MD, Henri Steyaert, MD, & Atsuyuki Yamataka, MD

**Description:** This session will try to explain how to deal with difficult situations during MIS surgery, how not to convert and when to convert. Experts will show how they operate on difficult cases using short videos and discuss some difficult cases involving laparoscopy, thoracoscopy, and retroperitoneal surgery.

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

- List 3 strategies for overcoming difficult situations in laparoscopic surgery (Knowledge)
- Discuss intraoperative strategies to overcome difficult situations in thoracoscopy (knowledge, performance)
- List 3 indications to convert to an open procedure (competence)
- Discuss how to deal with difficult situations in retroperitoneal MIS (knowledge)
- Manage unexpected situations during operation and continue using MIS (competence, performance)

2:45 pm - 4:00 pm

## Scientific Session: Urogenital MIS

**MODERATORS:** Maria Marcela Bailez, MD, Satoshi Ieiri, MD, & Philipp O. Szavay, MD

2:45 pm: **S038** RETROPERITONEOSCOPIC ANDERSON HAYNES PYELOPLASTY IN 100 CHILDREN – [Ravindra Ramadwar, MCh, DNB, FRCS](#), Kishore Adayanthaya, MCh, Snehalata Dhayagude, MD, Bombay Hospital, Hinduja Hospital

2:53 pm: **S039** BLU PATENT LYMPHOGRAPHY PREVENTS HYDROCELE AFTER LAPAROSCOPIC VARICOCELECTOMY: 10 YEARS OF EXPERIENCE – [S. F. Chiarenza](#), L. Costa, A. Carabaich, Dept Pediatric Surgery, Saint Bortolo Hospital, Vicenza, Italy

3:01 pm: **S040** PEDIATRIC URETEROPELVIC JUNCTION OBSTRUCTION – [Justin Lee, MD](#), David B. Tashjian, MD, FACS, FAAP, Kevin P Moriarty, MD, FACS, FAAP, Baystate Children's Hospital, Tufts University School of Medicine

3:09 pm: **S041** SURGICAL TECHNIQUES FOR UPPER POLE HEMINEPHRECTOMY OF DUPLEX KIDNEY IN LAPROENDOSCOPIC SINGLE-SITE SURGERY – [Yunli Bi, MD](#), Liangsheng Lu, MD, Children's Hospital of Fudan University

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# Complete Schedule

- 3:15 pm: **S042** ROBOT-ASSISTED LAPAROSCOPIC SURGERY IN CHILDREN: DOES IT APPLY TO ALL LEVELS OF THE URETER? – [Bruce W. Lindgren, MD](#), Jennifer Hagerty, DO, Theresa Meyer, RN, MS, Earl Y. Cheng, MD, Pediatric Urology, Children's Memorial Hospital, Chicago, IL, Surgery/Urology, Al duPont Hospital for Children, Wilmington, DE
- 3:21 pm: **S043** TOTALLY LAPAROSCOPIC APPROACH FOR FAILED CONVENTIONAL ORCHIOPEXY – [Mario Riquelme, MD](#), Arturo Aranda, MD, Mario Rodarte-shade, MD, Hospital San Jose - Tec de Monterrey
- 3:27 pm: **S044** CAN LAPAROSCOPIC RADICAL NEPHRECTOMY FOR UNILATERAL RENAL CANCER IN CHILDREN CONSIDERED SAVE ? A SINGLE CENTER EXPERIENCE – [M.G. Scuderi, MD](#), E. Camarda, MD, S. Puleo, MD, A. Di Cataldo, MD, V. Di Benedetto, Professor, Departem of Paediatric Surgery, Catania University, Catania Italy
- 3:33 pm: **S045** THE ROLE OF VIDEOSURGERY IN THE TREATMENT OF WILMS' TUMORS – [Edward Esteves, PhD](#), Rosemary G. Crocetti, MD, Juliana V Gomes, Enf, Eley M. Oliveira, MD, Patricia O. Brito, MD, Loretta S. C. Oliveira, MD, Rejane Nakano, MD, Pediatric Oncology Division, Araujo Jorge Cancer Hospital of Goias, Goiania (GO), Brazil
- 3:39 pm: **S046** PEDIATRIC LAPAROSCOPIC PYELOPLASTY AND ROBOTIC-ASSISTED LAPAROSCOPIC PYELOPLASTY: A COMPARATIVE SINGLE-INSTITUTION STUDY – [Edward Riachy, MD](#), W. Robert Defoor, MD, Pramod P. Reddy, MD, Eugene A. Minevich, MD, Shumyle Alam, MD, Paul H. Noh, MD, Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio
- 3:45 pm: **S047** PEDIATRIC ROBOTIC PYELOPLASTIES: INITIAL EXPERIENCE AT A SINGLE CENTER – Katherine Herbst, MSC, Puneeta Ramachandra, MD, [Christina Kim, MD, FAAP](#), Connecticut Children's Medical Center
- 3:51 pm: **S048** DIRECT PATH TO SUCCESS: A FAST AND ACCURATE TECHNIQUE OF ANTEGRADE PASSAGE OF A DOUBLE J STENT IN LAPAROSCOPIC PYELOPLASTY – [Fiona J. Murphy, MRCS, Ed](#), Supul Henneyake, FRCS, Royal Manchester Children's Hospital

*IPEG acknowledges our Diamond and Platinum Level Donors for their support of this activity.  
Diamond: Karl Storz Endoscopy, Stryker Endoscopy • Platinum: Ethicon Endo-Surgery, Inc.*

4:00 pm - 4:30 pm **Break**

4:30 pm - 5:30 pm

**Panel: Chest Wall Deformities** 

**CHAIR:** Marcelo H. Martinez Ferro, MD

**CO-CHAIRS:** Michael J. Goretzky, MD, Klaus Schaarschmidt, MD, & Patricio Varela, MD

**Description:** In this session new technical resources (Surgical and non-surgical) available for the treatment of Chest Wall Deformities will be addressed. Treatment of difficult patients and complications will also be approached.

**Objective:** The main objective is to change the mentality on how to approach pediatric chest wall deformities. No single technique is better than others, but they are all complimentary and doctors need to understand which one fits better to each patient.

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

- List 3 ways of treating pectus Excavatum (knowledge)
- Use an algorithm for the treatment of pectus Carinatum (performance)
- Understand how to apply different techniques in a sequential mode in a single patient. (competence)
- Learn how to approach difficult cases and complications. (competence)

TIME	TOPIC	FACULTY
4:30 pm	A New Classification for Typical and Rare Cases of Chest Wall Deformities	Patricio Varela, MD
4:40 pm	The CHKD Experience with the Nuss Procedure	Michael Goretzky, MD
4:55 pm	The Berlin Experience with the Treatment of Chest Wall Deformities	Klaus Schaarschmidt, MD
5:10 pm	A Proposed Algorithm for the Treatment of Pectus Carinatum	Marcelo H. Martinez Ferro, MD
5:20 pm	Presentation of Difficult Cases and Complications (Interactive Session)	Sherif Emil, MD

7:30 pm - 11:00 pm

**IPEG/SAGES Main Event!**  
Dress code: Casual!

*Historic USS Midway Aircraft Carrier and Museum*

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# Complete Schedule

**Saturday, March 10, 2012**

**General Sessions are at the San Diego Convention Center - Room 6C**

7:00 am - 8:15 am

**Scientific Session: Miscellaneous** 

**MODERATORS:** Manuel Lopez, MD, Daniel J. Ostlie, MD, & Yuk Him Tam, MD

- 7:00 am: **S049** LAPAROSCOPIC VERSUS OPEN DISTAL PANCREATECTOMY FOR TRAUMATIC PANCREATIC TRANSECTION: MULTI-INSTITUTIONAL OUTCOMES – [Corey W. Iqbal, MD](#), Shauna M. Levy, MD, Kuojen Tsao, MD, Mikael Petrosyan, MD, Timothy D. Kane, MD, Elizabeth M. Pontarelli, MD, Jeffrey S. Upperman, MD, Shawn D. St. Peter, MD, Children's Mercy Hospitals and Clinics, University of Texas Health Science Center At Houston and Children's Memorial Hermann Hospital, Children's National Medical Center, Children's Hospital of Los Angeles
- 7:09 am: **S050** IPEG SURVEY ON LIVE CASE DEMONSTRATIONS IN PEDIATRIC SURGERY – [Jens Dingemann, MD](#), Pablo Laje, MD, Shawn D. St. Peter, MD, Benno M. Ure, MD, PhD, Hannover Medical School and Bult Children's Hospital Hannover, Germany / Dept. of General Surgery, The Children's Hospital of Philadelphia, Philadelphia, USA / Dept of Surgery, Children's Mercy Hospital, Kansas City, USA
- 7:15 am: **S051** LAPAROSCOPIC ADRENALECTOMY FOR ADRENAL TUMOR IN CHILDREN: TRANSPERITONEAL OR RETROPERITONEAL APPROACH? – [Tran N. Son, MD, PhD](#), Nguyen T. Liem, MD, PhD, National Hospital of Pediatrics, Hanoi, Vietnam
- 7:21 am: **S052** THORACOSCOPIC PROCEDURES FOR TREATMENT OF MEDIASTINAL AND PULMONARY MASSES IN CHILDREN: 10 YEARS EXPERIENCE – Alexander Rsazumovsky, Prof., [Victor Rachkov](#), Alexander Zadvernyuk, Abdumanap Alhasov, Zoriko Mitupov, Said-khassan Batayev, Nadezhda Kulikova, Oganeg Geodakyan, Filatov Children's Hospital, Moscow, Russia
- 7:27 am: **S053** LAPAROSCOPIC HERNIA SAC TRANSECTION AND INTRA-CORPOREAL LIGATION SHOWS VERY LOW RECURRENCE RATE IN PEDIATRIC INGUINAL HERNIA – [Yoon-jung Boo, MD](#), Hyung-joon Han, MD, Division of Pediatric Surgery, Department of Surgery, Korea University College of Medicine
- 7:33 am: **S054** THE PEDESTAL PROJECT: EXPLICIT PEDIATRIC MIS TRAINING BEYOND SIMULATION – [Thane Blinman, MD](#), Pat Casale, MD, Children's Hospital of Philadelphia
- 7:39 am: **S055** THORACOABDOMINAL REBAR IMPALEMENT: A MINIMALLY INVASIVE APPROACH – [Kathleen M. Dominguez, MD](#), David P. Blake, MD, Mary C. McCarthy, MD, Wright State University, Miami Valley Hospital
- 7:45 am: **S056** MAGNAMOSIS (MAGNETIC COMPRESSION ANASTOMOSIS DEVICE FOR MIS): TRIBULATIONS OF THE DEVELOPMENT AND REGULATORY PROCESS: 510K, IDE, CE MARK, ETC – Michael R. Harrison, MD, Kelly D. Gonzales, MD, Kullada O. Pichakron, MD, Dillon A. Kwiat, BS, James Wall, MD, [Shinjiro Hirose, MD](#), Department of Surgery, University of California, San Francisco, San Francisco, CA, Department of Surgery, David Grant USAF Medical Center, Travis AFB, CA, Department of Surgery, Stanford University, Palo Alto, CA
- 7:51 am: **S057** LAPAROSCOPIC OVARIAN CORTICAL HARVESTING IN GIRLS AT RISK OF GONADAL FAILURE – [Naomi Whyler, Dr.](#), Claire Clark, MBChB, MRCS, Ed, Fraser Munro, FRCS, Hamish Wallace, Professor, Richard Anderson, Professor, Amanda McCabe, FRCS, Timothy Bradnock, MBChB, MRCS, Ed., Royal Hospital for Sick Children Edinburgh
- 7:57 am: **S058** COST TRENDS IN PEDIATRIC LAPAROSCOPIC SURGERY – [Stephen D. Adams, MRCS](#), Simon C. Blackburn, MRCS, Anthony Phippard, Anies A. Mahomed, FRCS, Paed., Royal Alexandra Children's Hospital, Brighton
- 8:03 am: **S059** EFFECT OF RESIDENT POST-GRADUATE YEAR ON POST-OPERATIVE COMPLICATIONS AFTER LAPAROSCOPIC APPENDECTOMY – Jessica A. Naiditch, MD, Timothy B. Lautz, MD, [Katherine A. Barsness, MD](#), Children's Memorial Hospital, Northwestern University Feinberg School of Medicine, Chicago, IL
- 8:09 am: **S060** TRACTION ELONGATION OF THE DIAPHRAGM OR FOKERS TECHNIQUE FOR REPAIR OF THE LARGE DIAPHRAGMATIC DEFECT – [Yury Kozlov, MD](#), Vladimir Novozhilov, MD, Irina Weber, MD, Andrey Rasputin, Marina Kononenko, Elena Novikova, Nicolay Syrkin, Konstantin Povarincev, Natalya Aleynikova, MD, Municipal Pediatric Hospital, Irkutsk, Russia

8:15 am - 8:45 am

**General Assembly**

**MODERATOR:** Carroll M. Harmon, MD, PhD

8:45 am - 9:00 am

**Awards**

Coollest Tricks – **PRESENTED BY:** Carroll M. Harmon, MD, PhD

Basic Science – **PRESENTED BY:** Shawn D. St. Peter, MD

IRCAD – **PRESENTED BY:** Todd A. Ponsky, MD

2012 Research Grant – **PRESENTED BY:** Shawn D. St. Peter, MD

9:00 am - 9:15 am

**2011 Research Grant Presentation: "Long-Gap Pure Esophageal Atresia: Development of a Survival Rabbit Model and Minimally Invasive Repair Techniques"** 

Todd A. Ponsky, MD, University Hospitals Case Medical Center

9:15 am - 9:45 am

**Break**

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# Complete Schedule

9:45 am - 10:45 am

## Panel: IBD

Room 6C

**CHAIR:** James Geiger, MD, **CO-CHAIRS:** John H.T. Waldhausen, MD & Bruce Jaffray, MD

**Description:** This session will address technical aspects of performing ileoanal pull-through procedures, surgical approaches to difficult situations in patients with Crohn's disease and indeterminate colitis, indications for pull-through procedures and single incision laparoscopic surgery in patients with Crohn's disease.

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

- List the pros and cons of hand sewn vs double stapled technique for ileoanal pullthrough (competence)
- Discuss the technical aspects of laparoscopic surgery for ileoanal pullthrough and minimally invasive techniques for the treatment of Crohn's disease (competence)
- Discuss the indications for surgery and the risk factors involved for patients treated with immune modulators, steroids, etc. (competence)
- List the indications for pull through operations and single incision surgery in children with Crohn's (competence)

TIME	TOPIC	FACULTY
9:45 am	Hand-sewn versus Double-Stapled Technique for Ileoanal Pull-through	Bruce Jaffray, MD
10:00 am	Surgical Approach to Difficult Situations with Crohn's Disease and Indeterminate Colitis	John H.T. Waldhausen, MD
10:15 am	Single Site Surgery for Crohn's	James Geiger, MD
10:30 am	Panel Discussion with Audience Q & A	ALL

10:00 am - 1:00 pm

## Exhibits Open

San Diego Convention Center - Exhibit Hall C

10:45 am - 11:45 am

## Scientific Session: Thorax

**MODERATORS:** Maria Marcela Bailez, MD, Giovana Riccipetioni, MD, & Steven S. Rothenberg, MD

- 10:45 am: **S061** EXPANDING "ENDOSCOPIC REVERSED NUSS" PECTUS CARINATUM REPAIR WITH 8-HOLE-STABILIZERS, SUBMUSCULAR CO2 AND PRESTERNAL NUSS BAR(S) BERLIN-BUCH MIDTERM RESULTS IN 72 PATIENTS 2008-2010 – [K. Schaarschmidt, Prof., MD](#), [M. Lempe, MD](#), [F. Schlesinger, MD](#), [U. Jaeschke, MD](#), [S. Polleichtner](#), Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch, Germany
- 10:51 am: **S062** THORACOSCOPIC REPAIR OF RECURRENT CONGENITAL DIAPHRAGMATIC HERNIAS: INITIAL EXPERIENCE – [Shaun M. Kunisaki, MD](#), [Ian Powelson](#), [Robert A. Drongowski](#), [Marcus D. Jarboe, MD](#), [James D. Geiger, MD](#), [George B. Mychaliska, MD](#), University of Michigan C.S. Mott Children's Hospital
- 10:57 am: **S063** ENDOSCOPIC SERIAL EXTERNAL RIB CORTEX EXCISION FOR CORRECTION OF PROMINENT COSTAL ARCHES IN THORACOSCOPIC NUSS REPAIR – [Klaus Schaarschmidt, Prof., MD, PhD](#), [Michael Lempe, MD](#), [Uwe Jaeschke, MD](#), [Susanne Polleichtner](#), Helios Centre of Pediatric and Adolescent Surgery Berlin-Buch, Germany
- 11:03 am: **S064** MINIMALLY INVASIVE RELEASE OF THE MEDIAN ARCUATE LIGAMENT FOR CELIAC ARTERY COMPRESSION SYNDROME: AN EARLY EXPERIENCE IN A PEDIATRIC POPULATION – [Rachel L. Garness, RN, CNP](#), [Ryan Antiel](#), [Gustavo S. Oderich, MD](#), [Peter Gloviczki, MD](#), [Abdalla E. Zarroug, MD](#), Mayo Clinic, Rochester, MN, USA
- 11:09 am: **S065** THE EARLY FIBRINOLYTIC THERAPY REDUCES VATS AND THORACOTOMY RATES IN CHILDREN – [Hayley Wilson, Miss](#), [Devaraj Channappa, Dr.](#), [Christopher Lewis, Mr.](#), [Sridharan Jayaratnam, Dr.](#), [Askar Kukkady, Mr.](#), [Stuart Brown, Mr.](#), [Udaya Samarakody, Mrs.](#), Department of Pediatric Surgery, Waikato Hospital, Waikato Clinical School of University of Auckland, Hamilton, New Zealand
- 11:15 am: **S066** THORACOSCOPIC MANAGEMENT OF LONG GAP ESOPHAGEAL ATRESIA – [Edward Esteves, PhD](#), [Marcelo C. Silva, MD](#), [Kelly C. Paiva, MD](#), [Roneyara R. Valamiel, MD](#), [Agnor A. Moreira, MD](#), [Celio C. Chagas, MD](#), [Humberto B. Souza-filho, MD](#), Pediatric Surgery Division, University of Goias, Goiania(GO), Brazil and Joao Penido Hospital, Juiz de Fora (MG), Brasil
- 11:21 am: **S067** PAIN AND ANXIETY MANAGEMENT IN MINIVASIVE REPAIR OF PECTUS EXCAVATUM – [Elisa Brandigi, MD](#), [Marco Ghionzoli, MD](#), [Caterina Morelli, MD](#), [Francesca Tocchioni, MD](#), [Aurora Mariani, MD](#), [Stefania Ragozzino, MD](#), [Alessandro Pane, MD](#), [Alessandra Martin, MD](#), [Roberto Lo Piccolo, MD](#), [Andrea Messeri, MD](#), [Antonio Messineo, MD](#), Department of Pediatric Surgery, Children's Hospital A. Meyer, Florence, Italy
- 11:27 am: **S068** STAGED THORACOSCOPIC REPAIR OF A LONG GAP ESOPHAGEAL ATRESIA WITH INTERNAL TRACTION SUTURE – [D. Patkowski, MD, PhD](#), [W. Gorecki, MD, PhD](#), [S. Gerus, MD](#), [P. Wojciechowski, MD, PhD](#), [M. Zielinska, MD, PhD](#), [U. Dorobisz, MD, PhD](#), [A. I Prokurat, MD PhD](#), Departments of Pediatric Surgery and Urology, Anaesthesiology, Radiology, Medical University of Wroclaw, Department of Pediatric Surgery, Jagiellonian University, Krakow, Poland
- 11:33 am: **S069** THORACOSCOPIC RESECTION OF LUNG METASTASES IN CHILDREN FOLLOWING PREOPERATIVE CT-GUIDED LABELING – [Steven W. Warmann, MD](#), [Juergen F. Schaefer, MD](#), [Guido Seitz, MD](#), [Joerg Fuchs, MD](#), Department of Pediatric Surgery and Pediatric Urology, and Department of Pediatric Radiology, University Hospital Tuebingen, Hoppe-Seyler-Str. 3, 72076 Tuebingen, Germany
- 11:39 am: **S070** LEFT THORACOSCOPIC THYMECTOMY FOR PEDIATRIC MYASTHENIA GRAVIS – [Samiksha Bansal, MD](#), [David Partrick, MD](#), Children Hospital of Colorado, Denver, CO

11:45 am - 12:00 pm

## Closing Remarks & Presentation of the IPEG 2013 President: Tadashi Iwanaka, MD

**MODERATORS:** Carroll M. Harmon, MD, PhD

12:00 pm - 1:00 pm

## Free Lunch in Exhibit Hall for IPEG & SAGES attendees

San Diego Convention Center - Exhibit Hall C

# SAGES Session Summary

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**SAGES PROGRAM CHAIRS:** Daniel Jones, MD & Daniel Scott, MD

## **Wednesday, March 7, 2012**

- SAGES Half-Day Postgraduate Course: Fundamentals of Endoscopic Surgery (FES)
- SAGES Half-Day Postgraduate Course: Essentials of Robotic Surgery
- SAGES Half-Day Postgraduate Course: MIS Colorectal Surgery
- SAGES Panel: Foregut - Dysmotility from Mouth To Anus
- SAGES Symposium: Social Media for Surgeons
- SAGES Symposium: Endoscopic and Surgical Alternatives for Benign Pancreatic Disease
- SAGES Symposium: Upcoming Changes with Medical Reimbursements
- SAGES/SSAT Symposium: Minimally Invasive Hepatobiliary and Pancreatic Surgery
- SAGES Half-Day Hands-On Course: Robotic Surgery
- SAGES Half-Day Hands-On Course: Transanal Colorectal and Single Port Surgery
- SAGES Session: SAGES Top 21 Videos

### **Exhibits Opening Welcome Reception (5:30 pm - 7:30 pm)**

## **Thursday, March 8, 2012**

- SAGES Scientific Sessions
- SAGES Half-Day Postgraduate Course: Metabolic Surgery and Cure of Diabetes
- SAGES Postgraduate Course: POEM
- SAGES Postgraduate Course: Laparoscopic Ventral Hernia with Endoscopic Components Separation
- SAGES Resident/Fellow Scientific Session
- SAGES Session: Posters of Distinction
- SAGES Panel: Surgery in Space
- SAGES Panel: Education and Training in Crisis
- SAGES Panel: Stories of SAGES Heroes
- SAGES Video Session: Best of NOTES® from Around the World
- SAGES/IPEG Session: My Operation is Better than Your Operation

### **Exhibits/Posters/Learning Center (open 9:30 am - 3:30 pm)**

- SAGES Half-Day Hands-On Course: POEM
- SAGES Half-Day Hands-On Course: Laparoscopic Ventral Hernia with Endoscopic Components Separation
- SAGES Half-Day Postgraduate Course: Fundamental Use of Surgical Energy (FUSE)
- SAGES/CAGS Panel: Therapeutic Endoscopy
- SAGES/ALACE Session: Innovations in Obesity Surgery
- SAGES Video Session: Oops – Now What?
- Industry Symposia

## **Friday, March 9, 2012**

- SAGES Scientific Sessions
- SAGES/IPEG Panel: Great Debates in Pediatric Bariatric Surgery
- SAGES/ASCRS Panel: Current Controversies during Colorectal Surgery
- SAGES Panel: Simulation: New Paradigm for Competency
- SAGES Presidential Address: Steven D. Schweitzberg, MD
- SAGES Karl Storz Lecture: John Abele

### **Exhibits/Posters/Learning Center (open 9:30 am - 3:30 pm)**

- SAGES Session: Top Gun for Kids and Adults
- SAGES Panel: Do You Know More Than Your Fellow?
- SAGES Panel: Solid Organ
- SAGES Session: Emerging Technology
- SAGES Debate: Robotic Surgery: Hope or Hype?
- SAGES Session: Inguinal Hernia: Treating the Other Guy's Complications
- SAGES Session: Advanced Open and Laparoscopic Ventral Hernia Repair

## **Saturday, March 10, 2012**

- SAGES Scientific Sessions
- SAGES Panel: Champions for New Operations – Lessons Learned from Change Agents
- SAGES Panel: SAGES Response to Healthcare Reform
- SAGES Symposium: Starting Your Career
- SAGES Gerald Marks Lecture: Michael J. Zinner, MD

### **Exhibits/Posters/Learning Center (open 10:00 am - 1:00 pm)**

#### **Lunch in Exhibit Hall for all SAGES and IPEG Meeting Attendees (12:00 pm - 1:00 pm)**

- SAGES/ASMBS Panel: Bariatric Surgery Nightmares: Prevention and Management of Complications
- SAGES Panel: MIS Evolution: Single Port, Needlescopy, and Deployable Instruments
- SAGES Panel: Innovation in the Era of COI and Transparency
- SAGES Session: TeleMentoring and Remote Battlefield Surgery
- SAGES/AORN Panel: MIS Patient Safety Checklist
- SAGES Panel: Mental Training

# SAGES

"Surgical Spring Week"

April 17-20, 2013

Program Chairs: Fredrick Brody, MD & Santiago Horgan, MD



Baltimore is eagerly awaiting the arrival of SAGES, Society of American Gastrointestinal and Endoscopic Surgeons, April 17-20, 2013! Discover our renowned attractions, great restaurants, historic neighborhoods, and our world-famous Inner Harbor, all within walking distance from the Baltimore Convention Center. As we say in Baltimore, you're "two feet" away from everything.

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# SAGES



Society of American Gastrointestinal and Endoscopic Surgeons

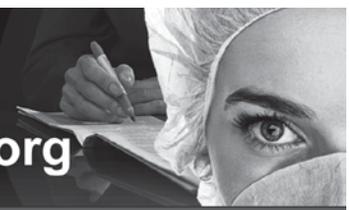
Resource/Program	Description	Members	Non-Members
 <b>IMAGES at SAGES</b>	<p><b>IMAGES</b> provides access to vast library of digital images, photos and graphics.</p>	<ul style="list-style-type: none"> <li>· Download images</li> <li>· Utilize images in Presentations</li> <li>· Upload/Share/Archive images</li> <li>· Rate/Review images</li> </ul>	<p>View access only to low resolution image versions</p>
 <b>SAGES TV</b>	<p><b>SAGES TV</b> is a central “searchable and fully navigational” depository for SAGES videos</p>	<ul style="list-style-type: none"> <li>· Upload/Share/Archive</li> <li>· VideosRate/Review Videos</li> </ul>	<p>View access only to video catalog</p>
 <b>S-WIKI</b>	<p><b>S-Wiki</b> is a surgical “Wikipedia” that has significant potential to become the most authoritative surgical reference on the web.</p>	<ul style="list-style-type: none"> <li>· Edit Existing Articles</li> <li>· Create New Articles</li> </ul>	<p>Read only Access to Articles</p>
 <b>SAGES Resident Webinars</b>	<p>These webinars have been developed specifically for residents and will feature expert panelist from SAGES.</p>	<p>Register and Participate in SAGES Resident Webinars for Free!</p>	<p>Register and Participate in SAGES Resident Webinars for Free!</p>
 <b>SAGESPAGES</b> THE SAGES SOCIAL NETWORK	<p><b>SAGESPAGES</b> is a surgeon-to-surgeon social network that will have replaced the previous SAGES member area.</p>	<ul style="list-style-type: none"> <li>· Post enhanced member profiles</li> <li>· Build “Friendships” with members</li> <li>· Messaging between members</li> <li>· Participate Committees</li> <li>· Upload/Archive documents</li> </ul>	<ul style="list-style-type: none"> <li>· Search/View Member Profiles</li> <li>· Read only access to public documents and updates</li> </ul>
 <b>SAGES University</b> Education • Research • Innovation	<p><b>SAGES University</b> facilitates online education content for MOC Part 2 Self assessment CME credit.</p>	<p>Full Access to complete all SAGES U Courses and obtain MOC Part 2 Self assessment CME credit</p>	<p>This Resource is for Members Only</p>
 <b>MYCME MOC</b>	<p><b>MYCME/MYMOG</b> is a central repository to track all SAGES awarded MOC Part 2 CME credit.</p>	<p>View and track all SAGES related CME Credit obtained from SAGES U and Live events</p>	<p>View and track all SAGES related CME Credit obtained from live events</p>
 <b>SAGES Guidelines</b>	<p>A complete list of all currently published <b>SAGES Guidelines</b> on the SAGES publication page.</p>	<p>On-line access to all SAGES Guidelines</p>	<p>On-line access to all SAGES Guidelines</p>
 <b>SAGES Go Global</b>	<p>SAGES International Proctoring Courses are a vehicle for SAGES to “give back” to the world community by leveraging its leading educational and training activities to become a leader in bringing safe minimally invasive surgery to the developing world.</p>	<p>SAGES Members may volunteer to participate in SAGES Go Global Activities</p>	
 <b>GO GLOBAL</b>			
 <b>MIS Safety Checklist</b>	<p>A checklist developed by SAGES and AORN to aid operating room personnel in the preparation of equipment and other duties unique to laparoscopic surgery cases.</p>	<p>On-line access to all SAGES Guidelines</p>	<p>On-line access to all SAGES Guidelines</p>

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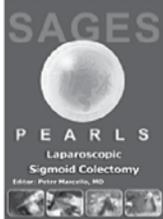
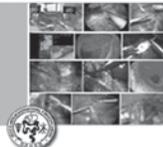
ELECTRONIC RESOURCES

# RESOURCES

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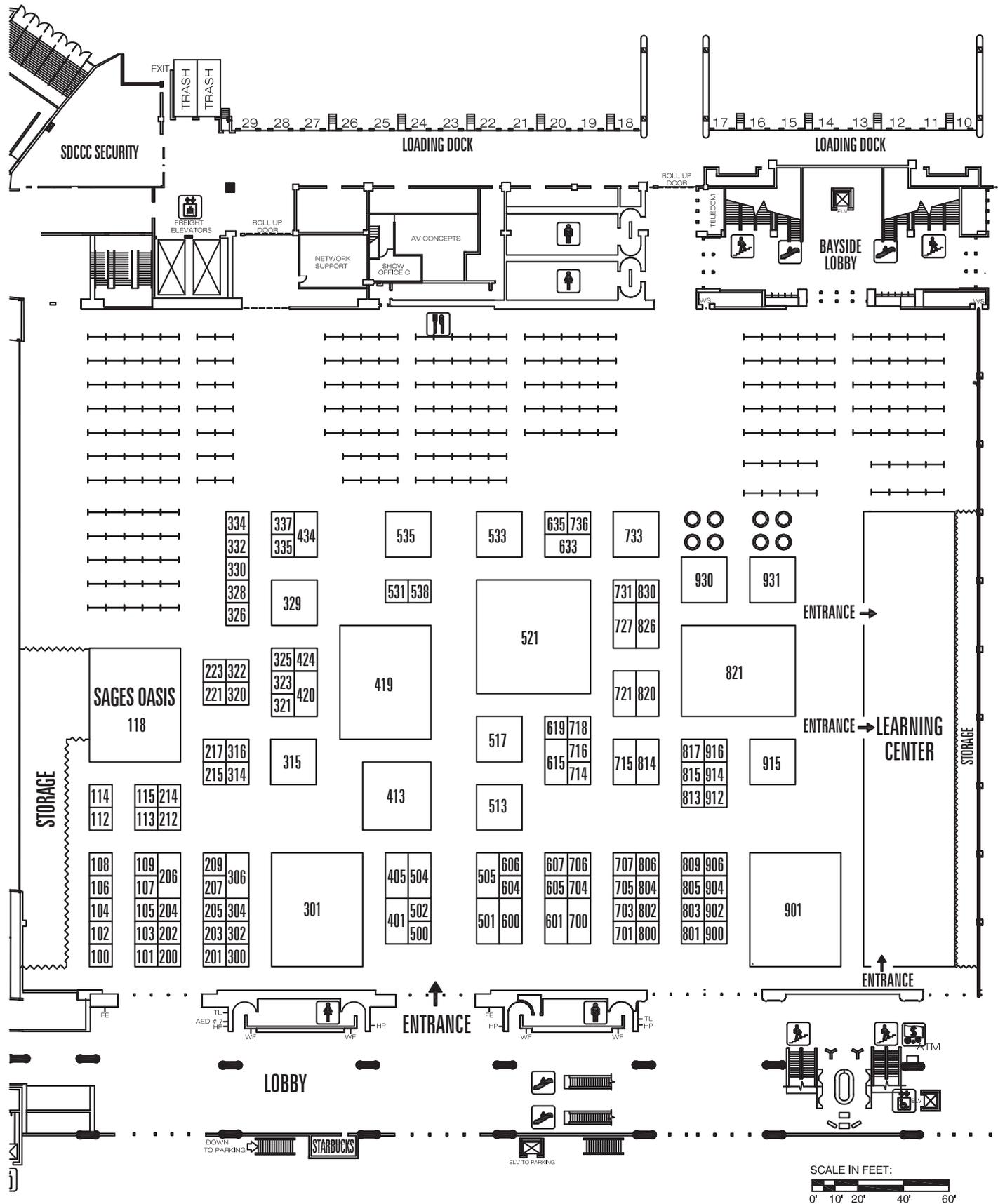
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Resource/Program	Description	Members	Non-Members
 <p><b>SAGES TOP 21 DVD</b> *New!</p> 	<p><b>SAGES Pearls Series Step by Step</b></p> <ul style="list-style-type: none"> <li>• Short Video Clips</li> <li>• Expert Narratives</li> <li>• Tips</li> <li>• Tricks</li> <li>• Important Steps</li> </ul> <p>This Collection contains the most common minimally invasive procedures performed by general surgeons, as determined by the SAGES Educational Resources Committee. <b>SAGES Top 21</b> replaces the very popular SAGES Top 14 DVD, with all new videos and commentaries.</p>	<p>Available For Purchase. Member Discount Available For product details visit <a href="http://www.cine-med.com/sages">www.cine-med.com/sages</a></p> <p>Available For Purchase. Member Discount Available For product details visit <a href="http://www.cine-med.com/sages">www.cine-med.com/sages</a></p>	<p>Available For Purchase. Full Price</p> <p>Available For Purchase. Full Price</p>
 <p><b>Patient Information Brochures</b></p> 	<p><b>SAGES Grand Rounds Master Series</b> offers video, slide presentations, discussion and in depth education.</p> <p>The SAGES Educational Resources Committee has developed these patient information brochures to assist surgeons in preparing their patients for surgery. Given the variations in technique, SAGES has designed these handouts to describe the most commonly performed techniques.</p>	<p>Available For Purchase. Member Discount Available For product details visit <a href="http://www.cine-med.com/sages">www.cine-med.com/sages</a></p> <p>Available For Purchase. Member Discount Available For product details visit <a href="http://www.cine-med.com/sages">www.cine-med.com/sages</a></p>	<p>Available For Purchase. Full Price</p> <p>Available For Purchase. Full Price</p>
	<p>On-line based education module designed to teach physiology, fundamental knowledge &amp; technical skills.</p>	<p>Available For Purchase. Member Discount Available To order FLS, please visit <a href="http://www.flsprogram.org">www.flsprogram.org</a> or call 310-437-0544 x 137</p>	<p>Available For Purchase. Full Price</p>
<b>COMING SOON!</b>			
	<p>The Fundamentals of Endoscopic Surgery (FES) Program is a test of knowledge and skills in flexible gastrointestinal (GI) endoscopy. FES is the flexible endoscopy equivalent of the Fundamentals of Laparoscopic Surgery™ (FLS) Program developed by SAGES.</p>	<p>Will Soon Be Available For Purchase.</p> <p>Standard Price</p>	<p>Will Soon Be Available For Purchase.</p> <p>Standard Price</p>
	<p>The Fundamental Use of Surgical Energy (FUSE) Program is an educational program/curriculum that will cover the use of energy in interventional procedure in the operating room and endoscopic procedure areas.</p>	<p>Will Soon Be Available For Purchase.</p> <p>Standard Price</p>	<p>Will Soon Be Available For Purchase.</p> <p>Standard Price</p>

VIDEO EDUCATION CURRICULUM

# Exhibitor Floor Plan

## San Diego Convention Center Halls C & B2



# Exhibitor Profiles

## **3-DMED**

#538

255 Industrial Dr., Franklin, OH 45005  
**PHONE:** 937-746-2901 • **FAX:** 937-746-5071  
**WEBSITE:** www.3-Dmed.com

3-Dmed- makers of the Minimally Invasive Training Systems (MITS) that provides a creative environment to practice and teach laparoscopic skills, procedures, camera navigation, and instrument demonstration. All Systems are self-contained and portable. Visit us to practice FLS skills or to try our new Single-Site MITS!

## **ACELL INC.**

#902

6640 Eli Whitney Dr., Ste. 200, Columbia, MD 21046  
**PHONE:** 410-953-8518 • **FAX:** 410-715-4511  
**WEBSITE:** www.acell.com

MatriStem® Products are medical devices that maintain and support a healing environment through constructive remodeling. Comprised of naturally-occurring urinary bladder matrix (UBM), MatriStem maintains an intact epithelial basement membrane. MatriStem is appropriate for various wound care and surgical procedures.

## **ADVANCED ENDOSCOPY DEVICES, INC.**

#304

22134 Sherman Way, Canoga Park, CA 91303  
**PHONE:** 818-227-2720 • **FAX:** 818-227-2724  
**WEBSITE:** www.aed.md

AED offers a full line of HD Endoscopes for Laparoscopy and Bariatric Surgery. AED's Precise Lap Forceps are not only of the highest quality but has the largest selection of Jaw patterns. Our modular Needle Holders give you the option to disassemble, clean prior to every case. Since, 1985 AED has had a presence in the US as a leading service company for any manufacturer's Endoscopes, Endoscopic instruments and Video systems. We pride ourselves in offering the most innovative products, the highest level of quality and the most competitive prices.

## **AESCULAP, INC.**

#915

3773 Corporate Pkwy., Center Valley, PA 18034  
**PHONE:** 610-797-9300 • **FAX:** 610-791-6888  
**WEBSITE:** www.aesculapusa.com

Aesculap is a leading manufacturer and supplier of handheld instruments for minimally invasive surgery. These laparoscopic instruments combine precision craftsmanship with modern materials and design. Precise performance makes Aesculap laparoscopic instruments the instrument of choice for today's and tomorrow's surgery.

## **AFCELL MEDICAL**

#201

322 Route 46 West, Ste. 150, Parsippany, NJ 07054  
**PHONE:** 260-468-3635 • **FAX:** 260-247-2422  
**WEBSITE:** www.afcellmedical.com

## **ALLERGAN**

#601

2525 Dupont Drive, Irvine, CA 92612  
**PHONE:** 714-246-4500 • **FAX:** 714-246-4971  
**WEBSITE:** www.allergan.com

Allergan has joined the effort to fight the growing obesity epidemic with the LAP-BAND® Adjustable Gastric Banding System, the first minimally invasive surgical approach approved in the United States by the FDA, to help patients achieve sustained weight loss, realize their goals for healthy living, and reduce obesity-related risks.

## **AMBRY GENETICS**

#736

15 Argonaut, Aliso Viejo, CA 92656  
**PHONE:** 949-900-5500 • **FAX:** 949-900-5501  
**WEBSITE:** www.ambrygen.com

Ambry Genetics, a leader in diagnostic testing provides both the DNA analysis and interpretation to help diagnose and manage your patients. Our testing menu includes: Pancreatitis, Colon Cancer, Alagille syndrome, Wilson Disease, Pancreatic Cancer, Endometrial Cancer, Ovarian cancer and more.

## **AMERICAN COLLEGE OF SURGEONS BARIATRIC SURGERY CENTER NETWORK (ACS BSCN) ACCREDITATION PROGRAM**

#322

633 North Saint Clair St., Chicago, IL 60611  
**PHONE:** 312-202-5000 • **FAX:** 312-202-5063  
**WEBSITE:** www.acsbscn.org

The American College of Surgeons continues its dedication to quality improvement through the Bariatric Surgery Center Network Accreditation Program. The ACS BSCN accredits facilities that have undergone an independent, rigorous peer evaluation in accordance with nationally recognized bariatric standards and participate in the program's longitudinal outcomes database. Please visit booth 322 for information regarding program standards and enrollment.

## **APOLLO ENDOSURGERY, INC.**

#633

7000 Bee Caves Rd., Suite 350, Austin, TX 78746  
**PHONE:** 512-328-9990 • **FAX:** 512-328-9994  
**WEBSITE:** www.apolloendo.com

Apollo Endosurgery, Inc. is dedicated to revolutionizing patient care through the development of flexible surgery, which is emerging from the convergence of laparoscopic surgery and therapeutic gastroenterology. Flexible surgery minimizes the trauma of surgical access by taking advantage of natural orifices to deliver surgical tools to targeted areas. All of Apollo's products are compatible with existing flexible endoscope platforms

## **APOLLO SURGICAL INDUSTRIES, INC.**

#912

741 Teaneck Rd., Teaneck, NJ 07666  
**PHONE:** 800-749-4699 • **FAX:** 866-731-0346  
**WEBSITE:** www.apollosurgical.com

Apollo Surgical Industries, Inc. distributes proprietary surgical instruments that are designed by surgeons, and better for surgeons. With a focus on laparoscopic products, Apollo combines intuitive design with efficient detail to create higher quality instruments at a lower cost.

## **APPLIED MEDICAL**

#315

22872 Avenida Empresa, Rancho Santa Margarita, CA 92688  
**PHONE:** 949-713-8000 • **FAX:** 949-713-8205  
**WEBSITE:** www.appliedmedical.com

As a new generation medical company devoted to meeting the fundamental demands of healthcare, Applied believes that enhanced clinical outcomes and availability of care must be coupled with exceptional value. Applied designs, manufactures and distributes medical devices for minimally invasive surgery which enhance patient outcomes while improving the quality and affordability of care.

# Exhibitor Profiles

## **ATRIUM MEDICAL CORPORATION**

**#806**

5 Wentworth Dr., Hudson, NH 03051

**PHONE:** 603-880-1433 • **FAX:** 603-386-6266

**WEBSITE:** www.atriummedical.com

Atrium's C-QUR™ Mesh family of hernia products combine our industry-leading ProLite™ polypropylene with a proprietary Omega 3 fatty acid absorbable coating. Pre-clinical studies demonstrate minimized tissue attachment and significant reduction in inflammation, resulting in a well healed, reinforced repair.

## **AUTOMATED MEDICAL PRODUCTS CORPORATION**

**#300**

PO Box 2508, Edison, NJ 08818

**PHONE:** 732-602-7717 • **FAX:** 732-602-7706

**WEBSITE:** www.ironintern.com

Automated Medical Products Corp offers the Iron Intern® Available for use in laparoscopic and open surgery. The Iron Intern® Stieber Rib Grip Kit provides superior exposure in the abdomen and serves liver transplants. Find out more about these products at www.ironintern.com.

## **BIARIATRIC TIMES**

**#217**

*Published by Matrix Medical Communications*

1595 Paoli Pike, Suite 103, West Chester, PA

**PHONE:** 866-325-9907 • **FAX:** 484-266-0726

**WEBSITE:** www.bariatrictimes.com

Bariatric Times is a leading peer-reviewed, monthly journal providing articles on clinical developments and metabolic insights in total bariatric patient care. Please stop by our booth #217 to sign up for a free subscription to Bariatric Times or Bariatric Times International e-Journal and learn more about our new e-Books and educational offerings.

## **BÂRRX MEDICAL, INC.**

**#727**

540 Oakmead Parkway, Sunnysvale, CA 94085

**PHONE:** 408-328-7300 • **FAX:** 408-328-7395

**WEBSITE:** www.barrx.com

Developed by BÂRRX Medical, the HALO Ablation System provides a uniform and controlled radiofrequency energy delivery, removing the diseased tissue and allowing regrowth of normal cells for the treatment of Barrett's esophagus, radiation proctitis and gastric antral vascular ectasia (GAVE).

## **BAXTER HEALTHCARE CORPORATION**

**#813**

One Baxter Parkway, Deerfield, IL 60015

**PHONE:** 800-423-2090

**WEBSITE:** www.baxterbiosurgery.com

Baxter is a global, diversified healthcare company with expertise in medical devices, pharmaceuticals, and biotechnology. The company continues its quest for advancing BioSurgery by offering products for hemostasis and sealing based on the latest scientific advances in the field.

## **BG MEDICAL**

**#434**

101 S. Hough St., Suite 6A, Barrington, IL 60010

**PHONE:** 1-800-390-4716 • **FAX:** 1-800-245-2161

**WEBSITE:** www.surgimesh.com

For all types of Open and Laparoscopic Hernia Repair, the unique SURGIMESH® Technology solves many of the long-standing problems such as groin pain and poor patient outcome due to mesh shrinkage. SURGIMESH® WN (Non-barrier Mesh) and SURGIMESH® XB (Barrier Mesh) are constructed of Non-Woven, Microfiber Polypropylene that has rapid and complete vascularized incorporation in just 12 days, thus avoiding historical failure modes of traditional knitted synthetic meshes.

## **BOSTON SCIENTIFIC**

**#504**

100 Boston Scientific Way, Marlboro, MA 01752

**PHONE:** 508 683 4000 • **WEBSITE:** www.bostonscientific.com

Boston Scientific Endoscopy develops a broad spectrum of diagnostic and therapeutic devices for a variety of digestive diseases throughout the GI tract. We are committed to innovation, collaboration and the development of devices that support our customers' goals for less invasive, more efficient procedures that contribute to better patient outcomes.

## **CADENCE PHARMACEUTICALS, INC.**

**#718**

12481 High Bluff Drive # 200, San Diego, CA 92130

**PHONE:** 858-436-1400 • **FAX:** 858-436-1401

**WEBSITE:** www.cadencepharm.com

Cadence Pharmaceuticals is a biopharmaceutical company focused on in-licensing, developing and commercializing proprietary product candidates principally for use in the hospital setting. The company is currently marketing OFIRMEV® (intravenous acetaminophen) for the treatment of acute pain and fever.

## **CALMOSEPTINE, INC.**

**#606**

16602 Burke Lane, Huntington Beach, CA 92647-4536

**PHONE:** 714-840-3405 • **FAX:** 714-840-9810

**WEBSITE:** www.calmoseptine.com

Calmoseptine Ointment is a multi-purpose moisture barrier that protects and helps heal skin irritations from moisture, such as urinary and fecal incontinence. Calmoseptine® Ointment temporarily relieves discomfort and itching. Free samples at our booth!

## **CAREFUSION**

**#700**

3750 Torrey View Court, San Diego, CA 92130

**PHONE:** 888-876-4287

**WEBSITE:** www.carefusion.com

CareFusion combines technology and intelligence to measurably improve patient care. Our clinically proven products are designed to help improve the safety and cost of healthcare for generations to come. Some of our most trusted brands include Alaris®, ChlorPrep®, Pyxis®, V. Mueller® and VIASYS.

## **CINE-MED, INC.**

**#405**

127 Main St. North / PO Box 1007, Woodbury, CT 06798

**PHONE:** 203-263-0006 or 800-515-1542

**WEBSITE:** www.cine-med.com

Ciné-Med partners with SAGES to produce and distribute the SAGES video library, including SAGES Grand Rounds, Postgraduate Courses, SAGES Top 21, and the SAGES Pearls series. Stop by booth #405 for more information and to view samples of these videos and more.

## **CLEVELAND CLINIC – CSITE**

**#716**

**(center for Surgical Innovation, Technology & Education)**

9595 Euclid Avenue / E32, Cleveland OH 44195

**PHONE:** 216-445-5601 • **FAX:** 216-636-3313

**WEBSITE:** http://csite.clevelandclinic.org/

The Center for Surgical Innovation, Technology & Education (cSite), hosts CME and non-CME courses for local and visiting physicians to advance their skill in laparoscopic and endoscopic techniques in various surgical specialties. Courses range from basic instruction in laparoscopic surgery methods to advanced, technically complex procedures for the experienced surgeon. Other cSite programs include FLS & FES testing, beta testing, simulation and da Vinci robotic training.

# Exhibitor Profiles

## **COMPVIEW MEDICAL**

**#715**

10035 SW Arctic Dr., Beaverton, OR 97005  
**PHONE:** 503-601-5586 • **FAX:** 503-626-8439  
**WEBSITE:** www.compviewmedical.com

CompView Medical delivers MIS OR capabilities for procedure and training rooms. NuBOOM® Visualization and Equipment Management System upgrades a standard OR to a Digital OR in as little as two days, reducing downtime, capital costs and improves productivity and safety.

## **CONMED**

**#420**

525 French Rd., Utica, NY 13502  
**PHONE:** 800-448-6506 • **FAX:** 800-438-3051  
**WEBSITE:** www.conmed.com

We are proud to offer gastrointestinal and endoscopic surgeons a complete array of energy-based solutions for sealing, cutting and coagulating tissue. Our booth (#420) features the new Altrus® Thermal Tissue Fusion System — the next generation in energy-based vessel sealing technology; the System 5000™ ESU; AER DEFENSE™ Surgical Smoke System and the 7550™ ESU with Argon Beam Coagulation®.

## **COOK MEDICAL**

**#501**

750 Daniels Way / PO Box 489, Bloomington, IN 47402  
**PHONE:** 800-457-4500 • **FAX:** 800-554-8335  
**WEBSITE:** www.cookmedical.com

Cook Medical will be featuring Biodesign, a non-dermis-based, non-cross-linked biologic graft technology that moves beyond to the next generation of tissue repair.

## **COOPERSURGICAL**

**#703**

95 Corporate Dr., Trumbull, CT 06611  
**PHONE:** 203-601-5200 • **FAX:** 203-601-4741  
**WEBSITE:** www.coopersurgical.com

CooperSurgical offers key proprietary products to be used in general surgery settings such as our Carter-Thomason® Laparoscopic Port Site Closure System; our SeeClear® Laparoscopic Smoke Evacuation System; and our Lone Star Retractor System™.

## **COVIDIEN**

**#521**

555 Long Wharf Dr., New Haven, CT 06511  
**PHONE:** 203-492-5000 • **FAX:** 203-821-3286  
**WEBSITE:** www.covidien.com

Covidien is a leading global healthcare products company that creates innovative medical solutions for better patient outcomes and delivers value through clinical leadership and excellence. Please visit www.covidien.com to learn more about our business.

## **CROSPON**

**#916**

701 Third Floor, Palomar Airport Rd., Carlsbad, CA 92011  
**PHONE:** 760-994-3355  
**WEBSITE:** www.crospan.com

Crospan manufacture of the EndoFLIP imaging system and catheter. The system uses a disposable catheter which uniquely allows lumen size and distensibility of the gastrointestinal tract to be measured in real time during Bariatric Surgery, Fundoplication and Heller Myotomy. The EndoFLIP system has FDA clearance for stoma size imaging during Gastric Banding creating consistent stoma size to be set during surgery, and sleeve measurements during Sleeve Gastrectomy and Gastric Imbrication procedures.

## **DAVOL INC., A BARD COMPANY**

**#533**

100 Crossings Blvd., Warwick, RI 02886  
**PHONE:** 800-556-6756 • **EMAIL:** DavollInfo@crbard.com  
**WEBSITE:** www.davol.com

Davol Inc. is the market leader in comprehensive soft tissue reconstruction, delivering a growing line of mesh prosthetics, biologic implants and fixation systems to complement innovative techniques in laparoscopic and open hernia repair.

## **ELSEVIER**

**#200**

1600 JFK Boulevard, Suite 1800, Philadelphia, PA 19103  
**PHONE:** 800-503-4069

ELSEVIER, dedicated to being your integral partner in delivering exceptional healthcare. Trust ELSEVIER to offer superior resources that expand your knowledge, foster communication, build insights, enable individual and collective advancement in the healthcare field. ELSEVIER proudly publishes Mosby, Saunders, and Churchill Livingstone titles. ELSEVIER. Building Insights. Breaking Boundaries.

## **ENCISION INC.**

**#817**

6797 Winchester Cir., Boulder, CO 80301  
**PHONE:** 303-444-2600 • **FAX:** 303-444-2693  
**WEBSITE:** www.encision.com

Encision's ACTIVE ELECTRODE MONITORING system is a laparoscopic safety system that continuously monitors. Encision's monopolar laparoscopic instruments during surgery to eliminate the risk of stray energy burn injury to patients during laparoscopy.

## **ENDOCHOICE**

**#531**

11810 Wills Rd., Suite 100, Alpharetta, GA 30009  
**PHONE:** 888-682-3636 • **FAX:** 866-567-8218  
**WEBSITE:** www.endochoice.com

EndoChoice is an emerging leader and medical technology provider dedicated to specialists treating a wide range of gastrointestinal diseases. EndoChoice is committed to the GI endoscopy market offering a comprehensive portfolio of treatment options for tissue acquisition, anatomic pathology, hemostasis, luminal patency, retrieval, infection control and procedural support.

## **ENDOEVOLUTION, LLC**

**#320**

51 Middlesex St., North Chelmsford, MA 01863  
**PHONE:** 978-251-8088 • **FAX:** 978-251-8585  
**WEBSITE:** www.endo360surgical.com

EndoEvolution is a medical device company that is developing the most advanced, next-generation MIS (Minimally Invasive Surgery) automated suturing. EndoEvolution's reusable and more advanced automated suturing products are designed to be easier to use and easier to learn to use, more effective in surgery, and deliver substantial cost-savings to hospitals compared to competitive MIS automated suturing devices, including the market-leading disposable devices.

## **ENDOGASTRIC SOLUTIONS**

**#306**

555 Twin Dolphin Dr., Suite 650, Redwood City, CA 94065  
**PHONE:** 650-226-2225 • **FAX:** 650-226-2201  
**WEBSITE:** www.endogastricsolutions.com

EndoGastric Solutions®, (EGS) is the pioneer in incisionless surgical procedures for the treatment of upper gastrointestinal diseases. TIF (Transoral Incisionless Fundoplication) with EGS' EsophyX® device creates a robust esophagogastric fundoplication to treat GERD. Two abstracts will be presented at SAGES 2012.

# Exhibitor Profiles

## **ETHICON ENDO-SURGERY**

**#419**

4545 Creek Rd., Cincinnati, Ohio 45242  
**PHONE:** 800-USE-ENDO (800-873-3636)  
**WEBSITE:** www.ethiconendosurgery.com

Ethicon Endo-Surgery, a Johnson & Johnson company, develops and markets advanced medical devices for minimally invasive and open surgical procedures, focusing on procedure-enabling devices for the interventional diagnosis and treatment of conditions in general and bariatric surgery, as well as gastrointestinal health, gynecology and surgical oncology. More information can be found at [www.ethiconendosurgery.com](http://www.ethiconendosurgery.com)

## **GENERAL SURGERY NEWS**

**#619**

545 West 45th St., Floor 8, New York, NY 10036  
**PHONE:** 212-957-5300 • **FAX:** 212-957-7230  
**WEBSITE:** www.GeneralSurgeryNews.com

General Surgery News is a monthly newspaper designed to keep general surgeons abreast of the latest developments in the field. The publication features extensive meeting coverage, analysis of journal articles, educational reviews, and information on new drugs and products.

## **GORE & ASSOCIATES**

**#517**

P.O. Box 2400, Flagstaff, AZ 86004  
**PHONE:** 928-771-2771 or 800-437-818  
**WEBSITE:** www.goremedical.com

Gore Medical Products Division has provided creative therapeutic solutions to complex medical problems for three decades. The extensive Gore Medical family of products includes vascular grafts, endovascular and interventional devices, surgical materials for hernia repair, soft tissue reconstruction, staple line reinforcement, and sutures for use in vascular, cardiac and general surgery.

## **H & H SURGICAL TECHNOLOGIES**

**#900**

4437 Robertson Rd., Madison, WI 53714  
**PHONE:** 608-222-2776 • **FAX:** 608-222-2604  
**WEBSITE:** www.hhsurgical.com

H+H Surgical Technologies is a leader in pre-owned medical equipment sales. We specialize in flexible endoscopy, laparoscopy and related instrumentation. We are dedicated to providing high quality and customer satisfaction. We feel that our prices are unbeatable and we stand behind every piece.

## **HRA HEALTHCARE RESEARCH & ANALYTICS**

**#804**

400 Lanidex Plaza, Parsippany, NJ 07054  
**PHONE:** 973-240-1200 • **FAX:** 973-463-1888  
**WEBSITE:** www.hraresearch.com

Our team of experienced interviewers will be distributing carefully developed questionnaires. We'll be gathering the answers to vital marketing and clinical questions- answers that can affect the introduction of new products or the continuation of existing healthcare products and services.

## **INTEGRA**

**#314**

311 Enterprise Dr., Plainsboro, NJ 08536  
**PHONE:** 609-275-0500 • **FAX:** 609-799-3297  
**WEBSITE:** www.integralife.com

Integra is a leader in Acute Care Surgical Products. The company's portfolio includes quality instrumentation solutions for your sterile processing and OR needs in laparoscopic, general, cardiovascular, neuro, plastic and reconstructive surgery. Products include Luxtec® illumination systems and cables, instruments from Jarit®, Redmond™, Padgett®, Omni-Tract® table-mounted retractors and CIMS® Consulting Services.

## **INTOUCH HEALTH**

**#321**

6330 Hollister Ave., Santa Barbara, CA 93117  
**PHONE:** 805-562-8686 • **FAX:** 805-562-8663  
**WEBSITE:** www.intouchhealth.com

InTouch Health is the world's only comprehensive Remote Presence telemedicine solution provider focused on helping hospitals transform their care delivery process with innovative healthcare models. Over one network, through a single interface, physicians can access a range of FDA-cleared devices to provide care into ED's, ICU's, patient wards, operating and procedure rooms.

## **INTUITIVE SURGICAL, INC.**

**#112 and #821**

1266 Kifer Rd., Sunnyvale, CA 94086  
**PHONE:** 408-523-2100 • **FAX:** 408-523-1390  
**WEBSITE:** www.intuitivesurgical.com

Intuitive Surgical, Inc. is the global leader in minimally invasive robotic-assisted surgery. The company's da Vinci® System enables surgeons in general, colorectal, bariatric and hepatobiliary specialties to offer a minimally invasive approach to more of their patients. Most recently, the company received FDA clearance for its Single-Site™ instrumentation for cholecystectomy.

## **IMDS**

**#221**

13600 Heritage Parkway, Suite 170, Fort Worth, Texas 76177  
**PHONE:** 877-583-0677  
**WEBSITE:** www.imds.net

IMDS is your strategic source for contract, full-service medical device development and manufacturing. With an intense focus on innovation, speed to market, and our partners' goals, we deliver products that enhance a patient's quality of life and standard of care.

## **KARL STORZ ENDOSCOPY-AMERICA, INC.**

**#413**

2151 East Grand Ave., El Segundo, CA 90245  
**PHONE:** 310-421-0837 • **FAX:** 424-218-8537  
**WEBSITE:** www.karlstorz.com

KARL STORZ provides minimally invasive solutions for virtually every surgical specialty. Among these innovative products is our Image 1® FULL HD platform, which acquires and displays wide 16'9 1080p60 images, providing the optimal viewing experience necessary for minimally invasive surgery.

## **LAGIS ENTERPRISE CO., LTD.**

**#801**

33, Lane 908, Sec.1, Jhongshan Rd., Dajia, Taichung 43762, Taiwan  
**PHONE:** +886 4 26880767 • **FAX:** +886 4 26880670  
**WEBSITE:** www.lagis.com.tw

LAGIS is a medical device development company to design, patent, and market devices for endoscopic surgeries. Development of LAGIS endo-surgical devices is accomplished with participation of leading surgeons to meet the needs of professionals devoted to the practice of surgery.

## **LEXION MEDICAL, INC.**

**#826**

545 Atwater Circle, St. Paul, MN 55103  
**PHONE:** 877-9LEXION • **FAX:** 651-635-0090  
**WEBSITE:** www.lexionmedical.com

LEXION Medical, a leader of innovative medical technologies improving patient safety, offers the Insuflow® Laparoscopic Gas Conditioning Systems for minimally invasive laparoscopic surgery, VesselGuardian® for vein harvesting and the PneuVIEW®XE Laparoscopic Smoke Elimination System.

# Exhibitor Profiles

## **LIFECELL A KCI COMPANY**

**#600**

One Millennium Way, Branchburg, NJ 08876  
**PHONE:** 908-947-1100 • **FAX:** 908-947-1200  
**WEBSITE:** www.lifecell.com

LifeCell™ provides AlloDerm® Regenerative Tissue Matrix and Stratattice™ Reconstructive Tissue Matrix used in hernia repair, breast reconstruction and breast plastic surgery revisions. These matrices support regeneration through rapid revascularization, cell repopulation and white cell migration

## **MARKET ACCESS PARTNERS**

**#721**

3236 Meadowview Rd., Evergreen, CO 80439  
**PHONE:** 303-6526-1900 Fax: 303-526-7920  
**WEBSITE:** www.marketaccesspartners.com

Market Access Partners provide market research consulting to the medical device and pharmaceutical industries. We use innovative qualitative and quantitative methodologies to research options of physicians, nurses and patients. We offer a management oriented approach to the product development and marketing.

## **MEDERI THERAPEUTICS INC.**

**#212**

8 Sound Shore Drive, Suite 304, Greenwich, CT 06830  
**PHONE:** 203-930-9900 Fax: 203-869-1013  
**WEBSITE:** www.mederitherapeutics.com/

Mederi Therapeutics manufactures and markets innovative medical devices that use radiofrequency energy to treat diseases of the human digestive system. Mederi's first two products — Stretta, for treatment of gastric reflux, and Secca for treatment of bowel incontinence — are safe, effective treatments that fill the void between conservative therapies and invasive and expensive alternatives. Secca and Stretta therapies are outpatient, endolumenal, and promote rapid recovery. Mederi Therapeutics is located in Greenwich, CT.

## **MEDIFLEX SURGICAL PRODUCTS**

**#607**

250 Gibbs Rd., Islandia, NY 11749  
**PHONE:** 800-879-7575 • **FAX:** 631-582-8487  
**WEBSITE:** www.mediflex.com

Mediflex will introduce our most exciting new products in 20 years. One is an instrument with unique features for single port and multi-port. Visit us in booth 607 to see it and other new devices from the Surgical Innovation Company.

## **MEDSPACE EXPLORATION**

**#731**

2400 Bernville Rd., Reading, PA 19600

Research with Reward\$! We are interested in your opinion on current products and practices. Stop by our booth to participate in surveys and interviews. Not only will you be compensated for your time and expertise, but you'll also help to improve your working environment!

## **MERCY CLINIC PHYSICIAN RECRUITMENT**

**#704**

1965 S. Fremont, Suite 200, Springfield, MO 65804  
**PHONE:** 877-880-6650 • **FAX:** 888-290-8300  
**WEBSITE:** www.mercy.net

Mercy is a physician-led and professionally managed integrated health system with over 1,100 physicians and 250 advanced practitioners across Arkansas, Kansas, Missouri and Oklahoma. We focus on clinical integration ensuring that the latest technology and specialty care is available to all locations.

## **MICROLINE SURGICAL**

**#535**

800 Cummings Center, Suite 166T, Beverly, MA 01915  
**PHONE:** 978-922-9810 • **FAX:** 978-922-9209  
**WEBSITE:** www.microlinesurgical.com

Microline Surgical develops and manufactures laparoscopic reusable instruments unsurpassed in precision, performance and reliability. Microline's energy products, known for their effectiveness, reliability and versatility, employ the direct transfer of thermal energy and pressure to simultaneously seal and divide tissue.

## **MIMIC TECHNOLOGIES, INC.**

**#820**

811 First Ave., Suite 408, Seattle, WA 98104  
**PHONE:** 800-918-1670 • **FAX:** 206-623-3491  
**WEBSITE:** www.mimicsimulation.com

Mimic Technologies is a pioneer and leader in Robotic Surgery Simulation. Visit us to test the dV-Trainer™, a highly realistic simulator for the da Vinci®. Independently validated, the dV-Trainer™ provides cost-effective, on-demand training moving surgeons up the learning curve fast!

## **NASHVILLE SURGICAL INSTRUMENTS**

**#505**

2005 Kumar Lane, Springfield, TN 37172  
**PHONE:** 615-382-4996 • **FAX:** 615-382-4199  
**WEBSITE:** www.NashvilleSurg.com

Kumar PRE-VIEW Cholangiography\* Clamp and Kumar PRE-VIEW Cholangiography\* Catheters allow Cystic Duct Marking to Prevent Common Bile Duct Injury. There is No Cystic Duct Cannulation! Kumar T-ANCHORS\* allow Easy Trans-fascial Mesh Fixation in Laparoscopic Ventral Hernia Repair by eliminating the need to grasp and feed sutures into the Suture Passer. May be used with any brand of mesh.

*\*Trademark and Patent*

## **NEW WAVE SURGICAL CORPORATION**

**#706**

3700 NW 124th Ave., Suite 135, Coral Springs, FL 33065  
**PHONE:** 866-346-8883 • **FAX:** 866-586-6793  
**WEBSITE:** www.newwavesurgical.com

Laparoscopic Care Kit with D-HELP- The ONLY SYSTEM designed to keep the laparoscopic lens defogged and clean from start to close! D-HELP:

- Replaces ALL other defogging products
- Cleans the scope
- Defogs the scope
- Protects the scope
- White Balances the scope
- Remains heated for 5 hours

## **NOVARTIS ONCOLOGY**

**#326**

180 Park Ave., Bldg. 105, Florham Park, NJ 07932  
**PHONE:** 1.888.NOV.NOVA  
**WEBSITE:** www.novartisoncology.com

Novartis Oncology discovers and develops innovative therapies that help change the way patients live with cancer and blood disorders, including Gleevec® (imatinib mesylate), Tassigna® (nilotinib), Afinitor® (everolimus), Zometa® (zoledronic acid), Femara® (letrozole tablets), Sandostatin® LAR Depot (octreotide acetate for injectable suspension) and Exjade® (deferasirox). Novartis Oncology has one of the broadest and most comprehensive pipelines in the industry.

# Exhibitor Profiles

## **OLIVE MEDICAL**

#502

2302 S. Presidents Dr., Ste. D, Salt Lake City, UT 84120  
**PHONE:** 866-300-1148 • **FAX:** 801-823-2238  
**WEBSITE:** www.olivemedical.com

Olive Medical specializes in manufacturing and distributing high-definition, low-cost endoscopic visualization equipment. The company recently launched the world's first true HD alternative to the 3 chip camera. Olive Medical pursues cutting edge design and vertical integration in order to provide new and innovative surgical visualization equipment.

## **OLYMPUS AMERICA INC.**

#301

3500 Corporate Parkway, Center Valley, PA 18034  
**PHONE:** 484-896-5000 • **FAX:** 484-896-7133  
**WEBSITE:** www.olympusamerica.com

Olympus develops solutions for healthcare professionals that help improve outcomes and enhance quality of life for their patients. By enabling less invasive procedures, innovative diagnostic and therapeutic endoscopy and early stage lung cancer evaluation and treatments, Olympus is transforming the future of healthcare.

## **PACIRA PHARMACEUTICALS, INC.**

#931

5 Sylvan Way, Parsippany, NJ 07054  
**PHONE:** 973-254-3575 • **FAX:** 973-267-0060  
**WEBSITE:** www.pacira.com

Pacira Pharmaceuticals, Inc. is a specialty pharmaceutical company focused on developing products for the acute care marketplace. The company's lead product, EXPAREL® (bupivacaine liposome injectable suspension), was approved in October 2011. EXPAREL and two other products utilize the proprietary delivery technology DepoFoam®.

## **PARÉ SURGICAL**

#701

7332 South Alton Way, Suite H, Centennial, CO 80112  
**PHONE:** 303-689-0187  
**WEBSITE:** www.paresurgical.com

5mm Quik-Stitch™ with pre-tied locking Roeder knot. New 2.7mm MicroGrip Percutaneous Retractor for Single & Reduced Port applications. Nitinol Jaws provide optimal strength. Ratcheted, one-handed operation. Light Up! your open surgeries with the shadowless NOVA ESU Pencil!

## **PERKINS HEALTHCARE TECHNOLOGIES**

#707

700 International Pkwy., Suite 100, Richardson, TX 75081  
**PHONE:** 877-923-4545 • **FAX:** 214-827-6319  
**WEBSITE:** www.perkins-ht.com

Perkins has been designing, developing, manufacturing, and distributing medical video Products exclusively since the company's inception in 1986. Perkins continues this tradition today, providing medical grade solutions that improve workflow, seamlessly integrate into examination suites and provide connectivity to disparate imaging / video sources and the displays.

## **PIKEVILLE MEDICAL CENTER INC.**

#209

911 Bypass Rd., Pikeville, KY 41501  
**PHONE:** 606-218-4915 • **FAX:** 606-218-4599  
**WEBSITE:** www.pikevillehospital.org

## **PLUS DIAGNOSTICS**

#914

17661 Cowan, Irvine, CA 92614  
825 Rahway Ave., Union, NJ 07083  
**PHONE:** 800-440-7284 • **FAX:** 732-901-1555  
**WEBSITE:** www.plusdx.com

PLUS Diagnostics is a national leader providing specialized GI pathology by integrating diagnostic excellence and unparalleled service. Gastroenterologists nationwide benefit from our premier connectivity and business solutions as well as our prognostic tests that enable advanced and personalized patient care.

## **PRACTICE PARTNERS IN HEALTHCARE, INC.**

#604

1 Chase Corporate Dr., Suite 200, Birmingham, AL 35244  
**PHONE:** 888-310-1311 • **FAX:** 205-824-6251  
**WEBSITE:** www.practicepartners.org

Practice Partners in Healthcare is a developer, manager, and minority equity partner of endoscopy centers and surgery centers. We deliver success-proven expertise to new and existing centers, in physician owned or physician/hospital joint ventures in both CON and non-CON states.

## **RICHARD WOLF MEDICAL INSTRUMENTS CORP.**

#513 and #605

353 Corporate Woods Pkwy., Vernon Hills, IL 60061  
**PHONE:** 847-913-1113 • **FAX:** 847-913-6959  
**WEBSITE:** www.richardwolfusa.com

Richard Wolf Medical Instruments (RWMIC) manufactures and distributes laparoscopic and thoracoscopic instruments. RWMIC also manufactures scopes, insufflators and a complete line of instruments and optics designed specifically for bariatric and colorectal surgery. RWMIC offers the only stereoscope on the market, designed specifically for Transanal Endoscopic Microsurgery. Recently introduced also, are our ergonomically designed set of laparoscopic forceps. They are autoclavable and come in the most popular jaw patterns.

## **ROBARD CORPORATION**

#809

821 East Gate Dr., Mount Laurel, NJ 08054  
**PHONE:** 800-222-9201 • **FAX:** 800-320-7928  
**WEBSITE:** www.Robard.com

Partner your surgical technique with our turnkey medically-supervised weight management program to provide patients with preoperative preparation, decreased surgical complications and enhanced post-op weight loss. Visit Robard Corporation at Booth #809 for best-in-class nutritional solutions for successful weight management.

## **SANDHILL SCIENTIFIC**

#500

9150 Commerce Center Cir., #500, Highlands Ranch, CO 80129  
**PHONE:** 303-470-7020 or 800-468-4556 • **FAX:** 303-470-2975  
**WEBSITE:** www.sandhillsci.com

Now in its 30th year, Sandhill Scientific is a recognized global leader in G.I. Diagnostics. Our ZepHrR Impedance/pH System has set the standard for Total Reflux Monitoring. And the broad capabilities of our Ultimate Manometry Platform include High Resolution Impedance Manometry and High Resolution Anorectal Manometry.

## **SALIX PHARMACEUTICALS, INC.**

#223

8510 Colonnade Center Dr., Raleigh, North Carolina 27615  
**PHONE:** 919-862-1000  
**WEBSITE:** www.salix.com

# Exhibitor Profiles

## **SIMBIONIX USA CORP.**

#615

7100 Euclid Ave., Suite 180, Cleveland, OH 44105  
**PHONE:** 216-229-2040 • **FAX:** 216-229-2090  
**WEBSITE:** www.simbionix.com

Simbionix is the world's leading provider of medical simulation and education technologies. Simbionix LAP Mentor™ and GI Mentor™ provide advanced simulation experience of complete MIS procedures. Simbionix was selected by SAGES to develop web-based didactic material and a hands-on exam for the FES Program.

## **SIMSURGERY**

#714

155 Federal Street, 10th Floor, Boston, MA 02110  
**WEBSITE:** www.simsurgery.com

SimSurgery develops and provides simulators for training of surgical skills and procedures in a global market place. The simulators are based on advanced VR (Virtual Reality) technology developed by SimSurgery. SimSurgery also offers affordable, suitable, portable and practical training with the new D-box training device.

## **SPRINGER**

#800

233 Spring St., New York, NY 10013  
**PHONE:** 212-460-1600 Fax: 212-460-1575  
**WEBSITE:** www.springer.com

Springer offers an increasing number of cutting-edge Surgery titles written by highly qualified experts. Visit our booth and browse books and journals on the newest developments in Surgery, including Surgical Endoscopy, the Official Journal of SAGES and EAES.

## **STRYKER ENDOSCOPY**

#901

5900 Optical Court, San Jose, CA 95138  
**PHONE:** 800-624-4422 • **FAX:** 800-729-2917  
**WEBSITE:** www.stryker.com

Stryker Corporation is one of the world's leading medical technology companies with the most broadly based range of products in orthopaedics and a significant presence in other medical specialties.

## **SURGICAL INNOVATIONS**

#733

Clayton Wood House, Unit 6, Clayton Wood Bank  
Leeds LS16 6QZ, UK  
**PHONE:** +44 (0)113 230 7597 • **FAX:** +44 (0)113 230 7598  
**WEBSITE:** www.surginno.com

Surgical Innovations (SI) specialises in the design and manufacture of creative solutions for minimally invasive surgery. SI has introduced advancements such as the YelloPort+plus™ port access system, Logi™ Range laparoscopic instrument system and, most recently, PretzelFlex™ - a revolutionary liver retractor.

## **SURGICAL PRODUCTS MAGAZINE**

#424

199 East Badger Rd., Suite 201, Madison, WI 53713  
**PHONE:** 973-920-7789 • **FAX:** 608-274-6454  
**WEBSITE:** www.surgicalproductsmag.com

Surgical Products magazine is the leading source for cutting-edge surgical technology to 60,000 surgeons and medical/purchasing professionals across the country. Available in print and digital editions, it is complemented by a daily "First Cuts" e-newsletter, e-product showcase and e-marketing blasts.

## **SURGICAL SCIENCE, INC.**

#538

7760 France Ave South, Suite 1100, Minneapolis, MN 55435  
**PHONE:** 612-568-6541 • **FAX:** 888-737-1648  
**WEBSITE:** www.Surgical-Science.com

Surgical Science, established in 1999, develops high quality tools for the Assessment, Training and Certification of medical professionals. Using Virtual Reality simulation technologies, users are able to build skills on Surgical Science simulators that demonstrate and transfer proficiency from virtual reality to the operating suites. Surgical Science is headquartered in Gothenburg (Sweden) with offices in Minneapolis, (North America) and Mexico City (Latin America).

## **SURGIQUEST, INC.**

#930

333 Quarry Rd., Milford, CT 06460  
**PHONE:** 203-799-2400 • **FAX:** 203-799-2401  
**WEBSITE:** www.surgiquest.com

SurgiQuest's AirSeal® is the World's Only Intelligent Access System for Minimally Invasive Surgery. By providing stable pneumoperitoneum, continuous smoke evacuation, and valve-free access to the abdominal cavity, AirSeal® reduces procedural risk, cost, time, and CO2 absorption.

## **SUTURE EASE LLC**

#316

12400 Arrows Way, Whitmore, CA 96096  
**PHONE:** 530-472-3498  
**WEBSITE:** www.sutureease.com

Suture Ease LLC is providing multi-functional technologies to enhance the efficacy, ease of use, and safety of laparoscopic procedures. Our flagship device, the Veress Closer, combines access/insufflation with reliable portsite closure, providing an elegant and cost-effective solution.

## **SYNOVIS SURGICAL INNOVATIONS**

#401

2575 University Ave. W, St. Paul MN 55114  
**PHONE:** 800-487-9627 • **FAX:** 651-642-9018  
**WEBSITE:** www.synovissurgical.com

Synovis Surgical Innovations, a division of Synovis Life Technologies, Inc., will feature Veritas® Collagen Matrix, a biomaterial for soft tissue repair that is rapidly revascularized and repopulated by surrounding host tissue. Synovis will also display Peri-Strips Dry® with Veritas® Collagen Matrix, its biologic circular and linear staple line reinforcement, for gastric, small bowel and mesentery applications.

## **TELEFLEX**

#215

2917 Weck Dr., Research Triangle Park, NC 27709  
**PHONE:** 866-246-6990 • **FAX:** 919-361-3914  
**WEBSITE:** www.teleflex.com

Teleflex is a global provider of medical devices used in critical care and surgery. We serve healthcare providers in more than 130 countries with specialty devices for vascular access, general and regional anesthesia, urology, respiratory care, cardiac care, and surgery.

## **TRANSENERIX**

#814

635 Davis Dr., Suite 300, Morrisville, NC 27560  
**PHONE:** 919-765-8400 • **FAX:** 919-765-8459  
**WEBSITE:** www.transenterix.com

TransEnterix is advancing laparoscopy with its innovations in flexible and micro laparoscopic instruments. The SPIDER® Surgical System provides surgeons enhanced capabilities to perform triangulation via single site access with flexible, articulating instruments. The 2.7mm SPIDER MicroLap instruments are reusable and offer a complete set of instruments as well as laparoscopes.

# Exhibitor Profiles

## UNIVERSITY OF TENNESSEE

### PHYSICIAN EXECUTIVE MBA PROGRAM

#906

916 Volunteer Blvd., 608 Stokely Management Center  
Knoxville, TN 37996-0562

**PHONE:** 865-974-1772 • **FAX:** 865-974-0929

**WEBSITE:** www.pemba.utk.edu

The #1 preferred Physician Executive MBA at The University of Tennessee is an internationally accredited one-year-long MBA, delivered via distance education and campus residency periods, offered exclusively for physicians seeking leadership skills.

## VECTEC

#302

327 Water St., Warren, RI 02885

**PHONE:** 401-289-2223 or 877-293-1665 • **FAX:** 401-289-2813

**WEBSITE:** www.vectecinc.com

VECTEC designs and manufactures innovative devices for laparoscopy and minimally invasive surgery procedures. Featured on display will be VECTEC's innovative new T-LIFT™ Tissue Retraction System, LaproTrain™ Laparoscopic Skills Trainer, and KOH Endotrainer for advanced suturing.

## VIKING SYSTEMS, INC.

#329

134 Flanders Rd., Westborough, MA 01581

**PHONE:** 508-366-3668

**WEBSITE:** www.vikingsystems.com

Viking Systems, Inc. is a leading worldwide developer, manufacturer and marketer of 3DHD and 2D visualization technology for complex minimally invasive surgery. Viking has developed a stand-alone 3DHD Vision System for laparoscopic surgery and currently markets and sells the system globally. With 3DHD technology we restore the surgeon's natural 3-D vision with depth perception making the endoscopic surgical field-of-view appear open. The future of 3D visualization is here – Viking 3DHD Vision System.

## VISION-SCIENCES, INC.

#803

40 Ramland Road South, Orangeburg, NY 10962

**PHONE:** 845-365-0600 • **FAX:** 845-365-0620

Website: www.visionosciences.com

## XODUS MEDICAL, INC.

#705

702 Prominence Dr., New Kensington, PA 15068

**PHONE:** 724-337-5500 • **FAX:** 724-337-0555

**WEBSITE:** www.xodusmedical.com

Introducing "Pigazzi Patient Positioning System", the first shape-conforming patient positioning system with advanced molding effect specifically designed to maintain the patients position and prevent patient slipping in steep reverse trendelenberg supports and secures without unnecessary pressure on neck, shoulders or arms. Provides highest protection against nerve damage and pressure ulcers.



Balboa Park, San Diego, CA

# IPEG Long Term Research Fund (LTRF)

In an effort to further IPEG's mission of education, research and improved patient care, the IPEG Executive Committee formed the IPEG Long Term Research Fund (LTRF). The primary goal of the LTRF is to award an annual research grant to IPEG members. This grant is meant to stimulate and support high quality original research from IPEG members in basic science. The IPEG Research Grant is made possible by the donations of numerous IPEG members. Without your promotion and financial support of this grant, this award would not be possible. **Contributions in Total as of January 12, 2012.**

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George W. Holcomb III, MD	Thom E. Lobe, MD	Todd A. Ponsky, MD	Steven Rothenberg, MD
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## \$300 to \$499

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## \$100 to \$299

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## \$50 to \$99

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Dariusz Patkowski, MD	BBraun Aesculap Chifa	Other	Other	My son is a Product Manager, Neurosurgery & Power Systems Aesculap Division
Jeffrey Ponsky, MD	US ENDOSCOPY	Consulting Fee	Consultant	
Todd A. Ponsky, MD*	Stryker Teleflex Teleflex	Consulting Fee Consulting Fee Other	Consultant Consultant Consultant	
Steven Rothenberg, MD*	STORZ Endoscopy	Consulting Fee	Consultant	
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## **S001 LAPAROSCOPIC SLEEVE GASTRECTOMY AND ROUX-Y GASTRIC BYPASS IMPROVES HYPERURICEMIA IN EXTREMELY OBESE CHILDREN FOLLOWING 12 MONTH OF TREATMENT –**

*Andreas Oberbach, MD PhD MPH, Thomas Inge, MD PhD, Martin Wabitsch, MD PhD, Holger Till, MD PhD University of Leipzig*

**AIM:** The present study investigated for the first time the association between Serum uric acid (sUA) concentrations and weight loss following laparoscopic sleeve gastrectomy and laparoscopic RYGBP compared to lifestyle intervention. sUA is supposed to play a major role in the pathogenesis of hypertension, insulin-resistance (IR) and obesity, as well as the development of renal and cardiovascular diseases (CVD) in childhood. It is important to investigate whether bariatric surgery can decrease the risk of cardiovascular risk in a long stage.

**METHODS:** In a prospective cohort study 10 children with morbid obesity underwent either laparoscopic sleeve gastrectomy (LSG, n=5,) or Roux-Y gastric bypass (RYGBP, n=5). Another extremely obese cohort (n=12) received a 9 to 12 months lifestyle intervention (LIG). Pre- and 12 months post intervention the serum concentration of UA and Xanthine-oxidases (XO) were assessed by Multiple reacting monitoring using mass spectrometry approaches. All blood samples were collected after a 12 hour overnight fasting period. sUA, XO and free radical metabolism were significantly correlated with changes in SDS-BMI, excess weight loss (EWL) and parameters of lipid- and glucose metabolism.

**RESULTS:** sUA and XO were increased in patients with extremely obesity compared to lean normal glucose tolerance group. sUA correlated significantly with XO and free radical level. Furthermore, sUA, XO and free radicals correlated with BMI, SDS-BMI, fasting plasma glucose (FPG), fasting plasma insulin (FPI), homeostasis model assessment index (HOMA-IR), systolic blood pressure (sBP), triglycerides (TG), atherogenic index of plasma (AIP),  $\gamma$ -glutamyltransferase ( $\gamma$ GT), growth hormone (GH), follicle-stimulating hormone (FSH) and Insulin-like growth factor-binding protein 3 (IGFBP3). After 12 months a significant lower SDS-BMI, HOMA-IR and sUA was found in all treatment groups, whereas the effect of bariatric surgery was more prominent than lifestyle treatment. The changes of sUA, XO and free radicals in serum were significantly correlated with changes of fat mass after 12 month of treatment. RYGBP showed the highest impact in changing of purine metabolism, followed by LSG and LIG.

**CONCLUSION:** Consequently, sUA is a potential target for therapies focused on reducing the risk of CVD and related disorders in childhood and adolescents extremely obesity following lifestyle intervention and bariatric surgery therapies. Our findings provide further support for future research to clarify the pathomechanism and predictive roles of sUA among children and adolescents.

## **S002 CHANGES IN KILLING OF INTERNALIZED BACTERIA ON PERITONEAL MACROPHAGE AFTER LAPAROSCOPIC AND OPEN ABDOMINAL SURGERY IN A MOUSE MODEL –**

*Jian Wang, professor, Qi Zhang, PhD Dept. of Pediatric Surgery, Affiliated Children's Hospital of Soochow University*

**BACKGROUND:** The stress response after abdominal operations has been associated with impaired phagocytosis by peritoneal macrophages. Compared with the traditional open abdominal surgery, laparoscopic surgery can result in better preservation of the patient's immunological defenses. This study examined the influence of minimally invasive techniques and open abdominal surgery on killing of internalized bacteria in mice peritoneal macrophage.

**METHODS:** 8- to 10-week-old BALB/c mice were randomly divided into 3 groups: control animals (C), open surgery (OS) and laparoscopic surgery (LS). Peritoneal macrophages were harvested via intraperitoneal lavage.

Isolated resident peritoneal macrophages were infected with *E. coli* at a ratio of 1:10 (macrophages: *E. coli*) at 37 °C for 30 min, and then treated with 10  $\mu$ g/ml gentamicin for 1–3 h. Intracellular *E. coli* were counted by plating onto LB agar plates after solubilization of the infected macrophages in 0.01% Triton X-100 in sterile water. Bacterial CFU will be counted, and intracellular bacterial killing will be calculated as follow: Percent killing = 100 – ((CFU at time x) / CFU at time 0) x 100. Statistical analysis was performed using SAS 8.0 and t test between groups. A P value of 0.05 was considered significant.

**RESULTS:** Significant differences were observed between groups. the LS group had a Percent killing of 63.34% $\pm$ 3.00%, which was the same as the C group's 58.34% $\pm$ 8.87% (P >0.05), but was obviously different from the OS group's 49.93% $\pm$ 6.78% (P <0.05).

**CONCLUSION:** Mice macrophages in open abdominal surgery are less efficient at killing internalized bacteria than those in laparoscopic surgery.

## **S003 ALLOMETRIC SCALING DETERMINES CO2 HANDLING DURING INSUFFLATION –**

*Thane A Blinman, MD Children's Hospital of Philadelphia*

**INTRODUCTION:** Small patients respond more sensitively to insufflation with carbon dioxide (CO<sub>2</sub>) during laparoscopy than do adults. The pathologic effects may be greater even as their propensity to have elevated pCO<sub>2</sub> is higher. Ventilator management during pediatric laparoscopy has been largely empirical, based mostly on somewhat unreliable EtCO<sub>2</sub> monitoring and on heuristics intended to prevent "barotrauma". This strategy leaves patients at risk for dangerous hypercarbia.

**METHODS:** A mathematical model of CO<sub>2</sub> production and elimination is devised for patients over a broad range of body size. Monte Carlo simulation of physiological parameters based on published data and physiological relationships allows prediction of required ventilator settings for patients of various sizes with and without abdominal insufflation.

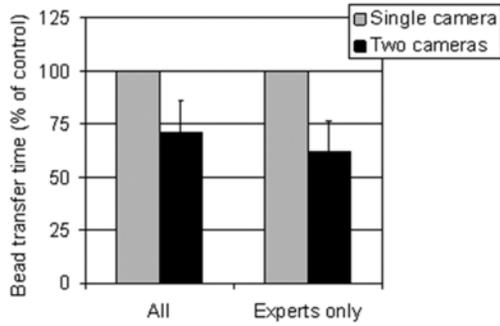
**RESULTS:** Required ventilator rate (bpm) follows a classic mass-dependent inverse power law. Laparoscopic insufflation shifts this curve upward. For smaller patients, the need for increasing respiratory rate is magnified, with infants needing much larger increases in respiratory rate than adults (e.g. 10-15bpm increase over baseline in a 3.5kg patient vs. 1-2bpm increase for 70kg patient).

**CONCLUSION:** Modeling demonstrates that CO<sub>2</sub> handling scales allometrically over a broad range of body size. This relationship suggests specific operative strategies based on body mass that can attenuate pathologic rise in pCO<sub>2</sub> during minimally invasive surgery. The model shows how smaller patients need greater alterations in support during CO<sub>2</sub> insufflation.

## **S004 INDIVIDUALIZED IMAGE IMPROVES EFFICIENCY IN LAPAROSCOPIC SURGERY –**

*Rajan K Thakkar, MD, Shaun A Steigman, MD, Jeremy T Aidlen, MD, Francois I Luks, MD Hasbro Children's Hospital and Alpert Medical School of Brown University*

**BACKGROUND:** A critical aspect of laparoscopic surgery is the dependence on a single viewpoint. At best, it prevents multitasking and at worst, it may provide suboptimal views of the operative field. We have previously described a prototype of interactive Laparoscopic Image Display (iLID) to enable individualized manipulation of the displayed image by each member of the operating team. The current study examines whether in fact the concept of individualized image manipulation improves performance during laparoscopic surgery.



**METHODS:** The concept of individualized manipulation of the endoscopic image was obtained in vitro using two cameras, independently manipulated by two operators, in a Fundamentals in Laparoscopic Surgery (FLS®) endotrainer. The standard task of bead transfers was adapted to a two-operator exercise whereby one person picks up the bead and transfers it mid-air to his partner, who places it on the peg. We measured the total time to pass ten beads. Each team of two (paired by experience level, novice or proficient) was timed twice, once while using a single camera (control) and once using two cameras (individualized image). In both cases, two flat-screen monitors were placed side by side and at a slight angle to each other, providing each operator with an optimal view. In the experimental group, each operator viewed the image captured by his own camera. The order in which each team performed the tandem experiments was assigned randomly. Bead transfer time using the individualized image was expressed as a percentage of control (single camera). Statistical analysis was performed using the Mann-Whitney U test for paired non-parametric data.

**RESULTS:** Sixteen surgical interns, residents and attending surgeons were paired in various combinations. Overall, bead transfer times for the individualized image experiment were significantly shorter than for control ( $71.2 \pm 24.3\%$ ;  $P < 0.05$ ). This improvement in transfer time was even more pronounced in the proficient group ( $61.8 \pm 14.8\%$ ; figure 1).

**CONCLUSIONS:** There have been many advances in laparoscopic image display, many of which have led to an incremental improvement in performance. These have been most beneficial to novices, as experts have learned to overcome such problems as heads-up display and hand-eye disconnect, paradoxical movement, 2D imaging and poor ergonomics. Despite these improvements, and unlike traditional "open" surgery, laparoscopy has always provided a single image display for all. Using a validated tool of laparoscopic training, we have shown that efficiency is improved with the use of an individually manipulated image. Moreover, this effect was more pronounced for experts than for novices, suggesting that interactive Laparoscopic Image Display (ILID) not only compensates for the relative difficulties of minimally invasive surgery, but allows multitasking and other maneuvers that were hitherto not possible. Whereas these results were achieved in vitro using two separate cameras, the clinical application of this concept will use image capture through a single telescope and individual, hands-free computer-assisted manipulation of the displayed image.

**S005 FETOSCOPIC BAG PLACEMENT OF GASTROSCHISIS IN A LAMB MODEL - PRELIMINARY RESULTS** – *Thomas F Krebs, MD, Katarina Wenke, MD, Bergholz Robert, MD, Kurt Hecher, MD* Department of Pediatric Surgery, UKE Medical School, Hamburg University, Hamburg, Germany

**AIM:** Evaluate the feasibility of Re-Fetoscopy with bag placement of gastroschisis in a lamb model to evaluate prenatal treatment options for congenital malformations.

**OBJECTIVES & METHODS:** On mid-gestation gastroschisis was created in seven German blackhead sheep. A second fetoscopic procedure was performed 21 days later with a prosthetic bag being introduced into the uterine cavity. Different methods of intestinal bag placement and fastening it to the fetal abdominal wall were evaluated. The fetus was retrieved by cesarean section 21 days later and evaluated.

**RESULTS:** In all fetuses gastroschisis could be successfully created and assessed with fetoscopy. Intestinal bag placement was possible applying 4 operative ports. Suturing the bag to the abdomen of the fetus was technically demanding due to restrictions of operative space and the fluid filled uterus. Stapling was applied as an alternative but none of the used staplers was able to penetrate either the bag or fetal skin because of their compliance. Two fetuses were lost.

**CONCLUSIONS:** Although technically demanding, we were able to demonstrate that fetoscopic bag placement for the management of gastroschisis appears to be a promising new technique. Application of specially designed instruments, bags and staplers is needed to evaluate this approach in larger animal series.

**S006 PECTUS EXCAVATUM AND MASS PHENOTYPE: AN UNKNOWN ASSOCIATION** – *Francesca Tocchioni, MD, Marco Ghionzoli, MD, Aurora Mariani, MD, Caterina Morelli, MD, Stefania Ragazzino, MD, Alessandro Pane, MD, Alessandra Martin, MD, Roberto Lo Piccolo, MD, Guglielmina Pepe, MD, Antonio Messineo, MD* Department of Pediatric Surgery, Children's Hospital A. Meyer, Florence, Italy

**BACKGROUND & AIM:** Severe Pectus Excavatum (PE) is a deep chest wall deformity that generates both a cosmetic damage and a cardiac/respiratory function impairment. Excluding scarce reports on Marfan syndrome (MS) and Ehlers-Danlos syndrome (EDS), few studies have examined the relation between severe PE and connective tissue disorders. The aim of this study is to verify the clinical significance of such correlation.

**METHODS:** Ninety-two consecutive patients, of whom 79 males, aged between 6 and 34 years, classified as severe PE, were seen at our institution from June 2005 to September 2010. All patients underwent to clinical, ophthalmological, cardiac and radiological (chest and spine RMN) screening. The following features were observed: skin stretch marks, scoliosis, joint hypermobility, echocardiographic signs, spinal defects, myopia.

**RESULTS:** Classical connectivopathies such as MS or EDS were present in only 5 patients (~5%) whereas a sole deformity was present in 4. The largest group (~71%) was represented by phenotypical alterations such as mitral valve prolapse, aortic root enlargement, skeletal and skin alterations (MASS). Among those patients, the most frequent clinical manifestations were the skeletal ones, followed by skin marks and mitral valve prolapse.

**CONCLUSION:** PE showed an evident association with an array of features that we describe as MASS. Although none of this subgroup of patients have been described with increased aortic root diameter when screened (feature largely present in MS patients), they probably would require a thorough and longer follow up than those affected by isolated PE because of the potential occurrence of severe cardiovascular complications such as aneurysms and dissection which are major causes of morbidity and mortality in MS.

## **S007 SUTURE CHOICE MATTERS IN RABBIT MODEL OF LAPAROSCOPIC, PRE-PERITONEAL, INGUINAL HERNIA REPAIR**

– *Katherine B Kelly, MD, David M Krpata, MD, Jeffrey A Blatnik, MD, Todd A Ponsky, MD University Hospitals of Cleveland Rainbow Babies and Children's Hospital, Case Western Reserve University*

**INTRODUCTION:** Pre-peritoneal ligation of the internal ring under laparoscopic visualization in the treatment of pediatric inguinal hernias is gaining popularity for possible improved cosmesis, potentially less trauma to the spermatic cord, potentially less post-operative pain, and the ability to evaluate for a contra-lateral hernia. Reported recurrence rates for the laparoscopic repair are widely variable. There is disparity in the specific technique and suture material used in reported series. We evaluated the effect of different suture material in a laparoscopic pre-peritoneal ligation of the patent processus vaginalis in a living rabbit model.

**METHODS:** New Zealand White Rabbits underwent laparoscopic assisted pre-peritoneal ligation of the patent processus vaginalis. The processus vaginalis was closed with silk (n=10), vicryl (n=10), or prolene (n=12). Animals were survived to at least 6 weeks and then underwent necropsy. At necropsy, the suture was removed and the integrity of the repairs was evaluated with progressively increased intra-abdominal pressure to a maximum of 34mmHg. Data were analyzed using Yates' Chi-squared test.

**RESULTS:** All rabbits survived to necropsy without complications. No suture material was identified during necropsy of the vicryl suture group. Eight (80%) of the vicryl closures failed, with 6 (60%) failing at initial inspection with an intra-abdominal pressure of 4mmHg. Nine (75%) of the prolene closures failed. Only 1 of 10 (10%) silk closures failed (p=0.009).

**CONCLUSIONS:** The non-absorbable, braided, silk suture resulted in improved closure rates compared to absorbable, braided, vicryl suture and the monofilament, non-absorbable, prolene suture in this animal model of laparoscopic pre-peritoneal ligation of the internal ring. Ligation with a braided, non-absorbable, silk suture probably incited an increased inflammatory response which likely created a scar and improved closure while persisting long enough for the scar to become established. Contrarily, ligation with the vicryl suture probably failed because the sutures dissolved before a scar was able to fully develop. Finally, the monofilament, prolene, closures did not seem to create an inflammatory scar like the braided suture. Thus, the prolene closure was suture dependent rather than tissue dependent as evidenced by failure of the ligation when the suture was removed. Non-absorbable, braided, suture may improve closure of pediatric indirect inguinal hernias during laparoscopic assisted pre-peritoneal ligation.

## **S008 PERITONEAL CHANGES DUE TO PNEUMOPERITONEUM IN LAPAROSCOPY: THE EFFECT OF CARBON DIOXIDE (CO2) INSUFFLATION ON PREPUBERAL RATS**

– *Alfonso Papparella\*, MD, Domenico Donniaccono\*, MD, Miriam Andrade Barrientos\*, MD, Fabiano Nino\*, MD, Sandra Coppola\*, MD, Alessandro Costagliola\*, DVM, Orlando Paciello\*, PhD DVM \*Second University of Naples - Faculty of Medicine - Pediatric Surgery \*Federico II University of Naples - Faculty of Veterinary Medicine - Department of Health and Animal Pathology*

**AIM:** The pneumoperitoneum (PN) and the CO2 used to insufflate the abdominal cavity in laparoscopic surgery seems to evoke local and systemic effects. The abdominal cavity is lined by peritoneum that has multiple biologic function such as regulation of inflammation, fibrinolysis, angiogenesis and tissue remodelling process. The purpose of the study was to evaluate the morphologic peritoneal changes due to CO2 insufflation on visceral and parietal peritoneum in prepuberal rats

**MATERIAL & METHODS:** 40 Sprague Dawley prepuberal rats, 5 weeks old (median weight 150gr) were randomly divided into three groups. In the first (S1 n=16 rats) PN was induced at a PCO2 of 10 mmHg and in the second (S2 n=16 rats) at 6 mmHg. The duration of insufflation was of 30 minutes at a flow rate of 0,5 l/min. In the third group (C n=8 rats) only anaesthesia was performed. All rats were sacrificed after 24 H. Sample of peritoneal and visceral serosa were obtained, embedded in formalin and stained with hematoxylin-eosin. Blinded morphologic evaluation was performed by pathologist at different magnification (4-100 X). A grading system was adopted to evaluate the changes such as mesothelial aspect, inflammatory response, oedema and haemorrhage. Zero indicated the absence of changes, 1 mild, 2 moderate and 3 severe changes. A total score, reflecting the overall severity of damage, was calculated by the sum of the grade evaluated. Thus, the total range of possible score was from 0 to 51. The histological grading was also related with the amount of total insufflated CO2. The group's score was compared with the Mann-Whitney U test.

**RESULTS:** There were no macroscopic alteration. The medium score of S1 group was 16,83 (p<0,05 vs S2 and C) with a range 8-24. The medium score in the group S2 was 11,5 (p<0,05 vs C) with range 0-19. Each differed significantly from that of group C that had a medium score of 2,5. The inflammatory response, in the lamina propria and in the sub-serosa, was represented by eosinophil granulocytes, mast cells and lymphocytes with a medium score of 4,1 in S1 group and 2,83 in the S2 group (C group = 1). Significant variations were not observed in the relationship between histological score and total insufflated CO2 liters (2,2/S1 and 3,1/S2).

**CONCLUSIONS:** Our data confirm that laparoscopy and pneumoperitoneum affect the peritoneal surface. CO2 cause a significant morphological changes related to the insufflation pressure. Low pressure (6 mm/hg) lead to a minor mesothelial reaction. A chronic inflammatory response and reactive mesothelial cells with prevalence of eosinophils granulocytes and mast cells were observed. The amount of CO2 insufflated seems not related to the mesothelial changes; nevertheless various factors such as temperature, illumination, duration of procedure, insufflation gas, dissection have to be investigated to elucidate the individual effects.

## **S009 EVALUATING SURGICAL PERFORMANCE OF TRAINEE SURGEONS USING CONSTRUCTIONISM IN COLLABORATIVE VIRTUAL GESTURE TRAINING**

– *Shabnam Parkar, Dr, Dean Mohamedally, Dr, Simon Copsey, Mr, Nicholas Chemin, Mr, Chris Child, Mr, Munther Haddad, Dr Chelsea & Westminster Hospital, London, Uinversity College London, City University*

Our prior work has described a software and hardware solution developed for trainee surgeons to perform simulated laparoscopic tasks using a cost effective virtual environment simulation on laptops. Previously a patented approach to infer motion tracked by laparoscopic surgical tools was developed to increase the dexterity and usability of training with the actual real instruments. We report on a new cycle of development of this technology that combines this activity with the use of a cost effective 3D sensor and reactive physics simulation. It enhances the accuracy and capabilities of the training experience. We also introduce a rising level of expertise due to capturing 3D gestures from expert consultant surgeons, and therefore basing task related manoeuvres on these. We will add a new modification to utilise the constructionist learning approach that views surgical training as a result of reconstructive and dynamic problem-solving aspects.

**METHOD:** We have targeted a group of trainee paediatric surgeons, junior doctors and medical students to partake and perform specific

tasks and gain a usability status for the simulator. They will have 10 trials each of specific tasks and each one's performance will be measured and evaluated by two independent consultant surgeons.

They will first build on simple tasks as one would with a box trainer eg transferring objects, grabbing. After refining these skills, one can build up to more complex tasks from specific parts of an operation, to performing the whole procedure. An online database will collect the data and calculate accuracy and timing scores. Once that is complete, formal results will be obtained.

**DISCUSSION:** We have developed the next phase of the simulation which incorporates motion tracking of instruments, using a 3D sensor and reactive physics simulation. We utilise this new modification to bring in a constructionist learning approach. This takes the view of surgical training as an activity of reconstruction and that of dynamic problem solving rather than as a transmission of knowledge by step-wise instruction. The trainee surgeons, in addition to refining their spatial awareness, dexterity and precision in using laparoscopic instruments, will be able to engage in multiple tasks to contribute to the resolution of target scenarios and key operations

**S010 DEVELOPMENT OF AN OBJECTIVE ENDOSCOPIC SURGICAL SKILL ASSESSMENT SYSTEM FOR PEDIATRIC SURGEONS: SUTURE LIGATURE MODEL OF THE CRURA OF THE DIAPHRAGM IN INFANT FUNDOPPLICATION** – Satoshi Ieiri, MD PhD, Ryota Souzaki, MD PhD, Hiroyuki Ishii, PhD, Noriyuki Matsuoka, PhD, Morimasa Tomikawa, MD PhD FACS, Atsuo Takanishi, PhD, Makoto Hashizume, MD PhD FACS, Tomoaki Taguchi, MD PhD Department of Pediatric Surgery, Kyushu University

**BACKGROUND & AIM:** In 2006, the Japanese Society of Pediatric Endoscopic Surgeons developed a pediatric endoscopic surgical skill qualification (ESSQ) system. However, because this is a subjective assessment system, we developed and validated an objective endoscopic surgical skill assessment system for pediatric surgeons.

**METHODS:** In the ESSQ system, the task operation is laparoscopic fundoplication. Therefore, we set up a suture ligature model of the crura of the diaphragm for infant fundoplication. This system is composed of a PC, suture pad, USB camera, and suturing unit. The suture pad was modified to be a suture ligature model of the crura of the diaphragm, as shown in Figure 1. A pressure sensor was installed in the suture pad, and a box trainer was used. An image showing the inside of the box was projected through a CCD camera onto the monitor. The box trainer incorporated forceps and a needle holder that is used during clinical endoscopic surgery. The participants had to perform 2 suture ligatures of the crura on both the ventral and dorsal side of the esophagus using an intracorporeal knot in the box trainer. The suture pad image was captured by USB camera and used for assessment, as shown in Figure 2. The task time was 15 min, and the time score was calculated using the residual time. The evaluation points were time, force on the tissue, suture tension, stitch spacing, equidistance (width), mean score, and total score. Examinees were divided into 2 groups. The expert group (E) had 4 expert pediatric endoscopic surgeons certified by the ESSQ system and 6 trainers from the Kyusyu University endoscopic surgery training center and the novice (N) group had 16 trainees from the pediatric endoscopic surgery training course held at Kyusyu University endoscopic surgery training center. The statistical analysis was performed using the two-tailed paired and unpaired Student's t-test, and  $p < 0.05$  was considered statistically significant.

**RESULTS:** The time score for E and N was  $63.50 \pm 26.52$  and  $6.56 \pm 12.66$  ( $p < 0.0001$ ), respectively. The score for force on the tissue for E and N was  $73.70 \pm 29.78$  and  $43.63 \pm 30.93$  ( $p < 0.0001$ ), respectively. The suture tension score for E and N was  $98.00 \pm 3.37$  and  $78.31 \pm 39.65$  ( $p = 0.0616$ ),

respectively, and the stitch spacing score for E and N was  $60.10 \pm 29.76$  and  $20.00 \pm 27.94$  ( $p < 0.05$ ), respectively. The equidistance score for E and N was  $70.20 \pm 16.96$  and  $46.81 \pm 33.83$  ( $p < 0.005$ ), respectively. The mean score for E and N was  $63.32 \pm 12.90$  and  $34.09 \pm 18.38$  ( $p < 0.0001$ ), respectively, and the total score for E and N was  $67.50 \pm 10.46$  and  $40.19 \pm 21.05$  ( $p < 0.0005$ ), respectively (Table 1). The time and the force scores on the tissue had a strong correlation.

**CONCLUSION:** The results revealed that the expert group possessed gentle and speedy skills compared with that of the novices. Using this validation study, our established model could be used to objectively evaluate the endoscopic surgical skills of pediatric surgeons. An objective evaluation not only facilitates assessing the trainee achievements but also reveals the basics. Moreover, the progress made along with repeated trials encourages trainees and promotes effective learning.

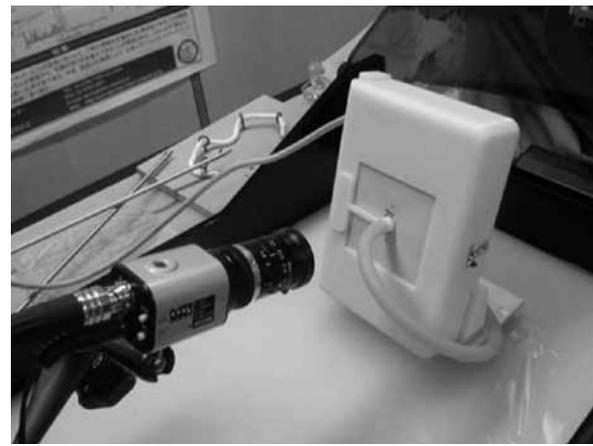


Figure 1

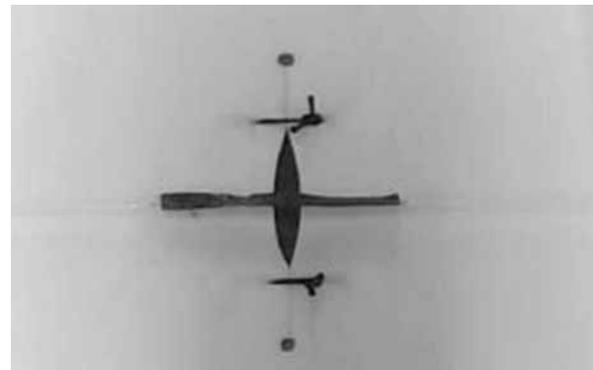


Figure 2

Evaluation points	Time	force on the tissue	suture tension	stitches spacing	stitches spacing equidistance (width)	Mean score	Total score
Expert (n=10)	63.50	73.70	98.00	60.10	70.20	63.32	67.50
Novice (n=16)	6.56	43.63	78.31	20.00	46.81	34.09	40.19
p value	<0.0001	<0.0001	0.0616	0.0451	0.0045	<0.0001	0.0001

Table 1

## **S011 LONG TERM RESULTS OF LAPAROSCOPIC SUBTOTAL >90% SPLENECTOMY FOR HAEMOLYTIC ANAEMIA IN 53 EXCESSIVELY TRANSFUSION DEPENDENT PRESCHOOL CHILDREN 2002-2010**

– Klaus Schaarschmidt, Prof MD PhD, Michael Lempe, MD, Uwe Jaeschke, MD, Weon Park, Susanne Polleichtner, Jan Patino Mayer, MD Helios Centre of Pediatric and Adolescent Surgery Berlin-Buch, Germany

**INTRODUCTION:** Splenectomy is undesirable for very young, excessively transfusion dependent children due to increased postsplenectomy sepsis risk. Subtotal splenectomy reduces transfusions to zero in most of these children, this prospective study establishes indications and technique of laparoscopic subtotal splenectomy, proving feasibility, safety and benefits in young children.

**METHODS & PROCEDURES:** 2/2002 - 6/2010, 53 children aged 4.51 +- 1.4 years (range 1.1 - 5.9 years) requiring 9.4 ± 16.1 blood transfusions (range 3 - 66) for severe spherocytosis, pyruvate kinase deficiency, thalassemia or sickle cell disease underwent laparoscopic subtotal splenectomy. All children had severe problems, in most venous lines or blood sampling became increasingly difficult. 7 children were 2 years or under, 17 children were 3 years or under requiring 18.4 ± 15.6 blood transfusions (range 7 - 66) all with severe hemosiderosis and several developing hepatic cirrhosis. After preoperative immunization against hemophilus influenzae, pneumococci and meningo-cocci in all children, from 3-5 ports central vessels were severed preserving polar vessels at 19 upper, 30 lower poles and 4 central segments. The spleen was divided by ultrasonic scalpel retaining 9.5 ± 4.7 % of splenic volume. Blood values and splenic volumes were controlled 6 monthly with follow up of 4.98years +- 2.97y (1.3-9.8y)

**RESULTS:** In all children laparoscopic subtotal splenectomies were technically successful but late viability could not be proven in 3 splenic rests by dopplersonography and scintigraphy. There was moderate regrowth of all 50 viable spleens up to 50%, predominantly during the first year. Hemoglobin rose permanently and significantly (p<0.0001, paired Student t-test) from 4.9 ± 1.3 g/dl (lowest preop) to 13.1 ± 1.1 g/dl (lowest postop) with no postoperative transfusion required and no further postoperative symptoms in 46 children. But 4 children had excessive splenic regrowth, developing recurrent hemolysis after 5.2 +- 1.7y (3.9-7.6y), 2 children requiring 1-3 transfusions so that uneventful late laparoscopic removal of the splenic rest became necessary in 4 children (8%) at age 10.1 +- 3.6 years

**CONCLUSIONS:** Mean follow-up of 5 years (1.3 – 9.8) is still short, but according to the present data laparoscopic subtotal splenectomy seems to reduce transfusion requirements with minimal operative trauma effectively for years in many and maybe permanently in most children. But even for the 4 recurrent children subtotal splenectomy at preschool age and later laparoscopic residual splenectomy at a mean of 10 years was a better solution than maintaining the massive transfusion regime in toddlers. Therefore the method should now be evaluated by other centres.

## **S012 EARLY AND INTERMEDIATE OUTCOMES OF 400 LAPAROSCOPIC OPERATIONS FOR CHOLEDOCHAL CYST IN CHILDREN**

– Nguyen Thanh Liem, MD PhD, Le Anh Dung, MD, Tran Ngoc Son, MD PhD, Pham Duy Hien, MD, Vu Manh Hoan, MD National Hospital of Pediatrics

**PURPOSE:** To present early and intermediate outcomes of 400 laparoscopic operations for choledochal cyst in children.

**PATIENTS & METHODS:** All children with choledochal cyst were laparoscopically operated on from January 2007-June 2011 in National hospital of pediatrics of Vietnam.

The operation was performed using 4 trocars. Choledochal cysts were completely removed. Digestive-biliary continuity was reestablished by hepaticoduodenostomy or hepaticojejunostomy.

**RESULTS:** Patients' ages ranged from 1 month to 192 months (mean: 47.5 ± 2.1 months). There were 305 girls and 95 boys. The mean diameter of the choledochal cyst was 48.1 ± 15.1mm (range: 10mm-170mm). Cystectomy and hepaticoduodenostomy were carried out in 238 patients and hepaticojejunostomy in 162 patients. The mean operative time was 164 ± 51 minutes for cystectomy and hepaticoduodenostomy and 211 ± 60 minutes for cystectomy and hepaticojejunostomy. Intraoperative complications included injury to the right hepatic duct in 1 patient, transection of two hepatic ducts in 2 patients, injury to the portal vein in 1 patient, and torsion of the Roux limb in 3 patients.

Biliary fistula occurred in 9 patients (2.5%), 5 patients in hepaticoduodenostomy and 4 patients in hepaticojejunostomy. The fistulae resolved spontaneously with conservative treatment in 8 patients. One patient required a second operation. Pancreatic fistula occurred in 4 patients (1%). All pancreatic fistulae resolved spontaneously with conservative treatment. One patient in the hepaticojejunostomy group suffered from duodenal bleeding.

The mean postoperative stay was 6.3 days ± 1.7 for the hepaticoduodenostomy group and 6.6 days ± 2 for the hepaticojejunostomy group. Follow-up from 3 months to 40 months was obtained in 311 patients (77.8%). Cholangitis occurred in 6 patients (1.5%), 5 patients in the hepaticoduodenostomy group (2.1%) and 1 patient in the hepaticojejunostomy group (0.6%). Gastritis occurred in 18 patients (4.5%), 14 patients in the hepaticoduodenostomy group and 4 patients in the hepaticojejunostomy group (2.5%). The difference between two groups concerning cholangitis and gastritis was not statistically significant.

**CONCLUSION:** Laparoscopic surgery is feasible, safe and effective for choledochal cyst in children.

## **S013 LAPAROSCOPIC MANAGEMENT OF CHOLEDOCHAL CYST - OUR EXPERIENCE OF 49 CASES**

– Ravindra Ramadwar, MCh DNB FRCS, Kishore Adayanthaya, MCh, Snehalata Dhayagude, MD Bombay Hospital, Hinduja Hospital

**INTRODUCTION:** Laparoscopic excision of choledochal cyst with hepaticoduodenostomy / duodenostomy is being offered as an alternative to open operation for choledochal cyst in children. The aim of the study was to evaluate our experience of laparoscopic management of choledochal cyst and assess the medium term results.

**METHOD:** We reviewed 49 patients who had undergone laparoscopic surgery for choledochal cyst since January 2003. The data was analysed for operative approach, intraoperative problems, postoperative complications and postoperative follow up with ultrasonography, liver function tests.

**RESULTS:** Since January 2003, 49 patients have undergone laparoscopic surgery for choledochal cyst. Mean age was 6 years (2 months – 18 years), mean weight was 12 kg (3.5 kg - 52 kg). 42 patients had type I and 7 patients had type IV A choledochal cyst. In 38 patients the cyst diameter was more than 5 cms. Mean operative time was 175 minutes (115 – 290 minutes). Mean intraoperative blood loss was 25 ml (10 – 45 ml). 40 patients underwent Roux-en-y hepaticoduodenostomy and 9 patients had hepaticoduodenostomy. The mean time taken for intra-corporeal hepaticoduodenostomy was 60 minutes (45-100 minutes). Conversion to open surgery was required in 1 patient with recurrent pancreatitis. Bile leak was seen in 2 patients with roux-en-y hepaticoduodenostomy, one was treated conservatively and other patient required percutaneous placement of stent. Mean hospitalisation was 6 days (4 – 14 days). At mean follow-up of 4 years (6 months – 8 years) one patient had recurrent

sub-acute obstruction and 2 patients had cholangitis. 46 patients have normal liver function tests and ultrasonography. 2 patients with recurrent cholangitis had abnormal liver function tests during cholangitis which reverted to normal after antibiotic therapy. HIDA scan in these patients show good drainage with no stasis. None of the patients with hepaticoducho-duodenostomy had any complications.

**CONCLUSION:** Laparoscopic excision of choledochal cyst with hepaticoducho-enterostomy is a safe alternative to open surgery and has satisfactory medium term results. Hepaticoducho-duodenostomy is an excellent option and can be performed safely laparoscopically.

**S014 LAPAROSCOPIC VERSUS CONVENTIONAL KASAI PORTOENTEROSTOMY DOES NOT FACILITATE SUBSEQUENT LIVER TRANSPLANTATION IN INFANTS WITH BILIARY ATRESIA** – *Joachim F Kuebler, MD, Thomas Becker, MD, Christina Oetzmann Von Sochaczewski, MD, Frank Lehner, MD, Claus Petersen, MD, Benno M Ure, MD Hannover Medical School, Departments of Pediatric Surgery and Abdominal Surgery*

**BACKGROUND:** The benefit of laparoscopic Kasai portoenterostomy remains controversial. With the progression of the disease, a significant number of patients require liver transplantation. Although in these patients, cosmetic aspects are not relevant, reduced internal scarring and less adhesions could facilitate the subsequent liver transplantation and thus represent a potential advantage of the laparoscopic technique.

**METHODS:** All patients undergoing liver transplantation in our hospital between 2006 to 2008 after laparoscopic (LAP) or conventional Kasai (CONV) procedure and operated by a single surgeon were included in this retrospective analysis. Primary outcome measure was duration of liver explantation. Secondary outcome measures were total duration of transplantation, amount of blood transfusion and need for reoperation within the first year.

**RESULTS:** A total of 17 patients were included, 9 patients after open Kasai and 8 patients after laparoscopic Kasai. There was no significant difference in patient characteristics. The mean duration of liver explantation was identical in LAP ( $87 \pm 4.5$  min.) and CONV ( $87.6 \pm 4.4$  min.) patients. Moreover, we did not identify any significant difference in the need for blood transfusions, total liver transplantation duration and need for reoperation.

**CONCLUSIONS:** We did not detect any measurable benefit during liver transplantation after laparoscopic versus conventional portoenterostomy. Although the laparoscopic procedure for biliary atresia has been shown to be technically feasible, significant benefits of the endoscopic technique remain to be demonstrated.

**S015 LAPAROSCOPIC MANAGEMENT OF ABDOMINAL LYMPHATIC CYST IN CHILDREN: EXPERIENCE WITH 47 CASES** – *Son N Tran, MD PhD, Nguyen T Liem, MD PhD National Hospital of Pediatrics, Hanoi, Vietnam*

**INTRODUCTION:** Abdominal lymphatic cysts (ALC) in children are usually seen as omental or mesenteric cysts, which are sometimes very large and complex. Excision of the cyst by open surgery has been considered the standard treatment for ALC. The role of laparoscopic surgery in management of ALC has not been well defined. The aim of this study is to investigate feasibility and effectiveness of laparoscopic surgery in management of ALC in children.

**METHODS:** Medical records of all patients undergoing laparoscopic surgery for ALC at National Hospital of Pediatrics, Hanoi, Vietnam from May, 2007 to June, 2011 were reviewed. The clinical presentations, diagnosis, intraoperative findings, operative procedures and results were analyzed. For laparoscopy, one umbilical port of 10mm and up to 3 other 5mm ports were used. Cystic fluid was aspirated prior to removal of the

cyst. When intestinal resection was indicated, the mesenteric cyst with the bowel loop was delivered out of the abdomen through a minimally enlarged umbilical incision, resection of the intestinal segment together with the cyst and the bowel anastomosis were performed extracorporeally.

**RESULTS:** 47 patients were identified, 25 boys and 22 girls, with mean age  $4.3 \pm 3.7$  years (ranged from 1 month to 15 years). The most common symptoms were abdominal pain (72.3%) and abdominal distention (34.0%). Four patients were presented with acute abdomen due to infection or hemorrhage of the cyst. Mean size of ALC was  $9.5 \pm 5.5$ cm (ranged from 3.4 to 30 cm). In 12 cases ALC was omental and in 35 cases - mesenteric. In 7 among the later, the cyst was with complex character, involving retroperitoneal structures like pancreas, kidney, major blood vessels. The surgery was carried out by single port in 9 cases (19.1%), 2 ports in 7 (14.9%), 3 ports in 26 (55.3%) and 4 ports in 5 cases (10.6%). Laparoscopic cyst excision was performed in 36 cases (76.6%), laparoscopy-assisted bowel resection en bloc with the cyst - in 8 cases (17.0%). In 3 patients (6.4%), conversion to open surgery was required. Operative time ranged from 30 to 165 minutes (mean  $79 \pm 39$  minutes). There was no intra- or postoperative complication. Mean length of hospital stay after the laparoscopic management was  $3.8 \pm 1.6$  days (ranged from 1 to 9 days). The results of pathologic investigation showed benign cystic lymphangioma in all cases. For the follow up period of 1 month to 4 years, recurrence occurred in one patient (2.1%) with complex mesenteric cyst, and all other patients were in good health.

**CONCLUSIONS:** Laparoscopic management is safe, feasible, effective and should be the treatment of choice for most cases of abdominal lymphatic cyst in children.

**S016 SURGICAL MANAGEMENT OF GALLSTONE PANCREATITIS IN THE PEDIATRIC POPULATION; MAYBE THEY ARE JUST LITTLE ADULTS** – *Erol M Knott, DO PhD, Alessandra C Gasior, DO, Jai Bikhchandani, MD, Janine P Cunningham, MD, Shawn D St. Peter, MD Children's Mercy Hospitals and Clinics*

**INTRODUCTION:** The natural history and optimal timing of surgical intervention for gallstone pancreatitis in children are not well established in the literature. Due to the low incidence of the disease, we sought to examine effects of varied practice patterns on outcomes.

**METHODS:** A retrospective review was performed on all patients undergoing cholecystectomy for a diagnosis of gallstone pancreatitis from January 2000 to June 2011. Demographics, diagnostic strategies, operative approaches, length of stay and morbidity were compared between Group 1 who had cholecystectomy performed during the admission of diagnosis and Group 2 who underwent cholecystectomy subsequently. Data is presented as average  $\pm$  SD. Unpaired t-test was used in the statistical analysis.

**RESULTS:** Cholecystectomy was performed for gallstone pancreatitis in 37 patients, of which 26 (70.3%) patients were female. Ultrasound was performed in all cases revealing cholelithiasis in 35 (94.6%). There were 22 patients in Group 1 and 15 in Group 2. Mean age was  $14.3 \pm 3.8$  years in Group 1 compared to  $12.5 \pm 5.0$  years in Group 2 ( $P=0.23$ ) and with body mass indices of  $24.9 \pm 7.3$  and  $21.4 \pm 4.1$ kg/m<sup>2</sup> respectively ( $P=0.13$ ). Endoscopic retrograde cholangiopancreatography was performed in 11 patients (8 in Group 1 and 3 in Group 2), of which 8 were prior to cholecystectomy, 2 after cholecystectomy, and 1 both. An open cholecystectomy was performed in 2 cases, both in Group 2. There were 4 single site laparoscopic cases all in Group 1. Total number of hospital days attributed to the diagnosis of gallstone pancreatitis was  $8.9 \pm 6.5$  in Group 1 compared to  $15.8 \pm 15.7$  in Group 2 ( $P=0.07$ ). There were 5 patients (33.3%) in Group 2 who required readmission for recurrent pancreatitis prior to their operation.

**CONCLUSION:** This represents the largest reported series of cholecystectomy for gallstone pancreatitis in children. Our results support the use of laparoscopic cholecystectomy during the initial hospitalization as is recommended in the adult literature, and this approach may decrease the total hospital stay.

**S017 LAPAROSCOPIC TREATMENT FOR PEDIATRIC SMALL INTESTINAL OBSTRUCTION: IS IT THE GOLD STANDARD?** – *Neil Featherstone, MD PhD, Zahid Mukhtar, MD, Nada Sudhakaran, MD, Stefano Giuliani, MD PhD ST.GEORGE'S HOSPITAL, LONDON, UK*

**INTRODUCTION:** Only a few reports have shown the effectiveness of laparoscopy in the treatment of pediatric small bowel obstruction. We performed a meta-analysis of the reported series to determine whether the outcome was satisfactory compared to laparotomy.

**METHODS:** Online databases were searched for English-language articles reporting quantifiable outcome data published between 1990 and 2010 pertaining to the laparoscopic treatment of pediatric small bowel obstruction (post-operative adhesions, Meckel's diverticulum, intussusception, congenital bands, internal hernias). Case reports were not considered. We focused on the following variables: aetiology, success rate, operative time, type of procedure, conversion rate, postoperative complications and length of stay (LOS). In addition, we reviewed our center experience for the past two years.

**RESULTS:** We screened 135 studies, 14 of which satisfied our inclusion criteria. They provided adequate descriptions of 430 cases, of which 266 (61.8%) were intussusceptions. Success rate of laparoscopy was 72.8%. 7/430 (1.6%) had operative complications; six of these were in the intussusception group. The mean LOS was 4.1 days (data was available for only 259 patients). Mean operative time was 65.8 minutes when reported. In our institution, we treated 6 cases of small bowel obstruction laparoscopically; there were 4 intussusception (half with a Meckel's diverticulum), 1 congenital band, and 1 mid-ileal stricture. None were converted to laparotomy.

**CONCLUSIONS:** There was significant heterogeneity among the studies surveyed. In agreement with the literature, we believe in the efficacy of laparoscopy in the treatment of pediatric small bowel obstruction. Complication rates and operative times are not worse than open surgery. Laparoscopy should always be considered as the initial approach by a pediatric surgeon with competent laparoscopic skills.

**S018 ERCP CAN PREVENT RE-OPERATIONS FOR BILIARY COMPLICATIONS AFTER LIVER RESECTION IN CHILDREN** – *M. Steen, MD, R. Bakx, MD PhD, M. Tabbers, MD PhD, J. Wilde, MD, K. Van Lienden, MD PhD, M. Benninga, MD PhD, H. Heij, MD PhD, E. Rauws, MD PhD Pediatric Surgical Center Amsterdam*

**BACKGROUND:** biliary complications after liver surgery are difficult to manage. ERCP with stenting of the Common Bile Duct (CBD) is not commonly practiced in children for this purpose.

**OBJECTIVE:** to evaluate the role of endoscopic retrograde cholangio-pancreatography (ERCP) as both a diagnostic and a therapeutic tool in the management of bile duct complications after liver resection in children.

**PATIENTS & METHODS:** the charts of all patients from 0 to 18 years who underwent liver resection in a tertiary children's hospital in Amsterdam, the Netherlands between 2000-2010 were retrospectively reviewed.

**RESULTS:** forty-five children with a median age of 3.6 years (range: 2 months to 17 years) were included. Indications for resection were hepatoblastoma (21), other malignancies (19) and benign hepatic disorders (5). After liver resection biliary complications occurred in 13 children (29%). Of these, ten patients were suffering from bile leakage and three had a stricture of

the bile duct. All ten patients with bile leakage underwent drainage of the peritoneal cavity; leakage stopped in two. The remaining eight patients underwent ERCP with stent placement after which leakage stopped in five patients. In three patients with a stricture of the bile duct, ERCP was performed in two, which solved the problem in one patient. ERCP was able to demonstrate the nature (bile leak and/or biliary tract stricture(s)), extent and location of the lesion in eight out of ten children. Biliary complications were cured by ERCP with stent placement in 6 of 11 patients, without serious procedure related complications. Rescue procedures in the other patients included hepaticojejunostomy and liver transplant.

**CONCLUSION:** ERCP with stenting of the CBD has a diagnostic and therapeutic role in the management of bile leaks after liver surgery in children. The value of ERCP in the management of a stricture of the biliary tract is less conclusive.

**S019 INITIAL EXPERIENCE WITH EXPANDABLE ESOPHAGEAL STENTS FOR BENIGN ESOPHAGEAL STRICTURES IN PEDIATRIC PATIENTS** – *Haroon Patel, MD Driscoll Childrens Hospital*

**PURPOSE:** Benign esophageal strictures in children are traditionally treated with serial dilation, often requiring many procedures. There is limited experience with the use of expandable stents for the treatment of benign esophageal strictures in children. A review of a single surgeon's experience with these stents was undertaken

**METHODS:** A retrospective chart review of pediatric patients at a free standing children's hospital.

**RESULTS:** A total of 6 stents were placed in 3 patients. Average followup is 4 years. There were no perforations in the series. There were no proximal dislodgements. Stents were readily retrieved from the stomach once they had slipped down and were no longer held in place by the stricture. All three patients required two different size stents. 2 patients required no further dilations after stent removal. 2 patients refused any further stents. 1 of these required further dilations. The major complaint was severe subternal chest pain. There were 4 hospitalizations for initial pain control. All stents were removed once there was evidence of adequate dilation. One stent had a food bolus impaction requiring endoscopic removal. Only 1 patient felt that they would go through stenting again if needed.

**CONCLUSIONS:** Expandable stents for benign esophageal strictures can be safely performed in children. They provide for complete gradual self expanding dilation obviating the need for repeat dilations. Unlike the adult experience however, they are associated with significant pain often requiring hospitalization. Repeat xrays and endoscopic procedures further detract from the potential benefits of this device in children.

**S020 MAGNET COMPRESSION ANASTOMOSIS FOR MINIMALLY INVASIVE COLORECTAL SURGERY** – *J Wall, MD, M Diana, MD, J Leroy, MD, V Deruijter, MD, K D Gonzales, MD, V Lindner, MD, J Marescaux, MD, M Harrison, MD Department of Surgery, Stanford University, Palo Alto, CA; Department of Surgery, University of California, San Francisco, San Francisco, CA*

**INTRODUCTION:** MAGNAMOSIS™ forms a compression anastomosis using self-assembling magnetic rings. It can be delivered endoscopically making it ideal for Natural Orifice Transluminal Endoscopic Surgery (NOTES). The system has proven effective in full-thickness porcine small bowel anastomoses with rapid patency, but has yet to be used on the colon. Partial-thickness mucosal anastomosis with magnetic rings have been reported in humans, but have not gained acceptance in part due to a prolonged time to patency.

**AIMS & METHODS:** The aim is to show the feasibility of MAGNAMOSIS™ in minimally invasive colorectal surgery and compare the efficacy of side-to-side (SS) and end-to-side (ES) anastomoses. 11 swine between 45-55 kg were used under ethics approval. One acute animal was used

for feasibility of the procedure. The next 10 animals were divided into 5 SS and 5 ES anastomoses and survived. Anastomoses were performed using a hybrid NOTES procedure involving transrectal access plus three abdominal trocars. A proximal magnet was precisely guided by a percutaneous endoscopic technique. The colon was divided and a distal magnet was delivered endoscopically. After self-assembly, a hole was made in the inner ring of the magnets for immediate patency. Ex-vivo strain testing measured the compression force delivered by the magnetic rings on the colon wall alone (SS) vs. colon with staple lines in between (ES & end-to-end (EE)).

**RESULTS:** Colorectal anastomoses were performed in all cases using a hybrid NOTES technique. The average operating time was 71 minutes. Average time to complete patency was 5 days in both the SS and ES groups respectively. Burst pressure at 10 days was greater than 95 mmHg in both groups. One SS anastomosis was stenotic at 10 days, but improved at 30 days and was not clinically significant. One ES failed on day 3 due to magnetic ring detachment. Table 1 shows compression forces for the 3 configurations.

**CONCLUSION:** MAGNAMOSIS™ was feasible for hybrid NOTES colorectal anastomosis. It has the advantage over circular staplers of precise delivery throughout the entire colon. SS anastomosis was reliable and effective. ES anastomosis was complicated by one detachment of the magnetic rings. Strain tests revealed that separation created by a staple line (ES) produced significantly less compression force between the rings, likely accounting for the single failure. Device optimization and FDA regulatory approval are pending. A minimum force of approximately 4N appears necessary for reliable anastomoses.

ANASTOMOSIS CONFIGURATION	FORCE (N)	95% CI
Colon SS	4.35	3.78-4.93
Colon SE	2.41	2.10-2.73
Colon EE	1.48	1.11-1.86

Table 1

**S021 MENTORING COMPLEX LAPAROSCOPIC SURGERY IN CHILDREN: LESSONS LEARNT FROM LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION** – Bin Wang, MD, Jian-xiong Mao, MD, Qi Feng, MD, Jian-yao Wang, MD, Lei Liu, MD, Kenneth K Wong, MD PhD Shenzhen Children Hospital & The University of Hong Kong

**BACKGROUND:** With advances in laparoscopic surgery, many pediatric surgical conditions can now be treated minimally invasively. However, acquiring the skills in the operations of complex conditions such as choledochal cysts remains a challenge. Here, we summarize the experiences in mentoring the learning of laparoscopic choledochal cyst excision in a tertiary referral center in China.

**METHODS:** Having accumulated experience and necessary skills in performing more simple laparoscopic surgery (inguinal hernia; appendicitis; laparoscopic anorectoplasty), the “learning” surgeon decided to embark on performing choledochal cyst excision laparoscopically. The data of first 10 patients (June 2010 to January 2011) were reviewed.

**RESULTS:** 10 cases were successfully operated during the study period laparoscopically. The “training” surgeon performed the first case with the “learning” surgeon as assistant. For the second and third cases, the “learning” surgeon carried out the dissection and excision of the choledochal cyst and the jejunojejunostomy, while the hepaticojejunostomy was done by the “training” surgeon. The fourth and fifth cases were performed by the “learning” surgeon with the “training” surgeon assisting and helping out only at necessary steps during the procedure. For six to eighth cases, the “learning” surgeon was assisted by surgical trainees with the “training” surgeon unscrubbed and advised

if required. The ninth and tenth cases were operated independently by the “learning” surgeon. The average time of operation for the ten cases was 4.5 hours (range 3.5-6.0 hours). Two patients had minor post-operative bile leak, which resolved with conservative management. All patients were discharged between 7 to 10 days. At three month follow up, there was no evidence of anastomotic stricture.

**CONCLUSION:** The teaching of complex laparoscopic surgery in children is a step-wise process and in the case of choledochal cyst excision, it can be smoothly and quickly learnt in the hands of an advanced laparoscopic surgeon.

**S022 LAPAROSCOPIC PURSE STRING CLOSURE WITH SAC DISCONNECTION FOR PEDIATRIC INGUINAL HERNIA WITH INTERNAL RING DIAMETER ABOVE 2 CM: 3 YEARS EXPERIENCE** – Sherif M Shehata, MCh CST MD PhD, Ashraf A El Attar, MD MRCS, Mohamed A Attia, MD, Alhassan M Hassan, MCh Department of Pediatric Surgery, Tanta University Hospital, Tanta, Egypt

**INTRODUCTION:** Laparoscopy became widely used in the management of pediatric inguinal hernia (PIH) due to its many advantages. Herniotomy is not suitable for PIH with wide internal ring (IR).

**AIM:** The aim of this work is to assess laparoscopic repair of PIH with IR diameter > 2 cm by laparoscopic purse string closure after sac disconnection in children in a tertiary academic center.

**PATIENTS & METHODS:** 62 consecutive children with unilateral PIH were treated along 3 years period from April 2008 till March 2011. All cases were subjected to laparoscopic exploration followed by laparoscopic hernia repair as a day case surgery. Exclusion criteria included: prematurity, < 6 months of age, irreducible, recurrent or bilateral cases. Cases with IR diameter < 2 cm were dealt with by laparoscopic herniotomy and excluded from the study. Laparoscopic hernia repair was performed by purse string closure after hernia sac disconnection using 2/0 Vicryl suture. The stitch is placed circumferentially about 5 mm away from the edge of the defect to complete high ligation of the hernia sac without handling of the vas deference or the spermatic vessels. The knot is tied either intra corporeally or extra corporeally according to surgeon's preference. Operative findings and post operative results and complications were assessed. The patients were followed for a period ranged between 6 and 40 months (mean: 19 months).

**RESULTS:** We have 62 cases with male: female as 47:15 and 10 of them presented in the first year of life. Operative age ranged between 6 months and 15 years (mean: 45 months). 40 presented as RT sided hernia with 9 associated with contralateral patent processus vaginalis (CPPV) as compared to 22 cases Lt sided with 6 CPPV upon laparoscopic exploration. Adhesions and direct defect reported once each that dealt with laparoscopically. Operative time ranged between 16 & 56 min in unilateral cases (mean: 27.4 min) and between 30 & 75 min in bilateral cases (mean: 45.5 min) without conversion. One case stayed in hospital for 72 hours for suspicion of diathermy bowel injury. Three cases of wound infection were reported and treated conservatively. No case of recurrence, testicular atrophy or hydrocele was reported in the follow up period. One case of negative CPPV developed hernia at one year post operatively and treated by laparoscopic herniotomy. Cosmetic outcomes were excellent.

**CONCLUSIONS:** Laparoscopic purse string closure after hernia sac disconnection is a feasible and safe in pediatric cases with large IR. Laparoscopy proved to be a superior alternative to the open repair of inguinal hernias in children since it provides an excellent view on the cord structures and they can be guarded well during the procedure and diagnose other pathologies. Larger studies and long-term follow up are needed to support our encouraging results.

## **S023 SURGICAL MANAGEMENT OF PEDIATRIC ADHESIVE BOWEL OBSTRUCTION** – Justin Lee, MD, David B Tashjian, MD FACS FAAP, Kevin P Moriarty, MD FACS FAAP Baystate Children's Hospital, Tufts University School of Medicine

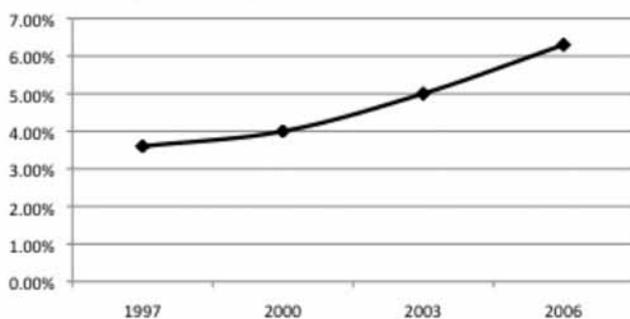
**INTRODUCTION:** Incidence of adhesive bowel obstruction is unknown in pediatric population. Increasing utilization of laparoscopy has been associated with potential benefits of less postoperative adhesions and a decreased lifetime risk for recurrent bowel obstruction. In the era of laparoscopy, a nationwide review of current surgical management of pediatric adhesive bowel obstruction is necessary. The objective of this study was to analyze a population-based database for recent trends in surgical management and compare open (OLA) versus laparoscopic (LLA) lysis of adhesions.

**METHODS:** Pediatric adhesive bowel obstruction cases were identified in the Kids' Inpatients Database from 1997, 2000, 2003, and 2006. LLA were compared with OLA. Data analysis included patient demographic, hospital variables, length of stay (LOS), and total hospital charge (THC). Complication analysis included postoperative shock, hemorrhage, hematoma, seroma, wound complications, infection, fistula, and pulmonary complications.

**RESULTS:** A total of 16,322 pediatric ARIO cases were identified during the study period. These were characterized by median age 11 years old, with 51.1% of the population female. Overall treatment included 44.0% OLA and 4.8% LLA. A near two-fold increase in utilization of laparoscopy was observed from 3.6% in 1997 to 6.3% in 2006 ( $P < 0.001$ ). Complication rates were lower for LLA versus OLA, (6.6% versus 10.8%, OR 0.587, CI 0.439-0.876,  $P < 0.001$ ), especially accidental puncture or laceration rate, (1.9% versus 3.8%, OR 0.487, CI 0.288-0.823,  $P < 0.001$ ). Conversion to OLA occurred in 1.7%. LLA hospitalization outcomes included a shorter median LOS (6 versus 8 days,  $P < 0.001$ ) and a lower mean THC (\$33,693.78 versus \$41,486.78,  $P < 0.001$ ) compare to OLA. Multivariate regression analysis did not find hospital bed size, location, teaching status, and regions to be statistically significant predictors for utilization of laparoscopy.

**CONCLUSIONS:** Laparoscopic lysis of adhesion is a safe option for pediatric adhesive bowel obstruction with lower complication rates and a reduced economic burden. Despite the increase in utilization of laparoscopy in recent years, only a minority of patients underwent LLA. Further studies are needed to identify and characterize the subgroup of patients who benefit from LLA.

### Laparoscopic Lysis of Adhesions



## **S024 SINGLE SURGEON EXPERIENCE WITH LAPAROSCOPIC SURGERY IN PEDIATRIC PATIENTS WITH INFLAMMATORY BOWEL DISEASE** – Renee Huang, MD, Issam Koleilat, MD, Edward C Lee, MD Albany Medical College

**PURPOSE:** Laparoscopic management of inflammatory bowel disease patients has been well-established in the adult population. However, the use, efficacy, and safety of a laparoscopic approach has been less clearly defined in the pediatric population. This study reviews the option of laparoscopic technique in pediatric patients in a single surgeon experience for inflammatory bowel disease.

**METHODS:** All consecutive pediatric patients with inflammatory bowel disease underwent laparoscopic attempt for management of disease from May 2002 to May 2011 and were prospectively entered into a database. The pediatric population was defined as being younger than 18 years old at a single institution. Patients were analyzed retrospectively with respect to demographics, prior abdominal surgery, perioperative factors, complication rate, and final pathology. Complication rates were measured within the first 30 days postoperatively.

**RESULTS:** A total of 44 pediatric patients with 52 surgeries underwent laparoscopic approach during the study period. Of the 52 operations, 3 were small bowel, 17 were ileocolic, and 32 were colorectal resections of whom 14 underwent ileal pouch-anal anastomosis (IPAA). For data purposes, each surgery was considered a separate patient event. Sixteen patients (36.4%) with 21 surgeries (40.4%) underwent surgery for ulcerative colitis, 25 patients (56.8%) with 28 surgeries (53.8%) underwent surgery for Crohn's disease, and 3 patients (6.8%) underwent 3 surgeries (5.8%) for indeterminate colitis. The mean age at time of surgery was 14.1 (3.5-17) years old. Nineteen patient cases were male and 33 were female with an average weight of 84.3 (22-156) pounds. The average ASA classification status was 2.25. Forty-two patient cases (80.8%) had no prior abdominal surgery, and 10 (19.2%) had previous bowel surgery. Mean operative time was 132 minutes. Two patients (3.8%) underwent conversion from a laparoscopic to open approach. Estimated blood loss was 64 ml. Six patients received a blood transfusion ranging from 150 ml. to 2 units of packed red blood cells. Average length of stay was 5.5 days, of which no patients required monitoring in a higher level of care setting. Postoperative complications were noted in 10 patients (19.2%) among whom 2 were treated for wound infection or abscess, 7 required readmission for postoperative ileus, and 1 required return to the operating room for exploratory laparotomy. Final pathologic examination revealed findings consistent with the original diagnosis in 47 patient cases, 4 with nonspecific findings of inflammation versus reactive changes, and 1 patient diagnosed with Crohn's disease had pathology consistent with ulcerative colitis.

**CONCLUSIONS:** The laparoscopic management of inflammatory bowel disease has not routinely been implemented in the pediatric population. Our study population was consecutively obtained and all underwent laparoscopic attempt. The perioperative morbidity and laparoscopic to open conversion rate remained low. This study demonstrates a successful laparoscopic approach in pediatrics, which may have particular long-term benefits in this population faced with an extensive life expectancy and recurrent disease that may require re-operation. The pediatric population with inflammatory bowel disorders requiring surgery can be routinely offered an initial laparoscopic approach by a laparoscopic-experienced surgeon.

## **S025 LONG TERM OUTCOMES AFTER PARTIAL VERSUS TOTAL FUNDOPLICATION IN NEUROLOGICALLY NORMAL CHILDREN –**

*Edward Esteves, PhD, Humberto B Souza-filho, MD, Calebe P Souza, Juliana V Gomes, Enf, Amilson M F Borges, MD, Paulo Sergio S Costa, PhD, Fatima Maria L Silva-lima, PhD Pediatric Surgery Division, University of Goias, Goiania, Brazil, Amparo Hospital and Saint Helen Hospital, Goiania, Brazil*

**BACKGROUND:** The most used laparoscopic technique for gastroesophageal reflux disease (GERD) has been total fundoplication (TFP) with hiatal herniorrhaphy (Nissen-Rosseti's), because the higher pressures from a 360-degree wrap are expected to allow the lowest GER recurrence rates, and it has been a little bit easier to perform than partial funduplications (PFP). However, some concerns have come through, considering the quality of life (QOL), persistent undesirable symptoms and a not low rate of wrap disruption even after a floppy TFP, especially in children with no neurological disease. There are very few reports on the late results of pediatric PFP, compared to TFP in this population, to convince us of which one would be better. Believing that the type of fundoplication should be individualized for each patient, the aim of the authors is to present a comparative study between our technique of partial versus TFP after a long-term follow-up in neurologically normal children.

**PATIENTS & METHODS:** From may/1999 to may/2006, among the children admitted with GERD for surgical treatment with no neurological disease, 305 children (171 males, 134 females, ages from 9 months to 18 years, mean 5.3 years-old), underwent laparoscopic PFP, according to our combined Thal-Boix-Ochoa technique. Another group of 278 children (148 males, 130 females, ages from 4 months to 18 years, mean 4.7 years-old) underwent a lap floppy Nissen fundoplication. The operations were chosen according to our GER severity score, after a signed informed consent. Our multidisciplinary team has followed the patients prospectively. The recovered data for analysis included operative data, surgical related complications, GER recurrences, redo procedures, symptoms and a QOL specific score. Statistics used parametric and non-parametric tests, alpha risk 5%, plotted in SPSS 17.

**RESULTS:** After a follow-up period of 5-12 years, all but 13 patients could be evaluated. Surgery-related complications, dysphagia, redo procedures, endoscopic dilatations and lower QOL scores were more common after TFP. Recurrence, cosmetics and hospital stay were similar in both groups. Children with esophageal dysmotility or muscular disorders had better overall results with PFP.

**CONCLUSIONS:** TFP should not be indicated for all neurologically normal children, due to the risk of complications and poorer long-term quality of life, that could be avoided with criteriously performed PFP, according to the severity and recurrence risk of GER.

## **S026 LAPAROSCOPIC CHOLECYSTECTOMY FOR BILIARY**

**DYSKINESIA: INCIDENCE INCREASING –** *Martin Lacher, MD, Charles J Aprahamian, MD, Donna Bartle, RN, Sonia S Talathi, Ramanath N Haricharan, MD, Carroll M Harmon, MD PhD Division of Pediatric Surgery, Department of Surgery, Children's of Alabama, University of Alabama at Birmingham, Birmingham, Alabama, USA*

**PURPOSE:** Our group previously reported on the effectiveness of laparoscopic cholecystectomy in children with biliary dyskinesia (BD) (Haricharan RN, J Ped Surg (2008) 43, 1060–64). The purpose of the current study was to compare our former report to those children who have undergone laparoscopic cholecystectomy for BD since that time. We hypothesized that the incidence of BD as an indication for laparoscopic cholecystectomy in children is increasing.

**METHODS:** After obtaining IRB approval, all children who underwent laparoscopic cholecystectomy between 8/2006 and 5/2011 (4.8 years) were screened for having received a cholecystokin (CCK)-stimulated

HIDA scan plus laparoscopic cholecystectomy for suspected BD during this period. A pathologic ejection fraction was defined as <35%. Results were compared to data of children operated on between 1/2001-7/2006 (5.6 years). Children with gallstones either on ultrasound or on pathologic evaluation were excluded.

**RESULTS:** 435 children underwent laparoscopic cholecystectomy (363 with four trocars and 72 via single incision approach (SIPES)) between 8/2006 and 5/2011. Eighty-six children (median age 13.3 years; range 4.7-19.2; 61% girls) with chronic abdominal pain and no gallstones on ultrasound had both a CCK-HIDA scan plus laparoscopic cholecystectomy for suspected BD. Mean BMI was 25.7 (boys: 25.5 (95% percentile); girls 26.05 (94% percentile); range 14.6-43.5) and therefore far above normal (50% percentile in the USA = 18.5 for boys and 19.0 for girls). CCK-HIDA scan was pathologic in 71 children (83%) (mean ejection fraction: 16%), normal (ejection fraction 36-70%) in 5 children (6%) and equivocal in 10 children (12%). Histology revealed cholesterosis (N=4), mild chronic cholecystitis (n=50) and no pathologic change (n=32). Analyzing the two time periods, the incidence of laparoscopic cholecystectomy for suspected BD has increased by a factor of 4.3 (23 cases (4.1 per year) between 1/2001-7/2006 compared to 86 cases (17.9 per year) between 8/2006-5/2011.

**CONCLUSION:** In our cohort 83% of all CCK-HIDA scans performed for suspected BD were pathologic (ejection fraction <35%). The incidence of laparoscopic cholecystectomy in children with suspected BD seems to be increasing significantly (times 4.3) over the last 10 years.

## **S027 COMPARATIVE EVALUATION OF THE FUNCTIONAL RESULTS OF TREATING HIGH FORMS OF THE ANUS AND RECTUM ATRESIA OF THE CHILDREN OPERATED TRADITIONALLY AND LAPAROSCOPICALLY –**

*Igor V Kirgizov, MD prof, Iliya A Shishkin, PhD, Alexey A Gusev, PhD, Artyom Shahtarin, PhD Scientific Centre of Children Health of RAMS. The first Moscow medical University named after I. M. Sechenov*

**RELEVANCE:** according to the extended data the value of the insufficient results of the anorectal diseases is still high and makes 10 up to 60 %. Nevertheless new methods of operational treating are introduced and brought into practice. One of them is laparoscopic proctoplasty at the high forms of the anus and rectum atresia, which, undoubtedly bring better cosmetic results. Functional results of the treatment using this method comparing with the traditional methods of proctoplasty evoke great interest.

**STUDY PURPOSE:** to make a comparative analysis of the functional treatment results in the group of children with high forms of the anus and rectum atresia operated via laparoscopic proctoplasty and in the group of children, operated via traditional method of Romualdi-Rehbein.

**MATERIALS & METHODS:** at the age of 4-7 evaluation of the functional results was carried out after primary radical operations with the help of integrated system of the polling the patients and their parents according to A.M.Holschneider (1983). Depending on the score the results were estimated as good, normal and insufficient. According to the type of the primary radical proctoplasty applied the children were divided into two groups: group I — (?=90) includes children with high forms of the atresia operated in a traditional way (Romualdi-Rehbein's operation). The second group II — (?=60) includes children with high forms of the atresia, operated via laparoscopic proctoplasty.

**INVESTIGATION RESULTS:** in the first group under investigation the functional results were admitted as good and normal in 19.4%, sufficient — 27.4% and insufficient in 53.2% of cases. In the second group good and normal functional results were considered in 43.3%, sufficient — 30% and insufficient — 26.7%.

**CONCLUSION:** Laparoscopic proctoplasty applied to the children with high forms of the anus and rectum atresia leads to the better functional results in comparison with an open operation on the method of Romualdi-Rehbein. It may be apparently connected with the more accurate pulling through of the constricted colon into the centre of the puborectal loop.

**SO28 MAJOR COMPLICATIONS AFTER LAPAROSCOPIC-ASSISTED PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE** – *Bo Xiang, MD*  
*The Pediatric Surgery, West China Hospital*

**PURPOSE:** To analyze the major complications after laparoscopic-assisted pull-through for Hirschsprung's disease

**MATERIALS & METHODS:** We performed a retrospective study of 162 pediatric patients receiving laparoscopic-assisted pull-throughs for Hirschsprung's disease in our hospital from March 2008 to March 2011. The post-operative complications were analyzed.

**RESULTS:** Our single institutional experience with laparoscopic-assisted pull-through for Hirschsprung's disease revealed major complications as follows: 1) Enterocolitis, occurred in 24 children (14.8%): 18 of them within 6 months after surgeries and 2 of them 1-year later; 7 patients experienced twice or more and 3 deaths occurred (1.8%) 2) 11 children had post-operational soiling, 7 of which resolved within 3 months and 4 had gradually relieved symptoms after 6 months 3) 16 anastomotic strictures occurred: 15 happened within one month and one after 6 months 4) Increased defecation rates were noted in 9 patients during the first month after surgery ranging from 3-4 times per day. 8 of them decreased to 1-3 times per day 6-month later 5) Constipations generally occurred in the first month after pull-through procedures. Three children who had defecation intervals for 2-3 days had relieved symptoms after anal dilatation treatments. No adhesive intestinal obstructions, anastomotic leakages, wound infections or rectal sheath inflammation happened in our group of patients.

**CONCLUSION:** As a minimal invasive surgical approach, laparoscopic-assisted pull-through brings less injury to patients with Hirschsprung's disease. But the higher rates of post-operational enterocolitis compared to conventional procedures (e.g. Duhamel procedure) should be concerns to pediatric surgeons. Regular follow-ups are crucial for at least 6 months.

**SO29 THE ANALYSIS OF CONVERSION TO OPENING SURGERY ON THE LAPAROSCOPIC EXCISION FOR CHILDREN WITH CHOLEDOCHAL CYST** – *Liu Jiang Bin, MD PhD, Zhen Shan, MD PhD, Xiao Xian Min, MD PhD*  
*Surgical Department of Children's Hospital, Fudan University, Shanghai, China*

**AIMS & OBJECTIVES:** To review our experience in laparoscopic total cyst excision with Roux-En-y hepatoenterostomy for choledochal cyst in children, and to analysis the reason of conversion to opening procedure.

**MATERIAL & METHODS:** Between April 2001 and March 2010, laparoscopic cyst excision with Roux-Y hepatoenterostomy was performed on 67 children with choledochal cyst in Children's Hospital of Fudan university in Shanghai, the age of patient ranged from 58 days to 11 years (average age 3.6 years), all the cases were performed with four Trocars in laparoscopic procedure. The gallbladder and the dilated bile duct were completely excised, Roux-en-Y hepaticojejunostomy was fashioned extracorporeally by exteriorizing the jejunum through the extended umbilical port site. End-to-side anastomosis between the common hepatic duct stump and Roux loop was carried out intracorporeally by continuous suture. The average operative time was 4.5 hours (3.5-10.5). Totally 11 cases converted to opening surgery in the laparoscopic procedure.

**RESULTS:** The reasons for conversions were following: bleeding (3 cases), difficult to excision the wall of cyst (2 cases), the distal end of common bile duct deep into the pancreas (2 cases), Pancreaticobiliary Malunion no demonstration completely under Cholangiography (2), ductoplasty (1 case), subcutaneous emphysema (1).

**CONCLUSION:** Laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy is a feasible, safe and effective surgery for the resection of congenital choledochal cyst in children. But the surgeons should control the indication of operation.

**SO30 TOTALLY TRANSANAL LESS PULLTHROUGH COLECTOMY - A NOVEL APPROACH AVOIDING ABDOMINAL WALL INCISION IN CHILDREN WITH LONG SEGMENTAL INTESTINAL AGANGLIONOSIS** – *Mohammad Reza Vahdad, MD, Hamidreza Foroutan, Professor*  
*Department of Pediatric Surgery, Faculty of Medicine, Ruhr-University Bochum, Germany; Department of Pediatric Surgery, Nemazee Hospital, Shiraz University of Medical Sciences, Shiraz, Iran .*

**INTRODUCTION:** Minimally invasive surgery in children with long segmental intestinal aganglionosis has experienced a trend towards reduction of the number of abdominal wall incisions. Both conventional laparoscopic surgery (CLS) and single site surgery fulfill this aim. In children, natural orifice transluminal endoscopic surgery (NOTES®) has been limited by the fear of complications associated with access site complications. We present a novel hybrid technique of totally transanal LESS pullthrough colectomy (TLPC) with avoidance of abdominal wall incision that combines LESS technology, TriPort®-equipment, NOTES approach and excludes access site complications.

**METHOD:** 2 boys and 1 girl (2.5, 6 months and 5 years of age) with long segmental intestinal aganglionosis were operated after the diagnosis was confirmed by histology, anorectal manometry, X-ray contrast enema and a failure of conservative treatment with laxatives and enemas. The TLPC procedure consists of an endorectal technique with submucosal dissection starting 1cm orally to the dental line until the peritoneal reflection. The rectal muscle is divided circumferentially at the peritoneal reflection. After ligation of the oral mucosa to avoid contamination the oral bowel is replaced into the abdominal cavity. Subsequently, a TriPort® is introduced trananally. Mesenterial resection of the aganglionic bowel is accomplished via transanal single site surgery until the estimated normoganglionic colon segment is reached. The normoganglionic bowel is pulled down to the site of anastomosis with simultaneous observation of the vascular perfusion. After removal of the port the aganglionic segment is pulled through the anus and resected. Frozen sections allow a safe anastomosis within the ganglionic segment.

**RESULTS:** The mean operative time was 83.3 minutes. The estimated blood loss was almost nil, and there were no intraoperative complications. All children displayed a normal bowel movement by the 4. postoperative day. No complications occurred at 3 months of follow-up.

**DISCUSSION :** TLPC combines minimal invasiveness of single site surgery and NOTES with the advantage of removing the NOTES access site located in the aganglionic segment, thus minimizing complications.

**CONCLUSION:** The TLPC approach is a safe, effective and feasible surgical procedure in children with long segmental intestinal aganglionosis. Larger number of cases and a longer follow-up are needed to evaluate this new technique.



## S031 SINGLE INCISION PEDIATRIC ENDOSURGERY

**SPLENECTOMY: A CASE CONTROL STUDY** – *Lena Perger, MD, Charles J Aprahamian, MD, Oliver J Muensterer, MD PhD, Albert J Chong, MD MPH, Martin Lacher, MD, Govardhana R Yannam, MD, Carroll M Harmon, MD PhD Children's of Alabama and University of Alabama at Birmingham, Scott & White Hospital and Texas A&M College of Medicine, Weil-Cornell Medical College, Kaiser Oakland Medical Center*

**BACKGROUND:** The use of Single Incision Pediatric Endosurgery (SIPES) is becoming wide spread among the community of endoscopic pediatric surgeons. It is especially suitable for ablative procedures focused on an organ located in a limited intra-abdominal space without a need for excessive manipulation of the target, such as splenectomy. The single, larger umbilical incision may also facilitate morcellation and extraction of the spleen.

**PURPOSE:** The aim of this study is to review the authors' collective experience of SIPES splenectomies in children, report outcomes, describe techniques, and identify pitfalls as well as learning points to consider for the future.

**METHODS:** After approval of study by all Institutional Review Boards, data on all SIPES splenectomies in children was collected prospectively and entered into a database. The study group was compared to a control group of 15 patients who were retrospectively identified to have undergone traditional laparoscopic splenectomy during the same time period.

**RESULTS:** Fifteen children underwent SIPES splenectomy. Ages ranged from one to fifteen years with a median of seven years, and weights were between 9.8 and 70.6 kg with a median of 24 kg. The control group was similar in age and weight characteristics. The most common indication was spherocytosis, followed by sickle cell disease and immune cytopenias. There were two conversions to open due to bleeding in SIPES group and one in laparoscopic group due to massive spleen size with dense vascular adhesions. Operative times were 40 to 190 minutes (median 84) in SIPES group and 51 to 154 minutes (median 99) in laparoscopic group. Median length of stay was two days in both groups. Follow-up ranged between one month and two years. 28 of 30 patients have resolved their pre-operative symptoms upon follow-up. One patient was lost to follow-up, and one patient who underwent laparoscopic partial splenectomy for splenic mass was diagnosed with lymphoma and post-operatively underwent chemotherapy.

**CONCLUSIONS:** The SIPES technique is very well suited for splenectomy, because despite all instruments and camera being in-line, the working angles are not compromised, and visualization is adequate. Operating time and hospital stay is comparable to standard laparoscopic splenectomy, but cosmetic result may be superior.

## S032 TRANSLUMENAL ESOPHAGUESOPHAGEAL ANASTOMOSIS FOR NOTES: AN EX VIVO FEASIBILITY STUDY

– *Tetsuya Ishimaru, MD, Tadashi Iwanaka, MD PhD, Akira Hatanaka, MD, Hiroshi Kawashima, MD Department of Pediatric Surgery, The University of Tokyo Hospital*

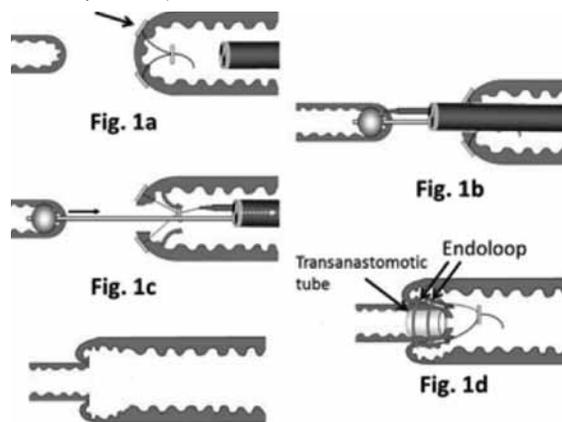
**AIM:** Transluminal anastomosis is one of the most challenging assignments before natural orifice transluminal endoscopic surgery (NOTES) can be widely applied in clinical practice. The aim of this study is to develop a novel procedure for esophagoesophageal anastomosis for NOTES.

**METHOD:** This is an ex vivo feasibility study performed in three porcine models. Three esophagi and whole stomachs were harvested from 100-kg pigs and the esophagi were resected at the middle and closed with interrupted sutures. The procedure consisted of the following: (1) a two-channel endoscope was introduced into the upper esophagus and a suturing device, a prototype of a double T-bar suturing device

(Olympus Medical Science Corp., Tokyo, Japan), was placed at the blind end of the upper esophagus with loose cinching (Fig.1a); (2) the blind end between the T-bars was incised and the scope was advanced out of the esophagus; (3) the lower esophagus was identified and a balloon catheter was inserted into it (Fig.1b); (4) after expansion of the balloon, the balloon catheter and a grasping forceps, which held a thread of the suturing device, were withdrawn so that the end of the upper esophagus was inverted and the lower esophagus was pulled up into the upper esophagus (Fig.1c); (5) the catheter was removed and a short transanastomotic tube was placed inside the duplicated part of the esophagus via the transgastric route; (6) two Endoloops were fastened tightly over the transanastomotic tube with the expectation that a wide opening would be created after the ligated tissue became necrotic and dropped off together with the Endoloops and the tube (Fig.1d, e). A liquid leak test, infusion of indigocarmine aqueous solution into the upper esophagus, was performed after the procedure.

**RESULTS:** The procedure was technically successful, just carried out under the endoscopic vision and without any assistance from outside of the esophagus in all three attempts. The length of time for this procedure was 65, 25, and 66 minutes, respectively. The liquid leak test showed no leakage until the esophageal duplication was released and the anastomosed esophagus was separated into two ducts. The internal pressure of the upper esophagus was 300, 248, and 142 mmHg, respectively.

**CONCLUSIONS:** Transluminal esophagoesophageal anastomosis is feasible. The duration of the procedure can be shortened to less than 30 minutes after gaining experience in more cases. The results of the leak test showed that the anastomosis formed by this procedure appears to have enough strength to be performed in clinical practice. Our procedure may be available in general surgery such as colorectal resection and can contribute to widen the indication for NOTES in the future. An in vivo survival study is needed to confirm safety and reliability of this procedure.



## S033 A NOVEL TECHNIQUE FOR MAPPING/LEVELLING BIOPSIES DURING PRIMARY LAPAROSCOPY ASSISTED TRANS-ANAL SOAVE ENDORECTAL PULLTHROUGH FOR HIRSCHSPRUNG'S DISEASE

– *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD Division of Pediatric surgery, Michael E Debaquey Department of surgery, Baylor college of medicine and Texas Children's Hospital, Houston, Texas.*

**INTRODUCTION:** Laparoscopic procedures are commonly performed for the various surgical treatments for Hirschsprung's disease. One of the most essential parts of the procedure is the mapping/levelling biopsies to determine the level of aganglionosis. The authors propose a novel safe technique, which incorporates the traditional suction biopsy forceps during primary laparoscopy assisted trans-anal soave endorectal pull-through for Hirschsprung's disease.

**MATERIAL & METHODS:** This technique was used in 3 new-born infants with Hirschsprung's disease at our institution with success.

**TECHNIQUE:** One 3mm Step port is introduced through the umbilicus. Pneumoperitoneum is achieved with CO<sub>2</sub> and a 3mm 30 Degree telescope is introduced. Under visualisation of the laparoscope a standard suction rectal biopsy forceps is inserted anally and serial suction biopsies are taken from within the lumen of the sigmoid and descending colon. Biopsies can be obtained in this manner up-to the splenic flexure.

**RESULTS:** Adequate biopsies were obtained in all the 3 neonates and definitive diagnosis of aganglionosis was made before performing the primary laparoscopic assisted trans-anal Soave (endorectal) pull-through for Hirschsprung's disease.

**CONCLUSIONS:** Above technique has the advantage of obtaining quick biopsies under visualization and thus saving time. The different levels biopsies are done are clearly defined via laparoscope and sufficient sample is obtained for pathological diagnosis. However, it does have the disadvantage of not being able to perform biopsies beyond the splenic flexure, which are needed in only 10-15 % cases anyway.

**S034 ROBOT-ASSISTED THORACOSCOPIC THYMECTOMY FOR TREATING MYASTHENIA GRAVIS IN CHILDREN** – *Joseph E Hartwich, MD, Jean Teasley, MD, Claudio Oiticica, MD, Sanjeev Tyagi, BS, David A Lanning, MD PhD Children's Hospital of Richmond, Virginia Commonwealth University*

**INTRODUCTION:** Myasthenia gravis (MG) is a devastating autoimmune disorder, in which autoantibodies are directed against acetylcholine receptors at post-synaptic neuromuscular junctions, inhibiting their stimulatory effect and leading to muscle weakness. In the United States, the prevalence of MG is approximately 14 to 20 per 100,000. One treatment option involves a thymectomy, which can lead to remission of symptoms. The amount of thymic tissue removed is correlated with a better outcome for patients. Thus, it is critical that the procedure used when performing a thymectomy maximize the resection of thymic tissue. Robotic-assisted thoracoscopic thymectomy provides a minimally invasive platform that avoids the mortality and morbidity of a median sternotomy while providing better visualization and a more delicate dissection than is available in a standard thoracoscopic procedure. Here we report our results of 9 pediatric patients who underwent a robotic-assisted thoracoscopic thymectomy.

**METHODS:** Following IRB approval, a total of 9 patients who underwent robotic thymectomy at one of two institutions were reviewed. All procedures were performed through the left chest using one 8mm camera port and two 5mm instrument ports and were performed by the same surgeon (DL). Intra-operative statistics such as operative time and blood loss were reviewed from operative records. Postoperative outcomes such as hospital stay, discharge medications, and complications were reviewed from hospital charts. Lastly, disease response was evaluated in consultation with a pediatric neurologist who specializes in MG.

**RESULTS:** Age at operation ranged from 2-16 years of age (avg 9.4 years). A majority of patients had an Osserman class of IIa (n=5). All patients were on mestinon preoperatively and 7/9 (77%) were taking prednisone. Mean operative time was 171.2+/-27.5 mins. Average postoperative hospital stay was 1.1+/-0.3 days. See table for additional results. One patient had a documented persistent pneumothorax on postoperative day one which was treated with nasal cannula oxygen for an additional day. There were no additional operative complications and all patients were discharged home on Tylenol with codeine for pain control. Four patients are asymptomatic but remain on mestinon (Defillipi score of 2) and four additional patients have had improved symptoms since thymectomy (Defillipi score of 3), demonstrating an

improvement in 8/9 patients undergoing the procedure. One patient had progression of disease after thymectomy.

**CONCLUSIONS:** Robotic-assisted thoracoscopic thymectomy is a safe and effective operation for children with MG. Minimal access provides for improved morbidity compared to median sternotomy, while robotic-assistance allows for articulating instruments, 3D visualization, and minimal blood loss. These factors may allow for a more complete resection compared to a standard thoracoscopic thymectomy.

Table 1

	Average time or weight (±SD)
Operative Time (min)	171.2±27.5
Blood Loss (mL)	14.7±14.0
Hospital Stay (days)	1.1±0.3
Weight of Thymus Removed (g)	22.4±9.0
Follow-up (months)	22.5±13.4

**S035 USING TRACTION FOR THE SAFE DIVISION OF THE PULMONARY VESSELS AND BRONCHUS DURING THORACOSCOPIC PULMONARY LOBECTOMY IN CHILDREN WEIGHING LESS THAN 15KG** – *Hiroyuki Koga, MD, Kenji Suzuki, MD, Tadaharu Okazaki, MD, Geoffrey L Lane, MD, Go Miyano, MD, Atsuyuki Yamataka, MD Juntendo University School of Medicine*

**PURPOSE:** During thoracoscopic pulmonary lobectomy (TPL) in larger children weighing more than 15kg, endoscopic staples (ES) such as endo-surgical stapler and endoscopic clips (EC) are used during dissection and division of the pulmonary vessels (PV) and bronchus. However, in smaller patients (<15kg), ES/EC cannot be used readily with safety because of limited space in the thoracic cavity. We report our technique for efficient thoracoscopic dissection and safe division of the PV and bronchus in children weighing less than 15kg.

**METHOD:** 12 patients weighing less than 15kg (range: 8-15kg; mean: 10kg) with sequestration /congenital cystic adenomatoid malformation were reviewed. Under single lung ventilation in the lateral decubitus position, 4 ports ranging from 5-12mm were used. After the PV and bronchus were exposed, thick silk was used to encircle them as a traction suture. By applying traction, the PV and bronchus can be exposed clearly and through counter traction, ES/EC can be applied easily.

**RESULT:** Using our technique, the PV and bronchus were dissected safely and efficiently and ES/EC could be applied to the PV and bronchus without difficulty. All cases had uneventful TPL (upper in 1, middle in 3 and lower in 8). Mean operative time was 210 minutes.

**CONCLUSION:** Our technique allows the PV and bronchus to be divided safely with ES/EC in children weighing less than 15kg. Although simple, we strongly recommend our technique be used during TPL in smaller children.

**S036 SINGLE-INCISION LAPAROSCOPIC ROUX-EN-Y HEPATICOJEJUNOSTOMY USING CONVENTIONAL INSTRUMENTS FOR CHILDREN WITH CHOLEDOCHAL CYSTS** – *Long Li, Professor, Mei Diao, Doctor, Ning Dong, Doctor, Qi Li, Doctor, Hui Ye, Doctor Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing, P. R. China*

**BACKGROUND:** Single-incision laparoscopy has recently become popular in pediatric surgery. Yet there has been no report on its application in the treatment of choledochal cysts (CDC). The current study is the first series to evaluate the safety and efficacy of single-incision laparoscopic hepaticojejunostomy (SILH) for CDC children.

**METHODS:** We reviewed 19 patients (median age: 3.00 years, range: 2 months-9.33 years, F/M: 12/5) who underwent SILH between April and June 2011. Early postoperative and follow-up results were compared with those of our historical controls.

**RESULTS:** Two patients underwent conversions to conventional 4-port laparoscopic hepatojejunostomy. One of them suffered from active inflammation of CDC with severe adhesion whereas the other had more than half of the CDC embedded in the pancreas requiring extensive dissection. SILH was completed in 17 patients (F/M: 12/5). According to the Todani's classification, 14 out of 17 patients were Type IV and 3 was Type I CDC. Fourteen out of 17 patients were cystic dilatations, and 3 were fusiform dilatations. The diameter of the largest cyst was 8.8 cm. The mean age at operation in SILH group was 3.03 years (range: 2 months-9.33 years;  $\leq 1$  year, n=5;  $\leq 3$  years, n=6;  $>3$  years, n=6). It was comparable to 4.16 years in our historical control group (CLH)1 (p=0.508). The operative time shortened from the initial 3.67 hours to 1.75 hours after the first 4 patients. The mean operative time was 3.06 hours, similar to 3.04 hours in CLH in our previous study (p=0.834). Intraoperative blood loss was minimal. No blood transfusion was required. Postoperative hospital stay, resumption of feed, duration of drainage in SILH were 6.17, 2.88 and 3.23 days respectively, which did not differ from those in CLH in our historical controls (p=0.059, 0.539, 0.442 respectively). The median follow-up period was 3 months. No mortality or morbidities of anastomotic stenosis, intrahepatic reflux, cholangitis, pancreatic leak, pancreatitis, intestinal obstruction, wound infection, injury of intra-abdominal organs or incisional hernia was observed. Early in this series, a 9-month old infant developed moderate bile leak which subsequently stopped after 10 days of drainage. Liver function parameters reversed to normal level after operation (p<0.001).

**CONCLUSIONS:** In experienced hands, SILH is safe and its short-term results are comparable to CLH. It potentially provides a viable option as a surgical treatment of CDC.

**REFERENCE:** 1. Diao M, Li L, Cheng W. Laparoscopic versus Open Roux-en-Y hepatojejunostomy for children with choledochal cysts: intermediate-term follow-up results. *Surgical endoscopy* 2011;25(5): 1567-1573.

### **S037 IMPACT OF BODY HABITUS ON SINGLE SITE LAPAROSCOPIC APPENDECTOMY FOR NON-PERFORATED APPENDICITIS: SUBSET ANALYSIS FROM A PROSPECTIVE, RANDOMIZED TRIAL** – *Shawn D St. Peter, MD, Erol M Knott, DO PhD, Alessandra C Gasior, DO, George W Holcomb III, MD, Daniel J Ostlie, MD Children's Mercy Hospitals and Clinics*

**BACKGROUND:** There have been several series documenting the utility of single site laparoscopic appendectomy. However, there are no data to support patient selection based on their physical characteristics. We recently completed a large prospective, randomized trial comparing single site laparoscopic appendectomy to standard 3 port laparoscopic appendectomy for non-perforated appendicitis. This dataset was used to examine the relative impact of body habitus on operative approach.

**METHODS:** We performed an analysis of the dataset collected in a prospective, randomized trial of 360 appendectomy patients who presented with non-perforated appendicitis. Body mass index (BMI) was calculated and plotted on growth chart to obtain BMI percentile according to gender and age. Standard definitions for overweight (BMI 85-95%) and obesity (BMI > 95%) were used.

**RESULTS:** In the single site group there were 26 overweight and 19 obese patients. In the 3 port group there were 25 overweight and 16 obese patients. There were no significant differences between overweight and normal with either approach. However, with the single site approach there was longer mean operative time, more doses of post-operative narcotics given, longer length of stay and greater hospital charges in obese patients (Table 1). In the 3 port group, there were no differences between normal and obese patients.

**CONCLUSION:** When using the single site approach for appendectomy, obesity in children creates longer operative times, more doses of post-operative analgesics, longer length of stay, and greater charges. However, obesity has no impact on 3 port appendectomy.

	<b>Single Site Normal (N=135)</b>	<b>Single Site Obese (N=19)</b>	<b>P-Value</b>
Operating Time (Minutes)	34.0 ± 13.6	45.4 ± 20.1	0.002
Doses of Narcotics	5.7 ± 3.5	7.6 ± 0.15	0.05
Length of Stay after Operation (Hours)	22.0 ± 5.7	25.4 ± 8.1	0.03
Hospital Charges (Thousands \$)	17.1K ± 3.8K	20.3K ± 4.7K	<0.001
	<b>3 Port Normal (N=139)</b>	<b>3 Port Obese (n=16)</b>	<b>P-Value</b>
Operating Time (Minutes)	29.6 ± 13.6	29.3 ± 20.1	0.93
Doses of Narcotics	5.3 ± 3.2	6.2 ± 4.4	0.32
Length of Stay after Operation (Hours)	22.5 ± 7.2	21.8 ± 5.4	0.72
Hospital Charges (Thousands \$)	16.4K ± 4.0K	17.1K ± 4.1K	0.51

### **S038 RETROPERITONEOSCOPIC ANDERSON HAYNES PYELOPLASTY IN 100 CHILDREN** – *Ravindra Ramadwar, MCh DNB FRCS, Kishore Adayanthaya, MCh, Snehalata Dhayagude, MD Bombay Hospital, Hinduja Hospital*

**AIM:** To evaluate i) feasibility of retroperitoneoscopic for exposure of kidney in children and ii) ability to perform Anderson Haynes pyeloplasty for pelviureteric junction obstruction

**METHOD:** All patients who underwent retroperitoneoscopic pyeloplasty since Jan. 2005 were analyzed prospectively. Retroperitoneal space was created using a balloon. The kidney and pelviureteric junction was exposed. Anderson Haynes pyeloplasty was performed in all patients and results were analyzed.

**RESULTS:** Retroperitoneoscopic pyeloplasty was performed on 100 patients (Age: 6 weeks – 14 years, M:F = 2:1) since Jan. 2005 to August 2011. Anderson Haynes pyeloplasty was performed on right side in 39 patients and on left side in 61 patients. Mean operative time was 2 ½ hours (range 1 ½ hours – 4 ½ hours). DJ stent was inserted in 83 patients and pelviureteric stent was kept in 18 patients. Mean time to postoperative oral feeding was 18 hours (range 6hours – 24 hours) and mean postoperative hospital stay was 4 days (Range 3 – 5 days). All patients tolerated the procedure well. At follow up the renal function is preserved or improved in all patients except one where the function has deteriorated. Three patients had postoperative urinary tract infection.

**CONCLUSIONS:** Retroperitoneoscopy provides an excellent exposure of kidney, pelvis and ureter in children. Anderson Haynes pyeloplasty can be performed safely with excellent results.

### **S039 BLU PATENT LYMPHOGRAPHY PREVENTS HYDROCELE AFTER LAPAROSCOPIC VARICOCELECTOMY: 10 YEARS OF EXPERIENCE** – *S.f. Chiarenza, L. Costa, A. Carabaich Dept Pediatric Surgery, Saint Bortolo Hospital, Vicenza, Italy*

**INTRODUCTION & AIMS:** is one of the complications of surgical varicocelectomy. The incidence of post operative hydrocele can reach 30% (until 3 years after operation). Laparoscopic microsurgical treatment (LMT) provides good functional results and low rate of late recurrence. However the incidence of late post-operative hydrocele (POH) remains a surgical problem. To prevent such complication, we propose lymphography by intradartoc injection of patent blu. Aim is to compare the incidence of POH in two groups: A lymphatic sparing(LS) and B non lymphatic sparing(NLS).

**MATERIALS & METHOD.** We prospectively analyzed 294 patients with grade III of left varicocele operated (2002-2011) with LMT. We divided the patients in two groups : A (196 pt) LS,B (98 pt) NLS (p-value = 0.0089).After anesthesiologic induction in all patients with LS 0,2-2,5 ml of blu patent dye was injected at intradartotic level ; at minimum 5 minutes after, laparoscopic access to abdominal cavity was obtained ; after identification of dyed lymphatics (group A), left internal spermatic vessels were isolated and dissected between endoclips. In group B (NLS) we only performed laparoscopically : isolation, clipping and dissection of internal spermatic vessels.

**RESULTS.** Lymphography was performed in 217 patients ; in 196/217 (90%) group A , lymphatic vessels were visible and a lymphatic sparing ligature was achieved. Group B comprised 77 patients without lymphography and 21 patients negative to lymphography (total 98 patients). In both the groups (294 patients) the microsurgical laparoscopic ligature of left internal spermatic vessels was successfully achieved . No peri or post-operative complications.All the patients were recorded and after operation have had clinical control to 1,6,12,24,36, months ; 22 patients were lost at clinical follow-up; they have had a telephonic control and referred no problems; the medium follow-up was 3 years (range 0,5-9 years). The relapse rate is almost similar in both groups, 4 patients in group A (1,36%) and 1 patient in group B ( 1 %). No patients in group A (LS) had post-operative hydrocele (POH) while in group B (NLS) , 11 pt (11 %) had hydrocele (POH), 7 of them needed a further intervention , 6 one time and one two time with complete healing after reoperations.

**CONCLUSIONS:** According our results perioperative blu lymphography is an effective method to prevent post-operative hydrocele after laparoscopic varicolectomy.The absence of side effects and the low rate of varicocele relapse encourage to spread this technique among pediatric surgeons

**S040 PEDIATRIC URETEROPELVIC JUNCTION OBSTRUCTION** – *Justin Lee, MD, David B Tashjian, MD FACS FAAP, Kevin P Moriarty, MD FACS FAAP Baystate Children's Hospital, Tufts University School of Medicine*

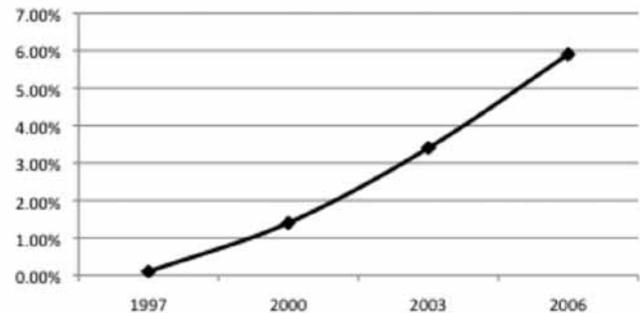
**INTRODUCTION:** Surgical management of ureteropelvic junction (UPJ) obstruction has evolved with the introduction of prenatal screening and laparoscopy. The literature has evolved toward observation for infants and the use of laparoscopy has changed modern surgery with potential benefits of shorter length of stay. We sought to analyze practice patterns of pediatric pyeloplasty from 1997 to 2006 and associated patient and hospital factors.

**METHODS:** Pediatric pyeloplasty cases were identified in the Kids' Inpatient Database from 1997, 2000, 2003, and 2006. Data analysis included patient demographics and hospital variables. The utilization of laparoscopy was chronicled and evaluated for length of stay (LOS) and total hospital charges (THC).

**RESULTS:** A total of 12,455 pyeloplasty cases were identified, with a median age of 3 years, 35.5% infants (age less than 1 year), 69.4% male, and 68.0% white. Infant pyeloplasty decreased from 42.2% in 1997 to 30.3% in 2006. The utilization of laparoscopy increased from 0.1% in 1997 to 5.9% in 2006. Laparoscopy was associated with shorter mean LOS (2.52 days versus 3.33 days, P=0.018) but higher mean THC (\$25,937.25 versus \$16,723.75, P<0.001). Multivariate logistic regression analysis identified private insurance (OR 2.647, CI 1.338-5.240, P=0.005) and non-infant pyeloplasty (OR 8.364, CI 5.400-12.955, P<0.001) to be associated with increased utilization of laparoscopy. Median income, urban location, and hospital teaching status were not statistically significant variables.

**CONCLUSIONS:** Pediatric UPJ obstruction continues to be a source of significant morbidity in the United States. Practice patterns however have evolved from 1997 to 2006 with decreasing infant pyeloplasty and increasing utilization of laparoscopy. Further studies are needed to determine clinical factors that influence optimal timing and the utilization of laparoscopy.

## Utilization of Laparoscopy



**S041 SURGICAL TECHNIQUES FOR UPPER POLE HEMINEPHRECTOMY OF DUPLEX KIDNEY IN LAPROENDOSCOPIC SINGLE-SITE SURGERY** – *Yunli Bi, MD, Liangsheng Lu, MD Children's Hospital of Fudan University*

**BACKGROUND:** Laparoscopic heminephrectomy of duplex kidney is technically demanding, especially for upper moiety. To our knowledge, single-site surgery has not been reported for this procedure.

We have performed 10 cases of upper pole heminephrectomy in LESS. The surgical techniques and the immediate clinical outcomes of these cases were reviewed to evaluate the feasibility of this procedure.

**METHODS:** There were 10 cases of duplex kidneys underwent single site surgery heminephrectomy from April 2010 to June 2011 with a mean age of 19.6 months (3-90); 2 of them were boys, the other 8 were girls. Six cases were prenatally detected by ultrasound with a severely dilated upper moiety; 2 cases presented with incontinence resulting from an ectopic ureter; the other 2 suffered from fever and urinary tract infection with a dilated upper moiety. Ultrasound, magnetic resonance urography and DTPA isotope renography were performed in all cases.

For surgical technique, a semicircle incision was made on the circumference of the umbilical ring. Three conventional ports were inserted inside this incision. The upper moiety was dissected out first. Then a transabdominal wall traction suture was placed through the parenchyma of the upper moiety to lift it. This helps to expose the renal hilum. After careful dissection, the polar vessels could be seen coming out of the main renal vessels. These polar vessels were coagulated and divided. Then the upper pole pelvis could be mobilized and divided. And the upper moiety was divided using harmonic scalpel. Below the main renal vessels the divided upper pole ureter was found and dissected as low as possible and divided.

**RESULTS:** Nine cases were successfully completed with no need for extra-umbilical incision. The second case in this series was converted to open because of bleeding. The mean operative time is 2.61 hours(2.5-3.0). There were no need for blood transfusion except one that was converted to open. The drainage is between 0-50ml. Oral food intake were started on postoperative day1. And the patient were discharged on postoperative day 4-8. There were no major complications in all cases.

CONCLUSIONS: LESS heminephrectomy for duplex kidney is technically feasible in children. Long term follow-up and large volume of cases are needed to prove its benefits.

**S042 ROBOT-ASSISTED LAPAROSCOPIC SURGERY IN CHILDREN: DOES IT APPLY TO ALL LEVELS OF THE URETER?** – *Bruce W Lindgren, MD, Jennifer Hagerty, DO, Theresa Meyer, RN MS, Earl Y Cheng, MD. Pediatric Urology, Children's Memorial Hospital, Chicago, IL; Surgery/Urology, Al duPont Hospital for Children, Wilmington, DE*

PURPOSE: Repair of Ureteropelvic Junction (UPJ) obstruction is the most common application of Robot-assisted laparoscopic (RAL) surgery in children; however its role continues to expand. We reviewed our experience with RAL surgery on all levels of the ureter.

METHODS: RAL cases performed from 2006, when we started performing RAL surgery, through April, 2010, were reviewed retrospectively; since April 2010 we have collected data prospectively. We reviewed all cases of RAL ureteral surgery in children and adolescents.

RESULTS: 102 RAL procedures were performed in 97 patients (1-bilateral staged, 4-reoperative procedures). (Table 1).

Level	Procedure	Dx	n	Improved Imaging	Sx Resolution	Complications
Proximal	Pyeloplasty	UPJO (1 horseshoe)	55	45/50 (U/S no change:3)	49/50	4-Minor 1-Persistent Obstr.
	Pyeloplasty + Pyeloscopy	UPJO + Stone or polyps	3	2/3	2/3	1-failed; Re-op RALP done
	Ureteropyelostomy	L.P. UPJO	3	3/3	3/3	0
	Ureterocalicostomy	UPJO	2	2/2	2/2	0
		UPJO in Horseshoe	1	0/1	0/1	Failed; re-op repair done
	Vascular Hitch	UPJO	1	0/1	0/1	Failed; re-op repair done
	Re-do Pyeloplasty	UPJO, recurrent	13	13/13	13/13	1-transient HTN
Mid	Re-do Ureterocalicostomy	UPJO, recurrent (1horseshoe)	3	3/3	3/3 3/3	1-Transfuse/conv. to open 1-Transient HTN
	U.P. Heminephrectomy	Ectopic Ureter	2	2/2	2/2	1-C diff.colitis
	IUU	Ectopic/incontinent	2	2/2	2/2	0
Distal		Ectopic / Obstructed	3	3/3	3/3	0
		Stricture from stone	1	1/1	1/1	0
	Distal Ureterectomy	Ectopic ureteral stump, UTIs	1	1/1	1/1	0
	Ureteral reimplant	VUR-Unilat.	4	4/4	4/4 No UTI	
		VUR-Bilat	8	6/8	7/8 No UTI 1-UTIs (pt stopped all meds)	1-proced aborted %1-Gr I VUR- Resolved with Deflux
<b>Total</b>			102	87/95 92	92/97 95%	4-Failed pyeloplasty or UC 2-Conversion aborted 1-Transfusion 2-Persistent VUR 7-Minor

UPJO= Ureteropelvic Junction Obstruction ; L.P. = lower pole; UC=Ureterocalicostomy; U.P. = Upper pole; IUU= Ipsilateral Ureteroureterostomy

The majority of the procedures were accomplished via a 3-Port approach, however location and number of laparoscopic / robotic ports, patient positioning, and robot positioning was individualized based on preoperative imaging, level of ureteral pathology, and patient size. Selective use of retrograde pyelography and ureteral catheter placement prior to RAL surgery was performed, particularly for reoperative cases and ureteroureterostomy.

Mean age was 8.9 years (10mo – 20 yr); mean weight 33.8 kg (10.0- 82.5kg). Mean Operative time and length of stay, in this mixed group, was 249 minutes (range 110 – 526 min) and 1.3 days, respectively. Mean f/u: 11.7mo; 5 were lost to f/u. Symptomatic and radiographic success was achieved in

93% and 95% of patients with UPJ obstruction, respectively, and in 100% of ureteroureterostomy, heminephrectomy and distal ureterectomy cases.

CONCLUSION: Robot-assisted laparoscopic surgery is safe and feasible for pathology at all levels of the ureter. Individualized approach to positioning and port sites are important factors in achieving favorable outcomes. Success rates equal to or exceeding open repair can be achieved while providing the benefits of a minimally invasive surgical approach.

**S043 TOTALLY LAPAROSCOPIC APPROACH FOR FAILED CONVENTIONAL ORCHIOPEXY** – *Mario Riquelme, MD, Arturo Aranda, MD, Mario Rodarte-shade, MD Hospital San Jose - Tec de Monterrey*

BACKGROUND: Orchiopexy represent one of the most common surgical intervention performed by the pediatric surgeon. Open inguinal approach has been traditionally the standard of care. However, it has been reported that up to 0.2 - 10% of the patients will require reoperation for recurrent cryptorchidism. Reoperations of the inguinal area represent a technical challenge requiring advanced skills and anatomical knowledge. The most common approach for these patients has been an open inguinal redo orchiopexy resulting in a high incidence of injury to vas deferens and spermatic vessels because of extensive scar tissue. Some authors have recently recommended a video-assisted approach. The aim of this report is to show results and feasibility with the totally laparoscopic approach for failed prior open orchiopexy.

METHODS: We report our surgical experience in patients with prior open orchiopexy who developed recurrent cryptorchidism and were approached by laparoscopy. Nine patients (2 bilateral) with 11 recurrent undescended testes were treated by the totally laparoscopic orchiopexy approach. All procedures were performed by a single surgeon. The mean age of the patients was 5.5 years (range 2.5 –6 years). We used a 4-port technique, starting with laparoscopic dissection of the vas deferens and spermatic vessels as high as possible in order to get adequate length of these structures. Inguinal internal ring was opened in order to get access to the inguinal canal and dissect the testis from scar tissue to finally bring the testis into the abdominal cavity. A 10-mm transcrotal trocar was introduced all the way to the abdominal cavity to finally pull through the testis into the scrotum.

RESULTS: Initial orchiopexy in all the patients was performed by conventional surgery. Six testis were located at the external inguinal ring and five within the inguinal canal. Laparoscopic orchiopexy was performed satisfactorily in all but one case in a mean time of 90 minutes. All procedures were performed in an ambulatory basis. We did not experience any perioperative complications. In a mean follow-up of 25 months there has not been any recurrent cryptorchidism nor atrophic testis.

CONCLUSION: Laparoscopy offers the advantage of achieving an extensive mobilization of spermatic vessels and a careful dissection of the vas deferens all the way to the posterior wall of the bladder. Direct magnification of inguinal structures offers the opportunity to avoid any injury of these structures during dissection in the inguinal canal. The totally laparoscopic approach for a failed orchiopexy represents a feasible and safe procedure.

**S044: CAN LAPAROSCOPIC RADICAL NEPHRECTOMY FOR UNILATERAL RENAL CANCER IN CHILDREN CONSIDERED SAFE ? A SINGLE CENTER EXPERIENCE** – *Mg Scuderi, MD, E Camarda, MD, S Puleo, MD, A Di Cataldo, MD, V Di Benedetto, Professor Departem of Paediatric Surgery, Catania University, Catania Italy*

PURPOSE: The role of minimally invasive surgery for the treatment of pediatric urological cancer has been limited to biopsies and resection for small and benign tumors. The purpose of this study is to present the experience of Italian single center group and report the result of laparoscopic radical nephrectomy (LRN) for unilateral renal cancer in children who underwent preoperative chemotherapy.

**MATERIALS & METHODS:** ten children with unilateral nonmetastatic renal cancer were treated since 2007 (mean age was 48 months). 8 (80%) of them were suspected of Wilms tumor (WT) and were included in the Italian AIEOP WT 2003 protocol. They received four weekly doses of vincristine (1,5mg/m<sup>2</sup>) and two doses of actinomycin D(1,35 mg/m<sup>2</sup>) and afterwards were submitted to LRN and lymph node sampling. The other 2 (20%) had metanephric stromal tumor (MST) and simple LRN with nodes biopsy was performed. Despite the age difference, the technique was carried out according to the same procedure. An open transumbilical approach was performed to realise the pneumoperitoneum and the abdominal cavity was always evaluated laparoscopically before the introduction of the other 4 trocars according to tumor location. The tumor was dissected and extracted without morcellation through a Pfannenstiel incision. In all patients the tumor was completely removed, as well as nodes samples and in 1 patient rupture of tumor occurred at the end of the procedure before extraction. The fibrous capsule involving the tumor, making the dissection easy to perform, and intraoperative bleeding was minimal. An intraperitoneal drain was placed in all cases.

**RESULTS:** All patients successfully underwent LRN with complete removal of tumour. No conversions were necessary. The patient with rupture was not overtreated because was considered stage III before the operation, and after 4 years she had no recurrency. 1 patient, treated as WT stage III, had recurrency one year after surgery and was treated in open surgery. The mean (range) operative time was 143,3 min (120-180 min), the drain was removal after three days and the mean hospital stay 5,3 (4-7) days. The estetical results were good in all cases.

**CONCLUSIONS:** LRN for unilateral pediatric renal cancer and in particular Wilms' tumor is feasible and safe procedure in children after chemotherapy, if performed with the same oncologic strategies as open surgery. If we reproduces all steps of the open surgical approach we can have good results with the advantage of short hospital stay and cosmetically more acceptable incisions. We also believe, and for as is mandatory, that a good practical experience of surgeon is required. Finally a long term follow-up and more cases are necessary to evaluate and compare the results of LRN approach with the open procedures.

**S045 THE ROLE OF VIDEOSURGERY IN THE TREATMENT OF WILMS' TUMORS** – *Edward Esteves, PhD, Rosemary G Crocetti, MD, Juliana V Gomes, Enf, Elecy M Oliveira, MD, Patricia O Brito, MD, Loretta S C Oliveira, MD, Rejane Nakano, MD Pediatric Oncology Division, Araujo Jorge Cancer Hospital of Goias, Goiania (GO), Brazil*

**BACKGROUND:** The classical surgical procedures for nephroblastomas have been through conventional laparotomy, or thoracotomy for lung metastasis. Many recent publications had reported on the videoassisted radical nephrectomy in selected cases, showing oncological outcomes similar to open nephrectomies, with the advantages of the minimally invasive surgery. The objective of the authors is to present a series of videoassisted radical nephroureterectomies (VARNU) for Wilms tumors and other applications of videosurgery for metastasis or re-staging purposes, after a medium-term follow-up.

**PATIENTS & METHODS:** From January/2002 to May/2008, 10 children with Wilms tumors underwent VARNU after SIOP protocols for preoperative chemotherapy. The criteria to indicate transperitoneal VARNU have been clinical stages I or II, and tumor transverse size no more than 6-8 cm, depending on the size of the patient. Using 3 ports, special transparietal sutures and lateralization of the patients, the kidney, ureter, perirenal fat, lymph nodes and eventually the adrenal gland, were freed laparoscopically and removed inside an endobag, through a suprapubic incision. Eight other patients underwent thoracoscopies or laparoscopies to remove metastasis (4 lung, 1 hepatic, 1 retroperitoneal) or for a second-look procedure in suspected post-treatment masses (2 cases, post-chemotherapy fibrotic mass). The criterion for the size of the metastasis

was 5 cm, removed through the axillary or umbilical ports. Four patients had laparoscopies indicated for pyeloplasty, ureteral reimplantation for grade 4 vesicoureteral reflux, cholecystectomy and oophorectomy for a secondary Hodgkin's disease radiation-field protection.

**RESULTS:** All the procedures could be performed without conversions and there were no laparoscopically related complications. Mean operative time for VARNU was 2.8 hours including the laparotomy. After a minimal follow-up period of 3 years, there is no tumor implant at port sites or at the other incisions. Those who underwent VARNU have no evidence of recurrence.

**CONCLUSIONS:** The laparoscopic or thoracoscopic procedures to help remove nephroblastomas are feasible and safe when performed in selected cases, allowing normal oncological results with minimal morbidity, with all the advantages of the minimal access surgery.

**S046 PEDIATRIC LAPAROSCOPIC PYELOPLASTY AND ROBOTIC-ASSISTED LAPAROSCOPIC PYELOPLASTY: A COMPARATIVE SINGLE-INSTITUTION STUDY** – *Edward Riachy, MD, W Robert Defoor, MD, Pramod P Reddy, MD, Eugene A Minevich, MD, Shumyle Alam, MD, Paul H Noh, MD Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio*

**PURPOSE:** Laparoscopic pyeloplasty (LP) and robotic-assisted laparoscopic pyeloplasty (RALP) have been performed to treat ureteropelvic junction obstruction (UPJO) in the pediatric population as an alternative to the open technique. The purpose of this study is to report our experience and compare the outcomes between these minimally invasive techniques.

**PATIENTS & METHODS:** A retrospective cohort study was performed of all patients who underwent LP and RALP for UPJO at a single pediatric institution from October 2007 to March 2011. Patient demographics, radiographic imaging, intra-operative details, and surgical outcomes were abstracted from the medical record. Indications for surgery included a symptomatic obstruction or an abnormal diuretic renal scan. A successful outcome was defined as absence of clinical symptoms, improvement of the drainage curve on a diuretic renal scan, improvement of hydronephrosis on ultrasound, or a stable ultrasound with resolution of symptoms.

**RESULTS:** We identified 51 patients who underwent 52 dismembered pyeloplasties (32 male, 19 female). LP was performed on 18 patients (9 left, 10 right). RALP was performed on 33 patients (18 left, 15 right). None had conversion to open surgery. Median age was 7 years for LP (range, 3 months - 18 years) and 10 years for RALP (range, 19 months - 22 years); p=0.096. Median weight was 30.3 Kg for LP (range, 6 - 71) and 40.7 Kg for RALP (range, 11 - 90); p=0.065. The median operative time was 274 minutes in LP (range, 145 - 387) and 227 minutes in RALP (range, 114 - 540); p=0.02. The median length of hospital stay was 1.63 days in LP (range, 1 - 4) and 2 days in RALP (range, 1 - 6); p=0.15. The median follow-up period was 33 months (range, 5 - 46) for LP and 17 months (range, 5 - 29) for RALP; p<0.01. Post-operatively, renal ultrasound showed an improvement of hydronephrosis in 15 patients with LP (78.9%) and in 27 patients with RALP (81.8%), and remained stable in 4 patients with LP (21.1%) and in 6 patients with RALP (18.2%); p=0.53. Post-operative nuclear renal scans were performed on 8 patients with LP (42%) and 2 patients with RALP (6%), and all demonstrated improved drainage. Based on the combination of symptoms and imaging, the overall success rate was 89.5% for LP and 100% for RALP; p=0.12. The complication rate was 10.5% (n=2) for LP and 3% (n=1) for RALP; p=0.54.

**CONCLUSIONS:** LP and RALP are both effective techniques to correct UPJO. RALP has a shorter operative time, but the hospital stay, success rate, and complication rate are comparable to LP.

## **S047 PEDIATRIC ROBOTIC PYELOPLASTIES: INITIAL EXPERIENCE AT A SINGLE CENTER** – *Katherine Herbst, MSC, Puneeta Ramachandra, MD, Christina Kim, MD FAAP Connecticut Children's Medical Center*

**PURPOSE:** The purpose of this analysis was to compare outcome and performance results from two studies performed at our institution. The first study was a retrospective chart review of the first 20 RALPs performed at the institution. The second study is a prospective registry which includes data from the 20 most recent RALPs performed at our institution.

**MATERIALS & METHODS:** Both studies received IRB approval. RALPs were performed in the retrospective group (RG) between January 2004 to April 2008. The prospective group's RALPs were performed between March 2009 to February 2011. All procedures were performed by one surgeon. Outcomes were based on post-operative imaging and excluded patients who had a re-do RALP. T-tests were performed for continuous variables and Fisher's Exact tests for categorical variables. Statistical analysis was performed with SPSS 17.0.

**RESULTS:** There was no significant difference in demographics between the two groups. The majority of patients were male (65% PG, 79% RG), diagnosed prenatally (57% PG, 52% RG), and pain was the reported most often as the primary indication for surgery (31% PG, 47% RG) followed by hydronephrosis or worsening renal function (42% PG, 37% RG). Mean age at time of surgery for PG was 77 months (SD +/- 61) and RG was 65 months (SD +/- 70). RALP surgical time was significantly shorter in the PG compared to the RG ( $p < 0.01$ ). Mean operative time was reduced by over an hour among these two time periods (294 min PG, 363 min RG). Narcotic use was statistically similar among the groups when comparing mean Morphine intravenous (IV) equivalent per kg (0.40 mg/kg PG, 0.42 mg/kg RG) as was mean length of stay (1.4 days PG, 1.6 days RG).

There was no statistically significance difference in resolution of hydronephrosis between the two groups. Postoperative imaging was stable or improved in 94% (PG) and 100% (RG). One patient in the PG had failure and required an endoscopic incision secondary to recurrent stenosis (5%). Mean follow up for PG was 8.5 months and 18.4 months for RG.

**CONCLUSION:** The experience in pediatric RALP is growing at our institution. The primary factor changing with experience is faster operative times. This increased efficiency does not correlate with compromised outcomes. We continue to enroll patients in our prospective database to strengthen the power of our outcomes analysis.

## **S048 DIRECT PATH TO SUCCESS: A FAST AND ACCURATE TECHNIQUE OF ANTEGRADE PASSAGE OF A DOUBLE J STENT IN LAPAROSCOPIC PYELOPLASTY** – *Fiona J Murphy, MRCS Ed, Supul Henneyake, FRCS Royal Manchester Children's Hospital*

We report the use of a novel technique to facilitate antegrade passage of a double J stent for laparoscopic pyeloplasty.

**TECHNIQUE:** A long cannula is passed from just under the 12th rib to provide direct passage for a guide wire down the ureter without coiling. The guide wire length is measured from the pubic symphysis to the back of cannula to ensure correct positioning of the tip in the bladder.

**METHODS:** We retrospectively reviewed the placement of Double J stents in all cases of laparoscopic pyeloplasty between 2005 and 2009.

**RESULTS:** Prior to the introduction of the above technique there were a total of 8 patients, average age 11.8 years and stent insertion took 18mins, there were 2 cases where the stent was malpositioned in the ureter. A total of 20 patients had Double J stents inserted using the cannula technique with an average age 11.2 years, insertion took 6 mins and all stents were in a good position.

**CONCLUSIONS:** The use of a cannula to insert the guidewire and/or the double J stent provides a direct path from the skin surface to the ureter to avoid coiling and therefore misplacement of the stent. This technique is fast, accurate and reproducible

## **S049 LAPAROSCOPIC VERSUS OPEN DISTAL PANCREATECTOMY FOR TRAUMATIC PANCREATIC TRANSECTION: MULTI-INSTITUTIONAL OUTCOMES** – *Corey W Iqbal, MD, Shauna M Levy, MD, Kuojen Tsao, MD, Mikael Petrosyan, MD, Timothy D Kane, MD, Elizabeth M Pontarelli, MD, Jeffrey S Upperman, MD, Shawn D St. Peter, MD Children's Mercy Hospitals and Clinics; University of Texas Health Science Center At Houston and Children's Memorial Hermann Hospital; Children's National Medical Center; Children's Hospital of Los Angeles*

**PURPOSE:** Pancreatic injuries due to abdominal trauma are uncommon. When they are associated with disruption of the main pancreatic duct, surgical intervention is indicated. However, the role of laparoscopy in the setting of traumatic pancreatic injuries has not been well described.

**METHODS:** The trauma registries at four large volume pediatric trauma centers were queried to identify those patients  $\leq 18$  years of age who underwent a distal pancreatectomy for traumatic pancreatic transection from 2000-2010. Patients with associated abdominal injuries that required emergent exploration and were therefore not candidates for laparoscopy were excluded. Data was collected via chart review. All values are expressed as the mean  $\pm$  standard deviation unless otherwise specified.

**RESULTS:** Eighteen patients who underwent a distal pancreatectomy for traumatic pancreatic injury without other emergent indications for laparotomy were identified. Mean age was  $8.6 \pm 4.9$  years and 67% were males. Six patients underwent laparoscopic pancreatectomy. Only one patient in the laparoscopic group had an associated traumatic splenic injury, but no patients in this group required splenectomy. The remaining 12 patients underwent open distal pancreatectomy of which 2 out of 3 patients with an associated traumatic splenic laceration also underwent splenectomy. Patients in the open group had a greater body mass index although this was not significant ( $18.2 \pm 3.9$  vs.  $15.3 \pm 1.6$  kg/m<sup>2</sup>,  $p=0.1$ ). There was no difference in the presence of other injuries between the laparoscopic and open groups (33% vs. 42%,  $p=1.0$ ). All patients underwent computed tomography scan: 100% in the laparoscopic group had confirmed duct disruption while 84% in the open group had confirmed duct disruption preoperatively ( $p=1.0$ ). Mean days to operation from the injury was  $1.3 \pm 1.2$  in the laparoscopic group versus  $0.9 \pm 1.5$  in the open group ( $p=0.5$ ). Intraoperatively, all patients were found to have pancreatic transection with disruption of the main pancreatic duct. The pancreatic stump was stapled in 67% of the laparoscopic group versus 38% of the open group ( $p=0.6$ ); the pancreatic duct was oversewn in 50% of the laparoscopic group versus 75% of the open group ( $p=0.6$ ). Mean operative time was  $191 \pm 78$  minutes with laparoscopy compared to  $162 \pm 67$  minutes open ( $p=0.6$ ). Median duration of hospitalization was 8 days in the laparoscopic group (range 6-18 days) compared to 11 days in the open group (range 5-25 days) ( $p=0.5$ ). There were 5 complications in the laparoscopic group including pancreatic leak ( $n=2$ ), postoperative ileus ( $n=1$ ), abdominal wall hematoma ( $n=1$ ), and wound infection ( $n=1$ ). Three complications occurred in the open group and included a symptomatic pleural effusion ( $n=1$ ), readmission for nausea and vomiting ( $n=1$ ), and a wound infection ( $n=1$ ).

**CONCLUSIONS:** Laparoscopy can be used to perform distal pancreatectomy for isolated pancreatic injuries in children with comparable results to the open approach. Data from more centers will further elucidate its comparative role.

## **S050 IPEG SURVEY ON LIVE CASE DEMONSTRATIONS IN**

**PEDIATRIC SURGERY** – *Jens Dingemann, MD, Pablo Laje, MD, Shawn D St Peter, MD, Benno M Ure, MD PhD Hannover Medical School and Bult Children's Hospital Hannover, Germany / Dept of General Surgery, The Children's Hospital of Philadelphia, Philadelphia, USA / Dept of Surgery, Children's Mercy Hospital, Kansas City, USA*

**BACKGROUND:** Live case demonstrations (LCD) during surgical meetings have become a common educational method in minimally invasive surgery throughout most surgical specialties. Recently, concern has been raised about the ethics of this teaching method, patient safety during live surgery and the risk-to-benefit ratio compared to other educational methods. Surgeon's elevated stress level, the need to comply with the meetings' time schedule, unfamiliar team and equipment for the surgeon and questionable indications for the procedure performed represent some of the unknown risk factors of LCD, which resulted in the prohibition of live surgery in some surgical societies. We aimed to investigate the opinion and experience of the members of IPEG on LCD.

**METHODS:** An online based survey was performed from December 2010 to January 2011 on behalf of the IPEG Research committee. All IPEG members were contacted by email and requested to complete an anonymous questionnaire including data on personal background and 11 statements on LCD. The questionnaire consisted of two different branches for attendees of live cases and performing surgeons. The participants were asked to indicate their agreement to the statements on a scale from 1 (I do not agree) – 5 (I fully agree). Scores are quoted as median and standard deviation on this scale.

**MAIN RESULTS:** 61 performing surgeons and 148 attendees completed the questionnaire. 83% of performing surgeons indicated elevated stress levels during LCD. 25% of both surgeons and attendees were aware of events that were harmful for the patient during LCD. Both groups agreed with the statement that LCD may be harmful for the patient (surgeons  $3\pm 1.2$ ; attendees  $3\pm 1.4$ ). Both groups disagreed with the statement that LCD may be beneficial for the patient (surgeons  $2\pm 1.2$ ; attendees  $2\pm 1.3$ ). However, LCD was rated as essential for educational purposes by both surgeons ( $3\pm 1.3$ ) and attendees ( $3\pm 1.3$ ). LCD was regarded as having a high impact on their surgical skills and everyday work by attendees ( $4\pm 1.2$ ). Surgeons agreed with the statement that the benefits of LCD in surgical education outweigh the possible disadvantage for the patient ( $3\pm 1.2$ ). Attendees did not agree with this statement ( $2\pm 1.3$ ). Both surgeons ( $4\pm 1.4$ ) and attendees ( $3\pm 1.4$ ) agreed that LCD should continue to be part of surgical meetings. Nevertheless, 36% of surgeons and 52% of attendees would not agree to consent for LCD in their own child.

**CONCLUSION:** LCD is regarded as an essential part of surgical education by the IPEG members. However, it represents a controversial topic among both performing surgeons and attendees. The majority of the IPEG community appear willing to continue LCD during pediatric surgical meetings. If IPEG decides to go on with LCD, our attention has to be drawn to patient safety issues and ethical considerations in this field.

## **S051 LAPAROSCOPIC ADRENALECTOMY FOR ADRENAL TUMOR IN CHILDREN: TRANSPERITONEAL OR RETROPERITONEAL APPROACH?**

– *Tran N Son, MD PhD, Nguyen T Liem, MD PhD National Hospital of Pediatrics, Hanoi, Vietnam*

**INTRODUCTION:** Indications for laparoscopic surgery (LS) in management of adrenal tumor in children as well as optimal selection between transperitoneal (TP) and retroperitoneal (RP) approach for this technique have not been well defined. The aim of this study is to investigate safety, feasibility and effectiveness of LS in management of adrenal tumor in children, comparing TP and RP approach.

**METHODS:** Medical records of all patients undergoing laparoscopic surgery for adrenal tumor from December 2002 to June 2011 at National Hospital of Pediatrics, Hanoi, Vietnam were reviewed. Choice of TP or RP approach was according to surgeon preference. Laparoscopic techniques, tumor characteristics and outcome were analyzed.

**RESULTS:** 27 patients were identified, 17 boys and 10 girls, with mean age of  $4.5\pm 3.6$  years (ranged from 1 to 11 years). The TR approach was used in 12 cases (8 left and 4 right side tumors, mean tumor size  $5.8\pm 2.4$ cm) and the RP - in 15 (4 left and 11 right side tumors, mean tumor size  $4.9\pm 1.5$ cm). Laparoscopic adrenalectomy was successful (without conversion) in 85.2%, 75% and 93.3% of all, TP and RP cases, respectively. Operative time ranged from 35 to 260 minutes (mean  $128\pm 52$  minutes) and mean number of ports used was 3.4. The most common tumor histology were neuroblastoma (8 cases, 29.6%), ganglioneuroma (7 cases, 25.9%), ganglioneuroblastoma (4 cases, 14.8%), pheochromocytoma (4 cases, 14.8%). There were no significant differences between the TP and the RP group regarding patient gender, age, tumor size, number of ports used, conversion rate, operative time. However, time for resuming of bowel function and length of stay in surgical department were significantly shorter in the RP group in comparison to the TP group (mean values of 1.0 and 1.4 days vs. 2.1 and 2.9 days, respectively,  $p<0.001$ ). There was no intra- or post-operative complication and all patients were discharged in good health. For a median follow up period of 14 months, a local recurrence was detected in one patient with undifferentiated neuroblastoma in the RP group, and adhesive intestinal obstruction occurred in one patient in the TP group.

**CONCLUSIONS:** Both TP and RP approaches for laparoscopic management of pediatric adrenal tumor are safe, feasible and effective in selected cases. The RP approach should be preferable because of its advantage of shorter time for resuming of bowel function and lack of risk of postoperative adhesive intestinal obstruction.

## **S052 THORACOSCOPIC PROCEDURES FOR TREATMENT OF MEDIASTINAL AND PULMONARY MASSES IN CHILDREN: 10 YEARS EXPERIENCE**

– *Alexander Rsazumovsky, Prof, Victor Rachkov, Alexander Zadvernyuk, Abdumanap Alhasov, Zoriko Mitupov, Said-khassan Batayev, Nadezhda Kulikova, Oganeg Geodakyan Filatov Children's Hospital, Moscow, Russia*

Due to the development of minimal invasive surgery most thoracic operations can be performed using a thoracoscopic approach. But the thoracoscopic removing of nonmalignant tumors in children is still a challenging procedure.

**METHODS:** From 2001 to 2011, in Filatov Children's Hospital, 108 children with mediastinal or pulmonary masses were operated on. The age of children ranged from 1 month to 17 years. 36% of patients were less than 1 year old. Their weight ranged from 3,3 kg to 77 kg. The cystic tumors and malformations were presented by congenital pulmonary cysts - 28 patients, foregut duplication cysts - 21, lymphangiomas - 13, subpleural bullae - 11, hydatid cysts - 8, and pericardial cysts - 3. The maximal size of cystic lesion was 2,400 ml. The solid masses were presented by teratomas - 7 in 9 children, benign neurogenic tumors - 8, pseudotumors - 6, thymolipoma - 2, lipoma - 2. The maximal size of solid masses in mediastinum was  $10\times 10\times 20$  cm. In most of the patients we used one-lung ventilation during thoracoscopies. In young children we used standard AVL. The pressure in the thoracic cavity was 4-8 mm Hg. In most cases we carried out the operation through a 4 trocars approach: 3 - 3 or 5 mm and 1 - 10 mm. For vessel sealing we used endoscopic clips, Hem-o-Lock clips and the LigaSure Sealing system. In several cases we used endoscopic staplers. Resected masses were removed through the incision for 10 mm trocar.

**RESULTS:** 80 patients underwent elective, and 28 - emergency surgery. We performed thoracoscopic lobectomies in 23 children with cysts and benign tumors of the lungs, atypical lung resection in 16 patients and thoracoscopic cystectomy in 16 patients. In 52 children we performed thoracoscopic operations to remove mediastinal cysts and benign tumors. In the beginning of our study there were 8 conversions to open procedures due to severe adhesive process in the thoracic cavity (4 cases), gigantic volume of the tumors (3 cases) and severe bleeding from the tumor's parenchyma (1 child). There were several complications: trauma of the diaphragmatic nerve, bleeding from intercostal arteries, adhesions and tumor parenchyma. In the postoperative period we found in 4 children pneumothorax and in 1 child - hydrothorax. There was no intraoperative or postoperative mortality.

**CONCLUSIONS:** We consider thoracoscopic operations to be the procedure of choice for mediastinal and pulmonary mass removal. These operations can be performed in all age groups, even for the children with low weight.

**S053 LAPAROSCOPIC HERNIA SAC TRANSECTION AND INTRACORPOREAL LIGATION SHOWS VERY LOW RECURRENCE RATE IN PEDIATRIC INGUINAL HERNIA** – *Yoon-jung Boo, MD, Hyung-joon Han, MD* Division of Pediatric Surgery, Department of Surgery, Korea University College of Medicine

**BACKGROUND:** There are many variable techniques for laparoscopic inguinal hernia repair in children. The aim of this study was to see feasibility of laparoscopic hernia technique which based on the same surgical principles with conventional open herniotomy.

**METHOD:** Between November 2008 and August 2011, 207 pediatric patients with inguinal hernia were included in this study under informed consent. All of the patients were operated with laparoscopic technique of sac transection and intra-corporeal ligation. The asymptomatic contralateral patent processus vaginalis were repaired with same method. Patients were routinely followed for 2 years. Perioperative complication and recurrence rate were evaluated.

**RESULTS:** In total 202 patients were enrolled in final analysis. The mean follow-up period was 12.5 months. Percentage of contralateral PPV was 43%. Mean operation time was 26 minutes for unilateral hernias and 34 minutes for bilateral hernias. One had mild hematoma on inguinal area immediate postoperative period, which was resolved spontaneously within 7 days. Recurrence and metachronous hernia were not observed so far.

**CONCLUSION:** Laparoscopic hernia sac transection and intra-corporeal ligation is safe and effective alternative for conventional herniotomy.

**S054 THE PEDESTAL PROJECT: EXPLICIT PEDIATRIC MIS TRAINING BEYOND SIMULATION** – *Thane Blinman, MD, Pat Casale, MD* Children's Hospital of Philadelphia

**INTRODUCTION:** Work-hour restrictions have reduced surgical training hours while operative techniques (especially minimally invasive methods) have become more challenging and patients have become more complex. The "long-soak" of experience-based training is a form of implicit training that cannot succeed within these constraints. Training deficiencies in new trainees have become apparent to experienced staff, test scores have declined, and patient safety has not improved.

**METHODS:** The PEDESTAL (PEdiatric Endoscopic Surgical Training & Advancement Laboratory) Project was launched in order to apply proven cognitive techniques to shift surgical training from an implicit to an explicit training model. Explicit training includes: deliberate practice, shaping/supervised learning, unsupervised training, fuzzy-trace theory, extended mind theory, and related techniques well-established in other fields for development of expert level of proficiency. These methods were adapted for a pediatric MIS curriculum of laboratory-based surgical (General and Urologic) training, with emphasis on "cognitive authenticity" of task training

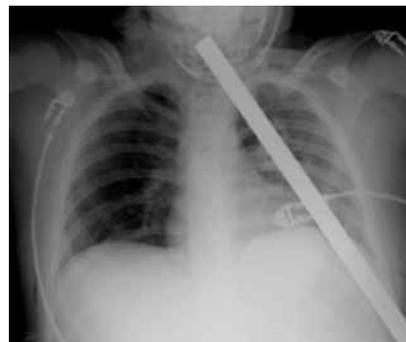
and methods grounded in the underlying biomechanics of patients of varying sizes (especially biological scaling). A cohort of trainees in this program was compared to previous trainees at the same training level.

**RESULTS:** Over a trial period of eight months, general surgery and urology residents from intern to post-training fellow level underwent training, each completing as many as eight training blocks according to a defined curriculum. All reported gains in knowledge of surgical biomechanics and breakthroughs in individual MIS skill. Attending staff noted improved performance by trainees in the operating room, particularly when skills practice was completed the night before a challenging case.

**CONCLUSIONS:** An explicit training program accelerates surgical skill development. Laboratory training can create a feed-forward training loop with operating-room training. Training methods used by athletes, musicians, pilots and other high-skill professionals can be adapted to surgical training, reliably accelerating surgical skill development.

**S055 THORACOABDOMINAL REBAR IMPALEMENT: A MINIMALLY INVASIVE APPROACH** – *Kathleen M Dominguez, MD, David P Blake, MD, Mary C Mccarthy, MD* Wright State University, Miami Valley Hospital

**INTRODUCTION:** Impalement injuries are rare, spectacular, and can result in complex surgical problems. Traditional management includes removal of the object in the operating room with wide operative exposure. We present the case of a child who sustained a thoracoabdominal impalement injury after falling on rebar, and successful management using minimally invasive techniques.



**CASE REPORT:** A 7 year-old female was playing at a construction site near her home. She fell, landing on a piece of rebar, resulting in impalement to her left flank. On presentation she was alert and hemodynamically normal. The rebar entered the left flank at the posterior axillary line in the 10th interspace. She had subcutaneous emphysema of the chest and neck. Physical exam was otherwise unremarkable. CXR revealed the end of the rebar to be right of midline at the level of C5. Given her hemodynamic stability, a CT scan was performed to assist in operative planning. The rebar appeared to enter the abdomen adjacent to the spleen and compress the stomach before traversing the diaphragm. It then traversed the lower chest and exited to the extra-thoracic soft tissues up to the level of the neck in the soft tissues.

**OPERATIVE TECHNIQUE:** The patient was positioned in a partial right lateral decubitus position. Two thoracoscopic ports were placed: in the fourth interspace in the anterior axillary line; and in the sixth interspace at the midclavicular line. Single lung ventilation was performed. We were unable to clearly view the path of the foreign body, but given the known path and that there was very little blood present in the thoracic cavity at this time, we proceeded to remove the foreign body. The rebar was pulled from the left flank wound and came out rather easily. The lung and left hemithorax were monitored during this process. Very little additional bleeding was noted. The left flank wound was then explored. The diaphragm was palpable through the wound, and

there was no apparent defect. The foreign body did not appear to have violated the abdomen, with the injury occurring at the costophrenic angle and then traversing the thorax. Given this, a decision was made to perform diagnostic laparoscopy to verify that no intra-abdominal injury or diaphragmatic injury had been sustained. The thorax was thoroughly irrigated and two 28-French Blake drains were placed. The left flank wound was debrided and the deep fascia was closed. We then proceeded with diagnostic laparoscopy through a single port at the umbilicus. The abdomen was explored and no pathology was evident. The diaphragm was viewed without difficulty and there did not appear to be any violation of the abdominal cavity or injury to the diaphragm. The spleen and stomach were intact without evidence of injury.

**POST OPERATIVE COURSE:** The patient recovered without incidence. Her chest drains were removed on post-operative days 2 and 3, and she was discharged home on post-operative day 6.

**CONCLUSION:** In select hemodynamically stable patients, impalement injuries can be managed using minimally invasive techniques. Preoperative imaging is useful in operative planning.

**5056 MAGNAMOSIS (MAGNETIC COMPRESSION ANASTOMOSIS DEVICE FOR MIS): TRIBULATIONS OF THE DEVELOPMENT AND REGULATORY PROCESS: 510K, IDE, CE MARK, ETC** – *Michael R Harrison, MD, Kelly D Gonzales, MD, Kullada O Pichakron, MD, Dillon A Kwiat, BS, James Wall, MD, Shinjiro Hirose, MD* Department of Surgery, University of California, San Francisco, San Francisco, CA; Department of Surgery, David Grant USAF Medical Center, Travis AFB, CA; Department of Surgery, Stanford University, Palo Alto, CA

**PURPOSE:** Magnamosis is a system that creates an anastomosis through magnetic compression. In prior studies, we demonstrated safety and efficacy in pigs by creating gastrojejunostomies, jejunajejunostomies, duodenocolostomies, and colocolostomies using minimally invasive endoscopic and laparoscopic techniques. The purpose of this study is to review the arduous process of design development and regulatory review.

**METHODS:** We reviewed the process from design development through regulatory FDA approval for the first in human pilot trials. The resources for the device development process (engineering, prototyping, biomechanical testing, intellectual property, regulatory consultation, etc) were accessed through a grant from the FDA establishing a Pediatric Device Consortium at UCSF, and in the later phases by a start up company, Magnamosis Inc.

**RESULTS:** The magnetic ring design evolved over 5 years from machined titanium, to machined plastic, to injection molded polycarbonate. The device designed to deliver and release each magnetic Ring evolved from standard flexible endoscopic guide wire and balloon to an endoscopic snare that fits into a circumferential groove in each ring. The fully developed magnamosis device can be placed using endoscopic and/or laparoscopic techniques, including SILS and NOTES.

The regulatory process proved difficult: An application for 510 K status required multiple lengthy responses to FDA questions and requirements including extensive and expensive biomechanical testing, leak testing, sterilization validation testing, biocompatibility testing, shelf life testing, packaging, labeling, instructions for use, package inserts, etc. In anticipation of human trials at IRCAD in Strasburg, we entered the equally difficult CE Mark process. And in anticipation of human trials in the US, the IDE process is necessary.

**CONCLUSION:** The design development process under the FDA funded Pediatric Device Consortium proved efficient and productive, yielding a device that can create a secure compression anastomosis using minimally invasive endoscopic and/or laparoscopic techniques. Innovative surgeons will find many ways to use the magnamosis

strategy to solve a variety of clinical problems. However, approval to use the device has proven extremely difficult due to the complexity and cost of navigating the regulatory process.

**5057 LAPAROSCOPIC OVARIAN CORTICAL HARVESTING IN GIRLS AT RISK OF GONADAL FAILURE** – *Naomi Whyler, Dr, Claire Clark, MBChB MRCS Ed, Fraser Munro, FRCS, Hamish Wallace, Professor, Richard Anderson, Professor, Amanda McCabe, FRCS, Timothy Bradnock, MBChB MRCS Ed Royal Hospital for Sick Children Edinburgh*

**ABSTRACT:** Introduction: Girls undergoing chemotherapy and radiotherapy are at a risk of gonadal failure. Ovarian tissue cryopreservation provides hope for restoration of fertility. Our unit is the national UK centre for ovarian cryopreservation in children and we present our experience.

**AIM:** Review the reason for referral, complications associated with the procedure and to highlight any problems that may have occurred with the service provided.

**METHOD:** A retrospective case note review was performed on all patients who had a laparoscopic ovarian cortical cryopreservation procedure in our insitute. Demographics, reason for referral, intra or post operative complications particularly portsite problems, bowel damage severe intra-operative bleeding and conversion to open procedure where looked at.

**RESULTS:** 20 patients were identified. Median age of 12.5yrs (range of 5-16). 9 patients were to have chemotherapy, 1 radiotherapy and 10 to receive both. Indications for referral included haematological malignancy ( 5 Hodgkin's lymphoma), solid tumours (3 rhabdomyosarcomas, 3 Ewing's sarcoma, and non haematological conditions ( sickle cell anaemia). There were no deaths associated with the procedure. There were no port-site problems, no severe intra or post-operative bleeding, no conversions, no bowel damage. So far no patients have requested ovarian access for fertility issues.

**CONCLUSION:** Laparoscopic ovarian cortical harvesting in our unit is a safe procedure with currently no peri-operative complications, that should be offered to girls at risk of premature ovarian failure due to medical treatments. Long term assessment of fertility is awaited.

**5058 COST TRENDS IN PEDIATRIC LAPAROSCOPIC SURGERY** – *Stephen D Adams, MRCS, Simon C Blackburn, MRCS, Anthony Phippard, Anies A Mahomed, FRCS Paed Royal Alexandra Children's Hospital, Brighton*

**BACKGROUND:** The adult and paediatric literature both suggest that the operative time and costs associated with commonly performed laparoscopic procedures decrease over time (1; 2).

**AIM:** Following our initial learning curve, we sought to examine the ongoing trends in costs and operative time in paediatric laparoscopic surgery.

**METHODS:** A dataset prospectively collected in a tertiary paediatric surgical unit between 2008 and 2010 was reviewed. Data regarding costs incurred from the use of consumable and re-usable items were extracted. The data were analysed in Microsoft Excel 2003 and Linear logistic regression performed to assess trends in cost and operative time. R-squared values were calculated.

**RESULTS:** Four index laparoscopic procedures were reviewed: appendicectomy, Fowler-Stephens' orchidopexy, fundoplication, and laparoscopic assisted percutaneous endoscopic gastrostomy (PEG) placement. 144 children were included, of whom 126 had complete costing data available. Data regarding operative time were complete for all patients. There was no significant change in procedure costs or operative time over this 3-year period.

**DISCUSSION:** The expectation that the costs and operative time associated with paediatric laparoscopic surgery continue to decrease over time is not supported by this analysis. A previous focus on cost-reduction in the department and a centralised procurement process within the trust means our costs are currently static. This study looks beyond our previously reported learning curve, therefore it seems mean operative time is now also a fairly constant variable.

**CONCLUSION:** Costs and operative times have stabilised for these four index procedures following our previously reported year-on-year decreases(2).

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## **S059 EFFECT OF RESIDENT POST-GRADUATE YEAR ON POST-OPERATIVE COMPLICATIONS AFTER LAPAROSCOPIC APPENDECTOMY**

– *Jessica A Naiditch, MD, Timothy B Lautz, MD, Katherine A Barsness, MD Children's Memorial Hospital, Northwestern University Feinberg School of Medicine, Chicago, IL*

**INTRODUCTION:** The effect of resident involvement in surgical cases on operative outcomes has not been well studied in pediatric surgery. The purpose of this study was to determine if the post-graduate level of the involved resident affects operative outcomes for patients undergoing laparoscopic appendectomy.

**METHODS:** After obtaining approval from our Internal Review Board, we conducted a retrospective chart review of all children that underwent a laparoscopic appendectomy from January 2007 to June 2011 at a free-standing children's hospital. Patients were divided into groups based on the most junior resident or fellow involved in the operation: (1) junior resident (first, second or third year); (2) senior resident (fourth or fifth year); (3) fellow; (4) attending only. Based on these groupings, we compared outcomes including operative time, need for conversion to an open operation, length of hospital stay, post-operative complications, and post-operative interventions. Outcomes of interest were compared using Chi-squared test for categorical data and ANOVA and Student's t-test for continuous data. All factors of interest were also entered into a multivariable logistic regression.

**RESULTS:** Patients in the junior resident group (n = 338), senior resident group (n = 133), fellow group (n = 259) and attending group (n = 86) were similar in terms of age (P = 0.71), gender distribution (P = 0.45), race (P = 0.26), and perforation status (P = 0.40). Operative time was shorter for senior residents (48.9 ± 14.4 minutes; P = 0.0020), fellows (43.1 ± 18.5 minutes; P < 0.0001) and attending surgeons (43.7 ± 15.2 minutes; P = 0.0001) when compared to junior resident cases (55.0 ± 20.4 minutes; referent) and fellow operative time was comparable to attending operative time (P = 0.81). Length of stay (3.5 ± 3.1 days, 3.8 ± 3.5 days, 4.4 ± 5.3 days, and 3.3 ± 2.1 days, respectively; P = 0.025) varied among the groups significantly. The rate of conversion to an open operation was similar between groups [2(0.6%), 0, 3 (1.2%), and 0; P = 0.61]. Resident level was not predictive of complications, which occurred in 29 junior resident cases (8.6%; referent), 17 senior resident cases (12.8%; OR 1.53; P = 0.21), 37 fellow cases (14.3%; OR 1.66; P = 0.06), and 9 attending cases (10.5%; OR 1.42; P = 0.40). Fellow involvement was associated with an increased rate of post-operative intervention including percutaneous abscess drainage or reoperation for abscess or bowel obstruction. These interventions occurred in 17 junior level cases (5.0%; referent), 7 senior level cases (5.3%; OR 1.06; P =

0.90), 28 fellow level cases (10.8%; OR 2.12; P = 0.024), and 4 attending cases (4.7%; OR 1.12; P 0.85).

**CONCLUSION:** Operative time correlates with post-graduate training level. The learning curve for efficient use of operating time is completed at the fellow level, when operative time is comparable to attending surgeons. Although fellow cases were more likely to require post-operative interventions, overall complication rates did not correlate with post-graduate training level. With proper supervision, junior resident intra-operative involvement in pediatric laparoscopic appendectomy does not negatively affect outcomes.

## **S060 TRACTION ELONGATION OF THE DIAPHRAGM OR FOKERS TECHNIQUE FOR REPAIR OF THE LARGE DIAPHRAGMATIC DEFECT**

– *Yury Kozlov, MD, Vladimir Novozhilov, MD, Irina Weber, MD, Andrey Rasputin, Marina Kononenko, Elena Novikova, Nicolay Syrkin, Konstantin Povarin, Natalya Aleynikova, MD Municipal Pediatric Hospital, Irkutsk, Russia*

**BACKGROUND:** Thoracoscopic repair of congenital diaphragmatic hernia (CDH) is a safe and feasible in a variety of children. The patients that had a large CDH defect were treated traditionally with patch incorporation via thoracoscopy or thoracotomy. But this technique has two basic disadvantages - a high recurrence rate and postoperative pectus deformity. The optimal tissue for defects closure is a native diaphragm. We report early results with growth induction of the diaphragm during the extracorporeal traction. This concept was applied initially by J.Foker on patients with long gap esophageal atresia.

**MATERIAL & METHODS:** We have been performing a thoracoscopic CDH repair in all neonates since 2005. In 2 full term patients in which a patch repair was necessary, the approach was converted in lengthening technique. This technique consists of the placement of extracorporeal traction sutures into the rim of the diaphragm and bringing these sutures through the thoracic wall in IX-X intercostal space under thoracoscopic control. Postoperatively, these sutures are pulled 2-3 mm daily. Once the thoracic wall and diaphragmatic rim were in proximity, a second one-trocar thoracoscopy was performed on 9 and 10 postoperative days and traction sutures were tied in subcutaneous tissue.

**RESULTS:** A relatively rapid growth response of the diaphragm occurred in all 2 patients. Following primary diaphragmatic repair demonstrated excellent closure of the defects. In first patient was developed a left chylothorax, which required tube drainage and octreotide administration. Both of these patients had a prolonged postoperative ventilatory support because was needed the muscular paralysis for staged repair of the diaphragm. Outpatient follow-up after 1, 3 and 12 months showed normal position of the left hemidiaphragm on radiographic control. There were no deaths and no evidence of recurrence and thoracic wall deformity. These results suggest that even the small segment of the diaphragm has a potential to achieve normal size and that the full CDH spectrum can have a primary repair.

**CONCLUSION:** We report a new method of the thoracoscopic repair for large CDH defects in neonates, based on unique idea of growth stimulation in a variety of human tissues. This 2-stage approach can be performed thoracoscopically instead patch incorporation.

## **S061 EXPANDING "ENDOSCOPIC REVERSED NUSS" PECTUS CARINATUM REPAIR WITH 8-HOLE-STABILIZERS, SUBMUSCULAR CO2 AND PRESTERNAL NUSS BAR(S) BERLIN-BUCH MIDTERM RESULTS IN 72 PATIENTS 2008-2010**

– *K Schaarschmidt, Prof MD, M Lempe, MD, F Schlesinger, MD, U Jaeschke, MD, S Polleichtner Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch, Germany*

**OBJECTIVE:** Since 2001 we minimized access (2.9-4.7 cm) for universally applicable endoscopic hybrid carinatum technique (EH) with 2

transsternal Willital bars in 165 EH patients with very satisfactory results. In 2008-2010 "endoscopic reversed Nuss" with a new 8-hole-stabilizer and endoscopic repair of costal flaring replaced the endoscopic hybrid technique in most patients with sufficient chest elasticity. This prospective study of 72 "Endoscopic Reversed Nuss" (ERN) pectus carinatum repairs intends to establish a standard technique and the scope of indications for this improved technique.

**METHODS:** 2008-2010 we used endoscopic Nuss bar compression with endoscopic repair of costal flaring applying a bilateral new 8-hole-stabilizer fixed to the bar without screws or wires, which allows unprecedented versatility and the use in pectus carinatum beyond adolescence. 72 "endoscopic reversed Nuss" patients aged  $17.6 \pm 6.1$  y (range 12.7-52.6y) were recorded prospectively and followed at 3 monthly intervals. We implant 1 or 2 standard Nuss bars (11-14') into an endoscopically dissected submuscular presternal pocket correcting PC by sternal back-pressure and balanced torque applied by the bilateral 8-hole-stabilizers. The bars were bent to a concavity over the maximal prominence of the PC and put under tension and torque by backward traction via bilateral 8-hole-stabilizers and 3 endoscopically placed pericostal wire sutures on each side. In 2 combined PE/PC deformations "sandwich bars" i.e. both a retrosternal Nuss bar and a presternal "reversed Nuss bar" with the sternum in between were used. In some patients endoscopic costotomies were performed to improve malleability of the chest.

**RESULTS:** All 72 pectus carinatum repairs, including 6 redos (4 redos after Ravitch and 2 for secondary PCs after Nuss) were done by "endoscopic reversed Nuss" (ERN) with no conversion, older patients received pleural drainages. So far there was no local or general complication, there was no seroma or bar dislocation although often one wire per side was found broken on bar removal (obviously a frequent but uneventful finding). 63 patients judged their result as excellent, 7 as good, 2 as fair, 19 "endoscopic reversed Nuss" bars were removed uneventfully 22-37 Mo after surgery with no recurrence after 2 years so far. The technical improvements allow the use in PC beyond adolescence including redos and combined deformities.

**CONCLUSIONS:** Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch is a supranational reference centre for thoracic deformities, during the same period 474 Nuss PE repairs (total 1154 Nuss) were performed. Although this is an early experience, "endoscopic reversed Nuss" (ERN) is safe and effective so far and new technical improvements have expanded the range of applicability to older patients and suitable redos.

## **S062 THORACOSCOPIC REPAIR OF RECURRENT CONGENITAL DIAPHRAGMATIC HERNIAS: INITIAL EXPERIENCE**

– *Shaun M. Kunisaki, MD, Ian Powelson, Robert A Drongowski, Marcus D Jarboe, MD, James D Geiger, MD, George B Mychaliska, MD University of Michigan C.S. Mott Children's Hospital*

**PURPOSE:** Recurrent herniation is a well-known complication following initial repair of a congenital diaphragmatic hernia (CDH). Nevertheless, there is no consensus on the best operative approach for recurrent diaphragmatic repair in the otherwise stable pediatric patient, and the role of minimally invasive surgery, specifically thoracoscopic repair, in this setting remains undefined. The purpose of this study was to evaluate our recent experience with thoracoscopic repair compared with traditional open methods of repair in patients with recurrent CDH.

**METHODS:** We retrospectively reviewed 239 consecutive patients with Bochdalek CDH managed at the University of Michigan C.S. Mott Children's Hospital between 1992 and 2011. Cases of recurrent CDH were identified and analyzed. Data collected included side of defect, associated co-morbidities, and operative methods employed for all

recurrent repairs. Operative time, duration of mechanical ventilation, and hospital length of stay following recurrent CDH repair were evaluated as end points and analyzed using  $\chi^2$  and unpaired t-testing with significance at p-values less than 0.05.

**RESULTS:** Nineteen patients (8%) developed a recurrent CDH in our registry. Seventy-nine percent of these recurrences occurred in children with left-sided defects. A patch was employed during the initial repair in 68% of cases. Fifty-eight percent required ECMO during the neonatal period. Fifteen patients (79%) had an open repair for recurrence. Although most of these patients had the recurrence repaired through a laparotomy incision, a thoracotomy was utilized in 3 patients. A thoracoscopic repair for recurrence was attempted in 6 cases and successfully completed in 4 patients. One of these patients had a previous thoracoscopic primary repair. A patch closure was required in 2 patients. The mean age at the time of thoracoscopic recurrent CDH repair was 11.5 months (range, 8.1-16.1 months). Mean operative time was 191 minutes (range, 94-296 minutes). All children were extubated within 24 hours following thoracoscopic repair. The mean hospital length of stay was 3.75 days (range, 1-6 days). There were no significant differences in operative time, duration of mechanical ventilation, and length of stay based on operative approach. There were no deaths or subsequent recurrences in the thoracoscopic recurrent repair group after a mean follow-up period of 24.9 months (range, 15.3-43.0 months). There were 2 patients with subsequent recurrences following open recurrent CDH repair.

**CONCLUSION:** Our initial experience suggests that thoracoscopic repair for recurrent Bochdalek CDH can be achieved with excellent outcomes in selected patients. The thoracoscopic approach appears to be a safe and effective alternative to laparotomy or thoracotomy for recurrent CDH.

## **S063 ENDOSCOPIC SERIAL EXTERNAL RIB CORTEX EXCISION FOR CORRECTION OF PROMINENT COSTAL ARCHES IN THORACOSCOPIC NUSS REPAIR**

– *Klaus Schaarschmidt, Prof MD PhD, Michael Lempe, MD, Uwe Jaeschke, MD, Susanne Polleichtner Helios Centre of Pediatric and Adolescent Surgery Berlin-Buch, Germany*

**OBJECTIVE:** Nuss procedure for pectus excavatum has stood the test of time but no satisfactory solution has been found for exceptionally prominent costal arches, which are present in about half the patients and severely disfiguring in roughly every 10th patient. These flaring ribs are increased by sternal elevation and are not normalized by standard Nuss procedures.

**METHODS & PROCEDURES:** Under epidural PCA 1154 adolescents (12-49 years, mean  $17.8 \pm 5.6$  y; 981 male/173 female) got thoracoscopic Nuss repair from 4/2000-8/2011. 539 patients (including the majority of the females) had prominent costal arches mostly slightly asymmetric. In 117 patients costal arch eversion exceeded the funnel depth. Based on our endoscopic hybrid technique for pectus carinatum, 2 trocars were inserted through the planned incision line and 3 intercostal spaces caudal to the incision line. CO<sub>2</sub> was insufflated into the submuscular space to lift the muscular coverage off the prominent ribs which was dissected off the bony thorax endoscopically right down to the costal arches. In 539 patients the ribs 7-10 were first incised by diathermy. Under direct sight then an endoscopic rongeur was introduced into the submuscular pockets. Serial strips from the external rib cortex of mostly 7 th-10th rib are excised rendering the prominent ribs malleable. 539 patients In 117 patients 2-3 segments of about 0.5-1cm are excised from the costal arch itself in these case the severed ribs are axially reanastomosed by strong vycril sutures under endoscopic sight using endoscopic needle holders. The costal arch is molded manually and an elastic thoracic bandage fitted in the operating room has to be worn

for 6 weeks postoperatively. The notched ribs are drained by suction drainage, blood loss is only slightly increased.

RESULTS: All including the most severe costal arch deformities could be corrected to normal from the Nuss accesses + drainage holes without additional access or complications. Apart from two early fair results aesthetic results are excellent, minor unevenness is corrected at the time of bar removal.

CONCLUSION: Endoscopic serial external rib cortex weakening was a simple and effective complementary procedure for repairing prominent costal arches in 539 thoracoscopic Nuss funnel chest repairs.

## **S064 MINIMALLY INVASIVE RELEASE OF THE MEDIAN ARCUATE LIGAMENT FOR CELIAC ARTERY COMPRESSION SYNDROME: AN EARLY EXPERIENCE IN A PEDIATRIC POPULATION**

– Rachel L Garness, RN CNP, Ryan Antiel, Gustavo S Oderich, MD, Peter Glocviczki, MD, Abdalla E Zarroug, MD Mayo Clinic, Rochester, MN, USA

INTRODUCTION: Celiac artery compression syndrome, also known as median arcuate ligament syndrome (MALS), is an uncommon syndrome resulting in external compression of the celiac axis by the median arcuate ligament. Symptoms of MALS, which significantly impact quality of life, include postprandial epigastric pain, weight loss, nausea and vomiting. Treatment, including surgical division of the median arcuate ligament after careful patient selection, remains controversial. Currently there are no published data regarding laparoscopic release in pediatric patients. We report an early experience, including quality of life measures in a series of adolescents.

METHODS: Patients (n=4) were managed by a multidisciplinary team at Mayo Clinic in Rochester, Minnesota. At surgical referral, mean age was 15 years (range 13 – 16 years) and all were female. Each patient complained of post-prandial pain in the mid-epigastrium, 3 also had nausea and vomiting. Mean time to diagnosis was 21.5 months (range 8-36 months). All patients underwent duplex ultrasound and either a CT or MRI angiogram pre-operatively. Therapeutic interventions were discussed with patients and families, including surgical division of the median arcuate ligament. All patients decided to proceed with surgical treatment. Patients and parents (4 mothers) were given the CHQ-CF87 (child form) and CHQ-PF50 (parent form) pre-operatively and at least 3 months post-operatively to assess quality of life. The Child Health Questionnaire (CHQ) is a validated questionnaire devised for both children and their families to measure quality of life in multiple domains of health (ex. physical functioning, role/social limitations, behavior and family activities and cohesion).

RESULTS: Laparoscopic release was performed using a 5 trocar technique. Fibrous tissue anterior to the celiac artery was completely cleared until the trifurcation of celiac axis was free. Upon completion, no visible stenosis was present. All procedures were performed laparoscopically without conversion to open. Median operative time was 187.5 minutes (range 152-235 minutes). There were no intra-operative or post-operative complications. Average hospital stay was 1.5 days (range 1-2 days). At post-operative follow-up (mean of 10 weeks, range 2-17.5) pain was markedly reduced or resolved in all four patients. Imaging studies (CTA or duplex ultrasound) at follow-up revealed considerably decreased stenosis of the celiac artery and flow velocities within normal limits (mean 213cm/sec, range 200-275). Post-operative quality of life measures (n=3) showed trends towards increasing well-being and functioning in all areas of the questionnaire.

CONCLUSION: In our early experience, laparoscopic treatment of MALS in adolescents is safe, efficacious, and has positive results on quality of life in well selected patients by a multidisciplinary team. Continued research is indicated to determine significance of results.

## **S065 THE EARLY FIBRINOLYTIC THERAPY REDUCES VATS AND THORACOTOMY RATES IN CHILDREN** – Hayley Wilson, Miss, Devaraj Channappa, Dr, Christopher Lewis, Mr, Sridharan Jayaratnam, Dr, Askar Kukkady, Mr, Stuart Brown, Mr, Udaya Samarakkody, Mrs Department of Pediatric Surgery, Waikato Hospital, Waikato Clinical School of University of Auckland, Hamilton, New Zealand

AIM: We aim to analyze the improvement in the outcome by following British Thoracic Society (BST) Guidelines with minor amendments in the management of parapneumonic effusions and Empyema in children.

BACKGROUND: The parapneumonic collection progressing to empyema is a challenging problem to the paediatric surgeons. Early video assisted thoracoscopic decortication (VATS) has improved the outcome in children. A structured approach to the management including early fibrinolytic therapy may further improve the outcome.

METHOD: Retrospective analysis of 11 years (1998- 2009: Group 1) and a prospective analysis of two years (2009-2011: Group 2) of patients admitted to the Division of Child Health, Waikato Hospital were undertaken. Group 1 was managed based on clearly defined clinical and radiological criteria. Group 2 was managed by the BTS guidelines with minor amendments endorsed by the American Association of paediatric Surgeons. The demographic data, pre hospital duration of illness, length of stay, pre-procedure and post procedure stay, microbiology, radiology, antibiotic therapy, Fibrinolytic therapy and surgical procedures were analysed. The primary outcome was the need for surgery, duration of hospital stay post procedure and the two groups were compared on these outcomes.

RESULTS: Group 1 and 2 had 51 and 20 patients respectively. The average age is 4.9 yrs. The predominant bacteria identified were Staphylococcus aureus and Streptococcus Pneumoniae. In Group 1, 26 had Intercostal tube (ICT) only and 22 had ICT followed by surgery. 3 were managed without ICT. The surgical group comprised of 10 of Video assisted thoracoscopy (VATS) and 12 of thoracotomy with decortication and 2 VATS followed by thoracotomy. In Group 2, 11 out of 15 patients with ICT received fibrinolytic therapy. 5 had no ICT. No patient required either VATS or thoracotomy in Group 2. The hospital stay in the two groups were comparable. The management has evolved in group 1 over the years. Therefore the comparison of hospital stay was not valid in the early part of the series.

CONCLUSION: The use of BST guidelines with further amendments has reduced the VATS and thoracotomy rates remarkably. The early Fibrinolytic therapy improves the outcome. The microbiology of the empyema has been consistent over the years.

## **S066 THORACOSCOPIC MANAGEMENT OF LONG GAP**

**ESOPHAGEAL ATRESIA** – Edward Esteves, PhD, Marcelo C Silva, MD, Kelly C Paiva, MD, Roneyara R Valamiel, MD, Agner A Moreira, MD, Celio C Chagas, MD, Humberto B Souza-filho, MD Pediatric Surgery Division, University of Goias, Goiania(GO), Brazil and Joao Penido Hospital, Juiz de Fora (MG), Brasil

BACKGROUND: Most cases of esophageal atresia (EA) are type C (3), which can almost always be repaired by thoracoscopic primary anastomosis. The difficult cases are the long gap ones, including type A (1) anomaly, some type C neonates with the proximal pouch at the neck or complicated cases after failure of primary anastomosis. The objective of this paper is to present some thoracoscopic techniques that we have successfully used in long gap EA in order to avoid esophageal replacement. Patients and methods: From dec/2000 to march/2011, 13 children admitted with long gap EA did not have the possibility of primary anastomosis without tension. Nine had type 1 EA and one type 3 EA, whose proximal pouch did not grow adequately during some weeks, including 3 of them located entirely at the neck. Two children had a failed primary anastomosis requiring a redo-procedure. One had a Kimura esophagostomy. A thoracoscopic Foker technique was used

in 9 patients, a U-tube-flap of the proximal pouch (Tan-Keith flap) in 2, primary anastomosis of the patient having a Kimura esophagostomy, total esophageal dissection and cardia elevation in one.

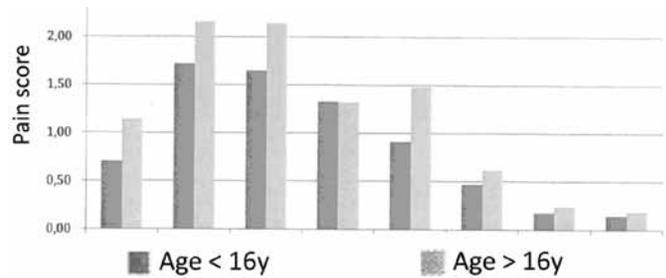
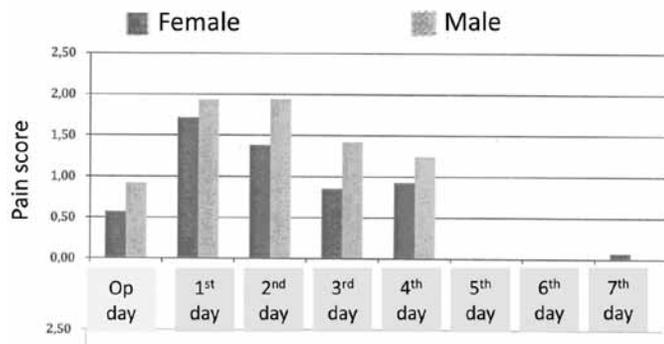
**RESULTS:** All 13 patients could be operated on without conversions. One patient had disruption of the Foker sutures at the proximal pouch after 6 days, however, at reoperation a primary anastomosis could be achieved with little tension and did well. Mean time of extracorporeal traction in Foker I technique was 22 days. One patient had a Foker II intracorporeal traction, he was reoperated on after 10 days and the anastomosis was easy. Gastroesophageal reflux was documented in 9 children (69%) after a variable period of time ranging from 2 months to 4 years post-operatively, and 5 (38%) of them needed a laparoscopic fundoplication. Esophageal stenosis have occurred in 5 patients, which has been treated endoscopically. Surgery-related complications included atelectasis (2 cases) and chylothorax (1). **Conclusions:** Many thoracoscopic procedures prior to primary anastomosis can be performed in patients with long gap EA, in order to help avoid anastomotic tension or loss of the esophagus. Most patients can be benefited by Foker traction sutures, extensive dissection of the esophagus and flaps from the proximal pouch. The main postoperative problem is gastroesophageal reflux, that should be investigated and most of them may need surgical treatment.

**S067 PAIN AND ANXIETY MANAGEMENT IN MINIVASIVE REPAIR OF PECTUS EXCAVATUM** – *Elisa Brandigi, MD, Marco Ghionzoli, MD, Caterina Morelli, MD, Francesca Tocchioni, MD, Aurora Mariani, MD, Stefania Ragozzino, MD, Alessandro Pane, MD, Alessandra Martin, MD, Roberto Lo Piccolo, MD, Andrea Messeri, MD, Antonio Messineo, MD* Department of Pediatric Surgery, Children's Hospital A. Meyer, Florence, Italy

**BACKGROUND & AIM:** Nuss procedure for the correction of Pectus Excavatum (PE) is associated with an intense postoperative pain. Our strategy to control early postoperative pain is to combine epidural analgesia and when not sufficient we supplement with intravenous analgesia. A crucial moment for pain control is represented by the changeover from epidural to oral analgesia occurring usually after 48-72 hours after surgery. Our aim was to identify a good strategy for pain control, reviewing all the cases treated at our institution over 4 years' period.

**METHODS:** Sixty consecutive patients, aged between 12 and 26 years, were operated at our institution from January 2007 to September 2010. Demographics, intraoperative, postoperative data were collected. Pain score was evaluated by means of numerical rating scale (NRS). Data are presented as median ± [range]. Student t-test was used for a statistical analysis.

**RESULTS:** Median age was 16 [12-27] with a male/female ration of 7,6:1. Epidural catheter was placed in all the cases and 45 patients (75%) required additional drugs to control pain and remained in place for 74 hours [72-96]. In 5 (8%) patients catheter was malfunctioning mainly due to obstruction. Cumulative oral opiates dose was 97.5mg [20-270]. Average opiate dose was 90mg for patients who also assumed anxiolytics and 109mg for the remainder. Pain score was increased in male patients and reduced in those younger than 16 years (Fig 1).



**CONCLUSION:** In our series we observed an increase of pain score within the first 24 hours after surgery is likely related to a residual effect of general anaesthetic. The first postoperative day, as expected, is characterised by the highest pain score with a significant reduction only after the 4th/5th day. Both gender and age had an impact on pain control and we also noticed a synergistical effect between opiates and tranquilizers. We reckon that the use of oral opiate after epidural meet the patients' pain control requirements, hence it might be debatable to maintain epidural analgesia for longer than usual.

**S068 STAGED THORACOSCOPIC REPAIR OF A LONG GAP ESOPHAGEAL ATRESIA WITH INTERNAL TRACTION SUTURE** – *D. Patkowski, MD PhD, W. Gorecki, MD PhD, S. Gerus, MD, P. Wojciechowski, MD PhD, M. Zielinska, MD PhD, U. Dorobisz, MD PhD, A. I Prokurat, MD PhD* Departments of Pediatric Surgery and Urology, Anaesthesiology, Radiology, Medical University of Wroclaw, Department of Pediatric Surgery, Jagiellonian University, Krakow, Poland

**BACKGROUND:** Repair of long gap esophageal atresia is a challenge. Several different techniques have been invented. No single one is universally accepted for its superiority. The definitive repair is significantly postponed in many children, who are subjected to staged procedures with negative consequences of rethoracotomy.

**OBJECTIVE:** To evaluate the safety and efficacy of repetitive thoracoscopy with suture approximation and delayed primary esophageal anastomosis in early infancy.

**MATERIAL & METHOD:** Between June 2010 and September 2011, six newborns (4 girls, 2 boys) with long gap esophageal atresia (no distal tracheo-esophageal fistula - TEF), were managed by a thoracoscopic approach. The first stage surgery was performed between 2 and 12 (median 2.5) days of life. The procedure was preceded by a rigid bronchoscopy to exclude a proximal fistula. Thoracoscopy was performed in right semi-prone position with combination of 3 ports- 5 mm and 3.5 mm placed around the scapula. A 5mm 300 telescope was used and 4-6 mmHg CO<sub>2</sub> pneumothorax was established for better exposure of posterior mediastinum. The azygos vein was not divided. Both oesophageal ends were mobilized and the proximal TEF present in two newborns was closed with 5mm clips and divided. Non-absorbable 2-0 suture was advanced to the proximal and distal esophagus. A sliding knot for slow approximation of both ends under the tension was used. All children had a feeding gastrostomy performed. At the subsequent approach, under favorable conditions, a definite anastomosis over an 8F nasogastric tube by single stitches of 5-0 Vicryl was constructed. Otherwise, new traction suture was applied.

**RESULTS:** Sixteen thoracoscopies were performed with no conversion to open thoracotomy. The second thoracoscopy was done between 28 and 45 (median 32) days of life, and the oesophageal anastomosis was completed in 3 patient on the 30th, 31st, and 45th day of life, respectively. One child had the third approach with anastomosis performed on the 73th day of life, another required 5 thoracoscopies: 3 approximations of oesophageal ends, one to close the perforation caused by traction suture

in upper oesophagus and one to complete the anastomosis on the 3rd, 28th, 35th, 62th, and 86th day of life, respectively. We found no difficulties with repetitive approach to the pleural cavity, as well as exposition, dissection and suture of esophagus after the previous procedures.

In 5 children with anastomosed esophagus, a contrast study was performed between 5-7 days postoperatively. Anastomotic healing was satisfactory in each case. Oral feeding was progressively started replacing the gastrostomy route. There was no mortality. Four children required calibration/dilatation of the anastomosis for a mild and treatable stricture. One case is still presenting with clinical signs of reflux. One case after two stages is still awaiting definitive procedure.

**CONCLUSION:** We believe our technique is alternative option for the repair of long gap esophageal atresia, and offers functional native esophagus in early infancy. Thoracoscopic approach allows to avoid negative consequences of open thoracotomy for growing child. Repetitive thoracoscopy does not hinder the exposure for dissection in pleura and posterior mediastinum.

### **S069 THORACOSCOPIC RESECTION OF LUNG METASTASES IN CHILDREN FOLLOWING PREOPERATIVE CT-GUIDED LABELING**

– *Steven W Warmann, MD, Juergen F Schaefer, MD, Guido Seitz, MD, Joerg Fuchs, MD* Department of Pediatric Surgery and Pediatric Urology, and Department of Pediatric Radiology, University Hospital Tuebingen, Hoppe-Seyler-Str. 3, 72076 Tuebingen, Germany

**BACKGROUND:** Lung metastases are associated with an impaired prognosis in most pediatric solid malignancies. Usually affected children receive neoadjuvant chemotherapy and additional local treatment thereafter if lung lesions persist. Usually, complete clearance of lung metastases represents an independent prognostic factor for which surgery plays a key role. However, several challenges persist from the surgical point of view: Regularly, the number of metastases detected by preoperative imaging differs relevantly from intraoperatively detectable lesions. Also some nodules are hard to identify during surgery since their consistency is similar to the lung parenchyma. The thoracoscopic approach has been increasingly used for resection of lung metastases in certain conditions. By now metastases that are not visible on the lung surface represent a limitation for using minimally invasive resection techniques. We present the use of preoperative CT-guided labeling of lung metastases prior to thoracoscopic resection.

**PATIENTS & METHODS:** We analyzed three patients who underwent thoracoscopic removal of lung metastases which were not visible on the lung surface. All patients had undergone previous lung surgery for primary lung metastases in their clinical course. One patient suffered from osteosarcoma, one had Ewing sarcoma, and one had a PNET. All patients received CT scan in the thin sliding Maximum intensity projection (thin MIP, 1mm) technique under general anesthesia. The lung nodules were labeled under CT guidance using platinum coils with conjunct transthoracic platinum wires. Immediately after this procedure the patients were taken to the operating room and thoracoscopic resection of the labeled metastases was carried out. Single lung ventilation was performed during thoracoscopy. Postoperatively, all children received a chest tube and were transferred to the intensive care unit for one day.

**RESULTS:** The age of the patients at operation was 14.2, 17.5, and 8.5 years, respectively. One patient had 5 metastases (3 on the right side/2 on the left side). The second patient had 2 lesions (1/1), and the third patient had 1 lesion on the right side. CT-guided labeling of metastases was performed without complications in all patients. Time for labeling was x minutes, y minutes, and z minutes, respectively. All labeling wires were clearly identified intraoperatively and all lesions could be removed by wedge resection. The time for thoracoscopic resection was 150

minutes, 60 minutes, and 45 minutes, respectively. R0 resection status was realized in all patients. Chest tubes were removed after 5, 7, and 3 days, respectively. Children were discharged from the hospital after 7, 8, and 5 days. There were no intraoperative or postoperative complications.

**CONCLUSIONS:** Thoracoscopic resection of preoperatively labeled lung metastases is a safe procedure in children suffering from solid tumors. This technique allows minimally invasive removal of metastases even when the lesions are not visible on the lung surface and seems ideal for resecting small numbers of metastases. It allows surgery on both lungs in a single stage approach. Operative trauma and time period until the subsequent systematic treatment are relevantly decreased. Further analyses will have to clarify whether this fact contributes to an improved prognosis for affected patients.

### **S070 LEFT THORACOSCOPIC THYMECTOMY FOR PEDIATRIC MYASTHENIA GRAVIS** – *Samiksha Bansal, MD, David Partrick, MD* Children Hospital of Colorado, Denver, CO

**BACKGROUND:** Myasthenia gravis is a debilitating disease necessitating long-term medical therapy. Autoimmune myasthenia gravis, the most common variant in children, often requires recourse to immunomodulation including prolonged usage of high-dose steroids. Thymectomy as a therapeutic modality for Myasthenia gravis (MG) has been practiced since 1911 and traditionally has been performed via transcervical or transsternal approach. Over the past two decades, there have been multiple reports in adults, where the success of trans-sternal thymectomy has been compared with the results of thoracoscopic thymectomy, but there are limited reports in the pediatric population. The aim of our study is to report our thoracoscopic experience with thymectomy in children and its efficacy in the treatment of MG. Our study represents the largest study for left thoracoscopic thymectomy in children to our knowledge.

**METHODS:** A retrospective analysis of all thoracoscopic thymectomies in children in our institution between September 2001 and February 2011 was performed. Patients with MG on anticholinesterase drugs and/or steroids were considered for surgery in case of clinical deterioration or failure of medical treatment alone. All thymectomies were performed using a left-thoracoscopic approach. Preoperative localization of thymic tissue was done by a thoracic CT exam.

**RESULTS:** A total of 8 children underwent left thoracoscopic thymectomies during the study period. The operative times were 128 +/- 46 min. Patients were placed in the right lateral thoracotomy position. Three 5 mm left sided thoracoscopic ports were used. There was no major intraoperative or postoperative complication. Postoperative chest tube drainage was not required. The children were discharged on the first postoperative day. The follow-up is 6 months to 10 years, with a clinical improvement enabling the diminution of medication for >75% of our patients.

**CONCLUSIONS:** Based on our study, we conclude that left thoracoscopic thymectomy in children is a safe and effective surgical technique for the treatment of MG. It is less invasive, has superior cosmesis, and presents a shorter hospital stay, less morbidity, and probably an increase in acceptance of thymectomy by patients and neurologists, enabling earlier surgical management in the course of the disease.

## **VO01 LAPAROSCOPIC MEDIAN ARCUATE LIGAMENT RELEASE**

– *Ryan M Antiel, MA, Joseph B Lillegard, MD PhD, Rachel L Garness, RN CNP, Yassar Hashim, MBBS, Abdalla E Zarroug, MD Mayo Clinic*

**BACKGROUND:** Median arcuate ligament syndrome (MALS) is an uncommon and controversial diagnosis that results from narrowing of the celiac artery by the fibrous portion of the diaphragmatic crura. The traditional surgical approach has been open celiotomy and division of the median arcuate ligament with or without celiac artery reconstruction. We present here our transperitoneal laparoscopic approach to MALS in an adolescent.

**METHODS:** 16 year-old female patient with history of postprandial pain and weight loss. Pre-operative evaluation consisted of mesenteric and celiac artery duplex scanning, abdominal and pelvic computed tomography (CT), and upper and lower gastroesophageal endoscopy. CT angiography demonstrated celiac artery narrowing just after the take off of the aorta, poststenotic dilation of the celiac artery and dilation of the gastroduodenal artery. No other abnormalities were found and therefore with the patient's history a diagnosis of MALS was determined.

**RESULTS:** A transperitoneal laparoscopic approach utilizing a single 10-mm umbilical trocar and four 5-mm trocars was used. All median arcuate ligament and ganglionic fibrous bands were completely released using electrocautery and scissors until the celiac, common hepatic, splenic and left gastric arteries were completely skeletonized. No residual stenosis remained. Total operative time was 240 minutes. There were no intraoperative or perioperative complications and the patient was discharge home on postoperative day number two. Follow-up duplex ultrasound confirmed normalization of peak systolic velocities. The patient states at 1, 6, and 12 months that she continues to have complete resolution of her preoperative symptoms.

**CONCLUSION:** Our patient was able to leave the hospital on postoperative day number two and did not suffer any significant morbidity. In selected cases, a minimally invasive approach to MALS can be safe and effective in children and should be considered.

## **VO02 LAPAROSCOPIC TREATMENT OF OBSTRUCTED UTERINE DUPLICATIONS IN PEDIATRICS**

– *Maria M Bailez, MD, Lucila Alvarez, MD, Paula Flores, MD Pediatric Surgery, Garrahan Children`s Hospital, Buenos Aires Argentina*

**INTRODUCTION:** Obstructed lateral fusion uterovaginal (UV) anomalies result from a failure of fusion of both mullerian ducts associated with one side failure of the lumen to communicate with the outside. The most frequent variety is the double uterus with an obstructed hemivagina and ipsilateral renal agenesis (Wunderlich-Heryn-Werner syndrome) which treatment is endovaginal resection of the septum, creating one single vagina. A higher level of obstruction (duplicated uterus, 1 obstructed at the cervix) is rare and its symptoms very acute because of the loss of the reservoir-like action of the duplicated vagina to accommodate the menstrual blood. We have previously described an hysteroscopic treatment under laparoscopic vision of these anomalies. This technique was not always easy to accomplish in pediatrics.

**AIM:** Describe a laparoscopic technique used to treat this variety of obstructed uterine duplication that requires uterine unification to provide a successful drainage of the obstructed hemiMuller into the patent one.

**PATIENTS:** Four adolescents with this anomaly were treated. Their mean age was 13,5 years. They were admitted with acute abdominal pain. All of them had severe dysmenorrhea; normal external genitalia and a patent vagina. There was no endovaginal "bulging" and ultrasound showed an asymmetric uterine duplication. (No chance of endovaginal treatment) MRI showed an asymmetric hematomethra in all of them but misdiagnosed an hematosalpinx as an hematocolpos in 1 patient.

**SURGICAL TECHNIQUE:** A 5mm 30degree lens was used in the umbilicus and 2 5mm working ports. A metal Rubin canula was used as a uterine manipulator through the patent cervix. The fundus of both uterus were incised as in the Strassman procedure by means of either a bipolar sealer with a monopolar tip or a monopolar hook device. Dissection continued resecting the thick tissue between both (duplicated walls) until the metal canula in the patent uterus could be seen. Its mobilization helped to confirm that both cavities communicate between them. The uterus was closed bringing both fundus together in the midline using a running suture. At the conclusion of the procedure a single incision was visible beginning from the back of the uterus at a position dictated by the depth of the septum and continuing anteriorly to a corresponding position in front.

**RESULTS:** All procedures were completed without conversion. Mean operative time was 90 min. Mean hospital stay was 1,5 days. Patients are asymptomatic, with regular menses and no ultrasonic evidence of obstruction after a mean follow up of 10 months. (4-24m)

**DISCUSSION:** Although rare the described anomaly always presents at a pediatric age. Sequela of undiagnosed and inadequate treatment is severe endometriosis. Minimally invasive techniques are the procedures of choice either hysteroscopic when possible or laparoscopic as presented in this video.

## **VO03 THORACOSCOPIC DIVISION OF A VASCULAR RING IN**

**A CHILD** – *Curt S Koontz, MD, Robert J Vandewalle, MD University of Tennessee College of Medicine - Chattanooga, TC Thompson Children's Hospital at Erlanger*

**PURPOSE:** To detail the technical aspects of a thoracoscopic vascular ring division

**METHODS:** In an exaggerated right lateral decubitus position (almost prone), a Veress needle was introduced into the left chest inferior to the tip of the scapula. Using 5 mmHg of CO<sub>2</sub>, a pneumothorax was created. A 5mm trocar was placed for the camera. The working ports were placed relative to the mid-axillary line: a 5mm trocar posteriorly and a 5mm trocar anteriorly. An additional 2mm incision was placed for a Mini-step grasper. Dissection of the pleura overlying the aorta was accomplished by electrocautery and blunt dissection. Structures to be identified during dissection of the vascular ring were the phrenic, vagus, and recurrent laryngeal nerves. A vessel loop was placed around the ligamentum arteriosum to facilitate clip placement. Division of the ligamentum was accomplished between two 5mm Hem-o-lok clips. A test clamp was performed prior to clipping. After division, esophageal adhesions were taken down bluntly, both proximally and distally to the vascular ring. An orogastric tube was placed to facilitate this dissection. Absorbable suture was used to close the deep layers and the skin incisions were closed with Dermabond.

**RESULTS:** The procedure was completed successfully using the thoracoscope. Operative time was around 90 minutes. A chest tube was not placed. The patient was observed in the PICU overnight and then discharged the next day. She was seen in follow up at 3 weeks. Her dysphagia symptoms had completely resolved. A post-operative esophagram showed marked improvement in the caliber of the esophagus. An indentation of the esophagus, however, from the aberrant left subclavian artery, was still present on the post-operative study.

**CONCLUSION:** Thoracoscopic division of a vascular ring in a child can be a safe and effective technique that minimizes the potential complications and cosmetic issues associated with a thoracotomy.

## **V004 USE OF THE CYSTOSCOPE AS A UTERINE MANIPULATOR AND THE SCROTAL INCISION OF THE DARTHOS POUCH AS A TROCER SITE .TRICKS TO AVOID ACESORY PORTS IN RESECTION OF MULLERIAN REMNANTS AND BILATERAL ORCHIDOPEXY IN A 46 DSD MALE** – *Maria M Bailez, MD, Lucila Alvarez, MD, Javier Ruiz, MD, Mariana Costanzo, MD Garrahan Children´s Hospital Buenos Aires Argentina*

AIM: Present a 46xy DSD patient who underwent a laparoscopic resection of a Mullerian remnant and bilateral orchidopexy using 2 tricks

PATIENT: At 7 days of life a baby presented because of ambiguous genitalia with a small phallus (2 cm length), labioscrotal folds, right small inguinal gonad (volume < 0.5 cc), and severe hypospadias with a single perineal opening . Karyotype was 46,XY. Basal levels of LH and FSH were increased for age and displayed an exaggerated response to LHRH. Basal and peak testosterone (T) levels were normal . Both low anti-Müllerian hormone (AMH) and inhibin B were observed. Müllerian structures were present on ultrasound and genitography disclosed a urogenital sinus. The baby presented normal adrenal function. A new heterozygous mutation in NR5A1 gene was found. Male sex was assigned. He responded well to three cycles of testosterone treatment (20 mg) with enlargement of the phallus (3.7 cm length and well-developed corporeal tissue). Laparoscopy showed Müllerian duct remnant that was removed. Bilateral orchidopexy was performed

SURGICAL TECHNIQUE: A 4 mm 30 degree lens and 2.3 mm working ports were used .The 2 tricks presented are 1) the cystoscope was introduced into the vaginal component of the urogenital sinus resembling a uterine manipulator used in adult gynecology facilitating the mullerian remnant mobilization under laparoscopic vision and avoiding the use of a 4th trocar. 2) one of the 2 scrotal incisions created for the darthos pouch was used to introduce 1 of the 3 mm working ports while the other was placed in the umbilicus by the lens (SPA concept) ending with a scarless surgery. A biopsy of the right ovary was performed.

RESULTS: Operative time was 80 min. One scrotal port probed to be useful for both orchidopexias .The biopsy of the right gonad revealed noncannulated seminiferous tubules with Sertoli cells, few germ cells, loose interstitium, and fibrovascular tissue. Leydig cells were not identified. Currently, at the age of one year old he is waiting correction of hypospadias.

## **V005 LEFT LATERAL SEGMENTECTOMY USING SINGLE SITE SURGERY PLUS-ONE FOR THE MANAGEMENT OF A COMPLEX LIVER CYST** – *Robert Baird, MSc MDCM, Jean-martin Laberge, MDCM Montreal Children's Hospital, McGill University Health Center*

Complex hepatic cysts in the pediatric population have a low malignant potential and are amenable to the application of minimally invasive techniques. In this report, we describe a novel approach to manage a complex hepatic cyst by performing a left lateral segmentectomy using a Single Site Surgery port with one additional 5 mm port. The pre-operative presentation and work-up, intra-operative technical details, and the short-term post-operative outcome is described. This technique is feasible in the absence of evidence of a malignant or parasitic origin of the cyst, and yields an excellent cosmetic result with an accelerated recovery timetable.

## **V006 LAPAROSCOPIC RESECTION OF A HEPATIC TUMOR** – *Gaston Elmo, Silvana Prodan, Lizia Toselli, Anahi Salomon, Santiago Calello, Julia Udaquiola, Daniel Liberto, Mauricio Urquiza, Miguel Ciardullo, Juan Pekolj, Pablo Lobos Hospital Italiano de Buenos Aires*

INTRODUCTION: Laparoscopic hepatic resection is a technique in recent development. In pediatric surgery Benign tumor lesions, localized in anterior and superficial hepatic segments could be a suitable indication for this method.

MATERIALS & METHOD: Case presentation - Video. The data was obtained from the electronic clinical history with the recording of the surgical act, edited for the solicited time.

RESULTS: A 10 year old female patient presented with complaints of pain and palpation of epigastric movable tumor. Images revealed an injury of 10cm in diameter with a central scar, clear delimitation, compatible with Focal nodular hyperplasia (FNH) Programmed Videolaparoscopy proceeded: 4 trocars, umbilical, epigastric and both flanks. A solid pediculated tumor is detected on the third segment. An atypical hepatic resection is performed on the third segment with safety margins using harmonic scalpel (Ultracision®), irrigation and aspiration canula and monopolar cautery. As bleeding appeared on the scene, Pringle manoeuvre with extra corporeal clamping was conducted. This was sustained for 7 minutes. Through an umbilical incision with minor extension, the piece (previously fragmented) was removed in a protection bag. Hemostasis was done with Argon Beam on the bloody area. Abdominal drainage (Blake® N°15). Operating time 150 minutes. Estimated blood loss < 50 ml. Discharge from hospital 48 hours PS. Pathological anatomy report confirmed diagnosis (FNH).

CONCLUSION: The laparoscopic resection permitted this patient's pathology to be solved, reducing discharge time and optimizing cosmetic results. The Pringle's maneuver was executed both safely and effectively to minimize the bleeding. The presented case supports video laparoscopic technique for pediatric hepatic resections in carefully selected cases.

## **V007 LAPAROSCOPIC AND ROBOTIC COMBINED TECHNIQUE FOR TOTAL PROCTOCOLECTOMY ON PEDIATRIC PATIENTS** – *Gaston Elmo, Silvana Prodan, Luzia Toselli, Anahi Salomon, Santiago Calello, Joaquin Larrabide, Daniel Liberto, Mauricio Urquiza, Pablo Lobos Hospital Italiano de Buenos Aires*

INTRODUCTION: A new technology called robotic surgery (RS) is spreading through a variety of procedures so as to solve many of the difficulties of laparoscopic interventions without losing the benefits of minimally invasive surgery. It has proven to have some advantages over laparoscopic surgery (LS) due to its ability in constrictive areas such as rectal interventions. In larger areas, such as the abdomen, it can be replaced by LS, obtaining less surgery time and lower costs. The aim of this paper is to describe a combined laparoscopic and robotic assisted surgery for total proctocolectomy with ileal pouch using the best of both techniques.

METHODS & MATERIALS: Two patients (aged 13 and 16) with different pathologies, ulcerative colitis and polyposis underwent total proctocolectomy applying combined laparoscopic and robotic assisted surgery (from January 2010 to June 2010). The Da Vinci® robot was used in both cases provided by Intuitive Surgical (Sunnyvale, CA) it is still the only surgical robot system approved by Food and Drug Administration (FDA) for proctocolectomy and laparoscopic equipment of 5mm for colectomy.

RESULTS: There were no intra-surgery complications. Surgery lasted 4hrs 30m (4 to 5hrs). Patients were discharged from hospital five days later (4 to 6 days). Radiological post-surgery control showed good passage and adequate storage of materials. Ileostomy closure was done without complications. Follow up of patients was between 17 and 14 months respectively, showing good evolution with fecal and urinary continence with 3 to 4 depositions daily. No erectile dysfunction was detected on the male patient.

DISCUSSION: The Da Vinci system works its best on confined and constrictive areas such as the pelvis cavity therefore it is not possible to seize all the advantages during open surgery. Disadvantages of

this procedure such as surgical cost and time are diminished when combined technique is used. Combined surgery has proven to be reliable and safe on pediatric patients with complex pathologies such as total proctocolectomy and Ileal Pouch. Hospital cost remains a weakness and no solid conclusions will be drawn until further studies are made which evaluate both benefits and costs of this procedure.

**V008 LAPAROSCOPIC EXCISION OF A CHOLEDOCHAL CYST WITH TOTAL INTRACORPOREAL RECONSTRUCTION** – *Shannon L Castle, MD, Bindi J Naik-mathuria, MD, Dean M Anselmo, MD, Manuel B Torres, MD, Nam Nguyen, MD Children's Hospital Los Angeles*

**INTRODUCTION:** Laparoscopic resection of choledochal cyst in children has become more widely accepted, though many surgeons continue to construct the Roux-en-Y jejunojunostomy extracorporeally. We present a laparoscopic resection of a type-1 choledochal cyst with a total intracorporeal reconstruction using linear staplers.

**METHODS:** The operation was performed with the patient in a lithotomy. The operating surgeon stood between the patient's legs and the assistant surgeon stood on the patient's left. Four trochars were used, a 12 mm canula via the umbilicus to accommodate the camera and endo-stapler, two 5 mm ports placed on each side of the mid-clavicular line about the level of the umbilicus, and the other 5 mm trocar at left subcostal. Two 0.0 Prolene® sutures were placed through the abdominal wall anchoring the body of the gallbladder and Falciform ligament to retract the liver. The choledochal cyst was resected in standard fashion. A 35 cm Roux limb was reconstructed at 20 cm from the ligament of Treitz using linear Endo-GIA staplers. A retrocolic hepaticojejunostomy was established with 5-0 PDS.

**RESULTS:** The operation was successfully performed in two and half hours. There were no intra-operative complications, and the blood loss was minimal. At five month follow-up, all of the patient's preoperative symptoms have resolved with excellent cosmetic results.

**CONCLUSION:** With the aid of the linear staplers, resection of choledochal cyst and a total intracorporeal Roux-in-Y hepaticojejunostomy construction can be achieved and may offer better orientation of the Roux-en-Y jejunojunostomy due to excellent visualization.

**V009 SINGLE-INCISION PEDIATRIC ENDOSURGICAL (SIPES) MORGAGNI DIAPHRAGMATIC HERNIA REPAIR** – *Arul S Thirumoorthi, MD, Alejandro Garcia, MD, Florencia Beleniski, MD, Oliver Muensterer, MD, Gudrun Aspelund, MD Division of Pediatric Surgery, Morgan Stanley Children's Hospital of New York-Presbyterian, Columbia University Medical Center, New York, NY*

**INTRODUCTION:** Anterior diaphragmatic hernias of the Morgagni type often present as an incidental finding on a chest radiograph. Most pediatric surgeons would advocate for elective repair. As the hernia itself produces minimal symptoms, postoperative cosmesis is often of great concern to the parents of the affected child.

**PURPOSE:** We present our technique of virtually scarless single-incision pediatric endosurgical (SIPES) repair of a Morgagni hernia in a 20 month old otherwise healthy girl.

**PATIENT & METHODS:** The patient presented to our hospital with fever and persistent cough and a chest radiograph was obtained, showing an anterior diaphragmatic hernia. The finding was confirmed on computed tomography. Patient recovered from illness and after discussion with the parents, she was scheduled for SIPES repair. A 2 cm longitudinal incision was made in the umbilicus and a proprietary laparoendoscopic single-site trocar was introduced. A 5 mm 70 degree endoscope was used for visualization, providing an anteriorly angulated view of the operating field. The herniated bowel was easily reduced into the abdomen using

two straight bowel graspers. Posterior diaphragmatic rim was clearly visualized. The fundus of the hernia sack was grasped and the entire sack was inverted into the abdomen. The sac was ligated at the base with an endoscopic loop tie, and excised using hook electrocautery. The defect was repaired primarily using 2-0 braided polyester percutaneous sutures. The first stitch was placed intracorporeally to approximate the medial portion of the diaphragm to the anterior abdominal wall. We elected to further reinforce the repair by suturing the muscular lip of the diaphragm to the xiphoid process and the periostium of the right and left lower costal angle using percutaneous sutures and extracorporeal knot tying as demonstrated on the video. The last suture detached from the needle, and we used a Berci fascial closure device to complete the stitch. The needle was removed through the trocar.

**RESULTS:** Operative time was 198 minutes. The patient recovered uneventfully and was discharged home on postoperative day 3. Follow-up at 3 and 6 weeks was unremarkable at which time the scar was well hidden in the navel.

**CONCLUSIONS:** SIPES Morgagni diaphragmatic hernia repair is a reasonable alternative to the open or conventional laparoscopic technique. Percutaneous suturing technique allowed us to anchor the rim of the diaphragm securely to the cartilaginous portion of the xiphoid and the costal periostium, which may prevent recurrence.

**V010 SUCCESSFUL ENDOSCOPIC TREATMENT OF A WINDSOCK DUODENAL WEB IN AN INFANT** – *Ufuk Ates, MD, Gonul Kucuk, MD, Halise Babayigit Akpınar, MD, Gulnur Gollu, MD, Berkug Bahadir, MD, Meltem Bingol-kologlu, MD, Huseyin Dindar, MD Ankara University School of Medicine Department of Pediatric Surgery*

Duodenal webs with windsock deformity are rare congenital disorders causing partial endoluminal obstruction. Duodenotomy with incision or excision of the web has been the most common modality of treatment. There are very few reports of the minimal invasive approach consisting of conventional or single incision laparoscopic surgery and endoscopic excision of duodenal webs.

A fourteen-month old boy presented with vomiting since birth and failure to thrive and weight loss for the last two months. Upper gastrointestinal contrast studies revealed dilated duodenal bulb and endoscopy was performed. Upper endoscopy is performed which identified a large duodenal web with a small apertura at the second part of the duodenum. The endoscopic appearance was consistent with a windsock deformity. Balloon dilatation of the apertura and incision of the web with snare-cutter was performed. No complication occurred during the procedure. The patient was fed on postoperative third day. He is free of symptoms in his follow-ups. The aim of this presentation is to demonstrate the minimal invasive approach in the management of windsock duodenal webs by demonstrating the endoscopic techniques used in this case.

**V011 LAPAROSCOPIC COMPLETION RIGHT ADRENALECTOMY AFTER OPEN LEFT ADRENALECTOMY AND PARTIAL RIGHT ADRENALECTOMY FOR PHEOCHROMOCYTOMA** – *Charles M Leys, MD MSCI, George W. Holcomb III, MD MBA Children's Mercy Hospital*

At 12 years of age, this 17-year-old underwent an open left adrenalectomy and partial right adrenalectomy for bilateral pheochromocytoma at another institution. The patient's family relocated to our area and he developed recurring symptoms of pheochromocytoma. Laboratory evaluation confirmed the suspected pheochromocytoma and a 3 x 2.8 x 2.5 cm right adrenal mass was seen on MRI scan. Although the lesion was found to arise in the right adrenal gland, it appeared to extend posterior to the vena cava and aorta.

After preoperative alpha blockade with phenoxybenzamine for 10 days and intravenous hydration the night prior to the operation, he underwent a laparoscopic completion right adrenalectomy. The operation was complicated by scarring from the previous open partial right adrenalectomy. However, it was possible to complete the operation laparoscopically and the patient was discharged on postoperative day 3.

This video will depict the salient operative details of the laparoscopic completion right adrenalectomy including dissection posterior to the vena cava and aorta. This patient has recovered completely and has not had any recurrent symptoms with a 2.5 year follow-up.

**V012 LAPAROSCOPIC REPAIR OF RECTO BLADDERNECK FISTULA AND HIGH RECTO PROSTATIC URETHRAL FISTULA- HOW THE PSARP MAKES IT BETTER** – *Marc A Levitt, MD, Andrea Bischoff, MD, Alberto Peña, MD Cincinnati Children's Hospital Medical Center*

**INTRODUCTION:** When operating on a male patient with an anorectal malformation the goals should be: to dissect the distal rectum, without injuring surrounding structures such as vas deferens, ureters, and nerves; to ligate the fistula without leaving rectum behind and without injuring the urethra; to mobilize the rectum enough that it reaches the perineum without tension, assuring a good blood supply; and to properly place the rectum in the center of the sphincters. These goals are mandatory regardless of the technique used for the repair.

**METHODS:** A video was recorded highlighting the advantages of adding the posterior sagittal anorectoplasty (PSARP) to the laparoscopic repair of recto bladderneck and high recto urethral prostatic fistula.

**RESULTS/TECHNIQUE:** The distal rectum is identified near the peritoneal reflection and the peritoneum around it is divided using the hook cautery, remaining as close as possible to the rectal wall. The dissection continues circumferentially and distally to the point where it narrows down and meets the bladderneck. A Maryland clamp is passed through a previously inserted endoloop, the fistula is divided with hot scissors, and the endoloop is tightened, closing the fistula. To gain enough length for the rectum to reach the perineum, all avascular attachments of the rectum are incised. Sometimes, particularly with high prostatic fistulas, this is enough for the rectum to reach the perineum. However, it is more common for the rectum to require further mobilization. Traction on the rectum helps to identify the vessels that are holding the rectum. The legs are elevated, the center of the sphincter is determined using an electric stimulator and a minimal posterior sagittal incision is made. With this incision it is safer to pass a clamp through the perineum creating a plane of dissection and a space in front of the sacrum, immediately behind the urethra. The distal rectum is grasped and pulled down, assuring the correct orientation and trajectory of the pull-through. If the rectum still does not reach the perineum, further length can be gained by selectively ligating the peripheral branches of the inferior mesenteric vessels, as close as possible to the bowel wall, preserving the main inferior mesenteric artery branch and depending upon the rectum's excellent intramural blood supply. The limits of the sphincter are determined, and the posterior sagittal incision is closed in layers. The posterior edge of the muscle complex is tacked to the posterior rectal wall which helps to avoid prolapse. The anoplasty is then performed.

**CONCLUSION:** The advantages of adding the PSARP to the laparoscopic repair of anorectal malformation include: a safe and accurate dissection from the perineum into the pelvis; meticulous dissection of the sphincter mechanism; rectal tapering when indicated; tacking of the posterior rectal wall to the muscle complex helping to prevent prolapse; and properly orienting the rectum in the sphincter mechanism.

**V013 LAPAROSCOPIC GRAHAM PATCH FOR A PERFORATED MARGINAL ULCER AFTER ROUX-EN-Y GASTRIC BYPASS** – *Michael V Tirabassi, MD, Beverly Haynes, MD, Carroll M Harmon, MD University of Alabama at Birmingham Medical School Children's Hospital of Alabama*

This is a case of a 20 year old male presenting with peritonitis and free air. He was 3 years status post Roux-En- Y Gastric bypass. His indications for surgical management of his obesity included a BMI of 51, sleep apnea, and aspirations of joining the football team. Several months prior to presentation the patient stopped taking his prescribed acid inhibiting medications. On Laparoscopic exploration a perforated marginal ulcer was found at the anastomosis between the Roux limb and his gastric pouch. A Graham patch was constructed first by placing four sutures. The color of suture material was alternated. This is important in order to prevent mistakes when tying the sutures around the omental patch.

We anticipated both a period of critical illness during his recovery and the possibility of stricture formation at the site of the perforation. For these reasons we chose to place a gastrostomy tube in his de-functionalized gastric remnant. This would allow his bypassed intestinal tract to be utilized for nutritional support. The gastric remnant cannot be approximated to the abdominal wall without risking obstruction of the Roux limb. We began by placing a purse string suture on the gastric wall. A whole was then created into the gastric lumen with the harmonic scalpel. The balloon tipped gastrostomy tube was passed through the omentum first, then into the stomach. The balloon was inflated and then the purse string suture was tied. A short witzel tunnel was then created. Gastrostomy tube feeds were initiated on POD# 5. An upper GI on POD# 5 demonstrated no remaining leak or stricture. He was discharged home on POD# 7 tolerating a gastric bypass diet. After 4 years of follow-up he has had no recurrent episodes of perforation. His current BMI is 27.

**V014 POST-TRAUMATIC DIAPHRAGMATIC LACERATION WITH INTRATHORACIC STOMACH: LAPAROSCOPIC REPAIR** – *Felix C Blanco, MD, Mark B Slidell, MD, Mikael Petrosyan, MD, Timothy D Kane Sheik Zayed Institute for Pediatric Surgical Innovation, Children's National Medical Center*

**INTRODUCTION:** Blunt diaphragmatic rupture is a rare but devastating injury in children. We present a video demonstrating the steps of laparoscopic repair of a post-traumatic diaphragmatic laceration with intrathoracic stomach in a child with blunt trauma.

**CASE REPORT:** A 7-year-old boy presented to us with absent breath sounds on the left chest after being struck by a car, prompting suspicion of traumatic pneumothorax. Chest radiograph obtained after tube thoracostomy revealed an unresolved large air collection with mediastinal shift. Subsequent placement of a nasogastric tube confirmed to the presence of a herniated intrathoracic stomach.

Laparoscopic exploration revealed a long linear tear in the antero-medial portion of the diaphragm, with the medial edge in close contact with the pericardial sac. The entire stomach, part of the greater omentum, and the left lobe of the liver were herniated into the left chest through the defect. After reducing the herniated viscera back into the abdomen, the edges of the laceration were approximated without tension. To accomplish the repair, we used a combination of running polypropylene sutures and interrupted stitches. Sutures were reinforced with pledgets in areas where the diaphragm was attenuated. The closure of the medial portion of the defect was particularly challenging due to the proximity of the lacerated diaphragm with the pericardial sac and the liver. The child had an uneventful post-operative course and remained asymptomatic until the follow-up visit.

**CONCLUSION:** Laparoscopic repair of complex diaphragmatic injuries is feasible and safe in children. When primary repair is possible, it is important to use proper surgical technique to prevent hernia recurrence.

**V015 DOUBLE ESOPHAGEAL ATRESIA: RESOLUTION BY A DOUBLE THORACOSCOPIC ANASTOMOSIS** – *Gaston Elmo, Silvana Prodan, Luzia Toselli, Anahi Salomon, Daniel Liberto, Mauricio Urquiza, Roberto Vagni, Pablo Lobos Hospital Italiano de Buenos Aires*

**INTRODUCTION:** Congenital esophageal stenosis (CES) is an infrequent entity. Its incidence is of 1:25000 to 50000 cases per year. In patients with diagnosis of esophageal atresia (EA), the reported incidence of ECE is of 4.8% to 14% so it should be taken into consideration if symptoms arise. We present a case with AE and ECE to whom a first thoracoscopic esophageal anastomosis was performed and, in a second time, a thoracoscopic correction of the stenosis.

**MATERIALS & METHODS:** Case report (out and inpatient records, operative report). Review of the literature (Medline database) in between 1980 and 2011. A thoracoscopic approach was used both times with a 5 mm OPTIC and 3 mm instruments (Storz®).

**RESULTS:** We present the case of a fetus with prenatal diagnosis of polyhydramnios and absence of gastric chamber. At birth, type 1 EA (long gap) was detected. At 6 months of age, a thoracoscopic esophageal anastomosis was performed. There were no operative complications. One month postoperative, the child presents with intermittent dysphagia and ECE at the distal third of the esophagus. A first failed attempt was done to dilate the stenosis so a second thoracoscopic surgery was performed: resection and end to end anastomosis. She has evolved adequately at 4 months postop. We have only found one case of ECE reported in the literature solved with this approach but no reports of double atresia with double thoracoscopy.

**DISCUSSION:** Thoracoscopy is the standard approach for the resolution of esophageal atresia in our center. It is possible to perform a double esophageal anastomosis with this approach in cases of double atresia. We prefer to solve it in two separate operative times in order to avoid damage to the esophageal vascularization.

**V016 LAPAROSCOPIC PARTIAL NEPHRECTOMY FOR WILMS TUMOR WITH INTRAOPERATIVE ULTRASOUND GUIDANCE** – *Katherine P Davenport, MD, Marion C Henry, MD, Philip C Guzzetta, MD, Timothy D Kane, MD Sheikh Zayed Institute for Pediatric Surgical Innovation, Children's National Medical Center*

We present the case of a 2.5 year old female with Wilms tumor which was found incidentally during the workup for urinary tract infection. Preoperative MRI of the abdomen confirmed initial US findings and illustrated a round, solid soft tissue mass within the upper pole of the left kidney measuring 2.5 x 2.2 x 2.7 cm with a distinct "claw" sign. A staging CT of the chest revealed a 3mm noncalcified left lower lobe nodule which has been stable on surveillance imaging. Following discussion with the oncology service and the family, the patient underwent laparoscopic partial nephrectomy. Intraoperative ultrasound was used to delineate the bounds of the mass and assisted in the selection of resection planes. Final pathologic assessment demonstrated a 4 x 3 x 2-cm Wilms tumor arising from a nephrogenic rest with favorable histology. There was no demonstration of invasion through the renal capsule, and the margin of excision was free of tumor. Lymph node sampling was also negative for disease, and she was classified as a stage I Wilms tumor. She encountered no perioperative complications and began her 19 week chemotherapy treatment per regimen EE4A. Surveillance imaging throughout her treatment showed stability of the small pulmonary nodule and no evidence of renal lesions bilaterally. The patient has completed her chemotherapeutic course and will be monitored with chest x-ray and abdominal ultrasound every three months. This case illustrates that laparoscopic partial nephrectomy for Wilms tumor can be a safe and effective method of treatment in the pediatric population.

**V017 EX-VIVO MODEL FOR TEF REPAIR AND LOBECTOMY** – *Katherine A Barsness, MD MSCI, Shar Mayerson, MD Northwestern University, Children's Memorial Hospital*

**BACKGROUND:** Tracheoesophageal fistula (TEF) repair and lobectomy for congenital lung anomalies are increasingly being performed thoracoscopically. However, these procedures are not commonly performed, leaving a gap in technical teaching opportunities for residents, fellows and faculty. We developed a model to recreate these procedures using porcine ex-planted tissue.

**METHODS:** Porcine tissue is removed with the lung, heart, great vessels, trachea and esophagus all contained within a single tissue block. For the TEF, a segmental resection of the esophagus is performed. The upper esophagus is purse-stringed closed and secured to the proximal trachea. A hole is made in the distal posterior trachea and the distal esophagus is anastomosed in an end-to-end fashion to the tracheal opening. For the lobectomy, the left upper lobe is used as the best fit lobectomy model. The left pulmonary artery and vein are isolated, filled with a viscous solution, and ligated. The solution distends the vessels, simulating blood filled hilar vessels.

**RESULTS:** Critical steps in a TEF repair are completed. The distal fistula is dissected free, transected and then ligated. The upper pouch is dissected free of the trachea. An end-to-end anastomosis is created using intracorporeal suturing techniques. Tension is variably set based on the length of esophagus resected at the time the model is created. Critical steps in a lobectomy are also completed. The pulmonary artery can be dissected free at the main trunk or out at the segmental branch level. The artery can be transected with an endoscopic stapler or energy device. The bronchus is dissected free of the vein and ligated. The vein is then ligated. Model advantages include 1) low cost (\$35 US dollars) 2) quick to prepare 3) anatomy similar to human. Model disadvantages include 1) thawed tissue is tougher than neonatal and infant tissues 2) currently unable to obtain neonatal sized tissue blocks.

**CONCLUSIONS:** The ex-vivo porcine model for thoracoscopic TEF repair and lobectomy successfully recreates the critical operative steps to aid in skill acquisition for these complex thoracoscopic procedures.

# Poster List

**P001 LAPAROSCOPY-ASSISTED ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE** – *Mustafa Kucukaydin, Prof., Ahmet B. Dogan, MD, Kadri C Sulubulut, MD, Ali Aslan, MD, Ozlem Yandim, MD, Department of Pediatric Surgery, Erciyes University, School of Medicine, Kayseri/Turkey*

**P002 LAPAROSCOPIC APPENDECTOMY IN CHILDREN: THE EXCLUSIVE USE OF LVSS DEVICE FOR THE CLOSURE OF THE APPENDICAL STUMP** – *Salmal Turial, MD, Maria Trendafilow, Felix Schier, MD, University Medical Centre, Department of pediatric surgery, Mainz, Germany*

**P003 LAPAROSCOPIC ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE – 5 YEARS EXPERIENCE** – *Zhaozhu Li, MD, Qingbo Cui, MD, Dapeng Jiang, MD, Junbin Guo, MD, Zheng Zhao, MD, Department of Pediatric Surgery, the 2nd Affiliated Hospital of Harbin Medical University, China*

**P004 REPAIR OF A TRAUMATIC HERNIA IN AN 11-YEAR-OLD BOY VIA MINIMALLY INVASIVE APPROACH** – *Corey W. Iqbal, MD, Shawn D. St. Peter, MD, Richard J Hendrickson, MD, Children's Mercy Hospitals and Clinics*

**P005 LAPAROSCOPIC SUBMUCOSAL APPENDECTOMY FOR DIFFICULT AND ADHERENT CASES: A NOVEL TECHNIQUE TO MINIMIZE COMPLICATIONS** – *Md. Jafrul Hannan, MS, Md. Mozammel Hoque, MS, Chattagram Maa-O-Shishu Hospital Medical College*

**P006 HOW TO MAKE A PORTABLE LAPAROSCOPIC SIMULATOR WITH A SKIRT HANGER** – *Iain A. Hennessey, Alder Hey Children's Hospital, Liverpool, United Kingdom*

**P007 LAPAROSCOPIC APPENDECTOMY WITH FLUOROSCOPIC GUIDANCE TO PREVENT LEAD TOXICITY** – *Jeremy C Bushman, MD, Bryan S Judge, MD, James M Decou, MD, Helen DeVos Children's Hospital, Grand Rapids, Michigan, USA*

**P008 ATROPINE AS AN ALTERNATIVE TO REOPERATIVE SURGERY FOR INCOMPLETE PYLOROMYOTOMY** – *Haroon Patel, MD, Driscoll Children's Hospital*

**P009 'THE UMBILICAL FAT SIGN': AN IMPORTANT AND CONSISTENT LAND MARK DURING SINGLE PORT/INCISION LAPAROSCOPIC SURGERY AND STANDARD LAPAROSCOPY** – *Bethany Slater, MD, Ashwin Pimpalwar, MD, Division of Pediatric Surgery, Michael E. DeBakey Department of Surgery, Baylor College of Medicine and Texas Children's Hospital, Houston, Texas*

**P010 SINGLE INCISION TRANSAXILLARY SUBCUTANEOUS EXCISION OF FIBROADENOMA OF THE BREAST IN CHILDREN: A NOVEL APPROACH** – *Michelle Martin, MD, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E DeBakey Department of Surgery, Baylor College of Medicine and Texas Children's Hospital, Houston, Texas*

**P011 COMBINED LAPAROSCOPIC-ENDOSCOPIC PLACEMENT OF PRIMARY GASTROJEJUNOSTOMY FEEDING TUBES IN CHILDREN: A PRELIMINARY REPORT** – *Nam X. Nguyen, MD, Shannon Castle, MD, Manuel Torres, MD, Dean Anselmo, MD, Children's Hospital of Los Angeles, Los Angeles, CA, USA, Miller Children's Hospital, Long Beach, CA, USA*

**P012 LAPAROSCOPY CHOLECYSTOSTOMY AND BILE DUCT LAVAGE TREATMENT OF INSPISSATED BILE SYNDROME** – *Qixing Xiong, MD, Qiang Shu, MD, Weiguang Liu, MD, Zhigang Gao, MD, Department of Pediatric Surgery*

**P013 EARLY LAPAROSCOPIC BILIARY TRACT EXPLORATION FOR INFANT CONJUGATED JAUNDICE** – *Zhigang Gao, MD, Qixing Xiong, MD, Qiang Shu, MD, Weiguang Liu, MD, Jinfa Tou, MD, Pediatric Surgery*

**P014 CARDIPLICATION AS A NOVEL ANTIREFLUX PROCEDURE FOR INFANTS: A PROOF OF CONCEPT IN AN INFANT PORCINE MODEL** – *Sarah J. Hill, MD, Mark L. Wulkan, MD, Emory University and Children's Healthcare of Atlanta*

**P015 RELIEF OF SMA SYNDROME WITH LAPAROSCOPIC LADD'S PROCEDURE** – *Sabina M. Siddiqui, MD, Samir K. Gadepalli, MD, James D. Geiger, MD, University of Michigan, Ann Arbor*

**P016 LAPAROSCOPIC MANAGEMENT OF INTESTINAL MALROTATION IN CHILDREN** – *Moorthy Gurunathan, Prakash Agarwal, Balamourougane Paramasamy, Madhu Ramasundaram, Balagopal Subramaniam, Sri Ramachandra Medical College, Chennai, India*

**P017 UTILITY OF LAPAROSCOPIC PROCEDURES IN THE TREATMENT OF NISSEN FUNDOPLICATION COMPLICATIONS** – *Carlos García-Hernández, MD, Lourdes Carvajal Figueroa, MD, Roberto Suarez Gutierrez, MD, Sergio Landa Juarez, MD, Hospital Star Medica Infantil Privado*

**P018 LAPAROSCOPIC CARDIOMYOTOMY FOR ESOPHAGEAL ACHALASIA IN TWO CHILDREN WITH TRIPLE-A SYNDROME** – *Cora Städtler, MD, Rebecca Künzel, MD, Thomas Boemers, MD, PhD, Cologne Children's Hospital*

**P019 USE OF CT ENTEROGRAPHY FOR THE DIAGNOSIS OF LOWER GASTROINTESTINAL BLEEDING** – *Mark L. Ryan, MD, Jonathan M. Fields, MD, James S. Davis, MD, Eduardo A. Perez, MD, Juan E. Sola, MD, Holly L. Neville, MD, University of Miami Miller School of Medicine*

**P020 TRANSANAL PULL-THROUGH SUBTOTAL COLECTOMY WITH SINGLE-PORT LAPAROSCOPIC GUIDANCE** – *Suolin Li, MD, Chi Sun, MD, Zengwen Yu, MD, Department of Pediatric Surgery, the Second Hospital of Hebei Medical University*

**P021 RISK OF HERNIA OCCURRENCE WHERE DIVISION OF AN INDIRECT INGUINAL SAC WITHOUT LIGATION IS UNDERTAKEN** – *Simon C. Blackburn, MRCS, Stephen D. Adams, MRCS, Anies A. Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton*

**P022 CHRONICALLY SYMPTOMATIC PATIENTS WITH UNDETECTABLE GALL BLADDER ON ULTRASONOGRAPHY COULD BENEFIT FROM EARLY CHOLECYSTECTOMY** – *Stephen D. Adams, MRCS, Simon C. Blackburn, MRCS, Anies A. Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

**P023 LAPAROSCOPIC HERNIA REPAIR IN PRETERM AND TERM INFANTS - ANALYSIS OF PAST MEDICAL HISTORY AND POSTOPERATIVE COMPLICATIONS** – *Christine Burgmeier, MD, Salmal Turial, MD, Felix Schier, MD, PhD, Department of Pediatric Surgery, University Medical Center Mainz*

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**P026 SINGLE STUMP LIGATION OF THE APPENDIX IS A PREFERABLE TECHNIQUE IN LAPROSCOPIC APPENDECTOMY FOR CHILDREN** – *Junko Fujino, MD, Akihiro Igarashi, MD, Masahiro Hatanaka, MD, Makoto Suzuki, PhD, Kazunori Tahara, PhD, Yuki Ishimaru, MD, Hitoshi Ikeda, PhD, Dokkyo Medical University, Koshigaya Hospital, Department of Pediatric Surgery*

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**P028 LAPAROSCOPIC REMOVAL OF NEEDLE AFTER PENETRATION AND MIGRATION IN CHILDREN** – Ufuk Ates, MD, Gonul Kucuk, MD, Gulnur Gollu, MD, Aydin Yagmurlu, MD, Huseyin Dindar, MD, Ankara University School of Medicine Department of Pediatric Surgery

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**P030 EXPERIENCE WITH THE USE OF HISTOACRYL IN THE MANAGEMENT OF GASTRIC VARICEAL BLEEDING IN CHILDREN** – Rodrigo H. Cifuentes, MD resident, Placido E. Rosas, MD, Luis Ariel W. Gonzalez, MD, Centro Medico Nacional 20 de Noviembre ISSSTE

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**P033 TRANSUMBILICAL LAPAROSCOPIC-ASSISTED VERSUS OPEN APPENDECTOMY IN CHILDREN: OUTCOMES IN A TEACHING HOSPITAL** – Tiago Henriques-Coelho, MD, PhD, Ana Catarina Longras, MD, Ruben Lamas-pinheiro, MD, Ana Alvarenga, MD, Jorge Correia-Pinto, MD PhD, Pediatric Surgery Department, Hospital São João, Porto, Portugal

**P034 SUCCESSFUL ENDOSCOPIC REMOVAL OF HUGE TRICHOBEZOARS ASSISTED WITH INTRAGASTRIC SURGERY TECHNIQUE IN A CHILD CASE** – H. Soh, MD, M. Kamiyama, MD, M. Oowari, MD, Y. Miyazaki, MD, K. Nakajima, MD, M. Fukuzawa, Department of Pediatric Surgery and Gastrointestinal Surgery, Osaka University Graduate School of Medicine

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**P039 LAPAROSCOPIC REPAIR OF DUODENAL ATRESIA IN PREMATURE NEONATES WEIGHING LESS THAN 2KG** – Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E DeBakey Department of surgery, Baylor college of medicine and Texas Children's Hospital, Houston, Texas.

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– *Clare M. Rees, MD MRCS MBChB, Lydia Hanna, MBBS BSc, Clare Skerritt, MRCS MBBS MSc, Hugh W. Grant, BSc MBChB MD FRCSEd FRCS(Eng), Department of Paediatric Surgery, John Radcliffe Hospital, Oxford, UK*

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– *Martin Lacher, MD, Oliver J. Muensterer, MD, PhD, Aprahamian J. Charles, MD, Lena Perger, MD, Michael Megison, MD, Carroll M Harmon, MD, PhD, 1) Children's of Alabama, University of Alabama at Birmingham/USA, 2) Division of Pediatric Surgery, Weill Cornell Medical College, New York/USA*

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– *Kui-ran Dong, MD, Kai Li, MD, Gong Chen, MD, Gongbao Liu, Haijun Zhong, Department of Surgery, Children's Hospital of Fudan University, Shanghai, PR China*

**P083 SINGLE INCISION LAPAROSCOPIC APPENDECTOMY IN CHILDREN: A REVIEW OF 275 CASES**

– *Timothy J Fairbanks, MD, Thuyet Ho, MD, UCSD Department of Surgery/Rady Children's Hospital of San Diego*

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– *Suolin Li, MD, Chi Sun, MD, Zengwen Yu, MD, Department of Pediatric Surgery, the Second Hospital of Hebei Medical University*

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– *Ulf Bühligen, MD, Robin Wachowiak, MD, Holger Till, MD PhD, Department of Pediatric Surgery, University of Leipzig, Leipzig Germany*

**P086 A DEBUT IN PEDIATRIC SINGLE PORT LAPAROSCOPIC SURGERY (SPLS): INDIVIDUALLY BENDABLE 3MM INSTRUMENTS COMBINED WITH THE SMALL PEDIATRIC X-CONE (STORZ®)**

– *Steffi Mayer, MD, Robin Wachowiak, MD, Holger Till, MD PhD, Department of Pediatric Surgery, University of Leipzig, Leipzig Germany*

**P087 SINGLE-INCISION LAPAROSCOPIC RESECTION OF OVARIAN MASSES IN CHILDREN**

– *Elizabeth M Pontarelli, MD, Claudia Emami, MD MPH, Nam Nguyen, MD, Dean M Anselmo, MD, Children's Hospital Los Angeles*

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– *Stephen D Adams, MRCS, Simon C Blackburn, MRCS, Anies A Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

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– *Mohabe A Vinson, MD, Paul H Noh, MD, Cincinnati Children's Hospital Medical Center*

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– *Ayed R Alqahtani, MD FRCSC FACS, King Saud University, College of Medicine, Department of Surgery*

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– *Michael V Tirabassi, MD, University of Wisconsin School of Medicine and Public Health*

**P092 OPERATIVE LAPAROSCOPE IN NEONATES AND INFANTS**

– *Stjepan Visnjic, MD PhD, Bozidar Zupancic, Vera Zupancic, Children's hospital Zagreb*

**P093 EARLY EXPERIENCE OF SINGLE-INCISION LAPAROSCOPIC HEPATICOJEJUNOSTOMY USING CONVENTIONAL INSTRUMENTS FOR TYPE I AND II BILIARY ATRESIA**

– *Mei Diao, Doctor, Long Li, Professor, Ning Dong, Doctor, Qi Li, Doctor, Hui Ye, Doctor, Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing, P. R. China*

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– *Michael J Leinwand, MD, Mohamed H Elgamal, MD, The Children's Hospital at Bronson*

**P095 SINGLE INCISION CHOLECYSTECTOMY IN CHILDREN, VERIFYING A CHANGING TECHNIQUE**

– *David C Yu, MD, Charles J Aprahamian, MD, Vince E Mortellaro, MD, Carroll M Harmon, MD PhD, Division of Pediatric Surgery, Department of Surgery, Children's of Alabama, University of Alabama at Birmingham*

**P096 NOVEL HYBRID (1 MAGNET & 1 CURVE GRASPER) TECHNIQUE FOR TRANSUMBILICAL CHOLECYSTECTOMY: INITIAL EXPERIENCE OF A PROMISING APPROACH**

– *Marcelo Martinez Ferro, MD, Guillermo Dominguez, MD, Carolina Millan, MD, Enrique Buela, MD, Gaston Bellia, MD, Fernando Rabinovich, MD, Horacio Bignon, MD, Mariano Albertal, MD, Fundación Hospitalaria – Hospital Privado de Niños Buenos Aires – Argentina*

**P097 SILS - IS IT COST AND TIME EFFECTIVE COMPARED TO STANDARD PEDIATRIC LAPAROSCOPIC SURGERY?**

– *Saidul Islam, MRCS, Stephen D Adams, MRCS, Anies A Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

**P098 INTRACORPOREAL SINGLE INCISION APPENDECTOMY WITH REGULAR INSTRUMENTS AND A PERCUTANEOUS SLING, OUR EXPERIENCE**

– *Juan I Bortagaray, MD, Fabricio Perez Lau, MD, Leandro Berberian, MD, Daniel Russo, MD, German Falke, MD, Juan C Puigdevall, MD, Hospital Universitario Austral*

**P099 A COMPARISON OF TRADITIONAL THREE PORT LAPAROSCOPIC APPENDECTOMY VS SINGLE INCISION LAPAROSCOPIC APPENDECTOMY (SILS) IN CHILDREN**

– *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E Debakey department of surgery, Baylor college of medicine and Texas Childrens Hospital, Houston, Texas*

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– *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E Debakey Department of surgery, Baylor college of medicine and Texas Children's Hospital, Houston, Texas.*

**P101 EXPERIENCE IN 406 CASES WITH MINIMALLY INVASIVE NUSS REPAIR OF PECTUS EXCAVATUM IN CHILDREN**

– *Qiang Shu, Professor, Jian-gen Yu, MD, Zhuo Shi, MD, Wei-ze Xu, Jian-hua Li, MD, Ze-wei Zhang, MD, Ru Lin, Xiong-kai Zhu, Department of Cardiothoracic Surgery, Children's Hospital, Zhejiang University School of Medicine*

**P102 USE OF THE LIGASURE VESSEL-SEALING DEVICE FOR THORACOSCOPIC PERIPHERAL LUNG RESECTION IN A SURVIVAL CANINE MODEL**

– *Philipp D Mayhew, BVMS DACVS, William T Culp, VMD DACVS, Peter J Pascoe, BVSc DACVA, Natasha Vapniasky Arzi, DVM, School of Veterinary Medicine, University of California-Davis*

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**P110 SURGICAL MANAGEMENT OF PEDIATRIC EMPYEMA** – [Justin Lee, MD](#), [David B Tashjian, MD FACS FAAP](#), [Kevin P Moriarty, MD FACS FAAP](#), Baystate Children's Hospital, Tufts University School of Medicine

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**P146 LAPAROSCOPIC RADICAL NEPHRECTOMY FOR THE MANAGEMENT OF CHROMOPHOBE RENAL CELL CARCINOMA IN A CHILD** – [Masataka Takahashi, MD](#), Tetsuya Ishimaru, MD, Yutaka Kanamori, PhD, Makoto Komura, PhD, Masahiko Sugiyama, PhD, Kan Terawaki, PhD, Kan Suzuki, PhD, Eriko Fukami, MD, Tadashi Iwanaka, PhD, Department of Pediatric Surgery, The University of Tokyo Hospital

**P147 USE OF ENERGY DEVICES FOR THE MANAGEMENT OF RENAL VESSELS IN PEDIATRIC MINIMALLY INVASIVE SURGERY (MIS)** – [B. Sivan, MD](#), W. R Defoor, MD, P. P Reddy, MD, E. A Minevich, MD, S. Alam, MD, P. H Noh, Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio

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**P149 INTRAVESIAL INJECTION OF BOTOLINUM TOXIN A IN CHILDREN** – [Christa Schimke, MD](#), Mircea Ardelean, MD, Günther Schimpl, Prof, Salzburger Landeskliniken, Department of Pediatric Surgery, Paracelsus Medical University

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**P151 LAPAROSCOPIC MANAGEMENT OF PERSISTENT MÜLLERIAN DUCT SYNDROME: AN 11-CASES REPORT** – [Jian Shen, MS AS](#), Yunli Bi, AP, Children's Hospital of Fudan University

**P152 LAPAROSCOPIC TRANS-MESOCOLIC "U"PYELOPLASTY IN HORSESHOE KIDNEY** – [Baran Tokar, MD](#), Surhan Arda, MD, Ahmet Topaloglu, MD, Eskisehir OGU Medical School, Department of Pediatric Surgery, Eskisehir, Turkey

**P153 LAPAROSCOPIC APPROACH IN LARGE PROXIMAL URETERIC STONES** – [Baran Tokar, MD](#), Surhan Arda, MD, Eskisehir OGU Medical School, Department of Pediatric Surgery, Eskisehir, Turkey

## **P001 LAPAROSCOPY-ASSISTED ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE**

– *Mustafa Kucukaydin, Prof., Ahmet B. Dogan, MD, Kadri C Sulubulut, MD, Ali Aslan, MD, Ozlem Yandim, MD, Department of Pediatric Surgery, Erciyes University, School of Medicine, Kayseri/Turkey*

**BACKGROUND & AIM:** There has been a recent trend in the use of laparoscopic-assisted one-stage endorectal pull-through in the management of Hirschsprung's disease (HD). We want to present our experience with laparoscopic assisted endorectal pull-through (LAERPT) for HD in the small infants.

**MATERIAL & METHODS:** Between January 2005 and May 2011, 37 small infants underwent LAERPT. The babies (23 male, 14 female) were in the age range of 10 days to 2 months (mean 20 days). The procedures were performed with one 3/4 mm camera and two 3 mm working ports. The transition zone was identified by seromuscular biopsies obtained laparoscopically. The colon and proximal rectum were mobilized laparoscopically. A transanal endorectal mucosal dissection and a coloanal anastomosis were done, using an absorbable monofilament 4/0 polyglyconate suture. Anal dilatation program was started in 14 th day of operations.

**RESULTS:** The entire mobilization of the bowel as well as biopsy confirmation of the transition zone was done laparoscopically in all the cases. The median operative time was 120 minutes (range, 90-150 minutes). All children tolerated full enteral feeds after 48 hours and the median hospital stay was 5 days (range, 4-7 days). There were no early postoperative major complications. Two cases developed the mild enterocolitis that resolved with conservative management. The average followed up period was 3,1 years (3 months–6 years). The overall functional outcome was good in all cases with no soiling, stool incontinence or constipation.

**CONCLUSION:** LAERPT, apart from being cosmetically superior, permits obtaining biopsies as well as an adequate mobilization of the bowel and a minimal dissection which causes less damage to the internal sphincter and pelvic nerves.

## **P002 LAPAROSCOPIC APPENDECTOMY IN CHILDREN: THE EXCLUSIVE USE OF LVSS DEVICE FOR THE CLOSURE OF THE APPENDICAL STUMP**

– *Salmi Turial, MD, Maria Trendaflow, Felix Schier, MD, University Medical Centre, Department of pediatric surgery, Mainz, Germany*

**PURPOSE:** To close the appendical stump during the minimally invasive approach for appendectomy, the use of ligatures, endoloops or lineal endostaples are the most preferred techniques. Post-op abscesses near the cecum are more frequent after minimally invasive surgery than with the open approach.

One reason for the increase in intraabdominal abscesses in the laparoscopic approach for appendectomy could be the inability to seal the appendical stump using loops, staples, or clips, in contrast to the open approach, where the appendical stump is secured outside of the peritoneal cavity by a purse string suture. Theoretically, it is conceivable that the use of energy based devices to seal the appendical stump could lead to a reduction of postoperative intraabdominal abscesses while improving the efficacy of the minimally invasive approach.

The aim of the present prospective study was to consider the use of the 10mm LigaSure Vessel Sealing System (LVSS) device for the closure of the appendical stump during laparoscopic appendectomy for acute appendicitis. To the best of our knowledge, the present study reports the exclusive use of LVSS for the appendical stump closure for the first time in humans.

**METHOD:** In the prospective study, children were enrolled with suspected acute appendicitis based on clinical and laboratory examination. The only device used for the appendix transection was a 10 mm laparoscopic LigaSure device. All data, including preoperative clinical, laboratory and ultrasound data, intraoperative findings and postoperative course were collected prospectively. All patients were followed-up four weeks after surgery using an abdominal ultrasound.

**RESULTS:** Of 51 patients (average age 12.1 years) the appendix stump was sealed and cut in one attempt in 38 patients and in two steps in 13 patients. The diameter of the appendix specimens was on average 1.3 cm (0.5-2.5 cm). The operative time was in mean 47 minutes (12-80). The histopathological findings of the specimens revealed residual of chronic appendicitis in seven cases, phlegmonous and suppurative appendicitis in 12 cases, ulcerous and gangrenous appendicitis in 19 cases and perforated appendicitis in 13 cases. No collateral thermal lesions were noted. An intraabdominal abscess formation did not occur in any of the cases. One minor wound infection on the umbilical trocar site was noted. The average length of hospital stay was 5.9 days. At follow up, a scarless appearance of the abdomen was found in all patients, except in the case of periumbilical wound infection.

**CONCLUSION:** Based on our preliminary results, it seems that the LVSS is a capable and reliable device to seal the appendical stump during laparoscopic appendectomy for acute appendicitis. The higher risk of intraabdominal abscesses after laparoscopic appendectomy has been generally accepted for the sake of minimal invasiveness. The LVSS seems to have eliminated this disadvantage of minimally invasive surgery.

## **P003 LAPAROSCOPIC ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE – 5 YEARS EXPERIENCE**

– *Zhaozhu Li, MD, Qingbo Cui, MD, Dapeng Jiang, MD, Junbin Guo, MD, Zheng Zhao, MD, Department of Pediatric Surgery, the 2nd Affiliated Hospital of Harbin Medical University, China*

**AIMS:** To describe our 5 years experience of laparoscopic endorectal pull-through and investigate long term outcomes of this procedure.

**METHODS:** All children were diagnosed with Hirschsprung's Disease (HD) from 2005-2010 were identified. Case notes, radiology, complications and pathology reports were reviewed.

**RESULTS:** Of 52 patients identified, 48 had a confirmed diagnosis of HD and 4 had a diagnosis of allied Hirschsprung disorder(HAD). 38 (73%) had laparoscopic endorectal pull-through (LEP) and 14 (26%) had endorectal pull-through (EP) as their definitive procedure; 80% were male. Diagnosis was made on radiology in 40/52(77%) patients and on anorectal manometric study in 21/30(70%) children, 100% had operating biopsy. Only 5 children were less 1 years old, others were more than 2 years old. Patients need rectal washouts (20%) or laxatives (60%) to help defecation before surgery. Patients were followed up for 11 months (range 6-60). At follow up in LEP group 2% were constipated, 7% were episodes of enterocolitis and 7% had some degree of faecal incontinence; in EP group 7% were constipated, 7% were episodes of enterocolitis and 7% had some degree of faecal incontinence. All patients had been anal dilatation for 3 months. 1 patient had significant complication in EP group, requiring stoma formation. Overall 78% were felt to have good post-op satisfaction, 10% fair and 10% poor outcome in LEP group; 42% were felt to have good post-op satisfaction, 14% fair and 29% poor outcome in EP group

**CONCLUSIONS:** Patients in our hospital were elder when they went to doctor. So the ill-intestinal were longer. LEP is better than EP for the management of choice with HD and HAD.

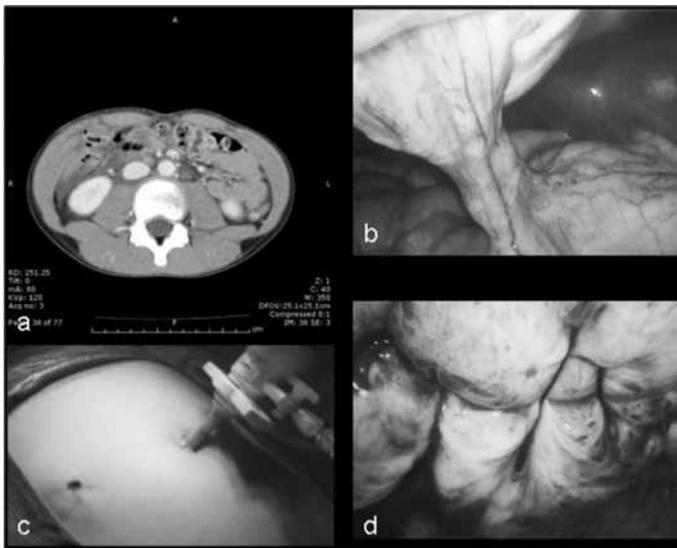
# Poster Abstracts

## **P004 REPAIR OF A TRAUMATIC HERNIA IN AN 11-YEAR-OLD BOY VIA MINIMALLY INVASIVE APPROACH** – *Corey W. Iqbal, MD, Shawn D. St. Peter, MD, Richard J Hendrickson, MD, Children's Mercy Hospitals and Clinics*

**BACKGROUND:** Abdominal wall hernias are uncommon in children compared to the adult experience and thus the pediatric surgeon does not have a large armamentarium for laparoscopic repair as do the adult surgeons. Therefore, we present an 11-year-old boy presenting with a traumatic abdominal wall hernia repaired using a minimally invasive approach **METHODS:** Retrospective case report was conducted.

**RESULTS:** An 11-year-old male sustained blunt abdominal trauma while bicycling. An abdominal computed tomography scan obtained during his trauma evaluation was suspicious for a right-sided abdominal wall hernia with acute inflammatory changes although there was no palpable mass on physical exam (Figure 1a). In follow-up he was found to have a palpable mass in his right lateral abdominal wall that enlarged with valsalva, and a complete transmuscular defect with herniated material was confirmed with ultrasound. He underwent exploratory laparoscopy using a 5mm umbilical cannula. Upon exploration he was found to have incarcerated omentum through a lateral ventral defect (Figure 1b). A stab incision was made over this defect and a blunt grasper was used to reduce the omentum (Figure 1c). Through this same stab incision a suture-passer was used to close the defect primarily with interrupted 0-polyglactin sutures (Figure 1d). He was dismissed home on post-operative day one. At 8 months follow-up he is symptom-free without evidence of recurrence.

**CONCLUSIONS:** Abdominal wall hernias in the pediatric patient are uncommon but can occur secondary to trauma. Primary repair using a minimally invasive approach is safe and effective in achieving adequate closure.



## **P005 LAPAROSCOPIC SUBMUCOSAL APPENDECTOMY FOR DIFFICULT AND ADHERENT CASES: A NOVEL TECHNIQUE TO MINIMIZE COMPLICATIONS** – *Md. Jafrul Hannan, MS, Md. Mozammel Hoque, MS, Chattagram Maa-O-Shishu Hospital Medical College*

**AIM OF THE STUDY:** Recurrent appendicitis with the appendix tip in sub-hepatic area and late presentations of perforated appendicitis sometimes test the skills of the surgeon. Due to dense adhesions and distorted anatomy, looking for the appendicular artery may lead to troublesome bleeding and injure the adjacent gut. Submucosal appendectomy could be an answer in these situations.

**METHODS:** From 7, October 2005 to 31st July 2011, laparoscopic appendectomies have been performed in 1589 patients and 239 of them were recurrent, perforated or sub-hepatic. In 19 of these cases no plane could be established between the appendix and adjacent structures during laparoscopy. So an incision was made on the anti-mesenteric wall of appendix and the mucosal sleeve pulled out first from apical side and then towards base leaving the muscular wall. The base of the tube was then ligated flush with cecum and divided distally. The muscular tube was left as it is. Peritoneal toileting was done and drain tubes were kept in perforated cases. Post-operative management was similar to usual appendectomies.

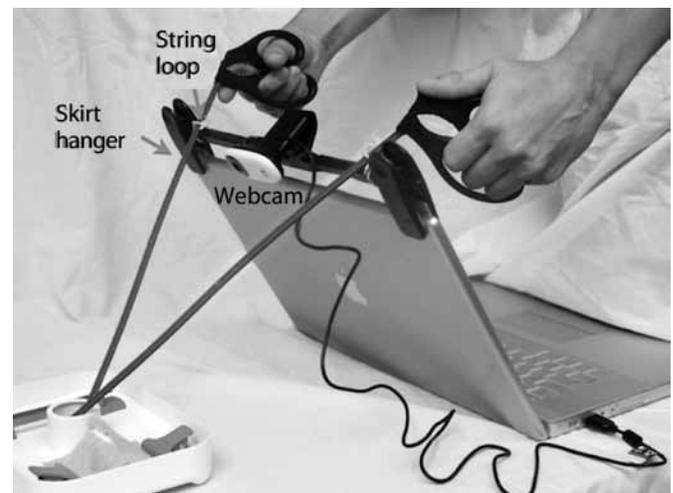
**RESULTS:** Number of cases was 19 of which 13 were male. Age ranged from 3 years to 14 years. Seven cases were perforated and 12 were recurrent appendicitis. According to position cases were: retro-ileal 2, sub-cecal 2, pelvic 3 and remainder retro-cecal appendices. Submucosal appendectomy was done in all these 19. There was no uncontrolled bleeding or gut injury during procedure. In one case cecal base was exposed during dissection and the muscle cuff was repaired. Time taken was average 51 minutes per case. Post-operative courses and follow-ups were uneventful in 16 cases and in 3 cases feeding was tolerated after 5 days. Follow up period ranged from 3 months to 5 years. Two cases came for occasional abdominal pain which subsided on conservative measures.

**CONCLUSIONS:** Submucosal appendectomy is an innovative technique and is a safe option for difficult cases during laparoscopy.

## **P006 HOW TO MAKE A PORTABLE LAPAROSCOPIC SIMULATOR WITH A SKIRT HANGER** – *Iain A. Hennessey, Alder Hey Children's Hospital, Liverpool, United Kingdom*

The use of laparoscopic box simulators has been shown to improve technical skills. However, access to these simulators in the home is limited by their bulky nature, expense or time required to build from base materials. I describe a novel way to construct a portable laparoscopic simulator in under 10 minutes, using readily available domestic items.

To make the simulator remove the centrally placed hook from a standard skirt/trouser hanger. Attach a webcam to the central portion (see figure), then tie on two hoops made from string to either arm to simulate port sites. Attach the resulting construct to a laptop screen and activate any video application using the webcam. This will result in a fully functional two port laparoscopic simulator, suitable for basic tasks such as knot tying or cube stacking.



**P007 LAPAROSCOPIC APPENDECTOMY WITH FLUOROSCOPIC GUIDANCE TO PREVENT LEAD TOXICITY** – *Jeremy C Bushman, MD, Bryan S Judge, MD, James M Decou, MD, Helen DeVos Children's Hospital, Grand Rapids, Michigan, USA*

**INTRODUCTION:** Retained lead in the gastrointestinal track can be absorbed and cause toxicity. Absorption typically occurs soon after ingestion and can reach significant levels. Lead toxicity can manifest as neurological changes, abdominal pain, hepatitis, hemolytic anemia, renal toxicity, and sterility. After measuring blood lead levels, treatment involves elimination of the lead source and removal of lead from the blood with chelating agents if necessary. We present a case of lead ingestion with retained pellets in the vermiform appendix.

**CASE REPORT:** A previously healthy 16 month old male bit off the end of a fish tank thermometer and ingested the lead pellets inside. An abdominal x-ray showed scattered metallic pellets throughout the stomach and small intestine. At this time, the patient was asymptomatic and had a normal lead level of 1 mcg/dl (normal = 0-5 mcg/dl). Over the next two days, the gastrointestinal tract was flushed with polyethylene glycol via a nasogastric tube, with passage of about eight pellets. A repeat abdominal x-ray showed a persistent collection of pellets in the right lower quadrant. The patient was discharged home with close follow-up. He passed six more pellets at home but still had several in the appendix by x-ray. His blood lead level remained normal. In order to remove the remaining pellets, the patient underwent laparoscopic appendectomy with fluoroscopic guidance. Fluoroscopy demonstrated that all of the pellets were in the appendix. The appendiceal base was grasped to prevent any pellets from escaping, and the appendix was ligated and divided with a stapler and then removed. Repeat fluoroscopy was performed on the abdominal cavity and the removed appendix -- all pellets were visualized in the specimen with none remaining in the abdomen. The patient recovered fully and has not developed any signs or symptoms of lead toxicity.

**CONCLUSION:** Removal of ingested lead from the gastrointestinal tract is indicated to prevent absorption and toxicity. Bowel washout is a reasonable first step, but in our patient, pellets were retained in the appendix. Foreign bodies in the appendix also could increase the risk of appendicitis. Laparoscopic appendectomy in this case seemed to be the safest option to prevent lead toxicity and other potential problems. Fluoroscopy was very helpful in assuring that all the lead pellets were removed with the appendix.

**P008 ATROPINE AS AN ALTERNATIVE TO REOPERATIVE SURGERY FOR INCOMPLETE PYLOROMYOTOMY** – *Haroon Patel, MD, Driscoll Childrens Hospital*

**PURPOSE:** The mainstay of treatment in the USA for hypertrophic pyloric stenosis remains surgical. While incomplete pyloromyotomy appears to be rare, we have seen a few cases since some of these procedures continue to be performed by non pediatric surgeons. Since Atropine has been used successfully and safely in many centers outside the USA for primary pyloric stenosis, we thought that it could be used for incomplete pyloromyotomies.

**METHODS:** A retrospective chart review of all cases of pyloric stenosis at our institution in the last 10 years.

**RESULTS:** There were no incomplete pyloromyotomies performed by board certified pediatric surgeons at our institution. 7 patients were referred after pyloromyotomy by a general surgeon within the first week after surgery. Only 3 charts were available for review. All of these procedures were done open through a right upper quadrant incision. All of them had atropine per published protocol. All 3 patients resumed feeds within 24 hours of atropine therapy and none required

reoperation. The average hospital length of stay was 3 days. Average atropine length of therapy was 2 months. There were no complications related to therapy.

**CONCLUSIONS:** Incomplete pyloromyotomies appear to occur infrequently. Atropine provides a safe alternative to reoperative surgery as definitive management for this situation and should be considered as first line therapy for incomplete pyloromyotomy.

**P009 'THE UMBILICAL FAT SIGN': AN IMPORTANT AND CONSISTENT LAND MARK DURING SINGLE PORT/INCISION LAPAROSCOPIC SURGERY AND STANDARD LAPAROSCOPY** – *Bethany Slater, MD, Ashwin Pimpalwar, MD, Division of Pediatric Surgery, Michael E. DeBakey Department of Surgery, Baylor College of Medicine and Texas Children's Hospital, Houston, Texas*

**BACKGROUND:** During Single port laparoscopic surgery (SPLS) Access is obtained through the umbilicus and the scar is hidden within the scar of the umbilicus for providing good cosmesis. It is essential that the incision be well planned so as to get the maximum exposure through the umbilical incision. The umbilical fat sign is an important landmark to achieve this.

**PURPOSE:** The aim of this study is to retrospectively review importance of the umbilical fat sign as a landmark for peritoneal access during SPLS in children.

**METHOD:**  
Period: 1.5 years,  
Total : 57 children SPLS.  
M: F - 33:24.  
Median age 10.8 years (R: 4-17).

**TECHNIQUE:** The limits of the umbilicus were marked using a marking pen. A vertical incision is made through the center of the umbilical scar. It is of vital importance to maintain the incision in the exact center of the scar tissue. Skiving away from the center makes the entry in the peritoneal cavity harder and prolongs peritoneal access time. During all the single port cases we have done so far we have noted that if we are in the center of the scar then we always see a blob of fat ('UMBILICAL FAT' sign) in the center. If we use a probe or grooved director through this fat direct access is obtained in the peritoneal cavity. Incision can then be extended on both sides and be kept to the limits of the umbilical ring. Peritoneal access can be obtained in 1-2 min using this approach. Umbilical reconstruction is the best performed with this approach.

**RESULTS:** One child developed signs of wound infection and was treated with antibiotics for 5 days successfully. Scars healed well in all cases with no wound dehiscence. No umbilical scars were visible at follow up (3-4 weeks post op).

**CONCLUSION:** Umbilical fat sign is an important landmark for surgeons during SPLS for direct and quick peritoneal access and better reconstruction of the umbilicus.

**P010 SINGLE INCISION TRANSAXILLARY SUBCUTANEOSCOPIC EXCISION OF FIBROADENOMA OF THE BREAST IN CHILDREN: A NOVEL APPROACH** – *Michelle Martin, MD, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E DeBakey Department of Surgery, Baylor College of Medicine and Texas Children's Hospital, Houston, Texas*

**INTRODUCTION:** Fibroadenoma of the breast have been traditionally excised by direct incision on the breast. This leaves a scar that increases in size as the child grows. Also, incision close to the breast bud and areola may result in injury to the ductal system. We propose a new cosmetic approach to this lesion and report our experience with the single incision transaxillary subcutaneousoscopic approach for excision of the fibroadenoma of the breast.

**PURPOSE:** The purpose of this case report is to delineate an innovative surgical approach to resection of a breast fibroadenoma which yields an adequate resection without damage to the ductal system while optimizing cosmetic results by avoiding scars.

**MATERIAL & METHODS:** A 15 year old female with no significant past medical or surgical history was referred to the surgical service with a solitary breast mass found on self-examination. The mass had been present for at least 2 years, was slowly enlarging in size, and was not variable in size with menstrual cycles. On physical examination, the mass was nontender and palpable at the 11 o'clock position in the left breast approximately 2 cm from the areola. Ultrasound revealed a 4.1 x 2.3 x 3.7 cm mass consistent with a fibroadenoma. A fine-needle aspiration biopsy of the mass showed increased stromal cellularity with mild epithelial hyperplasia. There was no evidence of atypical hyperplasia or malignancy.

**TECHNIQUE:** After detailed counseling regarding their options, the patient and her parents elected to undergo resection of the fibroadenoma; however, they were concerned with the anticipated cosmetic result and visibility of a scar. With their concerns in mind, a subcutaneoscopic approach was taken to excise the mass.

Patient was laid supine on the table with the left arm was fully abducted. A 3 cm transaxillary incision was made in the natural skin fold just behind the anterior axillary line. Using a Kittner dissector and the foley balloon catheter space was created subcutaneously. Once adequate space was created we placed a 5mm and a 3mm step port through the same incision and the skin was sutured closed around the ports. CO2 insufflation was then used to create a subcutaneous space to perform the procedure. The mass was circumferentially dissected free using the hook electrocautery and submitted to pathology for review. The wound was reapproximated using a layered closure. The skin was reapproximated in a subcuticular fashion and sealed with liquid skin adhesive. The patient tolerated the procedure well.

**RESULTS:** There were no complications apparent. The final result at 3 month follow up revealed an aesthetically pleasing skin incision that healed well and was hidden by the natural skin fold of the axilla.

**CONCLUSION:** Single Incision Transaxillary Subcutaneoscopic excision of Fibroadenoma of the Breast in children is safe and effective technique and should be considered for excision of benign breast lesions in children.

## **P011 COMBINED LAPAROSCOPIC-ENDOSCOPIC PLACEMENT OF PRIMARY GASTROJEJUNOSTOMY FEEDING TUBES IN CHILDREN: A PRELIMINARY REPORT**

*– Nam X. Nguyen, MD, Shannon Castle, MD, Manuel Torres, MD, Dean Anselmo, MD, Children's Hospital of Los Angeles, Los Angeles, CA, USA, Miller Children's Hospital, Long Beach, CA, USA*

**INTRODUCTION:** Feeding access is one of the most common procedures performed by pediatric surgeons, usually in the form of gastrostomy tubes (GT). However, some children require transpyloric feedings. Traditionally, gastrojejunal (GJ) tubes are placed via an open procedure in order to negotiate the tube into the jejunum or a GT is placed first and then switched to a GJ when the stoma is mature, which can take up to 6 to 8 weeks. We present a case series of primary GJ placement using a combination of laparoscopic-endoscopic approach.

**METHODS:** The initial steps of the procedure were similar to the laparoscopic GT insertion described by Keith Georgeson. Once the position of the needle was confirmed, an extra-long guidewire was used to insert into the stomach. A pre-determined GJ tube with a silk tie placed at the tip was inserted over the guidewire into the stomach. An esophagogastroduodenoscopy (EGD) was performed by

a gastroenterologist and the silk tie was grasped with a biopsy forceps and directed into the jejunum. The stomach was fastened to the abdominal wall in a standard fashion. All the patients who underwent the procedure were retrospectively analyzed. Patients' demographics, surgical outcomes and time to initiate feed were recorded.

**RESULTS:** From 07/2004 to 07/2009, six patients (4 M, 2 F) were identified. The mean age at operation was 30.2 months (28d-10yr). 5/6 of the patients were successfully performed laparo-endoscopically. One conversion to an open procedure was a result of a 28 day-old infant with gastric perforation. The average operative time was 94 minutes (63-155). One patient with previous funduplications and gastric mucosal prolapsed required closure of the existing GT and placement of GJ. Postoperative x-rays confirmed proper position of the tubes in all patients. Of the five with successful tube placement, feedings were initiated on postoperative day #1. None of the patient has had postoperative complications.

**CONCLUSION:** Combined laparoscopic-endoscopic primary GJ tube placement is an excellent alternative for patients who are unable to be fed via gastric route and require transpyloric feeding access.

## **P012 LAPAROSCOPY CHOLECYSTOSTOMY AND BILE DUCT LAVAGE TREATMENT OF INSPISSATED BILE SYNDROME**

*– Qixing Xiong, MD, Qiang Shu, MD, Weiguang Liu, MD, Zhigang Gao, MD, Department of Pediatric Surgery*

**BACKGROUND:** Inspissated bile syndrome is one of the etiological factors which lead to neonatal obstructive jaundice. The treatment of IBS is generally percutaneous transhepatic cholangiography with contemporary therapeutic saline lavage of the biliary tree. Herein we evaluate the effect of laparoscopic cholecystostomy and bile duct lavage on the treatment of inspissated bile syndrome.

**METHODS:** Between January 2005 and December 2009, 16 neonates with inspissated bile syndrome underwent laparoscopic cholecystostomy and bile duct lavage in our department. They were 7 males and 9 females, aged 40 days to 3 months, with an average of 65±23.4 days. The irrigation tube was placed in fundus of gallbladder, and cholangiography was performed to display biliary duct trees. One week after surgery, bile lavage was taken every 2 to 3 days according to bilirubin levels and liver function. The tubes were kept for 2-4 weeks.

**RESULTS:** All cases of biliary tract were irrigated during and after surgery. The level of bilirubin decreased and liver function was greatly improved. DBIL and AST were significantly decreased after one and two months compared to those before surgery ( $P < 0.05$ ).  $\gamma$ -GT has significantly lower after two months of surgery ( $P < 0.05$ ).

**CONCLUSION:** inspissated bile syndrome can easily differentiate from biliary atresia through laparoscopic cholecystostomy. Biliary duct lavage is a feasible and reliable procedure to treat inspissated bile syndrome. Thus, laparoscopic cholecystostomy and biliary tract lavage procedure has great advantage for inspissated bile syndrome.

## **P013 EARLY LAPAROSCOPIC BILIARY TRACT EXPLORATION FOR INFANT CONJUGATED JAUNDICE**

*– Zhigang Gao, MD, Qixing Xiong, MD, Qiang Shu, MD, Weiguang Liu, MD, Jinfa Tou, MD, Pediatric Surgery*

**OBJECTIVE:** To explore the value of early laparoscopic intervention in infant conjugated jaundice.

**METHOD:** Between January 2005 and December 2009, 58 conjugated jaundiced infants underwent early laparoscopic biliary tract exploration and cholangiography after two weeks of regular conservative treatments which failed to decrease bilirubin level significantly. They were 24 males and 34 females, aged 36 days to 94 days, with an average of 58±20.4 days. A laparoscopic aided cholangiography was done.

**RESULTS:** Correct diagnosis was established in all those 58 patients by laparoscopic procedures. In 16 patients, the gallbladder was found to be distended. Cholangiography at the time of operation after saline flushing showed contrast in the intrahepatic and the common bile duct with a flow of the contrast to the duodenum. The expansion of the common bile duct can be noted. They were diagnosed as inspissated bile syndrome (27.6%). After biliary tract were irrigated during and after surgery. The level of bilirubin decreased and liver function was greatly improved. DBIL and AST were significantly decreased after one and two months compared to those before surgery ( $P < 0.05$ ).  $\gamma$ -GT has significantly lower after two months of surgery ( $P < 0.05$ ). 42 patients were diagnosed as biliary atresia (72.4%) after laparoscopic exploration showed liver with atrophic solid gallbladder just visible within its fossa or cholangiography cannot show the intrahepatic biliary tree. Then these patient turned to Kasai procedure.

**CONCLUSION:** Early laparoscopic intervention in infant with cholestatic jaundice helps to establish early diagnosis and early correct treatment. For inspissated bile syndrome patients, cholecystostomy and biliary tract irrigation reduces cholestasis-induced liver damage. For biliary atresia patients, this procedure offers an early diagnosis.

**P014 CARDIPLICATION AS A NOVEL ANTIREFLUX PROCEDURE FOR INFANTS: A PROOF OF CONCEPT IN AN INFANT PORCINE MODEL** – Sarah J. Hill, MD, Mark L. Wulkan, MD, Emory University and Children's Healthcare of Atlanta

**INTRODUCTION:** Current surgical techniques for treatment of gastro-esophageal reflux disease (GERD) in infants are complicated by a high recurrence rate in the infant population. The primary cause of failure is generally related to recurrent hiatal hernia. Most infants with GERD will outgrow their disease as the gastro-esophageal junction matures. Unfortunately, the crural repair may impede maturing of the GEJ. We designed this study to determine if an alternative operation for GERD can increase the cardia yield pressure (CYP) in a piglet model.

**METHODS:** After IACUC approval, 12 male yucatan pigs, weighing 10-12kg underwent laparotomy and cardiaplication. Plication was performed by embroccating the cardia of the stomach over an intraluminal catheter, and secured with 2-3 interrupted sutures over a 1 cm length. Pre- and post-operative cardia yield pressure (CYP) was determined by filling the stomach with water until the cardia became incompetent. Incompetency was determined by reflux through an intra-esophageal catheter, or drop in gastric pressure. Pre- and Post-values were compared using the paired Student's t-test.

**RESULTS:** Cardiaplication was successfully completed in all pigs. CYP increased in all animals after cardiaplication from a mean of  $12.5 \pm 9.6$  to a mean of  $76 \pm 25$  cm of H<sub>2</sub>O ( $p < 0.001$ ).

**DISCUSSION:** Cardiaplication results in an increase in CYP in young pigs. Cardiaplication has the benefit of not modifying the crura, which may lead to a lower recurrence rate. This may translate into fewer postoperative complications and less need for reoperation.

**P015 RELIEF OF SMA SYNDROME WITH LAPAROSCOPIC LADD'S PROCEDURE** – Sabina M. Siddiqui, MD, Samir K. Gadepalli, MD, James D. Geiger, MD, University of Michigan, Ann Arbor

Superior mesenteric artery (SMA) syndrome is a rare form of small bowel obstruction caused by compression of the third portion of the duodenum between the superior mesenteric artery and the aorta. We present the case of a 14-year-old female with a partial small bowel obstruction due to SMA syndrome treated by a laparoscopic Ladd's procedure.

She presented with a several month history of an inability to tolerate solid foods but able to eat liquids, without any large weight loss. Pre-operative CT scan of the abdomen showed concern for a narrowing of

the duodenum as it passed underneath the superior mesenteric artery. The diagnosis was confirmed by endoscopy and laparoscopy.

A laparoscopic Ladd's procedure was performed including rotation of the obstructed portion of duodenum from under the SMA. Post-procedure endoscopy showed relief of the area of luminal narrowing. Post-operative evaluation showed resolution of symptoms up to one year after surgery.

Although SMA syndrome is a difficult problem to diagnose and treat, it should be considered in the differential for partial small bowel obstruction and a Ladd's procedure can be therapeutic.

**P016 LAPAROSCOPIC MANAGEMENT OF INTESTINAL MALROTATION IN CHILDREN** – Moorthy Gurunathan, Prakash Agarwal, Balamourougane Paramasamy, Madhu Ramasundaram, Balagopal Subramaniam, Sri Ramachandra Medical College, Chennai, India

**AIM:** Anomalies of midgut rotation and fixation has traditionally been treated by open Ladd's procedure. Recent literatures supports strongly in favour of laparoscopic approach for the same. We present our experience and results of laparoscopic Ladd's procedure.

**MATERIALS & METHODS:** From April 2007 to April 2011, 7 patients underwent laparoscopic Ladd's procedure for malrotation. Of 7, 4 were males and the age range from 3 months to 7 years. All patients presented with symptoms of intermittent bilious vomiting and the diagnosis of malrotation is confirmed by upper GI series in all. None of the patients had volvulus with gangrene. The procedure was performed using three trocars of 5 mm diameter placed at the infraumbilical ring and the right and left lower quadrants. A standard Ladd's procedure with appendectomy was performed in all cases.

**RESULTS:** All procedures were completed laparoscopically. Average duration of procedure is about 75 minutes (45 - 130 minutes). Feedings were started in post op day 2 and all patients were discharged on day 3. One patient presented with abdominal distension and bilious vomiting after a month of surgery and was explored for adhesiolysis and recovered.

**CONCLUSION:** Laparoscopic Ladd's procedure can be safely performed in infants and children and should be considered as a first line approach in patients with uncomplicated malrotation.

**P017 UTILITY OF LAPAROSCOPIC PROCEDURES IN THE TREATMENT OF NISSEN FUNDOPLICATION COMPLICATIONS** – Carlos García-Hernández, MD, Lourdes Carvajal Figueroa, MD, Roberto Suarez Gutierrez, MD, Sergio Landa Juarez, MD, Hospital Star Medica Infantil Privado

**INTRODUCTION:** Nissen fundoplication controls reflux in 95%. Complications may arise in 2 to 24%. The objective is to evaluate the utility of laparoscopy in the treatment of complications in Nissen fundoplication procedures in children.

**METHODS:** Retrospective study from 2005 to 2011, patients with some type of complication product of a Nissen procedure, either by laparoscopic or traditional approach. The patients were divided in four groups. Group I with digestive tube perforation, group II with early dysphagia, group III wrap migration and group IV with late dysphagia.

**RESULTS:** 49 patients. Group I: 2 children, aged from 1 to 3 years with respiratory insufficiency and subcutaneous emphysema, started 12 to 36 hours of post operator, thorax radiography with right pneumothorax in one case, normal contrast swallow study and normal endoscopy. 1 conversion, Group II: 5 children, ages 2 to 10, early dysphagia, beginning 8 to 24 hrs. Initial laparoscopic all barium swallow study with delay esophageal emptying easy passage of the endoscope, endoscopy of the esophagus and fundoplication deviation, dilated in 2 patients without improvement, laparoscopic re-operation in all between 2 and 15 days of the initial surgery. Causes: bad positioning of the fundoplication with

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greater curvature 1, lack of release of short vessels with esophageal deviation in the other. Group III: Migration of the fundoplication, 38 children were divided: a. - Migration to the left: 33 aged 3 months to 11 years, dysphagia, abdominal pain, vomiting and heartburn in 28 asymptomatic at 4, start of 2 months to 4 years, initial approach to laparoscopic 21 and open at 12, barium swallow study and endoscopy with esophageal dilatation, delayed esophageal emptying and migration to the left. 3 conversions. Findings: wide hiatus. b. - Migration to right: 5 children, 1 to 7 years, sudden dysphagia, abdominal pain and distension, starting from 6 months to 4 years after the initial surgery, the initial surgeries were laparoscopic in 3 and open in 2, X-ray with gastric distension and air imagine right to the mediastinum, failure to pass the endoscope. Findings, pyloric obstruction by omentum and gastric volvulus. Group IV: Late dysphagia, 4 children, 2 to 6 years, progressive dysphagia, beginning between 2 and 4 months, 3 initial approach by laparoscopy and 1 open, barium swallow study with esophageal dilatation, delayed esophageal emptying, endoscopy stenosis, 5 dilatations, improved to 2, 2 children re-operated, we found hiatal fibrosis.

**CONCLUSION:** Group I; Esophageal perforation with acute presentation require immediate reoperation. Group II, Early dysphagia where we found deviation from the fundoplication were caused by improper construction of the fundoplication. Group III, the most common, is the migration of the wrap, related to extensive dissection at the hiatus and gastric emptying obstruction. Group IV late dysphagia, the cause is excessive scarring at the hiatus. The complications must be recognized and treated immediately according to the proposed classification. In reoperations the laparoscopic approach assisted with GI endoscopy is a safe method that allows correction of the complications and control of the disease.

**P018 LAPAROSCOPIC CARDIOMYOTOMY FOR ESOPHAGEAL ACHALASIA IN TWO CHILDREN WITH TRIPLE-A SYNDROME** – Cora Städtler, MD, Rebecca Künzel, MD, Thomas Boemers, MD, PhD, Cologne Children's Hospital

The autosomal-recessive hereditary Triple-A Syndrome is characterized by the triad of adrenocorticotrophic hormone (ACTH)-resistant adrenal insufficiency, alacrimia and achalasia of the cardia. Although frequently alacrimia is the earliest feature, the most common manifestations are achalasia and adrenocortical insufficiency. As the disease progresses, neurological symptoms occur, such as polyneuropathy, amyotrophy and optic atrophy. The treatment of alacrimia consists of supplementing artificial tears, the adrenocortical insufficiency is treated by glucocorticoid- and mineralocorticoid-medication. There are different approaches for the therapy of the achalasia: endoscopic dilatation, as well as surgical and laparoscopic myotomy, with or without fundoplication.

In the past 5 years we treated two patients with Triple-A Syndrome (2 and 13 years old) concerning their achalasia. In one child we performed a laparoscopic cardiomyotomy in combination with a hemifundoplication according to Thal, the other underwent a simple cardiomyotomy without fundoplication. Both children are persistently free of complaints. Laparoscopic cardiomyotomy is an appropriate procedure for treatment of achalasia in children with Triple-A Syndrome.

**P019 USE OF CT ENTEROGRAPHY FOR THE DIAGNOSIS OF LOWER GASTROINTESTINAL BLEEDING** – Mark L. Ryan, MD, Jonathan M. Fields, MD, James S. Davis, MD, Eduardo A. Perez, MD, Juan E. Sola, MD, Holly L. Neville, MD, University of Miami Miller School of Medicine

**INTRODUCTION:** Lower gastrointestinal bleeding (LGIB) represents a significant diagnostic and therapeutic challenge. Identifying the source of LGIB in pediatric patients is even more difficult due to the extensive differential diagnosis, variable clinical presentation, and frequent spontaneous resolution of bleeding.

CT enterography (CTE) utilizes low density barium sulfate contrast with methylcellulose additive (Volumen®, E-Z-EM Inc, Lake Success, NY) to create distend the intestinal tract and enable visualization of the bowel wall. Combined with enhanced spatial resolution of newer multidetector CT systems, this allows for the identification of vascular lesions. Although the technology has been previously evaluated in adults with occult LGIB, it has only been applied to children who are suffering from the complications of Crohn's disease. This is the first case series describing the use of CT enterography for the diagnosis of LGIB in pediatric patients.

**METHODS:** We retrospectively reviewed all patients treated at a large, metropolitan children's hospital from 2006 to 2011, identifying children who had received CTE as part of their evaluation for LGIB. Patients meeting criteria were reviewed in detail, and data regarding clinical presentation, diagnostic testing, radiologic findings, treatment, and outcome was recorded. Patients received oral and/or rectal infusion of VoLumen contrast along with intravenous contrast for both arterial and venous phases.

**RESULTS:** Six patients were identified between 2006 and 2011 who had received CTE as a component of their evaluation for LGIB. Patient age ranged from 2 to 11. Results of diagnostic testing, pathology, and treatment are presented below. Figure 1 demonstrates an enhancing lesion on CTE.

Patient	US	Meckel's Scan	CTE	Treatment	Pathology
1	Neg	Neg	Pedunculated polyp in descending colon	Colonoscopy	Infarcted juvenile polyp
2	Neg	Neg	Tubular structure 2-3 cm in length connected to ileum	Operative	Meckel's Diverticulum
3	Neg	Neg	Polypoid lesion from anterior wall of cecum adjacent to ileocecal valve	Operative	Juvenile inflammatory polyp
4	Neg	-	Extensive polyposis coli. Enhancing masses in sigmoid (6 cm), descending colon (3 cm), and cecum (2 cm)	Colonoscopy	Adenomatous polyp
5	Neg	Neg	Dilated, enhancing blind ending structure attached to small bowel in right lower quadrant	Operative	Meckel's diverticulum
6	Neg	Neg	Enhancing, blind ending diverticulum in distal small bowel	Operative	Duplication cyst

**CONCLUSION:** CTE appears to be a valuable tool identifying the cause of LGIB prior to surgical or endoscopic intervention in patients with lesions that are difficult to localize using conventional imaging. Further studies are required to determine the optimal selection criteria for the evaluation of pediatric patients using CTE, and to clarify indications for its use.



Figure 1: CTE demonstrating an enhancing polyp within the cecum

**P020 TRANSANAL PULL-THROUGH SUBTOTAL COLECTOMY WITH SINGLE-PORT LAPAROSCOPIC GUIDANCE** – *Suolin Li, MD, Chi Sun, MD, Zengwen Yu, MD, Department of Pediatric Surgery, the Second Hospital of Hebei Medical University*

**OBJECTIVE:** To explore the feasibility and outcomes of single-port laparoscopic subtotal colectomy with transanal endorectal pull-through for extended Hirschsprung's disease and allied disorder (HAD).

**METHODS:** From March 2010 to May 2011, 10 children with the extensive form of HAD underwent a transumbilical single-port laparoscopic Soave procedure. Under the laparoscopic vision, the sigmoid, transverse and right colon were mobilized via rectal muscular sleeve access, then transanal endorectal pull-through completed the subtotal colectomy.

**RESULTS:** All the procedures were successfully performed in 10 cases. The average operative time was 124±16 min (range, 105 to 225 min). The length of the resected segment was 70-90 cm, and the estimated blood loss was 10-20 ml. There were no unanticipated intraoperative complications. One infant developed postoperative intestinal obstruction that required open exploration. The follow-up was available at a median time of 10 months (range 3-18 months), their bowel movement frequency changed from 5-15 per day latest postoperatively to 3-5 per day after 2 months. The clinical outcomes were excellent with no stool incontinence or constipation and the result of anorectal manometry was good.

**CONCLUSIONS:** Transanal endorectal pull-through subtotal colectomy with transumbilical single-port laparoscopy is a safe and feasible procedure, with more minimal invasion, invisible scars in the abdomen, and nearly the cosmetic result of NOTES.

**P021 RISK OF HERNIA OCCURRENCE WHERE DIVISION OF AN INDIRECT INGUINAL SAC WITHOUT LIGATION IS UNDERTAKEN**

– *Simon C. Blackburn, MRCS, Stephen D. Adams, MRCS, Anies A. Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton*

**AIM:** To ascertain the risk of inguinal hernia occurrence when division of the processus vaginalis is undertaken without ligation, in the context of a laparoscopic Fowler-Stephens orchidopexy.

**METHOD:** A cohort of patients with intra-abdominal testes subjected to a 2 stage Fowler-Stephens procedure were reviewed. Demographic and outcome data were recorded prospectively using Microsoft Excel. Analysis of a 6 year period between November 2005 and August 2011 was performed. A comprehensive search of the literature was undertaken and these data were compared with previously published studies of patients undergoing orchidopexy or herniotomy where the peritoneal defect was not closed.

**PROCEDURE:** The procedure was undertaken as previously described(1), with a conventional first stage using a three port technique. At the second stage the testis is mobilised on a peritoneal pedicle using sharp dissection, without division of the gubernaculum. Dissection is continued via groin incision and the testis delivered into a sub-dartos pouch. No attempt is made to approximate the peritoneal margins of the processus vaginalis/hernia or close the internal ring.

**RESULTS:** In our own experience 17 patients with undescended testes (2 with bilateral) underwent laparoscopically assisted, gubernaculum sparing, Fowler-Stephens orchidopexy. Median age at first operation was 1.86 years (range 1-9 years).

All patients (17) had successful surgery with all testes (19) palpable within the scrotum at post operative assessment at 3 and 6 months. No indirect, direct or incisional hernias were noted at a mean follow up of 2.7 years (SD 1.71).

A review of the literature revealed 5 relevant additional studies summarised in table 1. No hernias were seen following this technique in any of these series.

*Table showing results of literature search (Lap;laparoscopic, F-S; Fowler-Stephens Orchidopexy)*

Study	Operation	No. patients (no. cases)	Hernias	Length FU
Mohta 2003	Open orchidopexy/herniotomy	25 (25)	None	1 year
Handa 2005	Lap orchidopexy	58 (71)	None	1.5-6.5 years
Kumari 2009	Open orchidopexy	50 (62)	None	1 year
Riquelme 2010	Lap herniotomy	91 (91)	None	4 months-4 years
Jain 2011	Open orchidopexy	450 (504)	None	9-243 months
Our series, Mahomed 2011	Lap 2nd Stage F-S	17 (19)	None	2.6 years

**CONCLUSION:** Our own experience and reports in the literature support simple division of the indirect hernia sac as a tenable alternative to ligation. The result of this limited review would support a prospective randomised trial comparing ligation to simple division of hernia sacs.

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**P022 CHRONICALLY SYMPTOMATIC PATIENTS WITH UNDETECTABLE GALL BLADDER ON ULTRASONOGRAPHY COULD BENEFIT FROM EARLY CHOLECYSTECTOMY** – *Stephen D. Adams, MRCS, Simon C. Blackburn, MRCS, Anies A. Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

*MRCS, Simon C. Blackburn, MRCS, Anies A. Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

**BACKGROUND:** Of symptomatic patients coming to cholecystectomy 90% will have cholelithiasis with 10% falling into the category of acalculus cholecystitis. In all cases the gallbladder is evident on ultrasonography. Non visibility of the gallbladder on repeat radiological study is unusual and poses difficulty with interpretation and management.

**AIM:** To present the details of cases with protracted gallbladder dyspepsia where repeat ultrasonography in skilled hands failed to demonstrate evidence of a gallbladder. To complement the presentation with a video clip of a cholecystectomy performed in this context.

**METHOD:** A retrospective review of the clinical presentation and ultrasonographic findings in a cohort of cholecystectomies undertaken laparoscopically over a 15 year period in a tertiary paediatric setting. Cases with undetectable gallbladders were studied in more detail.

**RESULT:** Fifty four cases with mean age of 12.32 years, standard deviation 3.82, M:F ratio of 18:36, underwent laparoscopic cholecystectomy with a post operative median stay of 1 day (range 0-4 days). There were no conversions to open surgery and operating time averaged 81 minutes.

In all, except 3 patients, a gallbladder was evident on preoperative ultrasonography with cholelithiasis documented in 45 cases. The 3 cases; 2 females and a male aged 16, 17 and 8 years respectively with recurrent RUQ pain had undetectable gallbladders on repeat ultrasonography. The studies were performed, in the fasting state, by skilled operators, over at least an 8 month period. After a prolonged observation period all underwent successful cholecystectomy with instant symptomatic improvement. Histology demonstrated a markedly fibrotic and thickened gallbladder wall in all cases.

**CONCLUSION:** Non detectable gallbladders in symptomatic patients with intractable gall bladder dyspepsia suggest a chronically scarred

organ for which a cholecystectomy is indicated. Serial radiological study with its implicit delay simply prolongs suffering and it would seem sensible to subject these patients to cholecystectomy following repeat negative ultrasonography.

**P023 LAPAROSCOPIC HERNIA REPAIR IN PRETERM AND TERM INFANTS - ANALYSIS OF PAST MEDICAL HISTORY AND POSTOPERATIVE COMPLICATIONS**

– *Christine Burgmeier, MD, Salmal Turial, MD, Felix Schier, MD, PhD, Department of Pediatric Surgery, University Medical Center Mainz*

**INTRODUCTION:** Inguinal hernia is common in term and preterm infants. Various problems in the postoperative course after laparoscopic hernia repair in premature infants are connected with the immaturity of organs, especially the lungs. In this study we investigated the past medical history, pre-existing diseases and complications within the postoperative course after laparoscopic hernia repair in term and preterm infants.

**METHOD:** This retrospective, single-institution study included 167 term infants and 122 preterm infants undergoing laparoscopic hernia repair under general anesthesia in the first six month of life. We identified the past medical history and pre-existing diseases of these 289 infants (208 male and 81 female) who have been operated from April 2005 until July 2011. We reviewed the charts for gestational age, birth weight, gestational age at surgery and weight at time of surgery. In addition we investigated postoperative complications, length of hospital stay and need for intensive care monitoring and treatment.

**RESULTS:** 150 term infants (89,8 %) had a uneventful postoperative course on normal ward and could be discharged from hospital within 2 days. 134 term infants (80,2 %) had neither pre-existing diseases nor complicated past medical history. After laparoscopic hernia repair only 8 term infants (4,8 %) had respiratory postoperative complications, two of them required ventilator support. In the term group the past medical history revealed postnatal respiratory distress in only 5 infants. None of them had severe respiratory problems in the past medical history.

In contrast, in the preterm group 92 infants (75,4 %) had postpartum respiratory distress and disorders. Actually, 28 preterm infants (23,0 %) had severe respiratory problems in their past medical history. After laparoscopic hernia repair under general anesthesia 22 preterm infants (18,0 %) showed postoperative desaturations and apnea, but only 4 of them required intervention. In the preterm group 47 infants had an uneventful postoperative course and discharge from the hospital within two days.

**CONCLUSION:** The postoperative course after laparoscopic hernia repair under general anesthesia in term infants with clear past medical history is uneventful in the majority of cases. A lot of premature infants develop postpartum respiratory distress due to the immaturity of the lungs. Especially these infants have a great risk for postoperative complications and therefore need intensive care monitoring after laparoscopic hernia repair. Preterm infants with clear past medical history have a low risk for postoperative respiratory complications.

**P024 INGUINAL HERNIA AND PATENT PROCESSUS VAGINALIS IN PRETERM AND TERM INFANTS**

– *Christine Burgmeier, MD, Salmal Turial, MD, Felix Schier, MD, PhD, Department of Pediatric Surgery, University Medical Center Mainz, Germany*

**INTRODUCTION:** Inguinal hernia repair is the most common operation in pediatric surgery, also in preterm and term infants. The laparoscopic hernia repair easily enables the evaluation of both internal inguinal rings. The aim of this study was to analyze the incidence of uni- or bilateral inguinal hernia and contralateral patent processus vaginalis in term and preterm infants.

**METHOD:** We included 289 infants in this retrospective, single-institution study. From April 2005 until July 2011 122 preterm infants and 167 term infants underwent laparoscopic hernia repair under general anesthesia in the first six month of life. We reviewed gestational age, birth weight, gestational age at surgery and weight at time of surgery. Furthermore we analyzed side of the hernia and results of the intraoperative evaluation of the contralateral internal inguinal ring.

**RESULTS:** Altogether 208 boys and 81 girls underwent laparoscopic hernia repair. In the group of term infants 115 babies underwent unilateral hernia repair. During the operation we found a patent contralateral processus vaginalis in 35 of these infants (30 %). It is remarkable that 90 term infants (78,2 %) presented with right-sided inguinal hernia. Altogether we performed a bilateral inguinal hernia repair in 87 term infants (52 %). However, only 52 of them (31,1 %) presented with bilateral inguinal hernia.

In the premature infants group 55 babies underwent unilateral hernia repair. In 20 of them we found a patent processus vaginalis on the contralateral side. In contrast to the term group, only 29 preterm babies (23,8 %) presented with a right-sided inguinal hernia. We performed a bilateral hernia repair in a total of 87 preterm infants (71,3 %), 67 of them presented with bilateral inguinal hernia.

**CONCLUSION:** In summery bilateral inguinal hernia is more often in premature than in term infants. In our study the incidence of contralateral patent processus vaginalis did not differ between the two groups. Surprisingly we remarked a considerably difference in the occurrence of right-sided inguinal hernia in preterm compared with term infants.

**P025 FACTORS ASSOCIATED WITH BAND OR PORT DISPLACEMENTS AMONG ADOLESCENTS UNDERGOING LAPAROSCOPIC ADJUSTABLE GASTRIC BANDING (LAGB)**

– *Jeffrey L. Zitsman, MD, Mary F. DiGiorgi, MS, MPH, Beth A. Schrope, MD, PhD, Marc Bessler, MD, New York Presbyterian/Columbia University Medical Center, New York, NY 10032 USA*

**BACKGROUND:** In contrast to large numbers of adult patients, approximately 500 teenagers worldwide have been reported in adolescent LAGB studies. Our experience with over 100 previously unreported patients notes a band/port complication rate requiring reoperation of 15.2%. Few reports address these complications in teenagers undergoing LAGB.

**METHODS:** Between 8/1/06 and 7/31/11 138 subjects 14-19yrs have undergone LAGB (mean 17.0yr). All patients who underwent primary LAGB by a single surgeon with a minimum of 12 months follow up time were included in this study (n=125). Preoperative characteristics and post-operative weight loss were compared between patients who experienced device complications (port displacement, tubing leak, or band displacement/slip; n=19) and those who did not experience device complications (n=106). We evaluated gender, age at surgery, pre-operative body mass index (BMI), presence of superobesity (BMI > 50), and rate of weight loss for correlation with band/port complication.

**RESULTS:** Patients who underwent LAGB ranged in age from 14 to 19 yrs (mean=17.0 yrs); were 70% female and had an average pre-op BMI of 48.32±8.5.

	No band/port comps (n=106)	Band/port comps (n=19)	P value
% female	68%	84%	NS
Mean Age (yr)	17.1	16.6	NS
PreOp BMI	48.8	45.5	NS
BMI 50+	37.7%	15.8%	.065
6m%EWL	20.0	28.1	.055
12m%EWL	25.7	39.9	.047*
18m%EWL	31.5	41.2	NS
24m%EWL	35.0	46.5	NS
36m%EWL	37.9	44.1	NS

**CONCLUSIONS:** This data suggests that patients who achieve greater weight loss may be at a higher risk for band slips or port complications. This may be due to more rapid weight loss experienced by these patients.

## **P026 SINGLE STUMP LIGATION OF THE APPENDIX IS A PREFERABLE TECHNIQUE IN LAPROSCOPIC APPENDECTOMY FOR CHILDREN**

– *Junko Fujino, MD, Akihiro Igarashi, MD, Masahiro Hatanaka, MD, Makoto Suzuki, PhD, Kazunori Tahara, PhD, Yuki Ishimaru, MD, Hitoshi Ikeda, PhD, Dokkyo Medical University, Koshigaya Hospital, Department of Pediatric Surgery*

**BACKGROUND:** Laparoscopic appendectomy for acute appendicitis has been performed in our institution for over 10 years. Until March 2009, double stump ligation of the appendix (DSL) by Endoloop® was the standard technique to prevent loosening of the ligature. Single stump ligation of the appendix (SSL) in laparoscopic appendectomy has been performed since April 2009 because of its lower operative cost; furthermore, single (simple) ligation as a purse-string invagination was reported to be safe. Thus far, few cases of postoperative complications in patients with perforated appendicitis have been experienced.

**AIM:** To verify that SSL is a suitable procedure for complicated appendicitis, we compared the surgical outcome of SSL with that of DSL.

**METHODS:** The study period was 4 years, from April 2007 to March 2011. This study included 180 patients with acute appendicitis. Among them, 54 (30%) patients had complicated appendicitis, and they were divided into 2 groups. Group A consisted of 25 patients for whom SSL was performed from April 2009 to March 2011, and group B consisted of 29 patients for whom DSL was performed from April 2007 to March 2009. The incidences of postoperative complications, particularly intra-abdominal abscess, were retrospectively examined. Preoperative white blood cell (WBC) count, C-reactive protein (CRP) level, operation time, peritoneal lavage volume, and hospital stay were also compared between the 2 groups.

**RESULTS:** The mean age of group-A and group-B patients was 10.3 and 11.3 years, respectively. The incidence of intra-abdominal abscess was 1/25 (4%) in group A and 5/29 (25%) in group B. The incidence rate was higher in group B than in group A, but this difference was insignificant ( $p = 0.2$ ). The mean WBC count was 18,316/ $\mu$ L in group A and 15,675/ $\mu$ L in group B; CRP level was 10.3 mg/dL in group A and 7.96 mg/dL in group B. The mean peritoneal lavage volume was 2,083 mL in group A and 1,693 mL in group B. The mean length of hospital stay was 8 days for both the groups. CRP level, operation time, and peritoneal lavage volume did not significantly differ between the 2 groups, but WBC count did. These results indicate that the condition of the patients in both the groups was similar in the perioperative period.

**CONCLUSION:** SSL was not inferior to DSL in terms of the incidence of postoperative complications. We conclude that SSL is preferable to DSL, because it reduces the cost and time of appendectomy in children.

## **P027 LAPAROSCOPIC NISSEN FUNDOPLICATION IN CHILDREN LESS THAN FIVE KILOGRAMS WITH GASTROESOPHAGEAL REFLUX DISEASE**

– *Gonul Kucuk, MD, Ufuk Ates, MD, Gulnur Gollu, MD, Aydin Yagmurlu, MD, Ankara University School of Medicine Department of Pediatric Surgery*

The number of minimal invasive procedures performed in the neonatal period and infancy has increased as the laparoscopy experience of pediatric surgeons increased and also smaller instruments have been developed with the improvements in technology. Aspiration, caused by muscle weakness and swallowing dysfunction, and death are frequently encountered in infants with gastroesophageal reflux disease especially in neurologically impaired patients. The aim is to present patients less than five kilograms who have undergone laparoscopic Nissen fundoplication.

The charts of patients less than five kilograms who have undergone laparoscopic Nissen fundoplication between November 2007 and May 2011 were retrospectively reviewed. Demographic data of the children, comorbidities, operating times, presence of early and late complications, feeding time were evaluated.

Twelve children who were diagnosed as gastroesophageal reflux disease with the aid of upper gastrointestinal contrast studies and 24-hour pH monitorization were undergone laparoscopic Nissen fundoplication. The median age of the patients was four months (1month-12months). Eight of the patients were male and four of the patients were female. One of the children had been operated in the neonatal period because of proximal esophageal atresia and distal tracheoesophageal fistula. Ten of the children were neurologically impaired. The children were undergone laparoscopic Nissen by using 3mm instruments through three ports. The mean body weight of children was 3.4kg (2.4-5kg). simultaneous laparoscopic gastrostomy was performed in ten children and simultaneous tracheostomy in one child. Mean operating time was 76minutes (30-180minutes). There was no perioperative complication. Mean feeding time postoperatively was 1day (0-3days). One of the patients had ileus and was undergone bridectomy. Another patient was undergone laparotomy and revision of gastrostomy because of dislocation of gastrostomy on postoperative ninth day.

Laparoscopic Nissen fundoplication can also be safely performed in infants as in adults and children as the surgeons gain experience. It may be life-saving procedure especially in neurologically impaired children by decreasing complications related to aspiration and sudden death syndrome.

## **P028 LAPAROSCOPIC REMOVAL OF NEEDLE AFTER PENETRATION AND MIGRATION IN CHILDREN**

– *Ufuk Ates, MD, Gonul Kucuk, MD, Gulnur Gollu, MD, Aydin Yagmurlu, MD, Huseyin Dindar, MD, Ankara University School of Medicine Department of Pediatric Surgery*

Although most of ingested foreign bodies pass through gastrointestinal tract uneventfully, rarely the foreign body may penetrate out of gastrointestinal tract and may migrate to liver or other organs. Migration of a foreign body to the liver is extremely rare and very few pediatric cases have been reported in the literature. A six-year old boy who was admitted to hospital with a history of needle ingestion with no symptom and a seventeen-year old girl who was admitted with abdominal pain and whose plain abdominal X-ray revealed needle had no progression in the follow-ups. Endoscopic examination of both patients revealed no pathology. Fluoroscopy guided laparoscopic excision of needles was performed in both patients, one of which migrated to liver and the other penetrated to omentum. The aim of the study is to emphasize that surgeons dealing with non-progressive foreign bodies shouldn't hesitate on the decision of surgery, especially in centers where laparoscopy is widely available.

## **P029 A NEW METHOD FOR A SIMPLE, SAFE AND QUICK SINGLE INCISION GASTROSTOMY PLACEMENT**

– *Stefan Gfroerer, MD, Henning Fiegel, MD, You-jung Bak, MD, Udo Rolle, MD, Department of Pediatric Surgery, Goethe-University Frankfurt*

Gastrostomy placement is frequently performed as an endoscopic procedure in pediatric patients with dysphagia or failure to thrive (PEG -Procedure). For cases, where an transesophageal gastroscopic procedure for PEG insertion is contraindicated or where a laparoscopy for other reasons has to be performed, we describe a simple, safe and quick technique for gastrostomy tube placement in children as a single incision procedure. A 5mm trocar (or smaller) is inserted via an umbilical minilaparotomy. The scope is placed. Under vision another trocar (3mm) is placed umbilically next to the camera trocar. After inspection

of the abdomen the site of the prospective gastrostomy placement is discovered. Under abdominal inspection and simultaneous pressing on the abdominal wall the location of the infracostal skin incision for gastrostomy placement is determined. The skin is incised and after minor dissection of the abdominal wall with a small scissors a 5mm monopolar hook cautery is inserted into the abdominal cavity. A small gastric perforation is placed at the proposed gastrostomy site using the hook electrocautery. After removing the cautery a 14 Ch. gastrotube is inserted percutaneously at the site of the infracostal skin incision. Under laparoscopic supervision and elevating the stomach against the gastrotube with the 3 mm instrument the tube is easily inserted into the stomach. The gastrotube balloon is inflated and the stomach elevated to the ventral abdominal wall through traction on the gastrotube. The gastrotube is fixated under mild traction with the external plate. No additional sutures or exteriorization of the stomach are needed. In the last 12 months we used this technique in 3 patients. No major PEG-related complications were recorded. In 1 patient, minor PEG tube problems arose in the postoperative period, which were easily treated on an out-patient basis. The described technique provides a simple, safe and quick method, which combines the laparoscopic view with an excellent cosmesis.

### **P030 EXPERIENCE WITH THE USE OF HISTOACRYL IN THE MANAGEMENT OF GASTRIC VARICEAL BLEEDING IN CHILDREN**

– *Rodrigo H. Cifuentes, MD resident, Placido E. Rosas, MD, Luis Ariel W. Gonzalez, MD, Centro Medico Nacional 20 de Noviembre ISSSTE*

Bleeding variceal esophageal is relatively uncommon in children. its incidence varies with age, most of the occurrence bleeding before 10 years are exceptional in the first year of life. its lethality is 5 to 9% in children with obstruction consider the portal vein and greater in cases with liver cirrhosis. Portal hypertension is treated classically by portosystemic shunt until the procedure is associated with high morbidity by hepatic encephalopathy 3-6%, which increase the development of other treatment options such as Sclerotherapy of varicose veins, which were already carried out since 1937 and was introduced in 1959 at the pediatrics. The aim of this study was prospective in our area, treatment of esophageal varices by Endoscopic sclerosis in children.

**PATIENTS & METHODS:** Between January 2010 and January 2011, 7 patients endoscopy were admitted to the pediatric unit of our hospital because of gastrointestinal bleeding due to gastric varices to perform sclerotherapy. The age of patients ranged from 2 years to 12 years. Five male 2 female. The cause of portal hypertension was portal cavernomatosis in all patients. Episodes of gastrointestinal bleeding prior to treatment were 2 to 3 episodes with a time difference of 3 months. All patients were previously treated with propranolol and controls of blood counts without further treatment.

In all procedures use usually an endoscope Olympus GIF channel 150 would be 2807285 wide, the procedure was performed under sedation in all patients. Apply 0.5 ml of lipiodol then 0.5 ml of cyanoacrylate (Histoacryl) fundic varices in type gov 1 in 2 patients, and type gov 2 in 5 patients. All patients were able to reduce varicose veins in an average of 1 to 2 applications with endoscopic control every month, without further bleeding fundic varices, all with adequate control of the application with fluoroscopy, 4 patients were able to reduce varicose veins with 1 application, 3 patients with 2 applications without complication, we present a patient who died secondary to respiratory distress prior to the application of Histoacryl. The control of bleeding fundic varices by sclerotherapy is achieved in 80 to 90% of cases and the proportion of good success greatly increase when using cyanoacrylate in the obliteration of the variceal bleeding. The

application of this substance requires familiarity with the procedures conventional sclerotherapy to increase indeed the possibility of placing substance inside the varicose vein and avoid adhesion of the damage to the endoscope. in This experience fundic varices eradicated. Bleeding from esophageal varices is well tolerated by patients with good hepatic function. In children, unlike adults, 50-66% of cases of portal hypertension are presinusoidal source for cavernomatosis the carrier, in which the liver is usually healthy. All our patients cavernomatosis were carriers of the holder, which must have favorably influenced the results. the absence of significant complications attributable the procedure and bleeding. by our own team, for these reasons, despite the small number of cases pediatric gathered, we believe that sclerotherapy is probably, in our environment, a very good treatment in children with fundic varices.

**P031 LAPAROSCOPIC TRANSHIATAL GASTRIC PULL-UP** – *Ravindra Ramadwar, MCh, DNB, FRCS, Kishore Adayanthaya, MCh, Snehalata Dhayagude, MD, Bombay Hospital, Hinduja Hospital*

**BACKGROUND:** Oesophageal replacement for oesophageal atresia and caustic oesophageal strictures involves major dissection in abdomen, chest and neck. Gastric pull up is one of the options apart from reverse gastric tube, colon or jejunum. Retrosternal, transpleural or posterior mediastinal space is utilised for replacement. To minimise surgical trauma, laparoscopic transhiatal gastric pull up appeared to be a good alternative.

**AIM:** To evaluate the feasibility and safety of laparoscopic transhiatal gastric pull-up in children with oesophageal atresia, caustic oesophageal stricture and motility disorder

**METHOD:** Three children (age 2, 3 and 5 years) were selected for laparoscopic transhiatal gastric pull-up. One boy had oesophageal atresia with feeding gastrostomy and oesophagostomy. The other patient had a caustic oesophageal stricture requiring dilatation every two weeks for more than one year. Third patient had severe dilatation of oesophagus with respiratory distress with aperistaltic oesophagus on manometry. All patients underwent laparoscopic transhiatal gastric pull-up. In initial two patients feeding jejunostomy was also performed. In two patients oesophagectomy was performed under vision upto arch of aorta. The cervical and upper thoracic oesophagus was dissected easily from neck incision on right side. The posterior mediastinal dissection was done under vision to create adequate space for stomach.

**RESULTS:** All children withstood the procedure very well. The operative time was 150 min, 155 min and 170 min. Posterior mediastinal dissection was bloodless and none of the patients require blood transfusion. Postoperatively first two patients were electively ventilated for 24 hours and in them jejunostomy feeding was commenced after 48 hours. The third child was extubated on table and nasogastric feeding was commenced after 72 hours. In the same child oral feeding was commenced on 5th postoperative day and was on soft diet on 7th postoperative day. Contrast study was performed on postop day 7 in all patients. First two patients had minor leak which resolved spontaneously within 14 days of surgery. In these patients oral fluids were introduced on 7th day after contrast study. Patients were on full oral feeds by 15th postop day. Jejunostomy was removed after one month. At follow-up of 5 years, 2 years, and 6 months there was significant weight gain and no major feeding issues.

**CONCLUSION:** Laparoscopic transhiatal gastric pull-up with dissection of posterior mediastinum under vision appears to be feasible and safe.

## **P032 IMPACT OF LAPAROSCOPIC EXPLORATION ON COMPLICATIONS FOLLOWING UNILATERAL INGUINAL HERNIA REPAIR**

*– Vincent E. Mortellaro, MD, Marty Knot, MD, Frankie B. Fike, MD, Alessandra Gasior, MD, Susan W. Sharp, Daniel J. Ostlie, MD, George W. Holcomb, MD, Shawn D. St. Peter, MD, Department of Surgery Children's Mercy Hospital and Clinics Kansas City, MO*

**BACKGROUND:** In young children with a unilateral congenital inguinal hernia, the high incidence of having an occult contralateral hernia has led to the practice of laparoscopic contralateral exploration. The affect of performing laparoscopy on post-operative complications such surgical site infection has not been previously reported.

**METHOD:** A retrospective review was conducted of all patients who underwent a unilateral inguinal hernia repair from 1/1/2000 to 3/1/2010. We compared those who underwent laparoscopic evaluation of the contralateral ring to those who did not. Patient demographics, and operative data outcomes were evaluated. Fischer's exact test and t-test were used for statistical evaluation of data points.

**RESULTS:** There were 1167 patients who underwent unilateral inguinal hernia repair, and laparoscopy was used in 1012 patients. There were no major intraoperative complications. In the group who underwent laparoscopy, the mean age was 4.0 +/- 3.6 years old and 88% male. Hernia laterality was right in 635 patients (63%), and left in 377 patients (37%). At the time of exploration 315 (31%) patients were found to have bilateral inguinal hernias. Of these patients, 185 (59%) were undergoing right-sided repair and 130 (41%) were undergoing repair on the left. There were 10 patients (0.9%) who developed a surgical site infection. Infection developed in the side used for laparoscopic exploration in 9 patients and in the contralateral side in 1 patient. All patients with surgical site infections were started on oral antibiotics. Abscesses developed in 2 patients requiring incision and drainage. No patient required hospital admission or reoperation. The mean number of clinic visits in those who developed a surgical site infection was 2 visits. In the 155 patients who did not undergo laparoscopy, mean age was 4.3 +/- 4.4 years (P = 0.38) and were 85.8% male (P = 0.36). A unilateral hernia was identified preoperatively on the right side in 95 patients (61%) and on the left in 60 patients (39%). There was 1 wound infection identified in the control group (0.6%). (P=0.65)

**CONCLUSION:** There is minimal risk of infection following unilateral inguinal hernia repair, and this risk is not increased by the use of laparoscopic contralateral exploration.

## **P033 TRANSUBILICAL LAPAROSCOPIC-ASSISTED VERSUS OPEN APPENDECTOMY IN CHILDREN: OUTCOMES IN A TEACHING HOSPITAL**

*– Tiago Henriques-Coelho, MD, PhD, Ana Catarina Longras, MD, Ruben Lamas-pinho, MD, Ana Alvarenga, MD, Jorge Correia-Pinto, MD PhD, Pediatric Surgery Department, Hospital São João, Porto, Portugal*

**INTRODUCTION:** The best surgical approach to acute appendicitis is still a matter of debate in pediatric population.

**METHODS:** Between the January 2009 and December 2010, all pediatric patients submitted to appendectomy in a teaching hospital were retrospectively analyzed. Patients were classified in four groups: non-complicated appendicitis submitted to open surgery (NCA-OA), non-complicated appendicitis submitted to transumbilical laparoscopic-assisted appendectomy (NCA-LA), complicated appendicitis submitted to open surgery (CA-OA), complicated appendicitis submitted to transumbilical laparoscopic-assisted appendectomy (NCA-LA). Operative time, length of hospital stay, readmission rate, reoperation rate, major and minor complications were compared among the groups. Statistical analysis was performed with Two Way ANOVA for continuous variables and Chi-square test with Yates correction for categorical variables.

**RESULTS:** A total of 691 appendectomies were performed (NCA-OA, n=397, NCA-LA, n=90; CA-OA, n=156, CA-LA, n=48). Operative time was longer in NCA-LA (57±22min) and CA-LA (75±22min) groups, as compared with NCA-OA (43±15min) and CA-OA (57±34min) groups, respectively. Length of hospital stay was shorter in NCA-LA (1.8±1.0days) as compared in NCA-OA group (3.3±1.2days), whereas was similar between CA-LA and CA-OA groups. There were no differences in reoperation and readmission rates neither in major complications between LA and OA groups. Regarding minor complications, NCA-LA and CA-LA groups had a higher number of suture granuloma, as compared with NCA-OA and CA-OA groups.

**CONCLUSIONS:** Transumbilical laparoscopic-assisted appendectomy is a valid option in both complicated and non-complicated appendicitis, with the advantage of a better cosmetic outcome.

## **P034 SUCCESSFUL ENDOSCOPIC REMOVAL OF HUGE TRICHOBEZOARS ASSISTED WITH INTRAGASTRIC SURGERY TECHNIQUE IN A CHILD CASE**

*– H. Soh, MD, M. Kamiyama, MD, M. Oowari, MD, Y. Miyazaki, MD, K. Nakajima, MD, M. Fukuzawa, Department of Pediatric Surgery and Gastrointestinal Surgery, Osaka University Graduate School of Medicine*

Huge trichobezoars require surgical removal by laparotomy and gastrotomy. We present a case of a successful endoscopic removal of a huge gastric trichobezoar assisted with intragastric surgery technique in a child case.

**CASE:** An 11-year-old girl diagnosed with trichocryptomania was admitted to our hospital because of an abdominal pain. An abdominal CT scan revealed a high density huge mass in the stomach.

**OPERATION:** Under general anesthesia, gastric endoscopy showed trichobezoar in the stomach. The huge trichobezoar occupied most of the gastric lumen, so endoscopic removal was impossible. We attempted removal with intragastric surgery. A 10-mm trocar with balloon was inserted into the stomach through the abdominal wall with the umbilical skin incision. After a laparoscope was inserted into the gastric lumen through the port, two radially expandable sleeve ports were inserted into the gastric lumen using the puncture technique guided by the laparoscope in the stomach. Fragmentation of a large trichobezoars was performed with laparoscopic scissors inserted in the stomach under CO2 insufflations. All fragments of trichobezoars were removed by the gastric endoscope and the forceps inserted via 10 mm trocar. The post-operative course was uneventful. Cosmesis result was acceptable.

**CONCLUSION:** Endoscopic removal of huge trichobezoars with intragastric surgery technique is feasible and safety. This approach is one of the surgical options for huge trichobezoars removal in children.

## **P035 ROUTINE INTRAOPERATIVE CHOLANGIOGRAPHY IS USEFUL IN IDENTIFYING CHOLEDOCHOLITHIASIS**

*– Daniel Solomon, MD, Melissa Mckee, MD, Yale University School of Medicine, Department of Pediatric Surgery*

**INTRODUCTION:** The utility of routine intraoperative cholangiography (IOC) for identifying anatomy and common bile duct (CBD) pathology during laparoscopic cholecystectomy (LC) in children remains controversial. This paper describes the results of single surgeon's experience with routine IOC in pediatric LC.

**METHODS:** All laparoscopic cholecystectomies performed by a single surgeon between 11/2001 and 12/2010 were retrospectively recorded into a research database under a protocol approved by the institutional human investigations committee. Preoperative demographics, clinical, laboratory and radiographic data were recorded. Operative details,

results of IOC, post operative course, complications and pathology were also recorded. Patients were classified according to preoperative clinical suspicion for CBD stones based upon laboratory (obstructive jaundice) and radiographic data (dilated CBD). Statistics were calculated using Student's t-test and Fisher's exact test as appropriate and statistical significance was reached when  $p < 0.05$ .

**RESULTS:** Between November, 2001 and December, 2010, 124 consecutive pediatric patients underwent LC, 88 (70%) were female and the median age was 14.1 years. One hundred and thirteen patients (91%) had suspected stone disease. The most common causes for stones were hemolytic disorders (26%) obesity (24%) and idiopathic (22%). One hundred and four patients (84%) had a complete IOC. The most common reason for failure of IOC was inability to pass the cholangio-catheter (12 of 20 patients, 60%). Of the 114 complete IOCs, 14 (13%) demonstrated filling defects. There were no significant differences in age, weight or clinical indication for LC between patients with and without filling defects on IOC. There were no patients with pigmented stones and a filling defect on IOC while 16% of IOCs without filling defects were for pigmented stone disease ( $p = 0.02$ ). Preoperative laboratory and radiographic studies only predicted CBD obstruction in 4 of 14 cases (29%). There were no CBD injuries or complications related to the IOC, the minor complication rate was 0.02% and there was 1 conversion to open cholecystectomy (0.08%).

**CONCLUSION:** A significant percentage of children undergoing LC had filling defects on IOC (13%) and the ability of preoperative laboratory and radiographic exam to predict CBD stones was poor. Furthermore, IOC provided the benefit of clarification of surgical anatomy. In one of the largest single surgeon series of pediatric laparoscopic cholecystectomies, the utilization of routine IOC provided a useful adjunct to laboratory and radiographic exam.

**P036 APPLICATION OF COMBINATION ON THE DOUBLE BALLOON ENTEROSCOPY WITH LAPAROSCOPY IN THE PEDIATRIC DIGESTIVE BLEEDING PATIENTS WHOSE TECHNETIUM-99M SCANNING WERE NEGATIVE** – *Liu Jiang Bin, MD, PhD, Huang Ying, MD, PhD, Xiao Xian Min, MD, PhD, Surgical Department of Children's Hospital, Fudan University, Shanghai, China*

**OBJECTIVE:** to review the experiences of the combination on the double balloon enteroscopy (DBE) with laparoscopy in the pediatric digestive bleeding patients whose technetium-99m scanning were negative, and to explore the safety of the combination and to evaluate the clinical value and applicability in the pediatric cases. **Method** During the period from December, 2006 to October, 2009, 7 patients (age 3.5 to 11 years old) suffered the following symptoms including gastrointestinal bleeding, chronic abdominal pain, anemia and so on, additionally, whose technetium-99m scanning were negative. Firstly DBE was advanced retrograde by telescoping in the small intestine along its way. And then laparoscopy with single incision through umbilical region were followed if some surgical findings were confirmed by DBE. **Result** All the procedures on the 7 cases were performed under anesthesia, each procedure took approximately 90 to 120 minutes. The pathology were identified Meckel's diverticulum (4/7), duplication of intestine (2/7) and small intestinal hemangioma (1/7) postoperatively. No serious complications such as aspiration pneumonia, perforation or hemorrhage occurred. **Conclusion** the combination DBE with laparoscopy on the pediatric digestive bleeding patients DBE is a useful and feasible procedure in the pediatric patients. Especially on the patients whose technetium-99m scanning were negative.

**KEY WORDS:** Endoscopy, digestive system; Intestine, small; Child; Meckel diverticulum laparoscopy

**P037 THE ROLE OF OPEN APPENDECTOMY IN THE ERA OF LAPAROSCOPIC APPENDECTOMY IN CHILDREN** – *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric Surgery, Michael E. DeBakey Department of Surgery, Baylor College of Medicine and Texas Children's Hospital, Houston, Texas*

**INTRODUCTION:** Laparoscopy is the standard of care for paediatric appendectomy among many centres throughout the world.

**PATIENTS & METHODS:** 190 consecutive children presenting with appendicitis to a single surgeon underwent laparoscopic appendectomy. None were excluded from the study. The patient records were retrospectively reviewed.

**RESULTS:** All the 190 consecutive children with appendicitis underwent laparoscopic appendectomy. All cases were done laparoscopically and none needed conversion to an open procedure. None were excluded from the study. 60 children (31.58%) had perforated appendicitis, 65 children (34.21%) had suppurative appendicitis, 30 children (15.79%) had necrotising/gangrenous appendicitis and another 30 children had acute early appendicitis. There were 3 patients with chronic appendicitis, 1 patient with carcinoid tumour and 4 patients had normal appendix. The age range was from 6 months to 16 years with a median age of 10 years. The median hospital stay was 2 days.

6 patients (3.16%) developed significant post-operative collections, which were not amenable to antibiotic therapy. 5 of them needed radiologically guided percutaneous drainage. One of them needed a laparoscopic drainage. All of them recovered well.

11 patients (5.79%) developed minor complications (eg, wound infection, umbilical discharge, localised abscess, persistent fever, port site swelling), all of which responded to conservative management. All patients were followed up and eventually had good outcome.

**CONCLUSION:** Laparoscopic appendectomy is now a standard operation with excellent success rates. All 190 consecutive children (youngest and oldest, perforated or non perforated) presenting to a single surgeon at a tertiary care large volume pediatric centre were performed laparoscopically. None had open appendectomy or needed conversion to open appendectomy. There were no exclusions. We question the role of open appendectomies in this era of laparoscopic appendectomy in children.

**P038 LAPAROSCOPIC FEEDING GASTROSTOMY IN INFANTS WITH PRIOR ABDOMINAL OPERATIONS** – *Robert L. Bell, MD, Thomas Hui, MD, Wolfgang Stehr, MD, Olajire Idowu, MD, James Betts, MD, Sunghoon Kim, MD, Wendy Su, MD, Children's Hospital and Research Center Oakland, Oakland, California, USA, University of California San Francisco-East Bay, Oakland, CA, USA*

**PURPOSE:** Reoperation after surgery for inflammatory or ischemic intestinal disease poses significant challenges and risks in neonates and premature infants. Infants who have undergone multiple abdominal operations for diseases such as necrotizing enterocolitis often require subsequent creation of a feeding gastrostomy due to poor oral intake. This study aims to assess the outcomes of laparoscopic feeding gastrostomy (LFG) in infants with prior abdominal operations, as compared to open feeding gastrostomy (OFG).

**METHODS:** After IRB approval, retrospective chart review was performed for patients who underwent LFG or OFG after two or more abdominal operations as infants between January 2009 to June 2011. Patient demographics as well as intraoperative and postoperative outcomes were compared.

**RESULTS:** 5 patients meeting inclusion criteria underwent LFG during the study period, as compared to 3 similar patients who underwent

OFG. Indications for initial operation were necrotizing enterocolitis (4 LFG, 1 OFG), meconium peritonitis (1 LFG), and ischemia/obstruction due to Hirschsprung's disease (2 OFG). Mean gestational ages were 27 (24-36) weeks for the LFG group and 29 (range 25-35) weeks for the OFG group. Mean ages at the time of gastrostomy were 4.8 (range 3-7) months for LFG and 8.6 months (range 4-14) for OFG. Concurrent procedures were performed along with gastrostomy in 3 patients in the LFG group versus 2 in the OFG group. Skin-level buttons were placed in the LFG group, and Malecot tubes were placed in the OFG group. Mean operative times were 69 (range 28-119) minutes for LFG versus 143 (range 88-206) minutes for OFG. No complications or conversions occurred in LFG patients. Complications in the OFG group included an enterotomy and a gastrostomy tube dislodgement requiring reoperation.

**CONCLUSIONS:** Laparoscopic feeding gastrostomy can be performed safely in infants with multiple prior abdominal operations and intra-abdominal adhesions. Operating times were considerably lower with the laparoscopic approach, possibly explained by better exposure and decreased need for extensive lysis of adhesions. Laparoscopic feeding gastrostomy should be considered as a viable option in patients with previous laparotomies.

**P039 LAPAROSCOPIC REPAIR OF DUODENAL ATRESIA IN PREMATURE NEONATES WEIGHING LESS THAN 2KG** – *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E DeBakey Department of surgery, Baylor college of medicine and Texas Children's Hospital, Houston, Texas.*

**INTRODUCTION:** Laparoscopic approach has been well described for the repair of duodenal atresia. However there have been no reports of laparoscopic repair of this anomaly in premature babies less than 2kgs ( 1.73 and 1.56 kg ). The following report describes our laparoscopic approach to the repair of this anomaly in very small premature babies with extremely reduced intra-abdominal space.

**MATERIAL & METHODS:** Charts of two premature neonates with duodenal atresia weighing less than 2 kgs were retrospectively reviewed.

**TECHNIQUE:** 3mm Umbilical incision was made and a 3mm step port was introduced into the peritoneal cavity. Pneumoperitoneum was achieved CO<sub>2</sub> of 5 lit /min and a pressure of 10 mm. Two 3 mm ports were then introduced on either side. The two ends of the duodenum were visualised and mobilised. A suture was passed through the adventicia between the gall bladder and the liver and was used for gentle retraction. In one child there was complete duodenal atresia and in the other there was obstruction due to pre duodenal portal vein. A laparoscopic kimura diamond anastomosis and a side to side duodenoduodenostomy were respectively performed using 5'0' vicryl interrupted sutures. . The preduodenal portal vein was left undisturbed during the procedure. Hemostasis was achieved and the inspection of the remainder of the bowel was normal. The entire procedure was successfully performed laparoscopically. Ports were withdrawn under vision and the umbilical wound was closed with 2'0' vicryl on UR 6 needle. The other port sites were closed with glue.

**RESULTS:** Both neonates had uneventful recoveries and gradually tolerated full feeds and were allowed home. At one and three months follow up, both babies were doing well growing and gaining weight and the scars were almost not seen.

**CONCLUSION:** Laparoscopic repair of duodenal obstruction can be successfully performed in premature babies weighing less than 2 kilograms with good outcome.

**P040 EVALUATION OF GASTROINTESTINAL SYSTEM BLEEDING WITH ENDOSCOPY INTRODUCED BY ENTEROTOMY: EXTENSIVE JEJUNAL GASTRIC HETEROTOPIA** – *Baran Tokar, MD, Surhan Arda, MD, Mehmet Ciftci, MD, Huseyin Ilhan, MD, Eskisehir OGU Medical School, Department of Pediatric Surgery, Eskisehir, Turkey*

Sometimes it may be not possible to determine the exact location and cause of the gastrointestinal (GI) bleeding in children. Radiological and scintigraphic investigations and endoscopy introduced from a natural orifice such as gastroscopy and colonoscopy may not be sufficient to delineate the pathology. Enterotomy introduced videogastroscopic examination (EIVE) may provide a significant benefit in determination of intraluminal location of GI bleeding in patients having abdominal exploration for this complaint. We present a patient who had intraluminal extensive jejunal gastric heterotopia (JGH) determined by EIVE. Preoperative and operative findings and technical details of the procedure were also discussed. A 5-year-old girl was admitted with GI bleeding and peritonitis findings. When she was newborn, she had been operated for duodenal atresia, jejunal web and Meckel diverticulitis. She had type I diabetes mellitus, and also was examined two times by gastroscopy and once by colonoscopy due to complaint of melena occurring with irregular interval in the last 2 years. Scintigraphic investigation was also performed. All these examination had been done by pediatric gastroenterologists and no significant pathology had been defined. In her last admission, she presented with massive GI bleeding and peritonitis findings, was operated and two perforation points were determined in jejunum. Following the repair, her GI bleeding recurred in early postoperative period, and a bleeding duodenal ulcer was determined and cauterized by gastroscopy. Due to continuing GI bleeding and her last scintigraphic investigation showing a suspected bleeding locus in left upper abdomen and umbilicus, she was operated once again and EIVE was performed from the distal jejunum. JGH starting 10 cm of Treitz ligament and extending 50 cm distally was determined and excised totally. Following the operation, bleeding or any other complaint were not determined in the last 6 months. GI bleeding with an undetermined cause creates a challenging process with unsolved questions for physician who should be a decision maker in diagnosis and treatment. Pediatric gastroenterologists dealing with this problem should be cooperative with pediatric surgeon. During surgical abdominal exploration, performing EIVE in suspected regions may provide evaluation of GI segments to where it is not possible to reach by endoscopy introduced from a natural orifice.

**P041 IDIOPATHIC SCLEROSING ENCAPSULATING PERITONITIS: LOCAL FIBRINOUS COCOON FORMATION** – *Baran Tokar, MD, Surhan Arda, MD, Ahmet Topaloglu, MD, Huseyin Ilhan, Eskisehir OGU Medical School, Department of Pediatric Surgery, Eskisehir, Turkey*

Sclerosing encapsulating peritonitis (SEP) could be classified as idiopathic and secondary types. About 70 cases of the idiopathic type have been reported up to now. Idiopathic SEP is characterized by a total or partial encasement of the small or rarely large bowels by a thick fibrotic membrane with an unknown etiology. It is usually seen in young adolescent females. In the idiopathic type, the exact stimulus for the inflammatory reaction is not known, but some suggest that it may arise due to viral peritonitis, gynecological infections or due to retrograde menstruation. A tissue injury in intraabdominal organs triggers a fibrin gel matrix formation and healing process in the peritoneum. Depending onto organ and region, this process may cause a fibrinous cocoon formation. We present laparoscopic exploration findings of two girls with a diagnosis of idiopathic SEP. Both patients were admitted with abdominal pain and vomiting. Physical and laboratory examinations of the patients directed the preoperative

diagnosis of appendicitis and need of laparoscopic exploration. In both patients, appendix was normal in appearance, but a fibrinous cocoon like peritonization of terminal ileum in the first patient (12 years old) and similar encapsulation of cecum and ascending colon in the second patient (15 years old) were determined. This peritonization fixed the related intestinal segments onto the right lower abdominal wall. Fibrinous encapsulation with tethering bands was excised, the intestinal segment was released and appendectomy was performed in these cases. They did well in both early and late postoperative period. During a laparoscopic exploration for acute abdomen especially in young adolescent females, if a fibrinous encapsulation is determined around an intestinal segment, an idiopathic SEP should be considered in differential diagnosis, especially if there is no previous surgery and no related primary cause of a fibrinous adhesion such as appendicitis, sarcoidosis, systemic lupus erythematosus, and liver cirrhosis.

**P042 MORGAGNI HERNIA IN ASSOCIATION WITH ANTENATAL DIAGNOSIS OF ANOMALOUS UMBILICAL VEIN AND ABSENT DUCTUS VENOSUS** – *Haluk B. Güvenc, MD, Yunus Nas, MD, Selcuk Ozden, MD, Hisar Intercontinental Hospital, Depts of Pediatric Surgery, Pediatrics and Perinatology, Istanbul, Turkey*

**AIM:** Echocardiographic imaging in the fetus provides a reliable way to determine the presence and prognosis of underlying congenital cardiac and vascular defects before birth. An abnormal course of the umbilical vein is a rare anomaly. It's association with congenital absence of the ductus venosus, however, is common. The association of the umbilical venous system abnormalities with congenital diaphragmatic hernia is increasingly reported in the English literature. A case with Morgagni hernia in association with an anomalous umbilical vein bypassing the liver and directly entering the right atrium is presented.

**METHOD & MATERIAL:** A 21-hour-old, 2300 gr male under nasal CPAP ventilation was consulted in the NICU with an incidental diagnosis of right diaphragmatic hernia. History revealed echocardiographic diagnosis of absent ductus venosus and an anomalous umbilical vein directly entering the right atrium at 20 weeks of gestation. T1-W Flash and T2-W HASTE sequences of 1.5T MRI revealed the presence of a Morgagni hernia. Control echocardiography was within normal limits.

**RESULT:** The child eventually recovered from respiratory distress and tolerated breast feeding with mild cyanosis. A successful laparoscopic repair was accomplished when he was 2600 grams and 16 days old. The patient was discharged on the third postoperative day. Postoperative chest x-ray after 18 months revealed minimal anterior diaphragmatic eventration.

**CONCLUSION:** The presence of anomalous vascularity in association with agenesis of ductus venosus and eventration of diaphragm has been reported previously. Association of Morgagni hernia with absent ductus venosus is reported for the first time. All fetuses with abnormal connection of the umbilical vein need careful ultrasonographic assessment both in utero and after birth to exclude accompanying diaphragmatic abnormalities.



**P043 COMPARATIVE MID-TERM RESULTS BETWEEN INGUINAL HERNIOTOMY AND SINGLE-PORT LAPAROSCOPIC HERNIORRHAPHY FOR PEDIATRIC INGUINAL HERNIA** – *Yu-tang Chang, Jui-ying Lee, Jaw-yuan Wang, Kaohsiung Medical University Hospital*

**OBJECTIVE:** The aim of this study was to compare the mid-term outcomes of conventional inguinal herniotomy and single-port laparoscopic herniorrhaphy.

**SUMMARY BACKGROUND DATA:** Some recent papers have advocated single-port laparoscopic herniorrhaphy and obtained satisfactory results.

**METHODS:** Between April 2007 and March 2009, 202 records of infants and children with inguinal hernia treated were retrospectively reviewed. Of them, 86 patients were treated by conventional inguinal herniotomy (IH group), and 116 patients by single-port laparoscopic herniorrhaphy with preperitoneal hydrodissection, a totally extraperitoneal enclosing suture and extracorporeal knot-tying (LH group). Follow-up data were collected using a telephone questionnaire and last outpatient follow-up.

**RESULTS:** Mean follow-up was 35.7±7.2 months. Both procedures could achieve complete repair without recurrence. Operation time of unilateral repair was significantly longer in the LH group than in the IH group (40.1 min vs 20.0 min,  $P < 0.001$ ); however, operation time of bilateral repairs was comparable in both groups (46.0 min vs 37.5 min,  $P = 0.291$ ). Metachronous hernia developed in 6 of 80 patients (7.5%) initially presenting with unilateral hernia in the IH group and in no patient in the LH group ( $P = 0.005$ ).

**CONCLUSIONS:** Accompanied by the method of preperitoneal hydrodissection and a totally extraperitoneal enclosing suture, single-port laparoscopic herniorrhaphy, a real minimally invasive surgery, would be an effective procedure as conventional inguinal herniotomy. Single-port laparoscopic herniorrhaphy was associated with long operation time and a reduction in contralateral hernia development. However, every four patent processus vaginalis would require intervention to prevent one metachronous hernia.

**P044 A HYBRID APPROACH TO CHILDHOOD OVARIAN TUMORS: LAPAROSCOPIC STAGING AND OPEN RESECTION THROUGH A PFANNENSTIEL INCISION** – *Benjamin Tabak, MD, Danielle Cafasso, DO, Mary J. Edwards, MD, Tripler Army Medical Center*

While malignant ovarian tumors are uncommon in the pediatric and adolescent populations, pediatric surgeons are often called upon to acutely manage ovarian masses with characteristics suspicious for malignancy. Most often these are large solid or complex cystic masses causing acute symptoms due to mass effect, pain and/or hormonal secretion. The challenge is to perform an oncologically correct procedure while maximizing future fertility. Recent guidelines regarding management of pediatric ovarian neoplasms reflect the principles of ovarian and tubal preservation, mirroring the trend for adults of reproductive age. This change in practice has coincided with an increase in the use of laparoscopy for initial diagnosis and treatment of ovarian masses in children and adolescents. However, enthusiasm for the laparoscopic approach has been tempered due to theoretical concerns of a higher risk of cyst and tumor rupture, potentially resulting in up-staging, chemical peritonitis, increased adhesion formation, and decreased fertility.

We report our initial experience in nine such patients with a hybrid approach to pediatric ovarian masses: laparoscopic exploration and staging followed by open excision and pelvic lymph node inspection and sampling via a Pfannenstiel approach. While both techniques have been demonstrated to be safe and effective independently, we report several cases which demonstrate how the combination of laparoscopy and open surgery may be strike optimal balance between an oncologically sound assessment for malignancy, fertility preservation and acceptable cosmesis.

## **P045 EXPERIENCE OF SETTING UP LAPAROSCOPIC WORKSHOPS IN CHINA: A 4-YEAR REVIEW**

– *Kenneth K Wong, Dr, Long Li, Dr, Suolin Li, Dr, Paul K Tam, Dr, The University of Hong Kong; Capital Institute of China; Hebei Medical University*

**BACKGROUND:** The use of minimally invasive surgery in children worldwide has been increasing at a tremendous speed over the past few years. However, the best way to introduce and teach laparoscopic skills is still not determined. Here, we describe our experiences in the setting up and running of twice a year laparoscopic workshops in various localities in China.

**METHODS:** Since June 2007, a core group of laparoscopic surgeons from three centers have been organizing laparoscopic workshops on a twice a year basis. These workshops were generously subsidized with the aim of helping to promote minimally invasive surgery in Chinese pediatric surgeons.

**RESULTS:** From June 2007 to June 2011, 8 workshops have been organized in 7 different cities in various parts of China. The workshops have all been run on the same format, with didactic lectures; live operative demonstrations (general pediatric surgery and pediatric urology) and live hands-on animal laboratory experience, over a 3-4 day period. The average number of participants per workshop was 40. A total of over 350 participants already attended so far. The earlier workshops were attended mostly by senior surgeons, while there was a trend of more younger surgeons attending the recent workshops. All the workshops had prior CME approval and subsequent post-workshop feedback showed high satisfaction from all participants.

**CONCLUSION:** The teaching of laparoscopic surgery through dedicated and well-run workshops is meaningful. We anticipate to continue in the foreseeable future.

## **P046 MINIMALLY INVASIVE SURGERY IN CHILDREN WITH A HISTORY OF CONGENITAL ABDOMINAL WALL DEFECTS**

– *Sarah J. Hill, MD, Mark L. Wulkan, MD, Emory University and Children's Healthcare of Atlanta*

**PURPOSE:** Children with a history of a congenital abdominal wall defect (AWD) occasionally require additional abdominal surgery later in life, after their defect is closed. Concern over significant adhesive disease has led the majority of clinicians to avoid minimally invasive surgical techniques in this patient population. In an effort to evaluate feasibility of laparoscopic surgery in this select patient population, a retrospective review was conducted looking at all patients treated with congenital AWD at a tertiary care facility.

**METHODS:** Patients admitted between January 1, 2000 and January 1, 2011 with AWD were included in the study. Abdominal surgical procedures subsequent to closure of the defect were compared for indication, technique, length of surgery, estimated blood loss and postoperative length of stay.

**RESULTS:** During the stated time period, there were 139 admissions with abdominal wall defect, 67 female and 72 male. Gastroschisis was seen in 114 of these patients, omphalocele in 22 and Pentalogy of Cantrell in 3. 30% of the children (n=43) underwent subsequent abdominal surgery after the closure of their defect for a total of 65 procedures. 74% of these procedures (n=48) were performed open and 26% were laparoscopic (n=17). Due to dense adhesive disease, 2 cases (12%) were converted from laparoscopic (LAP) to open. The most common open procedures were ventral hernia repair, exploratory laparotomy for small bowel obstruction, and ostomy reversal. The most common LAP procedure was orchidopexy and fundoplication. Average weight at surgery did not vary between LAP and open, p=0.33. Estimated blood loss, length of surgery and length of stay were all shorter for LAP patients (p=0.001, 0.018, and 0.001 respectively) when compared to all open cases. There were no complications as a result of laparoscopic surgery in any of the patients.

**CONCLUSION:** This study evaluates the surgical history of patients with abdominal wall defects after their defect is closed. The results of this study suggest that in many situations, laparoscopic surgery is feasible and can be safely conducted on children with a history of congenital AWD. Recognizing that this is not a matched case-control study, observed differences in length of surgery and length of stay are likely a result of the differences in the type of surgery and surgical indication, rather than a reflection of the techniques used. Based on these results, when deciding on the surgical approach for a patient with a history of a congenital abdominal wall defect, surgeons should consider initiating abdominal surgery laparoscopically with the option to convert to laparotomy if excessive adhesions are encountered.

## **P047 LAPAROSCOPIC TREATMENT OF ISOLATED SALPINGEAL TORSION IN ADOLESCENTS**

– *Sherif Emil, MDCM, Fady Gaied, MD, Andrea Lo, MD, Robert Baird, MDCM, Jean-martin Laberge, MD, Montreal Children's Hospital, McGill University Health Centre*

**BACKGROUND:** Isolated torsion of the Fallopian tube, without ovarian torsion, is a rare cause of lower abdominal pain. We report our experience with four recent cases, along with data from a 20-year review of the pediatric literature.

**METHODS:** The records of 4 cases encountered during a 2 year period were reviewed. A literature review was completed by searching MEDLINE, MEDLINE IN PROCESS, EMBASE, CURRENT CONTENTS, and BIOSIS from 1990 to present.

**RESULTS:** Three patients were diagnosed on laparoscopy, and one pre-operatively on CT scan. Laparoscopic salpingectomy was performed in 3 cases, and laparoscopic detorsion in one. All 3 resected specimens revealed hemorrhage and gangrene of the salpinx, with an associated cyst in one. The pediatric literature review, including our report, revealed 33 case reports and case series with 45 patients. 56% of cases represented primary torsion, and 44% were secondary to underlying tubal pathology. 30 % of girls were pre-menarchal. The mean age at presentation and symptom duration were  $13.2 \pm 2.1$  years and  $6.0 \pm 12.5$  days, respectively. Fever and leukocytosis were present in 27% and 63%, respectively. Ultrasound, CT scan, and MRI showed a sensitivity of 14% (5/36), 14% (1/7), and 50% (2/4), respectively. A correct preoperative diagnosis was considered in only 15%. 88 % of cases were treated by salpingectomy, and 12% were treated by tubal detorsion. Long-term outcomes of detorsion were not reported.

**CONCLUSIONS:** Isolated salpingeal torsion in girls is rarely diagnosed pre-operatively, regardless of imaging technique. When encountered during laparoscopy, salpingectomy is the standard treatment. Long term outcomes of detorsion are not known.

## **P048 EXPERIENCE IN LAPAROSCOPIC ADRENALECTOMY IN CHILDREN**

– *Thomas Gelas, MD, Remi Dubois, MD, Frederic Hameury, MD, Pierre D. Mouriquand, MD, FRCS(Eng), FEAPU, Pierre-yves Mure, MD, PhD, Pediatric Surgery Department, Femme Mere Enfant Hospital - Hospices Civils de Lyon*

**BACKGROUND:** Experience with mini-invasive techniques for adrenal masses in children and adolescents is limited and literature is scarce. The transperitoneal approach to the adrenal gland was first reported in 1992 in adults and retroperitoneoscopy has been reported in 1999 but is still limited to sporadic small case series. Our aim was to report our single-center experience with minimally invasive adrenal surgery in children.

**PATIENTS & METHODS:** Between December 2005 and May 2011 laparoscopic adrenalectomy was performed in 18 patients (9 girls and 9 boys) with a median age and weight of 23 months (13-176) and 12 kg (10-50) respectively. A transperitoneal approach was performed in all cases but one. Three to 5 ports were used. The adrenal tumours were completely

excised, placed into a plastic bag and removed through the umbilical port site. The primary study outcome measures included operative time, complications, duration of hospital stay and outcome of surgery.

**RESULTS:** All of the adrenal tumours were completely excised without violation of the tumour capsule (R0). The median operating time was 90 min (range 60-374), there was no conversion to open surgery but terminal hand assistance was required in 2 cases through a Pfannenstiel incision. No major intra- or post-operative complications were noticed and the median hospital stay was 3 days (range 2-10). The median size of the masses was 39 mm (range 20-70). Histopathology examination revealed neuroblastoma (12), pheochromocytoma (2), ganglioneuroma (1), adrenocortical carcinoma (1), adrenal hematoma (1) and adrenal hemangioma (1). Average postoperative follow up was 15 months (range 0.6-50). There was no mortality and one patient had a late intra-abdominal recurrence (4 years) from a neuroblastoma.

**CONCLUSIONS:** Transperitoneal laparoscopic adrenalectomy is a safe and feasible procedure even for large sized tumours (>50 mm). It allows a complete visual inspection of the abdominal cavity. It can be used to treat suspected benign and malignant adrenal masses in selected children with minimal morbidity, short hospital stay and excellent cosmetic result.

**P049 ENDOSCOPIC TREATMENT FOR AN INTERNAL JUGULAR VEIN PHLEBECTASIA WITH WRAPPING BY A VASCULAR PROSTHESIS** – Yu-hao Hunag, Jui-ying Lee, Yu-tang Chang, Kaohsiung Medical University Hospital

The management of jugular vein phlebectasia through a transverse cervical incision provides good direct exposure. However, these patients still have a scar in the neck and may be of suboptimal cosmesis. The authors described a transaxillary subfascial endoscopic treatment of an internal jugular vein phlebectasia with wrapping by a vascular prosthesis in a 6-year-old boy. The wrapping prevented the vein from dilating, and the same time preserved its function. The transaxillary endoscopic technique, a working cavern created under the fascia of the pectoralis major, offered a safe and straightforward way to surgically manage jugular vein phlebectasia, while exempting injury to noninvolved tissues and avoiding the potential for poor cosmesis from any neck scar.

**P050 LAPAROSCOPIC MANAGEMENT OF OVARIAN CYST IN CHILDREN** – Balagopal Subramanian, Moorthy Gurunathan, Prakash Agarwal, Sri Ramachandra University, Chennai, India

**INTRODUCTION:** We present our experience with the management of various ovarian cysts in children managed Laparoscopically.

**MATERIAL & METHODS:** A prospective study was done in our department in female patients from newborn to 18 years, diagnosed by ultrasonography of having an ovarian cyst. 42 patients were studied between 2006-2010. They were managed by laparoscopy. We enumerate our experience in the management of these cases with regards to the management, findings and post-operative follow up.

**RESULTS:** The cases ranged from simple cyst to functional tumor, dermoid cyst and complex ovarian cyst. Few patients presented with torsion. In the initial part of our study we removed the torsed ovary but in the later part of our study we preserved the ischemic ovary. On routine follow up with Doppler ultrasound, all the preserved ovaries had recovered their blood supply and function well.

**DISCUSSION & CONCLUSIONS:** Recently ovarian preserving surgery in prepubertal and adolescent girls have been highlighted. Emphasis is being laid on preserving ischemic ovaries as they have been found to recover the blood supply and function well after detorsion. Removal of ovaries in prepubertal and adolescent girls lead to hormonal failure later on in life.

**P051 LAPAROSCOPIC INGUINAL HERNIA REPAIR AND CONCOMITANT CONTRALATERAL INGUINAL RING ASSESSMENT IN CHILDREN – A REVIEW** – A Vintila, MD, R. J. England, FRCS, G. V. Murthi, FRCS, S. S. Marven, FRCS, Sheffield Children's Hospital

**AIM OF THE STUDY:** Laparoscopic repair of inguinal hernia has recently been introduced at our institution. This study was undertaken to audit the results of this procedure and assess in particular: complications, concomitant assessment and repair of contralateral inguinal pathology and recurrence rate.

**PATIENTS & METHODS:** Retrospective study of the hospital records (clinical notes, theatre database) from June 2008 to December 2010 for all patients who underwent laparoscopic repair of inguinal hernia.

**RESULTS:** There were a total of 75 patients who underwent 92 laparoscopic procedures to correct inguinal ring pathology. Six patients had previous open repairs. Sex distribution was 55 male (73%) and 20 female (27%). Age range was 17 days to 13 years (median 137 days). There were 42 children (56%) under 6 months of age. Forty (53%) hernias occurred on the right, 23 (30%) on the left and bilateral 13 (17%). Assessment of the contralateral deep inguinal ring noted 6 hernias and 4 Patent Processus Vaginalis (PPV). All except one case of PPV were repaired at the same time. In one case of suspected hernia based on history, no inguinal pathology was found at laparoscopy. A variety of techniques and suture materials were used for repair. Most commonly the defect was closed using a continuous purse string repair with 5.0 Prolene (34%). The other techniques used involved multiple suture bites. In one case an omental patch was used for repair.

**COMPLICATIONS:** surgical site infection (umbilical port) 1 patient, recurrence occurred in 2 patients out of 52 available for follow-up (3.8%). There was no recurrence in patients who underwent repair under 12 months of age. Hospital stay varied between one day (daycase surgery) and 3 days. Follow-up was arranged for 61 patients (81.33%), 52 of which attended. Median follow-up was 3 months (range: 3 months – 1 year). Upon subjective clinical assessment at follow-up there was no instance of either ascended testis or testicular atrophy.

**CONCLUSIONS:** Laparoscopic inguinal hernia repair in children is safe. Laparoscopic assessment of the contralateral inguinal ring is simple, fast, and effective method for identifying pathology and performing a concomitant repair. The recurrence rate for our series was 3.8% with no recurrence under 12 months of age.

**P052 MINI INVASIVE SURGERY FOR ADRENOCORTICAL CARCINOMA IN CHILDREN: IS IT SAFE ?** – Thomas Gelas, MD, Didier Frappaz, MD, Pascale Berlier, Pierre D. Mouriquand, MD, FRCS, England FEAPU, Pierre-Yves Mure, MD, PhD, Pediatric Surgery Department, Femme Mere Enfant Hospital, Hospices Civils de Lyon

**BACKGROUND:** Adrenocortical carcinoma (ACC) is a rare tumor representing 1.3% of all carcinomas. Patients with completely resected small tumors (<200 g) have an excellent prognosis, whereas patients with residual disease have a poor prognosis. The objective of our study is to report a case of laparoscopic transperitoneal adrenalectomy performed in a child presenting a 5-cm adrenocortical tumor.

**CASE REPORT:** The patient was a 3 years old girl presenting clinical signs of virilization (clitoromegaly, pubic hair and acne) with normal blood pressure. The laboratory tests showed a very high DHEAS (>10.000 nmol/L) but normal cortisolemia and ACTH. The radiological examination revealed a right-sided adrenal mass measuring 55x50 mm. There was no sign of local, vascular or general invasion. Father's family was known to have genetically proven Li-Fraumeni syndrome with early malignancies developed in siblings.

# Poster Abstracts

The diagnosis of right ACC was suspected and transperitoneal laparoscopic adrenalectomy was performed. Peritoneal cavity was first explored and no local invasion or peritoneal carcinomatosis was detected. The right adrenal gland was then resected and placed in a bag retrieved through a Pfannensteil incision. Surgery duration was 150 min and post operative course was uneventful. Histopathological examination revealed an ACC weighing 53 g with free surgical margins. The patient is doing well 39 months after surgery without any signs of residual tumor or metastasis.

**DISCUSSION:** Laparoscopic adrenalectomy in children is well admitted and can be used in selected patients for benign and malignant tumors (neuroblastomas, pheochromocytomas). Laparoscopic adrenalectomy in ACC is controversial and many adult series have demonstrated an increased rate of recurrence, peritoneal carcinomatosis or positive surgical margins. Conversely, some authors have shown the safety of this technique for ACC less than 10 cm without local invasion. Conversion to open surgery is mandatory in case of local invasion and when the dissection cannot be as accurate as in conventional operations. Only 8 pediatric cases of ACC laparoscopic resection are reported (see table), conversion was necessary in 2 cases due to vascular invasion and one patient had a local recurrence secondary to tumor rupture.

**CONCLUSION:** We are reporting the successful laparoscopic treatment of an ACC. Pediatric experience in this field is scarce but careful pre-operative radiological evaluation is necessary and complete excision is mandatory due to the high risk of recurrence in case of surgical spillage. Mini-invasive surgery for ACC should be performed only in selected patients and by skilled surgeons. Multicentric and prospective evaluation of the safety of the use of laparoscopy for ACC is needed.

Authors	Year	Age (Months)	Size (mm)	Conversion	Follow-up
Tobias Machado	2002	18	50	NO	No recurrence, 1 year
Miller	2002	-	-	YES, renal vein thrombus	No recurrence
Castilho	2002	24	50	NO, adrenal vein thrombus	No recurrence, 35 months
Kadamba	2004	18	55	NO	No recurrence, 3 months
Skarsgard	2005	-	85	YES, renal vein thrombus	No recurrence
Lopez (2 cases)	2007	-	55	NO but capsule rupture	Recurrence, reop x 2
Kim	2011	32	50	NO	No recurrence, 60 months

**P053 URACHAL REMNANT- OLD PROBLEM NEW APPROACH - OUR 10 YEARS EXPERIENCE** – Eyal Forshmidt, MD, Daniel Shihhar, MD, Dani Yardeni, MD, Ron Bilik, MD, Safra children's hospital, Sheba Medical Center, Tel Hashomer. Israel

Urachus is a vestigial structure arising from the anterior bladder wall and extending cranially to the umbilicus within the extraperitoneal fat between the peritoneum and transversalis fascia.

Normally urachus becomes progressively obliterated with advancing age, but in some patients the obliteration of urachus may fail and result in 4 different types of urachal remnants; patent urachus, vesicourachal diverticulum, urachal sinus and urachal cyst. Urachal cyst, the most common anomaly, occurs in approximately 1/5,000 births

Although urachal anomaly is usually asymptomatic, they occasionally warrant intervention when infected and symptomatic. Especially, if the infection of urachal remnant result in the formation of abscess cavity, the use of broad spectrum antibiotics followed by staged removal of the remnant is warranted. Drainage only can be inadequate because the recurrence rate reaches 30 percent and the patient may face a risk of adenocarcinoma in the unresected remnant, although the incidence is extremely low. Therefore the surgical management warrants to be

performed through the radical excision of urachal remnant including the urachus and medial umbilical ligaments as well as the adjacent peritoneum from umbilicus to bladder dome with or without a cuff of bladder wall. The traditional approach to the total excision of urachal lesions has been via hypogastric transverse or midline vertical incision. As the advancement of technique and experience of laparoscopic surgery, some groups have advocated laparoscopic approach for the complete excision of urachal abnormalities.

**MATERIALS & METHODS:** Between the years 2001-2011 we treated 18 patients with urachal lesions. One third was adults (from the general surgery department which we collaborate with). In the pediatric age group there were 12 patients age (1m-17.5y) and adults 6 patients age (20-54y). The presenting symptoms were : umbilical pus secretion/ omphalitis (12), urachal fistula (2), associated umbilical hernia (2), abdominal mass and urinary complains (1), abdominal wall abscess (1)

**IMAGING:** All the patients went through a sonographic evaluation, 5 of them were examined by CT scan too.

**INITIAL TREATMENT AND DURATION:**

9 of the cases were treated by antibiotics (Augmentin) for 7-10 days

2 were drained percutaneously

1 was operated on for incision and drainage under general anesthesia

**OPERATING PROCEDURES:**

Pediatrics: 5 open, 6 laparoscopic (1 was converted to open), one was not operated

Adults: 5 laparoscopic, one was not operated.

The laparoscopic surgery is performed transperitoneally via 3 ports, incising the urachal tract distally near its insertion to the bladder under vision. Hospitalization time was between 1-9 days and the outcome was excellent in all patients with no complications.

**CONCLUSIONS:** With recent developments in minimal invasive surgery, laparoscopic approach for urachal remnant is recommended because of its technical feasibility and safety as well as cosmetic results. Our experience suggests that laparoscopic excision of urachal remnant can be performed easily and safely in children.

**P054 EXPERIENCE OF LAPAROSCOPIC APPROACH TREATMENT ON OVARIAN BENIGN MASSES-REPORT OF 45 CASES** – Gong Chen, MD, Yingli Qiao, MD, Shan Zheng, Pr, Kuiran Dong, Pr, Zhibao Lv, Pr, Children's Hospital of Fudan University

**OBJECTIVE:** To investigate the characteristics and methods of laparoscopic approach treatment on the ovarian cyst, torsion and the ovarian benign teratoma.

**METHODS:** In a study of patients requiring surgical management of ovarian masses, forty five cases underwent laparoscopic procure in a teaching hospital from March 2002 to September 2009. Inclusion criteria was mass not suspected to be malignant with ultrasound, CT scan and AFP detection. In this 45 cases, thirteen of them were ovarian cyst, while simple ovarian torsion and ovarian benign teratoma were 7 and 25 respectively, including 4 cases combined teratoma with ovarian torsion. All operations were performed by an experienced surgeon with laparoscope.

**RESULTS:** Adnexectomy was performed in 20 patients, while cystectomy, detorsion and ovarian preservation was carried in the other 25 patients. Among these patients who preserved ovaries, no recurrence cyst could be found in most of them, excepting one patient had lesion recurred and canceration. Two years later, thirteen of the patients who had the ovaries preserved had a satisfactory ovary function in the operative side. Four of them had a smaller ovary, but follicle still could be found with ultrasound. No peritonitis occurred in all cases.

**CONCLUSIONS:** Laparoscopic cystectomy with gonadal preservation can be successfully applied to ovarian cyst and benign teratoma. Conservative management with untwisting the ovarian torsion should be considered even with teratoma. Because of the possibility of encountering an unexpected ovarian malignancy, intraoperative histopathologic examination should be a routine procedure.

**P055 TRANSABDOMINAL PREPERITONEAL HERNIORRHAPHY FOR PAEDIATRIC HUGE INDIRECT INGUINAL HERNIA** – *Guibin Li, MD, Li Wang, MM, Yun Qiu, MM, Tianjin Fifth Centre Hospital*

**INTRODUCTION:** The laparoscopic repair of inguinal hernia is gaining popularity in adult among the surgical community. This laparoscopic approach offers potential benefits, such as decreased postoperative pain, decreased recurrence, and short recovery time. However, there is scant literature on laparoscopic hernia repair in children. In this article, we report our preliminary experience of transabdominal preperitoneal (TAPP) herniorrhaphy in treatment of pediatric huge indirect inguinal hernia.

**METHODS:** Between October 2007 and August 2010, 24 pediatric patients with huge indirect inguinal hernia underwent transabdominal preperitoneal herniorrhaphy. In surgical procedure, three 5mm trocars were introduced into the abdomen at the umbilicus and bilateral lower sides. The parietal peritoneum was opened above the inner ring. After dissecting the indirect sac, a patch overlying the defect was fixed by suturing to the rectus abdominis, pectineal ligament and the conjoint tendon. The peritoneum is closed meticulously by absorbable suture at last.

**RESULTS:** All 24 laparoscopic operations were successfully completed. The operative time ranged from 50 to 110 minutes. No complication occurred during hospitalization ranged from 2-4 days. Postoperative follow-up ranged from 7 to 24 months. No hernia recurrence has been detected to date.

**CONCLUSION:** TAPP is a safe and reliable tension-free herniorrhaphy in treatment of pediatric huge indirect inguinal hernia.

**P056 LAPAROSCOPIC MANAGEMENT OF SMALL BOWEL OBSTRUCTION IN CHILDREN** – *Adriana Patricia Pinilla Orejarena, MD, Ivan Dario Molina Ramirez, MD, Fernando Rey Alvarez, MD, Fernando Fierro Avila, MD, Jorge Beltran Chitiva, MD, Fundacion Hospital de la Misericordia, Bogota Colombia*

**BACKGROUND:** Mechanical bowel obstruction is a commonly encountered surgical problem in both the adult and pediatric population. Historically, laparotomy and open adhesiolysis have been the treatment for patients requiring surgery for small bowel obstruction. Unfortunately this often leads to further formation of intraabdominal adhesions, requiring another laparotomy for recurrent bowel obstruction.

**METHODS:** A retrospective review of our experience of laparoscopic management of acute small bowel obstruction in children was undertaken, from June 2010 to June 2011. Medical records were reviewed for age, etiology of obstruction, radiographic findings, number of operations, need of conversion, length of stay and post operative complications.

**RESULTS:** Seventy patients underwent laparoscopic management of small bowel obstruction. The mean age was 6.8 (range 3 to 13 years); 71% were women and 29% men. All patients were studied by abdominal films which showed changes consistent with bowel obstruction. 6 patients were managed non-surgically from 3 to 8 days without improvement. 4 patients had a prior Rockey Davis incision, two had median laparotomies, a patient had been operated by laparoscopy, and in one patient the adhesions were secondary to neutropenic colitis. Surgical time averaged 67 minutes (range 35 to 120 min). The procedure is performed through a single port in two patients, two ports in 2 patients and 3 ports in 3 patients, only 1 patient showed clinical of peritonitis and required

conversion to laparotomy for evidence of intestinal necrosis and reduction of operating field. Oral intake was started in an average of 4 days (range 2 to 8). In the patient who required conversion to laparotomy it was started on day 10. The hospital length of stay was 4 to 6 days for the laparoscopic group and 15 days for the converted patient. There were no intraoperative or postoperative complications.

**CONCLUSIONS:** Laparoscopic adhesiolysis has been shown to be safe and feasible in pediatric population. The most important aspect to a successful outcome is proper patient selection and surgical judgment. We recommend the laparoscopic adhesiolysis for selected patients without peritonitis and who do not improve with nonoperative management. The minimally invasive surgery offers the advantages of decreased length of stay, faster return to full activity and decreased the risk of postoperative adhesions formation. Patients who require an operation due to signs of bowel ischemia or severe distention are not good candidates for laparoscopic adhesiolysis

**P057 LAPAROSCOPIC MANAGEMENT OF INCARCERATED INGUINAL HERNIA SECONDARY TO BLUNT ABDOMINAL TRAUMA: A CASE REPORT** – *Fernando Rey Alvarez, MD, Jorge R. Beltran, MD, Adriana Pinilla Orejarena, MD, Misericordia Children Hospital, Pediatric Surgery Department-Universidad Nacional de Colombia, Bogotá, COL*

**RESUME:** A 13 year old boy with no prior history of inguinal or scrotal symptoms, sustained a blunt abdominal trauma with a bicycle handlebar into his right lower abdominal quadrant. He presented to the emergency room with abdominal pain and vomit. Inspection and clinical examination revealed a ring shaped ecchymotic mark and abrasion on the skin as a result of the impact of the handlebar (Fig 1). Scrotal and inguinal region were normal as well as laboratory tests. An abdominal wall hernia was found by ultrasonography and then confirmed by computed tomography (Fig 2). All intraabdominal structures were normal in the radiologic images.

Exploration was performed by laparoscopy; intraoperative inspection found distended bowel and clear peritoneal fluid. An inguinal hernia defect was found and an incarcerated loop of distal ileum was reduced. The abdominal wall around the deep inguinal ring was grossly torn and the peritoneum and preperitoneal fat tissue within the defect were ruptured. The bowel was not harmed and no ischemia or necrosis were present. The inguinal hernia was repaired laparoscopically with interrupted stitches using a non-absorbable suture (Fig 3). Exploration of the abdominal cavity was normal.

24 hours after surgery, patient was in good general condition with adequate oral intake. Recovery was uneventful and the patient did well, free of symptoms and with excellent cosmetic result at a 2-months follow-up.

**CONCLUSIONS:** Abdominal wall injuries secondary to blunt trauma are uncommon in children, and may present with complications like intraabdominal structure herniation, secondary incarceration or strangulation of the bowel loops. The laparoscopic management of this kind of defects is secure with good surgical and cosmetic results.

**P058 LAPAROSCOPIC APPROACH IN PERITONITIS SECONDARY TO APPENDICITIS IN CHILDREN: A REVIEW OF CASES** – *Fernando Rey Alvarez, MD, Fernando Fierro Avila, MD, Jorge R. Beltran Chitiva, MD, Adriana Pinilla Orejarena, MD, Misericordia Children Hospital, Pediatric Surgery Department-Universidad Nacional de Colombia, Bogotá, COL*

**BACKGROUND:** Laparoscopic management of peritonitis due to perforated appendicitis in children has become an important approach in modern minimally invasive surgery. Update information obtained from the latest publications is helping to clarify the results of these techniques in treating appendicitis with peritonitis in the pediatric population.

**METHODS:** This is review of cases performed from September 2010 to March 2011, including children with perforated appendicitis treated by laparoscopy in the Pediatric Surgery Service of the Misericordia Hospital with a 6 months period follow-up. Demographic data, symptoms, surgical outcomes, postoperative course and appendiceal histology were reviewed.

**RESULTS:** Sixteen patients were identified. There were no deaths or reinterventions. There were 10 females (62, 5%) and 6 males (37,5%), the median age was 9,25 (4-14) years. The mean time of abdominal pain until the surgeon assessed the patient was 53,2 (20-96) hours. There were 11 patients (68.75%) with generalized peritonitis and 5 patients (31.25%) with localized peritonitis. The mean operating time was 73.37 (40 – 170) minutes. Half of the patients underwent omentectomy and only one had to be converted to open surgery (6.3%). Three ports were utilized in eleven children (68,75%), whereas one port was used in 5 patients (31,25%). Children classified the pain 24 hours after surgery using the analogue pain scale, with a media of 2.18 (0 – 5 points).

In the postoperative period, 3 patients (18,7%) developed an intrabdominal abscess, two of which also had intestinal obstruction that did not required surgery. Two patients (12,5%) had superficial wound infections. In total, infective complications developed in 5 children (31,2%). Length of hospital stay was 9.8 days (5-22). All 16 children completed a six-month follow-up with no complications or new interventions.

**CONCLUSIONS:** The percentage of complications in these patients was approximately 30%, being more common in patients with generalized peritonitis. The laparoscopy management of appendicitis with peritonitis is safe; conversion, reoperation and mortality rates are low.

**P059 THORACOSCOPIC THYMECTOMY SHOULD BE CONSIDERED EARLY AS A TREATMENT OPTION FOR JUVENILE MYASTHENIA GRAVIS** – *Stefan Scholz\*, MD, Thomas Crawford, MD, Kim McIlrot, RN DNP, Paul Colombani, MD, Johns Hopkins Children's Center, Johns Hopkins University and \*Children's Hospital of Pittsburgh, University of Pittsburgh*

**BACKGROUND:** Complete thymectomy has been shown to be an effective treatment for adult patients with myasthenia gravis. In children, pediatric neurologists have been reluctant to consider thymectomy early in the therapeutic arsenal. Concerns have been the burden of the traditional approach via sternotomy in combination with minimal outcome data proving efficacy. Complete thoracoscopic removal of the thymus of children has been reported in small series with good cosmesis and minimal trauma facilitating a smooth postoperative course.

**METHODS:** We reviewed our prospectively recorded database of all pediatric patients referred for thymectomy since December 2007 to the pediatric surgery service at Johns Hopkins Hospital. Intra- and perioperative parameters were recorded as well as the latest follow-up. IRB approval was obtained for the study.

**RESULTS:** Nine children underwent thoracoscopic thymectomy. Average age was 10.4 years (3 to 18 years). All patients had symptoms for more than 1 year or suffered from severe disease such as vision-impairing ocular myasthenia gravis despite escalating medical treatment. All operations were performed by a single surgeon (PC). Besides in the first 2 cases, a left sided minimal invasive approach was used with two 5mm and one 10mm trocars. The average operating time was 176 minutes for the first 2 cases and 106 minutes for the following 7. Average blood loss was minimal. Particular attention was focused on removing the complete thymus in one piece and an endobag was utilized for retrieval. All patients were extubated in the operating room and maintained on esterase inhibitors for 24 hours. Postoperative pain management was uncomplicated and all patients besides the first one were discharged

after 1 or 2 days. The first patient had to have a chest tube placed for pneumothorax and stayed 4 days. At follow-up up to 3.4 years later, all patients had either no or minimal residual symptoms on none or reduced medication usually without steroids.

**CONCLUSIONS:** Thoracoscopic removal of the thymus gland in children carries very low intra- and perioperative morbidity. The operation requires minimal preoperative preparation and children can be released safely on postoperative day 1 or 2. The anatomy of the pediatric mediastinum and its more globular thymus aid the mandatory complete removal. The relative position of thymectomy in the various therapeutic options for the treatment of juvenile myasthenia gravis including its purely ocular form may be worth reconsidering.

**P060 LAPAROSCOPY FOR OVARIAN LESIONS IN CHILDREN** – *R.Rai, KI Narasimhan, Ly Ong, J Chua, Cp Ong, L Yee, As Jacobsen, KK Women's & Children's Hospital Singapore*

**AIM:** Laparoscopy is a well established diagnostic and therapeutic modality in paediatric surgery. We report our experience in laparoscopic management of ovarian lesions in children.

**METHODS:** Retrospective review of clinical records of patients with ovarian pathology, who were managed with laparoscopy or a lap-assisted procedure.

**RESULTS:** Over the past five years, fifty two children with an ovarian lesion(s) were operated at our centre with the aid of laparoscopy. The median age of the children at presentation was 13 yrs (range, 5 days to 16 years). Most of children had unilateral lesions except two. The main presenting symptom was abdominal pain in 34 cases (65%). Fifteen patients (29%) were noted to have an abdominal mass and 3 (6%) were incidentally diagnosed to have an ovarian lesion. Ovarian cyst with torsion was found in 22 cases (42%). Nine children (17%) were <3 months old. These were perinatally diagnosed as abdominal cysts and 6 of them were found to have an auto amputated ovary on exploration. Of the 52 cases in total, successful cystectomy with ovarian preservation was accomplished in 38(73%) cases and salpingo-oophorectomy was performed in 14 cases (27%). Conversion to open surgery was required in 2 cases (4%). There were 40 simple cysts (follicular/luteal/serous) (77%) and 10 mature cystic teratomas or dermoid cysts (21%). One patient (2%) had an immature teratoma. Median operative time was 105 mins (range, 45 to 300 mins). There were no operative or post-operative complications recorded. The median duration of hospital stay was 3 days (range, 1 to 6 days). The patients were followed up 3-6 monthly with clinical and ultrasound assessment. Of the 38 patients who underwent cystectomy with ovarian preservation, 35 (92%) patients showed normal recovery of the involved ovary.

**CONCLUSIONS:** Laparoscopy is safe and effective method of managing ovarian lesions in infants and children.

**P061 NEONATAL MINIMALLY INVASIVE SURGERY: WHERE IS THE LIMIT?** – *Miguel Guelfand, Marcela Santos, Patricio Varela, Jorge Godoy, Alejandra Ovalle, 1) Exequiel Gonzalez Cortes Hospital for Children, Santiago-CHILE 2) Clinica Las Condes, Santiago-CHILE*

**INTRODUCTION:** The development of 2mm and 3 mm laparoscopic instruments and the increase experience in minimally invasive procedures in newborns has make feasible to solve surgical problems in low birth weight patients. The objective of this study is to report the minimally invasive management of surgical problems in newborns less than 2,900 grams.

**METHOD:** A retrospective study was performed from August 2009 to August 2011. It included all newborns that weight less than 2,900 grams in which a laparoscopic or thoracoscopic procedure was done.

**RESULTS:** There were 26 newborns that weighed less than 2,900 grams (1480 – 2890). The procedures performed were: Esophageal atresia (4), congenital diaphragmatic hernia (5), duodenal obstruction (4), gastro-esophageal reflux (3), hypertrophic pyloric stenosis (3), anorectal malformation (2), intestinal malformation (4) and congenital hyperinsulinism (1). There was no mortality related to the surgeries. Four patients had intraoperative complications; three of them required conversion to open surgery (thoracotomy or laparotomy) and completed the procedure without any more incidents.

**CONCLUSIONS:** The association of the development of increasingly smaller instruments and the ability to perform surgery in confined spaces, has made it possible to advance in the performance of minimally invasive surgery in progressively smaller patients in a safety and effective way. This will reduce the problems associated with laparotomy or thoracotomy.

**P062 DELAYED LAPAROSCOPIC REPAIR OF BICYCLE HANDLEBAR HERNIA (BBH) IN A CHILD** – *J.H. Frost, B. Antao, S. Nour, A. Rajimwale, University Hospitals Leicester, Leicester, UK*

**BACKGROUND:** Blunt abdominal trauma due to handle bar is common in children. Most of these, either result in injury of solid organ or hollow viscus such as duodenum or pancreas. The bicycle handlebar injury resulting in hernia (BBH) in children is rare. We report a case of BBH managed with a delayed laparoscopic repair.

**METHOD:** An 11 year old child presented to the emergency department after falling off her bicycle and sustained a blunt abdominal trauma to her right iliac fossa. On clinical assessment she was haemodynamically stable and was noted to have a bruise and swelling over the site of her handle bar imprint in the right iliac fossa. An initial abdominal ultrasonography showed a 3 cm defect in the abdominal wall muscle with large bowel herniation. A subsequent CT scan of her abdomen confirmed the diagnosis of an abdominal wall hernia with the caecum herniated through the defect without any bowel dilatation, and no solid organ injury. The patient continued to remain stable, and was discharged after 48 hrs of conservative management.

She underwent a delayed laparoscopic repair using 3 ports (2 x 5 mm and 1 x 10 mm) of abdominal wall hernia four weeks later as a day-case procedure. At laparoscopy there was only omentum stuck to the 3 cm defect, which was dissected and the defect was closed using a figure of eight suture using 2/0 Ethibond Excel Polyester® (Ethicon Inc, USA). The port sites were closed using 3/0 Vicryl® (Ethicon Inc, USA) and 5/0 Vicryl® (Ethicon Inc, USA) sutures. She made an uneventful post-operative recovery and was discharged home the same day. There were no technical difficulties or any intra or post operative complications, and at 6 months follow-up she continues to remain well.

**CONCLUSION:** Although recognised as a rare entity, bicycle handlebar hernia is noted as a cause of high incidence of morbidity in children. In a stable child, we advocate a delayed laparoscopic repair. This approach helps in a better evaluation of the defect, while maintaining the advantages of minimally invasive surgery such as better cosmesis, less pain and shorter length of hospital stay.

**P063 IS THERE ANY ADVANTAGE TO SINGLE INCISIONAL LAPAROSCOPIC SURGERY IN INFANTS?** – *Ewan M. Brownlee, MBChB MRCS, G. A. Mackinlay, MBChB FRCSpaeds, J. P. H. Lam, MBChB FRCSpaeds, Royal Hospital for Sick Children, Edinburgh, UK*

**BACKGROUND:** Improved cosmesis is widely recognised as the main benefit of single incisional laparoscopic surgery (SILS). Recently, some centres have started to perform SILS in infants and neonates. However, in our experience, the cosmetic result from infants and neonates undergoing traditional laparoscopic surgery is excellent.

**AIM:** To assess the post-operative scars of infants following traditional laparoscopic surgery.

**METHODS:** 10 successive patients who previously underwent Transperitoneal Dismembered Pyeloplasty were invited to attend for photographs to be taken of their abdominal wounds. All patients had a 5mm infra-umbilical port, a 3.5mm epigastric port and a 3.5mm iliac fossa port. Photographs were all taken in the hospital's Medical Photography studio under controlled professional lighting conditions by the same Medical Photographer. Wounds were then marked and a further photograph taken. Unmarked photographs were then shown to 10 junior doctors who were asked to identify any visible scars and rate the cosmetic result on a scale of 1 to 5 - where 1 was Poor, 2 Prominent, 3 Acceptable, 4 Good and 5 was Excellent.

**RESULTS:** 6 patients have so far attended for photographs a median of 13 months post-op (range 8-19) in patients with a median age at surgery of 8 months (range 4-15). None of the junior doctors were able to identify all three scars on any of the photos. No individual scar was identifiable by all reviewers. 6 junior doctors were only able to identify any scars on two of six photographs. No scars were identified in over half (31) of the total of 60 photographs reviewed. Of 180 scars reviewed, only 37 (21%) were identified. The umbilical scars were least noticeable (3/60), followed by iliac fossa scars (11/60), with the epigastric scars most noticeable (23/60). Where any scars were correctly identified, the cosmetic result was always rated Good (44%) or Excellent (56%).

**CONCLUSION:** Traditional laparoscopic surgery in infants can have an excellent cosmetic result. The cosmetic benefit and thus role of SILS in infants and neonates is therefore questionable.

**P064 URETEROURETEROSTOMY IN CHILDREN WITH DUPLICATED SYSTEMS USING THE ROBOTIC-ASSISTED LAPAROSCOPIC APPROACH** – *Amy S. Burns, MD, George C. Bailey, BS, Craig A. Peters, MD, Childrens National and University of Virginia Health System*

**INTRODUCTION & OBJECTIVES:** Ureteroureterostomy (UU) is an accepted surgery for treating abnormalities associated with ureteral duplication in children. Here we report on the safety, efficacy, and outcomes of robotic-assisted laparoscopic ureteroureterostomy (RAUU) in the pediatric population.

**METHODS:** A retrospective chart review was employed for all patients with duplicated systems undergoing RAUU performed by a single surgeon from June 2006 to March 2009 for treatment of ureterocele (1) or ectopic ureter (9).

**RESULTS:** Ten children, all female, underwent RAUU. Surgery was performed on a total of 11 renal units (5 right; 4 left; 1 simultaneous bilateral). Patients presented with urinary tract infection (2), incontinence (3), UTI and incontinence (3), prior history of ureterocele with development of reflux following endoscopic incision (1), and prenatally detected hydronephrosis (1).

Mean age at surgery was 4.4 years (range 7.6 months-16.6 years). Mean weight was 20.7 kg (range 7.6-70.2 kg). All patients underwent a three-port transperitoneal upper to lower pole RAUU using a spatulated water tight end-to-side anastomosis. The anastomosis was proximal in nine patients and was distal in the one patient who underwent bilateral procedures. Mean operative time was 153 minutes (range 109-196 minutes) from incision to port closure and was 206 minutes (range 137-271 minutes) when including the cystoscopic portion for stent placement. Mean blood loss was 12.5 mL. No patient required conversion to an open procedure and there were no intraoperative complications. Double J stents were placed retrograde in nine patients (with extraction strings) and antegrade in one.

Mean length of hospital stay was 1.9 days (range 1.4-3.5 days). Mean length of follow-up was 22.8 months (range 1.0-51.7 months). Postoperative complications included febrile urinary tract infection (UTI) in one patient one week following surgery who did not require readmission. One patient with an obstructed ectopic ureter had persistent asymptomatic pyuria/bacteria for two years postoperatively but has had no evidence of UTI for the subsequent two years. Ureteral stents were removed on average 16 days postoperatively. In six patients with preoperative hydroureteronephrosis, five had complete resolution and one had significant improvement of hydroureteronephrosis on most recent follow-up imaging. All patients had complete resolution of their incontinence and recurrent UTI. Following RAUU, no patient has undergone additional urologic procedures.

**CONCLUSIONS:** RAUU is safe and effective with acceptable operative times, lengths of stay and complication rates. No patient has required further operative intervention after almost two years of mean follow-up, and excellent results were achieved in all children in terms of symptom resolution and improved imaging results.

### **P065 SURGICAL TREATMENT FOR ACHALASIA IN THE PEDIATRIC POPULATION: COMPARING ROBOTIC AND LAPAROSCOPIC REPAIR**

– *Juan I Camps, MD, MBA, Joel F. Bradley III, MD, Palmetto Health Children's Hospital, Columbia, SC*

**INTRODUCTION:** Achalasia is an uncommon condition in pediatric patients. Surgical treatment involves esophageal myotomy with a partial fundoplication. Laparoscopic treatment requires advanced surgical skills in minimal invasive surgery (MIS). Robotic assisted minimal invasive surgery (RMIS) has added a technical resource for pediatric surgeons to treat complex surgical conditions. Since esophageal achalasia is an uncommon condition, it is difficult to establish whether the use of robotics might be beneficial. The aim of the study is to analyze RMIS technology compared to traditional MIS in the surgical treatment of achalasia.

**METHODS:** From 2003 to 2009 fifteen children with diagnosis of achalasia underwent surgical correction by the same pediatric surgeon. These cases were reviewed retrospectively. In the pre-operative evaluation each patient was evaluated with a contrast esophagogram, esophageal manometry and esophageal endoscopy with dilation. All patients had progressive dysphagia over 6 months and recurrent symptoms after esophageal dilation prior to an operation. Each patient underwent surgical correction using MIS, but the last three consecutive patients underwent RMIS. The same basic surgical technique was used in both groups with transabdominal esophageal gastric junction dissection, mobilization of the distal esophagus, and a 3 cm myotomy above and below the gastroesophageal junction. Both groups had the myotomy edges anchored to the crura and a partial gastric wrap. The last three MIS cases were then compared to the 3 RMIS cases.

**RESULTS:** In the MIS group the age ranged from 10 to 15 years (mean of 13.3). The operating room setup time ranged from 34 to 38 minutes (mean= 35). Operative time ranged from 182 to 203 (mean = 192). In the RMIS group ages ranged from 7 to 16 years (mean = 11.7). Set up time ranged from 33 to 50 minutes (mean = 41). Operative time ranged from 191 to 266 minutes (mean = 220). There was no statistically significant difference in the OR set up times ( $p = 0.17$ ) or for the operative times ( $p = 0.28$ ). There were no immediate complications in either group and all patients were discharged home within 48 hours.

**CONCLUSION:** RMIS is a standard surgical option for the treatment achalasia in the adult population. In adults RMIS improves visualization and dexterity and some studies show a reduction in complications. Conversely, RMIS in pediatric patients has not yet been widely

accepted. There is scant data comparing RMIS versus MIS in children. There is no significant difference in the setup time, procedure time, or complications. This small case series shows that RMIS for the treatment of achalasia is a safe and efficacious modality for children.

### **P066 NISSEN FUNDOPLICATION IN CHILDREN: A CONVENIENT TRAINING MODEL IN ROBOTIC ASSISTED MINIMAL INVASIVE SURGERY**

– *Juan I Camps, MD, MBA, Joel F. Bradley III, MD, Catherine Loflin, MD, Palmetto Health Children's Hospital, Columbia, SC*

**INTRODUCTION:** The learning process using robotic technology in pediatric patients can be a complex task. The large variety of surgical procedures can make it difficult to learn new techniques. However, the Nissen fundoplication (NF) is a common surgical procedure performed by most pediatric surgeons and requires advanced skills to be completed with minimally invasive surgery. The purpose of this study is to show the feasibility and safety of using NF as a surgical training model to perform robotic surgery in children.

**METHODS:** From 2008 to 2010 a retrospective chart review was conducted off all pediatric patients who underwent a NF. All surgical cases were performed consecutively by the same pediatric surgeon at the same teaching institution. Demographic data was collected in each patient. Time analysis was performed in each surgical case.

**RESULTS:** A total of 50 pediatric patients underwent robotic NF. Eight patients had undergone a previous operation. Of the 50 patients 31 had a NF alone. Fifteen patients had a NF combined with a gastric tube. Three patients had a NF with a pyloroplasty and one patient had a NF, gastric tube and pyloroplasty. The average patient age in the cohort was 4.6 years (range from 4 months to 16 years of age) with 14 patients less than 1 year of age. The gender ratio of male to female was 1:8. The average surgical time was 2.18 hours (range from 1.35 to 5.05 hours). The smallest patient was 5 kg. No case required conversion to conventional laparoscopy or to an open procedure. No major postsurgical complications occurred.

**CONCLUSION:** Robotic assisted Nissen fundoplication is a safe and feasible surgical procedure in children. It serves as a model to acquire advanced technical skills in robotic surgery. Nissen fundoplication combines complex port placement, advanced dissection, and intracorporeal suturing. These skills can lead to more advanced robotic assisted minimally invasive procedures in children.

### **P067 ROBOTIC THYMECTOMY FOR MYESTHENIA GRAVIS** – *Daniel Ledbetter, MD, Jacob Stephenson, MD, Robert Ricca, MD, John J Meehan, MD FACS, Seattle Children's Hospital, University of Washington*

**PURPOSE:** The minimally invasive approach to a thymectomy for myasthenia gravis can be challenging using non-articulating instrumentation as the thymus traverses the mediastinum and encroaches into the lower neck. Moreover, this anterior structure can be difficult to reach with standard instrumentation due to the rigid chest wall hindering the range of motion of the thoracoscopic instruments. Robotic surgery is a technology which can make this procedure easier due to the articulating instrumentation and 3-D visualization. We present our series of robotic thymectomies in children.

**METHOD:** Four consecutive pediatric patients with myasthenia gravis and global weakness underwent robotic thymectomy using the Da Vinci Surgical Robot (Intuitive Surgical, Sunnyvale, CA) from May of 2010 through April of 2011. All patients had global symptoms refractory to medical management and 3 of the 4 patients had been intubated in the ICU on at least one occasion prior to surgery. Patients were 8, 10, 13 and 14 years of age (avg. 11.5 years) with an average weight of 38.5 kg. All patients had progressive disease despite an aggressive medical regimen including pyridostigmine.

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**RESULTS:** All procedures were accomplished using only 3 ports including one camera port and two instrument ports. The surgical approach was from the left chest in all 3 cases. We used the 12 mm 3-D HD scope on our first thymectomy. The 8.5 mm 3-D HD scope, made commercially available in mid-2010, was released a short time after our first case and was selected in the subsequent 3 patients. We used the 5 mm robotic instruments in all 4 cases. Use of additional accessory ports or trocar placement into the right chest was never required. All thymectomies were completed robotically with specimen extraction intact. Average blood loss was less than 20 cc. All patients went to the ICU post-operatively as a standard precaution for this patient population due to the pre-operative problem of global weakness. However, they all transferred to the floor by post-operative day one. A regular diet was initiated in all patients by post-operative day 1 as well. Three patients were discharged home on POD #2 and one patient went home on POD #1. No complications occurred.

**CONCLUSION:** Robotic surgery is a safe and effective technology for thymectomy in patients with myasthenia gravis. The procedure can be accomplished with as few as 3 ports. The 3-D visualization and articulating robotic instrumentation was particularly helpful in the dissection. The robotic approach is now our preferred method for thymectomy at our institution. Due to the rarity of thymectomies in pediatric patients, a collaborative effort between institutions is recommended to better evaluate this new technology in the treatment of myasthenia gravis.

## **P068 TRANSUMBILICAL LAPAROSCOPIC-ASSISTED SINGLE-PORT APPENDECTOMY: A SAFE AND COST-EFFECTIVE ALTERNATIVE TO CONVENTIONAL LAPAROSCOPIC TECHNIQUES IN CHILDREN**

– Sergio B Sesia, MD, Frank-martin Haecker, Professor, University Children's Hospital Basel

**OBJECTIVE:** To evaluate safety and cost-effectiveness of transumbilical laparoscopic-assisted single-port appendectomy (SPA) in children.

**METHODS:** Retrospective evaluation of a prospective kept database including 262 children who were operated by SPA between August 2005 and December 2008. SPA was performed using an unique 12-mm trocar with a 5-mm working channel, introduced through one sub-umbilical incision. After grasping the appendix with an atraumatic forceps and exteriorizing the appendix through the umbilicus, dissection and closure of the appendiceal stump were performed outside the abdominal cavity as in open surgery. For stump closure we utilized 2 sutures 3/0 vicryl RB-1.

**RESULTS:** After IRBA, we identified 262 children who underwent SPA, including 146 boys (55.7%) and 116 girls (44.3%). Median age at operation was 11.4 years (range, 1.1-15.9). Closure of the appendiceal stump using two sutures vicryl RB-1 was successful in all patients. The price of one suture is \$ 7.5. We did not use neither a stapler (price: \$ 276) nor endoloops (price: \$ 89). No insufficiency of the appendiceal stump was observed. During a follow-up of 69 months (range, 30 – 69), six obese (body mass index > 95th percentile) children (2.3%) developed an intra-abdominal abscess after perforated appendicitis which was not due to insufficiency of the stump. All these children were treated successfully by a course of antibiotics.

**CONCLUSION:** Besides safety, financial considerations attach an increasing importance in our health care system. Our results may demonstrate that the SPA technique with conventional extracorporeal closure of the appendiceal stump is safe and cost-effective. In our unit, SPA is the standard procedure for appendectomy in children.

## **P069 SILS ANTIREFLUX SURGERY IN CHILDREN IS FEASIBLE AND SAFE** – Clare M. Rees, MD, MRCS, MBChB, Lydia Hanna, MBBS, BSc, Clare Skerritt, MRCS MBBS MSc, Hugh W. Grant, BSc MBChB MD FRCSEd FRCSEng, Department of Paediatric Surgery, John Radcliffe Hospital, Oxford, UK

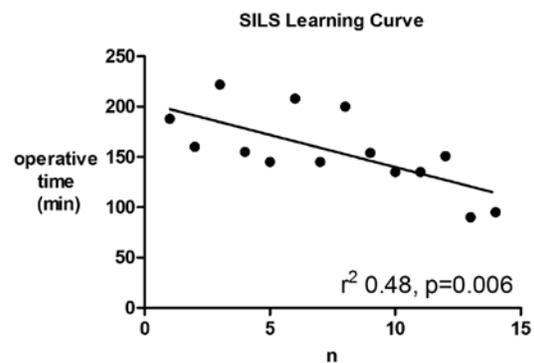
**AIMS:** To describe a novel technique for minimal access anti-reflux surgery and compare outcomes with standard laparoscopic surgery.

**METHODS:** All patients requiring fundoplication from December 2009 to August 2011 underwent standard laparoscopic Nissen fundoplication or single incision laparoscopic (SILS) Nissen fundoplication; initially (5 cases) SILS was restricted to patients >20kg. Demographic and operative data were collected prospectively. For SILS procedures the Olympus TriPort was inserted through a 'z' umbilical incision and a Nathanson liver retractor in the epigastrium. Additional ports were used if required. For standard laparoscopic surgery (LAP) a 3 port technique with a Nathanson in the epigastrium was used. Outcomes measured were duration of total operating time (including gastrostomy placement and port closure), post-operative analgesia requirement, length of stay, and complications. At follow up SILS patients were asked to rate the cosmesis of the umbilical scar on a scale of 0-10 (10=excellent). Data are reported as median [range] and compared using Fishers exact, t test and Mann Whitney test as appropriate.

**RESULTS:** Nissen fundoplication was performed on 55 patients -14 SILS, 41 Lap.

		SILS n=14	LAP n=41	p
<b>Demographics</b>	Age (years)	11.4 [0.8-17.7]	1.3 [0.3-15.8]	<0.0001
	Weight (kg)	31 [8.3-72]	9.2 [1.6-28.4]	<0.0001
	Neurologically impaired	8 (57%)	35 (85%)	0.06
<b>Operative details</b>	Duration (min)	152.5 [90-222]	145 [40-285]	0.5
	No. of ports (including Nathanson)	2 [1-5]	4	0.002
	Hiatus hernia repair	2 (14%)	10 (24%)	0.7
	Gastrostomy (PEG) performed	6 (43%)	31 (76%)	0.05
	Conversion	1 (to lap) (7%)	2 (5%)	1
<b>Outcomes</b>	Complications	1 (7%)	8 (20%)	0.4
	Opiate analgesia (hours)	23 [1-86]	34.5 [9-72]	0.06
	Length of stay (days)	31 [1-17]	4 [2-83]	0.1
	Late deaths	0	4 (10%)	0.6

An additional 5mm port was required in 5 SILS patients for ergonomic reasons (1), to treat a large hiatus hernia (1), and to control minor bleeding (3). One patient in the SILS group had 2 additional ports, and 2 in the LAP group were converted to open for pneumothorax (1) and difficult mobilisation (1). There was a clear learning curve in SILS ( $p=0.006$ )(Fig).



Post-operative complications included respiratory problems (1 SILS, 2 Lap), gastrostomy problems (2 Lap), dysphagia (1 Lap), vomiting (2 Lap) and haematemesis (1 Lap). One patient in the Lap group underwent

re-laparoscopy for possible gastrostomy leak 2 days post-op, no abnormality was found and she made a full recovery. Four children in the Lap group died of co-morbidities 0.5-7.5 months post-operatively.

SILS patients/parents were very satisfied with the cosmetic result reporting a median score of 10/10 (range 7-10).

**CONCLUSIONS:** Reduced port (SILS) fundoplication is feasible and safe in children. The ergonomics of SILS is different from standard laparoscopic surgery - manipulation is 'in/out' rather than 'left/right'. Lack of triangulation required modification of the operative technique to mobilise the stomach and pick up the suture needle, extracorporeal knots were used. The operation does not take longer, although a learning curve was noted. There were no differences in complications, hospital stay, or analgesia requirements. Patients/parents were very satisfied with the cosmetic outcome.

**P070 EARLY EXPERIENCE WITH SINGLE-PORT LAPAROSCOPIC NISSEN FUNDOPLICATION IN CHILDREN** – *Kristel De Vogelaere, MD, Kim Vanderlinden, MD, Carmela Spitali, MD, Antoine De Backer, MD, PhD, Georges Delvaux, MD, PhD, UZ Brussels, Belgium*

**OBJECTIVES:** Single-incision laparoscopic surgery (SILS) is one of the newest branches in minimally invasive laparoscopy in adults. SILS is gaining popularity in the pediatric group for routine operations: The three most common procedures are appendectomy, cholecystectomy and pyloromyotomy. Until now, reconstructive procedures, that require sutures, have sporadically been published. We report our first experience with a single incision laparoscopic Nissen fundoplication in a child.

**METHODS:** A SILS-port was inserted through a 2 cm umbilical incision. Conventional and special laparoscopic instruments were used to perform the procedure. A Veress needle was introduced in the right hypochondrium to retract the left liver lobe.

**RESULTS:** The operation time was 70 minutes. There were no intraoperative or postoperative complications. The patient was discharged on the third postoperative day on a full liquid diet. We encountered difficulties with the use of the conventional straight laparoscopic instruments: Intracorporeal suturing using conventional instruments was challenging because lack of angulation of the instruments

**CONCLUSIONS:** SILS Nissen is feasible in pediatric patients. Development of laparoscopic instruments specific for children would facilitate this SILS procedure. There is need for smaller, specialized ports and articulating instruments designed for the pediatric age group.

**P071 PRACTICABILITY AND LIMITATIONS OF A MULTIUSE SINGLE-SITE SINGLE PORT** – *Philipp O. Szavay, MD, Tobias Luthle, MD, Joerg Fuchs, MD, Dept. of Pediatric Surgery and Urology, University Children's Hospital*

**OBJECTIVES:** Laparoendoscopic single-site surgery (LESS) for pediatric pathology is increasingly used replacing laparoscopic procedures. However, single port devices are commonly disposable and therefore expensive. Aim of our investigation was to assess the practicability as well as limitations of a multiuse single-site single port (X-cone, Karl Storz Endoskope, Tuttlingen, Germany) for laparoendoscopic single-site surgery in pediatric patients.

**METHODS:** Since March 2010 LESS was performed in 11 children as pure single-site single port procedure with the use of a metal multi-use single-site single port (X-cone, Karl Storz Endoskope, Tuttlingen, Germany). All procedures were ablative, using different techniques including harmonic scalpel, electrocautery and clip-ligation. Indications were gall stones in 4 cases, along with splenomegaly in 2 patients, non functioning kidneys due to vesico-ureteral reflux in 2 cases, acute

appendicitis in 2 cases, teratoma of the ovary in one case, aplastic anemia with indication for ovarian kryo-conservation in another case and cryptorchidism in one case.

**RESULTS:** Mean age at operation was 11 years (27-197 months). Mean weight at operation was 36 kg (11.8-80). Median operating time was 111 minutes (36-368). Surgical procedures included cholecystectomy (4), including 2 patients who underwent splenectomy at the same time, nephroureterectomy (2), appendectomy (2), ovariectomy (2) and Fowler-Stevens-procedure (1). All children underwent LESS carried out in a standard laparoscopic transperitoneal technique. In one patient undergoing cholecystectomy and splenectomy an additional 12mm-trocar (Ethicon) was placed for the use of an Endo-GIA (Ethicon) for dissection of the splenic hilus. All procedures could be carried out safely with full achievement of the surgical target. In none of the patients a complication was noticed. Recovery was uneventful in all children.

**CONCLUSIONS:** LESS for pediatric patients can be done safely and efficiently with even less trauma than in conventional laparoscopy with a multiuse single-site single port. However, technical problems as gas leakage due to failure of sealing, limitations of the range of movements due to the rigidity of the metal device as well as tangling of instruments within the port had to be encountered. Nevertheless, as disposable single-site single ports are expensive, the x-cone offers an alternative for reasonable costs. However LESS for pediatric patients requires the future development of instruments and trocars which will be more suitable for children.

**P072 SINGLE-INCISION LAPAROSCOPIC NISSEN FUNDOPLICATION IN PATIENTS WITH SEVERE SCOLIOSIS: REPORT OF TWO INITIAL CASES** – *Makoto Suzuki, MD, PhD, Akihiro Igarashi, MD, Mariko Aoki, MD, Masahiro Hatanaka, MD, Junko Fujino, MD, Kazunori Tahara, MD, PhD, Yuki Ishimaru, MD, Hitoshi Ikeda, MD, PhD, Department of Pediatric Surgery, Dokkyo Medical University Koshigaya Hospital*

**BACKGROUND:** Laparoscopic fundoplication for patients with gastroesophageal reflux (GERD) has been shown to have many benefits including shorter hospital stay and fewer operative complications. Especially in children with severe scoliosis, laparoscopic fundoplication could allow improved operative visibility and easier access to the hiatus in comparison with the open approach. However, the traditional laparoscopic approach for them by the use of 4-5 trocars often present specific challenges to the surgeon because of their rigid costovertebral deformity, which limits the placement of trocars and the instrument mobility. In this report, we present two initial cases of hiatus hernia repair with the severe scoliosis which limits the placement of trocars on whom Single-incision laparoscopic Nissen fundoplication (SILS Nissen) were performed and describe the feasibility and usefulness of this approach for them.

**SURGICAL PROCEDURE:** The operation was performed through a 2 cm incision at the site of the gastrostomy using a proprietary single-incision multichannel trocar (SILS™ Port, Covidien, USA). The operative procedures were almost the same as in the traditional laparoscopic Nissen fundoplication but using different laparoscopic instruments, a flexible tip 5-mm laparoscope (VISERA VP, Olympus, Japan) and an articulating instrument (Autonomy™ Laparo-Angle™, Cambridge Endoscopic Devices Inc., USA). To retract the liver, 1 thread was hooked to the crus of the diaphragm and both ends of the thread were pulled up through the abdominal wall without a port. The left lobe of the liver was elevated with the suspended thread to expand the field of vision. The esophagus was freed from the crura until approximately its lower 3 cm could be pulled down into the abdominal cavity. Dissection of the fundus was started where the short gastric vessels appeared. Cruroraphy was performed with 2 non-absorbable sutures before

creating the fundoplication. Then the 360 degree wrapping around the anterior esophagus with the fundus of the stomach was performed with 3 non-absorbable sutures with no fixation to the crus of the diaphragm. Intracorporeal knot tying was used in all sutures.

**RESULT:** The two patients were referred to our hospital with the suspicion of GERD. They had both the motor and mental retardation. The pH-monitoring for 24 hours showed 9.6 and 9.0%, respectively, and the upper gastrointestinal series revealed the gastroesophageal reflux and sliding esophageal hiatal hernia. The presence of a severe scoliosis with rigid costvertebral deformity made traditional laparoscopic access challenging so we scheduled for SILS Nissen. There were no intraoperative complications, but unplanned additional trocar for using the liver retractor was added in one case. The operating time exclusive of gastrostomy was 302 and 233 minutes, respectively.

**CONCLUSION:** SILS Nissen through the site of the gastrostomy can be accomplished successfully and safely with no limitation of the instrument mobility due to the severe scoliosis. However, it needs not only the special instruments but also the highly skilled techniques to eliminate the influence of the loss of the triangulation.

## P073 WITHDRAWN

### P074 IS SINGLE INCISION PAEDIATRIC ENDOSCOPIC SURGERY MORE PAINFUL THAN STANDARD LAPAROSCOPY IN CHILDREN?

– Augusto Zani, Kemal Kemal, *Laura A. Cancelliere*, Shailesh Patel, Niji Ade-ajayi, Ashish P. Desai, Department of Paediatric Surgery, King 's College Hospital, London, UK

**BACKGROUND/AIM:** Single Incision Paediatric Endoscopic Surgery (SIPES) is a developing field, mainly established in adult general surgical practice. Whilst in children multiple incision laparoscopy is a well established approach for several conditions, SIPES has found limited use so far, mainly due to concerns about the size of the port. In fact, some authors believe that the use of SIPES in small patients with a small umbilicus would be associated with more postoperative pain. The aim of our study was to compare the postoperative pain in children who underwent SIPES and standard laparoscopy.

**METHODS:** Between March 2010 and July 2011, 10 patients (8 males) underwent 11 SIPES procedures for appendicectomy (n=6), orchidopexy (n=2), cholecystectomy (n=2), and total colectomy (n=1). One child was converted to standard 3 port laparoscopy and hence not included in study. Median age was 9 years (range, 4-15). These patients were matched for age, sex and type of operation with 10 controls. SIPES was obtained using the Olympus Triport Access system. Analysis outcomes included duration of surgery, length of postoperative hospital stay, intra- and post-operative complications, cosmetic outcome and pain score. Pain was analysed comparing the analgesic requirement (number of doses and dose/kg). Data were expressed as median and analysed using non-parametric tests.  $P < 0.05$  was regarded as significant.

**RESULTS:** The median duration of surgery of SIPES was 91.5 minutes (range 51-182) versus 90.5 minutes of standard laparoscopic procedures (range 65-575,  $P=0.74$ ). The median length of postoperative stay was 1.5 days for SIPES (range <24 hours-4 days) and 1 day for standard laparoscopic procedures (range <24 hours-8 days,  $P= 0.32$ ). There was no intra- or postoperative complications in any of the patients of the two groups. There was no difference in the median number of required doses of analgesics per patient between the two groups (Table). The median dose of Paracetamol in SIPES patients was 74 mg/kg (range 14-149) and in patients who underwent standard laparoscopy was 59 mg/Kg (range 13-108,  $P=0.76$ ). Only two patients per group needed morphine, and there was no difference in the dosage and frequency between the two groups.

	SIPES median (range)	Standard Laparoscopy median (range)	P value
Paracetamol	5 (1-20)	5 (1-9)	0.57
Ibuprofen	0 (0-3)	0.5 (0-6)	0.5
Diclofenac	0 (0-9)	0 (0-3)	0.27

**CONCLUSIONS:** Single port laparoscopic surgery is feasible and safe. Single port laparoscopic surgery is not associated with more pain than laparoscopic surgery.

### P075 SINGLE INCISION LAPAROSCOPIC CHOLECYSTECTOMY (SILC) IN CHILDREN AND ADOLESCENTS: A SINGLE INSTITUTION EXPERIENCE – Sugam Vasani, MD, M. A. Emran, MD, P. S. Almond, MD, H. I. Patel, MD, Driscoll Childrens Hospital

**BACKGROUND:** Single-incision laparoscopic cholecystectomy (SILC) is emerging as a less invasive alternative to standard cholecystectomy. The aim of this study is to describe our experience with SILC using conventional laparoscopic equipment in comparison with patients undergoing multi-incision (conventional) laparoscopic cholecystectomy in a pediatric patient population.

**STUDY DESIGN:** A retrospective chart review was performed and data collected from all laparoscopic cholecystectomies performed from Sep 2006 through Apr 2011 at Driscoll Children's Hospital by three pediatric surgeons. Exclusions for the SILC approach were severe pancreatitis, known common duct stone or previous open upper abdominal surgery. Patients with severe morbid obesity were initially excluded but were included as experience was gained. Data analyzed included patient age, gender, body mass index, operative time, operative approach, post-operative narcotic requirements (morphine sulfate equivalent), postoperative length of stay and complications. Fisher's Exact Test and Wilcoxon Rank-Sum Test were used to estimate statistical significance.

**OPERATIVE TECHNIQUE:** Transumbilical incision, conventional ports and standard laparoscopic instrumentation was used and later the ASC Triport (Bray, Co. Wicklow, Ireland) was used. We used an innovative technique of providing true cephalad traction to the gallbladder fundus using an intracorporeal suture to tack it to the diaphragm. Conventional technique was 4 ports except 2 cases using 2 ports as an initial transition to SILC.

**RESULTS:** 70 Laparoscopic cholecystectomies were performed during the study period; 31 SILC, 39 conventional. There was no conversion to open in either group. There were no conversions of SILC to conventional technique. Mean age was 15 years in the SILC group (range 18 months to 18 years) and 15.6 in the conventional group. Majority in both groups were female. The mean BMI was higher in the conventional group (34.2) compared to the SILC group (28.4, range 18-48). The pathology found in the SILC group included: acute cholecystitis, chronic cholecystitis, hydrops and biliary dyskinesia. Mean operative time was not significantly different, 76.7 min for SILC vs. 83.4 min for conventional with cholangiogram ( $p=0.91$ ). There were no intraoperative complications in either group. Postoperative hospital stay was similar in both groups with majority of patients spending one night in the hospital after cholecystectomy. There was no statistical difference between the groups in postoperative narcotic requirements and postoperative complications. Three patients in each group had significant postoperative pain with one patient in the single incision group requiring readmission for nonincisional epigastric pain. There was also one minor wound infection in the SILC group which resolved with oral antibiotics. Literature review of SILC identified 33 case series reported with over 500 cases proving the safety of SILC in adults; we identified only two studies for pediatric population with less than 20 cases.

**CONCLUSIONS:** As laparoscopic cholecystectomy becomes less invasive, proven safe dissection techniques should be maintained. Our results suggest that SILC is a safe, effective and minimally invasive alternative to conventional laparoscopic cholecystectomy in children and adolescents that provides the ability to hide the surgical incision within the umbilicus in appropriately selected patients.

## **P076 COST-EFFECTIVE PEDIATRIC SINGLE PORT**

**CHOLECYSTECTOMY: A NOVEL TECHNIQUE** – *J. Roberto Ramirez Gavidia, MD, David Magnuson, MD, Daniel Guerron, MD, Federico Seifarth, MD, Cleveland Clinic Foundation*

**INTRODUCTION:** In adults, different single port techniques have been successfully implemented for laparoscopic cholecystectomy. Most of the commercially available devices still require considerable incisions which make them less attractive for the use in children.

The search for improved cosmetics, practicability and cost efficiency has directed us to the revival of a first generation laparoscopic instrument, the 10mm Storz telescope with inbuilt working channel. The combination of this single port instrument with portless percutaneous graspers allowed us to develop an almost scarless and safe cholecystectomy procedure in children.

**METHODS:** We describe a simple yet novel operative technique. One longitudinal 11mm umbilical port incision and two abdominal stab incisions for percutaneous 2.3mm retractors (Stryker, MiniLap) are necessary. The 10mm Storz Hopkins telescope with 6mm working channel is used. The dissection is carried out with 45cm bariatric length instruments. The cystic artery and duct are sharply divided after application of WECK® Hem-o-lok® clips.

**DISCUSSION:** Single-port surgery has gained great popularity among surgical specialties. In pediatric patients it remains controversial due to relatively large port sites and limited intracorporeal working spaces. Inspired by a first generation single port instrument we developed the above described novel technique. This procedure provides excellent traditional exposure of Callot's triangle and allows application of conventional laparoscopic methods. Therefore the learning curve is gentle. Inexpensive Hem-o-lok® clips are used for the cystic artery and duct. Limiting is the 0° optic which can be compensated by proper retraction. No cholangiograms have been performed in this setting. This procedure has been shown to be safe, cost effective with virtually scarless results. It was successful in children and adult sized teenagers.

## **P077 LAPAROSCOPIC INTERVAL APPENDECTOMY FOR MASS-FORMING APPENDICITIS: THE ROLE OF TRANS-UMBILICAL SINGLE CHANNEL-SINGLE PORT SURGERY**

– *Yasuharu Ohno, MD, PhD, Toshiya Morimura, MD, PhD, Sin-ichi Hayashi, MD PhD, Department of Pediatric Surgery, Saitama Medical University*

**PURPOSE:** The authors have adopted a trans-umbilical laparoscopic-assisted single channel-single port appendectomy (TULAA) for acute appendicitis in children and have reported the results of this procedure. In addition, TULAA was recently introduced when performing laparoscopic interval appendectomy (LIA) for mass-forming appendicitis. The aim of this study was to evaluate the results of LIA using our single channel-single port procedure.

**METHODS:** LIA using the TULAA procedure was planned for 31 patients, between June 2007 and March 2011. LIA using TULAA was planned approximately 8 to 12 weeks following the initial medical treatment. The laparoscopic access was achieved using a vertical incision directly through the umbilicus. TULAA is a trans-umbilical single channel surgery and a 12-mm Blunt Tip Trocar with Universal® Seal (Applied Medical, CA) was introduced. Both a 5mm telescope and grasper are inserted simultaneously into the single channel. The grasper holds the appendix

and an extracorporeal appendectomy is performed. Electrosurgical instruments were used instead of a grasper for areas of severe adhesion. During the procedure, the CO2 pneumoperitoneum flow was increased (10-15 liter/min) to compensate for the gas leakage. The age, sex, weight, length of interval, operations, length of surgery, histological findings, postoperative hospital stay, and complications were collected.

**RESULTS:** The average age of the patients was 10.0 years and there were 19 males and 12 females. The average weight was 35.5 kg. The indications of interval appendectomy were mass-forming appendicitis in 29 patients, and relapsing appendicitis in 2. The LIA using TULAA was performed for 29 patients because two patients deviated from the protocol. All 29 patients were readmitted after an average interval period of 14.2 weeks. The LIA using TULAA procedure was completed successfully in 21 patients (72.4%). An accessory port(s) was necessary in 8 patients. Two of these 8 patients successfully underwent laparoscopic surgery, but the remaining 6 patients (20.7%) were converted to open appendectomy. All of the patients converted to open appendectomy were older and five of the six patients were female. The convert to open surgery was required because of severe adhesion at the ileocecal lesion in all converted patients. The average length of surgery was 43 min in the TULAA patients. Neither complications nor wound infection occurred in the 29 patients that underwent surgery.

**CONCLUSIONS:** The authors have reported TULAA to be successful in 83.2% of 500 patients with acute appendicitis in children. The Universal® Seal of Blunt Tip Trocar is highly durable to gas leaks, which maintains sufficient pneumoperitoneum pressure. The treatment strategy for mass-forming appendicitis has shifted from an urgent operation to interval appendectomy and recent advances in laparoscopic techniques have allowed performing an interval appendectomy using laparoscopic techniques. The current study describes the results of the TULAA procedure for mass-forming appendicitis. LIA using TULAA procedure was successfully performed over 70% of the patients. It is a technically safe procedure and provides better cosmetic results. The TULAA procedure can be used as the initial procedure of choice when performing LIA for mass-forming appendicitis in children.

## **P078 SINGLE-INCISION LAPAROSCOPIC ILEOCECAL RESECTION IN PEDIATRIC PATIENTS: EXPERIENCE WITH ELEVEN CONSECUTIVE CASES AND COMPARISON WITH MULTI-PORT LAPAROSCOPIC ILEOCECAL RESECTION**

– *Lori A. Defreest, MD, PhD, Cary Qualia, MD, Edward C. Lee, MD, Albany Medical College*

**INTRODUCTION:** Single-incisional laparoscopic (SIL) colectomy has been reported in adults, however not in pediatric patients. Here we report the first use of a single-incision laparoscopic ileocecal resection in children and compare to conventional laparoscopic colectomy.

**METHODS:** Eleven consecutive SIL ileocecal resections in pediatric patients with Crohn's Disease were performed by one surgeon at one institution between January 2010 and December 2010. All of these procedures utilized conventional laparoscopic instruments with a single-incision site for access. Data was collected retrospectively on demographics, operative time, length of post-operative hospitalization, and perioperative complications. These were compared to eleven ileocecal resections in pediatric patients with Crohn's Disease utilizing conventional laparoscopic techniques at the same institution over a period from December 2002 to February 2011.

**RESULTS:** Patient age and mean operative time were not significantly different between the two groups; patient weight was found to be significantly different. The average age of the patients who underwent SIL ileocecal resection was 15 years (range 9-18) and all but three patients were female and patient weight 49.7 kg (range 30-66 kg). Mean operative time

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was 72 min. (range 46-153 min). For the patients undergoing conventional laparoscopic hemicolectomy, the average patient age was 15.5 years (range 9-19) ( $p=0.62$ ) and patient weight was 58.6 kg (range 50-73 kg) ( $p=0.03$ ) and six patients were male. Mean operative time was 76 min (30-138 min) ( $p=0.62$ ). ASA grade (American Society of Anesthesiologists) averaged 2 for both groups. No conversion to conventional laparoscopic or open procedures was necessary for the SIL group and no intra-operative complications were reported. In the conventional group, one procedure required conversion to open. Estimated blood loss averaged 17 mL (range 5-50 mL) for the SILS procedures and 40 mL (range 10-150 mL) for the conventional laparoscopic group ( $p=0.08$ ). All post-operative courses in the SILS group had no significant complications and mean post-operative length of stay was 5 days (range 3-7 days). This was not significantly different from the mean post-operative length of stay for the conventional laparoscopic group of 4 days (range 3-6 days) ( $p=0.49$ ). All of the patients who have undergone SIL ileocecal resection have been seen subsequently in follow-up and all have had no significant complications although one required a brief readmission for ileus. Long-term follow-up data was available for seven of the eleven patients who underwent conventional laparoscopic surgery and no significant post-operative complications were noted.

**CONCLUSION:** These findings indicate that SIL ileocecal resection is a viable alternative to the standard laparoscopic approach in children. This early data suggests that this procedure can be performed safely, effectively, and with improved cosmesis. Continued experience with SIL ileocecal resection will be necessary to fully assess the benefits of this approach.

**P079 A PEDIATRIC LOW-COST HOMEMADE SILS: THE ONE GLOVE APPROACH** – *Riccardo Coletta, PhD, Bruno Benini, PhD, Vito Briganti, PhD, Alessando Calisti, PROF, Department of Pediatric Surgery and Urology, San Camillo Forlanini Hospital, Rome, Italy*

**INTRODUCTION:** Recent introduction of SILS techniques (single incision laparoscopic surgery) has improved technical approach and cosmetic impact of pediatric laparoscopic surgery but did not result in cost reduction for the need of expressly designed commercial devices. The present study is the first report on the use of a low-cost homemade alternative SILS device in pediatric patients

**METHODS:** An Institutional Board-approved retrospective chart review of all laparoscopic procedure performed between February and August 2011, using a new SILS technique, has been made. Our modified device employed a surgical glove inserted through an umbilical incision into the abdominal cavity: "One Glove Approach" (OGA). Laparoscope was introduced through the middle finger and other two instruments through the first and fifth. There were no exclusions for age but only for clinical reasons (diffuse peritonitis, signs of perforation, cardio circulatory instability). Clinical course and outcome was reviewed. Cosmetic satisfaction was measured using 6-point Likert-type questionnaires.

**RESULTS:** Our modified one-port technique was employed in thirty-one cases (M / F = 1.06 / 1). Median age was 10 years (range 1 – 16), median operative time 61 minutes (range 26 - 130), median length of hospital stay 3 days (range 1 - 9). Sixty eight percent of procedures performed were 21 appendectomies followed by 4 ovariectomies (13%), 2 cholecystectomies (7%), 1 orchidopexis (3%), 1 inguinal hernia repairs (3%), 1 partial nephrectomies (3%) and 1 partial pericystectomy of hepatic hydatid cyst (3%). All patients were discharged after an uneventful postoperative course. Likert score for aesthetic satisfaction was reported excellent.

**CONCLUSIONS:** Despite the limited number of cases OGA was safe and easy to perform. Inexpensive and easily available supplies like surgical gloves are an attractive alternative to costly devices expressly designed for SILS. OGA was largely employed in pediatric appendectomies but its use can be safely extended to several other procedures.

## **P080 SINGLE INCISION LAPAROSCOPIC (SILS) APPENDICECTOMY IS MORE EFFICIENT THAN STANDARD LAPAROSCOPY**

– *Clare M. Rees, MD MRCS MBChB, Lydia Hanna, MBBS BSc, Clare Skerritt, MRCS MBBS MSc, Hugh W. Grant, BSc MBChB MD FRCSed FRCS(Engl), Department of Paediatric Surgery, John Radcliffe Hospital, Oxford, UK*

**AIMS OF THE STUDY:** to describe the use of a new technology for minimal access appendicectomy in children and compare to outcomes with standard laparoscopic surgery.

**METHODS:** From December 2009 to August 2011, patients admitted with acute appendicitis under the care of a single surgeon were offered single incision laparoscopic (SILS) appendicectomy. This was performed by the consultant or a trainee under supervision. SILS operations were performed with the Olympus TriPort inserted at the umbilicus through a 'z' incision. Other patients had standard 3-port laparoscopic appendicectomy (LAP) performed by the on call team. Findings at operation were noted, patients were classified as complicated appendicitis if there was gangrene, perforation, or peritonitis with free pus. Outcome measures were compared including post-operative analgesia requirements, complications and length of stay. At follow-up SILS patients were asked to rate the cosmetic appearance of the umbilical scar on a scale of 0-10 (10=excellent). Data are described as median [range] and compared using Mann Whitney and Fisher's exact tests as appropriate.

**MAIN RESULTS:** Emergency appendicectomy was performed in 97 children; 73 Lap and 24 SILS. All SILS appendicectomies were completed through the single port; 3 Lap operations were converted to open.

	SILS n=24	Lap n=73	p
Age (years)	12.5 [6.8-15.1]	11.2 [2.1-19.5]	0.07
Weight (kg)	44.9 [22.2-74.1]	41.1 [12.4-92]	0.5
Operative time (mins)	75 [41-115]	85 [42-200]	0.02
Complicated appendicitis	5 (25%)	20 (27%)	0.6
Conversion	0	3 (4%)	0.6
Opiate analgesia required	9 (38%)	21 (29%)	0.6
Duration of IV opiate analgesia (hrs)	13 [1-72]	35 [9-120]	0.08
Post op complications	4 (17%)	6 (8%)	0.3
Post op length of stay (days)	2 [1-27]	2 [1-9]	0.3

Complications included pelvic collection (3 SILS, 1 Lap), minor bleeding requiring extension of incision (1 Lap), traumatic urethral catheterisation (1 Lap), empyema (1 Lap), wound infection (1 SILS, 1 Lap), persistent pain (1 Lap). Two patients with pelvic collection post SILS appendicectomy had re-look SILS operation and drainage.

SILS patients were followed up for 2 months [1-7] and rated the cosmetic appearance of the umbilical scar as 8.8/10 (range 6-10).

**CONCLUSIONS:** SILS appendicectomy is safe in children and can be an alternative to standard laparoscopic surgery. There were no differences in post-operative analgesia requirements, length of stay, or complications but the operating time was shorter for SILS appendicectomy. The ergonomics are different to laparoscopic surgery and may pose challenges initially, but the operation can be significantly quicker as fewer ports are needed. SILS appendicectomy was an appropriate training operation and could safely be performed by trainees under supervision. Patients were very satisfied with the cosmetic outcome.

## **P081 FEASIBILITY OF SINGLE-INCISION PEDIATRIC ENDOSURGERY (SIPES) FOR TREATMENT OF ACUTE APPENDICITIS IN 377 CHILDREN**

– *Martin Lacher, MD, Oliver J. Muensterer, MD, PhD, Aprahamian J. Charles, MD, Lena Perger, MD, Michael Megison, MD, Carroll M Harmon, MD, PhD, 1) Children's of Alabama, University of Alabama at Birmingham/USA, 2) Division of Pediatric Surgery, Weill Cornell Medical College, New York/USA*

**ABSTRACT BACKGROUND:** Single-incision pediatric endosurgery (SIPES) has gained popularity for ablative procedures like appendectomies in many Pediatric Surgical centers. This study evaluates the outcome of SIPES for treatment of appendicitis in our institutions.

**MATERIALS & METHODS:** After IRB approval was obtained, data were prospectively collected on all SIPES appendectomies performed in our hospitals from March 2009 through July 2011. The surgical techniques, operative times, complications, conversion rates, and outcomes were recorded.

**RESULTS:** SIPES appendectomy was attempted in 377 children (ages 1.42-17.9 years, 240 males, 137 females, median 10.9 years, weight 9.8-132kg, median 43kg). 363 appendectomies were performed at institution No 1 (Birmingham) and 14 at institution No 2 (NYC). Intraoperatively acute appendicitis was found in 248 cases, perforated appendicitis in 74 cases and in 18 cases the appendix was macroscopically normal. 37 patients were operated for interval appendectomy following antibiotic treatment for ruptured appendicitis. Appendectomy was carried out solely as SIPES in 358 cases (95%). One unplanned additional trocar was placed in 13 cases and two additional trocars in 5 cases. On average, total median operative time was  $37 \pm 14$  minutes ( $33 \pm 15$  minutes for fellows (N=243) and  $45 \pm 15$  minutes for residents (N=134)). The postoperative length of stay was 1.2 days for non-perforated appendicitis, 1.7 days for interval appendectomy and 6.7 days for perforated appendicitis. There were 3 intraoperative complications: 1 perforation in the cecum, which was stapled, 1 cecal serosal injury, which was sutured and one defective staple line which was imbricated by a 3-0 vicryl suture using intracorporeal knot tying. There were no conversions to open appendectomy. Pathologic reports revealed acute or perforated appendicitis (N=320), post-inflammatory changes after interval appendectomy (N=28), a carcinoid tumor (N=2), no pathologic change (N=18) and other pathology (N=9). A fecalith was present in 80 patients (21%). Mean follow up was 24 days. Overall, 24 patients (6.3%) were readmitted (fever/pain N=6, bleeding from umbilical incision N=1, intraabdominal abscess N=14, umbilical wound infection N=5. 11 patients (2.9%) underwent reoperation (drainage of intraabdominal abscess N=7, wound drainage N=3, right hemicolectomy for carcinoid N=1). In perforated appendicitis the postoperative intraabdominal abscess rate was 11/74 cases (14.9%) which was similar to our previous report on conventional laparoscopic appendectomy from our institution (13.6%; Yagmurlu, A, Surg Endosc, 2006 20:1051-4). The umbilical wound infection rate (1/74 cases; 1.4%) was lower than previously reported (6.8%) for conventional laparoscopic appendectomy for perforated appendicitis. Compared to the costs of three single-use trocars (12mm, 5mm, 5mm) for conventional appendectomy the costs for using a SIPES port were higher.

**CONCLUSION:** Appendectomy can be accomplished successfully and safely using single-incision endosurgery in children with acceptable operating time without leaving any appreciable scar. The necessity for placement of additional trocars is rare. So far, the intraoperative and postoperative complication rate is not higher than in conventional laparoscopic appendectomy.

## **P082 LAPARO-ENDOSCOPIC SINGLE SITE SURGERY FOR NISSEN FUNDUPLICATION IN CHILDREN USING CONVENTIONAL INSTRUMENTS: INITIAL EXPERIENCE AND SHORT-TERM**

**OUTCOME** – *Kui-ran Dong, MD, Kai Li, MD, Gong Chen, MD, Gongbao Liu, Haijun Zhong, Department of Surgery, Children's Hospital of Fudan University, Shanghai, PR China*

**PURPOSE:** Laparoscopic Nissen fundoplication has been shown to have many benefits for patients including shorter hospital stay and fewer operative complications. The traditional laparoscopic Nissen fundoplication has been performed by the use of 5 incisions. With the inception of single incision procedures, surgeons have been examining other procedures that may benefit from adoption of an even less invasive technique. But in most reports of LESS for Nissen fundoplication, some special new instruments such as esophageal retractor, flexible tip laparoscope, Roticulator grasper should be used during the procedure. We report our initial experience of laparo-endoscopic single site surgery for nissen fundoplication using conventional instruments in pediatric surgery.

**METHODS:** Between Dec. 2010 and Aug. 2011, seven pediatric patients underwent laparo-endoscopic single site nissen fundoplication with the approval of our Hospital Ethics Committee. There are 4 male and 3 female patients with the age from 2 month to 168 month. Five patients were diagnosed as esophageal hiatal hernia and another one is underwent serious gastroesophageal reflux. For LESS technique, the patients were positioned supine. A 2.5cm incision was made on the upper circumference of the umbilicus. Three conventional trocars were inserted through this incision, one 5mm for the Sono-surg ultrasonic device on the left, and two 3mm for camera and grasper on the middle and right. Conventional laparoscopic instruments and 30 degree camera were used for the procedures. In order to exposing the esophageal hiatus, a traction suture was placed through abdominal wall, right side crus of the diaphragm and lig teres hepatic to elevate the left lobe of liver. Then standard Nissen fundoplication procedure were carried out.

**RESULTS:** Besides one case was converted to open operation because of bleeding when the short gastric vessels were cutting, other 6 procedures were successfully completed with no intra-operative complication occurred. The mean operative time was 127 min (90-218 min). The patients could tolerate food intake on postoperative day 2~3. The hospital stay was 5~7 days. We followed up an UGI for these patients on postoperative day 7 and day 30. On day 7, no stenosis or reflux of the esophageal were showed. On day 30, 1 case showed slightly recurrence of paraesophageal hiatal hernia.

**CONCLUSION:** The difficulty of LESS for Nissen fundoplication in childhood lies in the surgical area expose and suture knot. A traction suture through abdominal wall, right side crus of the diaphragm and lig teres hepatic is an effective way to exposed the esophageal hiatus. Right hand holding the needle holder winding the left hand grasper can make a good knot inside the peritoneal cavity. Single incision laparoscopic Nissen fundoplication using conventional instrument is feasible in children. More data are needed to fully assess the benefit of this technique.



**P083 SINGLE INCISION LAPAROSCOPIC APPENDECTOMY IN CHILDREN: A REVIEW OF 275 CASES** – *Timothy J Fairbanks, MD, Thuyet Ho, MD, UCSD Department of Surgery/Rady Children's Hospital of San Diego*

**INTRODUCTION:** Appendicitis is one of the most common pediatric surgical emergencies. Recently, Single Incision Laparoscopic Surgery has gained momentum for a variety of abdominal operations. With the potential benefits of less pain and little or no visible scar, the application of this technique is attractive in the pediatric population. The purpose of this study is to evaluate the safety and feasibility of Single Incision Laparoscopic Appendectomy in children.

**METHODS:** Retrospective analysis was conducted on patients 18 years old and younger who underwent Single Incision Laparoscopic Appendectomy from October 2009 through August 2011 at our institution by a single surgeon. The procedure was performed completely intracorporeally, with a traditional 5 mm port, a 3 mm grasper and a 5 mm 45 degree scope inserted through separate fascial incisions within a single 2 cm incision hidden in the base of the umbilicus. Patient demographics including age and weight, as well as operative time and postoperative complications were reviewed.

**RESULTS:** A total of 275 patients underwent appendectomy during the 23 months of the study. The age ranged from 2-18 years old and weight ranged from 11- 113 kgs. The mean operative time improved from 45.5 mins to 34.4 mins during the first 9 months of the study. Complications included 5 postoperative wound infections (1.8%) and three intra-abdominal fluid collections (1.1%). Three patients were readmitted with partial small bowel obstructions (all three responded to conservative management.) One umbilical wound required revision secondary to seroma formation. One patient required the addition of a second port to retrieve a large fecalith. Two patients required conversion to a conventional right lower quadrant incision. There were no port insertion complications. There have been no umbilical hernias to date.

**CONCLUSIONS:** Single Incision Laparoscopic Appendectomy is safe and feasible in children. It is possible to perform a laparoscopic appendectomy through a small incision hidden within the umbilicus with little or no visible scar. The technique used here utilizes a conventional port and laparoscopic equipment. Many early studies comparing single incision and traditional 3 port laparoscopic appendectomies compare a procedure that an individual surgeon has performed less than a hundred times with a procedure he or she has performed hundreds of times. With time, large studies by surgeons comfortable with single incision laparoscopy will give us an accurate expectation of this new technique on the other side of the learning curve. Single incision laparoscopic appendectomy should be considered an excellent option for surgeons motivated to provide minimally invasive options to their patients.

**P084 INITIAL EXPERIENCE OF TRANSUBILICAL SINGLE INCISION LAPAROSCOPIC SPLENECTOMY** – *Suolin Li, MD, Chi Sun, MD, Zengwen Yu, MD, Department of Pediatric Surgery, the Second Hospital of Hebei Medical University*

**OBJECTIVE:** To summarize the initial experience of transumbilical single incision laparoscopic splenectomy in children, and explore the feasibility and safety of this laparoscopic procedures.

**METHODS** From April 2010 to July 2011, the clinical data of 8 children with splenic allied hematologic disorders undergoing laparoscopic splenectomy via the umbilical single incision were retrospectively reviewed. There were 5 boys and 3 girls, whose age ranged from 4 to 14 years old. Of them, 6 cases suffered from hereditary spherocytosis and 2 cases with idiopathic thrombocytopenic purpura. We used the

Tri-port and curved instruments which were improved by ourselves to finish the operation. The splenic attachments were taken down using the harmonic scalpel, and the hilum was clipped with Hem-o-lok or transected with Endo-GIA. The spleen was removed from the abdomen via the single incision.

**RESULTS:** All of the laparoscopic splenectomies were completed successfully with transumbilical single incision approach without conversion to conventional laparoscopic surgery. The operation time ranged from 85 to 220 min and the estimated blood loss was 10-30ml. There were no perioperative complications. All cases were cured that the postoperative hospital stay was 5-8 days. During a follow-up period of 2 to 18 months, all children were very well with improved growth and normal hematology.

**CONCLUSIONS:** Compared with standard laparoscopic splenectomy, transumbilical single incision laparoscopic splenectomy may reduce the invasiveness of the abdominal wall, improve cosmetic outcomes and could be carried out safely in children. Greater numbers and a prospective trial will be necessary to assess the true benefit of this approach.

**P085 12 YEARS OF EXPERIENCE USING A 5MM OPERATING LAPAROSCOPE WITH A 3,5 MM WORKING CHANNEL – A MULTI POTENT INSTRUMENT FOR SINGLE PORT LAPAROSCOPIC SURGERY (SPLS) IN CHILDREN** – *Ulf Bühlig, MD, Robin Wachowiak, MD, Holger Till, MD PhD, Department of Pediatric Surgery, University of Leipzig, Leipzig Germany*

**PURPOSE:** Most studies about single port laparoscopic surgery (SPLS) describe a rather short observation period. The aim of the present study is to reveal our 12 year experience of using a 5mm operating laparoscope with a 3,5mm working channel for a variety of pediatric procedures.

**MATERIAL & METHODS:** From 1999 to 2011, a total of 153 cases had been selected for SPLS using the so-called Leipzig Ei Optik. This set contained a specially customized operating laparoscope (5mm, 0° lens by Wolf® Germany) and several 3,5mm instruments (30cm length) like dissectors, shears, bipolar forceps and endo graspers. Great care was taken to match the expected complexity of the procedure with the ergonomic (in-line) potency or limitations of these instruments. In particular, 59 laparoscopic ventricular-peritoneal (VP-) shunt revisions, 21 laparoscopic adhesiolyses, 18 laparoscopic herniorrhaphies, 16 laparoscopic assisted gastrostomies, 23 urologic laparoscopies for kryptorchism or ovarian pathologies, 12 laparoscopic varicocelectomies, 1 derotation of an ovarian torsion, 1 laparoscopic assisted appendectomy, 2 thoracoscopic debridements of acute pleura emphyema.

**RESULTS:** All 153 cases, selected for SPLS, could be completed without intraoperative complications or conversions to 3-port conventional laparoscopy and open surgery. The mean age of the patients was 12,8 years (range from 16 month to 17 years), mean operating time was 65 min (range from 25 min to 120 min). No reoperations were necessary.

**CONCLUSIONS:** Over 12 years we observed that single-handed, in-line SPLS using a 5mm operating laparoscope proved to be feasible and safe for a great variety of pediatric surgical cases. Adequate selection of such procedures seemed crucial. If the pathological situation would have required an additional port and instrument, SPLS could have easily been advanced without compromising the concept of an almost "scarless" surgery in children.

**P086 A DEBUT IN PEDIATRIC SINGLE PORT LAPAROSCOPIC SURGERY (SPLS): INDIVIDUALLY BENDABLE 3MM INSTRUMENTS COMBINED WITH THE SMALL PEDIATRIC X-CONE (STORZ®)** – *Steffi Mayer, MD, Robin Wachowiak, MD, Holger Till, MD PhD, Department of Pediatric Surgery, University of Leipzig, Leipzig Germany*

OBJECTIVE: Using conventional laparoscopic instruments with rigid shafts for single portal laparoscopic surgery (SPLS) may cause distinct ergonomic challenges like crossing, clashing and crowding. This applies particularly to infants. In a case of Meckel's diverticulum we were the first to test novel 3mm instruments with individually bendable shafts and a miniaturized model of the multichannel steel port (mini-X-Cone, KARL STORZ, Tuttlingen, Germany).

METHODS: A 14 months old boy weighing 11 kg presented with per anal bleeding from a Meckel's diverticulum. Written consent was obtained for a SPLS Meckel's diverticulectomy. A s-shaped incision in the umbilicus served for the introduction of two L-shaped half shells of the port, which were then connected (inner oval diameter 15x18mm) and sealed with a 4 port silicone cap. Two novel 3mm graspers (Karl Storz®) were double-bent at the operating table according to the geometry of this patient and the expected surgical task. Using a 5mm 30° scope, the small intestine was then inspected step by step until the Meckel's diverticulum could be identified and mobilized. Finally it was laparoscopically exteriorized for complete resection and anastomosis.

RESULTS: Installation of the new port, individual shaping of the novel instruments and SPLS mobilization of the diverticulum lasted for 15 minutes (overall operation time 80 minutes). No intra- or postoperative complications occurred. The patient was discharged from the hospital on 4th day after surgery and has been free of complaints since.

CONCLUSION: Individually bendable instruments allowed for precise adaptation to the patient's geometry. The new pediatric X-cone improved significantly the ergonomics of SPLS in smaller children. We advocate the further development of such innovations to increase performance and safety of SPLS especially in smaller children.

**P087 SINGLE-INCISION LAPAROSCOPIC RESECTION OF OVARIAN MASSES IN CHILDREN** – *Elizabeth M Pontarelli, MD, Claudia Emami, MD MPH, Nam Nguyen, MD, Dean M Anselmo, MD, Children's Hospital Los Angeles*

Ovarian masses are common in girls after menarche, usually presenting with abdominal pain in the urgent care setting. Resection of these masses is most often performed with a three or four port laparoscopic approach. With the advent of the single incision laparoscopic (SIL) surgery, there are an increasing number of procedures performed by this modality. To date, there is limited experience with SIL resection of ovarian masses, especially in the pediatric population. We reviewed our experience with SIL resection of ovarian masses to evaluate the safety and efficacy of this approach. Our group performed five ovarian mass resections via the SIL approach at two different pediatric hospitals during 2010-2011. The average age was 14 years (range 11 to 17), and all had ultrasound proven ovarian masses. One patient had disease recurrence following a previous resection. Pre-operative imaging showed four patients with cystic masses 5-6cm in size and one patient with a large 22cm cyst occupying most of the abdominal cavity. Average operating time was 77±19.8 minutes with no additional ports necessary, and all patients had resection of the mass without oophorectomy. Three patients had spillage of cyst contents during the surgery, including the one with previous recurrence (the latter was the only patient with subsequent disease recurrence). Pathology revealed 4 mature cystic teratomas, and one serous cystadenoma. On average patients were discharged 39.2 hours after surgery (range 25-72).

Postoperative narcotic use was calculated in morphine equivalents, with Hydrocodone 3mg=1mg and Dilaudid 0.2mg=1mg. Patients averaged 6.16 mg of morphine per day (0.14mg/kg/day). All patients had excellent cosmetic results on follow-up, and no postoperative complications. In our experience, single incision laparoscopy is a safe and effective approach for resection of ovarian masses in children, and provides a cosmetic outcome that may be preferred by young girls.

Age	Mass Size (cm)	Pathology	Surgery Time (min)	Length of Stay (hours)	Narcotic Use Morphine Equivalents (mg/day)
14	6	Mature Cystic Teratoma	58	26	0
12	5	Mature Cystic Teratoma	54	25	4.79
16	22	Serous Cystadenoma	98	48	6
17	5	Mature Cystic Teratoma	89	72	10.8
11	5	Mature Cystic Teratoma	86	25	9.25

**P088 SEMICIRCULAR INCISION IN THE SUPERIOR UMBILICAL FOLD FOR SILS PRESERVES THE UMBILICAL PROFILE** – *Stephen D Adams, MRCS, Simon C Blackburn, MRCS, Anies A Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

BACKGROUND: Single Incision Laparoscopic Surgery (SILS) has been highlighted in recent literature as a safe and effective means of performing a range of common paediatric surgical procedures. The primary attraction is the lack of visible scarring.

AIM: To describe an effective and cosmetically acceptable means of SILS port placement in children, preserving the umbilical profile.

METHODS: We describe a paediatric case series utilising semi-circular incision in the superior umbilical fold for SILS procedures. The linea alba is exposed over 2cm and stay sutures are applied. A vertical incision is made without entering the umbilical ring. Data were recorded prospectively in a Microsoft Excel Spreadsheet.

RESULTS: 21 Cases were performed in a 1-year period. A Covidien SILS port (Covidien, Dublin Ireland) was used in 19 cases, and a Triport (Advanced Surgical Concepts, Bray, Ireland) in 2 cases. This included 10 Appendicectomies, 5 ovarian/paraovarian cystectomies, 2 Palomo procedures, 3 nephrectomy/heminephrectomies and 1 Meckel's diverticulectomy. There was 1 wound infection in a teenager with perforated appendicitis, this resolved with dressings and antibiotics. No incisional hernias have occurred. The cosmetic results are presented to demonstrate the efficacy of the technique.

DISCUSSION: Our practice in performing pyloromyotomy had shown that the above-described technique could provide satisfactory access to the peritoneal cavity through a cosmetically acceptable scar in infants (1). Our hypothesis was that this incision was transferrable to Single Incision Laparoscopic Surgery (SILS). Previous reports of cosmetically acceptable umbilical incisions include the Yin-Yang incision (2). Our technique, which maintains the integrity of the umbilical ring and allows preservation of the umbilical profile, offers a distinct cosmetic advantage.

CONCLUSION: We have demonstrated the aesthetic benefits of utilising a superior umbilical-fold incision for SILS in children.

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## **P089 LAPAROENDOSCOPIC SINGLE SITE (LESS) ORCHIDOPEXY FOR INTRA-ABDOMINAL TESTES IN THE PEDIATRIC POPULATION: INITIAL EXPERIENCE**

– *Mohabe A Vinson, MD, Paul H Noh, MD, Cincinnati Children's Hospital Medical Center*

**OBJECTIVE:** To assess the feasibility of laparoendoscopic single site incision (LESS) orchidopexy

**METHODS:** A retrospective case series was performed of 4 children who underwent LESS orchidopexy by a single surgeon at a pediatric institution in 2011. Patient demographics, intra-operative details, operative time, complications, and surgical outcomes were abstracted from the medical record. During the initial evaluation, a diagnostic laparoscopy through a midline umbilical incision was performed to assess the patients with non-palpable testes. Subsequently, a commercially available multi-channel port was utilized at the umbilical incision. A 5 mm flexible tip laparoscope and 3 mm and 5 mm instruments were used for the dissection. All procedures were recorded on video.

**RESULTS:** All four patients underwent a successful LESS orchidopexy. Patient age ranged from 8 months to 2 years old. Three patients underwent primary orchidopexy, including a bilateral procedure. One patient underwent a staged Fowler-Stephens orchidopexy, with the LESS technique utilized during the 2nd stage. The laparoscopic dissection of each testis was 35 minutes. There was no blood loss or intra-operative complications. All procedures were performed on an outpatient basis. Post-operative pain was managed with Tylenol and Ibuprofen. All patients were seen post operatively 4-6 weeks after the procedure. All testes were noted to be in the scrotum without testicular atrophy. The umbilical incisions were healing without complication and with a subjectively imperceptible scar.

**CONCLUSIONS:** LESS orchidopexy is technically feasible, effective, and safe surgical management for intra-abdominal testes. The initial experience was favorable and the technique warrants further evaluation.

## **P090 SINGLE PORT LAPAROSCOPIC AND ROBOTIC NISSEN FUNDOPLICATION IN CHILDREN**

– *Aayed R Alqahtani, MD FRCSC FACS, King Saud University, College of Medicine, Department of Surgery*

The technical innovations in minimally invasive surgery (MIS) has come a long way since the first description of laparoscopic cholecystectomy. Single incision laparoscopic surgery (SILS) is one of the most important recent MIS evolution that might bridge the gap between natural orifice transluminal endoscopic surgery (NOTES) and the future MIS. SILS has been successfully used for few pediatric procedures including laparoscopic cholecystectomy and appendectomy. However no Previous published reports of using SILS in pediatric Nissen Fundoplication. This case series study was undertaken to report our experience with single incision fundoplication including robotic in pediatric patients with gastroesophageal reflux.

**PATIENTS & METHODS:** All patients who underwent SILS robotic and laparoscopic Nissen fundoplication were included in the study. A total of 10 consecutive Laparoscopic and one robotic SILS were performed. The umbilicus was the point of entry and the primary surgeon was the same in all cases. Patient demographics and operative results were evaluated.

**RESULTS:** All cases were completed successfully using SILS, without conversion to conventional laparoscopy or open surgery. The mean operating time was 120 minutes. There were no complications.

**CONCLUSION:** Our experience shows that although technically demanding Single incision laparoscopic fundoplication is feasible and safe in the pediatric population. Using Robotic surgery will minimize the technical difficulties.

## **P091 SINGLE INCISION LAPAROSCOPIC APPENDECTOMY: EDUCATIONAL BARRIERS**

– *Michael V Tirabassi, MD, University of Wisconsin School of Medicine and Public Health*

**PURPOSE:** We hypothesize that the training surgical residents receive in multi-port laparoscopy will be sufficient for them to participate in single incision laparoscopic appendectomies (SILA) during their training.

**METHODS:** The introduction of SILA at our children's hospital presented the first significant exposure of our surgical residents to SILS (single incision laparoscopic surgical) techniques. At the conclusion of each case the participating resident was asked to fill out a brief survey on a smart phone in the operating room prior to performing any other tasks.

**RESULTS:** There were 12 SILA cases performed during the study period of 6 months. The operating residents completed 100% of surveys. The patients ranged in age from 5 to 16 years old. The patients ranged in weight from 18 to 66 Kg. 7 participants were PGY4, the remaining were junior residents. 42% of the residents had performed greater than 15 standard laparoscopic appendectomies. Only one resident had performed less than 5 appendectomies. 100% of the residents had formal training in multi-port laparoscopy in the training laboratory. 0% of the residents had formal training in SILS. 66% of the residents had participated in less than 5 SILA procedures and the remaining residents had never seen the procedure before. 0% of the residents had experience with SILS procedures other than appendectomy. When asked what percent of the procedure they performed 7 answered 50% or less, 4 answered 85%, and 1 answered 95%. When asked what percent of the procedure they would have performed if it was a 3 port appendectomy 1 answered 50% or less, 8 answered 85%, and 3 answered 95%. This difference was statistically significant by Chi-square test ( $P < 0.0001$ ). 92% of the residents felt the case had either a positive or very positive impact on their surgical training. Based on their current experience 50% of the residents felt they would feel comfortable performing SILA in their practice.

**CONCLUSIONS:** The surgical residents surveyed in this study felt they did not participate in SILA to the same extent as a 3-port appendectomy. Despite this their overall impression was positive of the learning experience. Currently we have a formal course for the residents on the essentials of laparoscopy that all first year residents complete. We intend to add a SILS module to this course.

## **P092 OPERATIVE LAPAROSCOPE IN NEONATES AND INFANTS**

– *Stjepan Visnjic, MD PhD, Bozidar Zupancic, Vera Zupancic, Childrens hospital Zagreb*

**INTRO:** Single incision surgery (SILS) has gained popularity in the field of minimally invasive surgery (MIS). Multiport SILS is an option for toddlers and older children, but the usage of operative scope (SILS-sc) remains the only SILS option for neonates. Wide spectrum of laparoscopic or laparoscopically assisted procedures are feasible.

**METHODS ;** 53 selected non-compromised patients under the age of 1 underwent SILS-sc. Indications were, abdominal pain 13, simple appendicitis 2, nonpalpable testis 12/3, diagnostic/staging biopsies 3, ovarian cysts 12, biopsies/colostomy for Hirschsprung's 6, gastrostomy3, urachal cyst 1, and empyema 1.

**RESULTS:** All procedures were successfully completed. No intraoperative complications were noticed, and one postoperative wound infection. Only one port and one incision were sufficient for 51 patients. Additional port was used in 2 cases. Rescue analgesia was administered in 5/51. The average hospital stay was 3.1 days.

**CONCLUSION:** SILS-sc has been shown as a valuable diagnostic and therapeutic approach with potentially numerous advantages. Fewer

incisions result in cost-reduction for additional ports and instruments. It is also time saving for port placement, and improved cosmesis is additional benefit, all without additional risk for the patient. In selected indications SILS-sc may replace traditional laparoscopy and in the same time provide all clinical benefits and secondary savings associated with laparoscopy.

**P093 EARLY EXPERIENCE OF SINGLE-INCISION LAPAROSCOPIC HEPATICOJEJUNOSTOMY USING CONVENTIONAL INSTRUMENTS FOR TYPE I AND II BILIARY ATRESIA** – *Mei Diao, Doctor, Long Li, Professor, Ning Dong, Doctor, Qi Li, Doctor, Hui Ye, Doctor, Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing, P. R. China*

**BACKGROUND:** Single incision laparoscopic surgery is an evolution of minimal invasive concept to reach the “visual scarless”. We presented the first two cases of successful single incision laparoscopic hepatojejunostomy (SILH) for Type I and II BA.

**METHODS:** SILHs were accomplished for one Type I BA and additional one Type II BA patient. Type I BA: a female infant with prenatally ultrasonographic study detected hilum cyst and persistent jaundice since 3 days of age referred to our department. Laboratory results showed significantly deranged liver function (ALT: 64.2 U/L, AST: 102.1 U/L, GGT: 356.8 U/L, ALP: 1054 U/L, TBIL: 181.9  $\mu\text{mol/L}$ , DBIL: 98.2  $\mu\text{mol/L}$ ). Ultrasonographic study showed a distal incomplete obstruction with proximal cystic dilatation, which indicated Type I BA. She underwent SILH at 2 months of age. Type II BA: a male infant referred to our hospital for progressive jaundice since 1 month after birth. Laboratory results demonstrated significantly aberrant liver function (ALT: 316U/L, AST: 433 U/L, GGT: 1200 U/L, ALP: 3280 U/L, TBIL: 249  $\mu\text{mol/L}$ , DBIL: 186.6  $\mu\text{mol/L}$ ). Ultrasonographic study suspected cystic BA.

A middle-longitudinal umbilical skin incision was made. An extra-long 5-mm 30° laparoscope was inserted through the camera port which was placed in the midline fascial incisions. Two 3-mm conventional laparoscopic instruments were inserted through working ports which were placed lateral to the camera port on both sides at the ends of the horizontal umbilical incision. Three suture retraction sutures were placed through abdominal wall and 1) serosa of the gallbladder fundus, 2) fibrous tissue of hepatic helium, and 3) mid-portion of anterior wall of cystic dilatation. The blind cystic ends of bile ducts were dissected and incised. Anastomosis was completed by continuous suture along 6-9, 6-3, then 3-12-9 o'clock directions. The diameter of the anastomosis was greater than 1.0 cm.

Patients regularly took antibiotics, Glycyrrhizin and Ursodeoxycholic acid after surgery till the laboratory results returned to normal level. Postoperative results of laboratory, ultrasonographic and upper gastrointestinal studies were reviewed.

**RESULTS:** The operative times were 80 minutes in Type I BA patient and 70 minutes in Type II BA patient. Blood losses were minimal. Both patients recovered uneventfully. Postoperative hospital stays were 5 days in Type I BA patient and 13 days in Type II BA patients. Both resumed full diets on postoperative day 2. Jaundice gradually declined since postoperative day 3 in Type I BA patient and day 6 in Type II BA patient. Total and direct bilirubin normalized at postoperative 1 month in Type I BA patient and 3 months in Type II BA patient. Liver function significantly improved at postoperative 1 and 3 months in both 2 patients. ALT, AST and ALP returned to normal or nearly normal levels at postoperative 3 months. To date, no mortality or morbidity of cholangitis, bile leak, anastomotic stenosis, intrahepatic reflux, intestinal obstruction, wound infection/hernia were observed.

**CONCLUSIONS:** SILH for Type I and II BA can be done safely in infants in experienced hands. A prospective randomized study is warranted to compare its long-term efficacy with conventional laparoscopic hepatojejunostomy.

**P094 SINGLE INCISION LAPAROSCOPIC CHOLECYSTECTOMY FOR BILIARY DYSKINESIA IN CHILDREN: A SIMPLE, SAFE, AND INEXPENSIVE TECHNIQUE** – *Michael J Leinwand, MD, Mohamed H Elgamal, MD, The Children's Hospital at Bronson*

**PURPOSE:** This retrospective review sought to evaluate the feasibility of single incision laparoscopic cholecystectomy (SILC) in children with biliary dyskinesia using standard laparoscopic equipment.

**METHODS:** Eighteen children with biliary dyskinesia underwent SILC between March and September, 2010. Two 5mm trocars and a trocarless grasper were inserted through a 2cm vertical transumbilical incision. Instrument collisions were minimized by using low-profile trocars of different lengths and a bariatric laparoscope with a right-angle light adaptor. The EndoGrab device (Virtual Ports; Richmond, VA), an internally anchored retractor, was used to suspend the gallbladder from the superior abdominal wall or diaphragm. This device obviated the need for an additional trocar. The cholecystectomy was otherwise performed in the usual fashion. Of note, this technique did not employ a port platform, articulating instrument, or deflectable-tip laparoscope.

**RESULTS:** There were 15 girls and 3 boys with a mean age of 15.9 years (9-18). Sixteen (88.9%) underwent true SILC. One patient (second case) was converted to a four-port laparoscopic procedure due to uncertainty of the ductal anatomy. Another (eighth case) required a 5mm subxiphoid port for additional liver retraction. Mean operative time was 82 minutes (range 42 - 105); 94 minutes (75-105) for the first six patients, 85 minutes (60-102) for the second six, and 68 minutes (42 -90) for the last six. Operative times between the first and last groups were significantly different ( $p=0.02$ ). Sixteen patients were discharged home the following day. Two patients remained a second night, one for poor oral intake, the other for migraine headaches. There were no complications.

The disposable equipment needed to perform SILC in this series was \$205.05 less than that needed for the standard four-port operation (\$516.32 vs. \$721.37, respectively), a 28.4% savings.

**CONCLUSION:** Single incision laparoscopic cholecystectomy is safe and feasible in children with biliary dyskinesia. The operation can be done easily with standard laparoscopic equipment. The operative time decreased with experience. The disposable equipment needed was less expensive than that used in the standard four-port laparoscopic technique. (IRB exemption obtained).

**P095 SINGLE INCISION CHOLECYSTECTOMY IN CHILDREN, VERIFYING A CHANGING TECHNIQUE** – *David C Yu, MD, Charles J Aprahamian, MD, Vince E Mortellaro, MD, Carroll M Harmon, MD PhD, Division of Pediatric Surgery, Department of Surgery, Children's of Alabama, University of Alabama at Birmingham*

**INTRODUCTION:** Single incision pediatric endosurgery (SIPES) is becoming more widespread. Although cases reports and small series have demonstrated the feasibility of cholecystectomy by SIPES techniques, large case series validating its efficacy are still lacking.

**MATERIALS & METHODS:** Following IRB approval, a review of all attempted SIPES cholecystectomies at a single institution was performed. Cases were considered SIPES if they used either an umbilical incision alone, or added a 2 millimeter (mm) right upper quadrant grasper without the addition of a non-umbilical port. Operations were performed by pediatric surgery fellows or general surgery residents supervised by one of seven fellowship trained pediatric surgeons. The surgical technique typically used three standard laparoscopic instruments placed through an umbilical port with the addition of a right upper quadrant grasper placed through a 2mm incision.

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**RESULTS:** Over a 30 month period (March 2009-August 2011), 102 cases of attempted SIPES cholecystectomy were performed. Patients mean age at the time of operation was 12.7 years (Range 13 months to 21 years) with a mean weight of 55.7 kilograms (Range 8-120). The most common diagnoses were symptomatic cholelithiasis, biliary dyskinesia, and sickle cell related cholelithiasis. Mean operative time was 65 minutes with a mean blood loss of 6 milliliters per case. There were no common bile duct injuries or clinically significant bile leaks. Five significant intraoperative complications were recorded: bleeding (3), gastric injury (1), and duodenal injury (1). Conversion from SIPES technique occurred in eight cases; six times additional ports were placed, one patient required an intraoperative cholangiogram catheter placed through a stab incision, and one case required subcostal surgical incision. Patients were discharged home, on average, 1.7 days following surgery.

**DISCUSSION:** Although there is a moderate learning curve to SIPES, cholecystectomy can be performed safely and in a timely fashion with minimal morbidity and outstanding cosmetic results. Regarding operative time and surgical morbidity, results are comparable to standard laparoscopic cholecystectomy. SIPES cholecystectomy can be performed for any diagnosis that a standard laparoscopic cholecystectomy would be used, and on patients ranging from small children to morbidly obese young adults.

**P096 NOVEL HYBRID (1 MAGNET & 1 CURVE GRASPER) TECHNIQUE FOR TRANSUBILICAL CHOLECYSTECTOMY: INITIAL EXPERIENCE OF A PROMISING APPROACH** – *Marcelo Martinez Ferro, MD, Guillermo Dominguez, MD, Carolina Millan, MD, Enrique Buena, MD, Gaston Bellia, MD, Fernando Rabinovich, MD, Horacio Bignon, MD, Mariano Albertal, MD, Fundación Hospitalaria – Hospital Privado de Niños Buenos Aires – Argentina*

**BACKGROUND:** As we described earlier, pure magnet-assisted transumbilical cholecystectomy enables optimal visualization and triangulation. Nonetheless, this technique requires the use of two deployable magnets (DM), which may entail a longer learning curve due to the potential for magnet collision. On an effort to simplify the procedure, we describe a novel hybrid technique that allows adequate triangulation with the use of only one DM.

**METHODS:** The technique involves the combined use of one DM (IMANLAP, Buenos Aires, Argentina) and a long gently curved 5mm x 45 cm, non-roticulating dissector (Karl Storz, Tuttlingen, Germany). Through a median 1.7-cm transumbilical incision, two trocars (12-mm and flexible 5-mm) are introduced. Then, an 11-mm, 0° laparoscope with a 27-cm long, 6-mm working channel (Storz, Tuttlingen, Germany) is inserted through the 12-mm trocar. The DM (single grasper type) was introduced to the abdominal cavity using the working channel to provide cephalad retraction of the fundus. After that, the flexible trocar is used to introduce the curved grasper, which grabs the infundibulum, providing counter-traction and optimal exposure of the Calot's triangle. Using the 6-mm working channel, the hilum was dissected, and the cystic duct and artery were clipped and divided.

**RESULTS:** 6 patients successfully underwent hybrid transumbilical cholecystectomy. The average age was 14±3.5 years (range 8–18) and the average weight 62.5±16.9 kg (31–81). Mean operative time was 62±8.4 min (50–70). Length of stay was 1.4±0.6 days. No patient required conversion to either a conventional laparoscopic cholecystectomy or open cholecystectomy. There were no in-hospital complications.

**CONCLUSION:** Our results suggest that the hybrid technique combining magnetic devices and a curved dissector during transumbilical laparoscopic cholecystectomy is feasible and safe, and may represent a scar less surgical alternative to conventional laparoscopy.

**P097 SILS - IS IT COST AND TIME EFFECTIVE COMPARED TO STANDARD PEDIATRIC LAPAROSCOPIC SURGERY?** – *Saidul Islam, MRCS, Stephen D Adams, MRCS, Anies A Mahomed, FRCS, Royal Alexandra Children's Hospital, Brighton, UK*

**AIMS:** To review our experience with Single Incision Laparoscopic Surgery (SILS) and to compare costs and operative time to standard laparoscopic surgery.

**METHODS:** A prospectively collected database of operative times and costs was analysed for the years 2008-2011. SILS cases were compared to standard laparoscopy on a procedure matched-basis. Patient demographics, on-table time and consumable costs were collated. Descriptive statistics and Mann Whitney U-test were analysed with SPSS for Windows.

**RESULTS:** Cost and operating time, Mean (range)

Total (n= 93)	SILS (n=21)	Laparoscopy (n=72)	p-value
Appendicectomy Cost (GBP)	n= 10 397 (280-603)	n= 48 467 (175- 758)	0.64
Appendicectomy Time (mins)	60 (60-140)	103 (40-215)	0.10
Nephrectomy / Heminephrectomy Cost (GBP)	n= 4 942 (779 - 974)	n=9 1127 (520- 1595)	0.11
Nephrectomy / Heminephrectomy Time (mins)	130 (90-180)	160 (70-235)	0.21
Ovarian cystectomy / Oophorectomy Cost (GBP)	n= 4 394 (223-702)	n= 6 495 (246-729)	0.56
Ovarian cystectomy / Oophorectomy Time (mins)	90 (60- 120)	80 (60-130)	missing
Palomo Cost (GBP)	n= 3 734 (532 - 735)	n= 9 400(205-801)	0.07
Palomo Time (mins)	60 (50- 60)	80 (55-100)	0.17

Neither consumable costs nor operative time were significantly different between each group. A trend toward higher costs for SILS palomo procedures is noted. SILS appendicectomy operative time trends lower than for standard laparoscopy, this may reflect the fact that all the SILS procedures in this period were performed by a single laparoscopic surgeon.

**CONCLUSION:** SILS appears to be cost effective for the common paediatric surgical operations. There is no significant difference in operating time in this series, but we are limited by small sample size. Larger studies will be necessary to validate these initial observations.

**P098 INTRACORPOREAL SINGLE INCISION APPENDECTOMY WITH REGULAR INSTRUMENTS AND A PERCUTANEOUS SLING, OUR EXPERIENCE** – *Juan I Bortagaray, MD, Fabricio Perez Lau, MD, Leandro Berberian, MD, Daniel Russo, MD, German Falke, MD, Juan C Puigdevall, MD, Hospital Universitario Austral*

**INTRODUCTION:** Laparoscopic appendectomy is a wide used technique and considered the gold standard for appendicitis. Over the last years we have witnessed several modifications on the surgical technique ending in what we call now Single Incision Laparoscopic Surgery. The objective of this study is to describe our institution initial experience with this technique.

**PATIENTS & METHODS:** retrospective study. Revision of clinical charts of 42 patients that underwent a laparoscopic single incision appendectomy between July 2010 and August 2011 at our institution. Under general anesthesia a single 1cm incision was performed in the umbilicus. Pneumoperitoneum was achieved with a Veress needle and two 5mm reusable trocars (1 optic port and 1 working port) were inserted through the same cutaneous incision. Under direct vision, a 20G Angiocath trocar, and a 3-0 Prolene suture through it (SLING) were passed through the abdominal wall at the level where the appendix was found. The Angiocath trocar is pulled out the abdomen leaving only

the suture as a loop. The tip of the appendix was passed through the loop created by the Prolene suture and pulled towards the abdominal wall and it was held in place with a hemostat clamp. The mesoappendix was dissected with monopolar energy. The appendix was ligated at the base with a 2-0 PDS suture and tied with a fisher knot fastened with a knot pusher. The appendix was removed through the umbilicus. Complications were divided into intraoperative and postoperative minor and major (surgical resolution). Hospital stay was evaluated separately depending on the type of appendicitis. Cosmetic result was also evaluated.

**RESULTS:** 42 cases in total (17 boys and 25 girls). Average age 9.3 years (from 3 to 15 years). Average surgical time 49.2 minutes (from 20 to 95 minutes). In 2 cases 3rd suprapubic 5mm trocar was needed. Intraoperative complication: 1 patient with bleeding of the appendicular artery. Minor complications: 2 wound seromas, 1 wound infection, 1 intra abdominal collection. In all cases the resolution was achieved with antibiotics. There were no major postoperative complications. Average hospital stay: 2 days for congestive, 2.1 days for the phlegmonous, 4.2 days for the gangrenous and 6 days for the peritonitis. Cosmetic result: 40 patients with a hidden umbilical scar.

**CONCLUSION:** In our experience, single incision laparoscopic appendectomies with the aid of a percutaneous SLING is a feasible and reproducible and cheap technical option using regular laparoscopic instruments with excellent cosmetic results.

**P099 A COMPARISON OF TRADITIONAL THREE PORT LAPAROSCOPIC APPENDECTOMY VS SINGLE INCISION LAPAROSCOPIC APPENDECTOMY (SILS) IN CHILDREN** – *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E Debaquey department of surgery, Baylor college of medicine and Texas Childrens Hospital, Houston, Texas*

**INTRODUCTION:** Laparoscopy is now the gold standard for appendectomy in children. Recently Single Incision Laparoscopic Appendectomy (SILS) is being increasingly used but the benefits are unproven. We compared the results of traditional three port laparoscopic appendectomy and SILS appendectomy at our institute.

**PATIENTS & METHODS:** The study is a single centre, single surgeon experience of laparoscopic appendectomy of 190 consecutive children presenting with appendicitis between March 2008 and May 2011. The patient data was retrospectively analysed.

**RESULTS:** All 190 patients underwent laparoscopic appendectomy (traditional three port or SILS) and none needed conversion to open procedure. 76(40%) patients underwent traditional laparoscopic procedure and 114 (60%) patients underwent SILS. In SILS approach, there were 62 male and 52 female children. In traditional approach there were 47 male and 29 females. The age range of SILS was between 3 to 18 years with a median age of 11 years. The age range of traditional approach was between 6 months to 16 years with a median of 10 years. In SILS approach, 2 patients had normal appendix, 27 had acute appendicitis, 4 had chronic appendicitis, 42 had suppurative appendicitis, 17 had necrotic/gangrenous appendicitis and 22 had perforation. In the traditional method, 2 had normal appendix, 15 had acute appendicitis, 2 had chronic appendicitis, 30 had suppurative appendicitis, 15 had necrotic/gangrenous appendicitis, 11 had perforated appendicitis and 1 patient had a carcinoid tumour.

There were 2 (1.75%) major complications (post op collections needing radiological percutaneous drainage) and 7 (6.1%) minor complications in SILS appendectomy. There were 4 (5.3%) major complications (post op collections- 3 needing radiological percutaneous drainage and one needing a re-laparotomy) and 4(5.3%) minor complications

in the traditional approach. All minor complications in both groups responded to conservative management. All these patients were followed up and eventually had a good outcome. At follow up all patients with traditional 3 port laparoscopy had visible scars but none were seen with SILS appendectomy. Both groups were comparable and there was no significant difference in all the variables compared between the two groups.

**CONCLUSION:** In our experience single incision laparoscopic appendectomy is as effective as the traditional three port laparoscopic appendectomy but has better cosmetic outcome.

**P100 REDUCING THE SIZE OF THE HOLE AND KEEPING WITHIN THE LIMITS OF THE UMBILICAL RING IN SMALLER/YOUNGER CHILDREN: THE USE OF 3MM INSTRUMENTS FOR SINGLE PORT LAPAROSCOPIC APPENDECTOMY** – *Ashok Daya Ram, MBBS, Ashwin Pimpalwar, MD, Division of Pediatric surgery, Michael E Debaquey Department of surgery, Baylor college of medicine and Texas Children's Hospital, Houston, Texas.*

**BACKGROUND:** SILS (Single incision laparoscopic surgery) needs a single umbilical incision within the umbilical ring to get good cosmetic results. In smaller/younger children this ring may be small. The use of 5mm instruments leads to crowding of instruments with less manoeuvrability. We describe the use of 3 mm instruments for SILS appendectomy in children less than 10 years old. Use of 3mm instruments prevents crowding of instruments and allows to stay within the umbilical ring providing better cosmetic results.

**MATERIAL & METHOD:** From March 2008 to July 2011 a total of 114 patients underwent SILS appendectomy of which 60 patients were 10 years or younger. Charts were retrospectively reviewed.

**TECHNIQUE:** Vertical Incision was made in the scar of the umbilicus keeping within the limits of the umbilical ring an Olympus Triport was placed in to the peritoneal cavity. A conventional 5mm/3mm 30 deg of standard length telescope was then introduced. Using the straight 3mm laparoscopic instruments the appendix was dissected and then resected using endoloopes. It was then retrieved through the cap of the Triport. The authors use 3 mm instruments through the Olympus tripod with successful outcomes from the operation.

**RESULTS:** Out of 114 patients in which SILS was performed, 60 patients (37 male and 23 female) were 10 years or younger (median age of 8 years) and in all of them 3mm instruments were used. Only one patient had post operative wound infection which settled with oral antibiotics. One patient complained of umbilical fullness which settled down with conservative management. All patients were followed up 3-4 weeks post-surgery and had excellent cosmetic results with the scar almost not seen.

**CONCLUSION:** By using the 3mm instruments, the umbilical incision in smaller children less than 10 years could fit the size of the umbilical ring giving a very neat cosmetic appearance. This method can be used in children as young as two years with successful outcomes.

**P101 EXPERIENCE IN 406 CASES WITH MINIMALLY INVASIVE NUSS REPAIR OF PECTUS EXCAVATUM IN CHILDREN** – *Qiang Shu, Professor, Jian-gen Yu, MD, Zhuo Shi, MD, Wei-ze Xu, Jian-hua Li, MD, Ze-wei Zhang, MD, Ru Lin, Xiong-kai Zhu, Department of Cardiothoracic Surgery, Children's Hospital, Zhejiang University School of Medicine*

**BACKGROUND:** This study was to investigate the advantages of thoracoscopy-assisted minimally invasive Nuss operation for the treatment of pectus excavatum (PE) in children.

**METHODS:** A total of 406 patients with PE (female: 93; male: 313) with an average age of 6.8 years (range: 3.5-17.5 years) were included in this study. Associated diseases included congenital heart disease in

9 patients and congenital pulmonary cyst in 2. The Haller index of the patients ranged from 3.35 to 7.23, with an average of  $5.17 \pm 1.64$ . Minimally invasive Nuss operation was performed for all the patients.

**RESULTS:** The operations were performed successfully and no operative mortality occurred. The average blood loss during the operation was less than 10 mL and the operating time ranged from 30 to 85 minutes with an average of 45 minutes. The length of hospital stay ranged from 5 to 9 days with an average of 7 days. Struts were implanted in 12 (3.0%) of the 406 patients. Injury of the pericardium occurred in 1 patient during the operation. Early post-operative complications occurred in 9 patients with pneumothorax and 6 patients with pleural effusion, which were cured by puncture or drainage. Poor wound healing occurred in 4 patients (1.0%) and was cured by nutritional support. During a 3-month to 6-year follow-up, 2 patients had scoliosis and 3 patients had displacement of the struts, which were cured by a second Nuss operation. Allergy occurred in 2 patients: the symptoms were improved in 1 patient after conservative treatment, but the strut was removed in advance due to allergy in the other patient. Totally 154 patients (40.0%) underwent operation for strut removal. Excellent repair results were achieved in 387 (95.3%) patients, good repair results in 12 (3.0%), and fair results in 7 (1.7%).

**CONCLUSIONS:** Thoracoscopy-assisted Nuss operation has many advantages including small and masked incision, short operative time, small amount of blood loss, fast recovery, less trauma, and satisfactory outcomes of repair. Nuss is a safe and reliable technique for repair of PE.

**P102 USE OF THE LIGASURE VESSEL-SEALING DEVICE FOR THORACOSCOPIC PERIPHERAL LUNG RESECTION IN A SURVIVAL CANINE MODEL** – *Philipp D Mayhew, BVMS DACVS, William T Culp, VMD DACVS, Peter J Pascoe, BVSc DACVA, Natasha Vapniasky Arzi, DVM, School of Veterinary Medicine, University of California-Davis*

Lung biopsy is indicated for diagnosis of diffuse lung disease as well as resection of small peripherally located mass lesions or bullae. The use of vessel-sealing devices for peripheral pulmonary biopsy has the potential for allowing stapleless and sutureless pulmonary biopsy.

The aims of this study were to assess the histopathological effects on pulmonary parenchyma and the complications associated with peripheral lung biopsy using the Ligasure Atlas device in a canine model.

Six mature female intact hound dogs weighing a median of 21.5kg (range 19.1-22.9kg) were used. Dogs were anesthetized using a standard protocol and placed in dorsal recumbency. Thoracoscopic access was achieved by placement of a subxiphoid telescope portal. Instrument portals were placed at the 4-6th intercostal spaces on the right side and at the 10th intercostal space on the left side. One-lung ventilation was induced using a double lumen endobronchial tube. The 10mm Ligasure Atlas device was used to harvest a peripheral lung biopsy sample from the periphery of the left cranial lung lobe. Dogs were recovered from anesthesia. Thoracic radiography was performed at 1, 2 and 4 and approximately 180 days post-operatively to evaluate for air leakage or other complications.

In all dogs lung biopsy specimens were collected without complication. Fresh samples weighed a mean of  $0.36 \pm 0.28$  grams (median 0.29, range 0.026-0.81 grams). Fresh sample length, width and depth ranged from 0.6-4cm, 0.15-1.5 and 0.1-0.8cm respectively. Histological evaluation of resected specimens revealed three distinct zones. The crush zone representing the tissue within the jaws of the device, a transition zone of thermally damaged parenchyma and beyond that a viable zone of normal pulmonary parenchyma. The pulmonary parenchyma was mildly to moderately disrupted close to the

excisional margin and was characterized by parenchymal collapse and eosinophilia with loss of cellular and nuclear detail with basophilic streaming, interpreted as crushing artifact. The pulmonary parenchyma of the remaining viable portion of the lung was variably inflated and maintained clear cellular and nuclear morphology. Characteristics of the histological sections of tissue were as follows: mean length of the crush zone was  $1270 \pm 51 \mu\text{m}$  (median 1250, range 1250-1375 $\mu\text{m}$ ), mean length of the transition zone was  $2250 \pm 2292 \mu\text{m}$  (median 1312, range 750-6750  $\mu\text{m}$ ), mean length of the viable zone was  $0.83 \pm 0.27$  cm (median 0.8, range, 0.5-1.5cm). No evidence of acute air leakage was seen at surgery. Post-operatively one dog had a small amount of residual pneumothorax thought to be secondary to incomplete thoracic evacuation of air post-operatively. No other dogs had any evidence of pneumothorax at any time point post-operatively.

In this survival canine model peripheral lung resection using the Ligasure Atlas<sup>®</sup> vessel-sealing device was not associated with significant morbidity and caused limited thermal damage to adjacent tissue. Further studies are required to evaluate the efficacy of the device in patients with parenchymal disease and in cases where larger resections might be required.

**P103 POST CARDIAC SURGERY & PLEURODESIS, RECURRENT PERICARDIAL EFFUSION - LAPAROSCOPIC APPROACH** – *Prakash Agarwal, M Ch, Rajkishore Bagdi, M Ch, Apollo Children's Hospital*

**AIM:** To present our experience with the management of recurrent pleural effusion through the abdominal approach.

**CASE HISTORY:** A 10 yr old girl who was a known case of Double outlet right ventricle with VSD underwent Glen shunt and Redo- Rastelli procedure. She developed post operative pleural effusion needing prolonged Intercostal drainage and repeated pleurodesis were done on her.

**THE PROBLEM:** She had Pericardial effusion which was not manageable by pericardiocentesis, done twice. Since her chest already bore multiple scars, it was difficult to approach through the thorax. A more permanent solution for the effusion/ chylous fluid in the pericardium was sought. The pericardial effusion was affecting outcome of cardiac procedure.

**THE OPTIONS:** Abdominal route was the only way to drain the pericardial collection and parents were upset about the scars on the chest and Chest Drain sites.

**THE SURGERY:** A abdominal route was used and Laparoscopic pericardial fenestration was done. There was good resolution of pericardial effusion. There was no ascites, no pericardial effusion, good improvement in cardiac function, no diaphragmatic hernia at 6month follow up

**CONCLUSION:** Laparoscopic transabdominal pericardial window is a new standard in the treatment of recurrent pericardial effusion complicated by cardiac tamponade.

**P104 ROLE OF THORACOSCOPY IN THE MANAGEMENT OF VARIOUS FOREGUT DUPLICATION CYST** – *Prakash Agarwal, M Ch, Rajkishore Bagdi, M Ch, Balagopal Subramaniam, M Ch, Balamourougane Paramaswamy, M Ch, Sri Ramchandra Medical Center and Apollo Children's Hospital*

**AIM:** To highlight the role of thoracoscopy in the management of various foregut duplication cyst.

**INTRODUCTION:** Foregut duplications are rare pathology including esophageal and bronchogenic cysts. The diagnosis is most often made from an incidental finding on chest radiograph, respiratory distress or failure to thrive. Treatment consists of complete resection by thoracotomy or thoracoscopy. We present our experience with the management of 4 cases that were managed thoracoscopically.

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**MATERIALS & METHODS:** From March 2008- August 2011, four patients underwent thoracoscopy for resection of foregut duplication cyst. All the cyst were on the right side and were performed with three or four ports. The masses were removed after decompressing the cyst and enlarging one of the port sites. Chest tubes were placed in all patients.

**RESULT:** All the 4 cases underwent successful thorascopic resection. 3 cases were esophageal duplication cyst out of which one was a neuro enteric cyst, extending from the apex to the esophageal hiatus and 2 had common wall with the esophagus. 1 was a bronchogenic cyst. Histopathology demonstrated gastric mucosa in the neuroenteric duplication cyst. There were no complication or recurrence till date in any of these cases.

**CONCLUSION:** Thorascopic resection is safe and effective method of treating foregut duplication cyst. Outcomes have been good with no morbidity or mortality even in cases extending through the whole length of thorax, which would otherwise need an extended thoracotomy. Thorascopic resection should be considered the first line of management for these benign masses.

## **P105 ROUTINE INTRAOPERATIVE USE OF THE VACUUM BELL FOR ELEVATING THE STERNUM DURING THE NUSS PROCEDURE**

– *Frank-martin Haecker, MD, Sergio Sesia, MD, Department of Pediatric Surgery, University Children's Hospital, Basle*

**OBJECTIVE:** to evaluate the routine use of the vacuum bell for elevating the sternum during minimally invasive repair of Pectus excavatum (MIRPE, the Nuss procedure).

**METHOD:** retrospective evaluation of a prospective kept database including all patients who underwent MIRPE at our institution between 2005 and 2010. Data included patient's demographic characteristics, age at surgery, gender, Haller index, duration of surgery and intraoperative complications.

**RESULTS:** 50 patients aged from 9 to 28 years (average 14,95 years) were analyzed, including 39 males and 11 females. The preoperative Haller index was between 3,25 and 7,4 (average 5,05). Mean duration of surgery was 58 minutes (range, 45 to 92 minutes). With the use of the vacuum bell, the sternum could be elevated clearly recognizable what was confirmed by thoracoscopy. Advancement of the Pectus introducer and placement of the pectus bar was safe, successful and uneventful in all patients. No cardiac and/or pericardial lesion was noted as well as no lesion of the mammary vessels.

**CONCLUSION:** the intraoperative use of the vacuum bell during the MIRPE is safe and effective as it facilitates the retrosternal dissection and the insertion of the pectus bar. If available, we recommend the use of this device for MIRPE routinely.

## **P106 EARLY OUTCOMES OF THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA (CDH): TWO CENTRES' EXPERIENCE**

– *Jinshi Huang, MD, Patrick H Chung, MBBS, Ivy H Chan, MBBS, Qiang Tao, MD, Kenneth K Wong, MD PhD, Paul K Tam, MD ChM, Jiangxi Children Hospital, Nanchang & The University of Hong Kong*

**INTRODUCTION:** With the successful development of minimal invasive surgery in neonates and early infants, thorascopic repair of congenital diaphragmatic hernia (CDH) is gaining popularity. We report our experience in performing this operation and compared this to the traditional open approach.

**MATERIAL & METHOD:** The medical records of all neonates and infants with CDH operated in the past ten years (2001-2011) were reviewed. They were divided into two groups according to laparotomy or thorascopic approaches. The open approach was used up to 2009

when we changed our practice to thorascopic repair. Demographic data and clinical outcomes of both groups were analyzed separately. Statistical analysis was performed by SPSS v15.0.

**RESULTS:** A total of 40 patients (male:female = 27: 13) were identified (23 in open and 17 in thorascopic group). Nearly all patients had the defect located on left side. One patients in the thorascopic group needed conversion to laparotomy due to intra-operative instability. While there was no statistical difference in terms of age at operation, sex, body weight and the location of defect, the mean operative duration was slightly longer in patients operated thorascopically (123.23+/-36.03mins vs. 109.8+/-32.6mins, p=0.8). Repair with prosthetic patch was needed in 7 patients in the open group and 1 patient in the thorascopy group. Early post-operative complications (wound infection, hematoma) were more frequently encountered in the open group, although this was not statistically significant (8:3, p=0.6). There was one recurrence in each group.

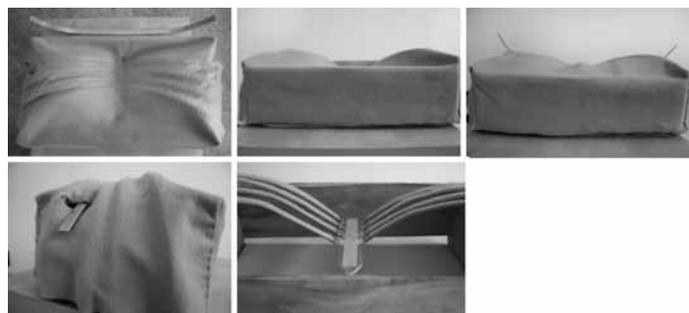
**CONCLUSION:** Thorascopic repair of CDH in neonates and young infants seems to be feasible and safe, with comparable early clinical outcomes to traditional open surgery. The slightly longer operating times may be off set by less trauma to the patients and earlier discharge.

## **P107 DEVELOPMENT OF A SURGICAL SIMULATOR MODEL FOR THE NUSS PROCEDURE**

– *Arielle E Kanters, BA BS, Gabriel Gabarain, BS, Todd Ponsky, MD, Case Western Reserve University, Rainbow Babies and Children's Hospital*

**BACKGROUND:** In 1987 Dr. Donald Nuss described a minimally invasive approach to repair pectus excavatum. While seemingly simple, this technique has many nuances that allow for proper bar placement. While there are courses available to learn this technique, no simulation model exists that allows physicians to practice the Procedure before attempting it on a patient for the first time. Here we describe the development of a simulation "Nuss Training Model".

**MODEL DESIGN:** Using synthetic materials, a chest wall was created that mirrors the structural deformity associated with Pectus Excavatum. Tension on the sternum is maintained through the use of springs anchored to the back of the model. The material covering the chest wall allows for the insertion of the Nuss bar and a thoracoscope. Once the metal bar is inserted into the chest cavity and rotated, the chest deformity is corrected. Specifically, this model familiarizes the physician with the proper technique for localizing the appropriate bar insertion and exit sites, placing the bar, tunneling the bar through the chest cavity, resting the bar on the appropriate ribs, rotating the bar despite significant resistance, and securing the bar.



**CONCLUSIONS:** A fully functioning, interactive model for the Nuss Procedure has been constructed. This model is ideal for both surgical instruction and patient education. This model will allow for widespread instruction and practice before the technique is implemented on a pediatric patient, thereby ensuring both the surgeon's comfort with the procedure as well as increased patient safety.

**P108 MINIMALLY INVASIVE RESECTION OF AN INTRADIAPHRAGMATIC PULMONARY SEQUESTRATION: A CHALLENGING CASE OF LOCALIZATION**

– *Jarod P Mcateer, MD, Jacob Stephenson, MD, Kenneth W Gow, MD, Seattle Children's Hospital and the University of Washington*

**BACKGROUND:** Extralobar pulmonary sequestration (ELS) most commonly occurs in the thoracic cavity, though subdiaphragmatic lesions are reported. Intradiaphragmatic lesions are rarely described and are difficult to localize on preoperative imaging. We describe the first minimally invasive resection of an intradiaphragmatic ELS.

**CASE REPORT:** A 7 week old former term female infant was referred for evaluation of a prenatally detected left sided peri-diaphragmatic lesion. Ultrasound examinations at 21 and 27 weeks gestation revealed a left retroperitoneal mass, 1.1 X 0.5 X 1.2cm in size on initial exam and growing to 2 X 1.5 X 0.7cm on subsequent ultrasound. Postnatal ultrasounds could not reliably localize the mass as either above or below the diaphragm. A CT scan was obtained which showed a left-sided 2.0 X 1.1 X 1.8 cm soft tissue mass but also could not further characterize its location. Differential diagnosis included ELS, bronchogenic cyst, and malignancies including neuroblastoma. Urinary VMA and HVA as well as serum AFP and  $\beta$ -hCG all returned negative.

The patient was taken to the OR for exploratory laparoscopy and planned resection. The stomach was mobilized and the esophageal hiatus exposed. Dissection proceeded to expose the area around the spleen and pancreatic tail. No mass was visualized in the abdomen, but a rounded density was noted upon inspection of the left hemi-diaphragm. The decision was made to approach the lesion from the thoracic cavity, and the abdominal ports were thus closed and the patient turned onto her right side. Three ports were placed in the left chest for a thoracoscopic approach. Again, a bulge was noted in the diaphragm. A combination of hook cautery and sharp dissection was used to dissect the lesion free from the area between the two diaphragm leaflets. A feeding artery was noted and clipped. The resultant residual diaphragmatic defect was closed with two vertical mattress sutures of 3-0 silk and a chest tube was placed. The chest tube was removed on post-op day 1 and the patient discharged to home on post-op day 2. Pathology was consistent with extralobar pulmonary sequestration.

**CONCLUSION:** ELS rarely occur in an intradiaphragmatic location. Further, it may be difficult to characterize the location of such lesions based on preoperating imaging. Thoracoscopy is both a safe and effective method for definitive treatment of intradiaphragmatic ELS, allowing excellent visualization and access for resection.

**P109 A SAFE TECHNIQUE OF THORACOSCOPIC CLIPPING OF PATENT DUCTUS ARTERIOSUS**

– *Nguyen Thanh Liem, MD PhD, To Manh Tuan, MD, Nguyen Van Linh, MD, National Hospital of Pediatrics*

**AIM:** To present a new technique of thoracoscopic clipping of patent ductus arteriosus (PDA) in children and its early outcomes.

**PATIENTS & METHODS:** Patients were anesthetized, ventilated via single-lung ventilation (SLV), and placed in a right lateral position. The surgeon and the assistant stood at the patient's feet and a monitor was placed at the patient's head. The ductus was pulled forward and completely clipped.

**RESULTS:** From May 2010 to February 2011, 58 patients with PDA (27 boys and 31 girls) were operated on using the same technique. Patients' ages ranged from 8 days to 36 months. Patients' mean weight was 5.9±2.8kg (range: 2.1-10kg). The mean operative time was 33 minutes ± 12 minutes (range: from 15-90 minutes). There were no intraoperative complications. Postoperative complications occurred in 2 patients. One patient developed a pneumothorax and 1 patient developed a pleural

effusion. Mean postoperative stay was 4.1 ± 2.1 days for patients > 3 months old and was 11.9 ± 8.4 days for patient ≤ 3 months old. No injuries of recurrent laryngeal nerve occurred in any patients and there were no residual shunts in any patients 3 – 6 months after discharge.

**CONCLUSION:** A modified technique of thoracoscopic closure is a safe and effective procedure for PDA in children.

**P110 SURGICAL MANAGEMENT OF PEDIATRIC EMPYEMA**

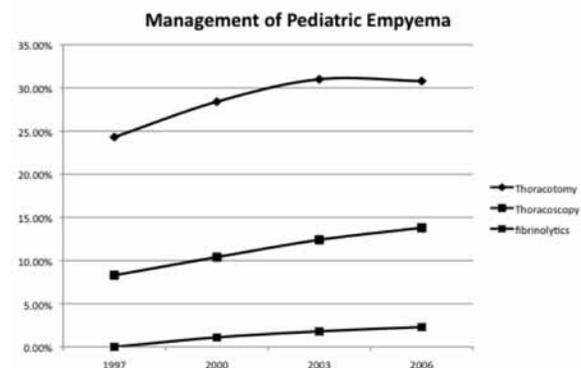
– *Justin Lee, MD, David B Tashjian, MD FACS FAAP, Kevin P Moriarty, MD FACS FAAP, Baystate Children's Hospital, Tufts University School of Medicine*

**INTRODUCTION:** The treatment of pediatric empyema has evolved with treatment options including antibiotic therapy, chest tube placement, fibrinolytic therapy, video-assisted thoracoscopic surgery (VATS), and thoracotomy. Various clinical factors may influence and determine the role surgical interventions. We sought to analyze trends in various treatment options for pediatric empyema from 1997 to 2006 and associated patient and hospital factors.

**METHODS:** Pediatric empyema cases were identified in the Kids' Inpatient Database from 1997, 2000, 2003, and 2006. Data analysis included patient demographics and hospital variables. Postoperative complications, length of stay (LOS) and total hospital charges (THC) were compared for thoracoscopy versus thoracotomy.

**RESULTS:** A total of 16,889 pediatric empyema cases were identified, with a mean age of 7.54 years (SEM, 0.050), 57.7% male, and 42.8% white. The utilization of fibrinolytics increased from 0% in 1997 to 2.3% in 2006, (P<0.001), with 19.4% needing subsequent decortication (15.4% open decortication versus 4.0% thoracoscopic decortication). There was a small increase in the utilization of thoracotomy, from 24.3% in 1997 to 30.8% in 2006, (P<0.001). The utilization of thoracoscopy increased almost 2-fold, from 8.3% in 1997 to 13.8% in 2006, (P<0.001). Thoracoscopy versus thoracotomy was associated with shorter mean LOS (13.59 days versus 14.91 days, P<0.001) and lower mean THC (\$67,317.27 versus \$78,086.01, P<0.001). Complication rates were lower for thoracoscopy versus thoracotomy, (4.7% versus 6.9%, OR 0.662, CI 0.523-0.839, P=0.001), especially postoperative pulmonary complications (1.9% versus 3.0%, OR 0.624, CI 0.433-0.899, P=0.010). Multivariate logistic regression analysis did not find insurance status, median income, patient location, hospital location, teaching status, or regional location to be statistically significant predictors for utilization of thoracoscopy.

**CONCLUSIONS:** Increasing utilization of thoracoscopy seems to be a safe option for pediatric empyema with lower complication rates, shorter mean LOS and THC compare to thoracotomy. Our study shows a trend in increasing utilization fibrinolytics however with potential subsequent decortication. Further studies are needed to analyze clinical factors that determine the choice of surgical treatment and outcome.



**P111 A NOVEL BIOLOGIC PROSTHETIC PATCH FOR THE REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA OF BOCHDALEK IN INFANTS** – *Michael S Katz, MD, L. Grier Arthur, MD, Rajeev Prasad, MD, St. Christopher's Hospital for Children*

**INTRODUCTION:** The surgical repair of a congenital diaphragmatic hernia (CDH) can be challenging, particularly when a primary repair is not feasible and a prosthetic patch must be used. We present our experience with CDH repair utilizing XenMatrix™, a biologic non-cross-linked acellular porcine dermal collagen matrix.

**METHODS:** Under IRB protocol #19940, we retrospectively reviewed the charts of all infants who underwent repair of a CDH with XenMatrix™. Patient gestational age, age and weight at the time of surgery were noted. The operative time, any intraoperative or postoperative complication and length of follow-up were recorded.

**RESULTS:** Between April 2009 and April 2011, XenMatrix™ was used for the repair of a CDH in three patients. All patients had a left-sided CDH. The XenMatrix™ patch was placed via a thoracoscopic approach in one patient for an initial repair. Two patients underwent repair of a recurrent CDH, one completed utilizing a thoracoscopic approach and the other via an open abdominal approach. Of the two patients with a recurrent CDH, one originally had a primary closure performed open and the other had a Gore-tex® patch placed thoracoscopically. The mean gestational age was 37±3 weeks. The mean age at surgery was 143 days (range 4-260 days), and the mean operative weight was 5±2 kg. The mean operative time was 323±19 minutes. There were no intra-operative or post-operative complications. After a mean follow-up of 337 days (range 109-620 days), no patient in whom XenMatrix™ was used has had a recurrence of the CDH.

**DISCUSSION:** In each of the three cases of CDH, a prosthetic patch was required because the diaphragmatic defect could not be closed primarily. We chose to utilize XenMatrix™, a biologic material with a high burst strength that does not require rehydration, has no sidedness and is easy to manipulate, especially when a minimally invasive approach is utilized. Thus far in our experience there have been no complications or recurrences. We believe that XenMatrix™ should be considered for the repair of a congenital diaphragmatic hernia when a patch-closure is necessary.

**P112 SIMULTANEOUS USE OF VATS AND PAIR IN A CASE OF MULTIPLE ORGAN HYDATIDOSIS** – *Gungor Karagüzel, MD, Kagan Ceken, MD, Nurdan Arslan, MD, Hanife Karakaya, MD, Mustafa Melikoglu, MD, Akdeniz University School of Medicine, Departments of Pediatric Surgery, Radiology and Anesthesia&Reanimation, Antalya, TURKEY*

Although hydatid disease is not uncommon in Mediterranean countries, three or more organ involvements are very rare. Herein, we report a 4 year old boy with multiple organ hydatidosis. He presented with fever and cough. Radiologic evaluation showed large cystic lesions suggesting hydatid disease in right lobe of liver and both lungs. Under albendazole treatment, the patient underwent single-stage surgery including three steps with careful airway management. At first step, the hydatid cyst located in right lobe of liver was percutaneously treated by PAIR method (puncture-aspiration-injection-reaspiration). Second and third steps included treatment of right and left sided pulmonary cysts using PAIR method followed by video-assisted thoracoscopic surgery (VATS), respectively. The patient developed a left pneumothorax and subcutaneous emphysema due to chest tube obstruction on postoperative day one, which was treated with additional chest tube insertion. Air leak from right side lasted 12 days and improved with a residual air-filled lesion. The patient was doing well two months after discharge from hospital. Combination of VATS and PAIR in multiple organ hydatidosis can be an alternative mode of management in selected patients.

**P113 LAPAROSCOPIC REPAIR OF INCARCERATED CONGENITAL DIAPHRAGMATIC HERNIAS PRESENTING BEYOND THE NEWBORN PERIOD** – *Obinna O Adibe, MD, Janine P Cunningham, MD, Alessandra C Gasior, DO, Daniel J Ostlie, MD, Shawn D St. Peter, MD, Children's Mercy Hospitals and Clinics*

**PURPOSE/BACKGROUND:** Congenital diaphragmatic hernias (CDH) diagnosed outside of the newborn period are an uncommon occurrence in developed countries. Incarceration of viscera presenting as bowel obstruction is a rare clinical scenario with only a few cases reported in the literature, all of which have been repaired via laparotomy. We have recently encountered a series of these cases that we approached laparoscopically.

**MATERIALS/METHODS:** We performed a retrospective review to identify patients who underwent laparoscopic repair of CDH with incarceration after the neonatal period. Demographics, presentation characteristics, operative details and outcomes were reviewed.

**RESULTS:** Between 2008 and 2011, three patients underwent laparoscopic repair of incarcerated CDH presenting with bowel obstruction. The mean age was 60.8 months (2-157 months) with a mean weight of 30.2 kg (11-66.5 kg). All occurred on the left. All cases were completed laparoscopically using a 5-mm umbilical port and three to four additional ports. The mean operative time was 133 minutes (117-164 minutes). There were no intraoperative or post-operative complications. Mean length of hospital stay was four days (1-8 days). Median follow-up was 6.3 months (range 0.8-42.3 months). One patient suffered a recurrence after a motor vehicle collision then underwent a successful second laparoscopic repair.

**CONCLUSION:** The laparoscopic approach for patients presenting with an incarcerated CDH beyond the newborn period appears feasible.

**P114 THORACOSCOPIC PULMONARY RESECTION IN NEWBORN AND INFANTS** – *Alexander Rsazumovsky, Prof, Victor Rachkov, Nadezhda Kulikova, Nikita Stepanenko, Abdumanap Alkhasov, Oganeg Geodakyan, Zoriko Mitupov, Said-khassan Batayev, Filatov Children's Hospital, Moscow, Russia*

The thoracoscopic approach for pulmonary resection in children has recently become the procedure of choice for different lung anomalies and diseases. Since 2005, years we have performed 114 thoracoscopic (TS) pulmonary resections in children. 34 operations were done to newborns and infants. The age of 13 patients ranged from 1 day to 1 month, and from 1 month to 1 year in 21 patients. Their weight ranged from 3.240 to 12,5 kg. The indications for TS operations were cystic adenomatoid malformatios in 18 children, pulmonary sequestration in 6 patients, lobar emphysema in 5 children, other congenital malformations in 3, and benign tumors in 2 infants.

The procedure of choice was a TS lobectomy. If possible, we used one-lung ventilation. In TS lobectomies we used the same surgical principles as in open procedures. The operation was carried out through the 3 or 4 trocar approach. In most cases we use 2 or 3 3mm trocars and one 10 mm for endostapler (keeping in mind the necessity to remove the resected tissue at the end of the operation). Pulmonary vessels were clipped or divided by a Bi Clamp device. Bronchi were ligated or closed by Hem-o-lock clips. In case of segmentectomy we used an endostapler.

**RESULTS.** Mean operation time was 42 ±17,5 min. There was no mortality in our study. No intraoperative complications were observed. Conversion was required in 2 patients due to severe adhesions, in the pleural cavity for 1 child, and difficult extrapleural localization of pulmonary sequester in another case. Two patients developed postoperative pneumothorax. All complications were subsequently resolved.

**CONCLUSION:** In newborn and infants with thoracic pathology, thoracoscopy is highly effective for attaining the operation's goal for any age group, with low rates of conversion and complications.

## **P115 SINGLE INCISION SINGLE PORT THORACOSCOPIC**

**TREATMENT OF PEDIATRIC EMPYEMA** – *Fuad Alkhoury, MD, James Davis, MD, Luciana Giambarberi, MD, Eren Taydas, MD, Cathy Burnweit, MD, Leopoldo Malvezzi, MD, Colin G Knight, Miami Children's Hospital, Department of Pediatric Surgery*

**BACKGROUND:** Multi-port video-assisted thoracoscopy (VATS) has become the main approach in treating empyema. In our institution, we use single port single instrument (SISI) thoracoscopy in children with this condition. The goal of this study is to compare SISI and VATS for treating empyema.

**METHODS:** We reviewed the records of all the children admitted with empyema between January 2007 and December of 2010. Empyema was diagnosed by thoracic ultrasound or thoracic computed tomography. Children were treated with SISI or VATS depending on the attending surgeon. We compared: operative time, length of stay, days of tube thoracostomy, post-operative fever and equipments cost. Student t test was used for statistical analysis.

**RESULTS:** Sixty-seven charts included the empyema ICD9 code. Seventeen patients were excluded from analysis because of the diagnosis of simple effusions (n=14) or incomplete records (n=3). Of the 50 patients included in the study, 27 were treated with SISI and 23 with VATS. The duration of tube thoracostomy was longer in the SISI group (mean SISI group 2.6 days, VATS, 1.6 days, p<0.05). On the other hand, the length stay, and the duration of post operative fever was less in the SISI group (mean hospital stay 9 vs 11.5 days, p<0.05), (mean post-operative fever 3.6 vs 4.8 days, p< 0.05). There was also a substantial reduction in operative time and equipment cost (mean operative time of SISI 85 min vs VATS 109 min, p< 0.05) (mean SISI cost 608 dollars vs VATS 1296 dollars, p<0.05). One patient in the VATS group required a second intervention.

**CONCLUSIONS:** We conclude that the results of SISI and VATS for pediatric empyema treatment are comparable. Although children retained chest tubes longer in the SISI group, this difference does not affect the average length of stay. SISI provides safe, effective treatment with reduction in operative time and equipment cost.

## **P116 LUNG FUNCTION BEFORE THE MINIMALLY INVASIVE REPAIR FOR PECTUS EXCAVATUM (MIRPE) IN CHILDREN**

– *Sergio B Sesia, MD, Jürg Hammer, Professor, Frank-martin Haecker, Professor, Children's Hospital of Basel, Department of Paediatric Surgery, Spitalstrasse 33, 4056 Basel, Switzerland*

**BACKGROUND:** Although there is evidence about association between reduced exercise capacity and impaired cardiovascular performance in pectus excavatum patients (Pex), lung function testing still remains part of the routine preoperative investigations before MIRPE.

**AIM OF THE STUDY:** To evaluate the lung function in Pex before completion of MIRPE

**PATIENTS & METHODS:** We evaluate preoperative spirometry data in 61 Pex from 01.01.2000 to 31.12.2010 and evaluated total lung capacity (TLC), vital capacity (VC), forced expiratory volume in 1 second (FEV1), functional residual capacity (FRC), forced expiratory flow from 25% exhalation to 75% exhalation (FEF75/25) and Haller index score.

**RESULTS:** Less than 47 % of patients demonstrated an obstructive pattern (FEV1<80 %) and 44 % a restrictive pattern (VC<80%). The FEF 75/25 median was lower than normal by 18 %. The Haller index accounts for 3.25-7.4 (mean 5.05).

**CONCLUSION:** The results demonstrate that preoperatively Pex have nearly normal lung function relative to normal patients. Since Pex is more afflicted with impaired cardiovascular performance than ventilatory limitation, the value of routine preoperative lung function is questionable.

## **P117 SOLUTION TO IMPROVE SURGICAL SKILLS IN THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA**

– *Ramón Rivera-barreno, DVM PhD, Hugo Staines-orozco, pediatric Surgeon, Francisco Sanchez-margallo, DVM PhD, Carlos Rodriguez-alarcon, DVM PHD, Eva Perez-merino, DVM PHD, Jesus Uson-casaus, DVM PHD, Universidad Autonoma de Ciudad Juárez*

**BACKGROUND:** There are some procedures during the surgeon training programs that offer a minimum level of challenge or nothing at all because of their low incidence rate. **AIMS:** We designed this study in order to reproduce a surgical scenario in rabbit; similar to the pediatric surgeon's would face during thoracoscopic repair of Bochdalek's Congenital Diaphragmatic Hernia (CDH), and provide an economic method to improve the lack of specific surgical skills.

**METHODS:** In 3 dead rabbits (2.8-3 Kg), we established correct settings for the optic (4.5mm 30°) and the instruments (2.7mm) working channels. In rabbit corpses (2.8-3 Kg), we (six surgeons) performed a learning curve to acquire specific skills before using an in vivo model. For it, by laparotomy, we did a 3 cm left diaphragmatic incision, later we repaired the diaphragmatic cut by thoracoscopy with 5 intracorporeal knots. In 12 anesthetized New Zealand White Rabbits (2.8-3 Kg) we performed a laparotomy to create a left diaphragmatic incision in each one (2 cm), after that, we waited 48 hr for their thoracoscopic repairs. The surgical model was evaluated in two pediatric thoracoscopy courses by students and teachers (n=27).

**RESULTS:** We established in the rabbit the fourth intercostal space to set the optical trocar right below the scapula distal angle, and the sixth intercostal space for both work instruments trocar's, one 1.5 cm near to the vertebral column and the other 2.5 cm away of sternocostal junction. We established a minimum of 6.4 procedures done in rabbit corpses to provide the accuracy for the surgical movements and suture practice in rabbit's reduced intrathoracic space. We avoid the use of 38 live animals just for this part of the study. In in vivo model, we obtain abdominal viscerae in all cases, this finding allowed us to perform surgical drills in order to return the bowel in to the abdominal cavity and perform intracorporeal knots to repair the diaphragmatic defect. The evaluation made during the thoracoscopic in pediatric courses showed a  $9.63 \pm 0.67$  score according to the model usefulness from a 0-10 scale.

**CONCLUSIONS:** It is feasible to reproduce the thoracoscopic scenario of a Bochdalek's CDH in rabbits. The surgical training model that we created for thoracoscopic repair of a Bochdalek's CDH, can be easily reproducible, economic and useful in most department of pediatric and neonatal surgery improving the surgical skills in thoracoscopic repair of Bochdalek's CDH, as well as the refinement of surgical skills previously acquired.

## **P118 THORACOSCOPIC DEBRIDEMENT OF EMPYEMA THORACIC: WHICH TECHNIQUE IS BETTER?**

– *Burak Tander, MD, Unal Bicakci, MD, Mithat Gunaydin, MD, Dilek Demirel, MD, Tugce Bozkurter, MD, Riza Rizalar, MD, Ender Ariturk, MD, Ferit Bernay, MD, Ondokuz Mayıs University, Department of Pediatric Surgery*

**AIM OF THE STUDY:** The differences of single-port and two-port techniques for the debridement of the advanced stage thoracic empyema in children were evaluated.

**METHODS:** Age, gender, physical findings, surgical interventions, length of stay (LOS) and chest tube (LOCT) were reviewed in 44 patients with thoracic empyema (27M, 17F) between May 2002 and July 2011. We used a single-port technique (SPT) in 16 patients and two-port technique (TPT) in 28 patients. In the SPT, the telescope itself was used as a dissecting tool and no further instrument was inserted for dissection and debridement. In TPT, first port was for telescope and the second port for the surgical instrument for the debridement. A chest tube was inserted through the port site in both techniques.

**MAIN RESULTS:** The main symptom was fever in all patients. The empyema was located on the right hemithorax in 22 patients (10 patients with SPT and 12 patients with TPT), on the left side in 20 patients (6 patients with SPT and 14 patients with TPT) and bilateral in 2. The chest tube was removed mean 13 days in the SPT and mean 11 days in the TPT patients. The LOS was median 21 days and 15 days in patients with SPT and TPT respectively. A self limited and spontaneously resolved bronchopleural fistula was observed in 4 patients with SPT and 2 patients with TPT. No significant difference was found between both techniques in terms of the age, gender, site of empyema, fever, the necessity of a further surgery, developing bronchopleural fistula. The LOS and LOCT were apparently less in TPT patients, though the difference was not significant.

**CONCLUSION:** Although statistically not significant, TPT for the debridement of advanced stage empyema in children seems to be more effective in terms of LOS, LOCT and the risk of bronchopleural fistula.

**P119 THORACOSCOPIC REPAIR OF LONG GAP ESOPHAGEAL ATRESIA: A TWO CENTER EXPERIENCE** – *Steven Rothenberg, Miguel Guelfand, 1) Rocky Mountain Hospital for Children, Denver-USA 2) Exequiel Gonzalez Cortes Hospital for Children, Santiago-CHILE*

**OBJECTIVE:** Report the experience of 2 centers in the management of Esophageal atresia with no fistula (Long Gap) by minimally invasive surgery.

**PATIENTS & METHODS:** The authors reviewed all the patients with esophageal atresia with no fistula that were repair by minimally invasive surgery. Ten patients were treated between 2004 to 2010 in the 2 centers. Ages at the time of surgery ranged from 2 to 8 weeks of age, and weight from 3.0 to 3.8 kg. All patients had a laparoscopic gastrostomy placed day one or 2 of life. Gap length was determined either by placing contrast in the gastrostomy button and placing downward pressure on a replegic tube in the upper pouch or by placing urethral dilator in the lower pouch through the gastrostomy and anal dilators in the upper pouch. The time of surgery was dependent on size, other medical factors, and gap distance. All Gaps were measured between 3 to 5 vertebral bodies.

**RESULTS:** The repair was performed between 2 to 8 weeks by a right thoracoscopic approach. A three, four or 5mm scope and 3mm instruments were used to do the repair. Extensive mobilization of the upper and lower pouch was performed to minimize the gap and tension. The anastomosis was made with single interrupted sutures 4 or 5-0 PDS or Prolene sutures. In 1 patient it was not possible to complete the esophageal anastomosis and this was converted to a Gastric Transposition. All the other 9 patients had a complete esophageal anastomosis. There were no intra-operative complications. Operation time range between 100 – 180 minutes. Two patients had a post-operative leak that resolve spontaneously. Eight patients required dilatations. (range 1 to 8), and 6 patients required a Nissen for severe reflux. The gastric transposition patient died 1 year after the surgery not related to the repair. All of the patients are eating fully by mouth.

**CONCLUSIONS:** This study shows that a thoracoscopic approach to pure long esophageal atresia is a safe and viable technique. Gaps as long as 5 vertebral bodies can be broached with good long term results. The complication rate is comparable to historical controls and avoids the morbidity of an open thoracotomy. This initial experience suggests this technique is a good alternative to previously open techniques and further study is warranted.

**P120 THORACOSCOPIC REPAIR ON THE DIAPHRAGMATIC EVENTRATION IN CHILDREN: 13 CASES REPORT** – *Liu Jiang Bin, MD PhD, Zhen Shan, MD PhD, Xiao Xian Min, MD PhD, Surgical Department of Children's Hospital, Fudan University, Shanghai, China*

**AIMS & OBJECTIVES:** to review the experience on the thoracoscopic approach and technical details for diaphragmatic eventration repair in children.

**MATERIAL & METHODS:** from Mar 2009 to Jun 2011, 13 patients with diaphragmatic eventration, in which 8 cases on the right side and 5 cases on the left side, were operated for a diaphragmatic eventration. The age of patients range 1.2-4.5 years (average,  $2.8 \pm 1.2$  years), symptoms were recurrent pulmonary infection, dyspnea, et al. The diaphragm of patients were higher from to the 5th intercostals space to 8th. The patients in a lateral decubitus, and low carbon dioxide (4mmHg) insufflation allowed the lung collapse. Reduction of the eventration was made progressively after folding and plicating the diaphragm by running suture. An exsufflation (3 cases) or a drain (3 cases) were performed after surgery.

**RESULTS:** the operation time were from 1.5 hours to 0.75 hours (mean  $1.10 \pm 0.38$  hours), no conversion was done. Postoperative chest x-ray showed flattening of the diaphragm in all patients. There is no morbidity and no mortality. Patients discharged between 3 and 6 days. Dyspnea disappeared immediately. The patients were follow-up from 0.15 years to 1.50 years (mean  $0.75 \pm 0.55$  years) and on recurrence in them.

**CONCLUSIONS:** Thoracoscopic repair on the diaphragmatic eventration is safe and effective procedure, which gives a large operative space for suturing and plicating.

**P121 THE USE OF TWO BARS IN NUSS TECHNIQUE FOR PECTUS EXCAVATUM** – *Edward Esteves, PhD, Calebe P Souza, Enf, Amilson M F Borges, md, Juliana V Gomes, Enf, Pediatric Surgery Division, University of Goias, Goiania, Brazil and Saint Helen Hospital, Goiania, Brazil*

Some patients have too deep, complex or some degree of asymmetry of the chest wall requiring the use of two metallic bars by the Nuss technique. There are cases where surgeons implant a bar but the result is not good, because they did not detect the need for two bars. Many surgeons perform two incisions each side, or a large lateral chest incision to implant the bars. Objective: The authors present their patients operated by the Nuss technique with implantation of two rods through a single incision at each side of the thorax, analysing the indications, technical details and the preliminary results. Patients and methods: In the period of July/2002 to May/2010, 6 patients with pectus excavatum were operated aging 14-32 years (mean  $18.1 \pm 1.4$ ), 5 men, 1 woman. Associated syndromes included Marfan (2) and Eagle-Barrett (1). Two symmetrical, 4 asymmetrical. The defects included the plate type in 5 patients or glass type in one (without a central inner point able to be raised up by a single bar). This glass-like anomaly case had a very rigid sternum, and the decision to put 2 bars was intraoperative. All patients were operated on under general anesthesia and were maintained with continuous epidural block for 3 days. We have used a modified Nuss technique: in half the cases the thoracoscope was introduced at an axillary port. The lateral transverse 4 or 5-cm chest incision was performed in about half the distance between where the bars were expected to pass through.

A large subcutaneous dissection would give space to deal with the two bars and one stabilizer. Choosing the intercostal space to put in the bar depended on where the pressure could be split at the back of the sternum. The bars had a hyperconvex modeling at the tips, they were fixed with a stabilizer at each side, the top at the right and the bottom one at the left. Results: All operations were able to be performed without technical complications. The intensity of postoperative pain did not seem different from patients who received only one bar in our experience. The cosmetic results were excellent, but a patient operated on at 14 has shown a tendency to collapse the chest as he grows up. An adult patient had bilateral pleural effusion requiring drainage. Up to now there has been no other complications related to the bars. 2 patients had the bars removed with some difficulty, facilitated by the wide release of the skin on both ends of the bars. Conclusion: Patients with too deep pectus excavatum or a large vertical defect need two metal bars when applying Nuss procedures. The location of each bar varies in each case, achieving good results with a single incision to install and remove the bar.

## **P122 THORACOSCOPIC MANAGEMENT OF CARDIOVASCULAR DISEASES IN PEDIATRICS PATIENTS**

– *Villalpando-canchola Ricardo, PhD, Morales-juvera Edgar, PhD, Reyes-garcia Gabriel, PhD, Laguna Belen, PedSurgery Resident, Hospital of Pediatrics, National Medical Center, IMSS*

Although thoracoscopy was first described in the early 1900s, today there are many indications for the thoracoscopic approach in infants and children. Being the cardiovascular pathologies the latest to be incorporated as a routine procedure in children. We describe our experience in 9 patients with the following diagnosis; vascular rings (3), double arch, right aberrant subclavian, Pericarditis and pericardial effusion (4) with pericardiectomy, A-V block with definitive Marker pace, Acigos Vein ligation after a Cavo-Pulmonar Shunt. The patients Age was 1yo, 4yo, 13 yo, 6 mo, 5 mo, 6mo, 3 mo, 3 mo, all had and associated condition like, Interauricular shunt in 3, anomalous pulmonary connection, Interventricular Shunt, leukemia, eosinophilic gastroenteritis and malnutrition. All the procedures were done by full thoracoscopy (NOT VIADEOASISTED), with a pressure of 4 – 5 mmHg. The Procedure and demographics are described in the following table.

Dx	Age	Sex	Other Dx	Procedure	Surgic al time	Bloo d loss	Thorac ic Drainage	Draina ge time.
Pericardi al Effusion	1 yo	Femal e	Interauricular Shunt	Pericardiecto my	145 min	10	Yes	5 days
Pericardi al Effusion	13y o	Femal e	Eosinophilic Gastroenteritis	Pericardiecto my	50 min	10m l	Yes	3 days
Pericardi al Effusion	4 yo	Male	Leukemia	Pericardiecto my & Biopsy	120 min	20 ml	Yes	8 days
Pericardi al Effusion	6 mo	Male	Postperocardiect omy sx.	Pericardiecto my	110 min	25m l	Yes	5 days
A-V block	5 mo	Male	Anomalous pulmonary vein connection	Marker pace	125 min	10 ml	NO	
Rt Aberrant Subclavian	3m	Femal e	Interventriclar Shunt	Suture & Section of anomalous artery	140	20 ml	Yes	8 days
Rt Aberrant Subclavian	6 mo	Femal e	Down Sx.	Suture & Section of anomalous artery	120 min	15 ml	Yes	5 days
Double Aortic Arch	3 mo	Male	Interauricular & interventricular Shunt	Suture & Section of anomalous artery	123 min	10 ml	No	
Acigos Shunt	3 yo	Male	Tricuspidal Atresia	Acigos Vein Ligation	90 min	15 ml	No	

The refinement of the instruments allows us to plan and complete thoracoscopic procedures, without the need to use open surgery instruments. It has ben demonstrated the low morbidity in pericardiectomy patients and could be considered as the treatment

of choice. Patients with symptomatic vascular rings, we need a good imagine study to allow a good selection of patients. It has been demonstrated before that not all the patients require a pleural tube.

The thoracoscopy helps to prevent deformities seen in open surgery, and makes easier the pain management.

CONCLUSION: Agree with the described cases it is know an evident option, the thoracoscopic access in a good alternative to many of the cardiovascular pathologies in the pediatric age, and could be the first option in some of those patients.

## **P123 THORACOSCOPIC LOBECTOMY WITH LIMITED RESORCES**

– *Ramesh Santhanakrishnan, Prof, Srimurthy Kadaba, Dr, Narendrababu M, Dr, Gowrishankar , Dr, Indira Gandhi Institute of Child Health, Bangalore*

AIM: To study the feasibility of Thoracoscopic Lobectomy uisng conventional energy sources

MATERIAL & METHODS: We have attempted Thoracoscopic Lobectomy in 28 children. The indications included CCAM, Lobar Emphysema, Lung Cysts & Bronchiecttasis. We did not have access to any advanced energy sources like Harmonic Scalpel or Ligasure. We utilized just the conventional Diathermy and suture ligated / divided all the major vessels and the bronchus. All the other steps were the same

RESULTS: We had to convert to open surgery in 6 cases due to dense inflammation due to bronchiectasis, but never for any uncontrolled bleeding or vascular injury. We could successfully complete the surgery in the other 22 cases. The mean operative time was 190 minutes and the mean blood loss was about 120 ml. There were no procedure realted morbidity or mortality

CONCLUSION: Thoracoscopic Lobectomy is definitely feasible with just the conventional diathermy and suture liagation of the vessels. It can be as safely accomplished as with advanced energy sources. Even though the procedure may be longer, it is eminently suitable for developing countries and those centres without access to the advanced energy sources

## **P124 IS THERE A ROLE FOR THORACOSCOPIC DECORTICATION IN CHRONIC EMPYEMA**

– *Ramesh Santhanakrishnan, Dr, Srimurthy Kadaba, Dr, Narendrababu M, Dr, Gowrishankar , Dr, Indira Gandhi Institute of Child Health, Bangalore*

AIM: To study the Role of Thoracoscopic Decortication in Chronic Empyema

MATERIAL & METHODS: We attempted Thoracopic Decortication in 56 children with Chronic Empyema ( as evidenced by the duration of the disease, CT scan findings of thick peel and other factors). Age ranged from 1 year to 8 years (Mean: 2.2years). A pre-operative CT scan was done in most of the cases for the assessment of the empyema and the underlying lung and also to plan the torcar placement. We used conventional instruments with some modificatios for removing the peel and to debride the pleural cavity.

RESULTS: We could successfully complete thoracoscopic decortication in 36 cases (65%). We had to convert to open surgery in the remaining 35% cases due to very thick peel / underlying lung abscess / necrotising pneumonia / excessive bleeding. The mean operative time was 135 minutes and the mean blood loss was 130 ml. There were no procedure related morbidity or Mortality. There was a good lung expansion in all the cases and the duration of post-operative hospitalisation was 3.5 days (in Thoracoscopy cases) and 10.8 days (in open cases)

CONCLUSION: There is a definite role for Thoracoscopy even in children with Chronic Empyema. VATS reduces the hospitalization substantially and avoids the morbidity associated with open thoracotomy in these case.

## **P125 MINIMALLY INVASIVE REPAIR OF PECTUS CARINATUM: BILATERAL THORACOSCOPIC CHONDROTOMY AND SUPRASTERNAL COMPRESSION BAR PLACEMENT**

– *Robert L Bell, MD, Olajire Idowu, MD, Sunghoon Kim, MD, Children's Hospital and Research Center Oakland: Oakland, California, USA; University of California San Francisco-East Bay: Oakland, CA, USA*

**PURPOSE:** No effective minimally invasive repair of symmetric pectus carinatum—analogue to the Nuss procedure for pectus excavatum—has been described. We report a novel minimally invasive thoracoscopic repair of symmetric pectus carinatum.

**METHODS:** The procedure is performed under general anesthesia. The patient is positioned with the right side against the edge of the operating table and the left side elevated. The table is tilted to align the chest horizontally. Small, bilateral, transverse incisions are made laterally, through which cautery and rongeur can be passed between the ribs. Below each incision, a 5mm port is placed for thoracoscopy and insufflation. An 18-gauge needle placed through the skin is used to localize the cartilages to be cut. An angled pituitary rongeur and long cautery tip are used to perform chondrotomies near these points. Typically, 1cm lengths of cartilage from three adjacent levels are removed bilaterally. A suprasternal bar fitted to the patient's chest is passed through the transverse incisions in a submuscular plane over the point of maximal convexity. The bar is secured to the lateral ribs using #5 sternal wire and #2 fiberwires. These sutures are tied as the sternum is compressed to the desired correction level.

**RESULTS:** Three patients (ages 12, 14 and 17) with severe symmetric pectus carinatum underwent the repair. Pain was controlled with epidural anesthesia. Hospital stay was four to six days. All patients were pleased with the cosmetic outcome. Suprasternal bars were removed after 6 months, with good results.

**CONCLUSION:** Our novel minimally invasive thoracoscopic repair of pectus carinatum is a satisfactory alternative to open operative or compression orthotic approaches.

## **P126 CHEST RADIOGRAPHY ALONE IS INEFFECTIVE FOR DETECTING SEVERE DISPLACEMENT OF A PECTUS BAR INTO THE THORACIC CAVITY: A CASE REPORT**

– *Akihiro Shimotakahara, MD, Kozo Nakanishi, MD, Manabu Okawada, MD, Tadaharu Okazaki, MD, Geoffrey J Lane, MD, Atsuyuki Yamataka, Department of General Thoracic Surgery, Saitama National Hospital, Department of General Pediatric and Urogenital Surgery, Juntendo University School of Medicine*

**PURPOSE:** To report a case of severe displacement of a pectus bar inserted during a Nuss procedure for pectus excavatum that had been missed until elective bar removal was planned and preoperative computed tomography (CT) was performed.

**CASE REPORT:** A 17-year-old male underwent a Nuss procedure for severe asymmetric pectus excavatum. Recurrent bar displacement necessitated 3 re-do operations until 1 bar with bilateral stabilizers was inserted. Nevertheless, it had a tendency to move laterally which the patient would correct by pushing the bar leftwards when it moved to the right. We were concerned about possible visceral or skin injury related to manipulating the bar, but our case preferred to leave the bar in situ because it was serving its purpose. Chest radiography was performed at each outpatient visit. It showed lateral sliding of the bar but failed to identify any further problem. After three years of implantation, bar removal was planned. On preoperative CT, the left edge of the bar with its metal stabilizer was found in the left thoracic cavity, just in front of the pulmonary hilum. The bar was removed successfully using left thoracoscopy.

**DISCUSSION:** We reviewed serial chest radiographs retrospectively and were able to document that the bar started to move laterally about 1 month after the last operation and seemed to stop some 5 months later. From 10 to 18 months, the left edge of the bar appeared to move slightly backwards on lateral chest radiography with minor increase in the length of the gap between the bar and the sternum. There was no change in position of the bar on postero-anterior chest radiography. We presume that the left edge of the bar sank into the thoracic cavity during this period. The 3 dimensional position of the bar was easily visualized on preoperative CT.

**CONCLUSION:** Chest radiography alone is ineffective for assessing the exact position of a pectus bar. In cases of bar displacement, surgeons should not hesitate to perform CT to check the exact bar location.

## **P127 COMPLICATIONS OF LAPAROSCOPIC GASTROSTOMY: CASE REPORT OF SUB-MUCOSAL BUTTON PLACEMENT**

– *Philip Hammond, Atul Sabharwal, Royal Hospital for Sick Children, Yorkhill, Glasgow*

**INTRODUCTION:** Patient safety is enhanced by an awareness of the potential complications of a surgical procedure. This allows steps to be taken to reduce their occurrence as well as ameliorate their consequences by early recognition and management. We present a previously unreported complication of laparoscopic primary gastrostomy button placement with intra-mural balloon inflation forming a sub-mucosal pouch.

**CASE REPORT:** A neurologically impaired 16 month old boy had a laparoscopic Nissen fundoplication and gastrostomy button placement. This gastrostomy was inserted using a technique of needle puncture of the stomach between two stay sutures under laparoscopic visualization, dilatation of the tract over a guidewire, and insertion of a button through the dilator sheath. In the post-operative period the gastrostomy button was placed on free drainage. There was minimal aspirate over the subsequent 48 hours and hence small volume feed boluses were commenced via the gastrostomy. Over the following 24 hours he became pyrexial, tachypnoeic, and the abdomen was noted to be distended. The feeds were stopped and 550mls of milky fluid was drained from the gastrostomy button (a volume equivalent to all of the feed since gastrostomy placement). A contrast study via the button outlined a large hollow structure which was not in continuity with the stomach lumen nor the peritoneal cavity. Upper gastro-intestinal endoscopy was performed and the fundoplication wrap appeared satisfactory but the gastrostomy balloon was not visible within the stomach lumen although its outline could be visualised beneath the mucosa. This balloon was deflated under endoscopic vision and removed and a 16 Fr 'Corflo' (deformable) percutaneous endoscopic gastrostomy (PEG) inserted through the existing site in the anterior abdominal wall. After two days a repeat contrast study demonstrated satisfactory placement of the gastrostomy and feeds were slowly re-introduced and intravenous antibiotics were administered for five days. Although he had a prolonged hospital stay the patient made a satisfactory recovery.

**DISCUSSION:** There are several techniques described for primary gastrostomy button placement which are suitable for use with concurrent laparoscopic fundoplication. To the authors knowledge the complication of intra-mural gastrostomy balloon placement with sub-mucosal gastric pouch has not previously been reported in the literature. Laparoscopic visualization does not confirm luminal placement of the button. Certainly it is important to be fastidious regarding aspiration of gastric content (with a low pH) before commencing feeds and ensuring they are tolerated before increasing the volumes.

# Poster Abstracts

In our experience we have also become aware of the potential complication of passing the needle and guidewire through both anterior and posterior gastric walls. As a precaution, to reduce both these complications, it is now our practice to inflate the stomach with air via the naso-gastric tube prior to gastrostomy placement to provide a larger and firmer target for puncture.

Once this complication was recognised with a contrast study, resolution was achieved by drainage of the contents of the sub-mucosal pouch and straightforward placement of a PEG. This avoided the more invasive alternatives of laparoscopic or open exploration.

## **P128 LAPAROSCOPIC APPENDECTOMY IS A SUPERIOR OPTION FOR COMPLICATED APPENDICITIS IN CHILDREN? : LAPAROSCOPY GROUP SHOWS HIGHER INTRA-ABDOMINAL INFLAMMATORY COMPLICATION AND READMISSION RATE**

– *Yoon-jung Boo, MD, Jung-myun Kwak, MD, Geon-young Byun, MD, Hyung-joon Han, MD, Division of Pediatric Surgery, Department of Surgery, Korea University College of Medicine*

**BACKGROUND:** Several randomized studies have shown that intra-abdominal abscess formation after laparoscopic appendectomy is higher than open appendectomy in adults, but the controversy still remains in this area. In children, though the evidence is still lack in concluding the superiority of laparoscopic appendectomy, many studies have shown that there is no difference in complication rate between laparoscopic and open procedure even in the complicated appendicitis. We retrospectively analyzed our data for complicated appendicitis to investigate postoperative intra-abdominal inflammatory complication and readmission rate.

**MATERIALS & METHODS:** A total of 1158 pediatric patients (age $\leq$ 15) underwent operation for appendicitis over a period of 8 years. Among them, 274 patients (23.7%) were diagnosed with complicated appendicitis on the radiologic, operative and pathologic findings. The outcome of 284 patients with complicated appendicitis in children was retrospectively analyzed.

**RESULTS:** 108 underwent laparoscopic appendectomy (LA), 166 underwent open appendectomy (OA). Patients in the LA group returned to oral intake earlier (1.9 days vs. 2.7 days;  $p < .05$ ) and had a shorter hospital stay (5.0 days vs. 6.3 days;  $p < .05$ ). However, the rate of the postoperative intra-abdominal inflammatory complication is higher in the LA group (LA; 15/108 [13.9%] vs. OA; 12/166 [7.2%]). Readmission rate was also higher in the LA group (LA; 9/108 [8.3%] vs. OA; 3/166 [1.8%]).

**CONCLUSIONS:** The minimal invasive laparoscopic technique has more advantages compared to open procedure in the hospital stay and cosmetic outcome. But, intra-abdominal inflammatory complication rate and readmission rate were higher in the laparoscopy group. This retrospective study has a limitation to make a clear conclusion; however, we should not ignore this negative result for the fancy laparoscopic technique. Well-designed randomized clinical trial should be performed to clarify this result.

## **P129 DOUBLE DUODENAL STENOSIS: A RARE ENTITY** – *S Tammy Li, MD, Milissa A Mckee, MD MPH, Yale University School of Medicine*

Double duodenal stenosis is an extremely rare condition. This report describes a case of double duodenal stenosis and a review of the literature on this topic.

A term infant with no associated anomalies was prenatally diagnosed with a double bubble. At laparoscopic exploration the patient was found to have a tight stenosis in a preampullary location. The distal segment of duodenum was unremarkable in external appearance. He also underwent Ladd's procedure for malrotation. After repair

the infant had a prolonged period before establishing successful feeding. Contrast studies demonstrated an area of narrowing that was originally interpreted as an anastomotic stricture. Eventually the patient was reexplored. The original anastomotic site was widely patent. Distal to the suture line the patient was found to have a second area of duodenal stenosis approximately 5 cm distal to the first site. Duodenoplasty was performed with excellent results and relief of obstruction.

Double duodenal stenosis is rare but should be considered in patients who do not recover in a timely fashion.



## **P130 THORACOSCOPIC RE-EXPLORATION FOR UNCONTROLLED ANASTOMOTIC LEAK FOLLOWING ESOPHAGEAL ATRESIA REPAIR**

– *Tamara N Fitzgerald, MD PhD, Ruben Rodriguez, MD, Karen A Diefenbach, MD, Milissa A Mckee, MD MPH, Division of Pediatric Surgery, Yale New-Haven Hospital*

**INTRODUCTION:** Anastomotic leak after simple esophageal atresia (EA) repair is common, and usually resolves spontaneously. A more problematic situation is an anastomotic leak that is not controlled by the original chest tube, and is more likely to occur after a difficult case such as in pure EA. An uncontrolled leak must be managed to avoid sepsis. Thoracoscopic re-exploration is proposed as one approach to manage an uncontrolled leak.

**METHODS:** From 2010-2011 two patients with thoracoscopic EA repair for pure esophageal atresia developed a post-operative leak that was uncontrolled by the chest tube that had been placed at the original surgery. These 2 patients underwent thoracoscopic re-exploration for washout and placement of adequate thoracic drainage.

**RESULTS:** Both patients achieved spontaneous closure of the leak, after washout and placement of additional drainage. The initial thoracoscopic approach allowed for thoracoscopic re-intervention at the time the leak was diagnosed, which subsequently provided assurance that the chest was drained adequately. Thus, early re-exploration provided for salvage of a difficult situation, and may have minimized morbidity.

**CONCLUSION:** Early thoracoscopic re-exploration is possible after thoracoscopic EA repair, and may be used to manage an uncontrolled anastomotic leak. Thoracoscopic re-exploration provides excellent visualization of the chest and ensures adequate drainage in a minimally invasive manner. This approach may hasten healing of the anastomosis and allow salvage of a difficult complication while minimizing the morbidity to the patient.



### **P131 CHRONIC AMBULATORY PERITONEAL DIALYSIS: COMPARISON OF LAPAROSCOPIC AND OPEN SURGERY**

*– Burak Tander, MD, Unal Bicakci, MD, Gurkan Genc, MD, Mithat Gunaydin, MD, Ozan Ozkaya, MD, Riza Rizalar, MD, Ender Ariturk, MD, Ferit Bernay, MD, Ondokuz Mayıs University, Department of Pediatric Surgery and Pediatrics, Samsun, Turkey*

**AIM:** The patients with end stage renal failure who had chronic ambulatory peritoneal dialysis (CAPD) have been evaluated and the laparoscopic and open insertion methods are compared.

**PATIENTS & METHODS:** Between January 2002 and September 2010, all patients with CAPD have been evaluated according to age, sex, complications, cause of renal failure, catheter insertion type, presence of peritonitis, catheter survival rate and kt/V ratio. Leakage, catheter obstruction and dermatitis are defined as minor complications. We performed a modified laparoscopic method. We used only two ports, first was an intraumbilical port for the telescope, the other for the instrument, as well as for the dialysis catheter. We put the dialysis catheter into the retrovesical space under direct vision through the instrument port. The omentectomy was performed through the telescope port with assistance of an optic forceps used in bronchoscopy for the foreign body removal.

**RESULTS:** There were 39 patients (22 F, 17 M) with a median age of 14 years. The etiology of renal failure was urologic conditions in 6 patients, nephrologic conditions in 17 and unknown in 16 cases. Thirty patients underwent an open approach and in 9 patients we inserted the catheter laparoscopically. We have encountered peritonitis in 26 patients (23 in open surgery, 3 in laparoscopic surgery). Rate of the peritonitis was significantly less in patients with laparoscopic approach. Patients with peritonitis were significantly younger than those who had no attack of peritonitis (Mean 12.7 vs 16.7 years). No significant difference has been found between the open and laparoscopic approaches according to development of other minor complications (7 in open, 3 in laparoscopic methods). Catheter survival rate for the first year was 95%, and for the five years 87.5%. The mean kt/V which indicates the effectiveness of peritoneal dialysis was 2.3±0.6. No difference was found between laparoscopic and open approach according to kt/V.

**CONCLUSION:** Peritonitis is the most common complication of CAPD. However, the overall complication rate is low. Catheter survival rate was excellent both in open and laparoscopic surgery groups. Laparoscopic method for the CAPD is safe, effective, cosmetically superior and it has significantly less peritonitis.

### **P132 DIFFERENT SURGICAL APPROACHES FOR LAPAROENDOSCOPIC SINGLE-SITE NEPHROURETERECTOMY IN PEDIATRIC PATIENTS OF ALL AGE GROUPS**

*– Tobias Luthle, MD, Philipp Szavay, MD, Jörg Fuchs, MD, Department of Pediatric Surgery and Pediatric Urology, University Children's Hospital, Tuebingen, Germany*

**OBJECTIVES:** Laparoendoscopic single-site surgery (LESS) for pediatric urological pathology is increasingly used replacing laparoscopic procedures. However, single port devices are not available in sizes appropriate for small children. In addition those devices are commonly disposable and therefore expensive. Aim of our investigation was to assess different surgical approaches for laparoendoscopic single-site surgery nephroureterectomy in pediatric patients according to weight groups, using mainly conventional laparoscopic instruments.

**METHODS:** Since March 2010 LESS nephroureterectomy was performed in 8 children. Indication for nephrectomy was a non functioning kidney due to vesicoureteral reflux in 5 cases and giant cystic dysplasia in 3 patients. Children weighing below 10 kg underwent LESS nephroureterectomy through an umbilical incision using one 5 mm and two 3 mm trocars in the "Manhattan-technique". Patients above 10 kg were operated on using a metal multi-use single-site single port (X-cone, Karl Storz Endoskope, Tuttlingen, Germany) with different diameters for instruments ranging from 3-12.5mm. Dissection of renal vessels was performed using harmonic scalpel or clip-ligation. All ureters were dissected after ligation with a PDS-endoloop (Ethicon).

**RESULTS:** Median age at operation was 7 months (7-54). Median weight at operation was 8.6 kg (3.1-13.9). Median operating time was 115 minutes (75-165). 6 children underwent LESS nephroureterectomy using one 5 mm and two 3 mm trocars, and 2 patients were operated on with the x-cone. All operations were carried out in a standard laparoscopic transperitoneal technique without the use of additional trocars. In none of the patients a complication was noticed. Recovery was uneventful in all children.

**CONCLUSIONS:** LESS nephroureterectomy for pediatric patients can be done safely and efficiently with even less trauma than in conventional laparoscopy, irrespective of age and weight. However, different surgical approaches have to be considered since single-site ports are not available for small children and infants. We preferred to use conventional multi-use trocars or a multi-use single-site single port, respectively mainly for economical reasons. However both tools will benefit from future technical development of instruments and trocars more suitable for small children.

### **P133 LAPAROSCOPIC ASSISTED PYELOPLASTY IN SMALL INFANTS**

*– Mustafa Kucukaydin, Prof. Ahmet B Dogan, MD, Kadri C Sulubulut, MD, Ali Aslan, MD, Ozlem Yandim, MD, Department of Pediatric Surgery, Erciyes University, School of Medicine Kayseri/Turkey*

**BACKGROUND & AIM:** Pediatric urologic operations that can now be regularly performed using the minimally invasive surgery (MIS). One of the procedures is laparoscopic dismembered pyeloplasty (LP) for hydronephrotic kidney with ureteropelvic junction (UPJ) obstruction. LP is very difficult for small infant. Laparoscopic assisted pyeloplasty (LAP) is an innovative alternative MIS. In this study, we want to present our experiences with LAP in the small infants.

**MATERIAL & METHODS:** Between December 2008 and May 2011, 40 small infants underwent LAP. The babies (28 male, 12 female) were in the age

range of 8 days to 60 days (mean 35 days). The UPJ obstructions were left sided in 24 cases (60%), right sided in 13(33%) and bilateral in 3 (7%). All of the patients were detected to have UPJ obstruction during the antenatal evaluation. Using a 3/ 4 mm camera and two 3 mm working ports, UPJ was mobilized by a transperitoneal laparoscopic technique. The UPJ was brought out with a sling through a tiny flank incision and a standard dismembered pyeloplasty was performed over a double J stent.

RESULTS: Mean operative time was 60 minutes (range, 50–90 minutes). Incision was smaller than 1, 5 cm in all, and the average postoperative hospital stay was 4 days (range, 3-6 days). Follow-up ranging from 3 to 24 months showed reduction in hydronephrosis and improvement in renal function of all the operated units.

CONCLUSION: Laparoscopic assisted pyeloplasty is especially recommended in small babies where laparoscopic pyeloplasty is difficult.

**P134 EFFICACY OF ENDOSCOPIC HYALURONIC ACID/ DEXTRANOMER GEL IMPLANTATION AS FIRST LINE TREATMENT OF VESICoureTERAL REFLUX (VUR) IN CHILDREN - SINGLE CENTER EXPERIENCE** – *Frank-martin Haecker, MD, Sergio Sesia, MD, Martina Frech, MD, Maja Von Rotz, Christoph Rudin, MD, Department of Pediatric Surgery, University Children's Hospital, Basle*

OBJECTIVE: To analyse the effectiveness and the success rate of endoscopic treatment (ET) using Dx/HA for primary vesico-ureteral reflux (VUR) in children, and to assess the incidence of postoperative urinary tract infections (UTIs).

METHODS: We retrospectively reviewed charts of 135 children with VUR grade II-V, who underwent ET, including children with additional urogenital malformations. Outcome was verified with voiding cystourethrography (VCUG) and periodical urinalysis.

RESULTS: 135 children with a total of 223 ureters underwent ET. 85 patients presented bilateral VUR. Additional malformations were: duplex ureters (28 patients), PUV (16 patients), diverticulum (6 patients), neurogenic bladder (2 patients) and ectopic orifice. VUR grade was II in 66, III in 92, IV in 58 and V in 7 ureters, respectively. Postoperative VCUG demonstrated no VUR in 186 ureters (83%) and diminished VUR grade in additional 19 ureters (total 92%). After a second ET, VCUG was negative in 29 ureters. The overall success rate was 99%. 40 patients have had more than 3 febrile and 89 patients showed 1-3 febrile UTIs before ET. 4/135 patients (2.9%) had 1 febrile UTI within the first year of follow-up. Serious complications of ET were not noted. All patients were treated on an outpatient basis.

CONCLUSION: ET is effective in eliminating VUR, even in high-grade reflux, as well as in patients suffering from VUR with additional malformations. Early intervention may reduce the incidence of UTIs and prevent long-term renal damage. Additionally, ET is more cost-effective than open reimplantation.

**P135 SINGLE-TROCAR RETROPERITONEOSCOPIC NEPHRECTOMY IN CHILDREN** – *Nguyen Thanh Liem, MD, PhD, Le Anh Dung, MD, Nguyen Duy Viet, MD, National Hospital of Pediatrics*

PURPOSE: To present technique and outcomes of single-trocar retroperitoneoscopic nephrectomy in children

METHODS: The patient was placed in a lateral decubitus position. A skin incision of 11 mm width was made above the iliac crest. The operation was performed through a single trocar with an operating laparoscope. CO<sub>2</sub> pressure was maintained between 12-14 mmHg. The kidney was identified. The renal vessels and ureter were dissected and clipped. Dissection was carried out around the kidney to separate the kidney from surrounding tissue. The renal vessels and ureter were divided. The kidney was withdrawn through the trocar incision.

RESULT: From April 2010 to July 2011, single trocar retroperitoneoscopic nephrectomy was performed in 9 children including 5 patients with ectopic and malfunctional kidney and 4 patients with multicystic dysplastic kidney. Patient's ages ranged from 2 years to 13 years old. The mean operative time was 62±13 minutes. There were no intraoperative or postoperative complications. Mean postoperative hospital stay was 24 hours.

CONCLUSION: The single-trocar nephrectomy is a feasible and safe procedure for children with ectopic and malfunctional kidneys and multicystic dysplastic kidneys.

**P136 SINGLE TROCAR RETROPERITONEOSCOPIC ASSISTED IPSILATERAL URETEROURETEROSTOMY FOR URETERAL DUPLICATION** – *Nguyen Thanh Liem, MD, PhD, Le Anh Dung, MD, Nguyen Duy Viet, MD, National Hospital of Pediatrics*

AIM: To present a technique and early outcomes of single trocar retroperitoneoscopic assisted ureteroureterostomy for ureteral duplication.

METHODS: All patients were placed in a lateral decubitus position. A skin incision of 10mm width was made above the iliac crest. The operation was performed through single trocar with operating laparoscope. The two ureters were encircled with a vessel loop and exteriorized outside the retroperitoneal space via trocar incision. The pathologic ureter was divided as low as possible. The recipient ureter was opened longitudinally. End-to-side ureteroureterostomy anastomosis was performed extracorporeally with two running 6/0 PDS sutures.

RESULTS: From December 2010 to July 2011, 9 patients were operated on using the same technique. Patients' ages ranged from 2 months to 72 months. Mean operative time was 78±21 minutes. There were no intra or postoperative complications. Postoperative stay was 2.6 ± 1.0 days. Follow-up revealed two renal moieties with preserved function in all patients. The diameter of involved ureters and pelvices was significantly reduced in all patients.

CONCLUSION: One trocar retroperitoneoscopic assisted uretero-ureterostomy is a safe and effective procedure for ureteral duplication.

**P137 REVIEW OF ANTIREFLUX PROCEDURES IN THE TREATMENT OF PRIMARY VESICoureTERAL REFLUX FROM 1958 TO 2008** – *Bozidar Zupancic, Prof, Stjepan Visnjic, Mislav Bastic, Zoran Bahtijarevic, Fran Stampalija, Vera Zupancic, Anto Pajic, Sonja Krofak, Clinical Hospital Center "Sestre Milosrdnice", Department of Pediatric Surgery*

AIM: We aim to present our experience in the treatment of primary vesicoureteral reflux using different operative and endoscopic techniques based on 50 years of clinical experience.

METHODS: We have performed 2514 antireflux plastic procedures on 2018 children between 1958 and 2008. The age of patients ranged from 1 month to 15 years, median age was 3,5 years. Different open surgical techniques were performed (Bischoff, Paquin-Williams, Politano-Leadbetter, antireflux ureterovesicoplasty on the vertex of the bladder (AUVB) and Lich-Gregoir). In 2003 we started using the endoscopic procedure with subostial Deflux instillation. We treated 345 children (228 girls and 117 boys) using this method. Final assessment of our results was performed two years after the procedure based on a complete urological work up, rated as satisfactory or unsatisfactory.

RESULTS: In the period of first 14 years (1958-1972) we performed mainly antireflux procedures according to Bischoff, Paquin-Williams and Politano-Leadbetter on a relatively small number of patients – approximately 14 procedures per year. From 1973 to 2008 the majority of open antireflux

procedures were the AUVB method – approximately 71 antireflux plastics per year and Lich-Gregoir's procedure – 56 antireflux procedures per year in average. In the first series of patients with VUR grades 2 to 4, the Bischoff operation showed unsatisfactory results in 30 %, Paquin-Williams procedure in 50 % and the Politano-Leadbetter technique in 10 %. The operative failure rate in 1461 AUVBs was 6,5 % and in 909 Lich-Gregoir procedures was 4 %. Using the endoscopic procedure, after the first instillation the success rate was 74%, after the second 27% and after the third 64%. Overall failure rate was 9%.

**CONCLUSION:** The method of choice for the treatment of VUR is endoscopic instillation of Deflux which may be performed in almost all cases and all grades of VUR. Hospital stay was reduced drastically to an average of two days. Complication rate is kept low and success rate fairly high. When endoscopic treatment does not suffice, our open surgical procedure of choice is the Lich-Gregoir procedure. If the result of Lich-Gregoir operation was unsatisfactory we recommend the AUVB as the first and second recurrence operation. After all, in case of the repeated VUR recurrence or the postoperative stenosis, as the last operation we perform the antireflux ureteroileocystoplasty.

### **P138 ENDOUROLOGIC APPROACH TO NEUROGENIC BLADDER**

– *Rosa M Romero, MD, Susana Rivas, MD, Alberto Parente, MD, Ana Tardáguila, MD, Jose M Angulo, MD, Pediatric Urology Unit, Pediatric Surgery Department, Hospital Universitario Gregorio Marañón.*

**AIM:** Present our results in minimally invasive management of neurogenic bladder dysfunction based on repeated intradetrusor injection of botulin A toxin (D-BTXA), periurethral injection of bulking agents (PUIBA) and endoscopic treatment of vesicoureteral reflux (STING) when needed.

**METHODS:** We retrospectively reviewed the clinical records an urodynamic studies of children treated with this therapy, combined or isolated. A total of 22 patients with neurogenic bladder dysfunction, non-responders to classical therapy with anticholinergics and clean intermittent catheterization were included for the study. Mean age at first endourologic treatment was 13,4 years (5 – 17,8). Sixteen patients had overactive non-compliant bladder and were treated with repeated-BTXA. Among them 6 patients required PUIBA (Macroplastique™ or Deflux™) and 5 STING (Deflux™). Bladder capacity increased and maximum detrusor pressure was successfully treated with repeated D-BTXA in 13 of 16 cases. Urinary continence in patients treated with BTX-A and PUIBA improved in all cases, and in 5 complete dryness was obtained between catheterization. Vesicoureteral reflux was successfully treated in all cases. In six children, with good bladder compliance and capacity, and incontinence despite proper treatment, PUIBA was performed, and in three of this patients STING was also performed. In those patients treated with PUIBA complete dryness was reached only in half, but improvement in continence was noted in all. Vesicoureteral reflux persisted in 2 of the children treated with combination PUIBA and STING.

**CONCLUSIONS:** Minimally approach to neurogenic bladder in children is feasible and can avoid or at least delay high morbidity surgical procedures.

### **P139 TRANSCROTAL APPROACH ORCHIOPEXY WITH SINGLE-PORT LAPAROSCOPIC GUIDANCE**

– *Suolin Li, MD, Yazhen Ma, MD, Zengwen Yu, MD, Department of Pediatric Surgery, 2nd Hospital of Hebei Medical University*

**OBJECTIVE** To investigate the feasibility and efficacy of transcrotal approach orchiopexy for inguinal cryptorchidism under single-port laparoscopic vision through the umbilicus.

**METHODS** From August 2010 to May 2011, 25 children with 30 undescended testes in the inguinal canal were underwent transcrotal access orchiopexy followed by laparoscopy. The patients with high intra-

abdominal testes or palpable testes beyond the external inguinal ring were excluded. After the laparoscope was introduced into the abdominal cavity, the inguinal area was observed and the testicular position was identified. A transverse incision was made on the scrotum, and then a tissue forceps was inserted into the inguinal canal or abdominal cavity through the scrotum and the external ring. Under the laparoscopic vision, the testis was grasped and pulled through extracorporeally. The processus vaginalis was separated off the cord structure to release the testis from cephalad retraction, and then the testis was fixed within the dartos pouch. Finally, under laparoscopic guidance, the patent processus vaginalis was closed extracorporeally by a nonabsorbable suture, which was introduced into the abdomen by an 16-gauge homemade hooked injection needle access on one side of the internal ring and withdrawn on the opposite side by the same hooked needle through a stab port.

**RESULTS** All 30 testes were successfully descended transcrotal access under laparoscopic guidance. The operative time was 30-90 minutes. There were no intraoperative complications. All of the testes maintained an adequate size and intrascrotal position with no atrophy or recurrent inguinal hernia during a follow-up of 3 to 12 months.

**CONCLUSIONS** Transcrotal endoinguinal pull-through orchiopexy with simple laparoscopic guidance is a safe, effective and feasible procedure. It offers excellent cosmetic outcomes.

### **P140 LONG-TERM RESULTS OF ENDOUROLOGICAL MANAGEMENT OF URETEROPELVIC JUNCTION OBSTRUCTION WITH BALLOON DILATATION IN INFANTS**

– *Alberto Parente, José María Angulo, Rosa María Romero, Susana Rivas, Hospital Gregorio Marañón, Madrid, Spain*

**AIM:** Minimally invasive techniques for the treatment of pyeloureteral junction obstruction in children had spread. We show our experience in retrograde dilatation with high pressure balloon in infants.

**METHODS:** It's a retrospective study of 21 under 1 year of age infants treated in our hospital. The average follow-up after intervention is 42.4±15.2 months. The diagnostic protocol included abdominal ultrasound, cystogram and diuretic renography. The treatment was realized by endourology retrograde balloon dilatation under fluoroscopy. The balloons were in all the cases semicompliant, with a profile of 5 mm, 6 mm ó 7 mm. After the dilatation stents type double J were placed, caliber and length was chosen depending on the weight of the patient.

**RESULTS:** The mean duration of the intervention was 36.4±15.5 minutes. In 2 patients dilatation wasn't possible and they needed pyeloplasty. Length of hospital stay was 24 hours in all the patients except one. The analgesic needs were exclusively non steroid antiinflammatories. The double J stent was withdrawn with cystoscopy. We had 3 complications: a migration of the stent, a urinary infection and an urinoma. In the controls the disappearance of the hydronephrosis was observed in all cases. The diuretic renography improved in all babies, being the shape of the curve normal in 17 cases and semi obstructive in 2. The average of elimination halftime was 9.8±2.8 minutes.

**CONCLUSIONS:** Balloon dilatation of pyeloureteral junction obstruction is a minimally invasive technique that is suitable in infants with good results and low complication rate.

### **P141 COMPARATIVE EVALUATION OF THE RESULTS OF SURGICAL TREATMENT OF CRYPTORCHISM IN CHILDREN**

– *Damir B Dzhenaev, MD, Omar A Mamlin, MD, Yesmurat K Nartbayev, Yerbol A Mussin, MBA, National Research Centre for Mother and Child Health*

Cryptorchism - one of the most common disorders in childhood for boys, which is accompanied by spermatopoietic and hormonal function disturbances of testes and requires early surgical correction. Orhipeksya,

especially in case of abdominal form, is technically difficult and traumatic. In this regard, the endovideosurgery methods are increasingly used for correction of cryptorchism in recent decades. The purpose of this study was a comparative evaluation the results of treatment of children with cryptorchism, operated by "open" and endovideosurgical ways. Since August 2007, 49 patients with various forms of cryptorchism have been treated in the urology department of National Research Center for Mother and Child Health. Age of patients ranged from one year to 14 years. Endovideosurgery has been applied in the treatment of 32 patients (study group). The operation consisted of the following steps: diagnostic laparoscopy in order to clarify the level of retention, visual evaluation of the testis, its blood vessels and the fixing apparatus, the intersection Gunter's cord, the mobilization of the vascular bundle and ductus deferens, forming a channel from the abdomen into the scrotum, bringing down the testis and fixation it in the scrotum. The "open" brining down and fixation of the testis by Petrivalskij-Schumaker has been performed in 17 patients (control group). For comparative assessment of body's postaggressive response to laparoscopic and traditional types of operations for cryptorchism we studied: the state of simpaticoadrenal system (in circadian excretion of adrenaline and noradrenaline) and several biochemical blood parameters, reflecting the functional state of the suprarenal glands and liver, the balance of carbohydrate and protein metabolism. To assess the state of the testis we conducted ultrasound and Doppler exams of gonads in the preoperative period, on the 3rd and 6 month of postoperative period. There were no complications in the immediate and late postoperative period. The analysis of the comparative evaluation of body's postaggressive response to laparoscopic and traditional operations has showed that laparoscopic surgery is less invasive, less traumatic, less durable surgical intervention, which is characterized to have more favorable postoperative period. More expressive positive dynamics, concluded in the growth of gonads and the normalization of blood flow parameters while ultrasound and Doppler study, has been in patients undergone endovideosurgical interventions. Thus, this study shows clear advantages of endovideosurgical treatment of cryptorchism in children and calls for their widespread introduction into clinical practice.

## **P142 SINGLE-STAGE LAPAROSCOPIC ORCHIDOPEXY FOR INTRA-ABDOMINAL TESTIS IN CHILDREN UNDER 2 YEARS OLD**

– *Flurim Hamitaga, MD, Mario Mendoza-sagaon, MD, Rudolf Leuthardt, MD, Ospedale Regionale di Bellinzona e Valli*

**PURPOSE:** Approximately 20 percent of non-palpable testes are intra-abdominal. In recent years the laparoscopic orchidopexy have been reported to offer excellent results. However, controversy still exist regarding the ideal age of the child for the surgery and if the single-stage orchidopexy is better than the two-stage orchidopexy. Therefore, we decided to review the results of all patients in our institution who underwent a laparoscopic orchidopexy for intra-abdominal testes within the first two years of life.

**MATERIALS & METHODS:** The files of all children within the first two years of life who were operated with a laparoscopic orchidopexy for intra-abdominal testes were analyzed. Patients older than two years and those with intracanalicular testes were excluded from the study. The technique consists of mobilization of the spermatic vessels and the vas deferens from the peritoneum, sectioning the gubernaculum. The stretching test was performed before descending the testicles into the scrotum to evaluate the length of the spermatic cord. In all cases we fixed the testes to the scrotum with 3 stitches of nonabsorbable suture.

**RESULTS:** From January 2005 to May 2011, we performed single-stage laparoscopic orchidopexy on 21 children under two years of life with intra-abdominal testes. The intra-abdominal testis were right-sided in

10 patients, and left-sided in 11 patients. In 4 patients a contralateral classic open orchidopexy for ectopic inguinal testis was performed. Four patients had an hypotrophic testicle seen during the procedure. No surgical complications were recorded. No postoperative testicular atrophy was recorded. Follow-up goes from 6 months to 6 years.

**CONCLUSIONS:** Single-stage laparoscopic orchidopexy for intra-abdominal testis in children under 2 years of life is a safe and feasible procedure and offers good results. The stretching test of the testicle allows to determine if a single-stage laparoscopic orchidopexy could be performed.

## **P143 LAPAROSCOPIC UPPER POLE AND LOWER POLE HEMINEPHRECTOMY IS SAFE IN INFANTS FOR BENIGN RENAL DISEASES**

– *Devendra C Joshi, MD, Miguel Castellan, MD, Rafael Gosalbez, MD, Andrew Labbie, MD, Jackson Memorial Hospital, Pediatric Urology, Miami, USA, Miami Children's Hospital, Pediatric Urology, Miami, USA*

**INTRODUCTION:** Growing evidence suggests that laparoscopic surgery can be successfully performed in pediatric population. The purpose of this study was to review and report our experience with laparoscopic heminephrectomy in patients less than 1 year of age.

**MATERIAL & METHODS:** A total of 28 unilateral laparoscopic heminephrectomies for non-functioning duplicated renal moiety were performed. The age of the patients ranged from 145 days - <12 months and the group included 21 girls and 7 boys. Upper pole heminephrectomy was performed in 26 patients and 2 patients underwent lower pole heminephrectomy. The pathology for the non-functioning renal moiety included ectopic ureteral insertion in 14 patients (50%), ureterocele in 12 patients (42%) and high-grade vesico-ureteral reflux into lower pole in 2 patients (8%). The initial approach was transperitoneal in 25 patients while 3 patients were started with retroperitoneal approach. Concomitant ancillary procedures were performed in 14 patients (50%) including 3 open procedures.

**RESULTS:** All procedures were completed laparoscopically. Two procedures started were started with retroperitoneal approach but were completed transperitoneally due to development of pneumoperitoneum. The mean operative time was 135 minutes (95-300 min) with longer duration observed in patients who also had ancillary procedure performed. The average blood loss was 10 ml. and feeds were resumed within 24 hours in all patients. Complications were observed in 4 patients (14%). One patient (3%) had intraoperative pneumothorax, managed with chest tube drainage. Two patients (6%) had postoperative collection that was managed conservatively. One patient (3%) developed hypertension following an upper pole excision requiring anti-hypertensives. The mean duration of hospital stay was 2.3 days.

**CONCLUSIONS:** Laparoscopic procedures can be safely performed for benign renal disease in infants with minimal morbidity. Transperitoneal approach is the preferable due to limited retroperitoneal space. Complications rates are low and other open procedures can be easily performed concomitantly with good results.

## **P144 GOING SOLO: TELESCOPE HOLDER TO FACILITATE SUTURING IN LAPAROSCOPIC PYELOPLASTY**

– *Fiona J Murphy, MRCS, Supul Hennayake, FRCS, Royal Manchester Children's Hospital*

We report the use of a telescope holder to facilitate suturing in laparoscopic pyeloplasty

**METHODS:** We retrospectively reviewed all cases of laparoscopic pyeloplasty between Oct 2005 and Sept 2010. We introduced a telescope holder in 2008 and collected data on patient demographics and operative time both pre and post telescope holder.

**RESULTS:** There were 35 cases M=27, left sided=22, 6 had crossing

vessels. Pre 2008 there were 11 cases with an operative time of 155 mins. In 2008 there were 11 cases with an operative time of 98 mins. Post 2008 there were 13 cases with an operative time of 90 mins.

**CONCLUSIONS:** The use of a telescope holder in laparoscopic pyeloplasty has reduced operative time by 41%. It benefits the surgeon by providing a stable operative field and prevents the surgeon from bumping into the assistant. It benefits the assistant by leaving them free to study the operation, to assist with double J stent insertion and means that they are not too tired to undertake suturing!

**P145 LAPAROSCOPIC TREATMENT IN PEDIATRIC UROLOGY –**  
*Damir B Djenaliev, MD, Omar A Mamlin, MD, Yesmurat K Nartbaev, Yerbol A Mussin, MBA, National Research Center for Mother and Child Health (Astana, Kazakhstan)*

One of the most significant achievements in modern pediatric surgery in the past decades is the widespread introduction of laparoscopic surgery into clinical practice. At present, for many diseases, this method has become an alternative to traditional surgical intervention, and in some cases even become the method of choice. One of the most promising directions in pediatric surgery is now laparoscopic urology. In the urology department of JSC "NRCMCH" 138 endovideosurgical interventions have been performed in children with urological pathology since August 2007. Laparoscopic surgery for left-side idiopathic varicocele. Since August 2007, 86 patients with idiopathic left-side, II - III degree varicocele have been treated using endovideosurgery in the urology department of National Research Center of Mother and Child Health. Laparoscopic surgery has been performed by Ivanishevich in 60 patients, by Palomo -26. Patients got up and moved freely on the day of surgery. There were no complications or recurrences of disease in our cases. Laparoscopic surgery for cryptorchism. Since August 2007, 32 patients with various forms of cryptorchism have been treated using endovideosurgery in the urology department of National Research Center of Mother and Child Health. The operation consisted of the following steps: diagnostic laparoscopy in order to clarify the level of retention, visual evaluation of the testis, its blood vessels and the fixing apparatus, the intersection Gunter's cord, the mobilization of the vascular bundle and ductus deferens, forming a channel from the abdomen into the scrotum, bringing down the testis and fixation it in the scrotum. Ultrasound and Doppler monitoring showed positive dynamics expressed in the growth of gonads and the normalization of blood flow parameters. Laparoscopic nephrectomy has been performed in 14 patients with the terminal stage of hydronephrosis, and 4 - with right-side multikistosis. We used abdominal access with mobilization of the descending colon. There were no intra- and postoperative complications in our cases. Laparoscopic surgery for urolithiasis. Laparoscopy has been successfully been applied in 2 patients with urolithiasis. In the first patient with a stone in the middle third of right ureter, after opening the peritoneum the laparoscopic ureterolithotomy was performed; in the second patient after unsuccessful attempts to remove the bladder stone using the ureterocystoscope and Dormy's baskets, the 5 m trocar was inserted under vision control of cystoscope and concrement was removed by the aid of a firm forceps. Analysis of the literature and our little experience allows us to consider confidently that in modern pediatric urology there is a definite trend of gradual transformation of surgery to minimally invasive, which endoscopic surgery is.

**P146 LAPAROSCOPIC RADICAL NEPHRECTOMY FOR THE MANAGEMENT OF CHROMOPHOBE RENAL CELL CARCINOMA IN A CHILD –**  
*Masataka Takahashi, MD, Tetsuya Ishimaru, MD, Yutaka Kanamori, PhD, Makoto Komura, PhD, Masahiko Sugiyama, PhD, Kan Terawaki, PhD, Kan Suzuki, PhD, Eriko Fukami, MD, Tadashi Iwanaka, PhD, Department of Pediatric Surgery, The University of Tokyo Hospital*

**BACKGROUND:** In recent years, tumor removal using endosurgical procedures has been commonly performed at our institution for

cases showing tumor shrinkage and localization after postbiopsy chemotherapy. Laparoscopic nephrectomy is a standard procedure for the treatment of renal cell carcinoma (RCC) in adult patients, and there is conclusive evidence showing that the long-term cancer control afforded by this procedure is similar to that afforded by open surgical procedures and procedures for postinfection conditions and other benign kidney disorders. However, the standard therapeutic approach for renal cancer in children is open surgery, and the role of laparoscopy is still unclear. Here, we present a pediatric case of chromophobe RCC that was managed by performing planned laparoscopic radical nephrectomy.

**CASE REPORT:** A 13-year-old girl presented with right flank pain and hematuria. Computed tomography scans revealed a tumor, measuring 40 mm x 40 mm and showing 3 nodules metastasizing to the liver, in her right kidney. She underwent laparoscopic right radical nephrectomy. The patient was placed in a 45° left lateral position. A 12-mm port for a camera was inserted through the umbilicus using the open Hassan method, and a couple of 5-mm ports were placed to form an isosceles triangle in the right subcostal arch. An additional 12-mm port was inserted at a suprapubic position. Mobilization of the ascending colon and duodenum was performed, which allowed identification of the inferior vena cava (IVC) and aorta. The anterior surface of the IVC and the aorta was cleared of overlying lymphatic and adventitial tissue up to the level of the renal vein. The ureter and gonadal vein were identified and dissected. Lymph nodes located around the renal vessels and between the IVC and the abdominal aorta were dissected and removed. First, the right renal vein was divided with a vascular stapler. Next, blood flow in the right renal artery was controlled with two 5-mm clips, and the artery was divided. Then, the right kidney was mobilized. The specimen was inserted in a bag and retrieved through a suprapubic incision. The operation time was approximately 4.5 hours. The estimated blood loss was 250 mL, and no blood transfusion was required. After pathological analysis, the tumor was diagnosed as a rare chromophobe RCC. Soon after the operation, radiofrequency ablation was performed for the metastatic liver tumor sites. Since then, the patient has been receiving treatment with sunitinib.

**CONCLUSIONS:** In pediatric renal cancer cases affording good surgical views of the main tumor and large vessels, laparoscopic radical nephrectomy is feasible and is an excellent option. The laparoscopic approach not only improves the convalescence, pain, hospital stay, and cosmetic outcome, but also allows early planned postoperative treatment. However, long-term follow-up is necessary to evaluate the results of the laparoscopic approach.

**P147 USE OF ENERGY DEVICES FOR THE MANAGEMENT OF RENAL VESSELS IN PEDIATRIC MINIMALLY INVASIVE SURGERY (MIS) –**  
*B. Sivan, MD, W. R Defoor, MD, P. P Reddy, MD, E. A Minevich, MD, S. Alam, MD, P. H Noh, Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio*

**PURPOSE:** Minimally invasive renal surgery has become more widely utilized in pediatric patients in recent years. The optimal intra-operative management of the renal vessels in these cases has not been established. The use of a laparoscopic stapler device in pediatric patients can be cumbersome, especially in cases of partial nephrectomy. Control of blood vessels with energy based devices such as Ligasure® and Enseal® is FDA approved for vessels up to 7 mm in size. We present our experience with the use of energy devices during MIS for the control of the renal hilum vessels.

**MATERIAL & METHODS:** A retrospective cohort study of pediatric patients who underwent MIS, including nephrectomies and partial nephrectomies, was performed. Patient demographics, preoperative diagnosis, intra-operative details, and surgical outcomes were abstracted from the medical record. A Ligasure® or Enseal® laparoscopic

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device was used to control the renal blood vessels. Hemostasis was verified visually while the device was used and again prior to removing the ports at the end of the case.

**RESULTS:** Between April 2009 and July 2011, fifteen patients (10 male, 5 female) were identified that met the inclusion criteria. The median age was 5 years (range: 2 months – 11 years). Median follow-up was 11 months (range: 1 – 28). Nine left and six right-sided procedures were performed. No intra-operative bleeding related to the hilar vessel control occurred and no late bleeding was encountered.

**CONCLUSIONS:** Control of the renal vessels using energy devices, during pediatric minimally invasive renal surgery is a safe and effective technique. Intra-operative confirmation of hemostasis can be observed immediately and no late bleeding using this technique was encountered in this cohort. Further evaluation of this technique is warranted.

**P148 TWO-STAGE FOWLER STEPHENS ORCHIDOPEXY FOR INTRAABDOMINAL TESTES** – *Haluk Emir, Prof MD, Senol Emre, MD, Ozcan Rahsan, MD, Ahmet Alptekin, MD, Mehmet Elicevik, Assoc Prof MD, Sn Cenk Buyukunal, Prof MD, Yunus Soylet, Prof MD, Cerrahpasa Medical Faculty, Department of Pediatric Surgery, Division of Pediatric Urology, Istanbul University*

**AIM:** To evaluate the clinical outcomes of patients who underwent two-stage Fowler-Stephens (TSFS) procedure for intra-abdominal testis retroscopically

**PATIENTS & METHOD:** The medical records of 39 children (Mean age: 64 months, range: 11 months - 11 years) who underwent TSFS procedure between 1992-2010 were analyzed retrospectively. According to laparoscopic exploration findings, one stage or TSFS procedure was decided to perform. On the second stage, if there was no atrophic testis, an orchidopexy was performed either by a standart open surgical procedure or laparoscopically. The testis is mobilized to the scrotum on ductus deferens with a peritoneal flap which contains the collateral vessels. The follow-up period ranges between 3 months and 16 years (mean: 5.7 years).

**RESULTS:** TSFS procedure was performed for 48 intraabdominal testes in 39 patients (Right: 16, left: 14, bilateral: 9). The mean interval between the two stages was 7.3 months (r: 3 - 13 months). Three testes were recorded as a small testis in the first laparoscopic evaluation. In the second stage, orchietomy was indicated for testicular atrophy in 2 testes (4%), including the one which was defined as a small testis at the first stage. Orchidopexy was performed in the other 46 testes by standart open surgical procedure in 30 and laparoscopically in 16. One testis can be mobilized to the distal inguinal canal and the other 45 testes was located in the scrotum uneventfully except one with a pedicle injury during laparoscopic surgery. Of these 45 testes on the follow-up, 40 were palpable in the scrotum and testicular atrophy developed in the 5 testes. One of which was noted as small testis on second stage. Two atrophy developed after open surgical and other 2 after laparoscopic 2. stage operation. Overall success rate of TSFS orchidopexy was 83% (40/48).

**CONCLUSION:** Two stage Fowler - Stephens orchidopexy is an effective treatment modality for intraabdominal testes. Laparoscopic procedure can succesfully be used for both stage. Although mean 5.7 years macroscopic followup results seem satisfactory, long term follwup is needed for functional results.

**P149 INTRAVESIAL INJECTION OF BOTOLINUM TOXIN A IN CHILDREN** – *Christa Schimke, MD, Mircia Ardelean, MD, Günther Schimpf, Prof, Salzburger Landeskliniken, Department of Pediatric Surgery, Paracelsus Medical University*

**BACKGROUND:** Failure of conservative treatment of neurogenic bladder dysfunction in children and concerns about possible complications after

augmentation-cystoplastic or detrusorotomy initiated the introduction of intravesical Botolinum toxin A (BTA) injection in the pediatric population, which first was reported in adults in 2000, by Schurch and coworkers. In the ESPU-guidelines of 2006 injection of Botolinum toxin in therapy-resistant bladders is reported to be an effective and safe treatment alternative (level of evidence: 3).

**METHODS:** Within the last 4 years we performed in our institution 28 injections in 14 children to treat detrusor overactivity not responding to anticholinergic therapy and to improve persistent urinary incontinence inspite intermittent catheterization. As underlying pathology and reason for incontinence and high pressure bladders are summerized myelomeningoceles (11), cloacal anomalies (1), congenital tetraspacity (1), sacral teratoma (1), and arthrogryposis multiplex (1).

The injected amount of Botox was calculated at each session ranging from 6-10 IU/kg and the maximum dosage being 300 IU. BTA was diluted in saline at a ratio of 100 IU/10-20ml, depending on the size of the bladder. In cases with concomitant vesicoureteral reflux defluxinjection of the refluxing orifice has been performed at the same time. 3 patients with sphincter incompetence received an additional Defluxinjection in the bladder neck.

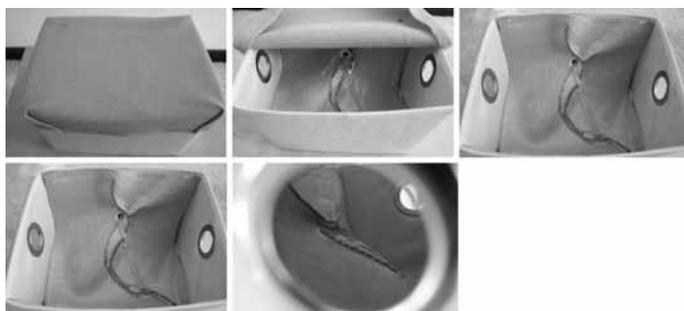
**RESULTS:** The therapeutic efficiency has been assessed by clinical history of bladder emptying (Maximum catheterized volume), continence protocols and comparison of videourodynamic parameters befor, 3 and 12 month after injection therapy. Significant improvements have been achieved in 8, 5 patients are completely dry, 2 required bladder augmentation, all of the responders needed repeated injections to stabilize the outcome.

**CONCLUSION:** Intravesical Injection of Botolinum toxin A has been included in the therapeutic spectrum of neurogenic bladder dysfunction as transient, non-invasive treatment option. Stiff bladders without an active component and cystoscopically verified severe trabeculation are unlikely to respond to botulinum toxin. Currently it is unclear how many times this treatment can be repeated. No adverse affects have been detected nor described.

**P150 DEVELOPMENT OF A SURGICAL SIMULATOR MODEL FOR PEDIATRIC LAPAROSCOPIC INGUINAL HERNIA REPAIR** – *Arielle Kanfers, BA BS, Gabriel Gabarain, BS, Todd Ponsky, MD, Case Western Reserve University, Rainbow Babies and Children's Hospital*

**BACKGROUND:** Pediatric inguinal hernia repair is the most commonly performed surgical procedure in children. Recently, we have seen a shift from traditional open surgery to minimally invasive laparoscopic repairs. Currently no model exists that allows physicians to practice the laparoscopic inguinal hernia repair before attempting it on a patient for the first time.

**MODEL DESIGN:** Using synthetic materials, an abdominal cavity was created that mirrors the structural deformity associated with an indirect inguinal hernia. The adhesion between the peritoneal layer and underlying layer allows for utilization of hydrodissection to isolate the spermatic cord from the hernia defect. Additionally, the material covering the abdominal wall allows for the insertion of a laparoscope as well as all other surgical tools typically used during the operation. The synthetic peritoneal layer is replaceable such that the same model can be used for multiple instructions. Specifically, this model familiarizes the surgeon with the laparoscopic approach to identifying the hernia defect, hydrodissection of the spermatic cord, and ligation of the hernia defect. Many different techniques exist for laparoscopic high ligation, and each of these techniques can be used on this model.



**CONCLUSIONS:** A fully functioning, interactive model for laparoscopic repair of an indirect inguinal hernia by way of high ligation of the hernia sac has been constructed. This model is ideal for both surgical instruction as well as patient education. This model will allow for widespread instruction and practice before the technique is attempted on a pediatric patient, thereby ensuring both the surgeon's comfort with the procedure and increased patient safety.

**P151 LAPAROSCOPIC MANAGEMENT OF PERSISTENT MÜLLERIAN DUCT SYNDROME: AN 11-CASES REPORT** – *Jian Shen, MSAS, Yunli Bi, AP, Children's Hospital of Fudan University*

**BACKGROUND & OBJECTIVES:** Persistent müllerian duct syndrome (PMDS) is a rare malformation, characterized by the presence of müllerian structures in a virilized male. The surgical management of patients with PMDS is controversial due to the potential morbidity associated with both the retention and the removal of the müllerian structures. The aim of this study was to describe the laparoscopic management to the vasa deferentia of patients with PMDS in our hospital from 2003 to 2011.

**METHODS:** All the cases of PMDS operated by laparoscope in our hospital were reviewed for the age at operation, the clinical manifestation, the findings and management in the operations. The müllerian duct structure or cyst was excised in every case, if necessary, the testes were biopsied, the hernia was repaired and orchiopexies were performed. Urethroscope was used to assist the laparoscopic procedure as a guide to identify the edge of the müllerian duct remnant and its junction to the urethra in the most recent two cases.

**RESULTS:** 11 patients with PMDS were operated by laparoscope since 2003. The mean age was  $49.82 \pm 41.20$  months (ranging from 5 to 145 months). There was one case of conversion because of bleeding in our early experience. The 11 patients can be classified into two groups according to the differential treatment of vasa deferentia. In Group 1 (4 cases), the vasa deferentia were cut off as their merging into the müllerian cyst. All of the four cases had intractable refluxing epididymo-orchitis with or without hypospadias (2 versus 2), and it was almost impossible to preserve the vasa deferentia in operation. In Group 2 (7 cases), the vasa deferentia were preserved. They presented as pyuria (one case), hypospadias with cryptorchidism or inguinal hernia (4 cases) and transverse testicular ectopia (2 cases). In these 7 cases, to preserve the fertility, pedicles of myometrium are left intact with the vasa deferentia, and the fimbriae of the distal tubes are not dissected from the testis.

**CONCLUSIONS:** Excision of müllerian structures is recommended in symptomatic cases such as those with intractable infection or whose müllerian structures limit intrascrotal placement of the testes. Preservation of vasa deferentia in infection cases is rather more difficult than that in cases without infection. Laparoscope combined with urethroscope technique is an effective and minimally invasive approach to the management of these patients.

**P152 LAPAROSCOPIC TRANS-MESOCOLIC "U"PYELOPLASTY IN HORSESHOE KIDNEY** – *Baran Tokar, MD, Surhan Arda, MD, Ahmet Topaloglu, MD, Eskisehir OGU Medical School, Department of Pediatric Surgery, Eskisehir, Turkey*

Ureteropelvic obstruction (UPO) occurs in between 15-33% of horseshoe kidneys (HSK). Although open surgery is well known and accepted approach in patients who need surgery for HSK and UPO combination, laparoscopy could be preferred in feasible cases. We present a patient having HSK and left UPO. A laparoscopic pyeloplasty with trans-mesocolic access was performed. A 9 years old male patient was admitted with abdominal pain and ultrasonography (USG) showing HSK and left UPO. In preoperative investigation, the left renal pelvis A-P diameter was 38 mm in USG. All functions were decreased together with lack of diuretic response in DTPA of the left kidney. A cystoscopy was performed and a left ureteric stent was placed just before laparoscopy. The patient was placed in the left upper semilateral position. Two 3 mm, one 5 mm working ports were introduced, and laparoscopic pyeloplasty was performed through a trans-mesocolic access. The left ureteropelvic junction (UPJ) was located at the apex of the left renal dilated pelvis. UPO was released by a reverse "U" incision just on the ureter and neighboring pelvic structure on the left UPJ without a dismembering. The anastomosis was done by 5/0 PDS. He was discharged in 3. postoperative day. Postoperative USG in the first month showed a downgraded dilatation of the left renal pelvis with 16 mm A-P diameter. Postoperative DTPA did not show a significant pathology, but only a functional stasis in both kidneys. When to make a surgical plan in HSK, it should be considered that the procedure would be more challenging comparing to a normal anatomy. In surgery of HSK, laparoscopy could be preferred depending on the pathology and experience of the surgeon. Laparoscopic exploration should begin with a consideration of possibility of using different access to the working area and alternative pyeloplasty techniques depending on the anatomical variations.

**P153 LAPAROSCOPIC APPROACH IN LARGE PROXIMAL URETERIC STONES** – *Baran Tokar, MD, Surhan Arda, MD, Eskisehir OGU Medical School, Department of Pediatric Surgery, Eskisehir, Turkey*

Most ureteral stones are managed using ureterorenoscopy (URS)-endourologic techniques or shockwave lithotripsy (SWL) in clinical practice. However, depending on the technical facilities or condition of the patient and the stone, an open surgery might be needed. In this group of patients, laparoscopic stone extirpation (LSE) should be considered before the open surgery. Here we present the technique of transperitoneal LSE in large and embedded ureteric stones. We operated 2 patients having proximal ureteric stone by transperitoneal LSE. The first patient (7 year-old-age) was admitted with abdominal pain and vomiting continuing since the last 6 months and becoming more intense in the last week. The radiological investigation showed a 16 mm stone located in the proximal ureter and obstructing the urine flow. To remove the stone as an unbroken single piece, a LSE was planned. URS and SWL were not tried. Following a transperitoneal access, the left ureter was found with a retrocolic dissection. Hyperemic and edematous proximal ureteric segment containing the stone was determined and stay sutures were placed. The ureter was opened by hook cautery, the embedded stone was extirpated as a single unbroken piece, and it was removed by endobag. The incision was closed by 3 interrupted sutures. The patient did well postoperatively and was discharged at the second postoperative day. LSE was also performed in the other patient with a right proximal ureteric stone. LSE with lower postoperative morbidity, shorter hospitalization and better cosmetic results should be considered as a better alternative to an open surgery, especially in large and embedded ureteric stones and in patients who are not feasible for URS and SWL or in cases where other techniques failed.

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