

FINAL PROGRAM



**IPEG's**  
**19<sup>th</sup> ANNUAL CONGRESS**  
*for Endosurgery in Children*

**JUNE 8-12, 2010**

**HILTON WAIKOLOA VILLAGE  
WAIKOLOA, HAWAII (THE BIG ISLAND)**

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# IPEG's 19<sup>th</sup> ANNUAL CONGRESS

## for Endosurgery in Children



### WHERE?

#### Hilton Waikoloa Village

69-425 Waikoloa Beach Dr.

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### WHO?

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# General Information

## EXHIBIT HALL HOURS

**Wednesday, June 9** 5:00 pm – 7:00 pm  
Welcome Reception in Exhibit Hall

**Thursday, June 10** 9:30 am – 3:30 pm  
Hall Open

**Friday, June 11** 9:30 am – 3:30 pm  
Hall Open

## POSTER HOURS

**Thursday, June 10** 9:30 am – 3:30 pm

**Friday, June 11** 9:30 am – 3:30 pm  
Poster Tours 11:30 am – 12:30 pm

## REGISTRATION HOURS

**Tuesday, June 8** 10:00 am – 6:00 pm

**Wednesday, June 9** 6:00 am – 6:00 pm

**Thursday, June 10** 6:00 am – 6:00 pm

**Friday, June 11** 6:00 am – 6:00 pm

**Saturday, June 12** 7:00 am – 12:00 pm

## SPEAKER READY ROOM HOURS

*Kings 1 Meeting Room*

**Tuesday, June 8** 10:00 am – 6:00 pm

**Wednesday, June 9** 7:00 am – 3:00 pm

**Thursday, June 10** 6:00 am – 4:00 pm

**Friday, June 11** 6:00 am – 4:00 pm

**Saturday, June 12** 6:00 am – 11:00 am

## 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*. (A \$1000+ value is yours for FREE with your paid IPEG membership)

## WHO SHOULD ATTEND?

The 19th 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.

## CME & EVALUATION FORMS

IPEG Registrants, please complete the IPEG CME & Evaluation form (page 117) and turn in at the IPEG Registration Desk to have your CME certificate mailed to you after the meeting.

Please allow 4-6 weeks for processing for all CME requests.

## 2010 MEETING OBJECTIVES

The objectives of the activity are to educate, expose and allow pediatric surgeons and urologist the opportunity to discuss the developing techniques and management principles regarding minimally invasive surgical techniques and scientific developments that will affect their patient population.

### Specific objectives include:

- Presentation of new and developing minimally invasive surgical techniques in a scientific environment.
- Opportunity to interact with experts in the fields of minimally invasive pediatric surgery and urology via panel interactions and audience response systems.
- Discussion of current and future controversial issues regarding minimally invasive surgery in infants and children.
- Advance the use of minimally invasive surgical procedures in infants and children.
- Encourage international interactions in the management and minimally invasive surgical interventions for infants and children.

At the conclusion of this event the participant will be able to implement the information and techniques that were obtained during the event and by doing this the care of that population will be improved and will continue to advance.

## ACCREDITATION

This 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). SAGES is accredited by ACCME to provide continuing medical education for physicians. SAGES designates this Continuing Medical Activity for:

### 5.5 AMA PRA Category 1 Credit(s)

for the Advance Endoscopic Course Lecture

### 2.5 AMA PRA Category 1 Credit(s)

for the Advance Endoscopic Hands-On Course

### 8.75 AMA PRA Category 1 Credit(s)

for Thursday Sessions

### 8.0 AMA PRA Category 1 Credit(s)

for Friday Sessions

### 2.25 AMA PRA Category 1 Credit(s)

for Saturday Sessions

For a total of **27 AMA PRA Category 1 Credit(s)**, Physicians should only claim credits commensurate with the extent of their participation in the activity.

## 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 Publications Committee to receive the 2010 IRCAD Award. The award recipient 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, on the campus of 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.

## 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.

## INTERNATIONAL PEDIATRIC ENDOSURGERY GROUP 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:

- Subscription to the *Journal of Laparoendoscopic & Advance Surgical Techniques*. (A \$1000+ 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)
- Significant discount on registration fees for the virtual Pediatric Surgery Education Series; A series of interactive web symposiums to focus on controversial issues in Pediatric Surgery, held in collaboration with Case Western Reserve University – Rainbow Babies & Children's Hospital.
- 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.
- Access to IPEG Research Grants.

For more information and applications, please go to:  
[www.ipeg.org/whyjoin.php](http://www.ipeg.org/whyjoin.php)

## IPEG CORPORATE SPONSORS

**Diamond:** Karl Storz Endoscopy

**Platinum:** Stryker Endoscopy

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### IPEG's 20<sup>th</sup> Annual Congress for Endosurgery in Children

*Save the  
Dates!*

May 3-7, 2011

Hilton Prague, Prague, Czech Republic

*Voted the Best Hotel in the Czech Republic in 2008 and 2009 by TTG, 2nd Best Business Hotel in Eastern Europe in 2009 by the Business Traveler UK Magazine*

### 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, USA

# 2010 IPEG Program Chairs

## **Maria Marcela Bailez, MD**

Program Chair, Buenos Aires, ARGENTINA



**Dr. Maria Marcela Bailez** has served as Head of the Surgical Center at the Garrahan's Children's Hospital (University of Buenos Aires Argentina) since 2007. She also serves as an Assistant Professor in the division of Pediatric Surgery at the same hospital starting in 1988. She is the Director of the Laparoscopic Pediatric Surgery Training Courses organized by the School of Medicine of the Northeast National University in Argentina.

Dr. Bailez received her medical degree at the University of Buenos Aires. She completed her fellowship in Pediatric Surgery at The Gutierrez Children's Hospital of Buenos Aires. She spent a year as a Visiting Assistant Professor at the Department of Pediatrics of The Johns Hopkins School of Medicine.

Dr. Bailez is the current Co-Chair of the Educational Committee of the International Pediatric Endosurgery Group. In addition, she is a member of the Executive Board of the International Society of Intersex (ISHID). He serves on the editorial board of 3 major surgical journals and is the author of 190 abstracts / publications and 9 book chapters. She has made more than 160 presentations, conferences and living surgery demonstrations around the world on pediatric surgical topics and was the winner of the IRCAD Award in 2007.

## **Todd A. Ponsky, MD**

Program Co-Chair, Cleveland Heights, Ohio, USA



**Dr. Todd Ponsky** is currently Assistant 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, Colorado from 2007-2008. Dr. Ponsky has a particular interest in pediatric minimally invasive surgery and "Single Port Access Surgery". He has trained over 100 surgeons in Single Port Access 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, and a 3-year-old daughter, Sasha.

## **Go Miyano, MD**

Program Co-Chair, Tokyo, JAPAN



**Dr. Go Miyano** is currently a Pediatric Surgery Trainee at Department of Pediatric General and Urogenital Surgery, Juntendo University Hospital, Tokyo. He was a resident at Department of Surgery, Juntendo University Hospital, Tokyo from 2001-2003; Pediatric Surgery Trainee at Department of Pediatric General and Urogenital Surgery, Juntendo University Hospital, Tokyo (supervised by Professor Takeshi Miyano) from 2003-2006; Research Fellow at Department of Pediatric Surgery, Blank Children's hospital (supervised by Thom E. Lobe, MD) from 2006-2007; Research Fellow at Department of Pediatric General and Thoracic Surgery, Cincinnati Children's Hospital (supervised by Professor Thomas H. Inge) from 2007-2008. He has about 25 manuscripts published in peer-reviewed journals, such as JPS, PSI and JLAST etc. He has

given over 10 presentations at various international conferences, such as IPEG, BAPS, PAPS and PSR etc. Dr. Miyano was membership in various professional societies, such as Japanese Society of Surgery, Japanese Society of Pediatric Surgery, International Pediatric Endosurgery Group, and Journal of Laparoendoscopic Advanced Surgical Technique A.

# IPEG 2010 Meeting Leaders & Faculty

## 2010 PROGRAM COMMITTEE

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Klaas (N) MA Bax, MD  
Sanjeev Dutta, MD  
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Munther Haddad, MD  
Caroll M. Harmon, MD, PhD  
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Saleem Islam, MD  
Pablo Laje, MD  
Marc A. Levitt, MD  
Thom E. Lobe, MD  
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Marcelo H. Martinez Ferro, MD  
Giorlomo Mattioli, MD  
Go Miyano, MD  
Philippe Montupet, MD  
Azad Najmaldin, MD  
Daniel J. Ostlie, MD  
Todd A. Ponsky, MD  
Olivier Reinberg, MD  
Steven Rothenberg, MD  
Shawn St. Peter, MD  
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Holger Till, MD  
Jean-Stéphane Valla, MD  
John H.T. Waldhausen, MD  
Juergen Waldschmidt, MD

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EUROPEAN REPRESENTATIVE: Juergen Schleef, MD  
AMERICA'S REPRESENTATIVE: Carroll "Mac" Harmon, MD, PhD  
PAST-PRESIDENT: George W. Holcomb III, MD

## PAST PRESIDENTS

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Jean-Stéphane Valla, MD (2008)  
Atsuyuki Yamataka, MD (2007)  
Keith 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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# 2010 IPEG Faculty



Craig Albanese



Hossein Allal



Aayed Al-Qahtani



Georges Azzie



Maria Marcela Bailez



Sanjeev Dutta



Edward Esteves



Keith Georgeson



J. Ted Gerstle



Barry Goodfield



Miguel Guelfand



Munther Haddad



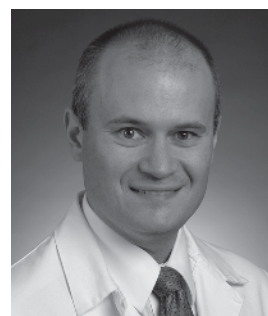
Carroll Harmon



George Holcomb III



Celeste Hollands



Thomas Inge



Joe Iocono



Salem Islam



Tadashi Iwanaka



Timothy Kane



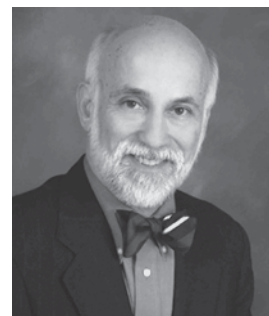
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John Meehan



Marc Michalsky



Go Miyano

# 2010 IPEG Faculty CONTINUED...



Azad Najmaldin



Daniel Ostlie



Todd Ponsky



Steven Rothenberg



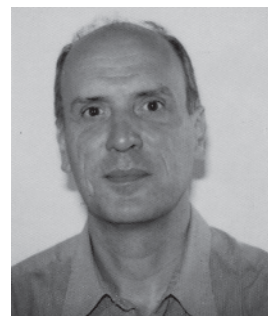
Klaus Schaarschmidt



Juergen Schleef



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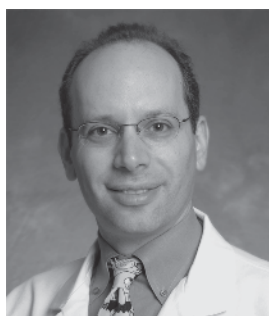
Holger Till



Benno Ure



David van der Zee



Mark Wulkan



Atsuyuki Yamataka



C.K. Yeung

# Faculty Disclosures

NAME	DISCLOSURE	WHAT WAS RECEIVED	FOR WHAT ROLE
Maria Marcela Bailez, MD	Covidien	Consulting Fee	Advisory Board for Ligasure Device (Latin American)
Sanjeev Dutta, MD, FRCS	Novare Stryker	Consulting Fee Consulting Fee	Proctoring Medical Advisor
Carroll M. Harmon, MD, PhD	Stryker		Advisory Panel
Thomas H. Inge, MD, PhD	Ethicon	Research Fund	Research
John J. Meehan, MD	Intuitive Surgical	Honoraria	Proctor Educational
Todd A. Ponsky, MD	Novare	Honoraria	Speaking
Steven S. Rothenberg, MD	Karl Storz	Consulting Fee	Consulting
Philipp Szavay, MD	Karl Storz, Germany	Financial Support	Contracted Research
Benno M. Ure, MD, PhD	Aesculas	Honoraria	Independent Contractor

## FACULTY WITH NOTHING TO DISCLOSE

Craig Albanese, MD	Manuel Lopez, MD
Hossein Allal, MD	Gordon A. MacKinlay, MD
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Georges Azzie, MD	Marcelo H. Martinez Ferro, MD
Edward Esteves, MD	Girolamo Mattioli, MD
Keith E. Georgeson, MD	Milissa McKee, MD
J. Ted Gerstle, MD	Marc Michalsky, MD
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Miguel A. Guelfand, MD	Azad Najmaldin, MD
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Celeste Hollands, MD	Juergen Schleef, MD
Joseph Iocono, MD	Shawn D. St. Peter, MD
Saleem Islam, MD	Henri Steyaert, MD
Tadashi Iwanaka, MD	Holger Till, MD
Timothy Kane, MD	David van der Zee, MD
Pablo Laje, MD	Mark Wulkan, MD
Marc A. Levitt, MD	Atsuyuki Yamataka, MD
Long Li, MD	C.K. Yeung, Prof.
Thom Lobe, MD	

## CME & EVALUATION FORMS

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# Presenter Disclosures

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Jorge Correia-Pinto, MD, PhD	Karl Storz	Other Financial Benefit	Consulting	
Karen A Diefenbach, MD	Karl Storz	Other Financial Benefit	Other Activities	Monetary gift for research
Saleem Islam, MD, MPH	Medtronic	Honorarium	Membership on Advisory Committees or Review Panels	
Timothy C. Lee, MD	Ethicon EndoSurgery	Other Financial Benefit	Other Activities	Research grant
T. E. Lobe, MD	Neatstitch, LTD	Ownership Interest	Board Membership	Not relevant to presentation
	Visual Medical Solutions	Ownership Interest	Management Position	Not relevant to presentation
John J. Meehan, Prof.	Intuitive Surgical	Honorarium	Speaking and/or Teaching	
Daniel J. Ostlie, MD	Covidien	Consulting Fee	Consulting	
Todd A. Ponsky, MD	Covidien	Honorarium	Speaking and/or Teaching	
	Storz	Honorarium	Speaking and/or Teaching	
	Stryker	Honorarium	Speaking and/or Teaching	
Ruben Rodriguez, MD	Storz	Consulting Fee		
Steven S. Rothenberg, MD	Storz	Consulting Fee	Consulting	

## PRESENTERS WITH NOTHING TO DISCLOSE

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Soo Min Ahn, Prof., MD	Satoshi Ieiri, MD, PhD	Roland W. Partridge, MA, MBChB, MRCS
Ricardo Alba-Palacios, MD	Ryan Juza, BS	Dariusz Patkowski, MD, PhD
Hossein Allal, MD, PhD	Brian D. Kenney, MD, MPH	Paul P. Philippe, MD
Naimaldin Azad, MB ChB, MS, FRCS	Takuya Kimura, MD, PhD	Lisandro A. Piaggio, MD
Juan Ignacio Bortagaray, MD	Mustafa Kucukaydin, Prof.	Rajeev Prasad, MD
A. Butter, MD, MSc, FRCSC	Joachim F. Kuebler, MD	Victor Rachkov
Juan I. Camps, MD, MBA	Carrie A. Laituri, MD	Alexander Razumovsky
Giovanny Casadiego, MD	Taiwo A. Lawal, MD	Giovanna Riccipetioni, MD
Robert A. Cina, MD	Louis C. Lee, MD	Steven Rothenberg, MD
Justin J. Clark, MD	Suolin LI, MD	John A. Sandoval, MD
Matthew S. Clifton, MD	Nguyen Thanh Liem, PhD	Klaus Schaarschmidt, Prof., MD
Sherif Emil, MDCM	Rebecca M. Lisle, MBBS, BSc, MRCS Eng	Sergio B. Sesia, MD
Masao Endo, MD, PhD	Manuel Lopez, MD	Amy B. Stanfill, MD
Edward Esteves, MD	Marcelo Martinez-Ferro, MD	Theodore Stathos
Julia R. Fishman, MD, BSc	Girolamo Mattioli, Prof.	Henri Steyaert, MD
Jeffrey W. Gander, MD	Milissa A. McKee, MD	Danielle D. Sweeney, MD
Carlos García-Hernández, MD	Mario Mendoza-Sagaon, MD	Philipp O. Szavay, MD
Deiadra Garrett, MD	Martin L. Metzelder, MD	Salmai Turial, MD
Oliver J. Gee, MB ChB, FRCS (Paed)	Go Miyano, MD	David C. Van der Zee, PhD, MD
Jeronimo Gonzalez, MD	Oliver J. Muensterer, MD, PhD	Gustavo A. Villalona, MD
Miguel Guelfand, MD	Hiroomi Okuyama, MD, PhD	Arezou Yaghoubian, MD
Florent Guerin, MD	Weihua Pan, MD	Atsuyuki Yamataka, MD

# Schedule-at-a-Glance

## TUESDAY, JUNE 8, 2010

12:00 pm – 6:00 pm	<b>ADVANCE ENDOSCOPIC COURSE: Lecture</b>	<i>Kings 2 Meeting Room</i>
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## WEDNESDAY, JUNE 9, 2010

7:00 am – 9:20 am	<b>ADVANCE ENDOSCOPIC COURSE: Lab (Group A)</b>	<i>Kona Ballroom</i>
9:40 am – 12:00 pm	<b>ADVANCE ENDOSCOPIC COURSE: Lab (Group B)</b>	<i>Kona Ballroom</i>
5:00 pm – 7:00 pm	<b>WELCOME RECEPTION in the Exhibit Hall</b>	<i>Kohala Ballroom</i>

## THURSDAY, JUNE 10, 2010

7:00 am – 7:45 am	<b>SCIENTIFIC SESSION: Gastrointestinal &amp; Hepatobiliary – Part I</b>	<i>Monarchy Ballroom</i>
7:45 am – 8:45 am	<b>PANEL: “The Great Gonad Debate”</b>	<i>Monarchy Ballroom</i>
8:45 am – 9:00 am	<b>Welcome Address</b>	<i>Monarchy Ballroom</i>
9:00 am – 10:00 am	<b>SCIENTIFIC SESSION: Basic Science</b>	<i>Monarchy Ballroom</i>
10:00 am – 10:30 am	<b>Break</b>	<i>Exhibit Hall/Kohala Ballroom</i>
10:30 am – 11:30 am	<b>SCIENTIFIC SESSION: Coolest Tricks</b>	<i>Monarchy Ballroom</i>
11:30 am – 12:00 pm	<b>IPEG Presidential Address &amp; Lecture: Why IPEG?</b>	<i>Monarchy Ballroom</i>
12:00 pm – 1:00 pm	<b>Lunch on Own/Exhibit Viewing</b>	
1:00 pm – 2:15 pm	<b>SCIENTIFIC SESSION: Thorax</b>	<i>Monarchy Ballroom</i>
2:15 pm – 3:00 pm	<b>KARL STORZ LECTURE: NOTES® – The Next or the Past Evolution?</b>	<i>Monarchy Ballroom</i>
3:00 pm – 3:30 pm	<b>Break</b>	<i>Exhibit Hall/Kohala Ballroom</i>
3:30 pm – 5:00 pm	<b>PANEL: MIS vs. Open – Controversies in Minimally Invasive Surgery</b>	<i>Monarchy Ballroom</i>
5:00 pm – 6:00 pm	<b>SCIENTIFIC SESSION: Top 20 Posters</b>	<i>Monarchy Ballroom</i>

## FRIDAY, JUNE 11, 2010

7:00 am – 8:00 am	<b>MORNING VIDEO SESSION: Colorectal &amp; Unexpected Findings</b>	<i>Monarchy Ballroom</i>
8:00 am – 9:30 am	<b>SCIENTIFIC SESSION: Gastrointestinal &amp; Hepatobiliary – Part II</b>	<i>Monarchy Ballroom</i>
9:30 am – 10:00 am	<b>KEYNOTE LECTURE: “The Toll of Turning Impossible Dreams to Tangible Realities”</b>	<i>Monarchy Ballroom</i>
10:00 am – 10:30 am	<b>Break</b>	<i>Exhibit Hall/Kohala Ballroom</i>
10:30 am – 11:30 am	<b>SCIENTIFIC SESSION: Alternative Technologies</b>	<i>Monarchy Ballroom</i>
11:30 am – 12:30 pm	<b>Poster Tours</b>	<i>Queen’s Ballroom</i>
	<b>Lunch on Own/Exhibit Viewing</b>	
1:00 pm – 3:00 pm	<b>PANEL: Re-Do MIS Surgery – Why &amp; How?</b>	<i>Monarchy Ballroom</i>
3:00 pm – 3:15 pm	<b>Break</b>	<i>Exhibit Hall/Kohala Ballroom</i>
3:15 pm – 5:15 pm	<b>PANEL: Morbid Obesity in Pediatrics – Difficult Cases</b>	<i>Monarchy Ballroom</i>
7:00 pm – 11:00 pm	<b>IPEG Main Event</b>	<i>Hilton Waikoloa/Lagoon Lanai</i>

## SATURDAY, JUNE 12, 2010

7:00 am – 8:00 am	<b>Ethicon Endo-Surgery, Inc. Industry Sponsored Symposium (Non-CME)</b>	<i>Monarchy Ballroom</i>
8:15 am – 9:15 am	<b>General Assembly</b>	<i>Monarchy Ballroom</i>
9:15 am – 10:15 am	<b>SCIENTIFIC SESSION: Urology</b>	<i>Monarchy Ballroom</i>
10:15 am – 10:30 am	<b>Break</b>	<i>Kohala Promenade</i>
10:30 am – 10:45 am	<b>IPEG Awards Session</b>	<i>Monarchy Ballroom</i>
10:45 am – 11:00 am	<b>2008 IRCAD Award Winner Abstract Presentation</b>	<i>Monarchy Ballroom</i>
11:00 am – 12:00 pm	<b>SCIENTIFIC VIDEO SESSION: Miscellaneous</b>	<i>Monarchy Ballroom</i>
12:00 pm	<b>Closing Remarks</b>	<i>Monarchy Ballroom</i>

# Complete Schedule

**TUESDAY, JUNE 8, 2010**

**ADVANCE ENDOSCOPIC COURSE: Asking the Experts & Improving Your Skills (LECTURE)**

CHAIR: Azad Najmaldin, MD

**12:00 pm – 6:00 pm**

*King 2 Meeting Room*

## Description

This is a two-part course designed for pediatric surgeons in practice interested in an opportunity to share expert opinions in the management of certain common but complex and challenging surgical conditions in infants and children, using minimally access techniques. Pediatric surgeons in training are welcomed as well. The format will be interactive, in which, case presentations are accompanied by discussions and question and answer session. The next morning, an inanimate laboratory will be utilized to demonstrate several skills necessary to perform pediatric MIS procedures. Participants will get the opportunity to get acquainted with and practice several endoscopic techniques in a safe environment.

## Objectives

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

- Describe surgical steps for thoracoscopic pediatric pulmonary lobectomies.
- List the most common complications of laparoscopic Nissen procedures in pediatrics.
- List technical changes in laparoscopic pull through for the treatment of Hirschsprung's disease
- List two advantages and disadvantages of Abrahanson's technique and external compression for the treatment of pectus carinatum in pediatrics.
- List two advantages and disadvantages of laparoscopic gastric pull up.
- List two advantages and disadvantages of cervicoscopic resection of thyroid, parathyroid and thymus.

TIME	TOPIC	FACULTY
12:00 pm	Introduction	Azad Najmaldin MD
12:05 pm	My Recipe for Pulmonary Lobectomy: Each Lobectomy Step by Step (Upper left; Lower left; Upper right and so on)	Steven S. Rothenberg, MD
12:30 pm	Q&A	
12:40 pm	Pull Through for Hirschsprung's Disease – Pull Through for Imperforated Anus; Technical Changes and Functional Results in the Celebration of the 15th year	Keith A. Georgeson, MD
1:15 pm	Q&A	
1:25 pm	Tricks in Advanced Laparoscopic Colorectal Surgery (Total Colectomy & Proctectomy: Cloacas and Sigmoid Vaginal Replacements)	Maria Marcela Bailez, MD
1:50 pm	Q&A	
2:00 pm	Laparoscopy: 10 Year Old Nissen Funduplications – An Evolution of Technical Changes	George W. Holcomb, III, MD
2:25 pm	Q&A	
2:35 pm	Break	
2:45 pm	Secrets for an Easy Laparoscopic Gastric Pull Up: How we do It? (Differences and Similarities)	Daniel J. Ostlie, MD & Edward Esteves, MD
3:10 pm	Q&A	
3:20 pm	Chest Wall Deformities: When to Use Two- Bars, Compression, or Abrahanson's Technique for Carinatum	Marcelo Martinez Ferro, MD
3:45 pm	Q&A	
3:55 pm	Advantages and Disadvantages of Robotic Assisted Surgery: An Established Personal Experience	Azad Najmaldin, MD
4:20 pm	Q&A	
4:30 pm	Procedures and Steps in Which Robotic Surgery Improves Performance: What I Would Ask the Robotic Industry for Our Pediatric Practice	C.K. Yeung, MD
4:55 pm	Q&A	
5:05 pm	Panel Discussion	

## WEDNESDAY, JUNE 9, 2010

### ADVANCE ENDOSCOPIC COURSE: Asking the Experts & Improving Your Skills

(SIMULATOR HANDS-ON COURSE)

GROUP A

GROUP B

CHAIR: David van der Zee, MD, CO-CHAIRS: Sanjeev Dutta, MD & Daniel J. Ostlie, MD

7:00 am – 9:20 am

9:40 am – 12:00 pm

Kona Ballroom

STATION	FACULTY
Basic Suturing Station	Miguel Guelfand, MD, Mark Wulkan, MD, & Juergen Schleef, MD
Single Port Laparoscopy	Go Miyano, MD, Todd A. Ponsky, MD & Atsuyuki Yamataka, MD
Gastric Banding	Thomas H. Inge, MD, PhD, Timothy Kane, MD & Pablo Laje, MD
Pediatric Fundamentals of Laparoscopic Surgery Skills	Georges Azzie, MD & Philipp Szavay, MD
Neo Trainer Model	Milissa McKee, MD
Pylorus Model	Joseph Iocono, MD
Esophageal Atresia Model	Hossein Allal, MD & Thom E. Lobe, MD
Pelvic Trainer	Benno M. Ure, MD, PhD
FLOATER: Shawn D. St. Peter, MD VOLUNTEER FACULTY: J. Ted Gerstle, MD, FRCSC, FAAP	

IPEG Acknowledges unrestricted educational grants in support of this course from: Applied Medical and Karl Storz Endoscopy – America  
IPEG Acknowledges contributions in-kind from: Aesculap, Inc., Applied Medical, Covidien, Ethicon Endosurgery, Inc., Hôpital Lapeyronie, Karl Storz Endoscopy – America, Olympus, Novare Surgical Systems, Stryker Endoscopy, University of Kentucky, University of Toronto, and Yale University.

### WELCOME RECEPTION in Exhibit Hall

5:00 pm – 7:00 pm

Kohala Ballroom

## THURSDAY, JUNE 10, 2010

### SCIENTIFIC SESSIONS

*\*Scientific Sessions are located in the Monarchy Ballroom*

#### Description

The theme of the 2010 IPEG meeting will be a cases oriented approach to challenges in clinical situations with expert panels and with invited faculty who will speak on specific topics. Included are oral sessions, video presentations, and poster presentations of abstracts selected by the Program Committee. Panel information and information about the abstracts & video presentation will be available in the Final Program distributed on-site.

#### Objectives

The objectives of the session are to educate, expose and allow pediatric surgeons and urologist the opportunity to discuss the developing techniques and management principles regarding minimally invasive surgical techniques and scientific developments that will affect their patient population. Specific Objectives include:

- Presentation of new and developing minimally invasive surgical techniques in a scientific environment.
- Opportunity to interact with experts in the fields of minimally invasive pediatric surgery and urology via panel interactions and audience response systems.
- Discussion of current and future controversial issues regarding minimally invasive surgery in infants and children.
- Advance the use of minimally invasive surgical procedures in infants and children.
- Encourage international interactions in the management and minimally invasive surgical interventions for infants and children.

At the conclusion of this event the participant will be able to implement the information and techniques that were obtained during the event and by doing this the care of that population will be improved and will continue to advance.

#### What is included?

Includes entrance to the IPEG Scientific Sessions on Thursday, Friday, and Saturday, entrance to the exhibit hall & welcome reception, general session breaks, Friday Poster Tours, and Main Event. *\*Seperate fee applies to postgraduate course(s).*

# Complete Schedule CONTINUED...

## SCIENTIFIC SESSION: Gastrointestinal & Hepatobiliary – Part I

MODERATOR: Go Miyano, MD

7:00 am – 7:45 am

Monarchy Ballroom

TIME	TOPIC
7:00 am	<b>V001</b> LAPAROSCOPIC DISTAL PANCREATECTOMY WITH SPLENIC PRESERVATION <u>Dorothy Rocourt, MD</u> , Brian Kenney, MD, MPH, Nationwide Children's Hospital, Ohio State University Medical School
7:05 am	<b>V002</b> LAPAROSCOPIC CAUDAL PANCREATICOJEJUNOSTOMY WITH SPLENIC PRESERVATION FOR THE TREATMENT OF CHRONIC PANCREATITIS IN CHILDREN CASE REPORT <u>Carlos García-Hernández, MD</u> , Lourdes Carvajal-Figueroa, MD, Roberto Suarez-Gutierrez, MD, Sergio Landa-Juarez, MD, Hospital Infantil Privado, México, Distrito Federal
7:10 am	<b>V003</b> LAPAROSCOPIC REPAIR OF A DUODENAL ATRESIA AND LADD'S PROCEDURE IN A NEONATE <u>Steven S Rothenberg, MD</u> , The Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons
7:17 am	<b>S001</b> PANCREATIC DUCT STENTING IN PATIENTS WITH SHORT BOWEL SYNDROME AND RECURRENT PANCREATITIS Theodore Stathos, MD, <u>Steven Rothenberg, MD</u> , The Rocky Mountain Hospital for Children
7:23 am	<b>S002</b> SHOULD WE BE CONCERNED ABOUT JENUNOILEAL ATRESIA DURING REPAIR OF DUODENAL ATRESIA? <u>Shawn D. St. Peter, MD</u> , Danny C. Little, MD, Katherine A. Barsness, MD, Daniel R. Copeland, MD, Casey M. Calkins, MD, Suzanne Yoder, MD, Steve S. Rothenberg, MD, Saleem Islam, MD, KuoJen Tsao, MD, Daniel J. Ostlie, MD, Children's Mercy Hospital and Clinics, Scott & White Hospital, Children's Memorial Hospital, Arkansas Children's Hospital, Medical College of Wisconsin, Rocky Mountain Pediatric Surgery, University of Florida, University of Texas Houston
7:29 am	<b>S003</b> VALUE OF LAPAROSCOPY IN CHILDREN WITH A SUSPECTED ROTATION ABNORMALITY ON IMAGING <u>Marvin Hsiao, MD</u> , Alan Daneman, MD, Jacob C. Langer, MD, Hospital for Sick Children
7:35 am	<b>S004</b> LONG TERM RESULTS OF CHOLECYSTOSCOPIC REMOVAL OF GALLSTONES IN HEMOLYTIC ANAEMIA <u>K. Schaarschmidt, Prof., MD</u> , M. Lempe, MD, F. Schlesinger, MD, U. Jaeschke, MD, Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch, Germany
7:40 am	<b>S005</b> CHOLEDOCHOLITHIASIS AT ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY IS RARE IN CHILDREN <u>Oliver J. Gee</u> , G. Jawaheer, Birmingham Children's Hospital

## PANEL: "The Great Gonad Debate"

CHAIR: Todd A. Ponsky, MD, CO-CHAIR: Maria Marcela Bailez, MD

7:45 am – 8:45 am

Monarchy Ballroom

### Description

This session will be in the format of case presentations to distinguished expert faculty highlighting controversies in the management of testicular and ovarian disorders. This session will also focus on new, innovative, minimally invasive techniques that can be used to treat these disorders.

### Objectives

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

- Understand the different options available for the treatment of the undescended testicle
- Perform minimally invasive techniques for certain testicular disorders.
- Understand the different options available for the treatment of the ovarian torsion and masses.
- Perform minimally invasive techniques for certain ovarian disorders.

**Faculty:** Juergen Schleef, MD, Shawn St. Peter, MD & C.K. Yeung, MD

TIME	TOPIC
7:45 am	The Undescended Testicle
7:55 am	The Incidental Patent Processus Vaginalis
8:05 am	Ovarian Torsion
8:15 am	Ovarian Teratoma
8:25 am	The Communicating Hydrocele
8:35 am	Mullerian Remnants
8:45 am	Panel Discussion

**Welcome Address**

Marcelo H. Martinez Ferro, MD, 2010 IPEG President, INTRODUCTION: Todd A. Ponsky, MD

**8:45 am – 9:00 am**

*Monarchy Ballroom*

**SCIENTIFIC SESSION: Basic Science**

MODERATORS: Benno M. Ure, MD, PhD & Atsuyuki Yamataka, MD

**9:00 am – 10:00 am**

*Monarchy Ballroom*

TIME	TOPIC
9:00 am	<b>S006</b> CHANGES IN THE CAPILLARY ORGAN PERFUSION DURING CO <sub>2</sub> -PNEUMOPERITONEUM IN NEONATE AND ADOLESCENT PIGS <u>Joachim F. Kuebler, MD</u> , Martin L. Metzelder, MD, Alexander Osthaus, MD, Robert Suempelmann, Prof., Gertrud Vieten, PhD, Benno M. Ure, Prof., Departments of Pediatric Surgery and Anesthesiology, Hannover Medical School
9:08 am	<b>S007</b> RESPIRATORY AND HEMODYNAMIC EFFECTS OF CO <sub>2</sub> INSUFFLATION DURING ENDOSCOPIC SURGERY IN NEONATES <u>Hiroomi Okuyama, MD, PhD</u> , Takashi Sasaki, MD, PhD, Yoshiyuki Shimizu, MD, PhD, Akio Kubota, MD, PhD, Hisayoshi Kawahara, MD, PhD, Division of Pediatric Surgery, Department of Surgery, Hyogo College of Medicine
9:16 am	<b>S008</b> PHARMACOLOGICAL ACIDIFICATION OF THE PERITONEAL CAVITY: EFFECTS ON SYSTEMIC INFLAMMATORY RESPONSE AND SURVIVAL TO POLYMICROBIAL SEPSIS <u>Joachim F. Kuebler, MD</u> , Akihiro Shimotakahara, MD, Katharina Wuensche, MD, Gertrud Vieten, PhD, Martin L. Metzelder, MD, Benno M. Ure, Prof., Department of Pediatric Surgery, Hannover
9:22 am	<b>S009</b> TEMPORARY GASTRIC ELECTRICAL STIMULATION IN CHILDREN: TECHNIQUES AND RESULTS <u>Saleem Islam, MD, MPH</u> , Joy Hughes, BS, Shamaila Waseem, MD, Christopher Jolley, BS, Thomas Abell, MD, University of Florida College of Medicine and University of Mississippi Medical Center
9:28 am	<b>S010</b> AUGMENTED REALITY NAVIGATION SYSTEM FOR LAPAROSCOPIC SPLENECTOMY IN CHILDREN BASED ON PREOPERATIVE CT IMAGE USING OPTIC TRACKING DEVICE <u>Satoshi Ieiri, MD, PhD</u> , Munenori Uemura, MD, PhD, Kouzou Konishi, MD, PhD, Morimasa Tomikawa, MD, PhD, FACS, Kazuo Tanoue, MD, PhD, FACS, Makoto Hashizume, MD, PhD, FACS, Tomoaki Taguchi, MD, PhD, Department of Pediatric Surgery, Faculty of Medical Sciences, Kyushu University
9:34 am	<b>S011</b> GOAL-DIRECTED LAPAROSCOPIC TRAINING IMPROVES LAPAROSCOPIC SKILL IN RESIDENTS <u>Ricardo Alba-Palacios, MD</u> , Rene Carmona-Barba, MD, Hospital del Niño de Toluca / Hospital del Niño Morelense
9:40 am	<b>S012</b> LAPAROSCOPIC VERSUS OPEN APPENDECTOMY IN CHILDREN: OUTCOMES COMPARISON BASED ON AGE <u>Steven L. Lee, MD</u> , Arezou Yaghoubian, MD, Armen Aboulian, MD, Stanley T. Lau, MD, Roman M. Sydorak, MD, Harbor-UCLA and Kaiser Permanente, Los Angeles Medical Center
9:47 am	<b>S013</b> COMPARISON OF PEDIATRIC LAPAROSCOPIC APPENDECTOMY OUTCOMES BETWEEN TEACHING AND NONTEACHING HOSPITALS: A MULTIDISCIPLINARY STUDY <u>Steven L. Lee, MD</u> , Arezou Yaghoubian, MD, Roman M. Sydorak, MD, Stanley T. Lau, MD, Kaiser Permanente, Los Angeles Medical Center and Harbor-UCLA Medical Center
9:53 am	<b>S014</b> APPENDICEAL STUMP CLOSURE IN CHILDREN. A PROSPECTIVE ANALYSIS. ENDOLOOPS VERSUS ENDOSTAPLES <u>Go Miyano, MD</u> , Masahiko Urao, MD, Geoffrey J. Lane, MD, Yoshifumi Kato, MD, Tadaharu Okazaki, MD, Atsuyuki Yamataka MD, Department of Pediatric General & Urogenital Surgery, Juntendo University Hospital, Juntendo University Nerima Hospital
9:59 am	<b>S015</b> INSURANCE PAYOR STATUS IS NOT PREDICTIVE OF WEIGHT LOSS FOLLOWING ADOLESCENT GASTRIC BYPASS <u>Timothy C. Lee, MD</u> , Todd M. Jenkins, PhD, MPH, Stavra A. Xanthakos, MD, MS, Margaret H. Zeller, PhD, Victor F. Garcia, MD, Thomas H. Inge, MD, PhD, Cincinnati Children's Hospital, Cincinnati, Ohio, USA

**Exhibitions & Poster Viewing**

IPEG Exhibits Open

IPEG Poster Viewing Open

**9:30 am – 3:30 am**

*Kohala Ballroom*

*Queen's Ballroom*

**Break**

**10:00 am – 10:30 am**

*Exhibit Hall/Kohala Ballroom*

# Complete Schedule CONTINUED...

## SCIENTIFIC SESSION: Coolest Tricks

MODERATORS: Carroll "Mac" Harmon, MD, PhD & Pablo Laje, MD

10:30 am – 11:30 am

Monarchy Ballroom

TIME	TOPIC
10:30 am	<b>V004</b> AN 'OPEN SOURCE', SELF-BUILT, CONVENTIONAL AND SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) SIMULATOR <u>Roland W. Partridge</u> , Atul J. Sabharwal, Department of Paediatric Surgery, Royal Hospital for Sick Children, Yorkhill, Glasgow, UK
10:35 am	<b>V005</b> REMOVING PROTEIN PLUGS IN THE COMMON CHANNEL DURING THE LAPAROSCOPIC EXCISION OF MINIMALLY DILATED CHOLEDOCHAL CYST: INTRALAPAROSCOPIC PANCREATOSCOPY <u>Atsuyuki Yamataka</u> , MD, Hiroyuki Koga, MD, Go Miyano, MD, Akihiro Shimotakahara, MD, Yoshifumi Kato, MD, Geoffrey J. Lane, MD, Tadaharu Okazaki, MD, Department of Pediatric General and Urogenital Surgery, Juntendo School of Medicine
10:40 am	<b>V006</b> THORACOSCOPIC PLICATION OF THE DIAPHRAGM WITH TWO TROCARS <u>Enrique Buela</u> , MD, Juan Ignacio Bortagaray, Roberto Vagni, MD, Fabio Díaz, MD, Hospital Nacional Profesor A. Posadas
10:45 am	<b>V007</b> ASSOCIATION OF THORACOSCOPIC AND ENDOSCOPIC APPROACH IN LENGTHENING TECHNIQUE FOR ULTRALONG GAP ESOPHAGEAL ATRESIA <u>Jeronimo Gonzalvez</u> , MD, Maria Soledad Fernandez, MD, Esperanza Hernandez, MD, Yrene Argumosa, MD, Maria Baquero, MD, Esther Gil, MD, Maria Medina, MD, Andres Martinez, MD, Francisca Carpintero, MD, Pascual Martinez, MD, University Hospital of Albacete
10:50 am	<b>V008</b> LAPAROSCOPIC LIVER RESECTION: LEFT LATERAL SEGMENTECTOMY IN A CHILD <u>Karen A. Diefenbach</u> , MD, Milissa A. McKee, MD, Yale School of Medicine
10:55 am	<b>V009</b> LAPAROSCOPIC CHOLECYSTECTOMY AND INTRAOPERATIVE CHOLANGIOGRAM USING SINGLE SITE (PLUS) <u>Matthew S. Clifton</u> , MD, Mark L. Wulkan, MD, Emory University/Children's Healthcare of Atlanta
11:00 am	<b>V010</b> ROBOTIC RETRIEVAL OF AN INGESTED FOREIGN BODY <u>John J. Meehan</u> , MD, Associate Professoor of Surgery, Seattle Children's Hospital
11:05 am	<b>V011</b> SINGLE INCISION NUSS PROCEDURE FOR PECTUS EXCAVATUM <u>Sidney M. Johnson</u> , MD, Justin J. Clark, MD, Kapi'olani Medical Center for Women and Children
11:10 am	<b>S016</b> MICROLAPAROSCPIC CHOLECYSTECTOMY WITH AN UNORTHODOX MINISCOPE POSITION <u>Salmai Turial</u> , MD, Jan Enders, MD, Veronica Engel, MD, Felix Schier, MD, Department of Pediatric Surgery, Medical University Centre, Mainz, Germany
11:15 am	<b>S017</b> A PRELIMINARY REPORT OF SINGLE SITE LAPAROSCOPIC HERNIORRHAPHY USING NEEDLE INSTRUMENTS IN CHILDREN WITH INGUINAL HERNIA: A NOVEL TECHNIQUE <u>Takuya Kimura</u> , MD, PhD, Yoshiyuki Ihara, PhD, Katsuji Yamauchi, PhD, Toshio Sawai, PhD, Takuya Kosumi, PhD, Takeo Yonekura, PhD, Department of Pediatric Surgery, Nara Hospital, Kinki University School of Medicine
11:20 am	<b>V012</b> CONGENITAL CYSTIC ADENOMATOID MALFORMATION (CCAM) AND INTRALOBAR SEQUESTRATION: THORACOSCOPIC LEFT LOWER LOBECTOMY USING A VESSELS SEALING SYSTEM (VSS) <u>Hossein Allal</u> , PhD, MD, Froylan Paniagua (2) MD, Gustave Andrianandraina, MD, Pediatric Visceral Surgery Department; Video-Surgery Unit; CHU Montpellier, France, (2) Hospital Para el Nino Poblano, Puebla, Mexico
11:25 am	<b>V013</b> LAPAROSCOPIC NEEDLE-ASSISTED REPAIR (LNAR) OF INGUINAL HERNIAS IN CHILDREN <u>Aaron P. Leshner</u> , MD, Robert A. Cina, MD, Christian J. Streck, MD, Andre Hebra, MD, Division of Pediatric Surgery, Department of Surgery, Medical University of South Carolina

## Presidential Address & Lecture: Why IPEG?

Marcelo H. Martinez Ferro, MD, INTRODUCTION: Maria Marcela Bailez, MD

11:30 am – 12:00 pm

Monarchy Ballroom



**Dr. Marcelo Martinez-Ferro** was born in Buenos Aires and graduated from the Buenos Aires University School of Medicine in 1983. He completed his residency in pediatric surgery at the Ricardo Gutierrez Children's Hospital and in 1988, joined the staff of Garrahan National Children's Hospital. During his 15-year tenure at the hospital he dedicated himself to drastically improving the survival rate of newborn surgical patients whose mortality rate was historically very high in Argentina. In 1992 he completed a fellowship at the Fetal Treatment Center of the UCSF where he confirmed his interest in fetal treatment and video surgery.

Dr. Martinez-Ferro developed numerous fetal, neonatal and pediatric surgical and MIS procedures, introducing them throughout South America. These unique procedures have earned him international recognition as a leader and pioneer in the field of pediatric MIS. Due to his broad experience in the treatment of malformations of the thoracic wall in particular, he is periodically invited to operate on patients and to train surgeons and around the globe.

*Continued...*

Throughout his career, Dr. Martinez-Ferro has maintained an active and busy academic and clinical practice. He is also an active member of many prominent surgical organizations. He has published nearly 100 articles on a multitude of pediatric surgery topics and remains a highly-requested lecturer and guest speaker for numerous surgical and medical societies around the world. In 2005, he published the first Spanish textbook on neonatal surgery "Neonatología Quirúrgica," which remains a Latin American bestseller.

Dr. Martínez-Ferro is currently the professor of surgery and pediatrics, Chief Division of Pediatric Surgery, at the Fundación Hospitalaria Children's Hospital and the Coordinator of Fetal Treatment Center at the CEMIC University Hospital in Buenos Aires. Dr. Martinez-Ferro and his wife Valeria live in Buenos Aires with their three children.

## Lunch on Own/Free Time/Exhibit Viewing

12:00 pm – 1:00 pm

## SCIENTIFIC SESSION: Thorax

MODERATORS: Sanjeev Dutta, MD

1:00 pm – 2:15 pm

Monarchy Ballroom

TIME	TOPIC
1:00 pm	<b>S018</b> THORACOSCOPIC LOBECTOMY IN INFANTS LESS THEN 10KG WITH PRENATALLY DIAGNOSED CYSTIC LUNG DISEASE <u>Ruben Rodriguez, MD</u> , Steven Rothenberg, MD, Keith Kuenzler, MD, William Middlesworth, The Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons
1:08 pm	<b>S019</b> THORACOSCOPIC CONGENITAL DIAPHRAGMATIC HERNIA REPAIR: CAN WE PREDICT THE NEED TO CONVERT? <u>Jeffrey W. Gander, MD</u> , Jason C. Fisher, MD, Mary Jo Haley, MD, Charles J. Stolar, MD, Keith A. Kuenzler, MD, Morgan Stanley Children's Hospital of New York-Presbyterian, Columbia University Medical Center
1:16 pm	<b>S020</b> PATCH PREDICTION AS A MEANS TO ASSESS ELIGIBILITY OF NEONATES FOR THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIAS <u>Julia R. Fishman, MD, BSc</u> , Simon C. Blackburn, MD, MRCS, BSc, Niall J. Jones, MD, FRCS, Nicholas Madden, MD, FRCS, Diane De Caluwe, MD, FRCS, Munther Haddad, MD, FRCS, Simon A. Clarke, MD, FRCS, Chelsea and Westminster NHS Foundation trust, London UK and Imperial College London
1:24 pm	<b>S021</b> DOES AZYGOS VEIN PRESERVATION IN REPAIR OF ESOPHAGEAL ATRESIA WITH TRACHEOESOPHAGEAL FISTULA SEPARATE THE FISTULA CLOSURE SITE AND THE ESOPHAGEAL ANASTOMOSIS - THE THORACOSCOPIC VIDEO RECORDINGS ANALYSIS <u>Dariusz Patkowski, MD, PhD</u> , Anna Antczak, MD, Robert Smigiel, MD, PhD, Wojciech Apoznanski, MD, PhD, Maciej Baglaj, Prof., MD, PhD, Jerzy Czernik, Prof., MD, PhD, Department of Pediatric Surgery and Urology, Department of Genetics, Medical University of Wrocław, Poland
1:29 pm	<b>V014</b> LAPAROSCOPIC ASSISTED TRANSIATIAL GASTRIC TRANSPOSITION FOR LONG GAP ESOPHAGEAL ATRESIA IN AN INFANT <u>Ryan Juza, BS</u> , Marjorie Arca, MD, John Densmore, MD, John Aiken, MD, Dave Lal, MD, Children's Hospital of Wisconsin & Medical College of Wisconsin
1:34 pm	<b>S022</b> MINIMALLY INVASIVE ESOPHAGECTOMY AND GASTRIC PULL-UP IN CHILDREN <u>Deidra Garrett, MD</u> , Dean Anselmo, MD, Henri R. Ford, MD, Fombe N. Diforchu, MD, Nam X. Nguyen, MD, Childrens Hospital of Los Angeles and Miller Children's Hospital
1:39 pm	<b>S023</b> BROAD SPECTRUM ARMAMENTARIUM IN LONG GAP OESOPHAGEAL ATRESIA David C. van der Zee, PhD, MD, Dept. Pediatric Surgery, University Medical Center Utrecht
1:44 pm	<b>S024</b> THORACOSCOPIC SURGERY FOR VASCULAR RINGS IN CHILDREN <u>Alexander Razumovsky</u> , Victor Rachkov, Zoricto Mitupov, Nadezhda Kulikova, Alexander Zadvernyuk, Abdumanap Alhasov, Filatov Children's Hospital, Moscow, Russia; Russian State Medical University
1:49 pm	<b>V015</b> THORACOSCOPIC REPAIR OF A CONGENITAL H-TYPE FISTULA: AN EFFECTIVE OPERATIVE TECHNIQUE <u>Rebecca M. Lisle, MBBS, BSc, MRCS(Eng)</u> , Ram M. Nataraja, MBBS, BSc, MRCS(Ed), Varadarajan Kalidasan, MBBS, MS, MCh, FRCS, Paed Surg, MA, Anies A. Mahomed, MBBCh, FCS, SA, FRCS, Glasg Ed., FRCS, Department of Paediatric Surgery, Royal Alexandra Children's Hospital, Brighton, BN2 5BE, United Kingdom.
1:54 pm	<b>S025</b> THORACOSCOPIC TREATMENT OF PULMONARY HYDATID CYST IN CHILDREN <u>Mustafa Kucukaydin, Prof.</u> , Serkan Arslan, MD, Ahmet Burak Dogan, MD, Mustafa Erman Dorterler, MD, Ali Aslan, MD, Kadri Cemil Sulubulut, MD, Ozlem Yandim, MD, Department of Pediatric Surgery, Erciyes University, School of Medicine Kayseri /Turkey

# Complete Schedule CONTINUED...

1:59 pm	<b>V016</b> THORACOSCOPIC RESECTION OF AN ESOPHAGEAL DIVERTICULUM IN A 4 YEAR OLD MALE <u>Steven Rothenberg, MD</u> , Theodore Stathos, MD, the Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons
2:04 pm	<b>S026</b> PERIOPERATIVE OUTCOME OF PATIENTS WITH ESOPHAGEAL ATRESIA AND TRACHEO-ESOPHAGEAL FISTULA UNDERGOING OPEN VERSUS THORACOSCOPIC SURGERY <u>Philipp O. Szavay MD</u> , Sabine M. Zundel, MD, Gunnar Blumenstock, MD, PhD, Tobias Luthle, MD, Monika Girisch, MD, Joerg Fuchs, MD, Dept. of Pediatric Surgery, Dept. of Cardiology and Critical Care Medicine, University Children's Hospital, Department of Statistics and Medical Biometry, University of Tuebingen
2:12 pm	<b>S027</b> ENDOSCOPIC PECTUS CARINATUM REPAIR USING TWO 8-HOLE-STABILIZERS, SUBMUSCULAR CO2 AND PRESTERNAL NUSS BAR COMPRESSION; NEW "BERLIN-BUCH REVERSED NUSS" FIRST RESULTS IN 35 PATIENTS <u>K. Schaarschmidt, Prof., MD</u> , M. Lempe, MD, F. Schlesinger, MD, U. Jaeschke, MD, S. Polleichtner, MD, Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch, Germany

## KARL STORZ LECTURE: NOTES® – The Next or the Past Revolution?

Jacques Marescaux, MD, INTRODUCTION: Steven S. Rothenberg, MD

*Live from IRCAD!*

**2:15 pm – 3:00 pm**

*Monarchy Ballroom*



**Dr. Jacques Marescaux** was born on August 4, 1948. He quickly set his sights on a medical career. Upon completing his internship, he decided that surgery could never be an end in itself if disassociated from a scientific approach. He obtained a position as university professor of surgery, at the age of 32.

In 1994, he created an original structure dedicated to surgical research and training: IRCAD, a private non-profit institute, where researchers, computer science engineers, roboticists, international surgical experts and industry giants meet.

Since its creation, IRCAD has gained a renown of excellence in surgical research, attested by 2425 international publications and communications.

In September 2001, Prof. Marescaux realized the first long-distance remote surgery from New York to Strasbourg (Lindbergh Operation).

IRCAD's strong research orientation being the development of ever less invasive surgical techniques, a new concept of transluminal surgery using natural orifices, avoiding any scar on skin and muscles, has been initiated

in 2004 (ANUBIS project) allowing the first surgical intervention via natural orifices on 2nd April 2007.

So many surgical changes imply the parallel development of a training structure: the European Institute of Tele-Surgery that has gained international renown which is easily confirmed by the number of surgeons registering for the courses: 3.500 surgeons from all the continents are being trained each year.

Backed by the acknowledgment of a real need to keep up the link between the training institute and surgeons, in 2000, Prof. Marescaux has imagined a Virtual University on the Internet (WeBSurg), a website available in five languages: French, English, Spanish, Japanese and Chinese. In 2009, there are more than 72.000 active members.

The international success of IRCAD is behind a mirror Institute in Taiwan (Asia Ircad – AITS), a second Institute should open in Brazil in the State of Sao Paulo.

## Break

**3:00 pm – 3:30 pm**

*Exhibit Hall/Kohala Ballroom*

## PANEL: MIS vs. Open – Controversies in Minimally Invasive Surgery

CHAIR: Mark L. Wulkan, MD, CO-CHAIR: Manuel Lopez, MD

**3:30 pm – 5:00 pm**

*Monarchy Ballroom*

## Description

The panel will discuss the pro's and con's of minimally invasive congenital diaphragmatic hernia repair, inguinal hernia repair and cancer surgery. There is ambiguity about the appropriateness of some minimally invasive procedures. Three areas in which there is not clear evidence are neonatal diaphragmatic hernia repair, inguinal hernia repair and cancer surgery. This session is designed to share expert opinion with the audience and promote audience participation through discussion of the topics.

## Objectives

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

- List three advantages and disadvantages of MIS Diaphragmatic hernia repair.
- List three advantages and disadvantages of MIS inguinal hernia repair.
- List three advantages and disadvantages of MIS cancer surgery.

TIME	TOPIC	FACULTY
3:30 pm	Neonatal CDH Repair – Open Neonatal CDH Repair – MIS	Pablo Laje, MD Timothy D. Kane, MD
3:50 pm	Q & A	
4:00 pm	Inguinal Hernia Repair - Open Inguinal Hernia Repair - MIS	Steven S. Rothenberg, MD Todd A. Ponsky, MD
4:20 pm	Q & A	
4:30 pm	Cancer Surgery – Open Cancer Surgery – MIS	Gordon A. MacKinlay, MD Girolamo Mattioli, MD
4:50 pm	Q & A	

## SCIENTIFIC SESSION: Top 20 Posters

CHAIR: Craig T. Albanese, MD

5:00 pm – 6:00 pm

Monarchy Ballroom

TIME	TOPIC
5:00 pm	<b>P001</b> DOES THE YEAR OF TRAINING OF THE OPERATING RESIDENT CORRELATE WITH OPERATIVE TIME IN LAPAROSCOPIC OR OPEN APPENDECTOMY IN CHILDREN? <u>Julie Mckee, PNP</u> , Marla Matar, MD, David Bliss, MD, Oregon Health and Science University and Legacy Health Systems
5:03 pm	<b>P002</b> ROBOTIC SURGERY IN CHILDREN: IS THERE A LEARNING CURVE? <u>Brice Antao, MRCS</u> , Tricia Merrigan, MD, Craig Nemechek, MD, Michael Irish, MD, Blank Children's Hospital, Des Moines, Iowa, USA
5:06 pm	<b>P003</b> RAPID TRANSITION FROM OPEN TO LAPAROSCOPIC APPENDECTOMY IN A HIGH-VOLUME CENTER: RESULTS AND LESSONS LEARNED <u>Jan F. Svensson, MD</u> , Markus Almström, MD, Jan O. Rutqvist, MD, Tomas Wester, MD, PhD, Department of Paediatric Surgery, Astrid Lindgren Children's Hospital, Stockholm, Sweden
5:09 pm	<b>P004</b> LAPAROSCOPIC APPENDECTOMY IN EXTREMELY OBESE CHILDREN IS ASSOCIATED WITH LOWER MORBIDITY Balazs Kutasy, MD, Manuela Hunziker, MD, Ganapathy Lakshamanadass, MD, Prem Puri, Prof., MS, FRCS, FRCSEd, FACS, The National Children's Hospital, Dublin, Ireland
5:12 pm	<b>P005</b> SEVERITY OF APPENDICITIS CORRELATES WITH THE PEDIATRIC APPENDICITIS SCORE, A PROSPECTIVE STUDY <u>Obinna O. Adibe, MD</u> , Keith E. Georgeson, MD, Carroll M. Harmon, MD, PhD, The Children's Hospital of Alabama, Birmingham, Alabama, USA
5:15 pm	<b>P006</b> LAPAROSCOPIC SURGERY SIGNIFICANTLY REDUCES POSTOPERATIVE BOWEL OBSTRUCTION AND DEVELOPMENT OF INTRAABDOMINAL ABSCESS FOLLOWING COMPLICATED APPENDICITIS COMPARED WITH OPEN SURGERY, IN CHILDREN <u>Ayhan Yaman, MD</u> , Coskun Kose, MD, Ufuk Ates, MD, Esra Temeltas, MD, Meltem Bingol-Kologlu, MD, Huseyin Dindar, MD, Aydin Yagmurlu, MD, Ankara University, Faculty of Medicine, Department of Pediatric Surgery, Ankara, Turkey
5:18 pm	<b>P007</b> THORACOSCOPIC REPAIR FOR CONGENITAL DIAPHRAGMATIC HERNIA: LESSONS FROM 134 CASES <u>Nguyen Thanh Liem, PhD</u> , National Hospital of Pediatrics
5:21 pm	<b>P008</b> NISSEN FUNDOPLICATION IN CHILDREN: A DECADE OF EXPERIENCE <u>Anindya Niyogi</u> , Arpan S. Tahim, Munther J. Haddad, Simon A. Clarke, Chelsea and Westminster Hospital, London
5:24 pm	<b>P009</b> CASE OF PRIMARY LAPAROSCOPIC DUHAMEL PULL-THROUGH IN TOTAL COLONIC AGANGLIONOSIS <u>Georgina Malakounides, MBBS, MRCS</u> , Niall Jones, MD, FRCSI, Paeds, Harry Ward, MS, FRCS, Royal London Hospital
5:27 pm	<b>P010</b> TRANSAXILLARY SUBCUTANEOUS ENDOSCOPIC STERNOCLEIDOMASTOID MUSCLE RELEASE FOR TREATMENT OF PERSISTENT TORTICOLLIS IN CHILDREN: OUR TECHNIQUE <u>Clair Johny, PA</u> , Ashwin Pimpalwar, MD, Texas Childrens Hospital, Houston, Texas, 77030

# Complete Schedule CONTINUED...

5:30 pm	<b>P011</b> LAPAROSCOPIC SURGERY USING LAPAROSCOPIC PERCUTANEOUS EXTRAPERITONEAL CLOSURE (LPEC) NEEDLE <u>Takuya Kosumi, PhD</u> , Takeo Yonekura, PhD, Tosio Sawai, PhD, Katuji Yamauchi, PhD, Takuya Kimura, PhD, Yoshiyuki Ihara, PhD, Department of Pediatric Surgery Nara Hospital, Kinki University School of Medicine
5:33 pm	<b>P012</b> SINGLE INCISION LAPAROSCOPIC INGUINAL HERNIA REPAIR IN CHILDREN: A DESCRIPTION OF TECHNIQUE <u>Andrew M. Ibrahim, BA</u> , <u>Todd A. Ponsky, MD</u> , Rainbow Babies and Children's Hospital, Case Western Reserve University School of Medicine
5:36 pm	<b>P013</b> TREATMENT OF PECTUS EXCAVATUM IN PATIENTS OVER 20 YEARS OF AGE <u>Edward Esteves, MD</u> , Marcelo Calcagno-Silva, MD, Humberto B. Sousa-Filho, MD, Kelly C. Paiva, MD, Denny C. Lima, MD, Celio C. Chagas, MD, Roneyara R. Valamiel, MD, Pediatric Surgery Division, University of Goias, Goiania (GO); Pediatric Surgery Division, Joao Penido Hospital, Juiz de Fora (MG), Brazil
5:39 pm	<b>P014</b> PEDIATRIC LAPAROSCOPIC CHOLECYSTECTOMY USING 2-3 MINIPOINTS WITHOUT CLIPS: ANALYSIS OF 310 CASES <u>Edward Esteves, MD</u> , Denny C. Lima, MD, Humberto B. Sousa-Filho, MD, Calebe P. Souza, MD, Eriberto Clemente-Neto, MD, Pediatric Surgery Division, University of Goias. Goiania, Brazil
5:42 pm	<b>P015</b> SPLENOMEGALY INDEX: A PREDICTIVE VALUE FOR LAPAROSCOPIC SPLENECTOMY IN PEDIATRIC PATIENTS <u>Juan I. Camps, MD</u> , Joel F. Bradley, III, MD, Michael J. Yost, PhD, Timothy Z. Brock, MD, Palmetto Health Children's Hospital and University of South Carolina Department of Surgery, Columbia, SC
5:45 pm	<b>P016</b> LATE LAPAROSCOPIC REPAIR OF HIGH ANORECTAL MALFORMATIONS IN CHILDREN OVER 4 YEARS OLD <u>Edward Esteves, MD</u> , Maria Marcela Bailez, MD, Daniel Carauni, MD, Luis H. Zea-Salazar, MD, Carlos V. Beckmann, MD, Humberto B. Sousa-Filho, MD, Aluisio Mello-Filho, MD, Pediatric Surgery Division, University of Goia, Goiania-Brazil, Pediatric Surgery Service of Kennedy Alborada Hospital, Guayaquil, Ecuador; Hospital de Niños de Corrientes, Argentina
5:48 pm	<b>P017</b> BALLOON DILATATION IS AN MINIMAL INVASIVE AND EFFECTIVE MODE OF TREATMENT IN CHILDREN WITH CONGENITAL CRICOPHARYNGEAL ACHALASIA <u>Coskun Kose, MD</u> , Esra Temeltas, MD, Ufuk Ates, MD, Huseyin Dindar, MD, Meltem Bingol-Kologlu, MD, Ankara University, Faculty of Medicine, Department of Pediatric Surgery Cebeci
5:51 pm	<b>P018</b> THE INTRODUCTION OF LAPAROSCOPIC MANAGEMENT FOR SUSPECTED MECKEL'S DIVERTICULUM IN CHILDREN – A SINGLE CENTRE EXPERIENCE <u>Mairi Steven, MD</u> , Andrew Watt, MD, Atul J. Sabharwal, MD, Royal Hospital for Sick Children, Glasgow, United Kingdom
5:54 pm	<b>P019</b> SINGLE INCISION LAPAROSCOPIC SURGERIES IN CHILDREN <u>Wendy Su, MD</u> , Trevor Boswell, Thomas Hui, MD, Children's Hospital and Research Center Oakland
5:57 pm	<b>P020</b> THE COOLEST WAY TO FIX A TROCAR IN PEDIATRIC MIS <u>Carolina Millan, MD</u> , Horacio Bignon, MD, Enrique Buella, MD, Gaston Bellia Munzon, MD, Esteban Gallino, MD, Juan Ignacio Bortagaray, MD, Marcelo Martinez-Ferro, MD, Fundación Hospitalaria - Private Children's Hospital

## FRIDAY, JUNE 11, 2010

\*Scientific Sessions are located in the Monarchy Ballroom

### MORNING VIDEO SESSION: Colorectal & Unexpected Findings

MODERATORS: Timothy Kane, MD & Saleem Islam, MD

**7:00 am – 8:00 am**

Monarchy Ballroom

TIME	TOPIC
7:00 am	<b>V017</b> LAPAROSCOPIC EXCISION OF AN ABDOMINAL LYMPHATIC MALFORMATION <u>Sherif Emil, MDCM</u> , Montreal Children's Hospital; McGill University Health Centre
7:05 am	<b>S028</b> EARLY MORBIDITY OF ROBOTIC ABDOMINAL PROCEDURES IN CHILDREN <u>Najmaldin Azad</u> , Robinson Philip, Sellors Jane, Leeds Teaching Hospital NHS Trust, Leeds, UK
7:10 am	<b>S029</b> MODIFIED LAPAROSCOPIC GASTROSTOMY TECHNIQUE HAS LOWER COMPLICATION RATE <u>Gustavo A. Villalona, MD</u> , Heather M. Kaufman, APRN, CPNP, Milissa A. McKee, MD, MPH, Karen A. Diefenbach, MD, Yale University School of Medicine, Yale-New Haven Children's Hospital

7:15 am	<b>S030</b> COMBINED LAPAROSCOPIC-THORACOSCOPIC REPAIR OF RECURRENT LARGE TRACHEOESOPHAGEAL FISTULA WITH OMENTUM AND GASTROESOPHAGEAL REFLUX IN ESOPHAGEAL ATRESIA <u>Edward Esteves, MD</u> , Mariza R. Faria, MD, Adriana C. Perez-Boscolli, MD, Elina Oliveira, MD, Pediatric Surgery Division, University of Goias, Goiania (GO)
7:20 am	<b>S031</b> LAPAROSCOPIC COLLIS-NISSEN FOR RECURRENT SEVERE REFLUX IN PEDIATRIC PATIENTS WITH ESOPHAGEAL ATRESIA AND RECURRENT HIATAL HERNIA <u>Steven S. Rothenberg, MD</u> , Anthony Chin, MD, The Rocky Mountain Hospital for Children
7:25 am	<b>S032</b> HOW TO REDUCE THE RISK OF COMPLICATION AFTER LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION IN CHILDREN <u>Weihua Pan, MD</u> , Yeming Wu, MD, Zhilong Yan, MD, Department of Pediatric Surgery, Xinhua Hospital, Medical School of Shanghai Jiaotong University
7:30 am	<b>S033</b> LAPAROSCOPIC TREATMENT OF POST-NECROTIZING ENTEROCOLITIS COLONIC STRICTURES <u>Marcelo Martinez-Ferro, MD</u> , Steven Rothenberg, MD, Shawn St. Peter, MD, Horacio Bignon, MD, George Holcomb, MD, Fundación Hospitalaria - Private Children's Hospital; The Rocky Mountain Hospital for Children and Children's Mercy Hospital
7:38 am	<b>S034</b> MICROLAPAROSCOPICALLY ASSISTED PULL-THROUGH PROCEDURE FOR HIRSCHSPRUNG'S DISEASE <u>Salmal Turial, MD</u> , Jan Enders, MD, Veronica Engel, MD, Felix Schier, MD, Department of Pediatric Surgery, Medical University Centre, Mainz, Germany
7:43 am	<b>S035</b> THE TRANSANAL APPROACH WITH LAPAROSCOPY OR LAPAROTOMY FOR THE TREATMENT OF RECTAL STRICTURES IN CROHN'S DISEASE <u>Taiwo A. Lawal, MD</u> , Jason S. Frischer, MD, Richard A. Falcone, MD, MPH, Kaveer Chatoorgoon, MD, Lee A. Denson, MD, Marc A. Levitt, MD, Cincinnati Children's Hospital Medical Center, Cincinnati, USA
7:48 am	<b>S036</b> COMPARISON OF TRANSANAL ENDORECTAL PULL-THROUGH AND LAPAROSCOPIC ASSISTED TRANSANAL ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE <u>Mustafa Kucukaydin, Prof.</u> , Ahmet Burak Dogan, MD, Ali Aslan, MD, Kadri Cemil Sulubulut, MD, Ozlem Yandim, MD, Serkan Arslan, MD, Mustafa Erman Dorterler, MD, Erciyes University, School of Medicine, Department of Pediatric Surgery, Kayseri
7:53 am	<b>S037</b> SINGLE INCISION LAPAROSCOPIC SURGERY: A DIFFERENT PROPOSAL <u>Miguel Geulfand, MD</u> , Patricio Varela, MD, Jorge Godoy, MD, Las Condes Clinic & Exequiel González Cortés Hospital for Children - CHILE

## SCIENTIFIC SESSION: Gastrointestinal & Hepatobiliary – Part II

MODERATORS: Keith A. Georgeson, MD & Go Miyano, MD

8:00 am – 9:30 am

Monarchy Ballroom

TIME	TOPIC
8:00 am	<b>S038</b> LAPAROSCOPIC REPAIR FOR CHOLEDOCHAL CYST: LESSONS LEARNED FROM 227 CASES <u>Nguyen Thanh Liem, PhD</u> , Pham Duy Hien, MD, Le Anh Dung, MD, Tran Ngoc Son, PhD, National Hospital of Pediatrics
8:08 am	<b>S039</b> LAPAROSCOPIC RESECTION OF CONGENITAL CHOLEDOCHAL CYST, HEPATICOJEJUNOSTOMY, AND EXTERNALLY MADE ROUX-EN-Y ANASTOMOSIS: A TECHNICAL SKILL AND INTERMEDIATE-TERM REPORT IN 50 CASES <u>Tang Shao-tao, MD</u> , Yang Ying, MD, Zhao Zhi-xiang, Department of Pediatric Surgery, Union Hospital of Huazhong College of Science and Technology, Wuhan, China
8:13 am	<b>V018</b> TECHNICAL REAPPRAISAL OF LAPAROSCOPIC KASAI PORTOENTEROSTOMY FOR UNCORRECTABLE BILIARY ATRESIA <u>Atsuyuki Yamataka, MD</u> , Go Miyano, MD, Hiroyuki Koga, MD, Tsubasa Takahashi, MD, Akihiro Shimotakahara, MD, Yoshifumi Kato, MD, Geoffrey J. Lane, MD, Tadaharu Okazaki, MD, Department of Pediatric General & Urogenital Surgery, Juntendo University Hospital
8:18 am	<b>S040</b> LAPAROSCOPIC TREATMENT OF BILE DUCTS MALFORMATIONS <u>Victor Rachkov</u> , Alexander Razumovsky, Nadezhda Kulikova, Abdumanap Alhasov, Zorikto Mitupov, Filatov Children's Hospital, Moscow, Russia; Russian State Medical University
8:23 am	<b>S041</b> LAPAROSCOPIC EXCISION OF CHOLEDOCHAL CYST AND TOTAL INTRACORPOREAL RECONSTRUCTION: A SERIES OF 10 CONSECUTIVE PATIENTS <u>Jeffrey W. Gander, MD</u> , Robert A. Cowles, MD, Jeffrey L. Zitsman, MD, Anthony Chin, MD, Steven S. Rothenberg, MD, Morgan Stanley Children's Hospital of New York-Presbyterian, Columbia University Medical Center & The Rocky Mountain Hospital for Children

# Complete Schedule CONTINUED...

8:28 am	<b>S042</b> LAPAROSCOPIC HEPATICOJEJUNOSTOMY AND INTRAHEPATIC CYSTOJEJUNOSTOMY FOR TYPE IV-A CHOLEDOCHAL CYSTS <u>Suolin Li, MD</u> , Zengwen Yu, MD, Yingchao Li, MD, Department of Pediatric Surgery, 2nd Hospital of Hebei Medical University
8:36 am	<b>S043</b> LAPAROSCOPIC ILEOCECTOMY IN PEDIATRIC PATIENTS WITH MEDICALLY REFRACTIVE CROHN'S DISEASE <u>Carrie A. Laituri, MD</u> , Jason D. Fraser, MD, Carissa L. Garey, MD, Pablo Aguayo, MD, Susan W. Sharp, PhD, Ronald J. Sharp, MD, Daniel J. Ostlie, MD, George W. Holcomb, III, MD, Shawn D. St. Peter, MD, The Children's Mercy Hospital, Kansas City, Missouri
8:41 am	<b>S044</b> LAPAROSCOPIC MANAGEMENT OF SMALL BOWEL OBSTRUCTION IN CHILDREN <u>Pablo Aguayo, MD</u> , Jason D. Fraser, MD, Shawn D. St. Peter, MD, Carrie A. Laituri, MD, Daniel J. Ostlie, MD, Children's Mercy Hospital and Clinics
8:46 am	<b>S045</b> A RETROSPECTIVE MULTICENTRIC STUDY OF 79 ALIMENTARY TRACT DUPLICATIONS OPERATED ON BY MINIMALLY INVASIVE SURGERY <u>Florent Guerin, MD</u> , Guillaume Podevin, MD, PhD, Manuel Lopez, MD, Hubert Lardy, MD, PhD, Emmanuel Sapin, MD, PhD, Jean Yves Kurzenne, MD, PhD, Jean Gaudin, MD, Gerard Morisson Lacombe, MD, Philippe Montupet, MD, Ionis Valioulis, MD, Martine Demarche, MD, GEIC (Groupe D'étude En Coeliocirurgie Infantile)
8:51 am	<b>S046</b> LAPAROSCOPICALLY ASSISTED ESOPHAGECTOMY AND COLONIC INTERPOSITION IN CHILDREN <u>Edward Esteves, MD</u> , Humberto B. Sousa-Filho, MD, Calebe P. Sousa, MD, José F. Silva, MD, André L. Costa, MD, Eriberto Clemente-Neto, MD, Seiji Watanabe, MD, Pediatric Surgery Division, University of Goias, Goiania, Brazil
8:56 am	<b>S047</b> LAPAROSCOPIC CORRECTION OF GASTRO-EOSOPHAGEAL REFLUX DISORDER IN CHILDREN: A SINGLE CENTRE 16 YEARS EXPERIENCE <u>Henri Steyaert, MD</u> , Jerome Lauron, MD, Jean Stephane Valla, PhD MD, Lenva Foundation for Children
9:01 am	<b>S048</b> NATIONAL VARIATION IN THE UTILIZATION OF LAPAROSCOPIC ANTIREFLUX SURGERY AT US CHILDREN'S HOSPITALS <u>John A. Sandoval, MD</u> , David A. Partrick, MD, Elaine H. Morrato, DrPh, MPH, David Fox, MD, Daksha Ranade, MPH, Allison Kempe, MD, MPH, Moritz M. Ziegler, MD, Departments of Pediatric Surgery and Pediatrics, The Children's Hospital, University of Colorado
9:06 am	<b>S049</b> TRANSUMBILICAL LAPAROSCOPICALLY ASSISTED APPENDECTOMY: AN ALTERNATIVE MINIMALLY INVASIVE TECHNIQUE IN PEDIATRIC PATIENTS <u>Amy B. Stanfill, MD</u> , Danielle K. Matilsky, Kavitha Kalvakuri, MD, Richard H. Pearl, MD, Elizabeth J. Wallace, MS, RN, Ravindra K. Vegunta, MD, Children's Hospital of Illinois, University of Illinois College of Medicine at Peoria
9:11 am	<b>S050</b> LAPAROSCOPIC-ASSISTED SINGLE-PORT APPENDECTOMY IN CHILDREN: IS THE POSTOPERATIVE INFECTIOUS COMPLICATION RATE DIFFERENT? <u>Sergio B. Sesia, MD</u> , Rainer Kubiak, MD, Johannes Mayr, PhD, Universitäts-Kinderspital Beider Basel, Switzerland
9:16 am	<b>S051</b> CAN WE IMPROVE OUTCOMES OF LAPAROSCOPIC SURGERY FOR BILIARY ATRESIA? <u>Nguyen Thanh Liem, PhD</u> , Tran Ngoc Son, PhD, Tran Anh Quynh, MD, Nguyen Pham Anh Hoa, MD, National Hospital of Pediatrics
9:21 am	<b>S052</b> COMPARISON OF LAPAROSCOPIC VERSUS OPEN MORGAGNI HERNIA REPAIR IN CHILDREN <u>Carrie A. Laituri, MD</u> , Carissa L. Garey, MD, Daniel J. Ostlie, MD, George W. Holcomb, III, MD, Shawn St. Peter, MD, The Children's Mercy Hospital, Kansas City, Missouri

## KEYNOTE LECTURE: "The Toll of Turning Impossible Dreams to Tangible Realities"

Barry Goodfield, MD, INTRODUCTION: Thom E. Lobe, MD

9:30 am – 10:00 am

Monarchy Ballroom



When parents dreams turn to nightmares it is often the skills of the Pediatric Endosurgeon that reverse the situation. Bringing innovation and creativity to crisis is their daily job but, there is a price tag. High stress, pressure, and often overwhelming expectations leave their marks on IPEG members. Dr. Barry Goodfield will discuss the personal costs of being an endosurgeon. This presentation will pose solutions to reduce the price the pediatric endosurgeon pays to excel. Expect practical suggestions wrapped in a package of inspiration.

**Dr. Barry Goodfield** has been a consultant and trainer to the medical societies in Bordeaux, and Paris. He has worked with traumatic birth experience and its impact on children and parents more than 30 years. He has split his time between his practice in the United States and Europe for the last 30 plus years. Dr. Goodfield sees the work of the IPEG as having major importance to not just the patient and family but to the society as a whole. He will comment on the personal impact to all involved and better prepare the pediatric endosurgeon to deal effectively with the challenges of the future.

**Break**

**10:00 am – 10:30 am**  
Exhibit Hall/Kohala Ballroom

**Exhibitions & Poster Viewing**

IPEG Exhibits Open  
IPEG Poster Viewing Open

**9:30 am – 3:30 pm**  
Kohala Ballroom  
Queen's Ballroom

**SCIENTIFIC SESSION: Alternative Technologies  
(Robotics, NOTES® & Single Port Access Laparoscopy)**

MODERATORS: Celeste Hollands, MD & John J. Meehan, MD

**10:30 am – 11:30 am**  
Monarchy Ballroom

TIME	TOPIC
10:30 am	<b>S053</b> PERORAL ESOPHAGEAL SEGMENTECTOMY AND ANASTOMOSIS WITH SINGLE TRANSTHORACIC TROCAR ASSISTANCE: A STEP FORWARD IN THORACIC N.O.T.E.S. Carla Rolanda, MD, PhD, David Silva, MD, Cláudio Branco, MD, Jorge Correia-Pinto, MD, PhD, Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho
10:35 am	<b>V019</b> EXPERIENCE WITH TRANESOPHAGEAL INCISIONLESS FUNDOPLICATION IN A CHILD Steven Rothenberg, MD, Theodore Stathos, MD, the Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons
10:40 am	<b>V020</b> ROBOTIC SPLENECTOMY Louis C. Lee, MD, Stephen S. Kim, Inova Fairfax Hospital for Children
10:45 am	<b>V021</b> DA VINCI ASSISTED DUODENOJEJUNOSTOMY FOR SUPERIOR MESENTERIC ARTERY SYNDROME CM Schlachta, MD, FRCSC, S. Jayaraman, MD, FRCSC, A. Butter, MD, MSc, FRCSC, University of Western Ontario, London Health Sciences Centre, Children's Hospital of Western Ontario and Canadian Surgical Technologies and Advanced Robotics (CSTAR)
10:50 am	<b>S054</b> POST OPERATIVE PATIENT SATISFACTION WITH SINGLE SITE SURGERY Todd Ponsky, MD, Yagnik K. Pandya, MD, Scott Boulanger, MD, Jennifer Diluciano, RN, Andrew Ibrahim, Rainbow Babies and Children's Hospital, Case Medical Center, Cleveland, OH
10:55 am	<b>S055</b> APPENDECTOMY USING SINGLE-INCISION PEDIATRIC ENDOSURGERY (SIPES) FOR ACUTE AND PERFORATED APPENDICITIS Oliver J. Muensterer, MD, PhD, Cecilia Puga Nougues, MD, Obinna O. Adibe, MD, Keith E. Georgeson, MD, Carrol M. Harmon, MD, PhD, Children's Hospital of Alabama, University of Alabama at Birmingham
11:00 am	<b>S056</b> EXPERIENCE WITH MODIFIED SINGLE-PORT ACCESS TRANSUMBILICAL LAPAROSCOPIC SURGERY IN PEDIATRIC POPULATION Soo Min Ahn, Division of Pediatric Surgery, Hallym University Sacred Heart Hospital
11:05 am	<b>V022</b> SINGLE PORT CHOLECYSTECTOMY IN RESIDENT TRAINING: A REPRODUCIBLE TECHNIQUE Todd A. Ponsky, MD, Rainbow Babies and Children's Hospital, Case Western Reserve University
11:10 am	<b>S057</b> EARLY EXPERIENCE WITH SINGLE INCISION THORACOSCOPIC SURGERY (SITS) IN THE PEDIATRIC POPULATION Rajeesh Prasad, MD, Lindsay G. Arthur, MD, Shaheen J. Timmapuri, MD, Marshall Z. Schwartz, MD, Timothy J. Fairbanks, MD, Kim G. Mendelson, MD, Matthew L. Moront, MD, St. Christopher's Hospital for Children and Drexel University College of Medicine
11:15 am	<b>S058</b> "THE MAGNETS REVOLUTIONS" THE ULTIMATE SOLUTION FOR TRACTION AND VISUALIZATION IN SILS Marcelo Martinez-Ferro, MD, Guillermo Dominguez, MD, Carolina Millan, MD, Fundacion Hospitalaria Children's Hospital
11:20 am	<b>S059</b> SINGLE-INCISION PEDIATRIC ENDOSURGICAL (SIPES) VERSUS CONVENTIONAL LAPAROSCOPIC PYLOROMYOTOMY: A SINGLE-SURGEON EXPERIENCE Oliver J. Muensterer, MD, PhD, Children's Hospital of Alabama, University of Alabama at Birmingham

**Poster Tours**

CHAIR: Craig T. Albanese

MODERATORS: J. Ted Gerstle, MD, FRCSC, FAAP; Munther Haddad, MD; Celeste Hollands, MD; Tadashi Iwanaka, MD; John J. Meehan, MD; Klaus Schaarschmidt, MD; & Henri Steyaert, MD

**11:30 am – 12:30 pm**  
Queen's Ballroom

**Lunch /Free Time/Exhibit Viewing**

**12:00 pm – 1:00 pm**

# Complete Schedule CONTINUED...

## PANEL: Re-Do MIS Surgery – Why & How?

CHAIRS: Thom E. Lobe, MD, CO-CHAIR: Holger Till, MD, PhD

**1:00 pm – 3:00 pm**

*Monarchy Ballroom*

### Description

This session will describe the rationale for performing Redo minimal access surgery and its technique as applied to commonly seen pediatric surgical problems. Advanced techniques, instrumentation and helpful tricks will be discussed as they apply to redo minimal access procedures.

### Objectives

- To understand the rationale and indications and contraindications for redo minimal access surgery.
- To understand technical approaches to perform safe redo surgery.
- To understand when enough is enough, and when to quit and open redo cases.
- To understand the complications that may occur with redo minimal access surgery.

TIME	TOPIC	FACULTY
1:00 pm	Role of MIS in Redo Hirschsprung's Disease	Marc A. Levitt, MD
1:20 pm	Q&A	
1:30 pm	Reoperative Surgery for Adhesions	Thom E. Lobe, MD
1:50 pm	Q&A	
2:00 pm	Upper Gastrointestinal Surgery	Holger Till, MD, PhD
2:20 pm	Q&A	
2:30 pm	Lessons Learned in MIS RedoNissen	Juergen Schleef, MD
2:50 pm	Q&A	

### BREAK

**3:00 pm – 3:15 pm**

*Exhibit Hall/Kohala Ballroom*

## PANEL: Morbid Obesity in Pediatrics – Difficult Cases

CHAIR: Thomas H. Inge, MD, CO-CHAIR: Marc Michalsky, MD

**3:15 pm – 5:15 pm**

*Monarchy Ballroom*

### Description

This session will describe the most promising and minimally invasive surgical treatment options applicable to adolescents with morbid obesity. Procedures will include roux en Y gastric bypass, adjustable gastric banding, and vertical sleeve gastrectomy. Discussion will also focus on mechanisms of disease control afforded by the surgical procedures. The panel will also be presented with challenging cases for discussion.

### Objectives

- To review the latest mid-term results following gastric bypass in adolescents in the US.
- To review the results to date for adolescents who have undergone adjustable gastric banding in the Northern and Southern hemisphere.
- To understand the rationale behind use of vertical sleeve gastrectomy and the results to date in adolescents in the Middle East
- To review the proposed mechanism(s) by which each of the procedures affect weight and metabolic changes postoperatively

TIME	TOPIC	FACULTY
3:00 pm	Gastric Bypass	Carroll "Mac" Harmon, MD, PhD
3:20 pm	Q&A	
3:25 pm	Gastric Banding	Marc Michalsky, MD & Miguel Guelfand, MD
3:45 pm	Q&A	
3:50 pm	Sleeve Gastrectomy	Aayed Al-Qahtani, MD & Holger Till, MD, PhD
4:10 pm	Q&A	
4:15 pm	Mechanisms of Action	Holger Till, MD, PhD
4:35 pm	Q&A	
4:40 pm	Difficult Cases	Panel Discussion

## IPEG Main Event

Join IPEG for a night of food, drinks, music and dancing!

Kick off the night by watching the sunset. The Lagoon Lanai overlooks the 4-acre of salt-water lagoon and the waterfall.

**7:00 pm – 11:00 pm**

*Hilton Waikoloa/Lagoon Lanai*

## SATURDAY, JUNE 12, 2010

### INDUSTRY SPONSORED SYMPOSIUM

#### Ethicon Endo-Surgery, Inc. – “The Science of Energy for Tissue Management”

CHAIR: Steven S. Rothenberg, MD

This event is not planned or sponsored by IPEG nor accredited for CME by SAGES. Registration is FREE for any meeting attendee.

#### Description

The science of energy program via surgeons that includes both advanced bipolar and (ultrasonic) harmonic technologies.

*This is a non-CME activity presented and supported by Ethicon Endo – Surgery, Inc*

**7:00 am – 8:00 am**

*Monarchy Ballroom*

### General Assembly

**8:15 am – 9:15 am**

*Monarchy Ballroom*

### SCIENTIFIC SESSION: Urology

MODERATORS: Girolamo Mattioli, MD & Shawn D. St. Peter, MD

**9:15 am – 10:15 am**

*Monarchy Ballroom*

TIME	TOPIC
9:15 am	<b>V023</b> ROBOTIC SURGERY: REPAIR OF A RETROCAVAL URETER CAUSING HYDRONEPHROSIS <u>Juan I. Camps, MD, MBA</u> , Joel F. Bradley, III, MD, Jeffrey T. Ehreth, MD, Palmetto Health Children’s Hospital and the University of South Carolina Department of Surgery
9:20 am	<b>S060</b> PROSPECTIVE RANDOMIZED CASE CONTROL STUDY OF OPEN VERSUS LAPAROSCOPIC PYELOPLASTY IN CHILDREN <u>Lisandro A. Piaggio, MD</u> , Juan P. Corbeta, MD, Victor Duran, MD, Juan C. Lopez, MD, Santiago Hueler, MD, Ricardo Dingevan, Hospital Nacional de Pediatría JP Garrahan. Hospital Interzonal G.A Dr. José Penna. Hospital Italiano Regional del Sur. Clínica Raúl Mattera
9:25 am	<b>S061</b> LAPAROSCOPIC PYELOPLASTY FOR URETEROPELVIC JUNCTION OBSTRUCTION IN CHILDREN <u>Danielle D. Sweeney, MD</u> , Steven G. Docimo, MD, Francis X. Schneck, MD, University of Pittsburgh Medical Center, Department of Pediatric Urology, Children’s Hospital of Pittsburgh
9:30 am	<b>S062</b> EARLY EXPERIENCE WITH INFANT LAPAROSCOPIC PYELOPLASTY FOR URETEROPELVIC JUNCTION OBSTRUCTION <u>Danielle D. Sweeney, MD</u> , Regina D. Norris, MD, Gaayana A. Raju, MD, Steven G. Docimo, MD, Francis X. Schneck, MD, University of Pittsburgh Medical Center, Children’s Hospital of Pittsburgh
9:35 am	<b>S063</b> THE ROLE OF LAPAROSCOPIC EXTRAVESICAL TRANSPERITONEAL APPROACH IN REFLUXING DUPLICATED COLLECTING SYSTEMS <u>Manuel Lopez, MD</u> , Michel François, MD, Carlos Melo, MD, François Varlet, MD, PhD, Department of Pediatric Surgery, University Hospital of Saint Etienne-France.
9:40 am	<b>S064</b> VESICOSCOPIC CROSS-TRIGONAL URETERAL REIMPLANTATION FOR VESICoureteral REFLUX IN CHILDREN: PRELIMINARY RESULTS OF A SINGLE-CENTER 3-YEARS EXPERIENCE <u>Monika Glass, MD</u> , Beatrice Ferdilus, MD, Emanuel Alexe, MD, Cindy Gomes, MD, Paul G. Philippe, MD, Chirurgie Pédiatrique, Centre Hospitalier de Luxembourg, 1210 Luxembourg
9:45 am	<b>S065</b> PRESERVATION OF ADRENOCORTICAL FUNCTION IN PATIENTS WITH BILATERAL PHEOCHROMOCYTOMAS USING A LAPAROSCOPIC APPROACH <u>Giovanny Casadiego, MD</u> , Doruk Ozgediz, MD, J. Ted Gerstle, MD, Hospital for Sick Children/University of Toronto, Toronto, Ontario, Canada
9:50 am	<b>V024</b> LAPAROSCOPIC COLOCYSTOPLASTY: THE IDEAL SURGERY FOR THE SELECTED PATIENT <u>Lisandro A. Piaggio, MD</u> , Nestor H. Piaggio, MD, Pablo Long, MD, Gustavo Sofia, MD, Hospital Italiano Regional del Sur, Bahía Blanca, Bs.As, Argentina
9:55 am	<b>V025</b> MIS FOR THE TREATMENT OF A CONGENITAL MIDURETERAL OBSTRUCTION <u>Lisandro A. Piaggio</u> , Nestor H. Piaggio, Hospital Italiano Regional del Sur, Bahía Blanca, Bs.As, Argentina

# Complete Schedule CONTINUED...

10:00 am	<b>S066</b> LAPAROSCOPIC VARICOCELECTOMY IN TEENAGERS: EXPERIENCE IN TWO SWISS CENTERS <u>Mario Mendoza-Sagaon, MD</u> , Flurim Hamitaga, MD, Olivier Reinberg, MD, Conrad Muller, MD, Rudolf Leuthardt, MD, Ospedale Regionale di Bellinzona e Valli, Bellinzona and Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland
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**Break**

**10:15 am – 10:30 am**  
*Kohala Promenade*

## IPEG AWARDS SESSION

**Basic Science Award** AWARDED BY: Benno M. Ure, MD, PhD

**10:30 am – 10:45 am**  
*Monarchy Ballroom*

**IRCAD** AWARDED BY: Marcelo H. Martinez Ferro, MD

## 2008 IRCAD AWARD WINNER ABSTRACT PRESENTATION

**“The Impact of CO<sub>2</sub> Pneumoperitoneum on Lives with Biliary Atresia”**

**10:45 am – 11:00 am**  
*Monarchy Ballroom*

Pablo Laje, MD, INTRODUCTION: Benno M. Ure, MD, PhD

## SCIENTIFIC VIDEO SESSION: Miscellaneous

MODERATORS: Long Li, MD & Edward Esteves, MD

**11:00 am – 12:00 pm**  
*Monarchy Ballroom*

TIME	TOPIC
11:15 am	<b>S067</b> THE RISKS OF MINIMAL ACCESS SURGERY IN CHILDREN: A BENCHMARK FOR CONSENT <u>Boma T. Adikibi, MD</u> , Gillian H. M. Duthie, MD, Claire Clark, MD, Fraser D. Munro, MD, Gordon A. MacKinlay, MD, Royal Hospital for Sick Children, Edinburgh, UK.
11:23 am	<b>S068</b> SETTING THE MARK: EXPERT PERFORMANCE RESULTS FOR THE NEONATAL MISTRAINERS <u>Karen A. Diefenbach, MD</u> , Milissa A. McKee, MD, Yale School of Medicine
11:28 am	<b>S069</b> THE TATE APPROACH FOR HEAD AND NECK ENDOCRINE SURGERY IN CHILDREN <u>T. E. Lobe, MD</u> , S. K. Wright, MD, Blank Children's Hospital, Des Moines, IA USA
11:33 am	<b>S070</b> MINIMAL ACCESS SURGERY IN PEDIATRIC CANCER: FOCUS ON VASCULAR MANAGEMENT <u>Girolamo Mattioli, Prof.</u> , Stefano Avanzini, MD, Piero Buffa, MD, Alberto Michelazzi, MD, Alessio Pini-Prato, MD, Alberto Garaventa, MD, Massimo Conte, MD, Giovanni Montobbio, MD, Vincenzo Jasonni, Prof., G. Gaslini Children's Hospital
11:38 am	<b>S071</b> THE ROLE OF LAPAROSCOPIC TECHNIQUES IN CHILDREN WITH SUSPECTED POST-TRANSPLANTATION LYMPHOPROLIFERATIVE DISORDERS (PTLD) <u>Martin L. Metzelder, MD</u> , Tillman Schober, MD, Lorenz Grigull, MD, Christoph Klein, Prof., Joachim F. Kuebler, MD, Benno M. Ure, Prof., Britta Maecker-Kolhoff, MD, Departments of Pediatric Surgery and Pediatric Hematology / Oncology, Hannover Medical School
11:43 am	<b>S072</b> IS MININVASIVE SURGERY (MIS) A SAFE PROCEDURE FOR PAEDIATRIC ONCOLOGICAL PATIENTS? <u>Giovanna Riccipetoni, MD</u> , Claudio Vella, MD, Camilla Viglio, MD, Enrica Caponcelli, MD, Marcello Napolitano, MD, Department of Pediatric Surgery Children's Hospital "V. Buzzi" – MILAN – (Italy)
11:48 am	<b>S073</b> LAPAROSCOPIC VERSUS OPEN MANAGEMENT OF MALIGNANT AND BENIGN OVARIAN MASSES IN CHILDREN <u>Giovanny Casadiego, MD</u> , J. Ted Gerstle, MD, Lisa Allen, MD, Hospital for Sick Children/University of Toronto, Toronto, Ontario, Canada
11:53 am	<b>S074</b> LAPAROSCOPIC REVISIT TO INTERNAL INGUINAL RING IN CHILDREN WITH PATENT PROCESSUS VAGINALIS <u>Masao Endo, MD, PhD</u> , Michinobu Ohno, MD, Fumiko Yoshida, MD, Miwako Nakano, MD, PhD, Saitama City Hospital
11:58 am	<b>V026</b> A RABBIT MODEL FOR LAPAROSCOPIC PEDIATRIC INGUINAL HERNIA REPAIR <u>Jeffrey A. Blatnik, MD</u> , Karem C. Harth, MD, Steve J. Schomisch, PhD, Todd A. Ponsky, MD, Department of Surgery, University Hospitals of Cleveland, Case Western Reserve University
12:03 pm	<b>V027</b> PEDIATRIC LAPAROSCOPIC VENTRICULOGASTRIC SHUNT <u>Juan Ignacio Bortagaray, MD</u> , Enrique Buella, MD, Horacio Bignon, MD, Carolina Millan, MD, Marcelo Martinez-Ferro, MD, Fundación Hospitalaria – Private Children's Hospital

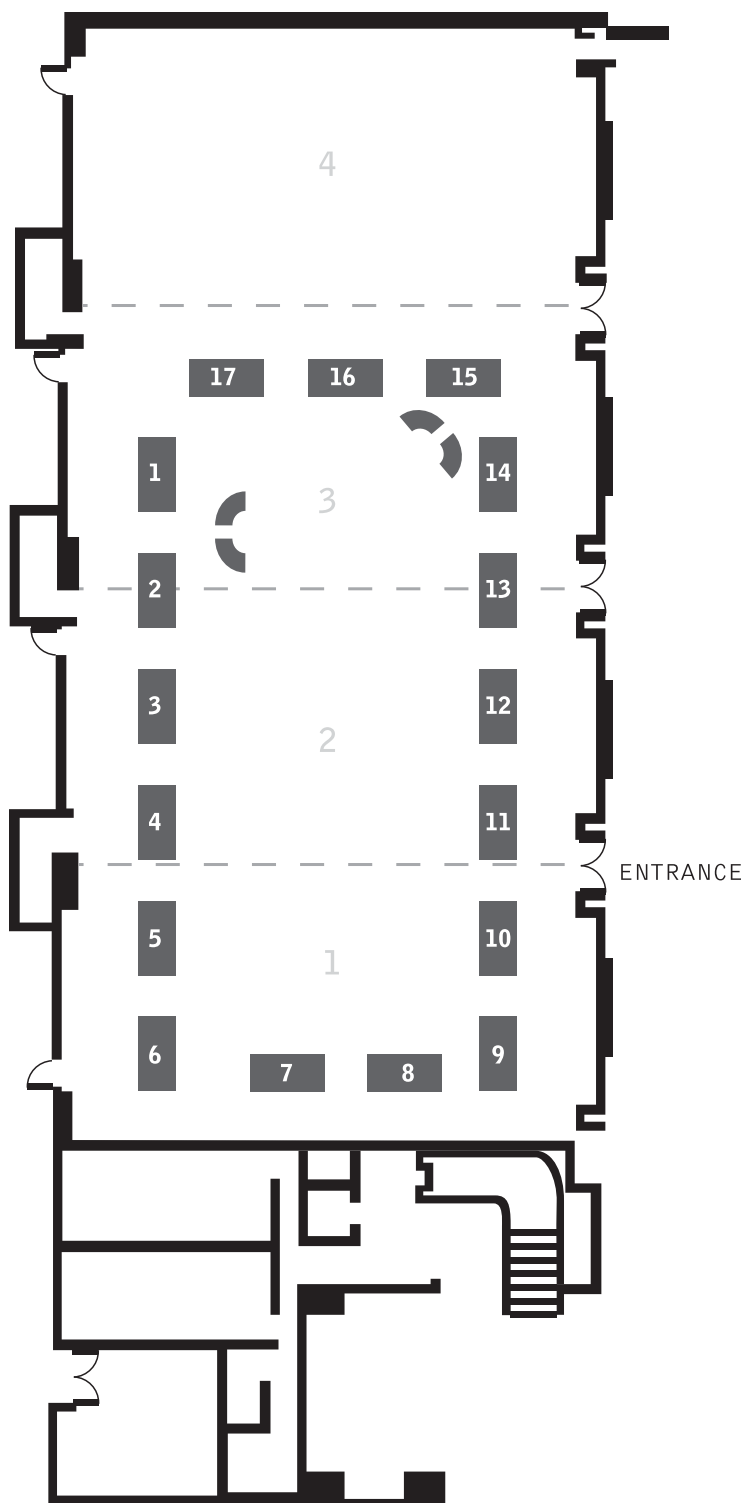
## Closing Remarks

Marcelo Martinez Ferro, MD & Maria Marcela Bailez, MD

**12:00 pm**  
*Monarchy Ballroom*

# Exhibitor Floor Plan & Profiles

## KOHALA BALLROOM



### APPLIED MEDICAL

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#9

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### STRYKER ENDOSCOPY

5900 Optical Court, San Jose, CA 95138  
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FAX: 800.729.2917  
WEBSITE: [www.stryker.com](http://www.stryker.com)

#11

# Oral Presentation Abstracts

## **S001 PANCREATIC DUCT STENTING IN PATIENTS WITH SHORT BOWEL SYNDROME AND RECURRENT PANCREATITIS**

Theodore Stathos, Steven Rothenberg, The Rocky Mountain Hospital for Children

Recurrent pancreatitis is an uncommon problem in the pediatric population. The most common causes are typically similar to those seen in adult patients. Toxin induced, idiopathic, familial, autoimmune, recurrent acute, and obstructive are the forms most commonly seen in the pediatric population. Five patients ranging from 2-9 years of age all of whom have had necrotizing enterocolitis (NEC) 4 with short bowel syndrome. All have been seen for recurrent pancreatitis. All of the patients that had intestinal resections that contributed to the short bowel syndrome were done secondary to necrotizing enterocolitis. All of these patients underwent standard treatment for the pancreatitis including gut rest and total parenteral nutrition. After the failure of the standard treatment, the patients ultimately underwent endoscopic retrograde cholangiopancreatography (ERCP) to assess for any physical or anatomic abnormality leading to the recurrent pancreatitis. Four had obvious strictures in the main pancreatic duct (PD) and one had a narrowed distal PD but no obvious stricture. All of the patients had both biliary and pancreatic duct stents placed at the first ERCP and were converted to a PD stent alone on the subsequent ERCP. Four out of the five patients had resolution of the recurrent pancreatitis. All of these patients had an obvious stricture of the PD at the time of the original ERCP. Three of these patients have successfully had the PD stents removed without recurrence of pancreatitis. One is still currently stented. The patient that failed the PD stenting has undergone pancreatic transplant. There have been no complications in any of the patients. We conclude that it seems safe to treat recurrent pancreatitis in young children with a combination of ERCP and PD stenting. Additional data is needed to assess whether NEC is a risk factor for the development of PD strictures.

## **S002 SHOULD WE BE CONCERNED ABOUT JENUNOILEAL ATRESIA DURING REPAIR OF DUODENAL ATRESIA?**

Shawn D. St. Peter, MD, Danny C. Little, MD, Katherine A. Barsness, MD, Daniel R. Copeland, MD, Casey M. Calkins, MD, Suzanne Yoder, MD, Steve S. Rothenberg, MD, Saleem Islam, MD, KuoJen Tsao, MD, Daniel J. Ostlie, MD, Children's Mercy Hospital and Clinics, Scott & White Hospital, Children's Memorial Hospital, Arkansas Children's Hospital, Medical College of Wisconsin, Rocky Mountain Pediatric Surgery, University of Florida, University of Texas Houston

**PURPOSE:** During repair for duodenal atresia it has been emphasized that inspection of the small bowel to identify a second atresia is required. The laparoscopic approach for repair of duodenal atresia has been criticized for its limitation to perform this step. Given that duodenal atresia and jejunoileal atresias do not share common embryologic origins, we question the validity of this concern. Therefore, we conducted a multi-center retrospective review of duodenal atresia patients to quantify the incidence of jejunoileal atresia in this population.

**METHODS:** After IRB approval (IRB# 07 12-187X), a retrospective review was conducted on all patients who have undergone duodenal atresia repair at 7 institutions over the past 7-12 years. Demographics and the presence or absence of a jejunoileal atresia were recorded.

**RESULTS:** 408 patients with duodenal atresia were identified. The mean gestational age was 36.3 +/- 2.9 weeks and the mean weight was 2.5 +/- 0.8 kg. Mean age at operation was 19 days (range 1-1314 days). There was 28% incidence of trisomy 21. Two patients (0.5%) were identified as having a second intestinal atresia, and both were type IIIB. 1 was diagnosed at the time of duodenal atresia repair; the other was a delayed diagnosis. Both patients did well after repair.

**CONCLUSIONS:** In this, the largest series of duodenal atresia patients compiled to date, the rate of a concomitant jejunoileal atresia is less than 1%. This low incidence is not high enough to mandate extensive inspection of the entire bowel in these patients and a second atresia should not be a concern during laparoscopic repair of duodenal atresia.

## **S003 VALUE OF LAPAROSCOPY IN CHILDREN WITH A SUSPECTED ROTATION ABNORMALITY ON IMAGING**

Marvin Hsiao, MD, Alan Daneman, MD, Jacob C Langer, MD Hospital for Sick Children

**BACKGROUND:** Although imaging is usually used for the diagnosis of rotation abnormalities, significant false positive and false negative rates have been reported. We studied the utility of laparoscopy in the management of children with a suspected rotation abnormality on imaging.

**METHODS:** The charts of all children undergoing laparoscopy for a suspected intestinal rotation abnormality from January, 2000 to August, 2009 were retrospectively reviewed.

**RESULTS:** There were 51 patients (25 female) aged 4 days to 16 years (median 18 mo). Presentation was to the clinic (57%), emergency department (25%), or as an in-patient (18%), with the most common symptoms being non-specific intermittent abdominal pain (33%), episodic vomiting (non-bilious: 29%, bilious: 18%), and failure to thrive (12%). Fifteen patients (29%) were asymptomatic and had imaging for other reasons. Pre-operative diagnosis based on UGI with or without contrast enema (CE) or ultrasound was malrotation without volvulus (49%), malrotation with volvulus (10%), and non-rotation (6%). The other 35% had equivocal or inconclusive imaging studies. Correlation between imaging and findings at laparoscopy are shown below, (with malrotation defined as a mesenteric base less than half the diameter of the abdominal cavity ie significant possibility of midgut volvulus).

### **Findings at Laparoscopy**

Imaging	Malro without volvulus	Malro with volvulus	Non-rotation	Normal
Malro without volvulus	12	2	9	2
Malro with volvulus	0	5	0	0
Non-rotation	0	0	3	0
Equivocal	4	1	8	4

All 30 children with malrotation found at laparoscopy underwent laparoscopic or open Ladd procedure. The 21 children with non-rotation or normal rotation underwent laparoscopy alone with or without appendectomy. Eleven of the 51 patients (22%) were converted to laparotomy, either due to planned conversion (4), difficulty identifying the anatomy (6) or presence of intestinal ischemia (1). Median time to regular diet was 3 days (range 0-24 days) and median length of hospitalization was 5 days (range 1-28). All 19 patients with non-rotation or normal rotation who did not have significant comorbidity were discharged the same day or on post-operative day 1. Post-operative opioids were given to 31/51 children (61%). Follow-up information was available for 41 patients, who were seen a median of 4 months (range 1-98) post-operatively. None of the children undergoing Ladd procedure developed volvulus within the follow up period. Two patients (1 laparoscopic Ladd procedure, 1 conversion to open Ladd procedure) developed adhesive small bowel obstruction requiring laparotomy 15 months and 17 days post-operatively. One patient who had a conversion to open Ladd procedure developed a pyloroduodenal fistula 2 years post-operatively.

**CONCLUSION:** Imaging studies may be inaccurate in differentiating malrotation from non-rotation or normal rotation. Laparoscopy provides an excellent opportunity to assess the base of the mesentery, and those children without a narrow-based mesentery can undergo laparoscopy alone, with excellent post-operative recovery. Those with malrotation should undergo either laparoscopic or open Ladd procedure.

**S004 LONG TERM RESULTS OF CHOLECYSTOSCOPIC REMOVAL OF GALLSTONES IN HEMOLYTIC ANAEMIA** K. Schaarschmidt, Prof., MD, M. Lempe, MD, F. Schlesinger, MD, U. Jaeschke, MD, Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch, Germany

**OBJECTIVE:** Cholecystotomy has been more than 100 years in use, the first cholecystotomy being performed by John S. Bobbs in Indianapolis, in the late nineteenth century. Laparoscopic cholecystotomy was introduced by the Russians V Prochorov and G Ustinov in 1981 and studied clinically for adults and experimentally by E Frimberger in 1989 and G Buess in 1991. Although cholecystotomy or cholecystoscopy avoid most or all postcholecystectomy complaints, they have never been evaluated systematically for larger number or longer periods in children.

**METHODS:** To examine a homogenous groups of patients we included all cases of secondary cholecystolithiasis from hereditary spherocytosis with simultaneous splenectomy (94) or hemisplenectomy (116 children) for the six-year period of 2003-2008 into a prospective study of 26 children (age 1.1- 14.8 years) who had laparoscopic cholecystotomy with gallstone removal and were followed for a mean of  $4.31 \pm 1.93$  years (range 1-6.7 years).

**RESULTS:** All gallbladders functioned normal before and after laparoscopic cholecystotomy. All 26 children were followed to date by 6 monthly ultrasound examination and all except one had no stone recurrences and have gallbladders free of gallstones at present. All cholecystoscopic gallstone removals were technically successful. One child needed a relaparoscopy for evacuation of an intraluminal hematoma of the gallbladder with laparoscopic reclosure of the cholecystotomy, so meticulous hemostasis is essential. In one child with laparoscopic subtotal splenectomy there was significant regrowth of the residual spleen with redevelopment of anaemia and hyperbilirubinaemia. This child had laparoscopic resplenectomy of the residual spleen with a second laparoscopic cholecystotomy and removal of recurrent stones at the same site. This child has been stone free 1.8 years after the second cholecystotomy.

**CONCLUSIONS:** Laparoscopic cholecystotomy is safe and > than 95% effective for secondary and recurrent secondary gallstones. Although these are early and limited prospective data we now use laparoscopic cholecystotomy routinely for hereditary spherocytosis, so that gallbladder preservation has replaced cholecystectomy in our practice for secondary cholelithiasis except for the most severe or complicated cases if the underlying cause of gallstone formation has been treated in the same session. We are now investigating, whether the same is true for primary childhood cholelithiasis

**S005 CHOLEDOCHOLITHIASIS AT ELECTIVE LAPAROSCOPIC CHOLECYSTECTOMY IS RARE IN CHILDREN** Oliver J. Gee, G. Jawaheer, Birmingham Children's Hospital

**BACKGROUND:** Choledocholithiasis is reported to be present in approximately 10% of adults undergoing laparoscopic cholecystectomy (LC) for symptomatic cholelithiasis. There is sparse accurate data on the prevalence of common bile duct (CBD) stones in children with gallbladder stones because routine intra-operative cholangiography (IOC) is rarely performed.

**METHOD:** Prospective data was collected on all children undergoing elective LC in our department between Jan 07 and Sep 09. At the time of referral all patients had an abdominal ultrasound performed. The definition of a dilated CBD was a diameter greater than 4mm. Intra-operative cholangiography was performed routinely in this population at the time of LC. If CBD stones are present it is our routine practice to perform laparoscopic CBD exploration, at time of LC, instead of an ERCP.

**RESULTS:** 35 consecutive children with a mean age of 9 (5-15) years underwent LC and IOC. There were 21 girls and 14 boys. Indications for LC were symptomatic gallstones (n = 30) or the presence of stones in children having laparoscopic splenectomy (n = 5). 17/35 (49%) patients had a diagnosis of haemolytic anaemia (12 hereditary spherocytosis, 5 sickle cell disease) and the remaining patients had gallstones of unknown aetiology. 4/30 (13%) patients with symptomatic stones presented with acute pancreatitis. Of those patients with haemolytic anaemia, 12/17 (71%) had symptoms at referral attributable to gallstones, 1 of whom had pancreatitis. 13/17 (76%) patients with haemolytic anaemia had a combined laparoscopic splenectomy and cholecystectomy. 16/35 (46%) children had a pre-operative dilated CBD on ultrasound. The mean diameter of the dilated common bile ducts was 6.1mm (4-11mm). IOC identified one patient with a cystic duct stone and no CBD stones. There were no conversions to open cholecystectomy and no bile duct injuries. No patient has represented with a retained CBD stone.

**CONCLUSIONS:** This is the first report of children with gallstones having routine IOC and hence the first accurate report of the prevalence of CBD stones at the time of elective LC. Unlike their adult counterparts, children with gallbladder stones rarely have CBD stones at the time of LC. Those children with evidence of a previous CBD stone have passed their stone spontaneously in most instances.

**S006 CHANGES IN THE CAPILLARY ORGAN PERFUSION DURING CO<sub>2</sub>-PNEUMOPERITONEUM IN NEONATE AND ADOLESCENT PIGS** Joachim F. Kuebler, MD, Martin L. Metzelder, MD, Alexander Osthaus, MD, Robert Suempelmann, Prof, Gertrud Vieten, PhD, Benno M. Ure, Prof, Departments of Pediatric Surgery and Anesthesiology, Hannover Medical School

**AIM:** Laparoscopic techniques are successfully used in the neonate. Nonetheless, clinical and experimental data point toward a higher sensitivity of neonates to the application of a CO<sub>2</sub>-pneumoperitoneum. The aim of our study was to investigate whether the application of a CO<sub>2</sub>-pneumoperitoneum in the young could lead to splanchnic or renal ischemia. In addition we investigated if administration of plasma expanders during the CO<sub>2</sub>-pneumoperitoneum could improve organ perfusion.

**METHODS:** Male German landrace pigs (n=25) were divided into four groups: (1) Neonates with low volume crystalloid restitution, (2) neonates with high volume colloidal restitution, (3) neonatal controls (sham pneumoperitoneum) and (4) adolescents with the low volume crystalloid restitution. After intubation and ventilation (art. pCO<sub>2</sub> ~40mmHg), arterial and venous catheterisation and midline laparotomy the portal vein was cannulated and the hepatic vein catheterized. Both ureters and the common bile duct were cannulated. Then a 3h, 10mmHg pneumoperitoneum (PP) followed by a 2h resuscitation period was applied. At baseline and in regular intervals fluorescent microspheres were injected to measure capillary blood flow and blood gas analysis of systemic arterial and venous blood as well as blood taken from the portal and hepatic vein was performed. Urine and bile flow was measured.

# Oral Presentation Abstracts

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**RESULTS:** There was a significant decrease during the pneumoperitoneum and the recovery period in urine production and renal perfusion in the crystalloid neonatal group, but not in the adult and the neonatal colloidal group ( $p < 0.05$ ). The decrease in the splanchnic capillary perfusion observed only in the neonatal crystalloid group did not reach significance. We observed a significant arterioportal shunt flow in all animals during the pneumoperitoneum ( $p < 0.05$ ). Bile flow was not affected in any group.

CO<sub>2</sub> insufflation increased pCO<sub>2</sub> in the portal vein and hepatic vein in all groups. Simultaneously we observed a small drop in the pH in these vessels ( $p < 0.05$ ). There was no significant difference in pO<sub>2</sub> and intestinal oxygen extraction between the groups, nor did we see a significant increase in the lactate levels systemically or in the portal or hepatic vein.

**CONCLUSIONS:** A long lasting 10mmHg pneumoperitoneum did not induce intestinal or hepatic ischemia in adolescent or neonatal pigs, regardless of fluid substitution regiments. Piglets with only crystalloid fluid substitution showed a decreased renal perfusion and developed persisting anuria during the observation period. These effects could be prevented by administration of plasma expanders. Thus, laparoscopic procedures in the neonatal patients treated with plasma expanders appear not to impair splanchnic or renal capillary perfusion.

**S007 RESPIRATORY AND HEMODYNAMIC EFFECTS OF CO<sub>2</sub> INSUFFLATION DURING ENDOSCOPIC SURGERY IN NEONATES** Hiroomi Okuyama, MD, PhD, Takashi Sasaki, MD, PhD, Yoshiyuki Shimizu, MD, PhD, Akio Kubota, MD, PhD, Hisayoshi Kawahara, MD, PhD Division of Pediatric Surgery, Department of Surgery, Hyogo College of Medicine

**PURPOSE:** Little is known about the cardiopulmonary effects of endoscopic surgery in neonates. The aim of this study is to evaluate the respiratory and hemodynamic effects of CO<sub>2</sub> insufflation during thoracoscopic and laparoscopic surgery in neonates.

**PATIENTS & METHODS:** We assessed the respiratory and hemodynamic effects of CO<sub>2</sub> insufflation during endoscopic surgery in 14 neonates. Seven neonates underwent thoracoscopic repair of esophageal atresia, and the remaining 7 neonates underwent laparoscopic repair of duodenal atresia. We used heated CO<sub>2</sub> insufflation system with the flow rate at 1 l/min. The pressure of insufflation was 8 mmHg for the laparoscopic procedure, and 4-5 mmHg for the thoracoscopic procedure. Single lung ventilation was applied for the thoracoscopic esophageal repair using 2Fr Fogarty catheter as a blocker. During the operation, rectal temperature (RT), heart rate (HR), arterial pressure (AP), end-tidal carbon dioxide (EtCO<sub>2</sub>) and SpO<sub>2</sub> were continuously recorded.

**RESULTS:** The mean birth weight of the infants with esophageal atresia was 2.9kg. Thoracoscopic repair was performed at 1 to 3 days of age. The mean operation time was 260 minutes. The mean birth weight of the infants with duodenal atresia was 2.7kg. Laparoscopic repair was performed at 3 to 15 days of age. The mean operation time was 230 minutes.

<HR> In the thoracoscopic cases, HR increased significantly during CO<sub>2</sub> insufflation, and returned to normal range at the post insufflation period. In contrast, in the laparoscopic cases, HR did not change throughout the operation. <AP> In the thoracoscopic cases, AP decreased significantly during CO<sub>2</sub> insufflation, and returned to normal range at the post insufflation period. In the laparoscopic cases, AP did not change during CO<sub>2</sub> insufflation, and increased significantly at the post insufflation period. <EtCO<sub>2</sub>> In both thoracoscopic and laparoscopic cases, EtCO<sub>2</sub>

increased significantly during CO<sub>2</sub> insufflation, and returned to normal range at the post insufflation period (Laparoscope: pre  $31.7 \pm 5.1$ , during CO<sub>2</sub>  $43.5 \pm 5.3$ , post  $34 \pm 5.4$ ; Thoracoscope: pre  $31.8 \pm 11.7$ , during CO<sub>2</sub>  $57.2 \pm 8.7$ , post  $45.2 \pm 15.2$  mmHg). The level of EtCO<sub>2</sub> during insufflation was higher in the thoracoscopic cases compared to the laparoscopic cases. <SpO<sub>2</sub>> In the thoracoscopic cases, SpO<sub>2</sub> decreased significantly during CO<sub>2</sub> insufflation, and returned to normal range at the post insufflation period (pre  $92.3 \pm 35.7$ , during CO<sub>2</sub>  $84.8 \pm 8.7$ , post  $93.5 \pm 3.8$  %). In contrast, in the laparoscopic cases, SpO<sub>2</sub> did not change throughout the operation. <RT > RT was well maintained between 36 and 38 ° in all cases throughout the operation.

**CONCLUSIONS:** Our data suggests that neonates can tolerate well both laparoscopic and thoracoscopic surgery. While the cardiopulmonary effects of CO<sub>2</sub> insufflation were minimum in the laparoscopic cases, significant changes were observed in AP, HR, EtCO<sub>2</sub>, and SpO<sub>2</sub> during CO<sub>2</sub> insufflation in the thoracoscopic cases. Improved understanding of the physiologic changes during neonatal endoscopic surgery will allow appropriate anesthetic management.

**S008 PHARMACOLOGICAL ACIDIFICATION OF THE PERITONEAL CAVITY: EFFECTS ON SYSTEMIC INFLAMMATORY RESPONSE AND SURVIVAL TO POLYMICROBIAL SEPSIS** Joachim F. Kuebler, MD, Akihiro Shimotakahara, MD, Katharina Wuensche, MD, Gertrud Vieten, PhD, Martin L Metzelder, MD, Benno M Ure, Prof Department of Pediatric Surgery, Hannover

**BACKGROUND:** CO<sub>2</sub> insufflation during laparoscopy modulates the inflammatory response and leads to acidification of the peritoneal surface. The aim of our study was to assess the effects of the peritoneal acidification on the systemic stress response to laparotomy and on the ability of the organism to overcome polymicrobial sepsis.

**METHODS:** In a first set of experiments, male Sprague-Dawley-rats (250-300g BW, n=23) underwent a midline laparotomy and 10 ml of neutral (pH 7.2) or acidic (pH 6.2) HEPES buffer solution was injected into the abdominal cavity. After 1h the abdominal cavity was closed and 6h after the laparotomy animals were killed and circulating levels of cytokines were measured (TNF- $\alpha$ , IL-6 and IL-10). In a second set of experiments, C57/Bl6 mice (20-25g BW, n=61) were anesthetized with ketamine and the peritoneal cavity was incubated for 30min. with 5 ml of neutral (pH 7.2) or acidic (pH 6.2) buffer solution. Then polymicrobial sepsis was induced by cecal ligation and puncture and the survival of the mice was observed for 7d.

**RESULTS:** In the rat model, we observed only a small decrease in the circulating levels of TNF- $\alpha$  (n.s.), IL-6 ( $p < 0.1$ ) and IL-10 ( $p < 0.05$ ) due to the peritoneal acidification. Similarly, the effect of peritoneal acidification on the survival of mice was not significant with a slightly improved survival of mice following exposition of the peritoneal cavity to pH 6.2 (63% vs. 75%, n.s.).

**CONCLUSION:** Acidification of the peritoneal cavity reduces slightly the systemic stress response to laparotomy and has no detrimental effect on the survival polymicrobial peritonitis. Our results suggest that the acidification of the peritoneum during CO<sub>2</sub> pneumoperitoneum might have a small beneficial effect, but no major advantage of the pharmacological acidification could be observed.

**S009 TEMPORARY GASTRIC ELECTRICAL STIMULATION IN CHILDREN: TECHNIQUES AND RESULTS** Saleem Islam, MD, MPH, Joy Hughes, BS, Shamaila Waseem, MD, Christopher Jolley, BS, Thomas Abell, MD, University of Florida College of Medicine and University of Mississippi Medical Center

**PURPOSE:** Children and adolescents with intractable nausea and vomiting due to gastroparesis (GP) and other motility disorders have almost no medical treatment options. They have a very poor quality of life and high hospital utilization. Gastric electrical stimulation (GES) has been shown to be an effective treatment for adults with intractable GP, however it works in about half of the patients implanted. We have previously reported the only experience with GES in children and now describe the use of a minimally invasive temporary GES (tGES), the different techniques used, its advantages and our results.

**METHODS:** After IRB approval, the records of consecutive children who underwent tGES at two institutions were reviewed. tGES was done using two techniques – one, a totally endoscopic approach with a modified epicardial pacing lead exiting the nose or mouth. The second was using endoscopic visualization for a trans gastrostomy placement of two modified fetal scalp electrodes. These were connected to an Enterra® stimulator. In each case, stimulation parameters were initially set at a voltage of 10, a frequency of 14 Hz, and 'on' time of 1 second. These were subsequently modified as needed. Data regarding etiology of disease, clinical course, method and response to tGES and outcomes were recorded and analyzed. Symptom scores were measured using a likert scale (1-5) applied to nausea, bloating, pain, vomiting and total symptom score, with analysis done using a paired t test.

**RESULTS:** 42 patients underwent 53 separate tGES attempts. Almost 80% were female and the mean age at time of tGES was 13.6 years (range 2-18 years). The most common indication was GP (76%), followed by generalized dysmotility, post lung transplant and antroduodenal dysmotility. 31 tGES were performed with endoscopy while the remaining were via gastrostomy, with 8 patients having both methods used. There was immediate significant improvement in symptom scores (nausea, vomiting, bloating, pain, and total ( $p=0.001$ )) in over 50% of the patients. Duration of tGES was a mean of 2 days with endoscopic approach and 12 days via gastrostomy. Endoscopic tGES was less durable due to the size of the lead. Responders to tGES were selected for permanent GES and underwent implantation. Non responders were placed on chronic GJ or J tube feeds or TPN. Male gender was associated with being a non responder, while age or diagnoses were not.

**CONCLUSIONS:** This is the only series using tGES in children ever reported. Our experience suggests that tGES is technically feasible and safe in children using either endoscopic or trans gastrostomy approaches. Using this minimally invasive approach, we have been able to expand the role of GES to patients other than GP and help better select patients who will benefit from permanent GES.

#### **S010 AUGMENTED REALITY NAVIGATION SYSTEM FOR LAPAROSCOPIC SPLENECTOMY IN CHILDREN BASED ON PREOPERATIVE CT IMAGE USING OPTIC TRACKING DEVICE**

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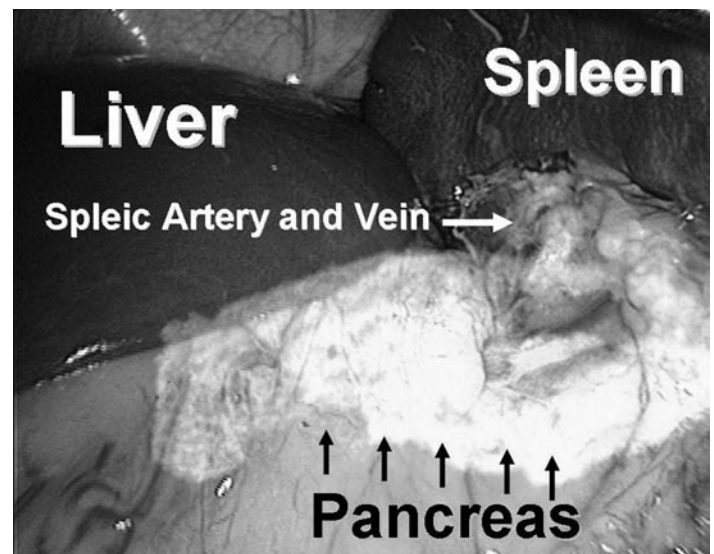
**PURPOSE:** Laproscopic splenectomy (LS) for the hematological disorder such as hereditary spherocytosis (HS) and idiopathic thrombocytopenia purpura (ITP) is the minimally invasive therapy for children .However, indications of laparoscopic treatment for these disease are still limited despite recent advances in laparoscopic techniques and instrumentations because of the operative complications such as hemorrhage and leakage of pancreatic juice. One of the reasons may be the lack of intraoperative information such as vascular and

pancreatic tail location, and relations to surrounding anatomical landmarks. In addition, limited views and lack of tactile sensation restrict the surgeon's abilities and stress the surgeon. Therefore an intraoperative navigation system is strongly recommended for safe and precise endoscopic surgery in children. We developed an augmented reality (AR) navigation system based on preoperative Multi detector-row CT imaging (0.5-1.0 mm slices). The purpose of this study is to evaluate the usefulness, feasibility, and accuracy of this system using clinical laparoscopic splenectomy in children.

**METHODS:** We constructed an AR visualization that superimposed preoperative three-dimensional CT images (Aquilion 64, Toshiba Medical Co. Ltd., Tokyo Japan) onto captured laparoscopic live images. Volume images were reconstructed by 3D viewer application (Virtual Place 300, AZE Co Ltd., Tokyo, Japan). We used an optical tracking system (Polaris, Northern Digital Inc., Ontario, Canada) for registration between volume image and body surface markers. We evaluated the system with 3 cases of HS and 1 case of ITP. To evaluate registration accuracy, we calculated root mean square (RMS) distances from the marker position to the volume data.

**RESULTS:** The operator recognized the hidden vascular variation of the splenic artery and vein, accessory spleen, and pancreatic tail by overlaying an image onto a laparoscopic live image. Overlay images were followed according to the movement of the scope with 3–4 fps. The registration accuracy (RMS:mm) of 3 cases was  $17.0 \pm 18.3$ ,  $9.5 \pm 9.7$ ,  $6.6 \pm 6.8$ , and  $2.9 \pm 3.0$ . The deviations were corrected using the surface profile of the spleen. Typical overlay image was shown in figure 1. Splenic artery, splenic vein, and pancreas were on to laparoscopic live images.

**CONCLUSION:** This AR navigation system was effective and could be used in clinical endoscopic surgery. The system provides real-time anatomical information which cannot be otherwise visualized without navigation. These results demonstrated that a rapid calibration method was effective. The deviation of registration was improved within an acceptable level, but this system does not adapt to respiratory motion, pneumoperitoneum, or organ deformation. Therefore, a real-time imaging modality such as a three-dimensional ultrasound should be built into this system. In the near future, we will attempt to increase accuracy of our present system, and develop a "clinically approved" multimodal matching method for capturing intraoperative organ deformations.



## **S011 GOAL-DIRECTED LAPAROSCOPIC TRAINING IMPROVES LAPAROSCOPIC SKILL IN RESIDENTS** Ricardo Alba-Palacios, MD, Rene Carmona-Barba, MD, Hospital del Niño de Toluca / Hospital del Niño Morelense

**INTRODUCTION:** it has become well accepted that laparoscopic surgery procedures require a different set of skills compared with open procedures. Laparoscopic skills differ from open skills because of issues of the altered tactile sensation, the lack of depth perception, the requirement to work in a 3-dimensional environment while visualizing a 2-dimensional environment, the relatively limited degrees of freedom of laparoscopic instruments, the increased length of laparoscopic instrumentation, and the varying eye-hand coordination. The issues of limited resident education time, shortage of manpower, cost of operating room time, decreasing reimbursement for the attending surgeons, and most importantly, patient safety make the operating room a less than ideal situation to teach basic laparoscopic skills. Laparoscopic skills training outside the operating room is becoming the standard for educating surgical residents. Because of the restrictions on the work week, it is imperative for this training to be efficient. We hypothesized that goal-directed laparoscopic training (GDLT) would result in better skill acquisition than laparoscopic training without goals (LT).

**METHODS:** Pediatric surgery residents participated in this study. Metrics were scores that incorporated time and errors. One group of residents (LT) went through a 10- week laparoscopic training course without goals; one group of residents (GDLT) was given goals to achieve during their course. Each group practiced for the same amount of time. The tasks were peg exercise, run the rope, pattern cutting, clip/cut vessel, extracorporeal knot tying, intracorporeal knot tying, and suturing device.

Statistical analysis was performed via 2-tailed Mann-Whitney tests.

**RESULTS:** There were 4 residents in the LT group and 4 residents in the GDLT. The GDLT group had statistically significant higher scores on 7 of the 8 tasks compared the LT group ( $P < .02$  to  $P < .0001$ ). The GDLT group performed better in the final task, suturing device, than the LT group, but this did not reach statistical significance (451 vs 414;  $P = .14$ ).

**CONCLUSIONS:** GDLT should be used by surgeons instead of LT. Future studies need to examine whether GDLT translates into a better operative technique and outcomes

## **S012 LAPAROSCOPIC VERSUS OPEN APPENDECTOMY IN CHILDREN: OUTCOMES COMPARISON BASED ON AGE** Steven L. Lee, MD, Arezou Yaghoubian, MD, Armen Aboulian, MD, Stanley T. Lau, MD, Roman M. Sydorak, MD, Harbor-UCLA and Kaiser Permanente, Los Angeles Medical Center

**BACKGROUND:** The advantages of laparoscopic appendectomy (LA) over open appendectomy (OA) in children are not well documented. This study compares the outcomes of LA vs. OA based on age.

**METHODS:** A retrospective study from 1998-2008 of children (<18 years) with appendicitis was performed. Data were extracted from 12 acute care medical centers. Patients were separated into 3 age groups: young (<5 years), middle (5-12 years), and older (>12 years). Morbidity (wound infection, abscess drainage, and readmission within 30 days) and length of hospitalization (LOH) were analyzed.

**RESULTS:** 7874 patients were included in this study (LA=3551, OA=4323). Use of LA increased from 22% in 1998 to 82% in 2008. This increase was seen in all age groups. Overall results are summarized in the table.

	Laparoscopic	Open	P
<b>Nonperforated Appendicitis</b>	2711	2605	
Wound Infection	1.3%	2.7%	0.0003
Abscess Drainage	0.7%	0.5%	0.5
Readmission in 30 days	1.9%	2.9%	0.3
LOH- days	1.7±1.5	2.1±1.6	<0.0001
<b>Perforated Appendicitis</b>	838	1393	
Wound Infection	5.7%	9.2%	0.004
Abscess Drainage	8.5%	7.0%	0.2
Readmission in 30 days	7.2%	9.0%	0.2
LOH- days	5.0±3.0	5.7±3.4	<0.0001

With respect to specific age groups, morbidity and LOH were similar in the young (<5 years) and middle (5-12 years) aged groups for both perforated and nonperforated appendicitis. In older children (>12 years) with nonperforated appendicitis, the wound infection rate was lower for LA (LA=1.1% vs. OA=3.5%,  $p=0.001$ ). In older children with perforated appendicitis, abscess drainage was lower (LA=8.0% vs. OA=17.5%,  $p=0.0001$ ) and LOH was shorter (LA=4.8±3.4 days vs. OA=5.6±3.7 days,  $p=0.0005$ ).

**CONCLUSIONS:** LA has become the preferred operation for appendicitis in children. Overall, LA was associated with lower wound infection rate and shorter LOH compared to OA. However, these findings were mainly seen in children older than 12 years of age, as morbidity and LOH in Children 12 years and younger were similar between LA and OA.

## **S013 COMPARISON OF PEDIATRIC LAPAROSCOPIC APPENDECTOMY OUTCOMES BETWEEN TEACHING AND NONTTEACHING HOSPITALS: A MULTIDISCIPLINARY STUDY**

Steven L. Lee, MD, Arezou Yaghoubian, MD, Roman M. Sydorak, MD, Stanley T. Lau, MD, Kaiser Permanente, Los Angeles Medical Center and Harbor-UCLA Medical Center

**PURPOSE:** In this era of heightened emphasis on patient outcomes, it is important to document the effect of residents acting as the surgeon for a surgical procedure. This study compares the outcomes of laparoscopic appendectomy (LA) in children between teaching and nonteaching institutions.

**METHODS:** A retrospective review of all patients <18 years of age undergoing LA for appendicitis from 1998-2007 was performed. The outcomes from two teaching institutions (each with its own General Surgery residency program) were compared to 10 nonteaching institutions. Study outcomes included postoperative morbidity and length of hospitalization (LOH). Data were analyzed using Wilcoxon rank-sum test and chi-squared analysis.

**RESULTS:** 542 patients were treated at the teaching institution (mean age= 11 years, 62% male) and 3012 at the nonteaching institutions (mean age= 13 years, 60% male). The perforated appendicitis rate was 33% at the teaching institution and 22% at the nonteaching institution ( $p<0.0001$ ). Data are summarized in the table.

	Teaching	Nonteaching	P
<b>Non-perforated Appendicitis</b>	364	2348	
Wound Infection	0.5%	1.4%	0.3
Abscess Drainage	0.3%	0.7%	0.5
Readmission in 30 days	1.1%	2.0%	0.3
LOH- days	2.1 ± 1.7	1.6 ± 1.5	0.02

	Teaching	Nonteaching	P
<b>Perforated Appendicitis</b>	178	664	
Wound Infection	1.7%	7.0%	0.004
Abscess Drainage	4.0%	9.6%	0.01
Readmission in 30 days	0.6%	8.9%	<0.0001
LOH- days	5.7 ± 3.2	4.8 ± 3.2	0.002

**CONCLUSIONS:** The morbidity for LA was significantly lower in children with perforated appendicitis at teaching institutions. However, LOH for both perforated and non-perforated appendicitis was slightly longer at the teaching institutions. Overall, the presence of surgical trainees had minimal adverse impact on the outcomes of LA in children with appendicitis.

#### **S014 APPENDICEAL STUMP CLOSURE IN CHILDREN. A PROSPECTIVE ANALYSIS. ENDOLOOPS VERSUS ENDOSTAPLES**

Go Miyano, MD, Masahiko Urao, MD, Geoffrey J. Lane, MD, Yoshifumi Kato, MD, Tadaharu Okazaki, MD, Atsuyuki Yamataka, MD, Department of Pediatric General & Urogenital Surgery, Juntendo University Hospital, Juntendo University Nerima Hospital

**AIM:** The aim of this study was to compare endoloops and endostaples for stump closure during laparoscopic appendectomy in children.

**METHODS:** This prospective study was carried out at Juntendo University Hospital and Juntendo University's Nerima Hospital, covering all laparoscopic appendectomies (LA) for uncomplicated appendicitis performed from July 2005 to August 2009. Patients with complicated appendicitis such as perforated appendicitis or intraabdominal abscess were excluded, leaving 75 patients who underwent LA using endoloops (EL) and 81 patients who underwent LA using endostaples (ES). Choice of technique was decided by the attending surgeon's preference. All patients were managed according to the same intra and postoperative protocols. The two groups were prospectively compared with respect to demographics, incidence of intra and postoperative complications, rates of readmission to hospital, length of hospitalization, duration of surgery, and total cost.

**RESULTS:** There was no significant difference in mean age at operation (EL: 10.5 years (range: 3 - 16); ES: 10.8 years (range: 5 - 16); gender (F/M) ratio (EL: 26 / 49; ES: 33 / 48); preoperative mean white blood cell count (EL: 13500/mm<sup>3</sup>; ES: 12000/mm<sup>3</sup>) and mean CRP (EL: 3.9 mg/dL; ES: 2.7 mg/dL); pathological findings; mean duration of surgery (EL: 60 minutes; ES: 53 minutes), and mean length of hospitalization (EL: 4.3 days; ES: 3.9 days). There were no intraoperative complications or ICU admissions in either group, but one EL case needed to be converted to open surgery (p=NS). There were no significant differences in the incidences of intraabdominal abscess (EL: n=2 or 2.7%; ES: n=1 or 1.2%), transient ileus (EL: n=1 or 1.3%; ES: n=2 or 2.5%); small bowel obstruction (EL: n=0 or 0%; ES: n=1 or 1.2%), and wound infection (EL: n=2 or 2.7%; ES: n=1 or 1.2%). The rate of readmission to hospital was 4.0% for EL (n=3; 1 intraabdominal abscess, 1 colitis and 1 fever of unknown origin) and 2.5% for ES (n=2; 1 small bowel obstruction, 1 intraabdominal abscess). (p=NS). The mean operative cost in the EL group was \$891, and that in the ES group was \$1296.

**CONCLUSION:** This is the first prospective study in children comparing laparoscopic appendectomy for uncomplicated appendicitis using EL or ES. There is no significant difference in morbidity between children who undergo laparoscopic appendectomy using EL or ES. One of our

stuff altered his procedure of choice from using EL to ES, because he experienced 1 case of intraabdominal abscess; he is uncomfortable with that the mucosa of appendix is exposed even after appendiceal stump is closed using EL. Although the direct operating cost of ES was higher than of EL, the surgeon's preference should be highly respected when we face each surgical case.

#### **S015 INSURANCE PAYOR STATUS IS NOT PREDICTIVE OF WEIGHT LOSS FOLLOWING ADOLESCENT GASTRIC BYPASS**

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**PURPOSE:** Socioeconomic status (SES) has been identified as a predictor of poorer outcomes in many surgical diseases, including morbid obesity. It is important to similarly identify which factors may predict weight loss success in youth. The goal of this study was to evaluate the effect of insurance payor type on 2-year weight loss outcomes in an adolescent population.

**METHODS:** The Follow-up of Adolescent Bariatric Surgery (FABS) study is a longitudinal study of adolescents and young adults (age ≤21) seeking obesity treatment at Cincinnati Children's Hospital Medical Center (CCHMC). Patients enrolled in FABS who underwent laparoscopic Roux-en-Y Gastric Bypass (RYGB) surgery between August 2002 and January 2007 at CCHMC were included in this analysis. Demographics, anthropometrics, and insurance payor status (private / public) were gathered from clinical and administrative records. Comparisons of categorical variables by insurance type were performed using Fisher's exact tests. Similar comparisons for continuous variables were conducted using equal and unequal variance t-tests. To longitudinally assess the impact of insurance payor type on post-operative body mass index (BMI: kg/m<sup>2</sup>), a mixed linear regression was performed. Covariates considered for potential inclusion into the model were: age at surgery, gender, race, time between baseline consultation and surgery, and baseline BMI. A p-value < 0.05 was considered statistically significant.

**RESULTS:** Over the study period, 63 consecutive adolescents underwent laparoscopic RYGB surgery, with 100% and 78% retention at one and two years, respectively. Thirty-five patients (55.6%) had private insurance while 28 (44.4%) were funded by public insurance. The mean BMI at baseline for all patients was 59.3 kg/m<sup>2</sup>, ranging from 41.4 to 95.5 kg/m<sup>2</sup>. Two-thirds (66.7%) of the cohort was female, with 84.8% self-identified as white race. The mean age at surgery was 17.4 years (range=13 to 23 years). Private and public insurance payor groups were similar in terms of age at surgery (p = 0.2792), gender (p = 0.1848), and race (p = 0.1492). However, baseline BMI was significantly higher for those with public insurance (62.8 kg/m<sup>2</sup>) compared to subjects with private insurance (56.5 kg/m<sup>2</sup>) (p = 0.0404).

From baseline, BMI declined by 39.8% two years following surgery (p < 0.0001). However, there was no significant change in BMI between post-op years one and two (p = 0.9812). Insurance payor group was not found to be significantly associated with BMI following surgery (p = 0.6661). Additionally, the rate of change in BMI over time was also found to be similar for each insurance group (Group x Time interaction, p = 0.3512).

**CONCLUSION:** While these findings require verification in larger cohorts, the data suggest that patients with varied SES status enjoy similarly good weight loss efficacy in the context of a multidisciplinary pediatric bariatric program.

**S016 MICROLAPAROSCOPIC CHOLECYSTECTOMY WITH AN UNORTHODOX MINISCOPE POSITION** Salmai Turial, MD, Jan Enders, MD, Veronica Engel, MD, Felix Schier, MD, Department of Pediatric Surgery, Medical University Centre, Mainz, Germany

**PURPOSE:** We report our initial experiences with microlaparoscopic cholecystectomy in children using a 2.4mm scope through out a MiniPort to the right of umbilicus. The umbilicus is used as as working trocar for large diameter instruments. Traditionally for laparoscopic cholecystectomy, the scope is inserted at the umbilicus. The use of 2 mm instruments thus excludes 5 mm instruments such as the LigaSure. Recently, we developed a new 2.4 mm scope in cooperation with Karl Storz GmbH Tuttlingen, Germany, which was used through a MiniPort instead of 5mm scope. So far, it was possible to displace the scope out of the umbilical area without to compromise the superior cosmesis after using MiniPorts

**METHOD:** The miniscope was inserted 2-3 cm right to the umbilicus and slightly higher as the umbilical line. A Miniport for the 2mm grasper was inserted through the right abdominal wall laterally and a 5mm working trocar was inserted infraumbilically for the use of Ligasure, bipolar thermocautery or suction in case of need. The three-angle principle of laparoscopic instrumentation was remained as it was shifted to the right side of abdominal wall, only. In supine position of the patient, the surgeon stands on the left or right side according to his preference.

**RESULTS:** In 2009, microlaparoscopic cholecystectomies were performed in 6 children. Average age: 16 years. Four boys and two girls with an average body weight of 46,4kg (range 32 to 83kg). All cases were completed successfully. In two cases the optic trocar was repositioned one cm laterally after the initial trocar position was to close to the umbilicus resulting in instrument crash with the 5 mm instruments at the umbilicus. The view at cystohepatic triangle was sufficient. There was no specific complication due to the rearranged trocar positions nor to the use of miniscope. The operative time was considerable shorter compare to the exclusive use of 2 mm instruments with need of ligation by hand instead of the LigaSure. At follow up, the cosmesis is superior.

**CONCLUSION:** Based on our early experiences, the microlaparoscopic cholecystectomy is safe, feasible and it helps to reduce the access trauma and operative time with a superior cosmesis.

**S017 A PRELIMINARY REPORT OF SINGLE SITE LAPAROSCOPIC HERNIORRHAPHY USING NEEDLE INSTRUMENTS IN CHILDREN WITH INGUINAL HERNIA: A NOVEL TECHNIQUE** Takuya Kimura, MD, PhD, Yoshiyuki Ihara, PhD, Katsuji Yamauchi, PhD, Toshio Sawai, PhD, Takuya Kosumi, PhD, Takeo Yonekura, PhD Department of Pediatric Surgery, Nara Hospital, Kinki University School of Medicine

**BACKGROUND:** Laparoscopic herniorrhaphy has been an effective alternative in children with inguinal hernia; however, reported techniques require two or three sites to accomplish the procedure. We present a new technique for laparoscopic herniorrhaphy with subumbilical single site access using 2 needle trocars for female childhood inguinal hernia.

**METHODS:** After general anesthesia, patients were placed in a supine position. A transparent 3mm trocar was placed at the umbilicus with open technique, and purse string suture was made at the open site of fascia to maintain pneumoperitoneum and to close the abdomen at the end of procedure. A 3mm 45 degree camera was inserted through this trocar, and a 2mm trocar was inserted

just close to the first trocar under direct vision through the first transparent trocar. A needle grasp forceps was inserted through the 2mm trocar, and the orifice of the inguinal hernia was inspected. After marking the corresponding surface skin of the hernia orifice by 18-gauge needle, a 19-gauge hooked injection needle with a nonabsorbable thread was introduced and advanced along the preperitoneal space on the lateral side of the hernia defect, and passed into the intra-abdominal space medial to the round ligament of the uterus. The thread was detached from the hooked needle, and the needle was subsequently withdrawn at the roof of the hernia defect. Then, the needle was reintroduced along the medial side of the hernia defect, and passed into the intra-abdominal space at the same peritoneal puncture site. The thread was caught and pulled out to the abdominal wall, and tied extracorporeally. The same procedure was performed for contralateral side when patent processus vaginalis was present.

**RESULTS:** The procedure was technically successful without placement of additional trocars. No intraoperative complication was observed. All patients were discharged on the same day after the surgery.

**CONCLUSIONS:** Single site laparoscopic herniorrhaphy using needle instruments is feasible and seems to be safe. Further studies are required to be determined whether this approach would benefit patient compared with standard laparoscopic herniorrhaphy.

**S018 THORACOSCOPIC LOBECTOMY IN INFANTS LESS THEN 10KG WITH PRENATALLY DIAGNOSED CYSTIC LUNG DISEASE** Ruben Rodriguez, MD, Steven Rothenberg, MD, Keith Kuenzler, MD, William Middlesworth The Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons

**PURPOSE:** Thoracoscopic lobectomy for congenitally acquired cystic lung disease is now an accepted technique in many pediatric surgery centers. The majority of these lesions are diagnosed prenatally. However the timing of surgery remains in question. We reviewed our experience over a 10 year period to evaluate early resection of these lesions.

**METHODS:** From Jan 2001 to August 2009 70 patients at 2 institutions, under 1 year of age and under 10 KG, underwent thoracoscopic lobectomy. All had a prenatal diagnosis of Congenital Adenomatoid Malformation (CCAM) 49, Bronchpulmonary sequestration (BPS) 18, or Congenital Lobar Emphysema (CLE) 3, which was confirmed after birth by CT scan. Age at operation ranged from 4 days to 11 months and weight from 3.1 to 10 kg.

**RESULTS:** 69 of 70 lobectomies were completed thoracoscopically. There were 15 upper lobe and 55 lower lobectomies. Operative time ranged from 45 minutes to 225 minutes. Length of stay ranged from 1 to 5 days. A subset of 24 patients, were done under 5 kg and less then 3 months of age. Their operative time averaged 90 minutes and mean length of stay was 1.5 days.

**CONCLUSION:** Thoracoscopic Lobectomy is safe and viable in neonates and infants. All lesions present at the time of birth were present on later follow-up, so prolonged observation to evaluate for spontaneous regression is not indicated. Resection shortly after birth is technically feasible and appears to result in shorter operative times and length of stay.

## S019 THORACOSCOPIC CONGENITAL DIAPHRAGMATIC HERNIA REPAIR: CAN WE PREDICT THE NEED TO CONVERT?

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**PURPOSE:** As expertise in thoracoscopic repair of congenital diaphragmatic hernia (CDH) has emerged in many centers, it remains unclear whether traditional factors prompting open conversion (e.g., the need for prosthetic patch) continue to limit the application of thoracoscopy. We present a large single-institution experience with thoracoscopic CDH repair, and ask whether any patient variables are predictive of open conversion.

**METHODS:** We reviewed 194 consecutive neonates with unilateral CDH repaired between January 2000 and October 2009. Neonates repaired thoracoscopically from 2006–2009 were compared to open repairs of the same period. To account for inherent selection bias, thoracoscopic repairs were also compared to clinically-matched controls undergoing open repair from 2000–2005. Perinatal, intraoperative, and outcome data were assessed using X<sup>2</sup>, Mann-Whitney-U, and regression modeling. Statistical significance was set at P<0.05.

**RESULTS:** Thoracoscopic repair was initiated in 34 patients. Open conversion occurred in 8/16 repairs during the first 18 months of this series, compared with 2/18 open conversions in the subsequent 28 months (50% vs. 11%; P=0.02). While the most common reason for open-conversion in our early experience was the need for patch repair, 11 fully thoracoscopic patch repairs were successfully completed during the final 12 months of the study period. No perinatal variables were predictive of open-conversion by univariate or multivariate analysis (Table). Significant outcome differences (e.g. length of stay, survival) detected between thoracoscopic and open repairs during the recent period were not observed when thoracoscopic repairs were compared to matched historical open controls. We identified 4 recurrences after 24 successful thoracoscopic repairs, compared to 11 of 77 recurrences among matched historic controls (17% vs. 14%; P=0.50).

**CONCLUSIONS:** Success rates for thoracoscopic CDH repair appear to follow an institutional learning curve, with patch repairs no longer necessitating open conversion. These data suggest that no perinatal variables accurately predict the need to abandon thoracoscopy. While recurrence rates appear similar between matched open controls and thoracoscopic repairs, prospective trials will be required to determine whether true outcome differences exist among CDH patients with similar disease severity undergoing thoracoscopic versus open repair.

	2000 – 2005	2006 – 2009			P-Value	P-Value	P-Value
	Historic Open (N=77)	Current Open (N=29)	Current Thoracoscopic (N=24)	Current Conversions (N=10)	(Thoracoscopic vs Historic Open)	(Thoracoscopic vs Current Open)	(Thoracoscopic vs Conversions)
Right-Sided CDH	7.6%	13.8%	12.5%	20%	0.440	0.890	0.618
Prenatal LHR	1.63	1.21	1.51	1.56	0.707	0.039*	0.999
Prenatal Liver-Up	50%	86.4%	56.3%	66.7%	0.755	0.062	0.691
ECMO	0.0%	41.4%	0.0%	11.1%	0.999	<0.001*	0.294
Use of Patch	41.6%	86.2%	45.8%	90.0%	0.814	0.003*	0.024*
PostOp LOS (days)	36	52	29	32	0.883	0.026*	0.193
PostOp Survival	100%	69%	100%	100%	0.999	0.003*	0.999
Recurrences	14% (11/77)	3.4% (1/29)	17% (4/24)	20% (2/10)	0.502	0.164	0.816

\*Statistically significant

## S020 PATCH PREDICTION AS A MEANS TO ASSESS ELIGIBILITY OF NEONATES FOR THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIAS

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and Westminster NHS Foundation trust, London UK and Imperial College London

**AIMS:** Since the introduction of thoracoscopically repaired congenital diaphragmatic hernias (CDH), there has been a reported increase in the recurrence rate compared to those repaired using the open method. Our aim was to review our experience of this technique and develop a pre-operative scoring system for predicting patch repair and thus eligibility for having a thoracoscopic procedure.

**METHODS:** A prospective and retrospective data collection was carried out on all neonates undergoing either an open or thoracoscopic CDH repair over a 4 year period. Primary outcomes included weight; pre-operative inotrope support; length of pre-operative ventilation; and the position of nasogastric tube prior to the procedure. A scoring system based on our data was then applied to our results.

The observations were scored as follows:

- Weight (kg)
  - $\leq 1$  = score 2
  - $1 < x \leq 3$  = score 1
  - $> 3$  = score 0
- Inotropes
  - $\geq 2$  = score 2
  - 1 = score 1
  - 0 = score 0
- Length of time on ventilator (days)
  - $\geq 7$  = score 2
  - $2 \leq x < 7$  = score 1
  - $< 2$  = score 0
- Position of nasogastric tube
  - Intrathoracic = 1
  - Intra-abdominal = 0

The duration of surgery, complications and recurrence rates were also recorded. Data was analysed using an unpaired t-test.

**RESULTS:** Seventeen patients were included; 1 death occurred before surgery. Of the 8 patients that underwent thoracoscopic repair, 3 had patch placement; of the 8 patients that underwent open repair, 4 patients had patches placed at the time of surgery.

The mean score in those patients that required patches was significantly higher than those who did not have a patch repair (4.57 vs 1.89, SD = 1.13 vs 1.54, p = 0.0017).

**CONCLUSIONS:** Based on our experience of thoracoscopic CDH repair, we have devised a scoring system that predicts the likelihood of patch placement in neonates. As recurrence rates have been noted to be higher in patients with thoracoscopically placed patches, we believe that our scoring system could pre-operatively predict eligibility for a thoracoscopic repair as opposed to an open one. This would reduce the recurrence rate in this group. A prospective multicentre trial would help establish this scoring system.

## S021 DOES AZYGOS VEIN PRESERVATION IN REPAIR OF ESOPHAGEAL ATRESIA WITH TRACHEOESOPHAGEAL FISTULA SEPARATE THE FISTULA CLOSURE SITE AND THE ESOPHAGEAL ANASTOMOSIS - THE THORACOSCOPIC VIDEO RECORDINGS ANALYSIS

Dariusz Patkowski, MD, PhD, Anna Antczak, MD, Robert Smigiel, MD, PhD, Wojciech Apoznanski, MD, PhD, Maciej Baglaj, Prof MD, PhD, Jerzy Czernik, Prof., MD, PhD, Department of Pediatric Surgery and Urology, Department of Genetics, Medical University of Wrocław, Poland

The standard technique for repair of esophageal atresia(EA) and tracheoesophageal fistula (TEF) includes azygos vein ligation and transection. It is supposed that preservation of azygos vein may decrease the rate of anastomotic leakage. The intact azygos vein would also potentially reduced the chance of recurrent fistula formation by separation the site of TEF closure and esophageal anastomosis.

# Oral Presentation Abstracts

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**PURPOSE:** The analysis of preserved azygos vein position in relation to the site of TEF closure and esophageal anastomosis.

**METHODS:** From August 2005 to September 2009 thirty nine consecutive cases (21male, 18 female) wt. 1050g to 3700g underwent thoracoscopic EA/TEF repair. The azygos vein was preserved in each case. Thirty two video recordings were available for analysis. The position of the TEF closure site and the esophageal anastomosis in relation to the azygos vein were analyzed and classified into one of three groups: above, within and below azygos vein.

**RESULTS:** The TEF closure site was located in 16 (50%) cases below and in 16 (50%) cases within the azygos vein. The esophageal anastomosis was located in 10 (31%) cases within and in 22 (69%) cases above azygos vein. Concerning relation between the TEF closure site, the esophageal anastomosis and the azygos vein, the last always separated both elements. If the TEF closure site was located within the azygos vein then the esophageal anastomosis was in 10(62,5%) cases above and in 6(37,5%) cases within the azygos vein. If the TEF closure site was located below the azygos vein then esophageal anastomosis was in 12(75%) cases above and in 4(25%) cases within the azygos vein.

**CONCLUSION:** Preservation of the azygos vein in repair of esophageal atresia(EA) and tracheoesophageal fistula (TEF) separates the fistula closure site and the esophageal anastomosis and thus may potentially reduce the chance of recurrent fistula formation.

**S022 MINIMALLY INVASIVE ESOPHAGECTOMY AND GASTRIC PULL-UP IN CHILDREN** Deiandra Garrett, MD, Dean Anselmo, MD, Henri R. Ford, MD, Fombe Ndiforchu, MD, Nam X. Nguyen, MD, Childrens Hospital of Los Angeles and Miller Children's Hospital

**PURPOSE:** Minimally invasive esophagectomy and gastric pull-up is a widely accepted method in adults. However, the experience in pediatric population is limited. We wish to report our small case series of minimally invasive esophagectomy and gastric pull-up in pediatric patients. The aim of the study is to evaluate the safety, the feasibility, and the outcomes of the procedure.

**METHOD:** The operation was comprised of three parts. The first part was laparoscopic mobilization of the stomach, creation of gastric conduit, and placement of a feeding jejunostomy tube. Esophagectomy was performed either via laparoscopic transhiatus or right thoracoscopy or thoracotomy. The esophago-gastric anastomosis was established through a cervical incision. After the approval of the Institutional Review Board, we retrospectively evaluated the patients who underwent minimally invasive esophagectomy and gastric pull-up. Pertinent data including patients' demographics, operative time, blood loss, and postoperative courses were recorded.

**RESULTS:** From 5/07 to present, we identified three patients (2 girls and 1boy) with average age 46 months (34-57 months) and average weight 12.6 kg (11-15 kg). Two patients suffered from caustic ingestion and one patient had long-gap pure esophageal atresia who failed two thoracotomy stretching attempts (Folker's procedures). One patient underwent laparoscopic and right thoracoscopic (Ivor-Lewis) approach. One patient had the abdominal portion of the operation completed laparoscopically but was unable to achieve thoracoscopic segment due to previous transthoracic operations. This patient had her esophagectomy done via the right thoracotomy. The third patient underwent laparoscopic transhiatus esophagectomy without the thoracic component. Average operative time was about 7 hours (5:19 to 7:52 hours). There were no intraoperative complications with the average blood loss 50 cc (5-125 cc). Jejunostomy tube feeding was initiated on POD#1 and advanced to caloric needs in the next two to

three days as the patients tolerated. Esophagrams were obtained on either POD#6 or 7. There were no leaks on the initial studies, and the patients were started on PO soon after the evaluations. One patient developed cervical wound infection on POD# 9 due to retained foreign body (FB), which required neck exploration and removal of FB. One patient developed an anastomotic stricture at 7-month follow-up. She was successfully treated with two balloon dilatations. One patient developed a delayed esophago-gastric anastomotic leak at three months. The leak was spontaneously closed after a surgical drainage. At 15 months follow-up (4-28 months), all patients were eating regular food and only one still required supplemental night-time feedings.

**CONCLUSION:** In certain settings, minimally invasive esophagectomy and gastric pull-up in children is feasible and safe. Postoperative results are acceptable. However, more study is needed to validate the approach.

**S023 BROAD SPECTRUM ARMAMENTARIUM IN LONG GAP OESOPHAGEAL ATRESIA** David C. van der Zee, PhD, MD, Dept. Pediatric Surgery, University Medical Center Utrecht

**INTRODUCTION:** The thoracoscopic repair of oesophageal atresia is becoming more generally accepted.

Long gap oesophageal atresia still is a challenge in pediatric endoscopic surgery. A broad spectrum armamentarium of treatment modalities is warranted to provide the patient with the best outcome. In many instances primary anastomosis is not feasible in true long gap atresia. For some years now Foker has designed a delayed primary anastomosis technique in open surgery. More recently we successfully described the thoracoscopic Foker technique. However, if a thoracoscopic approach is not feasible, there should be a broad spectrum of armamentarium available, like gastric pull-up, jejunal interposition or in ultimo colon interposition, to satisfactorily restore continuity.

**MATERIAL & METHODS:** Between 2007-2008 14 children were born with an oesophageal atresia. One child had associated anomalies. Ten children had a distal tracheo-oesophageal fistula, four had a long gap oesophageal atresia, two of them also with a proximal fistula. Gestational age varied from 31-41 weeks with a weight of 1370-3665g.

**RESULTS:** The initial technique in our centre for long gap oesophageal atresia has been for many years the jejunal interposition, with gastric pull-up or coloninterposition as secondary options for treatment. The thoracoscopic Foker technique was first performed in 2007. Three children underwent a thoracoscopic delayed primary anastomosis. In the second patient that underwent a thoracoscopic delayed primary anastomosis the traction sutures tore out from the distal esophagus causing a perforation. The thoracoscopic technique was therefore changed to a jejunal interposition without delay. In the last patient that was referred from another hospital, too many intrathoracic procedures had already been carried out to be able to try a thoracoscopic procedure and this patient underwent a successful jejunal interposition. In this time period it was not necessary to perform a gastric pull-up or a colon interposition.

**CONCLUSION:** Thoracoscopic delayed primary anastomosis has become a feasible option in the armamentarium for long gap oesophageal atresia. On the other hand, there should be a low threshold for conversion to an alternative technique in case of complications. Therefore in centres that deal with more complicated forms of oesophageal atresia, such as long gap, other techniques like gastric pull-up, jejunal interposition or coloninterposition should be part of their broad spectrum armamentarium.

**S024 THORACOSCOPIC SURGERY FOR VASCULAR RINGS IN CHILDREN** Alexander Razumovsky, Victor Rachkov, Zoricto Mitupov, Nadezhda Kulikova, Alexander Zadvernyuk, Abdumanap Alhasov Filatov Children's Hospital, Moscow, Russia; Russian State Medical University

Vascular rings are a group of cardiovascular malformations which are the one of the main causes of the compression on the trachea and/or the esophagus in children. The main access for the operative correction of these disorders is left thoracotomy. Recently due to the development of endosurgical technique these operations became available by thoracoscopic approach.

Since June 2008 6 patients with vascular ring were treated in Filatov Children's Hospital by endosurgical procedures. Median age of these patients - 18 months (range: birth to 7 years). Severe respiratory symptoms were present in all cases, including stridor in 67%. There were no gastrointestinal symptoms. Oesophagography proved to be a valuable diagnostic technique when a vascular ring was suspected. Echocardiography was less informative, but was essential to exclude associated cardiovascular malformations. The proper diagnose was made with angiography or CT scan and MRI. In 4 vases we have found double aortic arch as a cause of tracheal compression. In 2 cases – the trachea was compressed by right aortic arch. Associated cardiac anomalies were present in 2 children.

The aim of the surgery is to reveal a vascular ring compressing the trachea and the esophagus. For these purpose we used 4 troacars approach (1 – 4,7 mm for telescope and 3 – 3,5 mm for instruments.) In case of right aortic arch dividing the arterial ligament gave release to the encircled trachea. In 4 patients with double aortic arch we divided the left aortic arch (with the use of "Hem-o lock" clips), the arterial ligament was clipped but not divided. The esophagus was widely freed from main vessels. This procedure helps to release compression of the trachea.

**RESULTS:** There was no operative or postoperative mortality. The mean operative time was 145 min. In one case we had to converse to the open operation due to the large diameter of vessels. Respiratory symptoms decreased in all cases. In two children after operation mild symptoms of tracheal compression remained due to tracheomalacia. There were no late reoperations and no evidence of aortic arch obstruction.

**CONCLUSIONS:** We consider the thoracoscopic approach to be the safe and effective method of treatment children with vascular rings.

**S025 THORACOSCOPIC TREATMENT OF PULMONARY HYDATID CYST IN CHILDREN** Mustafa Kucukaydin, Prof., Serkan Arslan, MD, Ahmet Burak Dogan, MD, Mustafa Erman Dorterler, MD, Ali Aslan, MD, Kadri Cemil Sulubulut, MD, Ozlem Yandim, MD Department of Pediatric Surgery, Erciyes University, School of Medicine Kayseri /Turkey

**BACKGROUND & AIM:** Surgical treatment has remained the standard option in the management of hydatid disease. However, surgeons were able to replicate the principles of conventional surgery using minimally invasive techniques. Herein, we report 8 pediatric patients of pulmonary hydatid cyst treated successfully using the thoracoscopic approach.

**MATERIAL & METHODS:** From April 2005 to May 2009, 8 children (6 male, 2 female), age range of 6 to 16 years, underwent thoracoscopic procedure for an echinococcosis cyst of the lung ( 5 left, 3 right side). All patients were diagnosed with clinical and radiological findings on plain X-ray chest and CT (Computed Tomography). All of them received oral albendazole 12 mg/kg/day soon after diagnosis. The patients were put in a full lateral decubitus position with simple lung intubation. Using a

5-mm camera and 5/10-mm working ports. Three ports were placed in a triangular fashion to the mid axillary line. A 5-mm 30o telescope was introduced through middle port. For a noncomplicated cyst the hypertonic saline was injected, and then the endocyst was extracted using a 10 mm endobag. Irrigations, partial decortications and partial excision of the exocyst were performed and the cyst in using suture ligation for air leak. Infected endocysts and partial exocyst were extracted as the same manner. A chest tube was placed through the lower port site.

**RESULTS:** It was a vomited cyst in 2 cases, a pyopneumocyst in 3 cases, and a noncomplicated and univesicular cyst in 3 cases. The patients had uneventful postoperative courses. At mean follow up of 23 months (6 months to 4 years), they were free of symptoms with no recurrence on the chest x-ray.

**CONCLUSION:** All stages of the surgical treatment of hydatid cyst of the lung in children can be easily accomplished by thoracoscopy. It is our impression that thoracoscopic management of pulmonary hydatid cyst is safe, offers the advantages of less pain, rapid recovery, less short-and long term morbidity, and good cosmesis.

**S026 PERIOPERATIVE OUTCOME OF PATIENTS WITH ESOPHAGEAL ATRESIA AND TRACHEO-ESOPHAGEAL FISTULA UNDERGOING OPEN VERSUS THORACOSCOPIC SURGERY** Philipp O. Szavay, MD, Sabine M. Zundel, MD, Gunnar Blumenstock, MD PhD, Tobias Luithle, MD, Monika Girsch, MD, Joerg Fuchs, MD, Dept. of Pediatric Surgery, Dept. of Cardiology and Critical Care Medicine, University Children's Hospital, Department of Statistics and Medical Biometry, University of Tuebingen

**INTRODUCTION:** Thoracoscopic approach for repair of esophageal atresia (EA) and tracheo-esophageal fistula (TEF) has become a standard procedure in many pediatric surgical centers. Still there are critical considerations of colleagues of disciplines also in charge for these infants, such as neonatologists, pediatric intensive care physicians but also parents. As thoracoscopic surgery in a newborn is demanding from both the surgeon and the patient it remained unclear if it is of benefit for the newborn. Aim of our investigation was to clearly define perioperative outcome and complication rate in children undergoing thoracoscopic versus open surgery for EA and TEF-repair.

**PATIENT & METHODS:** We reviewed patient records of 64 newborns undergoing surgery for EA and TEF between March 2002 and September 2008. Mean gestational age was 35 weeks, mean weight was 2380 g. There were 30 girls and 34 boys. 34 children had associated anomalies. Data are reported with median and range if not otherwise indicated. To compare pCO<sub>2</sub>max-values and the duration of postoperative ventilation in the two groups, the two-sample t test was performed on the log-transformed data. The level of statistical significance was set at p<0.05. Statistical analysis was conducted with the JMP® 7.0.2 software (SAS Institute, Cary, NC).

**RESULTS:** There were 23 children undergoing a thoracoscopic procedure out of these in 8 cases the operation was converted to open thoracotomy. Reasons for conversion were increasing hypoxia, bad sight and laceration of the lung in one case. Another 31 children were operated through a thoracotomy and in 10 newborns a cervical esophagostomy was performed due to long-gap esophageal atresia. All children but those with the cervical esophagostomy were provided with a chest drain disregarding the type of approach. Operating time/minutes was 136 in the thoracoscopic group and 113 in the thoracotomy group, with no significant difference (p>0.05). Values of pCO<sub>2</sub>max during operation/mmHG were 47.5 in the thoracoscopic group (n=20) and 54.6 in the open group respectively with no significant difference (p>0.05). Ventilation time postoperatively/hours was 87 in the

thoracoscopic group and 94 in the open group respectively with no significant difference ( $p>0.05$ ). Complications such as pneumothorax despite drainage, mediastinitis, insufficiency of the anastomosis and dislocation of a clip for the tracheo-esophageal fistula. were noticed in 4 children undergoing thoracoscopy and in 6 patients of the thoracotomy group. Again, there was no significant difference ( $p>0.05$ ).

**CONCLUSION:** Despite skeptical considerations thoracoscopic repair of EA with TEF is justified due to a comparable outcome to open surgery, competitive operating times, decreased trauma to the thoracic cavity and improved cosmesis. There seem to be lower intraoperative values of  $pCO_2$ max and a shorter postoperative ventilation time when children underwent thoracoscopic surgery. However due small numbers of patients, these data were not significant. Complication rates are not higher than in children operated on through a thoracotomy. However a learning curve has to be taken into account and large experience in minimal invasive surgery is mandatory for this procedure. Larger series have to be expected for a more objective evaluation of perioperative- as well as long-term outcome.

**S027 ENDOSCOPIC PECTUS CARINATUM REPAIR USING TWO 8-HOLE-STABILIZERS, SUBMUSCULAR CO<sub>2</sub> AND PRESTERNAL NUSS BAR COMPRESSION; NEW "BERLIN-BUCH REVERSED NUSS" FIRST RESULTS IN 35 PATIENTS** K. Schaarschmidt, Prof. MD, M. Lempe, MD, F. Schlesinger, MD, U. Jaeschke, MD, S. Pollechnner, MD, 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 143 EH patients with very satisfactory results. In 2008-2009 endoscopic Nuss bar compression with endoscopic repair of costal flaring applied a new 8-hole-stabilizer, which allows the use in PC beyond adolescence including redos and combined deformities. This prospective study of 35 "Endoscopic Berlin-Buch Reversed Nuss" (EBBRN) pectus carinatum repairs intends to establish indications for this improved technique.

**METHODS:** In 2008-2009 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. 35 EBBRN patients aged  $17.3 \pm 4.7$  y (range 12-32.1y) were recorded prospectively and followed at 3 monthly intervals. We implant a standard Nuss bar (11-14') into an endoscopically dissected submuscular presternal pocket correcting PC by sternal back-pressure. The bars were bent to a concavity over the maximal prominence of the PC and put under tension by backward traction via bilateral 8-hole-stabilizers and 3 endoscopically placed pericostal wire sutures.

**RESULTS:** All 35 pectus carinatum repairs, including 2 redos after Ravitch (up to 7 y ago) were done by EBBRN with no conversion, older patients received pleural drainages. So far there was no local or general complication, there was no seroma or bar dislocation. 31 patients judged their result as excellent, 4 as good, no EBBRN bar was removed so far.

**CONCLUSIONS:** Helios Center for Pediatric & Adolescent Surgery, Berlin-Buch is a supranational reference centre for thoracic deformities, during the same period 248 Nuss PE repairs (total 916 Nuss) were performed. Although this is a very early experience, EBBRN is safe and effective so far and new technical improvements have expanded the range of applicability to older patients and suitable redos. In combined PE/PC deformations both a retrosternal Nuss bar and a presternal reversed Nuss bar are used.

**S028 EARLY MORBIDITY OF ROBOTIC ABDOMINAL PROCEDURES IN CHILDREN** Najmaldin Azad, Robinson Philip, Sellors Jane Leeds Teaching Hospital NHS Trust, Leeds, UK

**AIMS:** Robotic surgery has been developed to address the difficulties encountered with the introduction of laparoscopic surgery. Prospective data on complication rates is scarce. This report presents early complications of the technique in our institution.

**METHODS:** The Da Vinci system was introduced to our unit in March 06. Since all children who underwent telorobotic assisted surgery by two experienced laparoscopic surgeons were included. Three arms of the Da Vinci system were used in all patients. The primary port was placed using an open technique. An additional laparoscopic port/instrument was used as and if necessary. Data was collected prospectively.

**RESULTS:** There were 163 procedures in 133 patients. The procedures were carried out independently by surgeon A 87%, B 4% and jointly 9%. The operations were urological in 57%, biliary and spleen in 6% and gastrointestinal in 31%. The median age was 8.7 +/- 4.9 years (2 months - 17) and 6% of the patients were less than 10kg in body weight with the smallest being 5.4kg. A history of previous abdominal surgery and scarring was present in 13% of the patients. The mean robotic operating time was 151 minutes (range 24-430). There were no robot related complications. However there were two (1.5%) intra-abdominal non-robot related complications (disruption of ureter from a guide wire and perforation of the stomach from a Seldinger peelaway system). In addition, three patients were converted to an open procedure (faulty robotic arm, extensive abdominal scarring and surgeon's preference) making the total conversion rate 3.7%. Significant post-operative complications occurred in three patients (2.3%) which included primary port site infection, premature displaced ureteric catheter and recurrent PUJ obstruction. Some patients received post-operative oral or IV Morphine for an average of 12 hours. The median duration of hospital stay was 2.0 +/- 4.8 days (range 1-34). All patients were followed up at regular intervals. To date, no other complications have been reported.

**CONCLUSIONS:** This prospective data demonstrates that in the hands of experienced laparoscopic surgeons and in selected groups of young and older children, the morbidity rates for robotic assisted surgery are very low during the learning period.

**S029 MODIFIED LAPAROSCOPIC GASTROSTOMY TECHNIQUE HAS LOWER COMPLICATION RATE** Gustavo A Villalona, MD, Heather M. Kaufman, APRN, CPNP, Milissa A. McKee, MD, MPH, Karen A. Diefenbach, MD, Yale University School of Medicine, Yale-New Haven Children's Hospital

**PURPOSE:** To compare the rate of reoperation for disruption of the gastrostomy tract after laparoscopic gastrostomy tubes (LGT) by our modified technique to our own series of percutaneous endoscopic gastrostomy (PEG) tubes as well as the published rates of reoperation for laparoscopic gastrostomy tubes and PEGs.

**METHODS:** In 2003, we modified our technique for laparoscopic gastrostomy tubes (primary buttons) to include laparoscopically placed sutures to secure the stomach to the abdominal wall. This modification of the Georgeson laparoscopic gastrostomy technique incorporated suture placement similar to that used in an open Stamm gastrostomy technique. A retrospective review was performed on all children undergoing laparoscopic gastostomy tube placement and PEGs from March 2003 to October 2009. In addition, a review of the literature was performed to identify the published rates of complications for these procedures.

**RESULTS:** During this time period, we have performed 85 laparoscopic gastrostomy tubes using this modified technique. In that same time period, there have been 34 PEGs placed. The modification in our laparoscopic technique was instituted after a patient required reoperation for dislodgement in a laparoscopic U-stitch gastrostomy. To date, in the modified LGT group, there have been no disruptions of the gastrostomy tract in either the early or late periods, less than or greater than 90 days respectively. There have been 4 (4.7%) early dislodgements of the gastrostomy tube (button). All of these were prior to post-operative day 14 (at post-op days 1, 2, 6, and 12), and all of these were replaced successfully with placement verified by contrast study. None required re-operation. In the PEG group, there have been 3 (8.8%) early dislodgements, 2 (5.9%) of which required re-operation. The published rate of dislodgement requiring re-operation in the Georgeson series of laparoscopic gastrostomy tubes is 2.5%. The published rate of re-operation for dislodgement in PEGs is 4.3-6%.

**CONCLUSION:** This modification of the Georgeson technique has been successful in reducing the complication rate associated with gastrostomy tube placement including decreasing the incidence of reoperation.

**S030 COMBINED LAPAROSCOPIC-THORACOSCOPIC REPAIR OF RECURRENT LARGE TRACHEOESOPHAGEAL FISTULA WITH OMENTUM AND GASTROESOPHAGEAL REFLUX IN ESOPHAGEAL ATRESIA** Edward Esteves, MD, Mariza R. Faria, MD, Adriana C. Perez-Boscolli, MD, Elina Oliveira, MD Pediatric Surgery Division, University of Goias, Goiania (GO)

**BACKGROUND:** The treatment of persistent tracheoesophageal fistula (TEF) in children with esophageal atresia (EA) is frequently difficult and can require surgical repair when conservative procedures fail, especially when there is severe or recurrent gastroesophageal reflux (GER). This is a case report of a successfully combined laparoscopic fundoplication and thoracoscopic repair of recurrent large TEF with omentum in a girl with type 3 esophageal atresia.

**CASE REPORT:** A 7 year old girl born with type 3 EA suffered from chronic pneumonia and cough due to persistent TEF since neonatal primary anastomosis elsewhere. She had undergone many bronchoscopic and endoscopic procedures to try to close the fistula and a second thoracotomy for a unsuccessful surgical repair of the TEF 2 years ago. A severe GER and esophageal dysmotility have been treated conservatively without clinical response. This operation started by identifying and temporarily closing the fistula with a Fogarty catheter. Using 3 ports, a laparoscopic mobilization of the great omentum was accomplished, followed by transhiatal dissection into the inferior mediastinum, where the omentum was temporarily put in. A Thal fundoplication and posterior hiatoplasty were performed, followed by modifying the position of the patient to a prone decubitus like the one for esophageal atresia. Using 3 ports, the pleural adhesions were released carefully and the TEF was identified surrounded by fibrotic tissues. The TEF was incised and both the trachea and esophagus were sutured with separate stitches. Under the mediastinal pleura, the great omentum was brought into this region and fixed inbetween the trachea and esophagus. A tube-laminar drain was exteriorized through the lowest port site. The patient had an uneventful postoperative course, having no more pneumonias and is completely asymptomatic after 2.5 years of follow-up. Periodical endoscopies confirm permanent closure of the TEF and a competent fundoplication.

**CONCLUSIONS:** The persistent TEF due to GER or not can be efficiently treated by an omental patch, simultaneously with a fundoplication, through a combined laparoscopic and thoracoscopic approach.

**S031 LAPAROSCOPIC COLLIS-NISSEN FOR RECURRENT SEVERE REFLUX IN PEDIATRIC PATIENTS WITH ESOPHAGEAL ATRESIA AND RECURRENT HIATAL HERNIA** Steven S. Rothenberg, MD, Anthony Chin, MD, The Rocky Mountain Hospital for Children

**PURPOSE:** Patients following esophageal atresia repair may often have a congenitally short esophagus leading to severe reflux and failed funduplications. This report evaluates the efficacy of a laparoscopic Collis-Nissen fundoplication in this group of patients who have failed a previous fundoplication.

**METHODS:** From January 2005 to September 2009, 5 patients who had been born with esophageal atresia presented with recurrent gastro-esophageal reflux disease (GERD) and hiatal hernia (H/H). Patients ages ranged from 5 to 12 years and weights from 17 to 32 kg.. All patients had undergone at least 3 previous funduplications and hiatal hernia repair. Four of five had at one open laparotomy for their previous repair. The procedure was performed through 5 ports and consisted of a takedown of the previous fundoplication, elongation of the esophagus using an endoscopic stapler, closure of the hiatus using Teflon pledgets to buttress the repair, and formation of the fundoplication.

**RESULTS:** All procedures were completed successfully laparoscopically. Procedure times ranged from 180 to 300 minutes. An NG tube was left for an average of 3 days in 4 or 5 patients. The fifth patient had a delayed perforation on day 3 and required re-exploration, and had a NG tube for 10 days. 4 of 5 patients were started on feeds on day 4 and were discharged on day 5. The 5th patient with the perforation was discharged on day 14. At an average follow-up of 42 months all patients have intact wraps and no recurrence of their hiatal hernia.

**CONCLUSION:** A laparoscopic Collis-Nissen in a child with previous failed fundoplication is a complex but efficacious procedure. Elongating the esophagus in patients with esophageal atresia may decrease the high recurrence rate of hiatal hernia in these patient's and should be considered if the patient fails their primary repair.

**S032 HOW TO REDUCE THE RISK OF COMPLICATION AFTER LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION IN CHILDREN** Wei Hua Pan, MD, Yeming Wu, MD, Zhilong Yan, MD Department of pediatric surgery, Xinhua Hospital, Medical School of Shanghai Jiaotong University

**OBJECTIVE:** We aim to introduce our clinical experience in treating choledochal cyst laparoscopically in children, which may focus on how to reduce the intra-operational risk and post-operational complications. **Methods:** From September 2003 to February 2009, sixty-one patients (18 boys and 43 girls, age from 8 days to 14 years) with choledochal cyst accepted cyst excision and Roux-Y hepatoenterostomy reconstruction under laparoscopy in department of pediatric surgery in Xinhua hospital and Shanghai Children's Medical Center. Type I choledochal cyst was confirmed by MRCP, which was the selecting standard for laparoscopy. The diameter of the cysts were from 1.2cm to 12cm, and no drainage of the cyst had been made before. **Results:** Fifty-four patients had been served the cyst excision and Roux-en-Y hepatoenterostomy reconstruction under laparoscopy successfully, while the other 7 patients been turn to open because of huge size of the cyst, adhesion, bleeding or technically reasons. Anastomotic leaking were found in 2 patients post-operationally. Follow-up were made ranged from 2-43 months, which discovered 2 cases of cephalad pancreas cyst, one case of pancreatitis, and 2 cases of intestinal obstruction due to adhesion. They were all relieved without operation. **Conclusions:** Laparoscopic choledochal cyst excision and Roux-en-Y hepatoenterostomy reconstruction was effective and safe

for childhood choledochal cyst, which has its advantage of minimal invasion significantly compare to the traditional open counterpart. However, well trained practicing skill under laparoscopy is necessary. Therefore, it should not be carry out until the skilled performer could handle the risk intra-operation.

**KEY WORDS:** choledochal cyst; laparoscopy; complication

**S033 LAPAROSCOPIC TREATMENT OF POST-NECROTIZING ENTEROCOLITIS COLONIC STRICTURES** Marcelo Martinez-Ferro, MD, Steven Rothenberg, MD, Shawn St. Peter, MD, Horacio Bignon, MD, George Holcomb, MD Fundación Hospitalaria - Private Children's Hospital; The Rocky Mountain Hospital for Children and Children's Mercy Hospital

**BACKGROUND:** The development of a colonic stricture is a well known complication for neonates with necrotizing enterocolitis (NEC) who have been managed medically. Traditionally, the operative approach has been a laparotomy. However, our multicenter group is reporting an early experience with the laparoscopic approach for these strictures.

**PATIENTS & METHODS:** Following IRB approval (or similar approval outside the U.S.), a retrospective review of all patients undergoing operative management for colonic strictures following necrotizing enterocolitis at our individual institutions was performed between January, 2005 and December, 2008. Demographics, operative approach, operative time and the postoperative course were reviewed.

**RESULTS:** Eleven infants at our three centers were identified. The mean birth weight was 1.7 kg (0.96-2.2 kg). The mean weight at operation was 3.0 kg (1.6-4.4 kg). Four babies (36%) underwent laparoscopic mobilization with an extracorporeal resection and anastomosis. Seven infants (64%) underwent laparoscopic mobilization with intracorporeal resection and anastomosis. The mean operative time was 93 minutes (80-120 min.). The anastomosis was colo-colic in all patients except in one case in which it was colo-rectal. There were no operative complications. Oral feedings were initiated at a median time of 3.5 days (1-11 days) following the operation. No postoperative complications developed and no stricture recurrences have been found in follow-up.

**CONCLUSION:** The laparoscopic approach with either an intracorporeal or extracorporeal resection and anastomosis is feasible in infants with a colonic stricture following medical management of necrotizing enterocolitis. The results of the laparoscopic approach are comparable to the open operation, but avoid the short and long term morbidity of a large abdominal incision.

**S034 MICROLAPAROSCOPICALLY ASSISTED PULL-THROUGH PROCEDURE FOR HIRSCHSPRUNG'S DISEASE** Salmal Turial, MD, Jan Enders, MD, Veronica Engel, MD, Felix Schier, MD, Department of Pediatric Surgery, Medical University Centre, Mainz, Germany

**PURPOSE:** To evaluate the efficiency of microlaparoscopically assisted pull-through for Hirschsprung's disease with respect of operating time and complications in a prospective feasibility study.

**METHODS:** Since 2005 pull-through procedures for Hirschsprung's disease were performed with 2 mm instruments and miniscopes, 1.9 to 2.4 mm in diameter, exclusively (microlaparoscopic).

Three MiniPorts were inserted at the right abdominal wall laterally in one line, at the level of umbilicus for the miniscope and cranial/caudal of the scope for the working trocars. Another MiniPort was inserted at the upper left abdominal quadrant for the colon retracting grasper.

The left colon was stretched with two transabdominal sutures in order to better expose the mesocolon.

**RESULTS:** Microlaparoscopically assisted pull-through were performed in 16 children (10 boys, six girls). Age ranged one month to two years (average 5,7 months). Six patients had previous abdominal surgery including colostoma placement (3) and diagnostic laparoscopic biopsy (3). Visualisation was sufficient in all cases. Initially, a 1.9 mm cystoscope or a 2.4 mm arthroscope was used in five cases. In the remainder a recently new developed 2,4mm miniscope was used. The length of the resected colon segment was up to the left colonic flexur in five children, up to the middle of the descending colon in four cases. A resection of the sigmoido-descends segment was performed in seven children. Average operation time was 3:30h (range 2:40h to 5:30h).

The only intraoperative complication an injury of the right iliacal vein by inadvertence slippage of electorcautery hook requiring laparotomy. There was no need ever to replace a miniscope by a 5mm laparoscope.

At follow up, 80% of the parents could not identify the scars from microlaparoscopy. All parents were very satisfied with the cosmesis, except for the parents with the conversion.

**CONCLUSION:** Microlaparoscopically assisted pull-through is a safe and feasible procedure regardless of age or previous surgery.

**S035 THE TRANSANAL APPROACH WITH LAPAROSCOPY OR LAPAROTOMY FOR THE TREATMENT OF RECTAL STRICTURES IN CROHN'S DISEASE** Taiwo A. Lawal, MD, Jason S. Frischer, MD, Richard A. Falcone, MD MPH, Kaveer Chatoorgoon, MD, Lee A. Denson, MD, Marc A. Levitt, MD Cincinnati Children's Hospital Medical Center, Cincinnati, USA

**INTRODUCTION:** Surgery still plays a significant role in the management of complicated Crohn's disease despite advances in medical management. Rectal strictures in patients with Crohn's colitis are common and options described for their treatment include direct steroid injection, injection of TNF inhibitors, endoscopic balloon dilatation, use of Hegar dilators, stricturoplasty, and proctectomy. Adequate treatment is a challenge especially with regards to the prevention of stricture recurrence and avoidance of permanent diversion. The transanal route to rectal and rectosigmoid resections have been popularized for the treatment of Hirschsprung disease. We present an option for surgical treatment of these strictures using a transanal resection of the rectum with the addition of laparoscopy or laparotomy.

**METHODS:** Three patients aged 17, 17, and 21 years, who had been treated for medically refractory or chronic Crohn's colitis and rectal strictures were referred to our institution. They had failed medical management, rectal dilation and balloon dilation of the strictures. All three had been diverted (ileostomy in two, colostomy in one). One had developed a rectovesical fistula despite diversion. In each case, we performed a transanal sphincter preserving dissection in the prone position, and then packed the perineum with sterile gauze. We then flipped the patient supine and placed them in lithotomy position for the intraabdominal mobilization, completion of the rectosigmoid resection, pull-through of the left colon, and coloanal anastomosis.

**RESULTS:** We resected the rectal strictures transanally in all three cases. One case provided the opportunity to perform a laparoscopy assisted procedure while the other two patients had laparotomy assisted rectosigmoid resections (one had dense adhesions to the pelvis and another had a rectovesical fistula). We did a coloanal anastomosis in two patients with healthy left colon. In the third case, the anal canal was preserved, but the patient was left with a stoma. The stool frequency in the patient who has had ileostomy closure is four voluntary bowel movements per day without soiling. The second

patient now has an endoscopically normal pull-through segment and is planned for ileostomy closure, and the third is being considered for possible restoration of bowel continuity. We found the prone position very helpful in performing the transanal rectal dissection.

**CONCLUSIONS:** Transanal resection is feasible in the surgical treatment of rectal strictures in patients with Crohn's colitis. It preserves the anal sphincteric mechanism and may help in avoiding a permanent stoma in this group of patients.

**S036 COMPARISON OF TRANSANAL ENDORECTAL PULL-THROUGH AND LAPAROSCOPIC ASSISTED TRANSANAL ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG'S DISEASE**

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**AIM:** In this study, we compared the results of transanal endorectal pull-through (TERP) and laparoscopic assisted transanal endorectal pull-through technique (LATERP) for Hirschsprung's disease (HD).

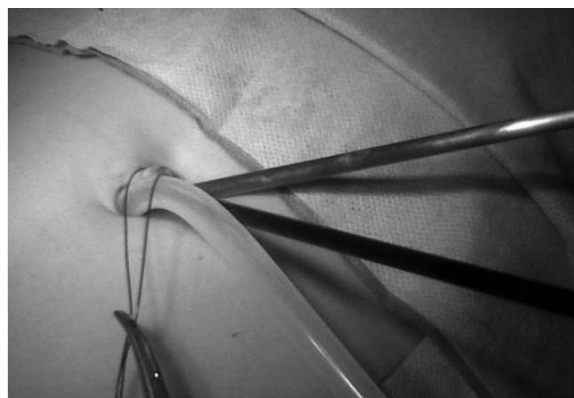
**MATERIAL & METHODS:** Fifty- two HD patients who underwent surgical treatment were divided in two groups according to operation technique and results were compared with each other. In group I, there were 25 patients (17 boys, 8 girls), age ranged from 12 days to 40 days (average of 24 days) and treated with TERP, between April 2000 and April 2005. In group II, there were 26 patients (19 boys, 7 girls), age ranged from 10 days to 60 days (average of 32 days) treated with LATERP between May 2005 and June 2009. Age, operating time, bleeding, perianal excoriation, anal dilatations and functional results were analyzed. The groups were compared using the T-test, Mann-Whitney-U test and Chi-Square test. The differences were considered significant when P values were less than .05.

**RESULTS:** Age and sex of the patients were not statistically different ( $P = .10$  and  $.08$ , respectively). Operating time and bleeding were less in group II ( $P = .04$  for both). There was no intestinal obstruction secondary to adhesions in two groups. Perianal excoriations and anal dilatations were less in-group II ( $P < .05$ ). Good functional results were obtained in the two groups.

**CONCLUSION:** Although the functional results are similar in the both groups, we think that LATERP has some advantages to the TERP, minimizing blood loss, operating time, perianal excoriations and less anal dilatations.

**S037 SINGLE INCISION LAPAROSCOPIC SURGERY: A DIFFERENT PROPOSAL**

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**INTRODUCTION:** Single incision laparoscopic surgery requires that the instruments are introduced through a multi-channel trocar or through various trocars sited in the umbilical region. This technique needs articulated instruments, multichannel trocars or various trocars at the same time. This is not only expensive but often requires a relatively large incision not suitable for small children. We describe our experience with an alternative single incision transumbilical laparoscopic technique without trocars.

**OBJECTIVE:** To describe our experience with single incision transumbilical laparoscopic surgery.

**PATIENT & METHOD:** A retrospective review of all the patients that underwent single incision (trocarless) transumbilical laparoscopic surgery was conducted between January 2008 and June 2009. All surgeries were performed with the same technique. A stay suture is placed in the umbilicus. An infra or intra-umbilical 5-10 mm skin incision is made before Veres needle insertion. After insufflation, patients had a 5-10 mm trocar introduced. Once laparoscopy is performed and the problem evaluated, the trocar is removed and extension of the fascia opening is performed if necessary. An enteral feeding catheter is introduced to deliver the CO<sub>2</sub>. Through the same incision, the camera and 1, 2 and up to 3 instruments can be placed. (As shown in the figure). This technique permits the use of 2 or 3 instruments in the abdominal cavity without restrictions of movement.

**RESULTS:** There were 100 trocarless, transumbilical laparoscopic surgeries performed with this technique: 90 appendectomies, 4 gastrostomies, 3 adnexal masses, 2 cholecystectomies and 1 intestinal duplication. Age ranged between 3 months and 15 years old and weight between 5 and 65 kilos. Mean operative time for appendectomies was 35 minutes, 30 minutes for gastrostomies, 40 minutes for adnexal masses, 70 minutes for cholecystectomies and the intestinal duplication 45 minutes. Mean hospital stay was 1 day for the appendectomies, 2 days for gastrostomies, 1 day for adnexal masses and 4 days for intestinal duplication. There were no intra-operative complications. There was one conversion to traditional laparoscopic surgery in this serie. No post-operative complications from this technique were seen in the follow up of these patients (3 – 18 months).

**DISCUSSION:** There are no publications for this technique in children. The single incision (trocarless) transumbilical laparoscopic surgery technique has the advantages to allow more freedom of movement, smaller umbilical incision and less cost. The trocarless, transumbilical technique appears to be feasible, safe and effective. This technique may also avoid the need for Veress needle and any trocar if decided.

**CONCLUSION:** Trocarless transumbilical laparoscopic surgery is an excellent alternative to multi-trocar or multi-channel trocar umbilical surgery.

**S038 LAPAROSCOPIC REPAIR FOR CHOLEDOCHAL CYST: LESSONS LEARNED FROM 227 CASES**

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**OBJECTIVE:** To report the technical details, early outcomes and lessons learned from laparoscopic repair for choledochal cyst with 227 cases.

**METHOD:** The operation was performed using four ports. The cystic duct was identified and divided. The liver was elevated by two stay sutures: one on the round ligament and the other on the distal cystic duct. The choledochal cyst was isolated and completely removed, and then biliary-digestive continuity was re-established.

**RESULTS:** From January 2007 to August 2009, 227 patients were operated on. There were 170 girls and 57 boys. Ages ranged from 2 months to 16 years (mean  $46.9 \pm 29.3$  months). Cyst diameter ranged from 10 mm to 184 mm. 133 patients belonged to type I Todani classification, and 94 patients were type IV. Cystic excision and hepaticoduodenostomy were performed in 150 patients and hepaticojejunostomy in 77 patients. The mean operating time was  $172.7 \pm 43.3$  minutes for laparoscopic cyst excision and hepaticoduodenostomy, and  $228.1 \pm 54.5$  minutes for laparoscopic cyst excision and hepaticojejunostomy. Conversion to open surgery was required in two patients. Intra-operative blood transfusion was required in four patients. There were no perioperative deaths. Postoperative anastomotic leakage occurred in seven patients, resolving spontaneously in six patients and requiring a second operation in one patient.

Postoperative hospital stay ranged from 4 to 27 days (mean:  $6.8 \text{ days} \pm 2.8 \text{ days}$ ). Follow-up of 176 patients (77.5%) occurred between one and 30 months post discharge (mean:  $10 \pm 2.2$  months). Of these patients, cholangitis occurred in four patients (1.76%).

**CONCLUSION:** Laparoscopic repair is a safe and effective procedure for choledochal cyst.

### **S039 LAPAROSCOPIC RESECTION OF CONGENITAL CHOLEDOCHAL CYST, HEPATICOJEJUNOSTOMY, AND EXTERNALLY MADE ROUX-EN-Y ANASTOMOSIS: A TECHNICAL SKILL AND INTERMEDIATE-TERM REPORT IN 50 CASES**

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**OBJECTIVE:** The aim of this study was to present our technique and the intermediate-term outcome in laparoscopic choledochal cyst excision with Roux-en-Y hepatoenterostomy.

**METHODS:** We retrospectively studied 50 children who had undergone laparoscopic complete resection of choledochal cyst, hepaticojejunostomy, and externally made Roux-en-Y anastomosis from September 2005 to December 2008. 32 were female and 18 were male. Age ranged from 2 months to 15 years (average, 2.3 years). All children in our center with choledochal cyst have been operated on by the same surgeon using a laparoscopic cyst excision and hepaticojejunostomy technique. Preoperatively, all patients were evaluated by ultrasonography, and magnetic resonance cholangiopancreatography (MRCP). The retrospective data and the following investigations about type of choledochal cyst, surgical technique, conversion rate, morbidity, and mortality were analyzed.

**RESULTS:** Of 50 patients, there were Type 1a choledochal cysts in 35 patients (70%), Type 1b in 12 patients (24%), Type IVa in 4 patients (8%) and Type IVb in 1 patient (2%). The average diameter of the cysts was 42 mm (range 12 mm to 158 mm). An anomalous pancreatobiliary junction was found in 86%. In 41 patients (82%), total cyst excision could be done. The large cyst was opened on the front wall and then divided circumferentially in the middle prior to removing the lower and upper parts in 25 cases; the dissection of the lower part and division of the small cyst from the common biliopancreatic duct before removing the total cyst was carried out in 16 cases. In 9 patients (18%), the Lilly's technique was adopted, leaving a narrow rim of the posterior cyst wall on the portal vein and hepatic artery. In 5 patients with huge cyst, the cyst extended caudally behind the duodenum, so the duodenum along with the head of pancreas had to be mobilized to visualize the lower limit of cyst. 2 patients were excised the hepatic duct and underwent plastic operation of bile duct. The

mean operative time was 226 minutes (range 190 to 450 minutes). 8 patients needed blood transfusion. Conversion was required in 2% (1/50) due to bleeding on cyst dissection. The mean hospital stay was 8 days (range 6 to 16 days). The mean follow-up time of 49 children patients was 31 months (range 9 to 45 months). The overall morbidity rate was 10.2% (5/49) including bile leakage (1), adhesive small bowel obstruction (2), intestinal necrosis (1), cholangitis (1). Gastritis due to bilious reflux occurred in 0%, the mortality rate and the incidence of carcinoma was 0%.

**CONCLUSIONS:** Dissecting the posterior cyst wall from the underlying portal vein is the most crucial part and the hepaticojejunostomy anastomosis is the most difficult part of the procedure. Laparoscopic choledochal cyst excision, hepaticojejunostomy, and externally made Roux-en-Y anastomosis can be safely and quickly performed in children with satisfactory intermediate-term results.

### **S040 LAPAROSCOPIC TREATMENT OF BILE DUCTS MALFORMATIONS**

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Recently laparoscopic approach is possible for many pediatric surgical diseases, including complex biliary malformations. We would like to describe our early experience with laparoscopic procedures for biliary atresia and choledochal cysts.

Since January, 2008 23 children underwent laparoscopic Kasai portoenterostomy or laparoscopic excision of a choledochal cyst with Roux-en-Y biliary reconstruction.

Laparoscopic Kasai portoenterostomy was performed in 15 children with biliary atresia. Age of the children varied from 50 days to 3,5 month. Mean weight -  $3640 \pm 124$ g. Laparoscopic excision of a choledochal cyst with Roux-en-Y biliary reconstruction was performed in 8 children. Age in this group - 2 -16 years.

All procedures were performed with 4 to 5 trocars using 3- and 5-mm ports. Excision of the fibrous biliary remnant (biliary atresia) or of the cyst (choledochal cysts) was performed laparoscopically in all cases. The Roux-en-Y limb was created through a 1-cm extension of the umbilical port site. Laparoscopic biliary reconstruction with creation of porto- or hepatico-entero anastomosis was performed successfully in all patients.

**RESULTS:** All children with choledochal cysts have normal bilirubin values. 12 of 15 children who underwent laparoscopic Kasai have a normal postoperative bilirubin level, whereas the 3 children did not drain bile and are candidates for a liver transplantation. Mean length of surgery was 140 minutes. There were no significant postoperative complications. A cosmetic was excellent in all cases.

### **S041 LAPAROSCOPIC EXCISION OF CHOLEDOCHAL CYST AND TOTAL INTRACORPOREAL RECONSTRUCTION: A SERIES OF 10 CONSECUTIVE PATIENTS**

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**PURPOSE:** There are numerous published reports of laparoscopic resection of choledochal cysts but almost all involve extracorporeal reconstruction of a biliary drainage system. We describe and evaluate the technique of laparoscopic resection of choledochal cyst with total intracorporeal reconstruction with a Roux-en-Y choledochal-jejunostomy.

**METHODS:** From March 2008 to July 2009 ten children aged 1 month to 16 years (mean 3 years) were diagnosed with a choledochal cyst. Presentation included pain (7/10), hyperbilirubinemia (8/10), jaundice (5/10), palpable mass (2/8), and fever (1/10). One patient was diagnosed on prenatal ultrasonography. All underwent laparoscopic resection with intra-corporeal reconstruction with a roux-en-y choledocho-jejunostomy using a four port technique. The roux-en-y was constructed using an endo-GIA in 3 cases and hand sewn in 7. The choledocho-jejunostomy was constructed with 5-0 PDS interrupted sutures.

**RESULTS:** All procedures were successfully completed laparoscopically. Operative time ranged from 140 minutes to 270 minutes (mean 200). Complete resection of the cyst was accomplished in all cases. Diet was started on post-operative day 2 in 9 of 10 cases. Hospital stay ranged from 4 to 8 days, with 8 of 10 being discharged by the 5th post-operative day. There were no cases of cholangitis or obstruction.

**CONCLUSION:** Laparoscopic resection of choledochal cysts with total intracorporeal reconstruction is a safe and effective technique. The minimal handling of the bowel appears to minimize post-operative ileus, allows for quicker post-operative feeding, and earlier discharge.

**S042 LAPAROSCOPIC HEPATICOJEJUNOSTOMY AND INTRAHEPATIC CYSTOJEJUNOSTOMY FOR TYPE IV-A CHOLEDOCHAL CYSTS** Suolin LI, MD, Zengwen YU, MD, Yingchao LI, MD Department of Pediatric Surgery, 2nd Hospital of Hebei Medical University

**BACKGROUND:** Type IV-A choledochal cysts are characterized by congenital cystic dilatation of the biliary tree extending to involve the intrahepatic biliary channels also. Dilatation of the intrahepatic bile duct is frequently observed around the hepatic hilum, occasionally in the umbilical portion, associated with downstream stricture. Surgical treatment of Type IV-A must achieve bile drainage from the intrahepatic cysts as well as from the choledochal cyst. A single-center experience of the laparoscopic hepaticojejunostomy and intrahepatic cystojejunostomy for type IV-A choledochal cysts was presented.

**METHODS:** We retrospectively studied 65 children who had undergone laparoscopic cholangiopancreatography and choledochal cyst excision in our institute from 2002 to 2009. A type IV-A (Todani's classification) cyst was found in 23% (15). After excision of the extrahepatic bile duct cyst at the hilum and making a large fenestration of the intrahepatic duct cyst, hepaticojejunostomy and intrahepatic cystojejunostomy were performed using a Roux-en-Y jejunal loop.

**RESULTS** Eight of them showed a stricture that converged into the common hepatic duct. The concomitant stenoses of the right and left hepatic ducts were observed in 3 cases. In 2 cases, a septum was found in the right hepatic ductal terminal. A downstream stricture was identified in the left hepatic duct. 14 cases with APBD were diagnosed and classified according to Komi classification. All of biliary stenoses in the porta hepatis were treated by ductoplasty. Postoperatively, intrahepatic cysts were remarkably reduced in size, and recurrent bouts of abdominal pain did not occur.

**CONCLUSIONS** Laparoscopic cholangiopancreatography is a valuable method in diagnosis of type IV-A choledochal cyst and needs only simple equipment. With the demonstrations, the radical resection of CCC and correction of the intrahepatic bile ductal stenosis. Laparoscopic hepaticojejunostomy and intrahepatic cystojejunostomy is effective and safe for children with type IV-A choledochal cysts.

#### **S043 LAPAROSCOPIC ILEOCECTOMY IN PEDIATRIC PATIENTS WITH MEDICALLY REFRACTIVE CROHN'S DISEASE** Carrie

A. Laituri, MD, Jason D. Fraser, MD, Carissa L. Garey, MD, Pablo Aguayo, MD, Susan W. Sharp, PhD, Ronald J. Sharp, MD, Daniel J. Ostlie, MD, George W. Holcomb III, MD, Shawn D. St. Peter, MD, The Children's Mercy Hospital, Kansas City, Missouri

**INTRODUCTION:** Definitive management for medically refractive ileocecal Crohn's disease is resection with primary anastomosis. Laparoscopic resection has been demonstrated to be effective in adults. There is a relative paucity of data in the pediatric population. We therefore audited our experience with laparoscopic ileocectomy in patients with medically refractory ileocecal Crohn's disease to determine its efficacy.

**METHODS:** We conducted a retrospective review of all pediatric patients who underwent laparoscopic ileocecal resection for medically refractive Crohn's disease at a single institution from 2000 -2009.

**RESULTS:** Twenty-nine patients aged 10 to 18 years (mean 15.3 years) with a mean weight of 49.5 kg (standard deviation  $\pm$  15.5kg) underwent laparoscopic ileocectomy for Crohn's disease. Four of these were performed using a single incision laparoscopic approach (SILS). The indications for surgery were (some patient's had multiple indications): obstruction/stricture (20), pain (10), abscess (3), fistula (2), perforation (1), and bleeding (1). There were a total of 5 abscesses encountered at operation. Eight patients were on total parenteral nutrition at the time of resection. Twenty-four patients (82.8%) were being treated with steroids at operation. The anastomosis was stapled in 25 patients and 4 were hand-sewn. Two patients developed a post-operative abscess, both of which were taking 20mg of prednisone daily. One patient developed a small bowel obstruction due to a second Crohn's stricture that manifested itself after the more severe downstream obstruction was relieved with ileocectomy.

Of the 4 patients that underwent a SILS operation, 3 were performed for obstruction/stricture and the other was for perforation. There were no intraoperative or postoperative complications.

The patients were followed for a maximum of 80.7 months (average 15.2 months, median 9.7 months). There were no anastomotic leaks or wound infections.

**CONCLUSIONS:** This series demonstrates that laparoscopic ileocectomy, both SILS and standard laparoscopy, is safe and effective in the setting of medically refractive Crohn's disease in pediatric patients.

#### **S044 LAPAROSCOPIC MANAGEMENT OF SMALL BOWEL OBSTRUCTION IN CHILDREN** Pablo Aguayo, MD, Jason D. Fraser,

MD, Shawn D. St. Peter, MD, Carrie A. Laituri, MD, Daniel J. Ostlie, MD, Children's Mercy Hospital and Clinics

**INTRODUCTION:** The use of laparoscopy in the treatment of acute small bowel obstruction (SBO) faces inherent obstacles including dilated loops of bowel, a limited working space, and postoperative adhesions. The objective of this study was to outline the efficacy of laparoscopic management of SBO in children.

**METHODS:** Children who presented with a diagnosis of SBO and underwent management via a laparoscopic approach at our institution from January 2001 to December 2008 were retrospectively reviewed. Medical records were reviewed for age, weight, etiology of obstruction, radiographic findings, need for conversion, number of operations, length of stay, and postoperative complications. Statistical analysis of data comparison between those patients who

were managed utilizing a laparoscopic approach and those in whom the laparoscopic approach was converted to a laparotomy were performed using a Chi-squared or a 2-tailed Student's t-Test with significance reported for  $p < 0.05$ .

**RESULTS:** Thirty-four patients underwent laparoscopic management of SBO. Mean age was  $8.1 \pm 5.9$  years with a mean weight of  $32.8 \pm 24.6$  kg. 67% were male. A pre-operative computed tomography scan was obtained in 21 patients (62%). Eleven cases (32%) required conversion to laparotomy. The most common reason for conversion to the open approach was poor working space (45.4%) followed by intestinal volvulus (27.2%), inability to identify source of obstruction (18.2%) and enterotomy (9%). The most common cause of SBO was adhesions (73.5%), followed by Meckel's diverticulum (8.8%), volvulus (8.8%) and other (8.8%). Post-operative complications occurred in 5 patients (14.7%). One patient died within thirty days of exploration due to intestinal ischemia secondary to midgut volvulus and subsequent septic shock. Five patients (14.7%) had a recurrent SBO with a mean time to recurrence of  $2.6 \pm 2.1$  months. There were no significant differences in demographic or preoperative variables between patients who were successfully managed with laparoscopy alone versus those patients in whom conversion to laparotomy was necessary. In patients that required conversion, the laparoscopic evaluation did aid in identifying the etiology and allowed for a directed surgical approach when appropriate.

**CONCLUSION:** Laparoscopy for the management of SBO in children is safe and can be therapeutic in the majority of patients. We recommend initial exploration in children with SBO be carried out via the laparoscopic approach, with an understanding that conversion to an open approach may be necessary to complete the operation.

**S045 A RETROSPECTIVE MULTICENTRIC STUDY OF 79 ALIMENTARY TRACT DUPLICATIONS OPERATED ON BY MINIMALLY INVASIVE SURGERY** Florent Guerin, MD, Guillaume Podevin, MD, PhD, Manuel Lopez, MD, Hubert Lardy, MD, PhD, Emmanuel Sapin, MD, PhD, Jean Yves Kurzenne, MD, PhD, Jean Gaudin, MD, Gerard Morisson Lacombe, MD, Philippe Montupet, MD, Ionis Valioulis, MD, Martine Demarche, MD, Geci (Groupe D'etude En Coeliouchirurgie Infantile)

**PURPOSE:** Alimentary tract duplications (ATDs) are a rare cause of intestinal obstruction in childhood. There are many cases reports but few series about minimally invasive surgery (MIS) for ATD. The aim of this study was to evaluate outcomes of MIS for ATD from the French GECI Group experience.

**METHODS:** The charts of patients from 12 centers between 1994 and 2009, operated on through thoracoscopic or laparoscopic approach for histologically proved ATDs, were reviewed.

We have assessed presentation at diagnosis, per-operative complications, post-operative outcome and status at last follow-up. Data were reported in mean with confidence intervals. We used parametric statistic tests, and  $p < 0.05$  was considered significant.

**RESULTS:** Among 79 patients, 49 (62%) had an antenatal suspicion of ATD. After delivery, 36 (46%) patients were symptomatic before surgery, 30% of the patients with antenatal diagnosis vs 73% without ( $p < 0.01$ ). The age at first symptoms for patients with antenatal diagnosis was 2.3 months [0-4] vs 53 months [36-70] for post-natal diagnosis ( $p < 0.01$ ).

Seventy patients had a laparoscopy for 2 esophageal, 13 gastric, 5 duodenal, 26 small intestine, 18 ileo-cecal, 2 appendix, 3 colonic

and 1 rectal duplications. Nine other patients had a thoracoscopy for esophageal duplications. The mean operative time was 79 mn [71-87]. There were 19 (24%) intestinal resection anastomosis, 36 (45.5%) enucleation and 24 (30.5%) unroofing. The conversion rate was 30% and was significantly higher for small bowel duplications, low weight and antenatally diagnosed patients (43% vs 16%) ( $p = 0.01$ ). There were 7 (8%) of per operative intestinal perforation immediately repaired. The main post operative complication was adhesive small bowel obstruction which occurred in 4 cases (5%). The length of hospital stay was 4.5 days [3.5-5.5]. The mean follow-up was 19 months [12-26]. Among the 25 (31%) patients who had an imaging control, 5 (20%) had a 15mm [10-25] residue. All but one patient (a patient with obstruction) were asymptomatic at last clinical control.

**CONCLUSION:** This study showed that MIS for ATD is feasible and safe with a low rate of complication. However, the high rate of conversion for patients with antenatal diagnosis shows that MIS is challenging for low weight patients.

**S046 LAPAROSCOPICALLY ASSISTED ESOPHAGECTOMY AND COLONIC INTERPOSITION IN CHILDREN** Edward Esteves, MD, Humberto B. Sousa-Filho, MD, Calebe P. Sousa, MD, José F. Silva, MD, André L. Costa, MD, Eriberto Clemente-Neto, MD, Seiji Watanabe, MD, Pediatric Surgery Division, University of Goias, Goiania, Brazil

**BACKGROUND:** Esophageal replacement (ER) is a major challenge in pediatric surgery, and the colon is one of the most used substitutes, usually when the stomach is not adequate as a conduit. Conventional open surgery and blind mediastinal dissections present reasonable morbidity in ER, which can be reduced by videosurgery. Objectives: The authors present novel techniques and the preliminary results of laparoscopically assisted esophagectomies and colonic interpositions (LECIN) in children.

**PATIENTS & METHODS:** Six children aged 19 months to 4 years underwent LECIN. Indications were severe caustic or peptic esophagitis and complicated esophageal atresia. The patients were operated on laparoscopically using 3 ports, including the gastrostomy site. Transhiatal esophagectomy was carried out, followed by pyloroplasty and mobilization of the transverse colon. The stomach at the gastrostomy site was freed and closed in 4 cases. The colon was exteriorized through this 2-3cm site or through the umbilicus (2 cases) and the conduit was fashioned extracorporeally, including the colocolic and gastrocolic anastomosis. The colon was pulled up along the retromediastinal tunnel for the colo-esophageal anastomosis through a cervical incision.

**RESULTS:** Operative times ranged from 3 to 4.3 hours, there were no conversions and no complications related to laparoscopy. There were no cardiorespiratory problems and 4 were extubated immediately after operation. Feedings could be started by day 3-4. Postoperative complications occurred only in 3 patients, including cervical fistula (1), atelectasis (1), pneumonia (1) and cervical stenosis due to persistent fibrotic esophagus, requiring re-anastomosis (1). One needed dilatations for mild dysphagia. After a follow-up period of 8-34 months, all patients are asymptomatic, gaining weight and feeding well, following special recommendations.

**CONCLUSIONS:** These preliminary data suggest that LECIN is feasible and can be safely performed with very low morbidity in children, showing all advantages of minimally invasive surgery using 3 ports and favored by extracorporeal procedures to reduce operative time and contamination.

**S047 LAPAROSCOPIC CORRECTION OF GASTRO-ESOPHAGEAL REFLUX DISORDER IN CHILDREN: A SINGLE CENTRE 16 YEARS EXPERIENCE** Henri Steyaert, MD, Jerome Lauron, MD, Jean Stephane Valla, PHD MD lenval Foundation for Children

Gastro-oesophageal reflux is a common disorder (GERD). Several laparoscopic techniques have been developed for its treatment. They all have in common a complete cardial restoration. Short and midterm results are known and made from this approach a Gold Standard even for children and infants.

**PURPOSE:** To evaluate long term results after laparoscopic correction of GERD in children.

**MATERIALS & METHODS:** 108 patients (mean age at surgery 6.75 years, range 1 month/27 years) with confirmed GERD and operated for laparoscopic correction of their reflux were analysed over a 16-year period. This cohort was divided into three groups:

G1 (n=55) normal children without any previous oesophageal history  
G2 (n=45) neurologically impaired children  
G3 (n=8) children with pre-existent oesophageal abnormality.

Type of fundoplication was left to surgeon's preference. Comparison of success, conversion rate, complications and recurrences (medical or surgical) was made between the three groups.

Satisfaction rate was evaluated through a telephone survey during the year 2009.

**RESULTS:** Operation consisted in fifty-eight Nissen, 45 Toupet and 5 anterior valves. Average follow-up for G1 was 8 years, 6 years for G2 and 5.5 years for G3. Four cases (3%) were converted. Six patients (5.5%) developed a Dumping syndrome: five in G1 and one in G2. Twelve patients (11%) presented with dysphagia: nine in G1, two in G2 and one in G3. 4.5% of them needed endoscopic dilatation. Eight children (7%) presented a recurrence. Four (3.5%) still have medical treatment (three in G1, one in G3). Four (3.5%) underwent a laparoscopic redo (one in G2, three in G3). 13% of the patients died during follow up (13 in G2, 1 in G3). Only one death (in G2) due to pulmonary complications was related to surgery.

Patients or their family were asked during the last year about their quality of life (on a 1 to 10 scale) and the persistence of symptoms. The satisfaction rate was 8.7/10 (range 3-10) with a participation rate of 94% of survivors.

**CONCLUSIONS:** Our long-term results show that the laparoscopic approach of GERD is good even at long term and very positively seen by children and or family. Among neurologically impaired children, our complications rate was lower than that of open surgery series and most of laparoscopic ones. Reasons may be the better operative position in mostly scoliotic patients and a decrease in postoperative pulmonary complications.

**S048 NATIONAL VARIATION IN THE UTILIZATION OF LAPAROSCOPIC ANTIREFLUX SURGERY AT US CHILDREN'S HOSPITALS** John A. Sandoval, MD, David A. Partrick, MD, Elaine H. Morrato, DrPh, MPH, David Fox, MD, Daksha Ranade, MPH, Allison Kempe, MD, MPH, Moritz M. Ziegler, MD, Departments of Pediatric Surgery and Pediatrics, The Children's Hospital, University of Colorado

**PURPOSE:** Cost and quality/safety are surrogate measures for optimal operative outcomes. The preferred approach for the common childhood antireflux procedure, open or laparoscopic,

requires definition. We report a national population-based study describing utilization of laparoscopic antireflux surgical procedures in children's hospitals comparing short-term morbidity outcomes versus open approaches.

**METHODS:** A retrospective cohort study of children whose primary procedure was antireflux surgery was done using data from 33 children's hospitals in the Pediatric Health Information System (PHIS) from 2005-2006 (N = 3,173). Open versus laparoscopic techniques and infectious and surgical complications were identified using ICD-9 procedure and diagnosis codes. Length of stay (LOS) was compared using the kruskal wallis test. Factors associated with laparoscopic surgery and infectious or surgical complications were identified using logistic regression models adjusting for sex, age, primary diagnosis, concurrent gastrostomy, mortality risk, and hospital case volume.

**RESULTS:** Laparoscopic cases represented 50.8% of antireflux procedures. Laparoscopic utilization varied widely between hospitals (8.5% to 86.4% of antireflux surgeries). Compared to infants, neonates were less likely (Odds Ratio=0.47) and children 1-5 yr and 6-12 yrs were more likely (Odds Ratio=1.35 and 1.7 respectively) to have a laparoscopic procedure. Hospital case volume was not associated with likelihood of laparoscopic surgery. LOS was significantly longer for children with open procedures (TABLE). Children undergoing laparoscopic procedures were less likely to have an infectious (Odds Ratio=0.61) or surgical complication (Odds Ratio = 0.49) compared to children with open procedures.

TABLE: Age-specific length of stay

**Laparoscopic/Open**

Age at admission	N	Mean Length of Stay (SD)	N	Mean Length of Stay (SD)	P-value
All ages	1613	11 (20)	1560	24 (49)	<0.0001
Neonate (<30days)	55	55 (48)	172	66 (78)	0.36
Infant (30d-1yr)	503	16 (23)	592	28 (56)	<0.0001
Early child (1-5yrs)	586	8 (12)	490	13 (24)	<0.0001
Late child (6-12yrs)	317	6 (10)	200	12 (18)	<0.0001
Adolescent (≥13yrs)	152	6 (8)	106	11 (14)	<0.0001

**CONCLUSIONS:** Laparoscopic antireflux surgery in children is associated with lower morbidity, shorter length of stay, and potentially, decreased cost of care. Recognizing these advantages, the wide variation in the adoption of laparoscopic techniques in U.S. children's hospitals warrants further analysis.

**S049 TRANSUMBILICAL LAPAROSCOPICALLY ASSISTED APPENDECTOMY: AN ALTERNATIVE MINIMALLY INVASIVE TECHNIQUE IN PEDIATRIC PATIENTS** Amy B. Stanfill, MD, Danielle K. Matilsky, Kavitha Kalvakuri, MD, Richard H. Pearl, MD, Elizabeth J. Wallace, MS RN, Ravindra K. Vegunta, MD, Children's Hospital of Illinois, University of Illinois College of Medicine at Peoria

**INTRODUCTION:** Transumbilical laparoscopically assisted appendectomy (TULAA) has been reported in the literature as an alternative to traditional three-port laparoscopic appendectomy (LA). Our study compares outcomes between the traditional laparoscopic technique and the one-trocar transumbilical technique in a single institution over a concurrent time frame for all cases of pediatric appendicitis.

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**METHODS:** An IRB approved, retrospective chart review of all appendectomies for appendicitis from July 2007 through June 2009 was performed. The diagnosis of appendicitis was made clinically or suggested by imaging results. All operations were performed by a pediatric surgeon, usually assisted by a general surgery resident. All appendectomies were performed either laparoscopically or transumbilically. One surgeon predominantly used the TULAA method, while the other two surgeons used strictly the traditional LA method. No cases were converted to open and for this study, "conversion" refers to conversion from TULAA to traditional LA. Categorization of specimens as normal, acute or ruptured was based on pathology reports. Outcomes analyzed for each group included surgical duration, cost, length of stay (LOS), fever ( $>101.5$  F), wound infection, ileus and post-operative abdominal-pelvic abscess (APA).

**RESULTS:** A total of 131 appendectomies were performed by three surgeons, 83 were LA and 48 were TULAA. For all stages of appendicitis, outcomes differed significantly only for LOS and operating room (OR) cost. When analyzing all stages of appendicitis, TULAA mean LOS was  $2.66 \pm 3.97$  days versus  $1.51 \pm 2.18$  days in the LA group ( $p < 0.05$ ). Median LOS for both TULAA and LA normal appendices was 1 day; for acute appendices TULAA median LOS was 1 day and LA was 0.6 days; for perforated appendices TULAA median LOS was 5 days, and for LA was 2.24 days. OR cost for the TULAA group was  $\$1640.53 \pm \$658.87$  versus  $\$2061.90 \pm \$574.17$  in the LA group ( $p < 0.05$ ). All other analyzed outcomes were not statistically significant between the LA and TULAA groups. See table for complete details.

**CONCLUSION:** Our study suggests that TULAA is a reasonable alternative to the standard minimally invasive technique for appendicitis in both acute and ruptured situations. All analyzed complications were similar between the groups, suggesting that TULAA is an acceptable surgical method in pediatric patients for all stages of appendicitis.

Stage of Appendicitis	Normal	Normal	Acute	Acute	Perforated	Perforated
	LA (n=12)	TULAA (n=13)	LA (n=57)	TULAA (n=24)	LA (n=14)	TULAA (n=11)
Total Complications	0	2 (15.4%)	4 (7%)	3 (12.5%)	7 (50%)	2 (18.2%)
Fever ( $>101.5$ F)	0	1 (7.7%)	1 (1.8%)	1 (4.2%)	1 (7.1%)	1 (9.1%)
Ileus	0	0	1 (1.8%)	0	2 (14.3%)	1 (9.1%)
Wound Infection	0	1 (7.7%)	0	0	1 (7.1%)	0
Abscess (APA)	0	0	1 (1.8%)	2 (8.3%)	3 (21.4%)	1 (9.1%)
Median LOS (in days)	1	1	0.6	1	2.24	5

**S050 LAPAROSCOPIC-ASSISTED SINGLE-PORT APPENDECTOMY IN CHILDREN: IS THE POSTOPERATIVE INFECTIOUS COMPLICATION RATE DIFFERENT?** Sergio B. Sesia, MD, Rainer Kubiak, MD, Johannes Mayr, PhD Universitäts-Kinderspital beider Basel, Switzerland

**AIMS:** Benefits of laparoscopic-assisted single-port appendectomy (SPA) include less postoperative pain, earlier mobilization, less requirement of analgesics, and minimal scarring. However there is debate whether the limited working domain and the retrieval of the

infected appendix via the umbilicus results in a higher infection rate compared with other laparoscopic or open techniques. The aim of the study is to determine the postoperative infection rate and possible predictive factors leading towards infection after SPA in children.

**METHODS:** For this retrospective study case notes of all children ( $n=285$ ) who underwent appendectomy between September 2006-August 2009 were reviewed. According to our protocol all patients with a clinical diagnosis of appendicitis had a pre-operative abdominal ultrasonography (US). Those children, in which the US revealed suspected perforation were excluded from SPA and subsequently underwent open surgery. SPA was performed using a 12-mm trocar with one 5-mm working channel, introduced through a subumbilical incision. After grasping the appendix with a forceps, it was exteriorised through the umbilicus and dissected outside the abdominal cavity as in open surgery. Pre-operatively each patient received one dose of Metronidazole and Cefuroxime and the umbilicus was cleaned in particular.

**RESULTS:** From 285 children, 265 underwent SPA. There were 143 boys (54 %) and 122 girls (46 %). Median age at operation was 11.8 years (range, 2-15). Three children (1.1 %) developed omphalitis within 14 days postoperatively that was treated successfully with a course of antibiotics. Noteworthy all of them had an increased body mass index. There was no postoperative intra-abdominal abscess formation requiring prolonged antibiotics or revisional surgery. The median length of antibiotics was 3 days (range, 1-10). There was no death related to surgery in this series.

**CONCLUSION:** In our institution, SPA is the method of choice for appendectomy in children with acute appendicitis, in which preoperative US does not reveal signs for perforation. The infection rate following SPA is not increased compared with other laparoscopic or open techniques. Obese children may be at an increased risk of developing wound infection following SPA and require in particular close postoperative monitoring.

**S051 CAN WE IMPROVE OUTCOMES OF LAPAROSCOPIC SURGERY FOR BILIARY ATRESIA?** Nguyen Thanh Liem, PhD, Tran Ngoc Son, PhD, Tran Anh Quynh, MD, Nguyen Pham Anh Hoa, MD National Hospital of Pediatrics

**AIM:** To present outcomes of the laparoscopic technique for biliary atresia with some important modifications.

**MATERIALS & METHODS:** We reviewed charts of all patients with biliary atresia who underwent laparoscopic portoenterostomy from July to December 2008. The operation was carried out using 4 trocars. The liver was elevated by two transcutaneous stay sutures: one on the round ligament and the other on the gallbladder. The left and right hepatic arteries and portal veins were dissected and retracted laterally by two transcutaneous sutures to expose the liver hilum. A stay suture was placed on fibrotic tissue at the liver hilum to facilitate its removal. A jejunal end-to-side anastomosis was constructed extra-abdominally. Portoenterostomy was carried out laparoscopically.

**RESULTS:** 11 patients with biliary atresia were operated on by the described technique. Mean operative time was 245 minutes. No patient required conversion. There were no operative deaths. Blood loss during operation was minimal. Follow-up from 1-6 months after discharge revealed that 8 patients had colored stools regularly. Three patients had colored stools intermittently. One patient died due to intractable hepatic failure due to associated CMV infection and citrin deficiency.

**CONCLUSION:** Outcomes of laparoscopic operation for biliary atresia can be improved with modified laparoscopic operations.

## **S052 COMPARISON OF LAPAROSCOPIC VERSUS OPEN MORGAGNI HERNIA REPAIR IN CHILDREN**

Carrie A. Laituri, MD, Carissa L. Garey, MD, Daniel J. Ostlie, MD, George W. Holcomb III, MD, Shawn St. Peter, MD The Children's Mercy Hospital, Kansas City, Missouri

**INTRODUCTION:** Morgagni hernias are anteromedial diaphragmatic defects, which are typically simple to repair. As opposed to posterolateral defects which are very difficult to expose laparoscopically, the anterior defects can be easily seen with this approach. We reviewed our experience with laparoscopic and open repair of Morgagni hernias in children and their associated outcomes.

**METHODS:** After obtaining IRB approval, a retrospective review was conducted on all patients who underwent repair of Morgagni hernia from January, 1994 to May, 2009. Data recorded included demographics, presentation at time of diagnosis, operative findings, type and method of closure, length of stay, time until reaching goal feeds, recurrences, complications, and follow-up.

**RESULTS:** There were 17 patients identified, of which, 10 underwent laparoscopic repair and 7 patients underwent an open repair.

The mean age at operation was 3 years (newborn - 14 years) with a mean weight of 20.7kg (3.6kg - 87.6kg). Intraoperatively, the size of diaphragmatic defect in maximal dimension ranged from 3cm to 11cm and two patients had bilateral defects (16.7%). There was no difference in the average age, weight, and defect size among both groups.

Of those that underwent laparoscopic hernia repair, 50% (5 patients) were closed with a SIS patch, 3 were closed primarily with interrupted sutures, and 2 were closed with transabdominal sutures. In the open group, 2 were closed primarily, 4 patients had transabdominal sutures placed, while only 1 had SIS patch for closure. Two patients in the open group were conversion from laparoscopy to an open procedure.

Mean time to goal feeds was  $1.1 \pm 0.3$  days in the laparoscopic group and  $3.6 \pm 2.1$  days in the open group ( $p < 0.01$ ). Mean length of stay was  $12.9 \pm 19.4$  days in the open group compared to  $2.1 \pm 2.5$  days in the laparoscopic group ( $p = 0.1$ ).

There were no intraoperative complications and no recurrences. Post-operatively, 1 patient in the laparoscopic group with a patch developed a bowel obstruction, and 1 patient in the open procedure developed a ventral hernia.

**CONCLUSIONS.** Laparoscopic repair of Morgagni hernias is a relatively simple and effective method of repair in children with the associated advantages of minimally invasive surgery.

## **S053 PERORAL ESOPHAGEAL SEGMENTECTOMY AND ANASTOMOSIS WITH SINGLE TRANSTHORACIC TROCAR ASSISTANCE: A STEP FORWARD IN THORACIC N.O.T.E.S.**

Carla Rolanda, MD, PhD, David Silva, MD, Cláudio Branco, MD, Jorge Correia-Pinto, MD, PhD, Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho

**BACKGROUND:** Transesophageal NOTES (Natural Orifice Transluminal Endoscopic Surgery) approach has been proposed for thoracic and mediastinal access. Similarly to transgastric surgery, serious limitations remain related with esophagotomy creation and safety closure. Hybrid approach in thoracic NOTES could work as an intermediate step before pure transesophageal NOTES.

**OBJECTIVES:** To assess the benefit of hybrid thoracic NOTES performing a complete peroral esophageal anastomosis, after segmental esophagectomy with assistance of a single transthoracic port.

**METHODS:** Two protocols were carried out to perform esophago-esophageal anastomosis: i) ex-vivo using a phantom model (5 porcine esophagus); ii) in-vivo after esophageal mobilization, and segmental esophagectomy (5 anesthetized pigs). A forward viewing double-channel endoscope and a transthoracic telescope with working-channel were coordinated in order to create a complete, single-layer and end-to-end esophageal anastomosis ex-vivo as well as in-vivo after mobilization and segmental resection of esophagus (4cm). Assessment of feasibility and anastomosis quality by inside and outside: patency, incorporation of mucosa in all stitches and leak tests.

**RESULTS:** Anastomosis was always achieved in both protocols. All anastomosis were patent allowing distal passage of the endoscope with mucosa incorporation. In in-vivo experiments leak was detected in three animals that were corrected with additional stitching.

**CONCLUSIONS:** Peroral esophageal anastomosis with single transthoracic trocar assistance is feasible, which represents a step forward in thoracic NOTES.

## **S054 POST OPERATIVE PATIENT SATISFACTION WITH SINGLE SITE SURGERY**

Todd Ponsky, MD, Yagnik K. Pandya, MD, Scott Boulanger, MD, Jennifer Diluciano, RN, Andrew Ibrahim Rainbow Babies and Children's Hospital, Case Medical Center, Cleveland, OH

**BACKGROUND:** Surgical practice has increasingly evolved to use less invasive operative techniques. While traditional laparoscopic procedures continue to be increasingly popular, more recent advances in technique allow entire operations to be completed through a single incision, laparoscopically. To date, however, there is no literature exploring patient's post-operative feedback about the potential value and drawbacks of single incision laparoscopic surgery. In this study we looked at patient's satisfaction related to their scar after single incision surgery.

**METHODS:** We retrospectively identified 120 pediatric surgical cases of patients undergoing single incision laparoscopic surgery as well as those undergoing similar operations through conventional laparoscopic surgery. After discharge from the hospital, each patient was mailed a survey asking questions about their post-operative scar pain, cosmetic appearance, and satisfaction with the appearance of their scar. These surveys were then collected and analyzed.

**RESULTS:** Of the [120] patients contacted, [70] were from single site surgery cases, while the other [50] were from conventional laparoscopic cases. Based on our preliminary data we hypothesize that post operative patient satisfaction with respect to scar appearance, post operative scar pain, and overall satisfaction with the scar, single incision laparoscopic surgery was similar or better when compared to similar traditional laparoscopic procedures.

**CONCLUSION:** Single site laparoscopic surgery, a novel advance in surgical technique appears to have similar to better results on patient's post-operative scar satisfaction when compared to traditional laparoscopic surgery. There is need in the future for a larger prospective study to further gain more insight about patient's satisfaction toward this new form of surgical intervention.

## **S055 APPENDECTOMY USING SINGLE-INCISION PEDIATRIC ENDOSURGERY (SIPES) FOR ACUTE AND PERFORATED APPENDICITIS**

Oliver J. Muensterer, MD, PhD, Cecilia Puga Nougues, MD, Obinna O. Adibe, MD, Keith E. Georgeson, MD, Carrol M. Harmon, MD, PhD Children's Hospital of Alabama, University of Alabama at Birmingham

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**BACKGROUND:** Single-incision pediatric endosurgical (SIPES) appendectomy has been reported in few pediatric surgical centers. Over the last half year, we have offered the technique to all patients in whom appendectomy was indicated.

**PURPOSE:** To report our experience with SIPES appendectomy for acute appendicitis, perforated appendicitis, and interval appendectomy, and to compare the results with those from patients who underwent conventional laparoscopic appendectomy the previous year.

**METHODS:** After IRB approval, data on all SIPES appendectomies performed in our hospital were prospectively collected, including operative time, intra- and postoperative complications, conversion rate, blood loss, and hospitalization time. Cases were stratified into 3 categories: acute appendicitis, perforated appendicitis, and interval appendectomy. They were compared to patients operated in 2007 in the conventional laparoscopic era.

**RESULTS:** During the study period, 77 SIPES appendectomies were performed. Mean age was 11 years (2 to 19 years), mean weight 45 kg (12 to 132 kg). All SIPES appendectomies were completed laparoscopically, and additional trocars were placed in 20% of cases. Interval appendectomies took longest and had the highest conversion rate (table). Follow-up data was available in 63 patients (82%) at a median of 3 weeks. There were 3 wound infections. Compared historic controls, operative time was lower with SIPES compared to conventional laparoscopy for acute appendicitis (37 +/- 12.3 versus 44.1 +/- 20.3 min,  $p=0.01$ , 95%CI 24.8 to 35.2 min).

	Acute	Perforated	Interval
N	50	16	9
OP time (min)	37 +/- 12	44 +/- 14	50 +/- 18
Conversion to lap	8 (16%)	4 (25%)	(33%)
Complications (intra)	3	1	0
Complications (post)	3	3	1
Hospitalization (days)	1.1 +/- 0.6	3.7 +/- 3.2	1.3 +/- 0.7

**CONCLUSION:** SIPES appendectomy is an alternative to the conventional laparoscopic approach, especially for acute appendicitis. It is technically more challenging for perforated appendicitis and interval appendectomies.

**S056 EXPERIENCE WITH MODIFIED SINGLE-PORT ACCESS TRANSUMBILICAL LAPAROSCOPIC SURGERY IN PEDIATRIC POPULATION** Soo Min Ahn, Division of Pediatric Surgery, Hallym University Sacred Heart Hospital

**PURPOSE:** The aim of this study was to evaluate the safety and feasibility of single-port laparoscopic surgery in pediatric population using a modified transumbilical access port in combination with adjustable instruments.

**METHOD:** Between October 2008 and July 2009, a total of 47 patients were selected and underwent single port access laparoscopic surgery. We set up a transumbilical single-port access route using an extra-small wound retractor and a surgical glove. The wound retractor was introduced through 2.5cm sized curvilinear transumbilical incision. A small sized surgical glove was joined with the wound retractor and rolled down to be tightened on periumbilical skin. Two 5mm trocars and a 2.7mm trocar were introduced through the digits of the glove and tied together to secure the pneumoperitoneum. We performed overall procedures using a 2.7mm straight dissector and 5mm flexible laparoscopic instruments under the vision of 30x-2.7mm or 5mm scope.

The various types of surgical procedures were similar to standard laparoscopic surgery.

**RESULTS:** There were 34 appendectomies, 5 cholecystectomies, 3 Meckel's diverticulectomies, 3 Palomo's varicocelectomies, 1 splenectomy, 1 Fredet-Ramstedt pyloromyotomy performed. Twenty-one of all procedures were completed successfully without conversion to conventional laparoscopic surgery. The pyloromyotomy was converted to standard laparoscopic procedure due to difficulty in maintaining the fulcrum of instruments. The age ranges from 1 month to 16 years (33 males and 14 females). Mean operative time was 29 minutes for appendectomy, 32 minutes for diverticulectomy, 33 minutes for Palomo procedure, 80 minutes for splenectomy, and 45 minutes for pyloromyotomy. Hospital stay of each procedure was similar to that of conventional one. There was no specific intraoperative and immediate postoperative complication.

**CONCLUSION:** Modified single-port access transumbilical laparoscopic surgery is safe and feasible for pediatric surgical patients with a variety of surgical conditions. However, it is necessary to identify the indications for applying single-port surgery to various surgical conditions in pediatric population.

**S057 EARLY EXPERIENCE WITH SINGLE INCISION THOROSCOPIC SURGERY (SITS) IN THE PEDIATRIC POPULATION** Rajeev Prasad, MD, Lindsay G Arthur, MD, Shaheen J Timmapuri, MD, Marshall Z Schwartz, MD, Timothy J Fairbanks, MD, Kim G Mendelson, MD, Matthew L Moront, MD St. Christopher's Hospital for Children and Drexel University College of Medicine

**INTRODUCTION:** Traditional thoroscopic procedures utilize multiple small incisions for trocar placement. There exists a growing trend in pediatric surgery to utilize single incision surgery, particularly for abdominal operations. We have recently applied the single incision approach for thoroscopic procedures in children and adolescents to a variety of conditions to reduce the chance of port site complications, such as chronic port site pain and paresthesias, and to improve cosmesis. We present our initial experience with single incision thoroscopic surgery (SITS) in the pediatric population.

**METHODS:** A retrospective chart review of the first 10 single incision thoroscopic operations done at our institution was conducted. The diagnosis and corresponding procedure performed were noted. The patients' mean age and weight as well as the median operative time, postoperative length of stay, and time until discontinuation of chest tubes were determined. Any complication was noted.

**RESULTS:** The 10 procedures were performed in 8 patients (2 patients each had bilateral procedures done under different anesthetics). All of the procedures were completed without intraoperative complication or significant blood loss. All operations were done under general double-lumen endotracheal tube anesthesia through a single incision 3.5cm or less. In each case, multiple trocars and/or unsheathed instruments were passed through the single small incision, which was subsequently used for the chest tube(s) at the conclusion of the procedure. The procedures performed included wedge resection and mechanical pleurodesis for spontaneous pneumothorax (n=7), wedge biopsies for lymphoma (n=1) and chronic granulomatous disease/aspergillosis (n=1), and resection of an apical extrapulmonary neuroblastoma (n=1). The mean patient age was 13.5 years (range 3 to 18 years), and the mean patient weight was 47 kilograms (range 16-63 kilograms). The median operative time was 64 minutes (range 50-201 minutes). The median postoperative length of stay was 7 days (range 3-19 days), and the median time until chest tube removal was 3 days (range 2-15 days). The mean follow up

was 7 months (range 3-12 months). One postoperative complication occurred. This patient developed a recurrent pneumothorax and persistent air leak after having undergone a wedge resection and pleurodesis for a spontaneous pneumothorax. The patient required a reoperation and subsequently did well.

**CONCLUSION:** Single incision surgery in children is gaining in popularity. In this review of our initial experience with SITS, we found that the patient age and weight range was broad, indicating that this is a feasible technique in both children and adolescents. Operative times, postoperative length of stay, and time to chest tube removal appeared to be comparable to multiple port thoracoscopy. Furthermore, the in-line positioning of the telescope and instruments (e.g. a grasper and/or stapler) often proved to be an advantage rather than a hindrance, particularly for pulmonary wedge resections. We believe that SITS can be performed with comparable safety and efficacy as compared to traditional multiport thoracoscopy in the pediatric population.

**S058 “THE MAGNETS REVOLUTIONS” THE ULTIMATE SOLUTION FOR TRACTION AND VISUALIZATION IN SILS**  
Marcelo Martínez-Ferro, MD, Guillermo Dominguez, MD, Carolina Millan, MD Fundacion Hospitalaria Children’s Hospital

**PURPOSE:** Although Single-incision laparoscopic surgery (SILS) is gaining popularity in pediatric surgery, the technique is constrained due to limitations in dexterity, instrument insertion, visualization, and retraction. The authors demonstrate an original and innovative technique using internal and external magnets that allow very efficient multiaxial traction/countertraction, mobilization and separation, required in a wide variety of SILS procedures. This is the first report of Magnet-Assisted SILS in children.

**METHODS:** One or two internal magnet forceps (IMANLAP®-Dominguez) are passed under visual control through the umbilical access port. Each internal magnetic device (10–11 mm in diameter) is made of a surgical steel tube packed with neodymium magnets inside, attached with a flexible band to an alligator type grasper. These magnetic instruments are handled by a specially designed non-magnetic forceps. The forceps is passed through the working channel and allows the positioning of each grasper in the tissue or organ chosen by the surgeon. A specially designed external magnet is placed adjacent to the abdominal wall and used to attract the internal magnet forceps into the desired position in order to provide an optimal surgical visualization. Once the surgical field is exposed, each 5-mm diameter instrument (dissection forceps, scissors, hook, harmonic scalpel, clips, suction probe, needle handle, etc.) can be passed through the working channel to complete the surgical procedure with a similar triangulation and exposition achieved during a classical multi-port laparoscopy.

**RESULTS:** 12 procedures were performed and included: Appendectomies, cholecystectomies, combined splenectomy/cholecystectomies and Ooforectomies. This technique was also used to reduce the number of trocars when performing laparoscopic Nissen funduplications with and without gastrostomy. All SILS procedures were completed successfully without need of conversion to standard laparoscopy or open surgery. No complications were observed with the use of this technology.

**CONCLUSIONS:** The possibility of retraction and triangulation from different angles, as if there were multiple access ports with opposite directions, is the principal achievement of this new technique with magnetic forceps and retractors. In addition, the magnetic forceps can be moved from the upper abdomen to the pelvis with no need for a new incision, therefore, the necessity of retraction and triangulation is not

limited by an access port fixed to the abdominal wall. This relatively small experience with retraction and triangulation with forceps controlled by magnetic fields, used on patients for “super minimally invasive surgery,” appears to show feasibility and safety. Further clinical experience is needed in order to understand the exact role of this technology in pediatric MIS.

**S059 SINGLE-INCISION PEDIATRIC ENDOSURGICAL (SIPES) VERSUS CONVENTIONAL LAPAROSCOPIC PYLOROMYOTOMY: A SINGLE-SURGEON EXPERIENCE** Oliver J Muensterer, MD, PhD, Children’s Hospital of Alabama, University of Alabama at Birmingham

**BACKGROUND:** Pyloromyotomy by single incision pediatric endosurgery (SIPES) is a new technique that leaves virtually no appreciable scar. Whether improved cosmesis warrants giving up the advantages of conventional laparoscopic instrument triangulation during the procedure has not been evaluated.

**PURPOSE:** To compare the results of the first 15 SIPES pyloromyotomies of a single surgeon to those of the surgeon’s last 15 conventional laparoscopic cases.

**METHODS:** After IRB approval, data was prospectively collected on all SIPES pyloromyotomies. Age, gender, operative time, estimated blood loss, conversion and complication rate, as well as outcome in the SIPES patients was compared to the conventional laparoscopic cohort. Continuous variables were analyzed by Student’s t-test.

**RESULTS:** There was no significant difference between the groups in age, weight, gender, blood loss, or length of stay. A trend towards shorter operating time was found in the conventional laparoscopic group (21.7 +/-9.9 versus 30.3 +/- 15.8 min, p=0.08, 95%CI 20.9 to 39.7 min). Two mucosal perforations occurred in the SIPES cohort. Both cases were converted to conventional laparoscopy, the defect was repaired with intracorporeal sutures, and they were kept NPO overnight. On postoperative day 1, a contrast study was performed to rule out leak, they were advanced to full feeds and discharged home. There were no wound infections or conversions to open surgery in either group. One patient was readmitted with persistent vomiting after conventional laparoscopy, but eventually discharged home on medication for gastroesophageal reflux. Parents were uniformly pleased with the cosmetic results of SIPES.

**Conclusion:** SIPES pyloromyotomy may have a higher perforation rate than the conventional laparoscopic approach. A high index of suspicion for this problem is warranted. If recognized, a laparoscopic repair can be performed. Improved cosmesis must be carefully weighed against the potentially increased risks of SIPES versus conventional laparoscopic pyloromyotomy when discussing the operative approach with the parents.

**S060 PROSPECTIVE RANDOMIZED CASE CONTROL STUDY OF OPEN VERSUS LAPAROSCOPIC PYELOPLASTY IN CHILDREN**  
Lisandro A. Piaggio, MD, Juan P. Corbetta, MD, Victor Duran, MD, Juan C. Lopez, MD, Santiago Hueler, MD, Ricardo Dingevan Hospital Nacional de Pediatría JP Garrahan, Hospital Interzonal G.A Dr. José Penna. Hospital Italiano Regional del Sur. Clínica Raúl Mattered

**INTRODUCTION:** reports comparing open pyeloplasty (OP) versus laparoscopic pyeloplasty (LP) favor LP in decreasing length of hospitalization and analgesic requirement. These few retrospective studies make little evidence of the benefits of LP. We compare LP versus OP for primary repair of ureteropelvic junction obstruction (UPJO) in children in a multicenter, prospective, randomized, case control study.

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**MATERIAL & METHODS:** IRB was obtained from all participating institutions. From May 2007 to March 2009, in a high volume pediatric hospital LP was randomly offered in the clinic as the patients were diagnosed with UPJO. If accepted to participate in the study they were scheduled for LP once a month when a teaching surgeon performed the case. The following patient diagnoses with UPJO was operated with OP and used as case control. In three other community hospitals patients were only offered LP. Demographic data, surgical time, perioperative complications, analgesia requirement, analgesia score during hospitalization, length of hospitalization and outcome were recorded. Exclusion criteria were solitary kidney, associated kidney stones or comorbidities. LP was performed transperitoneally with three ports. Kidney was access through a flank incision in OP. In all cases a double J ureteral stent, Foley catheter and perinephric drain were placed during the procedure and a dismembered pyeloplasty performed with a 5 or 6 monofilament running suture. Pain control was performed by trained pediatric nurses using international standards with NSAID and narcotics. Parents were asked to assessed pain in their children every 4 hours postoperatively and to complete a pain scale chart to which the nurses were blinded.

**RESULTS:** There were 36 patients, 15 OP, 21 LP (15 included in the study). Groups were similar with regard to sex, age, weight and laterality. Mean surgical time was longer in LP than OP group (mean 188 vs 65 minutes) ( $p < .01$ ). There was a trend towards shorter hospitalization for LP groups (mean 1.9 vs 2.5 days) ( $> .05$ ). Postoperative analgesia requirement was significantly higher in the OP group with a mean use of morphine of 1.7 mg/kg vs 0.06 mg/kg in the LP group ( $p < .05$ ). Pain scores were similar in both groups. There were 4 complications in the LP and 3 in OP group. There was no need for transfusions in any group. At a mean follow up of 16 months there were no failures.

**CONCLUSIONS:** in this prospective comparative cohort, LP was a longer procedure than OP. Both procedures had the same efficacy and complication rate, but patients undergoing LP needed fewer narcotics for pain control and had a trend towards shorter hospitalization.

**S061 LAPAROSCOPIC PYELOPLASTY FOR URETEROPELVIC JUNCTION OBSTRUCTION IN CHILDREN** Danielle D. Sweeney, MD, Steven G. Docimo, MD, Francis X. Schneck, MD, University of Pittsburgh Medical Center, Department of Pediatric Urology, Children's Hospital of Pittsburgh

**PURPOSE:** To examine our experience of laparoscopic pyeloplasty for the treatment of ureteropelvic junction obstruction (UPJO) in the pediatric population.

**METHODS:** From November 2001 to June 2009, 112 patients underwent transperitoneal laparoscopic pyeloplasty for the treatment of symptomatic or radiographic UPJO. Data was collected retrospectively. Patients were followed at regular intervals with imaging and symptom assessment. Failure was defined as inability to complete the intended procedure, persistent flank pain, radiographic evidence of obstruction, or the need for definitive adjunctive procedures.

**RESULTS:** Mean patient age was 9.4 years (0.2 -20.5 years), and follow-up was available on all 112 patients with a mean duration of 15.3 months (0.6- 84.5 months). Procedures performed included 99 laparoscopic Anderson-Hynes pyeloplasties, 4 laparoscopic Heineke-Mikulicz pyeloplasties, 3 laparoscopic Anderson-Hynes pyeloplasties with concomitant ureteroscopy, 1 laparoscopic pyeloureterostomy, 1 laparoscopic lower-pole dismembered pyeloplasty, 1 laparoscopic Heineke-Mikulicz with concomitant vesselpexy, 1 laparoscopic Anderson-Hynes pyeloplasty with concomitant appendectomy and 1

laparoscopic Anderson-Hynes pyeloplasty with concomitant vesselpexy. There was one open conversion in the series, for an open conversion rate of 0.8%. Total laparoscopic operative time was 254 minutes (102-525 minutes). Eighteen patients had either a pre-operative stent or nephrostomy tube, and 1 patient had a previous laparoscopic pyeloplasty. A crossing vessel was present in 52 (46%) patients. Mean length of stay was 1.3 days (1-5 days). There was one intraoperative complication reported (0.8%), which resolved with out any long term sequele. There were 12 (10.8 %) post-operative complications; most were relatively minor with complete resolution without long-term sequele. Post-operative ultrasound has been performed in 102 patients, with 99 (97%) patients demonstrating improvement of the UPJO. Three patients (3%) continued to have symptomatic and/or radiographic evidence of obstruction which necessitated the need for adjunctive procedures, which included laser endopyelotomy in 2 patients, and a re-do open pyeloplasty in one patient. Of those cases that were completed laparoscopically, the overall success rate was 97.2%.

**CONCLUSIONS:** Laparoscopic pyeloplasty for UPJO in the pediatric population is technically challenging, however, with experience, one can expect excellent success rates comparable to the open pyeloplasty, with minor complications with reasonable operative times.

**S062 EARLY EXPERIENCE WITH INFANT LAPAROSCOPIC PYELOPLASTY FOR URETEROPELVIC JUNCTION OBSTRUCTION** Danielle D. Sweeney, MD, Regina D. Norris, MD, Gaayana A. Raju, MD, Steven G. Docimo, MD, Francis X. Schneck, MD, University of Pittsburgh Medical Center, Children's Hospital of Pittsburgh

**PURPOSE:** To examine the early experience of infant laparoscopic pyeloplasty for the treatment of ureteropelvic junction obstruction (UPJO).

**METHODS:** From July 2004 to August 2009, 15 patients under 18 months of age, underwent transperitoneal laparoscopic pyeloplasty for the treatment of UPJO. Data was collected retrospectively. Patients were followed at regular intervals with imaging and symptom assessment. Failure was defined as inability to complete the intended procedure, flank pain, radiographic evidence of obstruction, or the need for adjunctive procedures.

**RESULTS:** Mean patient age was 8.4 months (2.9 -17.1 months). The diagnosis of UPJO was made prenatally in 13 (86%) patients. The remaining 2 (14%) patients presented with a urinary tract infection. Follow-up was available on 15 patients with a mean duration of 13.0 months (1-38.5 months). Procedures performed included 15 laparoscopic Anderson-Hynes pyeloplasties. All 15 cases were completed, and three ports were used in all cases. Mean laparoscopic time was 203 minutes (142 - 267 minutes). All of the patients had intrinsic and/or congenital obstruction of the ureter. Mean length of stay was 1.1 days (range 1-2), and no intraoperative complications were reported. There were 2 (13%) post-operative complications; 1 patient was treated with oral antibiotics for a UTI in the outpatient setting, and 1 patient was readmitted with pyelonephritis. Post-operative ultrasound has been performed in 13 patients, and all 13 (100%) demonstrated improvement of the UPJO.

**CONCLUSIONS:** Laparoscopic pyeloplasty for UPJO in the infant population is technically challenging, however, with experience, excellent success rates with few complications and reasonable operative times can be expected. Success rates in this age group are comparable with the open dismembered pyeloplasty. Based on our early experience, age should not deter one from performing a laparoscopic pyeloplasty.

**S063 THE ROLE OF LAPAROSCOPIC EXTRAVESICAL TRANSPERITONEAL APPROACH IN REFLUXING DUPLICATED COLLECTING SYSTEMS** Manuel Lopez, MD, Michel François, MD, Carlos Melo, MD, François Varlet, MD, PhD Department of Pediatric Surgery, University Hospital of Saint Etienne-France

**INTRODUCTION:** The need for surgical correction of Vesico-Ureteral Reflux (VUR) is increased in duplicated systems. We report our initial experience in the treatment of V.U.R in children with complete double system, by laparoscopic extravesical transperitoneal approach (L.E.T.A) to describe the evolution and to evaluate the outcome and benefits of this technique.

**MATERIALS & METHODS:** Between August 2007 and October 2009, 44 renal units in 31 children with V.U.R and deterioration of renal function on isotope renography were treated with L.E.T.A (Lich-Gregoir technique). Ten patients of them had a double total collector system associated with reflux in a lower system (4 bilateral and 6 unilateral VUR) and were 8 females and 2 males. Reflux was classified by using the international classification as grades I to V. Preoperative V.U.R. grade were: 5 renal units had a grade III, 4 grade IV and 1 grade V. The mean age was 62 months (range 15-80). Principal diagnoses associated with the complete duplex system were: Two intravesical ureterocele and another with dilated upper urinary tract and complete deterioration of upper polar rein function. Indications for surgery were febrile breakthrough UTI and deterioration of renal function.

**RESULTS:** The mean surgical time was 70 minutes (38-120) in unilateral and 124 min (100-180) in bilateral V.U.R. All procedures were successfully completed laparoscopically and the reflux was corrected in all patients, at the same time, 1 right upper hemi-nephrectomy and 2 ureterocele were removed by laparoscopy and endoscopy. The mean hospital stay was 24 hours. A cystogram and bladder-renal ultrasonographic was performed systematically at one month and one month and six months in post-operative respectively. None of them presented recurrence of VUR, ureterocele or hydronephrosis persisted.. The mean split function remain stable. The follow-up was 11 months (ranging 6-22 months), without recurrence of RVU.

**CONCLUSION:** L.E.T.A following the Lich Gregoir technique in the treatment of V.U.R. in patients with double collector system is a safe and effective approach, with success rates similar to the open technique, and a dramatic reduction in postoperative stay. One stage laparoscopic hemi-nephrectomy or excision of ureterocele and ureteric reimplantation can be safely and effectively.

**S064 VESICOSCOPIC CROSS-TRIGONAL URETERAL REIMPLANTATION FOR VESICoureterAL REFLUX IN CHILDREN: PRELIMINARY RESULTS OF A SINGLE-CENTER 3-YEARS EXPERIENCE** Monika Glass, MD, Beatrice Ferdilus, MD, Emanuel Alexe, MD, Cindy Gomes, MD, Paul G. Philippe, MD, Chirurgie Pédiatrique, Centre Hospitalier de Luxembourg, 1210 Luxembourg

**PURPOSE:** To evaluate our results with a novel technique of endoscopic intravesical ureteral cross-trigonal ureteral reimplantation under pneumovesicum for vesicoureteral reflux in infants and children.

**PATIENTS & METHODS:** Twenty children (7 boys and 13 girls) with primary dilating VUR associated with recurrent urinary-tract infections underwent endoscopic cross-trigonal ureteral reimplantation under CO2 pneumovesicum. Pathology distribution: 9 bilateral VUR with 29 refluxing ureters, 2 with ureterocele, 5 double systems (1 after failed Deflux-injection), 1 Hutch diverticulum, 1 persisting reflux in an ectopic ureter after Lich-Gregoir correction. Their ages ranged

from 6 months to 7 years (median 3 years). Access to the bladder was obtained by placing a 3.5 mm trocar in the dome, either by open access or by a Seldinger-type technique under cystoscopic view. With the bladder insufflated with CO2 to 10 mmHg pressure, a 3.3 mm, 0° telescope was used. Two more 3 mm working ports were inserted over a guide wire and a 10 Fr dilator on either side at the lateral bladder wall after percutaneous suspension. Endoscopic intravesical mobilization of the ureter, dissection of a submucosal tunnel, and a Cohen's type cross-trigonal ureteral reimplantation using interrupted 5-0 and 6-0 monofilament sutures were then performed. At the end of the procedure the trocar sites were not closed and a bladder catheter was inserted for 48 hours. Patients were discharged once spontaneous micturition was confirmed, usually on postop day 2.

Patients were followed up by clinical assessment and ultrasound examination. A postoperative voiding cystourethrogram was performed only in specific cases (duplex systems, megaureters or technical problems during the procedure) or in case of postoperative urinary infections.

**RESULTS:** The endoscopic cross-trigonal ureteral reimplantation was successfully performed in all except 2 patients (1 who had displacement of a port into the extravesical space and 1 with a too rigid posterior vesical wall). The mean operating time was 178 minutes (range 115-300 minutes). Follow-up ultrasound examinations showed no dilation in any cases. Seven systematic cystograms performed for specific reasons were all normal. Only one child had a recurrent infection: the cystogram showed resolution of the reflux on the operated side (duplex system), but the appearance of a contralateral reflux. All the others are free of recurrent infections with a mean follow up of 17 months.

**CONCLUSIONS:** Our experience confirms that endoscopic intravesical ureteral mobilization and cross-trigonal reimplantation can easily be performed, has a high success rate in reflux resolution (100% in our group) and a rapid recovery time. The long-term outcome needs further evaluation.

**S065 PRESERVATION OF ADRENOCORTICAL FUNCTION IN PATIENTS WITH BILATERAL PHEOCHROMOCYTOMAS USING A LAPAROSCOPIC APPROACH** Giovanni Casadiego, MD, Doruk Ozgediz, MD, J. Ted Gerstle, MD Hospital for Sick Children/University of Toronto, Toronto, Ontario, Canada

**BACKGROUND:** Several reports have been published regarding the surgical approach for bilateral adrenal masses for pheochromocytoma. These masses are often managed with complete resection of the adrenal glands, leaving the patient with no adrenocortical function and the requirement for life-long exogenous corticosteroid replacement therapy. The rationale for the complete resection has been to minimize the chance for tumour recurrence. Using a laparoscopic approach some authors have spared part of the uninvolved adrenal gland and have shown satisfactory outcomes with respect to safety and feasibility. Most have not commented upon the important issue of recurrent tumour during the post-operative follow-up period.

**OBJECTIVES:** The purpose of this study was to report a single-institution experience with the laparoscopic treatment of bilateral adrenal pheochromocytomas, focusing upon the important clinical parameters of preservation of endogenous adrenocortical function (performing a partial adrenalectomy), subsequent requirement for exogenous corticosteroid replacement therapy, and incidence of recurrent pheochromocytoma in long-term follow-up.

**METHODS:** The study was a retrospective patient chart review over a 10-year period.

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**RESULTS:** Four patients were identified with bilateral pheochromocytomas; two patients had bilateral disease on presentation; and two patients had unilateral disease on presentation, underwent surgery and subsequently developed contralateral disease. All carried a diagnosis of Von Hippel-Lindau disease. All had a positive family history of pheochromocytoma. Flushing, headache, sweating and hypertension were present to varying degrees in all of the patients. Two patients underwent bilateral laparoscopic resections in a synchronous fashion and two in a metachronous fashion for a total of 6 procedures. The data is summarized below in table form.

**Table 1**

	Bilateral Adrenalectomy Procedures (N=2)	Unilateral Adrenalectomy Procedures (N=4)*
Operative time, minutes	333 ± 58	202 ± 62
Estimated blood loss, ml	175 ± 178	38 ± 48
Conversion to open	1/2 (50%)	1/4 (75%)
Full feeds, days	5.0 ± 0.0	3.2 ± 1.5
Length of stay, days	5.5 ± 0.7	6.5 ± 5.7
Tumor size, cm <sup>3</sup>	21.1 ± 15.2	6.1 ± 4.9
Complications	0/2 (0%)	1/4 (25%)

\*2 patients each had two unilateral adrenalectomies=4 procedures

**Table 2**

	All Patients (N=4)
Exogenous steroid dependent	2/4 (50%)
ACTH stress test*, cortisol level after ACTH, nmol/L (normal > 500 nmol/L)	532 ± 96 (range: 422-593)
Tumor recurrence	0/4 (0%)
Follow-up period, months	37 ± 35 (range: 14-88)

\*ACTH stress test has been performed on 3 of the 4 patients

**CONCLUSIONS:** Laparoscopic partial adrenalectomy using a bilateral or unilateral approach can safely be performed for pheochromocytoma in patients with Von Hippel-Lindau disease with an acceptable conversion rate. Preservation of normal adrenocortical function was possible in half of the patients; an additional patient has partial adrenocortical function. No patient developed clinical or radiologic signs of recurrent pheochromocytoma in long-term follow-up. Based on this small series of patients, these children should be offered the opportunity to avoid the requirement for life-long exogenous corticosteroid replacement therapy and given the option of undergoing a partial adrenalectomy to preserve normal adrenocortical function.

**S066 LAPAROSCOPIC VARICOCELECTOMY IN TEENAGERS: EXPERIENCE IN TWO SWISS CENTERS** [Mario Mendoza-Sagaon, MD](#), [Flurim Hamitaga, MD](#), [Olivier Reinberg, MD](#), [Conrad Muller, MD](#), [Rudolf Leuthardt, MD](#), Ospedale Regionale di Bellinzona e Valli, Bellinzona and Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland

**INTRODUCTION:** Varicocele is an anomaly of the spermatic vein system characterized by dilatation of the pampiniform plexus that could impair the normal development of the testicle and the spermatogenesis. Surgical correction is indicated in advanced stages of the disease. Moreover, several authors have reported excellent results with a laparoscopic approach. The goal of this study is to evaluate the results of a laparoscopic varicocelectomy in teenagers in 2 pediatric surgical centers in Switzerland.

**METHODS:** The files of all patients, less than 18 years old, operated for a laparoscopic varicocelectomy in two Swiss pediatric surgical centers (Lausanne and Bellinzona), between 1998 and 2008, were analyzed. A questionnaire and/or a clinical appointment were performed to evaluate follow-up.

**RESULTS:** 64 patients were included in the study. All cases presented a left side varicocele. Range of age was 10 to 18 years. 48 patients presented a grade III varicocele, 11 patients a grade II and 5 patients an intermediary grade between II and III according to the Dubin-Amelar classification. Testicular asymmetry was found in 23 patients (4 grade II and 19 grade III). 35 patients were treated ambulatorially and 29 were kept in the hospital for one night. All of them were operated through a laparoscopic transperitoneal approach with 3 trocars and 3 or 5 mm instruments. The Palomo technique was performed in 51 cases and a modified Palomo, with preservation of the spermatic artery, in 13 cases. Follow-up was from 6 months to 9 years. 9 patients responded only to the questionnaire and 55 patients were clinically controlled. No testicular atrophy was reported. 2 cases of recurrence (3,1%) in the modified Palomo group were re-operated laparoscopically and a Palomo technique was achieved. One patient was re-operated for an early postoperative bleeding. Postoperative hydrocele was found in 9 patients (14%), 7 cases in the Palomo group and 2 cases of the modified Palomo group, and in 4 of these 9 patients a hydrocelectomy was performed. No postoperative infection, genitofemoral nerve injury, or other complications were recorded.

**CONCLUSION:** According to our results we concluded that the laparoscopic transperitoneal approach offers a great exposure of the spermatic vessels. The laparoscopic Palomo technique represents a minimal risk for testicular atrophy but a higher risk for postoperative hydrocele in comparison to the modified Palomo technique. In the other hand, the risk for recurrence is higher in the modified Palomo technique when compared to the Palomo technique. Finally, we agree with other authors that the laparoscopic varicocelectomy is a safe, feasible and excellent option for the treatment of the varicocele in teenagers.

**S067 THE RISKS OF MINIMAL ACCESS SURGERY IN CHILDREN: A BENCHMARK FOR CONSENT** [Boma T. Adikibi, MD](#), [Gillian H. M. Duthie, MD](#), [Claire Clark, MD](#), [Fraser D. Munro, MD](#), [Gordon A. MacKinlay, MD](#), Royal Hospital for Sick Children, Edinburgh, UK.

**AIM:** To determine the risk of complications and of conversion for laparoscopic and thoracoscopic procedures in children, thus allowing fully informed consent.

**METHODS:** Data was retrieved from the surgical audit database, a database of laparoscopic procedures and case notes for all minimally invasive surgical procedures performed in our institution between 1995 and 2008.

**RESULTS:** There were 2054 cases performed in 1998 patients. Of these 1934 (94%) cases were laparoscopic and 120 (6%) thoracoscopic. There were 1254 male and 744 female patients. The median age at operation was 6 years and 4 months. There were, 605 appendicectomies (34 interval), 237 funduplications (23 redo), 215 diagnostic laparoscopies, 168 pyloromyotomies, 39 cholecystectomies, 33 splenectomies, 112 Fowler Stephens procedures, 97 nephrectomies (including heminephrectomies), 57 Palomo procedures, 86 lap-assisted PEGs and 285 other procedures including 36 pull through procedures for Hirschsprung's disease. The overall complication rate is 4.4%. The complication rate for thoracoscopic and laparoscopic surgery is similar. The risk of an infective complication is 1.4%; the risk was highest for appendicectomy and nephrectomy with a rate

of 3%. The risk of visceral injury overall is 0.5%. A visceral injury explicable only by port insertion occurred in 0.15%. The risk of early reoperation is 1.3% overall. This risk is highest for fundoplication and pyloromyotomy at 5.8% and 5.3% respectively. The conversion rate is 2.4% overall. Appendectomy (1.8%), fundoplication (0.9%) and pyloromyotomy (2.9%) have low rates but they are higher for thoracoscopic cases (8.3%), nephrectomy (8%) and oncology procedures (10%). Complication rates for individual procedures will be presented in more detail.

**CONCLUSION:** Informed consent requires knowledge of the risks of surgery, including the surgical approach. This series provides a benchmark for the risks of minimal access surgery in children allowing fully informed consent.

#### **S068 SETTING THE MARK: EXPERT PERFORMANCE RESULTS FOR THE NEONATAL MIS TRAINERS** Karen A. Diefenbach, MD, Milissa A. McKee, MD, Yale School of Medicine

**PURPOSE:** We present the expert performance data for the Neonatal MIS trainers as well as the survey results taken at IPEG 2009

**METHODS:** Performance data was recorded for specific tasks using the neonatal MIS trainers. Twenty-three experts from North America, South America, and Europe participated. A pre-performance and post-performance survey were also performed to assess the demographics of the participants and to rate the usefulness of the trainers.

**RESULTS:** Demographics taken from the pre-performance survey indicates that there were 5 (22%) women and 18 (78%) men. Two reported being fellows and the remainder were attending level staff. Three (1.3%) had never used box trainers before whereas 12 (52%) had never use computer simulators. All participants reported that they had performed laparoscopic pyloromyotomies, funduplications, pull-thru procedures, and minimally invasive diaphragmatic hernia repairs. Twenty-two (96%) had performed thoracoscopic TEF repairs. Twenty (87%) had performed laparoscopic Ladd's procedures and 19 (83%) had performed thoracoscopic lobectomy or CCAM/sequestration resection. The performance data is summarized in the following table.

Task	Ave Time	Range	Ave. Errors
Dexterity Beads	1:41	1:13-2:55	1.7
Dexterity Washers	3:05	1:11-6:43	
Running Bowel	2:26	1:21-4:07	0.08
Abdominal Suturing	1:52	0:59-5:44	0
CDH Suturing	2:00	1:10-3:44	0
TEF Suturing	1:41	1:13-3:23	0

In the post-performance survey, 19 participants (83%) either agreed or strongly agreed that the trainers approximated the spatial restrictions of operating in a neonate, simulated the skills necessary to perform the tasks in a neonate, and are excellent teaching tools for surgeons learning minimally invasive surgery in neonates. Of the four participants that did not fall into this category, one participant stated they are "good" but not excellent, one disagreed that the chest trainer simulated the difficulty of performing thoracoscopy in the neonatal chest, one stated that the chest model did not approximate the difficulty of suturing under tension and the friability of the tissue, and the final one disagreed that the trainers were excellent tools to introduce these skills to an expert MIS surgeon. They either agreed or strongly agreed to the remaining questions.

**CONCLUSION:** International experts in the field of pediatric minimally invasive surgery have evaluated the neonatal MIS trainers and the majority feel that they are exceptional teaching tools. In addition, the

expert performance of the tasks sets the benchmark to which future participants may compare their performance and surgical educators may use to establish performance parameters.

#### **S069 THE TATE APPROACH FOR HEAD AND NECK ENDOCRINE SURGERY IN CHILDREN** T. E. Lobe, MD, S. K. Wright, MD, Blank Children's Hospital, Des Moines, IA USA

**PURPOSE:** The purpose of this study was to assess the safety, efficacy and learning curve for transaxillary, totally Endoscopic (TATE) head and neck endocrine surgery in children.

**MATERIALS & METHODS:** Between June, 2005 and October, 2009, 31 children with head and neck endocrine problems were subjected to the TATE approach. Safety, efficacy, complications and time of operation were assessed.

**RESULTS:** 31 children; mean age 12.7 years; F:M, 5:1, underwent a TATE approach. Glands ranged in size from 10gms (in a small 5 year old), to 63 grams (in one 16 year old). No cervical incisions were required and there were no conversions to open surgery. Three patients in our early experience underwent a robotic assisted procedure. Two patients suffered from hyperparathyroidism and had adenomas removed, using rapid PTH in the operating room to confirm immediate success. Of the remaining 29 children, 2 girls had an adenoma of the right thyroid lobe removed uneventfully and the remainder all had Graves disease which was treated successfully. Complications included transient hypocalcemia in 3 patients who were also on steroids for unrelated medical problems, transient neuropraxia in 3 patients with very large glands, 1 post-op, lateral, subcutaneous hematoma that resolved uneventfully, and one asthmatic with a spontaneous apical pneumothorax that presented as subcutaneous gas in the neck, 6 hours after the surgery and which resolved with chest tube placement. Average operative time for the 1st 10 patients was 288 minutes and for the subsequent patients was 155 minutes (range 92-210 minutes).

**CONCLUSIONS:** The TATE approach appears to be as safe and effective as open surgery for cervical endocrinopathies in children. Only transient, minor complications were observed. Operative time significantly decreases with experience making the length of surgery comparable to it's open counterpart.

#### **S070 MINIMAL ACCESS SURGERY IN PEDIATRIC CANCER: FOCUS ON VASCULAR MANAGEMENT** Girolamo Mattioli, Prof., Stefano Avanzini, MD, Piero Buffa, MD, Alberto Michelazzi, MD, Alessio Pini-Prato, MD, Alberto Garaventa, MD, Massimo Conte, MD, Giovanni Montobbio, MD, Vincenzo Jasonni, Prof G. Gaslini Children's Hospital

**BACKGROUND:** Minimal Access Surgery (MAS) is one of the cornerstones in the so-called fast-track organization model and is nowadays applied to almost all pediatric surgical fields. Yet, there is still some debate on which could be MAS reliable indications in children affected by cancer. Complications and their management are the most critical point in discussion. Aim of this study is to present the technical aspects of vascular management in a series of pediatric patients affected by cancer and treated with a MAS approach.

**METHODS:** This 20-months prospective study includes all patients aged less than 18 years and suspected to be affected by cancer who were diagnosed and/or treated through a MAS approach.

Data on surgical risk factors (SRFs), surgical procedure performed, histological diagnosis, complications, success and conversion rates are reported. Attention has been specifically focused on bleeding and vascular management. Obtaining a perfect vascular display and

# Oral Presentation Abstracts

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clearance starting distally to the mass prior to any further dissection are the most strategic key points. Vessel sealing system devices are largely employed rather than monopolar or metallic clips coagulation.

**RESULTS:** A total of 42 MAS procedures were performed in 37 patients. SRFs were detected in 18 out of 37 patients, affecting 18 out of 42 procedures. Biopsies were performed in 25 out of 42 procedures, resulting diagnostic in all but one (success rate of 96%). Seventeen out of 42 procedures consisted in a complete resection of the mass, totally managed with a MAS approach. Intraoperatively, 2 episodes of bleeding occurred and were successfully managed without conversion. Two patients underwent conversion to open approach in order to ensure a complete excision of the mass. No further complications occurred. On discharge, after a median hospital stay of 3 days (range 1-7 days), all patients were judged eligible to proceed to further treatments (either chemotherapy or radiotherapy).

**CONCLUSIONS:** As far as oncological criteria are respected in terms of SRFs and risk of tumor spreading, MAS can represent the mean to obtain an accurate diagnosis, staging, complete resection, palliation or management of oncological complications in child affected by cancer.

## **S071 THE ROLE OF LAPAROSCOPIC TECHNIQUES IN CHILDREN WITH SUSPECTED POST-TRANSPLANTATION LYMPHOPROLIFERATIVE DISORDERS (PTLD)**

Martin L. Metzelder, MD, Tillman Schober, MD, Lorenz Grigull, MD, Christoph Klein, Prof., Joachim F. Kuebler, MD, Benno M. Ure, Prof., Britta Maecker-Kolhoff, MD, Departments of Pediatric Surgery and Pediatric Hematology / Oncology, Hannover Medical School

**BACKGROUND:** In suspected post-transplantation lymphoproliferative disorders (PTLD) a confirming biopsy is required. The aim of this retrospective study was to assess the role of minimally invasive techniques (MIS) in the diagnosis of PTLD in a consecutive series of pediatric patients.

**METHODS:** Thirty-four children and adolescents (20 male, 14 female) had undergone solid organ transplantation from May, 1992, to November, 2008 (mean age at transplantation: 66 months, range 5 – 277), in whom a biopsy was performed for suspected PTLD from May, 1993, to September, 2009. Fourteen patients had former liver transplantation, 14 kidney, 3 heart, 2 lung, and 1 patient former heart and lung transplantation. The timepoint of onset and type of PTLD was assessed in all patients. The endpoint of the study was the rate of intraabdominal manifestations with need of MIS and its accuracy.

**RESULTS:** Twenty-seven of 34 patients (79%) had surgical biopsies of superficial lymph-nodes (n=9), oropharyngeal biopsy (n=5), gastrointestinal endoscopy or bronchoscopy (n=5), ultrasound guided biopsies (n=3), and biopsy of the bone marrow (n=1) or of the orbita (n=1). In 3 cases no data of the technique used were available. Due to lack of superficially located lesions, 7 of 34 patients (21%) had laparoscopic biopsy for suspected PTLD, of whom 5 had former abdominal organ graft (liver=3, kidney=2). In 6 of 7 cases (86%) a laparoscopic biopsy was successfully performed. Due to limited visibility with abscess formation at area of former kidney transplantation laparoscopy was converted in 1 patient. The easy access to a huge mass from the liver porta to the abdominal wall led to a primary biopsy via a Mini-laparotomy in another case. One patient with abdominal Burkitt's lymphoma developed a trocar metastasis, which was successfully treated by systemic chemotherapy. No other complications were observed after laparoscopic biopsy. Total accuracy of MIS biopsies was 100%. Morbidity and mortality was not influenced by biopsy technique or timepoint of PTLD onset.

**CONCLUSION:** In the majority of cases with suspected pediatric PTLD the diagnosis can be established without abdominal or thoracic access. However, in 20% of pediatric PTLD cases an intraabdominal biopsy is required, due to explicit intraabdominal manifestation. As laparoscopic surgery was even feasible in the majority of patients after prior abdominal organ transplantation, we suggest laparoscopic biopsy as a safe tool in diagnosing pediatric PTLD.

## **S072 IS MININVASIVE SURGERY (MIS) A SAFE PROCEDURE FOR PAEDIATRIC ONCOLOGICAL PATIENTS?**

Giovanna Riccipettoni, MD, Claudio Vella, MD, Camilla Viglio, MD, Enrica Caponcelli, MD, Marcello Napolitano, MD Department of Pediatric Surgery Children's Hospital "V. Buzzi" -- MILAN -- (Italy)

**AIM:** Mininvasive Surgery (MIS) in pediatric oncology is still debated. Moreover there is no evidence that this procedure increases the risk of trocar-site recurrence, dissemination and worsening prognosis. MIS procedure in oncologic surgery is useful to reach several aims: diagnostic biopsy, primary or secondary surgery, metastases treatment and second look for local recurrence. Respect of the oncologic principles according to tumor protocols is mandatory. It is important to always keep in mind the mass' feature (biology and size) to avoid intraoperative rupture, assure radicality, reduce the risk of tumor dissemination and prevent port-site recurrences.

28 patients were reviewed for postoperative complications and adverse events following MIS procedure.

**MATERIALS & METHODS:** 28 patients underwent to MIS in the last 4 years: 8 thorascopies, 20 laparoscopies. Biopsy samples and neoplastic masses were removed with devices to prevent spillage.

15 patients had diagnostic biopsy (54%), 12 patients had primary surgery (43%), and 1 patient had metastases treatment. Thoracoscopy biopsy was performed in: 2 germ cell tumors, 2 lymphomas, 1 pleuro-pulmonary blastoma. Primary excision was possible for 1 teratoma, 1 ganglioneuroma and one ablation for pulmonary metastases in Wilms's tumor. Laparoscopic biopsy was done in: 3 liver tumors, 3 lymphomas, 3 neuroblastoma, 1 sarcoma. All of these patients had prompt postoperative chemotherapy followed by open secondary surgical excision because of the size and feature of the tumor. Laparoscopic primary mass excision was carried out in 3 neuroblastoma, 1 pheochromocytoma, 1 ganglioneuroma, 2 mucinous ovarian cystadenomas, 3 ovarian teratomas.

Biopsies and masses were removed with endo-bag or devices to prevent tumor spillage.

**RESULTS:** In 15/15 biopsies the samples were adequate and suitable for histological and biological studies. In 12/12 patients that underwent to primary surgery the tumors were entirely removed without rupture and spillage. Nowadays none of the patients that underwent to mass excision has presented any sign of recurrence. 1 metastases ablation (Wilm's tumor) died for high grade malignancy. Accurate hemostasis without need of blood transfusion was obtained. No drain was placed. Post-operative stay was shorter: 24-48 hours for biopsies, 48-96 hours for tumor ablation. Chemotherapy was started straight forward. The tumors were entirely removed without any accidents. Thanks to faster postoperative recovery chemotherapy was quickly started.

**CONCLUSIONS:** MIS in Pediatric Oncology requires good experience in major oncologic surgery and high skill level in advanced pediatric endo-surgery. It is mandatory to reach accurate hemostasis to avoid blood transfusion and drain placement. Tissue injury and systemic

response seem to be reduced for MIS surgery, implying faster recovery, and allowing prompt chemotherapy onset. Laparoscopy offers better preservation of the peritoneal lining compared to open procedures with fewer incidence of adhesions, reducing complications and facilitating further procedures. In expert hands MIS can be employed in pediatric oncology with low risk and evident benefits.

### **S073 LAPAROSCOPIC VERSUS OPEN MANAGEMENT OF MALIGNANT AND BENIGN OVARIAN MASSES IN CHILDREN**

Giovanny Casadiego, MD, J. Ted Gerstle, MD, Lisa Allen, MD Hospital for Sick Children/University of Toronto, Toronto, Ontario, Canada

**BACKGROUND:** Ovarian masses in the pediatric age group are rare and malignancies are even less common. The management of these adnexal lesions are treated by laparoscopic and open approaches based on multiple clinical, radiologic and biochemical criteria.

**OBJECTIVES:** The purpose of this study was to compare children with ovarian masses who were operatively treated with laparoscopy with those treated with an open approach.

**METHODS:** This was a single-institution retrospective chart review of all children who underwent laparoscopic and open surgical procedures for the management of ovarian masses over a 5-year period. Demographic, clinical, radiologic, biochemical and pathologic data were collected. Research Ethics Board approval was obtained. Data was statistically assessed with the Student's t-test and Chi-square analysis where appropriate. Statistical significance:  $p < 0.05$ .

**RESULTS:** A total of 129 patient charts were reviewed. The data is summarized in the table.

**Table of Results**

	Laparoscopy, N=80	Open, N=49	p-value
Age, years	12.1 $\pm$ 4.2	12.5 $\pm$ 3.8	0.53
Complex mass	50/80 (62.5%)	42/49 (85.7%)	0.005
Tumour markers sent	24/80 (30.0%)	40/49 (81.6%)	<0.001
Tumour markers elevated	3/80 (3.8%)	15/49 (30.6%)	<0.001
Size of mass, cm	8.3 $\pm$ 5.0	14.8 $\pm$ 7.0	0.001
Tumor spillage intra-operatively	59/80 (73.8%)	10/49 (20.4%)	<0.001
Ovary-sparing procedur	67/80 (83.8%)	28/49 (57.1%)	0.001
Malignant histology	2/80 (2.5%)	14/49 (28.6)	<0.001
Length of stay, days	1.6 $\pm$ 5.6	6.7 $\pm$ 14.2	0.006

The malignant tumors in the laparoscopic group were a granulosa cell tumor and an immature teratoma; in the open group the malignant tumors included: germ cell tumors, immature teratomas, endodermal sinus tumors, dysgerminomas and granulosa cell tumors.

**CONCLUSIONS:** In patients with a complex ovarian mass that is relatively large and associated with elevated tumor markers, it is safer to proceed with an open approach as the incidence of malignancy is higher in this group of patients. In patients with a less complex ovarian mass that is relatively smaller and associated with normal tumor markers, it is reasonable to consider a laparoscopic approach as the incidence of malignancy is very uncommon. With these low-risk malignancy patients, ovary-sparing surgery should be considered and the surgeon should not be dissuaded because of concern for tumor spillage. A potential benefit for patients who are treated in this laparoscopic manner will be a shorter period of hospitalization.

### **S074 LAPAROSCOPIC REVISIT TO INTERNAL INGUINAL RING IN CHILDREN WITH PATENT PROCESSUS VAGINALIS**

Masao Endo, MD, PhD, Michinobu Ohno, MD, Fumiko Yoshida, MD, Miwako Nakano, MD PhD Saitama City Hospital

**AIM:** One of the drawbacks of traditional cut-down herniorrhaphy (C-D) in children is a lack of follow-up inspection of the internal inguinal ring (IIR) that has undergone any surgical intervention previously. Recently developed laparoscopic closures of the patent processus vaginalis (PPV) have been pointed out that these procedures have not been validated on their anatomical results. Intentional application of laparoscopy resolves partially these drawbacks. Laparoscopic approach in second-look operation makes it possible to identify the correct relation of the anatomic structures under direct vision. The purpose of this paper is to investigate the results of laparoscopic revisit to internal inguinal rings in children who previously underwent cut-down or laparoscopic herniorrhaphy.

**METHODS:** Among a consecutive series of 1,631 children who underwent laparoscopic closure of PPV (LCP) during 1996 to 2009, children who had undergone any surgical intervention to the IIR as the first operation, and children who underwent any laparoscopic surgery after definitive herniorrhaphy were analyzed in terms of the cause of second-look operation, patient characteristics, morphological appearance of the IIRs during revisit, and the influence of primary operation on the second look operation. Recanalized processus vaginalis was measured in its width of the orifice's diameter and length of the process, and compared with the primary PPV. The influence of the primary repair was estimated by comparing the operation times between primary and second-look operation.

**RESULTS:** The cohort consisted of 63 children (3.9% of 1,631 in total). The causes of the revisit distributed in 8 children with hernia recurrence after previous C-D, 2 with previous LCP, 25 with contralateral hernia after C-D, 6 with LCP, 20 with incidental diagnostic laparoscopy during any metachronological surgery under laparoscopic assistance, and 2 with postoperative direct hernia.

Eighteen children without recurrence in LCP group showed flat IIR covered with cicatricial tissue, whereas 2 IIRs with recurrence revealed large open orifices same as the primary findings without any adhesion. Thirty-three children without recurrence after C-D showed closed but somewhat depressed IIR site, and 8 reopened IIRs showed a spectrum from pinhole to widely opened orifice with or without adhesion of adjacent viscera or omentum. Three hydroceles recurred in spite of completely closed IIR at the second-look operation. Six IIRs of contralateral hernia in LCP group had had non-detected orifices diagnosed as no contralateral PPV (cPPV) at the primary repair. Laparoscopic repair of recurred PPV was easy and not time-wasting equally to the primary repair. Figures of anatomical findings of previously operated IIRs and cPPV at the second look operation will be demonstrated by motion pictures and/or snap shots.

**CONCLUSION:** Hernia repair with laparoscopic approach has provided a lot of information regarding anatomical follow-up of the primary operation site and incidental inspection of postoperative IIR during any laparoscopic surgery at every opportunity will play a role in resolving unsettled mysteries of indirect inguinal hernia and/or hydrocele.

# Video Abstracts

**V001 LAPAROSCOPIC DISTAL PANCREATECTOMY WITH SPLENIC PRESERVATION** Dorothy Rocourt, MD, [Brian Kenney, MD](#), MPH Nationwide Children's Hospital; Ohio State University Medical School

Laparoscopic distal pancreatectomy with splenic preservation is a technically demanding procedure. The patient is an 11 year old male who fell 10 feet while indoor wall climbing onto a rubber mat. He presented to our ED with complaints of an abdominal and lower back pain. His physical exam, however, was unremarkable with no obvious evidence of acute trauma. He had a CT of the abdomen and pelvis which demonstrated a cluster of cystic masses in the distal body and tail of the pancreas. The largest mass measured 1.3 x 1 x 1 centimeters. He was followed with serial abdominal ultrasounds over a period of eight months during which time the masses were noted to have increased in size. At this point surgical intervention was discussed with the family. Port placement consisted of a 5 mm umbilical port that was increased to a 10 mm port; three other 5mm ports were placed. Dissection started with division of the gastro-colic ligaments exposing the pancreas. There was a suggestion of a mass in the distal body. The splenic vessels were identified and carefully dissected with the use of the Harmonic scalpel. The proximal extent of our dissection was marked by the confluence of the inferior mesenteric vein and splenic vein based on preoperative imaging. A window was created at this level and a Penrose drain was placed around the pancreas and used for traction to complete the vascular dissection. The distal body and tail were transected with an endo GIA linear stapler. A Jackson-Pratt drain was used. He recovered uneventfully. Pathology revealed benign cysts lined by cuboidal epithelial cells, a rare congenital lesion without evidence of trauma. This case demonstrates that laparoscopic distal pancreatectomy with splenic preservation is feasible in the pediatric population.

**V002 LAPAROSCOPIC CAUDAL PANCREATICOJEJUNOSTOMY WITH SPLENIC PRESERVATION FOR THE TREATMENT OF CHRONIC PANCREATITIS IN CHILDREN CASE REPORT** [Carlos García-Hernández, MD](#), Lourdes Carvajal- Figueroa, MD, Roberto Suarez-Gutierrez, MD, Sergio Landa-Juarez, MD Hospital Infantil Privado. México, Distrito Federal

**INTRODUCTION.** Chronic pancreatitis in children is a rare disease; its principal symptom is intense abdominal pain. Once it is associated with pancreas divisum, the endoscopic sphincteroplasty is the optimal procedure. When this is not possible the intestinal drain has to be performed. There are just few reports of these procedures in children

**CASE REPORT:** Male 12 years old, his disease began when he was three years old, after he started presenting a necrotic hemorrhagic pancreatitis, he was operated of open cholecystectomy ten days later. Since that day he has been through multiple hospitalizations due to recurrent abdominal pain, frequently associated with serum amylase and lipase elevations, three failed ERCPs were obtained. In a more recent hospitalization when the patient was first presented, he showed the same symptoms. Then a Magnetic resonance cholangiopancreatography was performed and we found a pancreas divisum with a pancreatic duct of 5 mm. According to the size of the pancreatic duct, we decided to perform a distal pancreatectomy, avoiding the injury of the splenic vessels in order to preserve the spleen, and as well with an end to side pancreaticojejunal anastomosis. A 4 port approach was used in the same place that we frequently carry on Nissen procedures. The surgical time was of 163 minutes without complications. The oral feeding began at fifth day with a constant follow-up of 24 months without recurrence; amylase and lipase remained in normal values.

**DISCUSSION:** The pancreas divisum is the most frequent congenital disease of this organ. It could affect the pancreas voiding and afterwards produce a repetition pancreatitis. The goal of the treatment is to allow an adequate voiding, but it could be also possible to perform a sphincteroplasty by endoscopic approach. However sometimes this is not possible as it occurred with our patient, this proved the need to start an intestinal drain to avoid pancreatic damage. There are different versions of this procedures and its selection depends of the pancreatic duct size of each patient. When there is not an important dilatation it is better to practice a distal pancreatectomy with splenic preservation using an end to side anastomosis. This was the case of this patient from whom we obtained an adequate drain without recurrence. Even in the previous operations it could be possible to carry on the procedure by laparoscopic approach. The reports of these procedures in children are certainly scarce.

**V003 LAPAROSCOPIC REPAIR OF A DUODENAL ATRESIA AND LADD'S PROCEDURE IN A NEONATE** [Steven S. Rothenberg, MD](#), The Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons

**PURPOSE:** To demonstrate current refinements of technique in performing a duodenal anastomosis in a neonate with duodenal atresia.

**METHODS:** A 33 week premature infant with a prenatal diagnosis of Duodenal atresia was explored laparoscopically on day two of life for repair. The patient's weight was 2 Kg. Two 3mm ports and one 4mm port were used for the procedure. The patient was also found to have malrotation at the time of surgery. The procedure consisted of a Ladd's procedure and duodenoduodenostomy. Techniques of abdominal wall retraction sutures are demonstrated.

**RESULTS:** The procedure was completed successfully laparoscopically. The procedure took 60 minutes. An NG tube was used for 5 days and feeds were started on post-op day 6.

**CONCLUSION:** This video demonstrates that a laparoscopic duodenoduodenostomy and Ladd's procedure is efficacious and safe even in a small premature infant.

**V004 AN 'OPEN SOURCE', SELF-BUILT, CONVENTIONAL AND SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) SIMULATOR** [Roland W. Partridge](#), Atul J. Sabharwal Department of Paediatric Surgery, Royal Hospital for Sick Children, Yorkhill, Glasgow. UK. UK.

**AIMS:** A video presentation of the AcesoSim - an 'open source' laparoscopic simulator, which can be self-built using parts freely available on the high street, for less than one hundred pounds (\$160). Its unique feature is that the details of how to produce the simulator and associated procedure models, are published on a web-site (AcesoSim.org). This provides a forum for users to share developments to the design of both the simulator and the procedure models. Furthermore, it is also the first description of a self-built simulator capable of single incision laparoscopic surgery (SILS). Aceso = Gk goddess of the healing process; sister to Panacea, goddess of the cure.

**METHODS:** A 5-minute film demonstrates the AcesoSim. Procedure models for fundoplication, appendicectomy, cholecystectomy, pyloromyotomy, end-to-end anastomosis and basic manual dexterity are demonstrated. A 10-point Likert scale face validity questionnaire was performed by a group of trainees and consultants in a single institution, comparing intracorporeal suturing on the AcesoSim, with the virtual reality LapSim simulator (Surgical Science, Goteborg, Sweden).

**RESULTS:** Both conventional laparoscopic and SILS procedures are demonstrated on the video. The face validity questionnaire assessing conventional laparoscopic intracorporeal suturing, scoring from 1-10, demonstrated a significant ( $p < 0.001$ ) advantage to the AcesoSim over the LapSim regarding: mean(SD): overall usefulness as a training tool 9.22 (0.83) vs 5.11 (3.01), value for money 9.77 (0.44) vs 1.88 (1.69), realism of suturing 8.77 (0.97) vs 2.22 (1.56) and realism of tactile feedback 8.88 (0.93) vs 2.33 (1.41). Realism of anatomical representation was better in the LapSim: AcesoSim 3.75 (1.48) vs LapSim 6.37 (2.31)  $p < 0.01$ . There was no significant difference between the other factors of camera and instrument simulation realism and satisfaction with the user interface. (n=9: 3 consultants, 6 trainees).

**CONCLUSIONS:** The video is a clear presentation of this novel and exciting 'open source' and SILS enabled concept. The face validity questionnaire supports its potential as a useful training tool. Larger and more objective assessment studies are required to confirm this.

**V005 REMOVING PROTEIN PLUGS IN THE COMMON CHANNEL DURING THE LAPAROSCOPIC EXCISION OF MINIMALLY DILATED CHOLEDOCHAL CYST: INTRALAPAROSCOPIC PANCREATOSCOPY** Atsuyuki Yamataka, MD, Hiroyuki Koga, MD, Go Miyano, MD, Akihiro Shimotakahara, MD, Yoshifumi Kato, MD, Geoffrey J Lane, MD, Tadaharu Okazaki, MD Department of Pediatric General and Urogenital Surgery, Juntendo School of Medicine

We applied the principles of intraoperative endoscopy during the laparoscopic treatment of minimally dilated choledochal cyst (MDCC) to develop a new procedure, intralaparoscopic pancreatoscopy (ILPS), to investigate the pancreaticobiliary tree and clear it of protein plugs and debris. We present a case study to describe ILPS.

A 1-year-old girl presented with the signs and symptoms of pancreatitis. Magnetic resonance cholangiopancreatography (MRCP) showed a choledochal cyst with a minimally dilated common bile duct associated with pancreaticobiliary malunion, or MDCC; and a common channel that appeared to be packed with protein plugs and debris. It is known that if protein plugs are left in situ, there is an increased risk for postoperative pancreatitis/stone formation. Thus, we began to perform ILPS to remove protein plugs from the common channel during the laparoscopic excision of MDCC. Using conventional trocar placement, the common bile duct was dissected free from surrounding tissues such as the portal vein and hepatic artery whereupon it was transected at its mid portion. A 3.9mm trocar was then placed in the left epigastrium for introduction of a 7.5F cystoscope for ILPS. Under laparoscopic guidance, the tip of the scope was inserted into the common channel though the opened distal common bile duct. Protein plugs and other debris were found packed in the common channel. Normal saline was injected into the common channel through the side channel of the scope to wash all the protein plugs and debris away successfully. Following removal of all protein plugs and debris in the common channel, the distal common bile duct was ligated as it entered the pancreas, using an endoloop. Then, an 8F urinary scope was inserted through the left lower abdominal trocar, and under laparoscopic guidance, the tip of the scope was inserted into the common hepatic duct to wash out intrahepatic bile ducts. The proximal common bile duct was then excised with sharp and blunt dissection, leaving a common hepatic duct of appropriate length for biliary reconstruction. The Roux-en-Y jejunum limb was created through a 1cm extension of the umbilical port site. Then, laparoscopic hepatico-jejunostomy was performed successfully using interrupted 5/0 absorbable sutures. Because the common bile duct was only minimally dilated, the diameter of the anastomosis was only 7mm. Postoperative recovery was uneventful and she is currently well after 11 months' follow-up.

With ILPS, an extra trocar is required in the epigastrium in order to insert the tip of the scope into the common channel. Despite this additional surgical stress, we recommend ILPS be performed routinely because of the known high incidence of protein plugs and debris in MDCC. From experience, we find a cystoscope or a urinary scope is more practical for ILPS than other types of scopes, since other types of right/flexible scopes do not have a side channel to enable a continuous, even flow of saline to open and maintain the lumen of the common channel at a constant width.

**V006 THORACOSCOPIC PLICATION OF THE DIAPHRAGM WITH TWO TROCARS** Enrique Buela, MD, Juan Ignacio Bortagaray, Roberto Vagni, MD, Fabio Díaz, MD Hospital Nacional Profesor A. Posadas

**BACKGROUND:** The thoracoscopic treatment of diaphragmatic eventration (DE) has proven to be superior to conventional surgery. The possibility of improving MIS by reducing the number of trocars has been reported for laparoscopic abdominal surgery. We give an account of our initial experience in a pediatric patient who was approached thoracoscopically with two trocars and the aid of a percutaneous stitch.

**PATIENTS & METHODS:** A 16 months old boy was found to have an elevated left hemidiaphragm on chest radiography. He had persistent respiratory symptoms. The plication of the diaphragm was performed thoracoscopically. The patient was placed in lateral decubitus position with the affected side facing upwards. He was tracheally intubated. The 1st 4 mm trocar and the 2nd 3 mm trocar were introduced on the anterior axillary line, in the 3rd and 5th intercostal space, respectively. The operation was performed under controlled pneumothorax using carbon dioxide gas at 5 mm Hg. Reduction of the eventration was achieved progressively using an endograsper. A 20 cm long 18 Gauge needle was inserted percutaneously through the posterior 8th intercostal space into the thorax. The diaphragm was sutured 3-4 times. A Prolene 0 thread was passed through the needle's eye and was tightened extracorporeally through the 3 mm trocar. The latter procedure was repeated 4-5 times to achieve a complete plication of the diaphragm. Finally, the pneumothorax was aspirated and the trocars and needle were removed. The wounds were closed and no chest tube was left.

**RESULTS:** The patient tolerated the procedure well with prompt relief of respiratory symptoms. Operating time was 40 minutes. There were no intraoperative or postoperative complications. He did not need supplemental oxygen postoperatively and was discharged from hospital at the 2nd postoperative day. The cosmesis was satisfactory. Chest radiography showed flattening of the diaphragm. No recurrence of DE or respiratory symptoms were seen for the last 24 months.

**CONCLUSION:** Thoracoscopic repair of DE presented all the benefits of MIS, being a feasible and suitable approach for pediatric patients. It can be safely performed using two trocars and a percutaneous puncture. A better and more comfortable instrument maneuverability is enabled in the intrathoracic space. Further experience is required before accurate conclusions can be made.

**V007 ASSOCIATION OF THORACOSCOPIC AND ENDOSCOPIC APPROACH IN LENGTHENING TECHNIQUE FOR ULTRALONG GAP ESOPHAGEAL ATRESIA** Jeronimo Gonzalez, MD, Maria Soledad Fernandez, MD, Esperanza Hernandez, MD, Yrene Argumosa, MD, Maria Baquero, MD, Esther Gil, MD, Maria Medina, MD, Andres Martinez, MD, Francisca Carpintero, MD, Pascual Martinez, MD University Hospital of Albacete

**BACKGROUND:** The treatment of ultralong gap esophageal atresia (EA) with almost complete absence of the intrathoracic esophagus remains a major surgical challenge. In those cases, esophageal replacement with gastric or colon interposition have been used, but it is generally agreed that the child's own esophagus is the most desirable conduit. The primary repair of long gap EA after an elongation of the native esophagus with traction sutures enough to bridge the atretic gap was first described by Foker et al in 1997. Our goal was to describe a combination of thoracoscopic and endoscopic approach as the first time of Foker's technique. A flap unfolding the proximal dilated esophagus previous to end to end anastomosis achieved a reduction of the anastomotic tension.

**CASE HISTORY:** The patient was a male neonate born at 35 weeks of gestation, with a birthweight of 2451 g. The first chest and abdominal X-ray showed an esophageal atresia without distal fistula. The proximal esophagus reaches the second thoracic vertebra. Gastrostomy was performed as a first step, and the upper pouch was placed on replogle suction. A bronchoscopy showed no proximal tracheoesophageal fistula. Contrast study through the gastrostomy demonstrates that the distal pouch reaches the diaphragmatic line with virtual absence of the intrathoracic esophagus leaving a distance of 8 vertebrae. At the age of 2 months, traction sutures were applied thoracoscopically at the ends of both esophageal pouches. The movements of an endoscopy placed in the upper and lower segments facilitates the mobilization of both pouches and a better control in the application of sutures through the ends of the unopened segments. Metallic clips were placed on the sutures close to the esophageal ends to serve as radiopaque markers postoperatively. Daily traction of 2 to 4 mm on both esophageal ends was started on day two postoperatively. On day 7, both metallic clips found that the ends were in proximity. A thoracotomy was performed on day 8, and esophageal anastomosis was achieved with moderate tension after creating a flap unfolding the proximal pouch. A contrast esophagram done one week post-anastomosis showed a leak that responded well with conservative management and resolved after 22 days. At the age of 42 days he presented with a significant stenosis that required pneumatic dilatation. He currently is 6 months old and doing well tolerating full oral feedings and gaining weight.

**DISCUSSION:** With this case we have dispelled the doubts about the efficacy of the growth procedure to treat ultralong gap EA. The longitudinal tension produced by traction sutures have induced growth of the atretic segments nearly enough to bridge the thoracic gap. We disagree with the initial idea that the sutures should be made extraluminally to avoid mediastinitis. The endoscopic vision showed that our sutures were placed transluminally, but the traction exercised on the filaments contracted the pouches preventing the salivary leak.

**V008 LAPAROSCOPIC LIVER RESECTION: LEFT LATERAL SEGMENTECTOMY IN A CHILD** Karen A. Diefenbach, MD, Milissa A McKee, MD, Yale School of Medicine

**PURPOSE:** To demonstrate the technique used to perform a laparoscopic left lateral segmentectomy of the liver in a pediatric patient.

**METHODS:** We report a case of a child with a solitary nodule in the left lobe of the liver which was successfully resected laparoscopically. An 8 y/o female previously treated with chemotherapy and radiation for astrocytoma in the first year of life subsequently presented with a left renal cell carcinoma. She underwent a left nephrectomy and post-operative surveillance imaging revealed a growing nodule in the left lateral segment of the liver. Because of concern for malignancy

(metastatic disease or new primary), she underwent laparoscopic left lateral segmentectomy for diagnostic and therapeutic purposes. This video demonstrates the technique.

**RESULTS:** We successfully completed an anatomic left lateral segmentectomy laparoscopically. The patient did well and was subsequently discharged home on post-operative day five.

**CONCLUSION:** Laparoscopic anatomic liver resections are feasible for selected lesions in pediatric patients.

**V009 LAPAROSCOPIC CHOLECYSTECTOMY AND INTRAOPERATIVE CHOLANGIOGRAM USING SINGLE SITE (PLUS)** Matthew S Clifton, MD, Mark L. Wulkan, MD Emory University/Children's Healthcare of Atlanta

This video demonstrates the novel use of single site (plus) technique for laparoscopic cholecystectomy and intraoperative cholangiogram. The illustrated patient is a 16 year old girl who presented with a three month history of abdominal pain and severe biliary pancreatitis. Evaluation included ultrasound, which demonstrated a gallbladder filled with stones and a dilated biliary tree. At the time of operation, her bilirubin and lipase had normalized, and the patient was pain free. Two 5mm VersaStep (Covidien, Mansfield, MA) radially dilating trocars were inserted through the umbilicus, and used for the laparoscope and working port. MiniLap Alligator Clamps (Stryker, Kalamazoo, MI) were used for retraction and as operating instruments, and a 5 French angled Kumpe catheter (Cook Medical, Inc., Bloomington, IN) with a 0.035 inch glide wire used to access the biliary tree. Intraoperative cholangiogram showed a dilated biliary system, with no filling defects. The patient's post-operative course was complicated by nausea; she was discharged home on the second post-operative day.

**V010 ROBOTIC RETRIEVAL OF AN INGESTED FOREIGN BODY** John J. Meehan, Associate Professor of Surgery, Seattle Children's Hospital

**INTRODUCTION:** A 5 year old boy with was witnessed to put a large rock in his mouth. Before his mother could get to him, he had swallowed it. Plane film radiographs showed the large object within the stomach on successive films over a two week period with no progression. Eventually, he developed gastric outlet obstruction symptoms and was referred for evaluation.

**METHODS:** Initially, we attempted to retrieve the rock using esophagogastroduodenoscopy. Although the object was easy to snare with a basket, it simply wouldn't fit back up the esophagus despite multiple attempts and different angles. With the patient still anesthetized, we brought the standard Da Vinci surgical robot (Intuitive Surgical, Sunnyvale, CA) into the room and elected to retrieve the rock using a minimally invasive approach.

**RESULTS:** The operation was performed through 3 robotic ports: one 12 mm camera port at the umbilicus and two 5 mm instrument ports. A 12 mm accessory port for placing an endocatch bag was placed in the lower abdomen. A suspension stitch was used to hold the stomach up to the anterior abdominal wall. The 12 mm 3-D camera and the two 5 mm instruments then entered into the stomach through a gastrotomy. The rock was too big to grasp for any length of time so it had to be "cradled" with the articulating instruments and teased out the stomach. It was retrieved using a standard endocatch bag and the gastrotomy closed with running locked suture. The patient had an unremarkable post-operative course, tolerated clears on post-op day #1, and was discharged on post-op day #3.

**CONCLUSION(S):** The versatility of the robot is demonstrated in this unusual case. The advantages of robotic surgery may allow a wide variety of procedures to be performed using minimally invasive techniques more frequently in the future.

**V011 SINGLE INCISION NUSS PROCEDURE FOR PECTUS EXCAVATUM** Sidney M Johnson, MD, Justin J Clark, MD, Kapi'olani Medical Center for Women and Children

**PURPOSE:** To demonstrate a single incision Nuss pectus excavatum repair.

**METHODS:** The major technical modification is performing the entire procedure through a single 2 cm right unilateral thoracic incision in lieu of the standard 3 or 4 incisions. The subcutaneous tunnel is carried over from the right side in a pre-sternal plane. The bar introducer is used to make a generous subcutaneous pocket on the left lateral chest. The bar is configured, placed and positioned as per the standard Nuss approach. A 45-degree thoracoscope is used to visualize bar placement; multiple trocar positions are necessary through the same incision. The bar introducer is used to check the tunnel position for any cutaneous or muscular adhesions on the contralateral side. Bar fixation is performed unilaterally on the right with the Lorenz bar stabilizer and an endoclose device.

**RESULTS:** This video demonstrates a minimally invasive single incision technique for Nuss pectus repair

**CONCLUSION:** The single incision technique adds a cosmetic improvement to the traditional Nuss pectus excavatum repair.

**V012 CONGENITAL CYSTIC ADENOMATOID MALFORMATION (CCAM) AND INTRALOBAR SEQUESTRATION: THORACOSCOPIC LEFT LOWER LOBECTOMY USING A VESSELS SEALING SYSTEM (VSS)** Hossein Allal, PhD, MD, Froylan Paniagua (2), MD, Gustave Andrianandraina, MD, Pediatric Visceral Surgery Department; Video-surgery Unit; CHU Montpellier, France. (2) Hospital para el Nino Poblano. Puebla, Mexico

We present a case of CCAM associated with intralobar pulmonary sequestration using VSS technical points during lobectomy.

For the interlobar vessels, the vascular anatomy is ideally reconstructed in order to allow a selective dissection and division of the pulmonary arteries. When the great fissure is not totally free, the use of the VSS ensures a division with both pneumostasis and hemostasis to guarantee a perfect dissection. The jaws of the VSS should be perfectly clean in order to avoid any residual bleeding that may follow after the coagulation.

In the management of the systemic vessels there are several options today, you should use the VSS when the length of the vessel allows a safe coagulation. Indeed, if the vessels are too short, use either a ligature or clips. Coagulation should be sufficient and the stump of the vessel should also be long enough to resume the hemostasis or avoid subdiaphragmatic retraction.

After bronchus dissection, we can identify the pulmonary vein on a posterior position. The lower lobar vein is generally short, it should be dissected in a subadventitial position.

Its perfect dissection is mandatory to give sufficient length, this helps us achieve a separate ligature. We used ligature on proximal portion and the distal portion is coagulated and divided using VSS.

The bronchus is approached last. The lower lobe is maintained suspended by it, in order to well expose the region of the lobar vein. A vascular endo-stapler helps bind and divide the lower lobar bronchus.

**KEYWORDS.** pulmonary sequestration, vessels sealing system

**V013 LAPAROSCOPIC NEEDLE-ASSISTED REPAIR (LNAR) OF INGUINAL HERNIAS IN CHILDREN** Aaron P Leshner, MD, Robert A Cina, MD, Christian J Streck, MD, Andre Hebra, MD Division of Pediatric Surgery, Department of Surgery, Medical University of South Carolina

Minimally-invasive inguinal hernia repair in children is an acceptable alternative to the traditional open repair. Benefits of the laparoscopic approach include less postoperative pain, improved cosmetic result, quicker return to baseline function, and decreased operative time in the case of bilateral hernias. The laparoscopic approach also has the advantages of clear visualization of the hernia defect and, in males, the vas deferens is not manipulated. This video describes a needle-assisted approach to high ligation of the internal inguinal ring in the treatment of inguinal hernias.

Using a 5mm mini-Step trochar, the abdomen is insufflated. A 3mm stab lateral incision allows a Maryland dissector to be placed on the affected side if retraction is needed. A 2-0 prolene suture is placed using the Seldinger technique with a looped end into the preperitoneal space surrounding the internal ring. Suture ligation of the internal ring obliterates the hernia defect. In females, no additional retraction is needed, so the lateral instrument is unnecessary. Patients may be discharged to home on the day of surgery.

Preliminary data of an ongoing 24-month prospective study comparing laparoscopic versus open repair for all pediatric inguinal hernias repaired at our institution is included. We have collected prospective data on 98 consecutive inguinal herniorrhaphies at our institution – 84 (85%) of which have been performed laparoscopically. Operative time for single-side laparoscopic surgery was 19.6 minutes versus 29.0 minutes for bilateral procedures. With an average of 6.3 months of follow-up there have been no recurrences, two suture granulomas, and one wound infection.

**V014 LAPAROSCOPIC ASSISTED TRANSIATL GASTRIC TRANSPOSITION FOR LONG GAP ESOPHAGEAL ATRESIA IN AN INFANT** Ryan Juza, BS, Marjorie Arca, MD, John Densmore, MD, John Aiken, MD, Dave Lal, MD Children's Hospital of Wisconsin & Medical College of Wisconsin

Surgical treatment of long gap esophageal atresia remains controversial. As no perfect conduit exists, our group has favored gastric transposition for its ease and durability. In this video we present a neonate born with long gap esophageal atresia who underwent a laparoscopic assisted gastric transposition. We report on the operation as well as one year of follow-up. The objectives of the video are to describe this newly emerging surgical technique and its advantages and challenges.

**V015 THORACOSCOPIC REPAIR OF A CONGENITAL H-TYPE FISTULA: AN EFFECTIVE OPERATIVE TECHNIQUE** Rebecca M. Lisle, MBBS, BSc, MRCS(Eng), Ram M. Nataraja, MBBS BSc MRCS(Ed), Varadarajan Kalidasan, MBBS, MS, MCh, FRCS, Paed Surg MA, Anies A. Mahomed, MBBCh, FCS, SA, FRCS(Glasg) Ed FRCS, Department of Paediatric Surgery, Royal Alexandra Children's Hospital, Brighton, BN2 5BE, United Kingdom.

**AIM:** Congenital H-type fistula is a rare abnormality which has traditionally been approached via a cervical or thoracotomy incision. Both of these methods have significant morbidity and occasional mortality. Our aim is to present the surgical technique of thoracoscopic H-type fistula ligation in an older paediatric patient.

**METHODS:** The patient, an 8 year old girl, presented with a chronic cough. An H-type fistula was identified on video oesophagogram. The

fistula was confirmed with a 4mm bronchoscope immediately prior to the thoracoscopy. The patient was then positioned in a 45 degree left lateral position. A 5mm thoracoscopic port was inserted in the 4th intercostal space between the mid and anterior axillary lines and the right lung collapsed with positive pressure. Two additional ports were inserted under direct vision into the 2nd and 6th intercostal spaces. The parietal pleura was divided over tracheo-oesophageal groove and the vagus nerve reflected in the superior flap. The fistula was isolated and suture ligated on the tracheal side. It was then divided and the oesophageal defect oversewn. A pleural patch was reflected and laid over the repair site. No intercostal drainage was utilised.

**RESULTS:** The patient made an uneventful post operative recovery. Oral feeding was commenced on day two and the child was discharged on the fourth post operative day. A normal contrast swallow was performed at two weeks post discharge.

**CONCLUSION:** We demonstrate some critical technical steps in the management of the H-type fistula. The procedure can be accomplished using 3 ports and with dual lung ventilation. Routine intercostal drainage is not necessary. Whilst the thoracoscopic technique has been demonstrated to be possible in neonatal tracheo-oesophageal fistula repair, our case confirms its effectiveness in the older child.

**V016 THORACOSCOPIC RESECTION OF AN ESOPHAGEAL DIVERTICULUM IN A 4 YEAR OLD MALE** Steven Rothenberg, MD, Theodore Stathos, MD the Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons

**PURPOSE:** To demonstrate a thoracoscopic approach to difficult esophageal pathology.

**METHODS:** A four year old male with a long history of GERD and Hiatal Hernia, and 3 previous repairs including 2 open Nissen's and hiatal hernia repair, presented with increasing dysphagia to the point where he was entirely G-tube dependent. Ba swallow and EGD revealed an esophageal diverticulum just above the diaphragm. The site looked chronically inflamed on EGD. With this pathology suspected to be the source of pain the patient underwent thoracoscopic resection. The patient was positioned in a modified prone position with the left side elevated 30 degrees. Three 5 mm ports were used for the procedure. Rigid esophagoscopy was performed at the start of the procedure and Flexible esophagoscopy was used intra-operatively to help localize the lesion. A complete resection of the diverticulum was performed and a primary repair with vicryl suture was performed.

**RESULTS:** The procedure was completed successfully. Operative time was 90 minutes. An NG tube and chest drain was left in place. On day 3 a G-tube study was performed which showed no reflux or leak and tube feeds were started. On day 5 a swallow study was done which showed no leak and resolution of the diverticulum. At the time of discharge on day 6 the patient was tolerating a soft diet.

**CONCLUSION:** A Thoracoscopic approach to difficult esophageal pathology is safe and effective and avoids the major morbidity of a standard thoracotomy.

**V017 LAPAROSCOPIC EXCISION OF AN ABDOMINAL LYMPHATIC MALFORMATION** Sherif Emil, MDCM, Montreal Children's Hospital; McGill University Health Centre

**BACKGROUND:** Lymphatic malformations can occur within the abdominal cavity, where they can be discovered incidentally or become acutely symptomatic due to torsion, hemorrhage, rupture, or sudden enlargement. We present a video of a laparoscopic excision of an extensive lymphatic malformation arising from the lesser curvature of the stomach.

**VIDEO PRESENTATION:** A 15 year old girl presented with several days of shifting abdominal pain progressing steadily in severity. An ultrasound discovered a large cystic mass and suggested a pelvic origin. CT scan confirmed the diagnosis, suggesting a large cystic adnexal mass extending into the upper abdomen.

At laparoscopy, the cystic mass was found to be a giant, complex lymphatic malformation, complicated by torsion. The anatomy of the lymphatic malformation was progressively defined and a lesser curvature origin was determined. The malformation was dissected from the gastrocolic omentum, gastric wall, lesser curvature mesentery, and lesser sac to achieve complete excision.

The procedure was uncomplicated. The patient was started on oral intake immediately after the procedure, and discharged the following day. Her symptoms resolved. At one year follow-up, a screening ultrasound showed no evidence of recurrence.

**CONCLUSIONS:** Laparoscopy provides the advantage of identifying and treating alternate pathology at the same operation, when the initial diagnosis is inaccurate. Fundamental laparoscopic principles and techniques can be applied to treat rare and unusual lesions.

**V018 TECHNICAL REAPPRAISAL OF LAPAROSCOPIC KASAI PORTOENTEROSTOMY FOR UNCORRECTABLE BILIARY ATRESIA** Atsuyuki Yamataka, MD, Go Miyano, MD, Hiroyuki Koga, MD, Tsubasa Takahashi, MD, Akihiro Shimotakahara, MD, Yoshifumi Kato, MD, Geoffrey J Lane, MD, Tadaharu Okazaki, MD Department of Pediatric General & Urogenital Surgery, Juntendo University Hospital

Laparoscopic Kasai portoenterostomy (LKPE) has generally been abandoned in favor of open Kasai for uncorrectable biliary atresia (UCBA) because of poorer outcome. We are the only center currently performing LKPE in Japan and present our experience using our LKPE. A female infant presented with jaundice and acholic stools highly suggestive of UCBA. After thorough investigation, LKPE was performed at the age of 70 days. LKPE confirmed the provisional diagnosis of UCBA. In our LKPE, a 5mm trocar is placed in the epigastrium, in addition to conventional trocar placement. A Ligasure device is inserted through this additional trocar to seal portal vein branches at the porta hepatis draining into the caudate lobe, instead of hook diathermy that is used universally elsewhere because there is a risk for lateral thermal injury to micro bile ducts. We minimize porta hepatic micro bile duct injury during anastomosis between the Roux-en-Y jejunum and the liver parenchyma around the transected biliary remnant by not suturing where the original right and left bile ducts were, and making sutures deliberately shallow but deep enough to prevent leakage. In addition, our anastomosis is more central to the porta hepatis, like the original Kasai, compared with "extensive lateral dissection" commonly performed elsewhere in Japan. The length of the Roux-en-Y jejunal limb should be individualized, not predetermined to be 30, 40, or 50cm as is common practice; the jejuno-jejunostomy should fit naturally into the splenic flexure, otherwise the redundant limb may become tortuous as the patient grows, causing bile stasis and possible cholangitis. She became jaundice-free (Total bilirubin < 1.5mg/dL) within 2 months of LKPE and remains jaundice-free after 11 months' follow-up. Although an extra trocar is required, our technically reappraised LKPE may prove to be a promising alternative to open Kasai.

**V019 EXPERIENCE WITH TRANESOPHAGEAL INCISIONLESS FUNDOPLICATION IN A CHILD** Steven Rothenberg, MD, Theodore Stathos, MD the Rocky Mountain Hospital for Children, Columbia University College of Physicians and Surgeons

**PURPOSE:** To evaluate a new intra-luminal device for creating an anti-reflux valve in patients with severe gastro-esophageal reflux disease.

**METHODS:** A combined team of a pediatric surgeon and pediatric gastroenterologist received training in a new trans-esophageal, intra-luminal device, the Esophyx (Endogastric, solutions, Redmond Washington) used to create a transoral incisionless, fundoplication (TIF) in early 2009. This procedure was then offered as an alternative to a laparoscopic fundoplication in appropriate patients. Selection criteria included weight over 25 KG, DeMeester score greater than 40, No significant hiatal hernia on endoscopy, and a failure of medical management with continued severe symptoms. This video demonstrates the procedure in a 25 Kg, 8 year old male, with a DeMeester score of 60. The procedure was performed in the OR under general anesthesia and consent was obtained to perform a laparoscopic Nissen if the procedure was deemed undoable at the time of endoscopy. The procedure consisted of a diagnostic endoscopy, then insertion of the Esophyx device over the gastroscope and in to the stomach, and then formation of the TIF.

**RESULTS:** The procedure was completed successfully. Operative time was 45 minutes. The patient was admitted for observation overnight and started on clears immediately post-operatively, and discharged the next day.

The patient is asymptomatic with regard to his GERD. A repeat endoscopy and pH probe at 2 months post-procedure showed an intact fundoplication and marked improvement with reflux less than 1% and. The patient had mild dysphagia for approximately 7 days.

**CONCLUSION:** TIF maybe a reasonable alternative laparoscopic fundoplication in larger pediatric patients with severe symptomatic and refractory GERD. Long term follow-up and a larger patient series will be necessary to determine its true efficacy.

**V020 ROBOTIC SPLENECTOMY** Louis C Lee, MD, Stephen S Kim  
Inova Fairfax Hospital for Children

**INTRODUCTION:** This video demonstrates a da Vinci robot-assisted laparoscopic splenectomy in a 20 kilogram, 5 year-old female. The patient and her family had a history of hereditary spherocytosis. She presented with hyperbilirubinemia and splenomegaly of 12 cm.

**SURGICAL TECHNIQUE:** The patient was placed supine with her left side elevated. Four ports were inserted in a curvilinear fashion directed towards the left upper quadrant. A single 12 mm umbilical camera port, two 8 mm daVinci ports and a single 5 mm assistant port were placed. A bipolar Maryland dissector and monopolar hook were used for much of the dissection. The splenic artery and vein were individually ligated with 2-0 braided polyester sutures. The spleen was morsellated and removed through the umbilical port. Total operating time was approximately 2.5 hours, with minimal blood loss. The patient was discharged on post-operative day #1.

**CONCLUSION:** Robotic splenectomy is feasible in small children. The enhanced stereoscopic visualization allows fine dissection of the hilar vessels and splenic attachments. In instances where an endoscopic stapler may not be easy to apply, especially in small children, the endowrist robotic instruments allow individual ligation of major vessels. We expect the operative time to decrease with increasing robotic experience.

**V021 DA VINCI ASSISTED DUODENOJEJUNOSTOMY FOR SUPERIOR MESENTERIC ARTERY SYNDROME** CM Schlachta, MD, FRCSC, S. Jayaraman, MD, FRCSC, A. Butter, MD, MSc, FRCSC, University of Western Ontario, London Health Sciences Centre, Children's Hospital of Western Ontario and Canadian Surgical Technologies and Advanced Robotics (CSTAR)

Superior mesenteric artery (SMA) syndrome involves vascular compression of the third part of the duodenum, eventually leading to gastrointestinal obstruction. Duodenojejunostomy is indicated after failure of conservative management as well as in chronic cases. We report a case of a cachectic 16 year old girl with dyskeratosis congenita who suffered from SMA syndrome for 18 months. Upper endoscopy and preoperative imaging (upper GI series and abdominal CT scan) confirmed the diagnosis. A da Vinci assisted duodenojejunostomy was performed after obtaining informed consent from the patient and her parents. Intraoperatively, a dilated duodenum to the level of D3 was noted. A side-to-side two layer handsewn anastomosis was performed. The patient was discharged home on postoperative day #3. She gained 2 kg within one month. Fourteen months later, she remains asymptomatic. To our knowledge, this is the first reported case of a robotically assisted duodenojejunostomy for superior mesenteric artery syndrome.

**V022 SINGLE PORT CHOLECYSTECTOMY IN RESIDENT TRAINING: A REPRODUCIBLE TECHNIQUE** Todd A. Ponsky, MD, Rainbow Babies and Children's Hospital, Case Western Reserve University

**INTRODUCTION:** As single port surgery gains popularity, surgeons are continually looking for ways to modify and improve the technique, such as reducing the number of trocars, using purely straight instruments, and using operative laparoscopes. While these techniques may slightly reduce the size of the incision, they often add complexity to the case may lead to the collision of the hands, and are therefore not always easily reproduced by other surgeons or residents.

Here we describe a technique that is cost effective, easily reproduced, has a very short learning curve, no bumping of the hands, short operative time and is easily adapted by residents.

**VIDEO DESCRIPTION:** This video demonstrates our technique, which we have used to train over 150 surgeons. The specific case shown was performed by a PGY4 resident with no experience with single port surgery. Total operative time was 38 minutes and there were no complications.

The technique involves the placement of three low profile, inexpensive, 5mm trocars or one 2cm multi-port trocar in the umbilicus. The addition of a 2mm grasper in the inferior portion of the umbilicus replicates the traditional 4 port cholecystectomy. An inexpensive reticulating infundibulum grasper, a 50cm long laparoscope and a straight dissector can be used to perform the operation safely, without collision of the hands, and with safe visualization of the critical view.

**CONCLUSION:** If single port surgery is to be adopted by the masses, the technique must be, safe, easy, cost-effective and easily reproducible. The technique described here has been used to teach over 150 surgeons and has is easily reproducible.

**V023 ROBOTIC SURGERY: REPAIR OF A RETROCAVAL URETER CAUSING HYDRONEPHROSIS** Juan I. Camps, MD, MBA, Joel F. Bradley III, MD, Jeffrey T. Ehreth, MD, Palmetto Health Children's Hospital and the University of South Carolina Department of Surgery

**INTRODUCTION:** Retrocaval ureter is a rare condition occurring at an estimated 1 in 1000 of the general population. It is usually found as an incidental finding on routine radiologic examinations. The most common clinical presentation is hydronephrosis from obstruction of the ureter. Symptomatic patients usually present in the 3rd to 4th decade of life, however, there are few reported cases in the pediatric population. We present a case of a 10 year old child with a retrocaval ureter causing hydronephrosis who underwent a minimally invasive robotic repair.

**CASE REPORT:** 10 year old male presented with right flank pain and through his workup was found to have hydronephrosis from obstruction of his right ureter as it coursed posterior to the inferior vena cava. Preoperatively he had a ureteral stent placed to treat his hydronephrosis.

**METHODS:** He underwent a minimally invasive robotic ureteroureterostomy to correct the problem. He was positioned supine with his right side up at 45 degrees on a bean bag. A 12 millimeter robotic camera port was placed at the umbilicus. Two robotic trocars were placed as the main working arms with one in the right subcostal area and the other in the right flank. Two accessory ports were also placed, one in the lateral right flank to retract the liver and the other inferior to the umbilical port for suctioning and passing sutures. The retroperitoneum was entered at the pelvic brim and the ureter was identified. It was then traced up to the point at which it became retrocaval. Next, the renal pelvis and proximal ureter were dissected out until the ureter was free from underneath the vena cava. A vessel loop was placed around the ureter and greatly aided in the dissection. The ureter was then transected and the ends spatulated. It was brought out from underneath the vena cava to prepare for an ureteroureterostomy over a stent. A posterior running row of absorbable sutures was fashioned first, the stent was positioned, and then the anastomosis was completed anteriorly. Thus completing the robotic ureteral repair, the trocar sites were all closed in a standard fashion.

**RESULTS:** The patient did well postoperatively and went home on day number two. There were no immediate or late complications to date. He underwent a retrograde pyelogram six weeks out from his operation which showed no stenosis or leak at the anastomosis. His stent was then removed and he has done well since that time.

**DISCUSSION:** Retrocaval ureter is a rare cause of pediatric hydronephrosis. A minimally invasive robotic repair can provide a safe and feasible repair of this problem. The maneuverability and increased dexterity of the robotics greatly aids in the creation of intracorporeal anastomoses. This benefit is even more pronounced and appreciated in the pediatric population.

**V024 LAPAROSCOPIC COLOCYSTOPLASTY: THE IDEAL SURGERY FOR THE SELECTED PATIENT** Lisandro A. Piaggio, MD, Nestor H. Piaggio, MD, Pablo Long, MD, Gustavo Sofia, MD, Hospital Italiano Regional del Sur, Bahía Blanca, Bs.As, Argentina

**INTRODUCTION:** bladder augmentation with different tissues is the standard of care for neurogenic bladder with failed medical treatment

**MATERIAL & METHODS:** We present a video demonstrating our technique of laparoscopic colocolocystoplasty. The patient is a 12-year-old boy with neurogenic bladder secondary to myelomeningocele with a hypertonic noncompliant bladder despite maximum dose of anticholinergic medication and compromised upper urinary tract. He catheterizes through urethra and is dry between catheterization, is continent of stool, ambulates and has no VP shunt. We performed a transperitoneal approach with four ports: 18mm, 10mm (2) and 5mm (1). The bladder was extensively exposed. A 20 cm segment of sigmoid colon was isolated between two 60mm endostaplers. Bowel continuity was established with a 19mm circular stapler exposing the proximal colon through the belly bottom for anvil head placement. Bowel reconfiguration was performed exposing the isolated segment through the belly bottom. The bladder was extensively opened and colocolocystoplasty performed with two running sutures of 3-0 polyglactin. A suprapubic tube was placed and exteriorized through one of the port sites.

**RESULTS:** The procedure was successfully performed with minimal blood loss. Bowel function was recovered at 36 hours postoperatively. Patient was discharged home on postoperative day 4. Intravenous narcotic requirement was minimal. The suprapubic tube was discontinued at three weeks and patient resumed intermittent catheterization remaining dry. Serum creatinine level normalized at 1 month postoperative.

**CONCLUSION:** Laparoscopic colocolocystoplasty is a promising technique for selected patients with neurogenic bladder.

**V025 MIS FOR THE TREATMENT OF A CONGENITAL MIDURETERAL OBSTRUCTION** Lisandro A. Piaggio, Nestor H. Piaggio Hospital Italiano Regional del Sur, Bahía Blanca, Bs.As, Argentina

**INTRODUCTION:** congenital ureteral obstruction is typically present at the ureteropelvic or ureterovesical junction. Congenital obstruction of the middle portion of the ureter is rare. Its etiology is usually a ureteral membrane or "valve" rather than a true stenosis. Standard treatment is an open uretero-ureterostomy (UU) if the kidney has preserved function or nephroureterectomy in the contrary. To the best of our knowledge this is the first report of a laparoscopic UU for an congenital midureteral obstruction.

**MATERIAL & METHODS:** We present a video demonstrating a laparoscopic UU. The patient is a 14 month-old girl with antenatal diagnosis of hidroureteronephrosis. Imaging studies were compatible with left mid-ureteral obstruction. A ureteral membrane was found after percutaneous access to the kidney and treated with endoureteral cut, dilatation and double J stent placement. The obstruction reoccur and was successfully treated with a transperitoneal laparoscopic UU. Three ports (4mm (1), 3mm (2)) were used. A novel technique for nephrostent placement is showed. The anastomosis was carried out with a running 5-0 reabsorbable monofilament suture.

**RESULTS:** There were no intra or postoperative complications. The procedure was performed with negligible blood loss in 200 minutes. Postoperative course was uneventful. There was no need for narcotics for pain control. Patient was discharge home on postoperative day 2. Stent was removed in the clinic on ppop day 10. At 18 months of follow up the patient is asymptomatic with no evidence of obstruction on radiologic studies.

**CONCLUSION:** in our experience endoscopic techniques were not useful for the treatment of a congenital obstructing ureteral membrane. Laparoscopic UU yields in an effective MIS salvage procedure.

**V026 A RABBIT MODEL FOR LAPAROSCOPIC PEDIATRIC INGUINAL HERNIA REPAIR** Jeffrey A. Blatnik, MD, Kareem C. Harth, MD, Steve J. Schomisch, PhD, Todd A. Ponsky, MD, Department of Surgery, University Hospitals of Cleveland, Case Western Reserve University

**INTRODUCTION:** Laparoscopic repair of pediatric inguinal hernias has been described in great detail in the literature, and numerous techniques have been described. As with any new procedure a model for training is often necessary for adequate investigation of the technique. The purpose of our submission is to show a rabbit model for laparoscopic pediatric inguinal hernia repair, specifically for the Subcutaneous Endoscopically Assisted Ligation (SEAL) technique.

**DESCRIPTION OF VIDEO:** The SEAL technique involves placing a single umbilical laparoscopic port, and using a 30 degree laparoscope for visualization of the inguinal defect. A stitch is then placed extracorporeally into the abdomen and then guided retroperitoneally

around the defect to ligate the hernia. In males the spermatic cord is excluded from the stitch. The benefit of this technique over open repair may be less trauma to the spermatic cord, no visible scar and less pain for the patient.

The male New Zealand White rabbit has a congenital inguinal hernia similar to a patent processus vaginalis seen in infants. The spermatic cord in the rabbit travels within the lumen of the hernia sac as opposed to the human spermatic cord which is retroperitoneal and travels under the hernia sac. To simulate a male inguinal hernia repair the cord structure can be left in place and skipped over with the needle as performed in humans. For the female model, the testicle can be internalized laparoscopically by dividing the gubernaculum with laparoscopic shears. The defect can then be closed completely by the SEAL technique without the need to skip over the vessels.

**CONCLUSIONS:** The male New Zealand White rabbit can serve as an excellent model for training in laparoscopic pediatric inguinal hernia repair and for research. The methods to prepare the model for both male and female equivalent anatomy are shown, and can be completed easily by any laparoscopically trained surgeon. The SEAL technique as shown here is just one method of repair that can be performed with this model.

**V027 PEDIATRIC LAPAROSCOPIC VENTRICULOGASTRIC SHUNT** Juan Ignacio Bortagaray, MD, Enrique Buela, MD, Horacio Bignon, MD, Carolina Millan, MD, Marcelo Martinez-Ferro, MD Fundación Hospitalaria - Private Children's Hospital

**INTRODUCTION:** Hydrocephalus is an abnormal accumulation of cerebrospinal fluid (CSF) in the ventricles of the brain which may lead to increased intracranial pressure, progressive enlargement of the head, convulsions and mental disability. Obstructive hydrocephalus may be due to congenital or acquired causes. The treatment is surgical and generally involves the placement of a ventricular catheter to drain the excess fluid into the peritoneal, atrial or pleural cavity. We report our preliminary experience in the laparoscopic treatment of hydrocephalus by means of a ventriculogastric shunt (VGS) in a girl with chronic pyoventriculitis.

**CASE REPORT:** Female patient with neonatal diagnosis of tethered cord and dermoid sinus at the lumbosacral level. At 10 months old she presented infection of the dermoid sinus and hydrocephalus, requiring dermoid sinus resection, lumbar spine surgical toilette (LSST) and external ventricular drainage (EVD). Ventriculoperitoneal (VPS) or ventriculoatrial (VAS) shunts were contraindicated due to persistent positive CSF cultures. Another LSST was done as well as periodical revision procedures of the EVD, 3 ventriculostomies and coagulation of the choroid plexus. The girl was diagnosed with chronic pyoventriculitis and Arnold-Chiari malformation treated with an external posterior fossa drainage. At 15 months of age she presented a negative CSF culture and a VPS was attempted. 48 hs postoperatively it had to be removed because of a subphrenic abscess and peritonitis. At last, at 26 months of age, a VGS was performed.

**SURGICAL TECHNIQUE:** The patient was approached laparoscopically. A 4 mm umbilical port was used for the 4 mm 30° scope. The 6 mm and 3 mm working trocars were inserted into the right and left upper quadrants, respectively. A transparietal diaphragmatic stitch was used for liver retraction. The catheter was left at the epigastrium by the neurosurgeon and introduced into the abdominal cavity with a peel away system. The distal portion consisted of 2 parts: (1) a unidirectional antireflux valve located at its tip and (2) a connector with a knotted non-absorbable thread 5 cm

proximally to the valve. A purse string was performed in the anterior wall of the stomach's body where the catheter was introduced. The purse string was then closed and tied to the catheter's thread. A witzel tunnel was created to fix the catheter.

**RESULTS:** The patient tolerated the procedure well with an uneventful postoperative recovery. There were no intraoperative or postoperative complications. Antibiotic treatment was completed successfully. Neurologic improvements were noted. The girl was discharged from hospital one month after surgery and continued with professional home care. No dysfunction was registered within the 18 months follow-up.

**CONCLUSIONS:** The ventriculogastric shunt has proven to be safe for the treatment of selected cases of infantile hydrocephalus. The procedure is technically feasible and can be satisfactorily performed by laparoscopy whenever a VPS or VAS is contraindicated.

**V028 SINGLE SURGICAL SITE LAPAROSCOPIC APPENDECTOMY** Robert C. Kanard, MD, Todd Ponsky, MD, University of Illinois at Chicago

With the recent explosion of single site laparoscopic surgery, many new technologies have been developed to facilitate this approach. Although helpful in more advanced laparoscopic surgery, the new technology increases the cost of surgery and can complicate unnecessarily the more basic procedures. Here we present a technique for single site laparoscopic appendectomy using basic instruments already available.

The skin incision is made entirely within the borders of the umbilicus, and a prefascial space is created bluntly beneath the inferior margin of the incision. The umbilical hernia is reopened bluntly, and a trocar is inserted. After peritoneal insufflation is obtained, an examination can be made of the peritoneal space for other pathologies. A five millimeter stab incision is made inferior to the port with a one millimeter fascial bridge between the two fascial incisions. Loculations can be opened and purulent fluid can be evacuated at the time. The tip of the appendix is grasped with a locking grasper and the appendix is drawn to the umbilicus. The port is removed and the two fascial incisions are connected with the aid of a right angle clamp. The appendix is delivered into the operative field and the mesoappendix is divided either by suture ligation or electrocautery. The mesoappendix is divided progressively until the cecum is delivered into the operative field. The base of the appendix is ligated with two absorbable sutures. After the appendix is divided the port is reinserted. The operative site is then examined to confirm hemostasis and the appendix is divided at its base. The port is removed and the fascia is closed in the usual manner.

This approach simplifies and streamlines the procedure and decreases the learning curve for single site laparoscopy. Using a port, a camera, and a grasper the costs are also kept under control. Removing the appendix through a single incision obtains an excellent cosmetic outcome and, in certain patients, decreases post-operative pain.

**V029 HELPFUL TIPS FOR INTRACORPOREAL CHOLEDOCHAL CYST RESECTION AND ROUX-EN-Y RECONSTRUCTION** Chris M. Anderson, MD, Bryan Weidner, MD, Walt Disney Pavilion at Florida Hospital for Children

Given the incidence of biliary cysts is estimated to be 1:100,000 to 150,000, most pediatric surgeons will perform this surgery only a few times in their career. Recent series show an increase in prevalence among adults and older children, allowing greater opportunity for a minimally invasive approach for surgeons with varying skill levels. This video demonstrates a few simple tips to hopefully improve outcome and hasten operating time.

A 3-year old male presented with a two-day history of abdominal pain. Work-up revealed a Type I choledochal cyst with mild pancreatitis. After the pancreatitis resolved he underwent an intracorporeal choledochal cyst resection with Roux-en-Y reconstruction. The surgery was performed using 2, 5-mm and 3-mm ports. Portal exposure was enhanced using a transcutaneous stitch through the gallbladder. The Roux limb was marked and controlled with a red vessel loop and the proximal limb with a blue vessel loop. The jejunojejunostomy was performed with U-clips.

Total operating time was 240 minutes. No intraoperative complications reported. Mild pancreatitis post-operatively delayed oral intake, but once resolved, diet was advanced and the child discharged on post-operative day 5. No pain control was required after discharge. Follow-up 6 months later was unremarkable with no recurrent pain, jaundice, or pancreatitis.

Total intracorporeal choledochal cyst resection and Roux-en-Y reconstruction is feasible, even if encountered infrequently in practice. These few tips will help with exposure, anatomy, and decrease operative time in a complex laparoscopic procedure.

### **V030 LAPAROSCOPIC RESECTION OF A URACHAL REMNANT**

Michael J. Leinwand, MD, FACS, Brandon Minnick, MD, The Children's Hospital at Bronson

Presented is the case of a 12 year old boy with umbilical erythema, tenderness, and drainage. Ultrasound confirmed the diagnosis of urachal remnant. This video shows the laparoscopic resection of the urachal remnant. The technique was both simple and quick to accomplish. The clinical and cosmetic results were outstanding.

### **V031 A MORE SECURE LAPAROSCOPIC GASTROSTOMY: A MODIFICATION OF THE GEORGESON TECHNIQUE**

Karen A. Diefenbach, MD, Gustavo A. Villalona, MD, Milissa A. McKee, MD, Yale School of Medicine

**PURPOSE:** To demonstrate a modification of the Georgeson Laparoscopic Gastrostomy technique in which the stomach is sutured to the anterior abdominal wall with resulting decreased incidence of re-operation for dislodgement of the gastrostomy tube.

**METHODS:** A modification of the well-known laparoscopic gastrostomy technique is shown with placement of three interrupted sutures in the stomach which are brought up through the fascia and out of the gastrostomy site using a suture retrieval device. Once the needle and guidewire have been placed, the tract has been dilated, and the gastrostomy button has been placed, these sutures are tied down to secure the stomach to the anterior abdominal wall.

**RESULTS:** Although we have had several inadvertent removals of the gastrostomy buttons in both the early and late periods, since instituting this modification, we have had no disruptions of the gastrostomy tract. All buttons were successfully replaced without reoperation.

**CONCLUSION:** This modification of the Georgeson technique has been successful in reducing the incidence of dislodgement requiring reoperation.

### **V032 A NOVEL TECHNIQUE FOR PECTUS BAR STABILIZATION DURING NUSS PROCEDURE**

Ankush Gosain, MD, PhD, James W. Eubanks III, MD, University of Tennessee Health Science Center

**BACKGROUND:** Pectus bar displacement is a well-described complication following minimally invasive correction of pectus excavatum (Nuss procedure). The use of lateral stabilizing bars appears to decrease the incidence of bar migration but increases the

wound complication rate. We present a novel technique for minimally-invasive pectus bar stabilization with sternal wire without a lateral stabilizer bar.

**TECHNIQUE:** We utilize a single 5mm-trocar for thoracoscopic guidance during pectus bar placement. The trocar is placed in the lowest-possible intercostal space on the right. The left pleural space is routinely entered during the sternal dissection. Once the pectus bar has been positioned appropriately, the thoracoscope is advanced into the left hemithorax. Using the Endo Close device, a loop of 0-PDS suture is passed into the chest near the thoracic insertion of the pectus bar, and retrieved such that the loop traverses one rib. An end of #2 sternal wire is hooked to the end of this loop and the loop is then used to guide the wire back through the chest and around the rib. This is repeated with a second wire placed laterally around the same rib and a third wire around a separate rib, resulting in multiple-point fixation.

**CONCLUSIONS:** This technique of pectus bar stabilization allows for multiple-point fixation with sternal wire and avoids the bulk and potential wound complications associated with lateral stabilizer bars.

### **V033 OLD DEVICE, NEW APPLICATION - A SNAKE LIVER RETRACTOR USED TO MANIPULATE A MEDIASTINAL MASS**

Nadav Slijper, MD, Marcos Bettolli, MD Children Hospital of Eastern Ontario, Ottawa, Ontario, Canada

We present the use of a snake liver retractor in a case of a posterior mediastinal ganglioneuroma, as a mass manipulator.

A 4y 9m boy was referred to us with an incidental finding of a right posterior mediastinal mass. An MRI was suggestive of a neuroblastoma measuring 6.1 x 5.1 x 7.9 cm. A thoracoscopic biopsy confirmed a ganglioneuroma.

We approached the tumor using a right thoracoscopy. Owing to the mass size and consistency manipulation of the mass without grabbing and tearing the lesion was very difficult. The use of the snake liver retractor allowed us to handle the mass without injuring the tissue, thereby allowing us to safely dissect the mass and excise it.

We found the snake retractor safe and useful despite the limited working space within the child's chest. We believe that in other cases it could facilitate tissue handling while minimizing tissue injury and tumor spillage

### **V034 VALUE OF LAPAROSCOPE AS RIGID ENTEROSCOPE IN A CASE OF BLUE RUBBER BLEB NAEVUS SYNDROME**

S. D. Adams, Lisle R., Chouhan A., Coelho T., Mahomed A., A. Royal Alexandra Childrens Hospital, Brighton

This video demonstrates a novel technique for endoluminal use of a laparoscope to assist in open resection of congenital Gastro-intestinal venous anomalies.

12 year old Caucasian male referred with a diagnosis of Blue Rubber Bleb Naevus Syndrome (Bean Syndrome) affecting the Pharynx, skin and entire GI tract and having had a tracheostomy placed due to laryngeal lesions. He had been transfusion dependent for 6 years, requiring 46 adult units of packed red cells in the preceding year. Extensive investigation was undertaken including upper and lower GI endoscopies, capsule endoscopies and Red Cell Scan. It became clear that surgical treatment of the GI lesions was mandated and a novel approach was considered due to the extensive nature of the disease.

A midline laparotomy was performed and the bowel sequentially examined, the first lesion was identified and a wedge excision performed. This site was then used as an enterotomy to allow insertion

of a 0 degree 10 mm laparoscope. The laparoscope was passed along the bowel proximally and then distally and the bowel intussuscepted over the scope and slowly released to allow the entire bowel mucosa to be visualised. The lesions identified were marked with a clip on the exterior and complete wedge excision of each lesion performed. This procedure was repeated along the entire length of the small bowel and colon from distal duodenum to rectum, with the most distal lesion being used as the new enterotomy site.

In total 20 lesions were excised (13 small bowel, 7 colon). The operative time was 6 hours. There were no intra or postoperative complications and the patient made an uneventful recovery and was discharged home on day 11 post operatively. Post-op transfusion requirements have reduced to from 4 to 1.5 units per month accounted for by known pharyngeal lesions and a lesion in the third part of duodenum that was troublesome to visualize at open operation, a purely endoscopic procedure is planned to deal with this.

Several interventional approaches have been reported in the literature for this condition. The use of therapeutic endoscopy has been widely described. The sole use of endoscopy is limited due to its accessibility to the lesions. As most lesions are found in the small bowel a combined surgical approach with intraoperative endoscopy has been favoured. In patients where the entire bowel is not visualised there is a high risk of re-bleeding and further transfusion requirements. The success of utilising a laparoscope endoluminally in this situation should encourage further exploration of this technique.

**V035 GASTRO-PHRENOPEXY FOR INTERMITTENT PARTIAL ORGANOAXIAL VOLVULUS** Ram M. Nataraja, MBBS, BSc, MRCSd, Rebecca M. Lisle, MBBS, BSc, MRCSeng, Anies A. Mahomed, MBBCh, FCSSA, FRCSGlasg Ed FRCSpaeds Department of Paediatric Surgery, Royal Alexandra Children's Hospital, Brighton, BN2 5BE, United Kingdom

**AIMS:** Laparoscopy has provided a perspective of pathology not previously available on imaging or at open surgery. In this instance we present video images of the pathological features of partial organoaxial volvulus and demonstrate a novel but simple technique for its management.

**METHODS:** 2 paediatric patients with an initial presentation of post prandial epigastric discomfort were investigated by upper gastrointestinal contrast meal. These investigations revealed the presence of a rare variant of primary organoaxial gastric volvulus with the redundant fundus folded over the body of stomach. Both patients underwent a laparoscopy which confirmed gastromegaly with redundant gastrophrenic and gastrolial ligaments. A gastro-phrenopexy was performed with initial pexy of principally the fundus to the left hemi diaphragm utilising interrupted non absorbable sutures. The gastrophrenopexy was performed without an oesophagocardiopexy, anterior gastropexy or gastrostomy creation. A video demonstrates the technical aspects of the procedure with the associated pre- and post-operative imaging for both patients.

**RESULTS:** Both procedures were accomplished laparoscopically in less than 60 minutes with no immediate post-operative complications. The patients were discharged the following day on a full diet. Symptom resolution occurred with both patients. One patient underwent a repeat upper gastrointestinal contrast study 4 years post-intervention which demonstrated an intact gastropexy.

**CONCLUSIONS:** Partial organoaxial gastric volvulus is a definite entity which causes symptoms and requires a laparoscopic gastrophrenopexy. The technique of gastric fixation is straightforward and has durable long term results.

**V036 LAPAROSCOPIC EXCISION OF AN ESOPHAGEAL DUPLICATION CYST** Jennifer H. Aldrink, MD, Brian D. Kenney, MD, MPH Nationwide Children's Hospital

We report the case of a two-year old male with spinal muscular atrophy and chronic aspiration, who presented for laparoscopic Nissen fundoplication. An upper gastrointestinal series documented severe reflux and normal intestinal rotation. No other abnormalities were noted on the radiographic study. The child was maintained on gastrojejunal feeds from a previously placed gastrostomy tube until he presented for fundoplication.

At laparoscopy, one 5-mm port was placed in the umbilicus, followed by three additional 3-mm ports in the subxiphoid, right anterior axillary line, and left upper quadrant. Following exposure of the esophageal hiatus, a 3cm cystic structure was visualized, arising from the anterior esophagus. This esophageal duplication cyst was resected from the anterior surface of the esophagus using an alternate energy device. The cyst was completely excised without significant muscularis defect of the native esophagus. The esophageal crura were reapproximated and a 360-degree fundoplication was then constructed, incorporating the cyst resection site. The patient was started on enteral feeds on postoperative day one, and was discharged home on postoperative day three on full enteral feeds. The pathology was consistent with an esophageal duplication cyst.

**V037 ONE-TROCAR LAPAROSCOPIC-ASSISTED HERNIORRHAPHY IN INFANTS AND CHILDREN** Yu-Tang Chang, MD, Jan-Sing Hsieh, PhD, Jaw-Yuan Wang, PhD Kaohsiung Medical University Hospital

Laparoscopy is an alternative procedure for pediatric inguinal hernia; however, reported techniques usually necessitate two or three trocars and excellent intraabdominal skills. The authors describe the modification of one-trocar endoscopic-assisted closure of the hernia defect. Under a 5-mm laparoscopic guidance, the hernia defect was enclosed by a nonabsorbable suture, which was introduced into the abdomen by an 18-gauge vascular access on one side of the hernia defect and withdrawn on the opposite side by a homemade hook-pin through the same puncture wound. Then, extracorporeal knot tying was performed. During the procedure, 5 to 8 mL of isotonic saline solution was infused via the needle into the preperitoneal space (hydrodissection) to obtain the preperitoneal dissection of both sides of the hernia defect. Hydrodissection avoided trauma to the cord structures, made a complete ring without a gap, and provided further tensionless knot tying.

**V038 ENDOSCOPIC URETHRAL DIVERTICULECTOMY** Lisandro A. Piaggio, MD, Juan Martorelli, MD, Clinica Dr. Raúl Mattered, SERMEX, Bahía Blanca, BA, Argentina

**INTRODUCTION:** urethral diverticulum is a rare cause of obstruction of the lower urinary tract. Reports of endoscopic treatment are scant. The rationality of this approach is to excise the distal obstructing lip of the diverticulum, but may be insufficient for urinary deobstruction or normal anatomic restoration. The standard approach is an open one-stage surgical treatment with or without previous urinary diversion. Two-stage urethral reconstruction has also been proposed. Open surgery carries a higher risk of complications like urethro-cutaneous fistula. We propose an aggressive endoscopic anterior and posterior diverticular lips resection that aids in a more anatomical urethral reconfiguration.

**MATERIAL & METHODS:** we present a video of endoscopic resection of a urethral diverticulum. Patient is a 22 days old boy with urinary obstruction. Complaints, PMH, physical and radiologic findings are

discussed. A 9 Fr. pediatric nephro-cystoscope with a rectal 5 Fr. working channel was used. Fulguration of anterior and posterior diverticular lips were carried out with a 3 French angled disposable electrode. A 10 French urethral catheter was left indwelling for 10 days.

**RESULTS:** The procedure was successfully performed in 30 minutes. Patient remained in clinical observation for 48 hours. Postoperative course was uneventful except for some scrotal swelling that resolved completely on few days. Deobstruction was clinically evident. Long term urethrogram is completely normal. .

**CONCLUSION:** We believe that endoscopic urethral diverticulectomy should be the first line of treatment for congenital urethral obstructing diverticulum. Open surgery should be reserved only as a salvage procedure.

**V039 TRANSGASTRIC ENDOSCOPIC GUIDED EXCISION OF A LARGE GASTRIC TRICHOBEZOAR** Connie J. Rossini, MD, Kevin P. Moriarty, MD, Gregory T Banever, MD Baystate Children's Hospital / Tufts University School of Medicine, Springfield MA

**PURPOSE:** The purpose of this case report is to describe a novel minimally invasive way to remove a large gastric trichobezoar via a single port transgastric technique under endoscopic guidance.

**DESIGN:** This is a 15-year-old female who presented with a three-month history of weight loss, emesis and abdominal pain. A CT scan of the abdomen showed a large gastric bezoar extending into the duodenum. She had a long history of compulsive hair eating and was under weight with a body mass index of 17 at the time of surgery. Due to the large size of the bezoar, endoscopic removal was not possible. A minimally invasive approach with a combination of endoscopy and transgastric laparoscopy was performed for removal of the large gastric bezoar.

**RESULTS:** The patient underwent a transgastric removal of the trichobezoar under endoscopic guidance. Via a transverse left upper quadrant incision a gastrotomy with stay sutures was placed to allow a balloon tipped Hasson trocar to be introduced into the gastric lumen. With endoscopic visualization, a combination of laparoscopic scissors and a 5 mm LigaSure device were used to break up the trichobezoar into portions that could be removed via the transgastric port. After the majority of the bulk of the bezoar was removed, the remaining portion was removed en mass through the anterior abdominal wall incision. This allowed for a minimal incision size and avoidance of contaminating the peritoneal cavity. The patient was restarted on a diet post-operative day four and was treated with an antibiotic course for cellulitis of the incision.

**CONCLUSION:** In conclusion, a single port transgastric approach with endoscopic guidance is a minimally invasive option for removal of a large gastric trichobezoar.

**V040 SINGLE SITE LAPAROSCOPIC ILEOCECTOMY FOR RECURRENT INTUSSUSCEPTION** Katherine A. Barsness, MD, Alex Dzakovic, MD, Children's Memorial Hospital

**BACKGROUND:** This is a case of a 3 year male who presented with intussusception. He underwent successful air/contrast reduction. He then represented within 12 hours with recurrent intussusception. Over the next 24 hours he had 2 additional air/contrast enema reductions that were successful – with prompt recurrence. The final air/contrast study revealed a luminal filling defect in the terminal ileum.

**METHODS:** We elected to approach this patient via a single site laparoscopic technique. This video is a partially edited video that highlights some of the difficulties encountered during our learning curve for single site surgery.

Our access technique for single site laparoscopy involves three fascial incisions – one for the placement of a retracting instrument directly through the fascia and two incisions for ports to allow subsequent telescope and working instrument exchanges.

**RESULTS:** As the instruments are advanced into the abdominal cavity– there is close proximity of the instruments. The imprecise and somewhat random appearing movement of the instruments is secondary to the external interaction of the instrument handles. This interaction externally makes the identification of the terminal ileum and the intussusception difficult. Finally, the cecum is grasped and the terminal ileum is seen telescoping into the cecum. Unfortunately, the camera and the instruments are all in the same linear visual field.

Now that we have determined how to minimize the internal and external conflicts of the instruments – we are able to see the anatomy and use the instruments in a more precise fashion. Seen here is traction on the terminal ileum to slowly reduce the intussusceptum. Then, gentle distraction from the other instrument is used to ensure complete reduction. Note that the instruments are crossed inside the abdomen, and the distraction instrument is actually the left hand instrument. Crossing the instruments in this manner minimizes the external conflict between the instrument handles and the telescope.

We next proceed with mobilization of the terminal ileum and cecum to allow for bowel and luminal mass resection. At times, the working instrument is not in the center of the visual field. Centering can be aided by altering the angle of the telescope and the direction of the retracting instrument. Now that the retracting instrument is field right of the working instrument, appropriate tension can be placed on the tissue for dissection. As dissection moves proximally onto the cecum and terminal ileum, the retraction instrument is more prominent in the visual field, but still does not interfere with traction and dissection.

Once full mobilization was completed, an extracorporeal ileocectomy with end to end anastomosis was completed.

**CONCLUSION:** At the completion of the operation, the immediate postoperative appearance of the umbilicus is seen here. The child recovered quickly and was discharged home on the third postoperative day. Three weeks after the procedure, the umbilicus has healed with minimal scarring at the rim of the umbilicus.

**V041 THOROSCOPIC EXCISION OF A MEDIASTINAL BRONCHOGENIC CYST IN A THREE MONTH OLD** Sean J. Barnett, MD, MS, Timothy C. Lee, MD, Thomas H. Inge, MD, PhD, Cincinnati Children's Hospital Medical Center

The patient is a 5.5 kg, 3 month-old male who presented twice to the emergency room with apnea and cyanosis with crying. The chest radiograph was normal without evidence of pneumonia. Epinephrine and albuterol nebulizers improved the patient's breathing and he was discharged home following overnight admission. The patient presented a third time to the emergency room for similar symptoms and he was subsequently admitted to the general pediatric service. On the night of admission, the child became cyanotic, apneic, and bradycardic. A code was called and the patient was intubated and transferred to the pediatric intensive care unit. Chest radiograph obtained after intubation demonstrated atelectasis with some questionable mediastinal fullness. CT scan of the chest revealed a cystic mass with tracheal and mainstem bronchi compression situated between the superior vena cava and the aorta.

Prior to positioning the patient, bronchoscopy was performed which showed compression at the level of the carina and mainstem bronchi. The patient was positioned in the left lateral decubitus position with the head of the bed elevated to approximately 60 degrees. A 5 mm trocar

was initially placed along the mid-axillary line at the 5th intercostal space as an optical port. Three 3 mm trocars were then placed at the 3rd, 4th, and 5th intercostal spaces for dissection. The mass was easily identified inferior to the superior vena cava and the parietal pleura was scored. Gentle blunt dissection was used to further define the mass. The azygous vein was splayed over the mass and was preserved. Utilizing blunt dissection, the mass was rolled laterally away from the aorta. The mass was then decompressed and clear fluid was aspirated. This allowed for easy dissection of the remainder of the attachments with the hook cautery. Bronchoscopy confirmed that there was no communication with the trachea and the cyst was resected from the outer tracheal wall. Saline was used to check for any airleak at the resection point. Repeat bronchoscopy confirmed resolution of the airway compression at the conclusion of the case. Chest tube decompression was continued for one post-operative day until extubation. The patient was discharged on post-operative day number three with only Tylenol for pain control. Pathology was consistent with a bronchogenic cyst. At his 2 month follow-up, the patient had no further cyanotic episodes.

**V042 LAPAROSCOPIC REPAIR OF AN INCARCERATED RIGHT CONGENITAL DIAPHRAGMATIC HERNIA** Gustavo A. Villalona, MD, Milissa A. McKee, MD, Karen A. Diefenbach, MD, Yale School of Medicine

**PURPOSE:** We present a video of a laparoscopic repair of an incarcerated right congenital diaphragmatic hernia.

**METHODS:** The patient is a 22 month old boy who presented with crampy abdominal pain followed by bilious emesis. An abdominal film demonstrated bowel in the right chest. A laparoscopic approach was used due to the associated bowel obstruction. The majority of the small bowel was incarcerated in the right chest, but there was no evidence of bowel ischemia. The hernia was reduced and the defect was closed primarily.

**RESULTS:** We were able to successfully reduce the incarcerated bowel from the diaphragmatic hernia and repair the defect using a laparoscopic approach. The child did well and was discharged home on post-operative day four.

**CONCLUSION:** A minimally invasive surgical approach may be safely used in the setting of an incarcerated diaphragmatic hernia with excellent results.

**V043 LONG GAP ESOPHAGEAL ATRESIA: MINIMALLY INVASIVE REPAIR** Miguel Guelfand, MD, Exequiel González Cortés Hospital for Children - CHILE

**INTRODUCTION:** The last years esophageal atresia has been approach by minimally invasive surgery. Thoracoscopic surgery not only prevents complications of a thoracotomy, also allows better visualization and a safer dissection of the trachea and esophagus during the repair. The challenge in long gap pure esophageal atresia is to achieve primary anastomosis and yet preserve the integrity of esophagus

**OBJECTIVE:** Show our experience in the minimally invasive approach for long gap esophageal atresia.

**RESULTS:** 2 patients with long gap esophageal atresia were approach by thoracoscopic surgery between 2008 and 2009. They were managed initially with a laparoscopic gastrostomy and a double lumen tube in the upper blind esophagus pouch on continuous suction. The first patient had a long gap of 4 vertebral bodies and the second of 6 vertebral bodies. Both were managed expectantly until the distance of the 2 esophagus pouches were less than 2 vertebral bodies under tension. The patients were managed with the same surgical technique. In a Right Semi-Prone

position a 3 trocar technique was used with 3 and 5 mms ports. The camera was inserted below the scapula region, right port in the axilar region and left 3mm port in the left to the camera. The parietal pleura is open and the lower pouch is identified using the vagus nerve as a guide. The mobilization is done extensively to reach as much length as possible down to the level of the hiatus. We have not had any blood irrigation problem with this maneuver so far. Then the Azygos vein is dissected and divided under hook cautery. The upper pouch is dissected also extensively up to the cervical region. The upper pouch is open with the aid of an NG tube to preserve as much length as possible. The lower pouch is also open preserving length. The anastomosis is perform in an intracorporeal fashion taking care to include mucosa of both pouches. The back wall is done first, and after an NG tube is passed, the front wall of the anastomosis is finished. A chest tube can be placed if the suture is under tension. A barium esophagogram can be made at day 5 to 7 to check the anastomosis before oral feeding are started. Only one patient required a 2 dilatation course for a anastomotic stricture.

**CONCLUSION:** The minimally invasive repair of long gap esophageal atresia is a valid and safe option. Thoracoscopic approach achieves better visualization and magnification that allows better and safer dissection and repair of the trachea and the esophagus. Also prevents all the morbidity from a thoracotomy.

**V044 THORACOSCOPIC REMOVAL OF THORACO-AMNIOTIC SHUNT REMNANT** Giovanna Riccipetioni, MD, Gianluca Monguzzi, MD, Claudio Vella, MD, Giorgio Fava, MD, Salvatore Zirpoli, MD Department of Pediatric Surgery Children's Hospital "V. Buzzi" - MILAN - (Italy)

**CASE REPORT:** R.L., male. A male patient was referred to our centre because of bilateral hydrothorax detected over pregnancy. At 29 week of gestational age bilateral thoraco-amniotic shunts were placed with significant improvement. At 32 weeks the right shunt was completely retracted inside the thorax while the left one was still correctly located. The child was born at 37 weeks of gestation, the left shunt was removed straight forward after birth, but the right one remained inside the thoracic cavity. The baby presented severe respiratory distress which required high frequency oscillatory ventilation and NO2 (nitrogen oxide) for 2 weeks, than O2 supplementation was maintained until the 45° day of life.

At 52 days he underwent to thoracoscopic removal of the right t-a shunt. The baby was placed on the operative table in lateral 60 degree decubitus on his left flank with the right emithorax upside. A 3mm scope was inserted in the fourth intercostal space in mid axillary line. One operative 3mm trocar was introduced in the sixth intercostal space anteriorly. At first exploration diffuse pleural adhesion were detected and gently dissected was carried out with blunt instrument to create an adequate working space. Another 3 mm operative trocar was placed trough the sixth intercostal space in the posterior axillary line. The shunt was recognized, it was surrounded by a thick lining of fibrina; we know that the distal end of the pigtail was placed around the right pulmonaryilus thus we tried to perform a retraction with a clockwise rotation. This maneuver allowed us to easily remove the shunt from the right emithorax without any complication. A drain was introduced through the anterior operative trocar-site and removed after 48 hours. The patient was discharged at day 9. He is doing very well at follow-up of 6 month.

**V045 STAGED ENDOSCOPIC TREATMENT OF COMPLEX COMMUNICATING BRONCHOPULMONARY FOREGUT MALFORMATION IN A CHILD** Yuriy Sokolov, MD, Dmitriy Khaspekov, MD, Sergei Yurkov, MD, Konstantin Gorkovez, MD, Alexei Leonidov, MD, Perm Children's Hospital 15, Russian Medical Academy of Postgraduate Education, Moscow, Russia

**BACKGROUND:** Communicating bronchopulmonary foregut malformations (CBPFM) are rare congenital anomalies characterized by a patent communication between the esophagus or stomach and respiratory system. In CBPFM associated anomalies are frequent. We report a case of staged minimally invasive treatment of complex CBPFM in a child.

**MATERIAL/METHODS:** A 6-month-old girl, born at full term after uncomplicated pregnancy, presented with right -sided recurrent pneumonia persisting from the birth. Investigations revealed complex malformations of the foregut including a cystic duplication of the cervical esophagus, a right-sided extralobar sequestration, a duplication cyst of the upper esophagus and communication between the lower esophagus and right lower bronchus. Additionally, these were associated with a large thick wall cyst in the pancreatic tail. The surgical treatment was undertaken using combined staged thoracoscopic and laparoscopic approach. At the first stage, a right thoracoscopic procedure was carried out using 5 mm 30 degree camera and two 3 mm ports. Aberrant vessels to the extralobar sequestration were isolated and transected using a monopolar diathermy. The sequestration then was dissected and excised. The cystic lesion, adjacent to the upper esophagus, measured approximately 2,5 cm in diameter was also dissected and excised. The esophageal lumen was preserved intact. A 4-mm diameter fistula from the lower esophagus to the right lower bronchus was isolated and sutured with 3-0 Ethibond. All specimens were removed from the thorax through the extended port site. In addition, the left side of the neck was openly explored and the cyst adherent to the cervical esophagus was excised. At the second stage, 6 months later, a laparoscopic procedure was carried out. The large cyst measured approximately 4 cm in diameter was identified the pancreatic tail. The splenic artery spreading over the cyst was carefully dissected and separated from the cyst. The entire cyst was then dissected and excised from the pancreatic parenchyma. The resected specimen was removed through enlarged umbilical port site.

**RESULTS:** Both thoracoscopic and laparoscopic procedures were successfully completed without conversion. The duration of the operations was 180 min. and 120 min. respectively. The histopathological findings were consistent with esophageal and gastric duplication cysts. Postoperative recovery was uneventful. Pneumonia was completely resolved after the first thoracoscopic procedure. 4 year follow-up showed no evidence of fistula recurrence.

**CONCLUSION:** Our experience in this case, demonstrated that combined endoscopic minimally invasive approach is feasible, safe and effective treatment in infants with complex foregut malformations such as coexistence of CBPFM, extralobar lung sequestration and multiply supra- and infradiaphragmatic foregut duplication cysts.

## **V046 VESICOSCOPIC DIVERTICULECTOMY IN CHILDREN LISANDRO A. PIAGGIO, MD, NESTOR H. PIAGGIO HOSPITAL I.G.A DR. JOSÉ PENNA, HOSPITAL ITALIANO REGIONAL DEL SUR, BAHÍA BLANCA, BS.AS, ARGENTINA**

**INTRODUCTION:** most pediatric bladder diverticula are small, localized in a paraureteral situation and its clinical significance associated with vesicoureteral reflux (VUR). Big bladder diverticula in the absence of VUR or lower urinary obstruction are rare in this age group and its treatment usually performed by open surgery either with a trans or extra-vesical approach. We present a case of a giant symptomatic bladder diverticulum in a boy treated vesicoscopically.

**MATERIAL & METHODS:** We present a video demonstrating our technique of vesicoscopic diverticulectomy. The patient is a 6 year-

old boy with irritative bladder symptoms and a giant left paraureteral diverticulum and no VUR. Cystoscopy, pneumovesicoscopy and bladder anchoring to the anterior abdominal wall were performed at the beginning of the case. Three ports (4mm (1), 3mm (2)) were placed in the midline hypogastrium under cystoscopic view. Diverticular resection, detrusor and mucosal closure were performed vesicoscopically with regular 3 mm laparoscopic instruments. Specimen removal was performed through the urethra. Trocar sites closure is discussed.

**RESULTS:** The procedure was successfully performed with negligible blood loss in 250 minutes. Postoperative course was uneventful. There was no need for narcotics or anticholinergic medications for pain or bladder spasms control. Patient was discharge home on postoperative day 3 when the Foley catheter was removed with no need for pain medication. There were no intra or postoperative complications. Patient remains asymptomatic with normal radiologic studies at 2 years of follow up.

**CONCLUSION:** Different alternatives of minimally invasive surgery are expanding in the pediatric age group. In our experience, vesicoscopy was a safe reliable and effective way to treat a giant bladder diverticulum

## **V047 HEM-O-LOK POLYMER CLIPS & LAPAROSCOPIC URACHUS RESECTION** Enrique Buela, MD, Juan Ignacio Bortagaray, MD, Carolina Millan, MD, Marcelo Martinez-Ferro, MD Fundación Hospitalaria - Private Children's Hospital

**BACKGROUND:** Urachal remnants are rare congenital anomalies with an incidence of 1:150,000 children. They include patent urachus, diverticulum, urachal sinus, undescended bladder and cysts. The treatment is surgical, most commonly with the open method, because of the potential for infectious complications, local skin lesions and malignant degeneration. We report the case of an infant with a patent urachus who presented a wet umbilicus and was operated on laparoscopically. Polymeric clips were used as an innovative alternative way to ligate the bladder-sided stump.

**CASE REPORT:** A 6 months old boy was referred to our institution with a past history of 3 months intermittent umbilical secretion. Abdominal ecography revealed a thin tubular structure from the bladder to the umbilicus. The boy was diagnosed with a patent urachus and was approached laparoscopically. Under general anaesthesia, a bladder catheter was inserted and the patient was placed in a dorsal decubitus position, transversally across the operating table. The 4-mm laparoscope was inserted into the left upper quadrant. The working ports were placed at the left lower (5 mm trocar) and at the right upper (3 mm trocar) quadrants. The surgery was performed under artificial pneumothorax using carbon dioxide gas at 10 mm Hg. Two proximal Hem-o-Lok® clips were used to ligate the bladder-sided stump. The umbilical end was everted through the umbilicus and resected. The seal was confirmed by instilling physiologic solution through the catheter into the bladder. The patent urachus was excised through the 5 mm port. The bladder catheter was not left postoperatively.

**RESULTS:** Operative time was 35 minutes. There were no intraoperative or postoperative complications. The patient had no more leakage of umbilical secretion. The cosmetic result was excellent. There were no recurrences within the 6 month follow-up period.

**CONCLUSIONS:** The laparoscopic approach for patent urachus is technically feasible and yields all the benefits of minimally invasive surgery. It affords an optimal view of the operative field and an easy excision of the anomaly. The use of polymeric clips is practical and safe to ligate the bladder-sided stump. The latter is a procedure of choice for the management of urachal pathology in infants.

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- P022 LAPAROSCOPIC TREATMENT OF TOTAL COLONIC AGANGLIONOSIS** Roberto Vagni, MD, Luzia Toselli, MD, Gaston Elmo, MD, Daniel Liberto, MD, Pablo Lobos, MD, Hospital Italiano de Buenos Aires
- P023 LAPAROSCOPIC DUHAMEL OPERATION TECHNIQUE FOR TOTAL COLONIC AGANGLIONOSIS** Nguyen Thanh Liem, PhD, Tran Anh Quynh, MD, National Hospital of Pediatrics
- P024 OUR EXPERIENCE WITH LAParoscopy IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE** Dr. Alok Godse, Mr. Thomas Tsang, Mr. Ashish Minocha, Mr. Milind Kulkarni, Norfolk and Norwich University Hospital
- P025 MINIMALLY INVASIVE COLOPEXY FOR CHILDAIDITI SYNDROME** Wayne A. Blevins, MD, Minela Fernandez, MD, Danielle E. Cafasso, MD, Mary J. Edwards, MD, Tripler Army Medical Center
- P026 LAPAROSCOPIC GASTRIC TUBE INTERPOSITION FOR LONG GAP ESOPHAGEAL ATRESIA** Edward Esteves, MD, Kelly C. Paiva, MD, Marcelo Calcagno-Silva, MD, Humberto B. Sousa-Filho, MD, Roneyara R. Valamiel, MD, Celio C. Chagas, MD, Pediatric Surgery Division, University of Goias; Pediatric Surgery Division, Joao Penido Hospital, Goiania, Brazil
- P027 OSTEOSCOPY FOR PERCUTANEOUS CURETTAGE AND GRAFTING IN SYMPTOMATIC UNICAMERAL BONE CYSTS** Jerry Kieffer, MD, Paul Philippe, MD, Monika Glass, MD, Clinique Pédiatrique de Luxembourg
- P028 LAPAROSCOPIC REPAIR OF TRAUMATIC BOWEL INJURIES IN CHILDREN WITH NITINOL U-CLIP SUTURES: 2 CASE REPORTS** Katrine M. Lofberg, MD, Audrey Durrant, MD, Garret Zallen, MD, Oregon Health and Sciences University
- P029 RETRACTION OF THE GALLBLADDER PROVIDING EXCELLENT EXPOSURE OF THE CALOT'S TRIANGLE DURING SINGLE INCISION LAPAROSCOPY (SILS): OUR TECHNIQUE** Ismael Alejandro Salas De Armas, MD, Ashwin Pimpalwar, MD, Texas Childrens Hospital, Houston, Texas, 77030
- P030 A NOVEL TECHNIQUE FOR PERITONEAL DIALYSIS CATHETER INSERTION THAT ALLOWS FOR IMMEDIATE USE** Justin Daggett, Robert L. Parry, MD, Todd A. Ponsky, MD, Rainbow Babies and Children's Hospital, Case Western Reserve University
- P031 THE 120-DEGREE LAPAROSCOPE: IMPROVED VISUALIZATION OF THE CONTRALATERAL INTERNAL INGUINAL RING** Kim G. Mendelson, MD, PhD, Timothy J. Fairbanks, MD, Duane S. Duke, MD, Lindsay G. Arthur, MD, Rajeev Prasad, MD, St. Christopher's Hospital for Children
- P032 LAPAROSCOPIC MORGAGNI HERNIA REPAIR IN THE NEONATAL PERIOD** *WITHDRAWN*
- P033 MINIMALLY INVASIVE SURGERY IN PEDIATRIC TRAUMA: AN EXPERIENCE LEARNED** Miguel Guelfand, MD, Marcela Santos, MD, Exequiel González Cortés hospital for children - Chile
- P034 LAPAROSCOPIC ASSISTED CHOLEDOCHAL CYST EXCISION WITH ROUX EN Y HEPATICOJEJUNOSTOMY** Boma T. Adikibi, MD, Gillian H. M. Duthie, MD, Fraser D. Munro, MD, Gordon A. MacKinlay, MD, Royal Hospital for Sick Children, Edinburgh, UK
- P035 PERCUTANEOUS ENDOSCOPIC GASTROSTOMY PLACEMENT IN A HUMAN IMMUNODEFICIENCY VIRUS POSITIVE PAEDIATRIC POPULATION** Ram M. Nataraja, MBBS, BSc, MRCSEd, Julia R. Fishman, MBBS, BSc, Aisha Naseer, MBBS, Jo Dodge, Sam M. Walters, MB, BChir, MA, FRCP, Simon A. Clarke, MBBS, FRCS, Paeds Surg, Munther J. Haddad, MBBS, FRCS, Paeds Surg, Department of Paediatric Surgery, Chelsea and Westminster Hospital NHS Foundation Trust, 369 Fulham Road, London SW10 9NH, United Kingdom, Family Clinic, Imperial College Healthcare NHS Trust, Praed Street London W2 1NY, United Kingdom
- P036 OUR EXPERIENCE IN SURGICAL TREATMENT OF CHOLEDOCHAL CYSTS** Nikica Andromako, E. Gad\_ijeve, M. Horvat, Z. Koren, UKC MARIBOR, Department of Abdominal Surgery
- P037 LAPAROSCOPIC MANAGEMENT OF LARGE SPLENIC CYSTS** Laura J. Coates, MB, BS, MRCS, Timothy N. Rogers, MBChB, FCS, FRCS, Robin G. Garrett-Cox, MB, BChir, MA, MS, FRCS, Bristol Royal Hospital for Children
- P038 OPEN VERSUS LAPAROSCOPIC PYLOROMYOTOMY FOR HYPERTROPHIC PYLORIC STENOSIS; A SYSTEMATIC REVIEW AND META-ANALYSIS** R. Bakx, MD, PhD, M.W.M. Oomen, MD, D.T. Ubbink, MD, PhD, L.T. Hoekstra, MD, H. Heij, Prof., MD, PhD, Academic Medical Center
- P039 LAPAROSCOPY IS A GOLD STANDART IN DIAGNOSIS AND MANAGEMENT OF MECKEL'S DIVERTICULUM** Coskun Kose, MD, Ufuk Ates, MD, Esra Temeltas, MD, Huseyin Dindar, MD, Meltem Bingol-Kologlu, MD, Aydin Yagmurlu, MD, Ankara University, Faculty of Medicine, Department of Pediatric Surgery Cebeci Ankara
- P040 COMPARISON OF MICROLAPAROSCOPIC PYLOROMYOTOMY TO PARAUMBILICAL APPROACH (BIANCHI) AND WEBER-RAMSTEDT APPROACH FOR IDIOPATHIC HYPERTROPHIC PYLORIC STENOSIS** Salmal Turial, MD, Mariana Santos, MD, Jan Enders, MD, Felix Schier, MD, 1: Department of Pediatric Surgery, Medical University Centre, Mainz, Germany 2: Department of Pediatric Surgery, Mutterhaus der Borromäerinnen, Trier, Germany
- P041 TOUPET FUNDOPLICATION: A BETTER OPTION IN HELLER MYOTOMY IN ESOPHAGEAL ACHALASIA** E. Temeltas, C. Kose, U. Ates, A.S. Yaman, A. Yagmurlu, Department of Pediatric Surgery, Ankara University Faculty of Medicine

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**P043 EARLY EXPERIENCE WITH LAPAROSCOPIC CHOLECYSTECTOMY AT A SINGLE CENTRE** Alison Campbell, MD, Timothy J. Bradnock, MD, Charles Keys, MD, Graham Haddock, MD, Gregor M. Walker, MD, Atul J. Sabharwal, MD, The Royal Hospital for Sick Children, Glasgow

**P044 LAPAROSCOPIC REPAIR OF LARGE HERNIA WITH THE INTRATHORACIC STOMACH IN INFANTS** Hideki Soh, MD, Mitsugu Oowari, MD, Yuuichi Takama, MD, Masafumi Kamiyama, MD, Noriaki Usui, MD, Hisayoshi Kawahara, MD, Masahiro Fukuzawa, MD, Department of Pediatric Surgery, Osaka University Postgraduate School of Medicine

**P045 LAPAROSCOPIC REPAIR VERSUS OPEN LAPAROTOMY IN CONGENITAL DUODENAL OBSTRUCTION** Hossein Allal, PhD, MD, Jean C. Gouli, MD, Froylan Paniagua, MD, Gustave Andrianandraina, MD, Sonia Perez, MD, (1) Pediatric Visceral Surgery Department. Video surgery Unit. CHU Montpellier, France

**P046 TWO-PORT LAPAROSCOPIC PYLOROMYOTOMY FOR CONGENITAL HYPERTROPHIC PYLORIC STENOSIS IN 360 CASES** Ren Hongxia, Chen Lanping, Wu Xiaoxia, Children's Hospital of Shanxi Province

**P047 APPLICATION OF LAPAROSCOPIC PARTIAL AND TOTAL FUNDOPLICATION IN CHILDREN WITH GASTROESOPHAGEAL REFLUX DISEASES** Yeming Wu, MD, Zhilong Yan, MD, Jun Wang, MD, Xinhua Hospital and Shanghai Children's Medical Center, Shanghai Jiaotong University, Shanghai, China

**P048 VIDEOASSISTED ILEO-CECAL-COLON RESECTION FOR CROHN DISEASE** Claudio Vella, MD, Giorgio Fava, MD, Luciano Maestri, MD, Enrica Caponcelli, MD, Giovanna Riccipettoni, MD, Department of Pediatric Surgery Children's Hospital "V. Buzzi" – MILAN – (Italy)

**P049 THE APPENDIX POSITION AT THE TIME OF LAPAROSCOPIC APPENDICECTOMY** Amanda J. McCabe, Gordon A. MacKinlay, Fraser D. Munro, Department of Paediatric Surgery, Royal Hospital for Sick Children, Edinburgh, UK

**P050 LAPAROSCOPIC EXCISION OF RETROPERITONEAL TUMOR IN 2 CHILDREN** Mitsugu Owari, MD, Hideki Soh, PhD, MD, Takaharu Oue, PhD, MD, Masahiro Fukuzawa, PhD, MD, Division of Pediatric Surgery, Department of Surgery Osaka University Graduate School of Medicine

**P051 HEPATOPTOSIS-LAPAROSCOPIC HEPATOPEXY** Birte Detlefsen, MD, Martin Duebbers, MD, Thomas Boemers, Prof., MD, Department of Pediatric Surgery and Urology, Amsterdamse Strasse, Cologne

**P052 POSTOPERATIVE TUBE-RELATED COMPLICATIONS AFTER GASTROSTOMY PLACEMENT IN CHILDREN** Jessica A. Naiditch, MD, Tim Lautz, MD, Katherine Barsness, MD, Children's Memorial Hospital, Chicago, IL

**P053 GASTROSTOMY PLACEMENT IN PAEDIATRIC PRACTICE: COMPARISON OF 2 TECHNIQUES** J.F. Lecompte, MD, M. Durand, MD, H. Steyaert, MD, J.S. Valla, PhD, DMD, Lenval Foundation for Children

**P054 LAPAROSCOPIC ASSISTED INTESTINAL RESECTION IN YOUNGSTERS WITH CROHN'S DISEASE** Dragan Kravarusic, Elad Feigin, Raanan Shamir, Enrique Freud, Schneider Children's Medical Center

**P055 OMENTAL INFARCTION: PREOPERATIVE DIAGNOSIS AND LAPAROSCOPIC MANAGEMENT** Ankush Gosain, MD, PhD, John K. Uffman, MD, MPH, Rupa Seetharamaiah, MD, Martin Blakely, MD, Eunice Huang, MD, Sherman Hixson, MD, Max Langham, MD, James W. Eubanks III, MD, University of Tennessee Health Science Center

**P056 LAPAROSCOPIC VERSUS OPEN SPLENECTOMY** Dragan Kravarusic, Radoica Jokic, Georgios Konstantinidis, Enrique Freud, Schneider Children's Medical Center of Israel, Institute for Child and Youth Health Care of Vojvodina

**P057 ORCHIOPEXY: LAPAROSCOPY OR TRADITIONAL SURGICAL TECHNIQUE IN PATIENTS WITH AN UNDESCENDED PALPABLE TESTICLE** Pastor Escarcega - Fujigaki, MD, Guillermo Hernández - Peredo - Rezk, MD, Edgar Huerta- Murrieta, MD, Nancy Lezama, MD, Gerardo Kuri, MD, Abimael Bañuelos - Montano, MD, Centro de Especialidades Médicas del Estado de Veracruz. "Dr. Rafael Lucio"

**P058 ESTABLISHING OPERATIVE REFERENCE COST FOR PAEDIATRIC LAPAROSCOPIC SURGERY** Anthony D. Phippard, ODP, Ram M. Nataraja, MBBS, BSc, MRCSd, Anies A. Mahomed, MBCh, FCS, SA, FRCSGlasEd FRCS Paeds, Department of Paediatric Surgery, Royal Alexandra Children's Hospital, Brighton, BN2 5BE, United Kingdom

**P059 LAPAROSCOPIC SLEEVE GASTRECTOMY IN A PEDIATRIC PATIENT: THE PERFECT INDICATION** Abdalla E. Zarroug, MD, Seema Kumar, MD, James M. Swain, Mayo Clinic Rochester

**P060 A NEW COMPACT HIGH-DEFINITION VIDEO MICROSCOPE: A PARADIGM SHIFT IN CLINICAL AND RESEARCH MICROSURGERY?** Philip K Frykman, MD, PhD, FACS, Lifu Zhao, MD, MSc, Toshiko Nobuto, MD, Khawar Siddique, MD, Adam Mamelak, MD, Sharo Raissi, MD, George Berci, MD, FACS, Division of Pediatric Surgery and The Pediatric Surgery Laboratory, Division of Cardiothoracic Surgery, Department of Surgery; Department of Neurosurgery, Cedars-Sinai Medical Center

**P061 LAPAROSCOPIC TRAINING IN PAEDIATRIC SURGERY: A SINGLE CENTRE EXPERIENCE** G. H. Duthie, MRCS, B. T. Adikibi MRCS, F. D. Munro, MD, G. A. MacKinlay, MD, Royal Hospital for Sick Children, Edinburgh

**P062 LAPAROSCOPIC INTRACORPOREAL SUTURING COMPETENCE AMONG RESIDENTS: CAN WE PREDICT SUCCESS?** Joanne E. Baerg, MD, Marcos Michelotti, MD, A. Jose Tamez, MD, Mark E. Reeves, MD, PhD, Loma Linda University Children's Hospital

**P063 ENDOSURGERY FOR CHILDREN WITH TUMOR** Wang Jian , Li Long, The Capital Institute of Pediatrics

**P064 DEVELOPMENT OF A VIRTUAL LAPAROSCOPIC TRAINER USING ACCELEROMETER AUGMENTED TOOLS TO ASSESS PERFORMANCE IN SURGICAL TRAINING** Shabnam Parkar, MBBS, BScHons, MRCSEng, AISCN, Dean Mohamedally, BSc, PhD, Munther Haddad, MBBS, FRCS, Chris Child, Ricardo Doroana, Paediatric Surgery Department, Chelsea and Westminster Hospital, London; Tigerlilly Digital Ltd, London; Department of Computing, City University, London

**P065 EXPERIENCE WITH LAPAROSCOPIC TRANSPERITONEAL ADRENALECTOMY IN CHILDREN** Horacio Bignon, MD, Enrique Buela, MD, Carolina Millan, MD, Aldo Vizcaino, MD, Marcelo Martinez-Ferro, MD, Fundación Hospitalaria Private Children's Hospital and Dr. Ricardo Gutiérrez Children's Hospital.

**P066 IS LAPAROSCOPY CAN BE USED SAFELY IN THE REMOVAL OF THE LARGE RETROPERITONEAL MASSES?** Esra Temeltas, MD, Ufuk Ates, MD, Coskun Kose, MD, Ayhan Yaman, MD, Huseyin Dindar, MD, Department of Pediatric Surgery, Ankara University School of Medicine, Ankara TURKEY

**P067 DOES INSURANCE TYPE, ETHNICITY, OR ATTENDING SURGEON CORRELATE WITH WHETHER A CHILD UNDERGOES OPEN OR LAPAROSCOPIC APPENDECTOMY?** JULIE MCKEE, PNP, MARLA MATAR, MD, DAVID BLISS, MD, OREGON HEALTH AND SCIENCE UNIVERSITY AND LEGACY HEALTH SYSTEMS

**P068 ULTRASONICALLY LOCALIZED, MINIMAL INVASIVE REMOVAL OF POSTAPPENDICECTOMY-RETAINED COPROLITHS IN CHILDREN** Sergio B. Sesia, MD, Vivienne Bürgin, Frank-Martin Häcker, PhD, Johannes Mayr, PhD, Division of Pediatric Surgery, Universiti Children Hospital of Basel (UKBB), Switzerland

**P069 EVALUATION OF ENDOSCOPIC SURGICAL PLANNING IN AN INTERACTIVE 3D VISUALIZATION ENVIRONMENT** Brett Nekolny, BS, Joseph Holub, BS, Dan Opheim, MD, Jung Leng Foo, PhD, Thom Lobe, MD, Eliot Winer, PhD, Iowa State University, Blank Children's Hospital

**P070 STRENGTHS AND WEAKNESS OF PORCINE MODELS IN MINIMALLY INVASIVE PAEDIATRIC SURGERY** Sandeep S. Bidarkar, MBBS, DNB, MCh, Mandeep Kaur, MBBS, Ralph C. Cohen, MD, FRACS, Anirudha V. Deshpande, MBBS, MS, MCh, Children's Hospital at Westmead

**P071 LAPAROSCOPY IN SUSPECTED ABDOMINAL TUBERCULOSIS IS AN USEFUL AND EARLY DIAGNOSTIC METHOD** Ufuk Ates MD, Coskun Kose MD, Ayhan Yaman MD, Esra Temeltas MD, Huseyin Dindar MD, Meltem Kologlu MD, Ankara Universty, Faculty of medicine, Department of Pediatric Surgery, Ankara TURKEY

**P072 LAPAROSCOPY-ASSISTED SURGERY FOR BENIGN ABDOMINAL MASS IN CHILDREN** Hiroyuki Koga, MD, Tadaharu Okazaki, MD, Yoshifumi Kato, MD, Akihiro Shimotakahara, MD, Tsubasa Takahashi, MD, Geoffrey J. Lane, MD, Atsuyuki Yamataka, MD, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine

**P073 LAPAROSCOPIC TREATMENT TO HYDROCELE IN CHILDREN** Li GuiBin, MD, Qiu Yun, MS, The 5th Central Hospital of TianJin

**P074 NOBODY DOES IT BETTER? - SHO TRAINING IN LAPAROSCOPIC APPENDICECTOMY** Dr. Sumita Chhabra, Mr. Richard Lindley, Mr. Brian Davies, Nottingham University Hospitals NHS Trust, QMC Campus, Derby Road, Nottingham, NG7 2UH

**P075 LAPAROSCOPIC EVALUATION AND MANAGEMENT OF PERINEAL IMPALEMENT TRAUMA IN CHILDREN** Kyle N. Cowan, MD, Claudio De Carli, MD, Shirley Chou, MD, Marcos Bettolli, MD, Division of Paediatric General Surgery, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, Ontario, Canada

**P076 ROBOTIC PEDIATRIC SURGERY IN FRANCE : WHAT FUTURE AFTER 2 YEARS OF EXPERIENCE?** Guenolee de Lambert, MD, Karim Braik, MD, Michel Robert, MD, PhD, Hubert Lardy, MD, PhD, Department of General Pediatric Surgery and Pediatric Urology, Hospital of Tours, Tours, France

**P077 COMPARISON OF ROBOTIC AND LAPAROSCOPIC NISSEN FUNDOPLICATION IN CHILDREN** Brice Antao, MRCS, Tricia Merrigan, MD, Craig Nemechek, MD, Oneybuchi Ukabiala, MD, Thom Lobe, MD, Michael Irish, MD, Blank Children's Hospital, Des Moines, Iowa, USA

**P078 SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) APPENDECTOMY IN CHILDREN** Ismael Alejandro Salas de Armas, MD, Ashwin Pimpalwar, MD, Texas Childrens Hospital, Houston, Texas, 77030

**P079 TRANSUMBILICAL LAPAROSCOPIC ASSISTED APPENDECTOMY (TULAA) VERSUS OPEN APPENDECTOMY – PRELIMINARY RESULTS FROM A CASE CONTROL STUDY** Robert Bergholz, MD, Ines Klein, Katharina Wenke, MD, Thomas Krebs, MD, Department of Pediatric Surgery, Altona Children's Hospital, UKE Medical School Hamburg

**P080 SINGLE INCISION LAPAROSCOPIC SURGERY IN CHILDREN** Brice Antao, MRCS, Luke Farrow Medical Student, Michael Irish, MD, Blank Children's Hospital, Des Moines, Iowa, USA

**P081 LAPAROENDOSCOPIC SINGLE SITE SURGERY IN COLOMBIAN CHILDREN** Fernando Arias, MD, FACS, Isabel Canon, MD, Monica Rdriguez, PHA, Armando Rojas, MD, Hospital Universitario Fundación SantaFé de Bogotá, Bogotá, Colombia.

**P082 COMBINED SILS CHOLECYSTECTOMY AND CHOLANGIOGRAPHY – FEASIBLE AND SAFE IN CHILDREN** Markus Duersch, MD, Bertram Reingruber, MD, PhD, Departement of Pediatric Surgery, Klinik Stankt Hedwig - Barmherzige Brueder, Regensburg

**P083 LAPAROSCOPIC SINGLE PORT SURGERY IN CHILDREN: OUR EARLY EXPERIENCE** Ismael Alejandro Salas De Armas, MD, Ashwin Pimpalwar MD, Texas Childrens Hospital, Houston, Texas, 77030

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**P111 DOES LAPAROSCOPY CONSTITUTE AN ADDITIONAL RISK FOR CHILDREN WITH A VENTRICULOPERITONEAL SHUNT?** Michael Kohl, MD, Salmal Tural, MD, Wolfgang Wagner, Professor, Felix Schier, Professor, Department of Pediatric Surgery and Section of Pediatric Neurosurgery, Department of Neurosurgery, University Hospitals, University Medical Center, Mainz, Germany

**P112 TWO PORT LAPAROSCOPIC PLACEMENT OF PERITONEAL DIALYSIS CATHETER WITH AN EASY TECHNIQUE OF ABDOMINAL WALL FIXATION** Ufuk Ates, MD, Esra Temeltas, MD, Berkutug Bahadir, MD, Huseyin Dindar, MD, Meltem Bingol-Kologlu, MD, Ankara University, Faculty of Medicine, Department of Pediatric Surgery

**P113 STAB-INCISION LAPAROSCOPIC PYELOPLASTY: A SINGLE INSTITUTION EXPERIENCE** Goutham Vemana, MD, Paul H. Noh, MD, Cincinnati Children's Hospital Medical Center

**P114 PRETRANSPLANT LAPAROSCOPIC NEPHRECTOMIES IN PEDIATRIC PATIENTS** Brent J. Goslin, MD, James M. DeCou, MD, Daniel J. Robertson, MD, Timothy E. Bunchman, MD, Helen DeVos Children's Hospital, Grand Rapids, Michigan

**P115 RETROPERITONEOSCOPIC HEMINEPHRECTOMY: DIFFERENT APPROACH, SAME RESULTS; THE NEW GOLD STANDARD?** Renato Gana, MD, Pedro-Jose Lopez, MD, Danielle Reyes, MD, Guillermo Concha, MD, Francisco J. Reed, MD, Nelly Letelier, MD, Ricardo Zubietta, Hospital Exequiel Gonzalez Cortes

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**P118 ROBOTIC URETERAL REIMPLANTATION: AN INITIAL EXPERIENCE** Christina Kim, MD, David Chalmers, MD, Katherine Herbst, PhD, Connecticut Children's Medical Center

**P119 MANUAL INJECTABLE TREATMENT FOR HIGH GRADES REFLUX WITH A PERMANENT BULKING SUBSTANCE** Roberto Vagni, MD, Edurne Ormaechea, MD, Ricardo Soria, MD, Andres Villegas, MD, Juan Moldes, MD, Eduardo Ruiz, MD, Francisco Debadiola, MD, Hospital Italiano de Buenos Aires

**P120 ONE TROCAR ASSISTED PYELOPLASTY: OUR EXPERIENCE** Maria Grazia Scuderi, MD, Salvatore Arena, MD, Vincenzo Di Benedetto, MD, Pediatric Surgery Department – "Policlinico-Vittorio Emanuele" Hospital, Catania University - Italy

**P121 LAPAROSCOPIC ASSISTED PYELOPLASTY IN CHILDREN** Mustafa Kucukaydin, Prof., Mustafa Erman Dorterler, MD, Kadri Cemil Sulubulut, MD, Ali Aslan, MD, Ahmet Burak Dogan, MD, Serkan Arslan, MD, Ozlem Yandim, MD, Department of Pediatric Surgery, Erciyes University, School of Medicine Kayseri /Turkey

# Poster Abstracts

## **P001 DOES THE YEAR OF TRAINING OF THE OPERATING RESIDENT CORRELATE WITH OPERATIVE TIME IN LAPAROSCOPIC OR OPEN APPENDECTOMY IN CHILDREN?**

Julie Mckee, PNP, Marla Matar, MD, David Bliss, MD Oregon Health and Science University and Legacy Health Systems

*Does the year of training of the operating resident correlate with operative time in laparoscopic or open appendectomy in children?*

**BACKGROUND:** The participation of surgical trainees in operative procedures is essential to developing technical competence. However, the impact of trainees upon the patients is poorly understood.

**METHODS:** We retrospectively analyzed the records of all children less than 18 years of age operated upon for appendicitis at two regional children's hospitals and NOT enrolled in a contemporaneous randomized trial of laparoscopic versus open appendectomy. The patients were stratified by degree of disease ("mild"= normal, acute, or interval; complicated= gangrenous or ruptured), type of operation (Open=O, Laparoscopic=L), and the year in training of the operating residents grouped as none (attending only) junior (R1+2), senior (R3+4), and Pediatric Surgical trainee (R6+7). Statistical significance was examined using the single-tailed ANOVA for comparison of multiple groups and two-tailed t-test for paired groups.

**RESULTS:** 223 patients were identified and 211 records were successfully abstracted. Mean operative times and standard deviations are shown below (groups with fewer than 5 patients are listed as NA):

	<b>L-mild (hrs)</b>	<b>L-complicated (hrs)</b>	<b>O-mild (hrs)</b>	<b>O-complicated (hrs)</b>
None (n=17)	.64 +/- .22 (n=10)	.63 +/- .29 (n=6)	NA	NA
R1+2 (n=103)	.72 +/- .6 (n=50)	.94 +/- .34 (n=16)	.74 +/- .26 (n=23)	.81 +/- .47 (n=14)
R3+4 (n=73)	.80 +/- .40 (n=36)	.87 +/- .42 (n=20)	.61 +/- .23 (n=12)	.82 +/- .14 (n=5)
R6+7 (n=18)	.54 +/- .15 (12)	NA	NA	NA

There is no statistical difference in the operative times of laparoscopic and open approaches to mild or complicated disease when junior residents are involved. Similarly, the operative times for complicated appendicitis when senior residents are involved. However, open operations performed by senior residents for mild disease tended to be shorter than the laparoscopic cohort (p=0.1)

**CONCLUSIONS:** In a sample of children undergoing appendectomy by the method of their parent's choice, there is a trend toward decreased operating time with greater experience of the involved trainee or when the attending surgeon operates alone. This effect appears more pronounced in the patients with complicated disease. Greater patient numbers and prospective data should clarify these relationships.

## **P002 ROBOTIC SURGERY IN CHILDREN: IS THERE A LEARNING CURVE?** Brice Antao, MRCS, Tricia Merrigan, MD, Craig Nemechek, MD, Michael Irish, MD Blank Children's Hospital, Des Moines, Iowa, USA

**BACKGROUND:** Robotic surgery has been shown to have several advantages over conventional laparoscopic surgery. However it's application within paediatric surgery has been partly limited by growing concerns about its learning curve, as encountered in conventional laparoscopy. The aim of this study was to evaluate the learning curve for robotic surgery in children.

**METHODS:** The initial 18 cases of Nissen fundoplication performed by the senior author (MI), using conventional laparoscopy (LNF) and robotic surgery (RNF) were reviewed. In the LNF group (18 cases, 11 female: 7 male) 8 were neurologically impaired and 7 cases had a gastrostomy. Like wise, in the RNF group (18 cases, 11 female: 7 male) 6 were neurologically impaired and 9 cases had a gastrostomy. Variables assessed were robot docking time, robot set-up time, operating time, total operating room time, complications, conversions and total hospital stay. Learning curve were assessed by means of regression analysis with logarithmic curve fit and continuous variables were analysed using Student t test and Chi square test, where p < 0.05 was considered significant.

**RESULTS:** The mean age at surgery was 21.44 ± 38.41 months (LNF) and 89.11 ± 76.41 months (RNF). The mean robot set-up time was 41.11 ± 11.07 minutes and the mean robot docking time was 8.72 ± 5.41 minutes. The robot set-up time was 38.33 ± 9.49 minutes (cases 1-9) versus 43.89 ± 12.36 minutes (cases 10-18) [p = 0.301] and the robot docking time was 11.67 ± 6.38 minutes (cases 1-9) versus 5.78 ± 1.39 minutes (cases 10-18) [p = 0.016]. The operating time was 131.89 ± 39.52 minutes (LNF) versus 169.39 ± 48.87 minutes (RNF) [p < 0.001] and total operation room time was 189.94 ± 41.21 minutes (LNF) versus 224.61 ± 51.44 minutes (RNF) [p<0.001]. There was a statistically significant learning curve pattern with regards to operating time (LNF) [r2 = 0.412, p = 0.004] in comparison with RNF group (r2 = 0.049, p = 0.378). There were 5 conversions in LNF group compared to one in RNF group (p < 0.001). Mean hospital stay was 10.06 ± 10.15 days (LNF) versus 5.83 ± 6.07 days (RNF) [p < 0.001].

**CONCLUSIONS:** Robotic surgery has the technical advantages of overcoming the learning curve for minimally invasive procedures in children. The learning curve for robotic surgery appears shorter compared to conventional laparoscopy, and is mainly related to the ergonomics of the robotic cart (set-up and docking). A team-based approach with a dedicated trained robotic theatre team is critical in establishing and progressing up the learning curve for robotic surgery

## **P003 RAPID TRANSITION FROM OPEN TO LAPAROSCOPIC APPENDECTOMY IN A HIGH-VOLUME CENTER: RESULTS AND LESSONS LEARNED**

Jan F. Svensson, MD, Markus Almström, MD, Jan O. Rutqvist, MD, Tomas Wester, MD, PhD, Department of Paediatric Surgery, Astrid Lindgren Children's Hospital, Stockholm, Sweden

**BACKGROUND:** Supported by the evidence presented by Aziz and co-workers and by the Cochrane collaboration in 2006, we decided to switch from open to laparoscopic appendectomy in October 2007. The purpose of this study was to evaluate the safety and feasibility of a swift transition from an open to a laparoscopic approach for acute appendicitis in children.

**MATERIALS & METHODS:** A total of 655 patients underwent appendectomy during 2007-2008, 349 with laparoscopic technique and 306 with open technique. An evidence-based protocol was developed to minimize complications and shorten the learning curve. This protocol provided a standardized laparoscopic surgical technique, including selection and positioning of ports, method of stump ligation and removal of the appendix from the abdomen. All patients subjected to appendectomy for acute appendicitis were prospectively followed from October 2007. For comparison all patients operated between January and October 2007, predominantly with open technique, were reviewed. Data are presented as medians. A significant difference is considered when p<0.05. (ns) =non-significant.

**RESULTS:** 39% of the patients were girls and the median age was 11.3 years. 3.4% of the patients in the laparoscopic group were converted to open technique. The frequency of negative appendectomies was 2.1%. The operating time was shorter in the open group, 37 versus 51 minutes ( $p<0.0001$ ). After 25 procedures the operating time for laparoscopic surgeons was comparable to the open technique, 37 versus 43 minutes (ns), decreasing further to 39 minutes after 50 laparoscopic appendectomies and to 28 minutes after 70 laparoscopic appendectomies. The postoperative hospital stay was shorter in the laparoscopic group than in the open group, 2.0 versus 2.8 days ( $p=0.023$ ) but similar in 2008, 2.0 versus 1.9 days (ns). There was no difference in the frequency of intra-abdominal abscess formation: 4% in the laparoscopic group and 5% in the open group respectively (ns).

**CONCLUSIONS:** Our data supports the safety and feasibility of a swift transition from open to laparoscopic appendectomy in a high-volume university hospital with a diversity of laparoscopic skills. We used a strict protocol and thorough training to support a short learning curve. The learning curve should be considered to consist of about 25 laparoscopic procedures to attain operating times comparable to open surgery. As a secondary outcome, our transition from open to laparoscopic surgery for acute appendicitis has benefitted us in performing other more advanced minimally access procedures.

**P004 LAPAROSCOPIC APPENDECTOMY IN EXTREMELY OBESE CHILDREN IS ASSOCIATED WITH LOWER MORBIDITY** Balazs Kutasy, MD, Manuela Hunziker, MD, Ganapathy Lakshmanadass, MD, Prem Puri, Prof MS FRCS FRCSEd FACS The National Children's Hospital, Dublin, Ireland

**AIMS:** In recent years there has been worldwide increase in childhood obesity. Laparoscopic appendectomy in obese children was contraindicated in the beginning, however now it is commonly used for the treatment of appendicitis. The purpose of this study was to compare open versus laparoscopic appendectomy in extremely obese children.

**METHODS:** The hospital records of 947 consecutive patients, who underwent appendectomy for acute appendicitis between 2002 and 2008 were analysed. 164 children (17.3%) were extremely obese. Extremely obese was defined, as greater than 2 standard deviations above the standardized mean weight for age. 38 of 164 (23.1%) patients had open appendectomy and 126 (76.8%) underwent laparoscopic appendectomy. The length of hospital stay (LOS), operation time (OT), complication rate and frequency of taking postoperative pain relief were compared between open and laparoscopic appendectomy in extremely obese children.

**RESULTS:** The incidence of complicated and non-complicated appendicitis was similar both in open and laparoscopic appendectomy group. The Table shows the LOS, OT, complication rate and required postoperative analgesia in extremely obese children who underwent open or laparoscopic appendectomy.

	Open appendectomy n=38	Laparoscopic appendectomy n=126
<b>Mean length of hospital stay</b>	2.8 day	2.71 day
<b>Mean operation time</b>	59.28 min.	47.02 min.*
<b>Complication rate</b>	7.89% (n=3)	4.76%* (n=6)
<b>Wound infection</b>	5.26% (n=2)	2.38%* (n=3)
<b>Intraabdominal abscess</b>	2.63% (n=1)	2.38% (n=3)
<b>Postoperative painkillers</b>	6.95x	4.77x*

\* $p<0.05$

Open appendectomy for acute appendicitis in extremely obese children is associated with significantly shorter operating time, lower overall complication rate and less required postoperative analgesia.

**CONCLUSION:** Laparoscopic appendectomy should be the procedure of choice for the treatment of acute appendicitis in extremely obese children.

**P005 SEVERITY OF APPENDICITIS CORRELATES WITH THE PEDIATRIC APPENDICITIS SCORE, A PROSPECTIVE STUDY** Obinna O. Adibe, MD, Keith E. Georgeson, MD, Carroll M. Harmon, MD, PhD, The Children's Hospital of Alabama, Birmingham, Alabama, USA

**PURPOSE:** The pediatric appendicitis score (PAS) has been used as a diagnostic tool for the clinical assessment of acute abdominal pain in children. Our institution has utilized this scoring system as part of a clinical pathway for diagnosis and treatment of appendicitis. We sought to discover if the PAS could predict operative findings and length of hospital stay after laparoscopic appendectomy.

**METHODS:** After IRB approval, patients were enrolled in a prospective study using the PAS as part of a clinical pathway. Patients were divided into three groups based on the PAS assigned on admission: 1) PAS 0-5; 2) PAS 6-8; 3) PAS 9-10. A PAS of  $\geq 6$  is considered as high probability for appendicitis, while a PAS  $< 4$  is low probability. Data pertaining to operative findings during laparoscopic appendectomy and length of hospital stay after the operation was collected. Statistical analysis was performed using the student's t test, with results reported as mean  $\pm$  standard error.

**RESULTS:** Between June and September 2009, 112 patients were enrolled in the study (median age 10.5, range 1-18), 69 of these patients underwent early laparoscopic appendectomy. For group one (mean PAS  $3.6 \pm 0.18$ ; n = 20): 15 (75%) had simple appendicitis, 1 (5%) was complex, and 4 (20%) were normal. For group two (mean PAS  $6.7 \pm 0.11$ ; n = 38): 26 (68.4%) patients had simple appendicitis, 10 (26.3%) were complex, 1 (2.7%) was normal, and 1 (2.6%) was "other" (ovarian hemorrhagic cyst). For group three (mean PAS  $9.4 \pm 0.13$ ; n = 11): 3 (27.3%) were simple, 7 (63.6%) were complex, and 1 (9.1%) was normal. Mean length of hospital stay increased from  $1.63 \pm 0.34$  for patients in group one to  $5.9 \pm 1.37$  for patients in group three ( $p=0.008$ ).

**CONCLUSION:** Our preliminary prospective data suggests that the PAS may be a valuable prognostic tool for the treatment of acute appendicitis. This can influence preoperative management and postoperative clinical pathways. Further studies are necessary to validate our findings.

**P006 LAPAROSCOPIC SURGERY SIGNIFICANTLY REDUCES POSTOPERATIVE BOWEL OBSTRUCTION AND DEVELOPMENT OF INTRAABDOMINAL ABSCESS FOLLOWING COMPLICATED APPENDICITIS COMPARED WITH OPEN SURGERY, IN CHILDREN** Ayhan Yaman, MD, Coskun Kose, MD, Ufuk Ates, MD, Esra Temeltas, MD, Meltem Bingol-Kologlu, MD, Huseyin Dindar, MD, Aydin Yagmurlu, MD, Ankara University, Faculty of Medicine, Department of Pediatric Surgery, Ankara, Turkey

**INTRODUCTION:** Laparoscopic appendectomy has gained wide spread acceptance over the last 10 years. Advantages include improved diagnostic accuracy, decreased wound complication rate and better cosmetic results when compared to the open procedure. However, its use in the management of complicated appendicitis is somewhat controversial. The purpose of the study was to determine and

evaluate the incidence of postoperative bowel obstruction (PBO) and development of intraabdominal abscess (IA) after laparoscopic and open appendectomy in children.

**MATERIAL & METHODS:** The medical files of children who were undergone an appendectomy, either via the laparoscopic or open approach, at our department from 2001 until 2008 were reviewed to confirm the rate of PBO and IA. The incidences of PBO and IA following laparoscopic and open appendectomy were compared with the chi-square analysis.

**RESULTS:** From the 838 children who were undergone appendectomy, 602 had acute appendicitis and 236 had complicated appendicitis. Laparoscopic appendectomy was performed in 474 patients of the acute group and in 176 of the complicated group. Open appendectomy was performed in 188 and 60 patients of the 2 groups, respectively. 26 of the 176 patients in complicated group underwent initial nonsurgical treatment followed by interval appendectomy. The overall incidence of PBO development in complicated appendicitis was 3.9%. In the laparoscopic appendectomy population, a significantly low incidence of 0.5 % of PBO development was detected, compared with the 10% of the open appendectomy group ( $P < .0001$ ). The overall incidence of postoperative IA development in complicated appendicitis was 3.5%. In the laparoscopic appendectomy group, a significantly low incidence of 1.7 % of IA development was detected, compared with the 8.3% of the open appendectomy group ( $P < .0001$ ).

**CONCLUSION:** Laparoscopic appendectomy for complicated appendicitis in children is feasible and safe. It diminishes the potential of postoperative bowel obstruction and development of intraabdominal abscess compared to open approach.

## **P007 THORACOSCOPIC REPAIR FOR CONGENITAL DIAPHRAGMATIC HERNIA: LESSONS FROM 134 CASES** Nguyen Thanh Liem, PhD, National Hospital of Pediatrics

**PURPOSE:** To describe the surgical technique, initial results, and an overview of indications for thoracoscopic repair of congenital diaphragmatic hernia.

**MATERIALS & METHODS:** A retrospective review was undertaken of patients with CDH who underwent thoracoscopic repair by the same surgeon from January 2001 to September 2009. Patients underwent surgery under general anesthesia. Reduction of the hernia contents was carried out using one optical trocar and two operating trocars. Pleural insufflation with carbon dioxide was maintained at a pressure of 4 to 6 mmHg. The hernia defect was repaired using non-absorbable interrupted sutures with extracorporeal knots.

**RESULTS:** There were 134 patients, including 89 boys and 45 girls. 71 patients were newborn, and 63 patients were infants and older. The hernia was located on the left side in 109 patients and on the right side in 25 patients. The mean operative time was 66.5 minutes. Conversion was required in 11 patients. There were no complications, however 13 postoperative deaths occurred.

**CONCLUSIONS:** Thoracoscopic repair is feasible and safe for CDH children, including selective newborns. The technique causes minimal trauma, results in good respiratory function and promotes early recovery.

## **P008 NISSEN FUNDOPLICATION IN CHILDREN: A DECADE OF EXPERIENCE** Anindya Niyogi, Arpan S. Tahim, Munther J. Haddad, Simon A. Clarke, Chelsea and Westminster Hospital, London

**AIM:** To compare the outcome of laparoscopic versus open Nissen fundoplication in children and to identify the co-morbidities that may predict failure of the procedure.

**METHODS:** A retrospective case-note review of 2 surgeons was carried out over a 10 year period. The decision to undertake laparoscopic or open surgery was according to the choice of the surgeon. Surgery was considered unsuccessful, if symptoms of GORD persist after 6 months of surgery requiring anti-reflux medications and/or revision of surgery. Data was analysed using SPSS v17.0.

**RESULTS:** 128 children had 135 procedures. The median age of operation was 2 years and median follow-up period was 1 year. 52% had associated neurological disorders; 9% had respiratory disease requiring non-invasive ventilation; 17% had complex cardiac disease. 94 procedures were laparoscopic; 39 open. 7 laparoscopic procedures required conversion. 77% had a Gastrostomy. 40% required HDU/PICU post op (median 2 days)

7 required re-operation for recurrence of GORD. 6 had a laparoscopic procedure as their primary operation. No significant difference existed in recurrence among children with neurological impairment ( $p = 0.134$ ) or respiratory insufficiency ( $p = 0.304$ ); recurrence was significantly higher in children with complex cardiac disease ( $p = 0.002$ ).

Laparoscopic Nissen fundoplication involved an increased operative time ( $p = 0.001$ ), though required less post-operative intravenous analgesia ( $p = 0.021$ ) and less time to establish full feeds ( $p = 0.029$ ). There was no difference for either procedure in reoperation rate ( $p = 0.671$ ), hospital stay ( $p = 0.547$ ), high dependency/intensive care ( $p = 0.478$ ) or complications ( $p = 0.314$ ).

**CONCLUSION:** Though laparoscopic Nissen fundoplication resulted in a longer operating time, advantages included a reduced analgesic requirement and early establishment of feed. Complex cardiac disease was identified as an independent predictor of failure. A Long term prospective randomised controlled trial would be required to confirm these findings.

## **P009 CASE OF PRIMARY LAPAROSCOPIC DUHAMEL PULL-THROUGH IN TOTAL COLONIC AGANGLIONOSIS** Georgina Malakounides, MBBS MRCS, Bhanumathi Lakshminarayanan, MD, Niall Jones, MD FRCSI Paeds, Harry Ward, MS FRCS Royal London Hospital

Laparoscopic primary pull-throughs have become the preferred approach in the operative management of Hirschsprung disease. Total colonic aganglionosis (TCA) is however widely perceived to necessitate a staged approach. There is no current consensus on the type and timing of definitive surgery.

We present the first case report of a term male infant with TCA who underwent a primary laparoscopic Duhamel pull-through.

Published series of TCA reveal only limited experience with primary pull-throughs. Only one previous case report of a laparoscopic approach in this instance has been published by Yagi et al in 2003 but this was with a Soave technique.

Our case had a diagnosis of Hirschsprung disease made by rectal suction biopsy and a primary pull-through at 4 weeks of age was planned through the laparoscopic approach. Intra-operative seromuscular biopsies confirmed TCA involving the distal 11cm of ileum. We proceeded to perform a total colectomy and a primary Duhamel pull-through without a stoma. We used a rectal prolapsing technique in order to transect the rectum extra-corporeally and a 45mm endo GIA stapler to obliterate the neorectal spur.

The operative procedure was uncomplicated. At five months of age he opens his bowels on average 6 times a day, has no perineal excoriation and is gaining weight. Our case has shown laparoscopic primary Duhamel pull-through to be a safe and feasible approach in TCA and avoids the potential morbidity associated with an ileostomy.

**P010 TRANSAXILLARY SUBCUTANEOUS ENDOSCOPIC STERNOCLEIDOMASTOID MUSCLE RELEASE FOR TREATMENT OF PERSISTENT TORTICOLLIS IN CHILDREN: OUR TECHNIQUE** Clair Johny, PA, Ashwin Pimpalwar, MD Texas Childrens Hospital, Houston, Texas, 77030

**PURPOSE:** The purpose of this study was to evaluate the effectiveness of the transaxillary subcutaneous endoscopic sternocleidomastoid muscle release for treatment of persistent torticollis. Traditionally torticollis is treated with an open approach which results in a neck scar. We report our technique of transaxillary subcutaneousoscopic sternomastoid release for treatment of torticollis.

**MATERIAL:** A 10-year old girl presented to us for the first time with history of right sided torticollis. The torticollis was only noticed about a year ago by mother. Her neck movements were grossly restricted and she could not rotate or extend her neck. The right sternomastoid was palpable in form of a tight fibrous band.

**METHODS/SURGICAL TECHNIQUE:** The patient was positioned supine with the right arm abducted 90 degrees. A 5mm incision was made on the anterior axillary line on the right side. A subcutaneous space was created using our technique with a Kitner and Foley's catheter. A 5mm one-step expandable port was then introduced along with 5mm 30 deg telescope. Using this technique the right sternocleidomastoid was completely exposed. During this procedure it is necessary to maintain adequate thickness of the skin flap to prevent necrosis of the skin. The subcutaneous space was maintained using CO<sub>2</sub> at the pressure of 10 mm Hg and a flow of 5 lit/min. Once adequate space was created another 3mm one-step expandable port was placed in the subcutaneous cave. Using a hook diathermy the sternomastoid was divided completely. The carotid sheath and its contents were well visualized during the procedure and could be protected from damage. This technique provided excellent exposure to the right neck structures and could be used for other procedures in the neck. Once the muscle was completely divided and the carotid fascia was visible the procedure was complete. The two incisions were approximated using a 3.0 vicryl suture and then closed with dermabond glue. 10 cc of 0.5% bupivacaine was injected to provide local anesthesia. The operative time was 40 minutes.

**OUTCOME:** The child did extremely well post-operatively. She had full range of motion of her neck and was not complaining of any pain. Incisions were clean dry and intact with the glue. Patient was discharged on Tylenol PRN. The child was then followed up in clinic 3 weeks post-operatively and continued to have full range of motion and excellent cosmetic results. The axillary scars were well healed and almost not seen. The parents were extremely pleased with the outcome.

**CONCLUSION:** Transaxillary subcutaneous endoscopic approach to release sternomastoid muscle for the treatment of torticollis is an effective, safe, has good cosmetic results and avoids scars in the neck.

**P011 LAPAROSCOPIC SURGERY USING LAPAROSCOPIC PERCUTANEOUS EXTRAPERITONEAL CLOSURE (LPEC) NEEDLE** Takuya Kosumi, PhD, Takeo Yonekura, PhD, Tosio Sawai, PhD, Katuji Yamauchi, PhD, Takuya Kimura, PhD, Yoshiyuki Ihara, PhD, Department of pediatric Surgery Nara Hospital, Kinki University School of Medicine

**INTRODUCTION:** In 1997, Takehara et al. reported laparoscopic percutaneous extraperitoneal closure (LPEC) as a radical operation for childhood inguinal hernia. He developed a needle, called as an LPEC needle (Hakko Co., Ltd., JAPAN; Nagano), for closure of the hernia orifice in childhood inguinal hernia. This 19 gauge LPEC needle has a

hooked wire inside to hold the thread easily. We report laparoscopic operations with this LPEC needle as an assistive device for various pediatric diseases other than inguinal hernia repair, and discuss its effectiveness.

**SUBJECTS & METHODS:** The LPEC needle was applied for laparoscopic operations, such as repair of retrosternal hernia, anterior gastropexy for gastrostomy and gastric volvulus, and other various procedures.

**RESULTS:** (1) Closure of the hernia orifice for retrosternal hernia – Laparoscopic surgery was performed for a 4-month-old boy diagnosed as bilateral retrosternal hernia associated with Hirschsprung's disease. The LPEC needle was used for closure of the bilateral parasternal hernia. An LPEC needle holding 2-0 nonabsorbable suture was percutaneously inserted into the abdominal cavity. It introduced to the dorsal diaphragmatic hernia rim, and the thread was released from the needle. After pulled back, it was introduced again with tilting direction at the same puncture site, and advanced to the dorsal diaphragmatic hernia rim. The thread was held by the LPEC needle, the needle was pulled out of the abdominal cavity. A total of 2 and 4 horizontal mattress sutures were placed on the left and right sides, respectively, and were tied subcutaneously. These procedures were finished in a short time while waiting for the results of the intraoperative pathological examination of the extent of the aganglionic segment of Hirschsprung disease. There has been no recurrence for 6 months since the operation.

(2) Anterior gastropexy – Laparoscopic anterior gastropexy was performed for 8 children with gastric volvulus. Three nonabsorbable threads were placed on the anterior gastric wall. The LPEC needle was inserted to the abdominal cavity from the skin, and caught the ends of each thread at the same puncture site with different directions. The threads were tied subcutaneously to fixation anterior stomach to the anterior abdominal wall. Laparoscopic anterior gastropexy was also advanced for percutaneous endoscopic gastrostomy in 30 neurologically impaired children to secure fixation of gastrostomy as the same fashion.

(3) Other various procedures – LPEC needles were applied to pexis of the tube of ventriculo-peritoneal or peritoneal dialysis to the abdominal wall, fixation of the ribs and Nuss bar for funnel chest, and lifting the abdominal wall by holding the round ligament of the liver or lateral ligament.

**CONCLUSION:** Suturing of the anterior abdominal wall is difficult laparoscopically. The LPEC needle provided easy fixation to the anterior abdominal wall. It was also useful for shortening the time required for surgery and beneficial from an esthetic point of view. An LPEC needle has the potential to become one of the important devices in laparoscopic surgery.

**P012 SINGLE INCISION LAPAROSCOPIC INGUINAL HERNIA REPAIR IN CHILDREN: A DESCRIPTION OF TECHNIQUE** Andrew M. Ibrahim, BA, Todd A. Ponsky, MD, Rainbow Babies and Children's Hospital, Case Western Reserve University School of Medicine

**BACKGROUND:** A novel laparoscopic technique for pediatric hernia repairs, as described by Ozgediz, et al., describes closing the hernia sac with a subcutaneous, endoscopic, assisted ligation (SEAL) technique. In certain cases, however, an additional instrument is placed to manipulate the hernia sac for better visualization. Here we describe a modification to the SEAL technique in which a 4mm Operative Hysteroscope (Storz, Tuttlingen, Germany) is used rather than a standard laparoscope. This allows for hernia sac manipulation without the need for an additional port..

**DESCRIPTION OF TECHNIQUE:** After insufflating the abdomen a 5mm trocar is inserted through the umbilicus. A 4mm operative laparoscope is inserted through the trocar. A finder needle is then used externally to identify the inguinal canal. A 2-0 tycron (Covidien, Norwalk, CT) stitch is placed into the groin from the outside until it is seen laparoscopically behind the peritoneum of the hernia sac. The needle is passed around the internal ring, skipping over the Vas deferens and vessels and out through the other side. The biopsy forceps is inserted through the scope and the hernia sac is grasped and manipulated to maximize visualization of the critical structures. The needle is then backtracked into the original needle stick site and tied down.

**RESULTS & DISCUSSION:** In short-term postoperative follow up there have been no recurrences or evidence of injury to the critical structures. Furthermore, there are potential cosmetic and pain benefits to utilizing this single incision technique.

**CONCLUSION:** Hernia repair through single incision laparoscopy may be a safe alternative to conventional laparoscopic hernia repair in children. Further prospective studies are needed to analyze if this approach has superior long-term outcomes.

**P013 TREATMENT OF PECTUS EXCAVATUM IN PATIENTS OVER 20 YEARS OF AGE** Edward Esteves, MD, Marcelo Calcagno-Silva, MD, Humberto B Sousa-Filho, MD, Kelly C Paiva, MD, Denny C Lima, MD, Celio C Chagas, MD, Roneyara R Valamiel, MD Pediatric Surgery Division, University of Goias, Goiania (GO); Pediatric Surgery Division, Joao Penido Hospital, Juiz de Fora (MG), Brazil

**BACKGROUND:** The ideal time to operate on pectus excavatum using Nuss technique is between 13 and 18 years of age, when there is still good elasticity and flexibility of the anterior thoracic wall. The great casuistics from Nuss et al have shown that older patients tend to present more difficulty to bend the sternum and more postoperative pain, however there are no specific studies analysing this particular group of patients, who still keep coming to us looking for surgical treatment. **Objectives:** The authors present a prospective study of patients with pectus excavatum operated on after 20 years of age, by Nuss technique, analysing technical improvements, new tricks, modifications on the bar and preliminary outcomes.

**MATERIALS & METHODS:** From May 2003 to September 2009, 19 patients presenting pectus excavatum (group 1) were operated on at ages 20-27 years (average  $22.6 \pm 1.5$ ), 12 men and 7 women. Associated syndromes included Marfan (2) y Ehlers-Danlos (1). Nine were punch type, ten plate type. Thirteen symmetrical, 6 asymmetrical. All patients had epidural continuous anesthesia for 3 days. A modified Nuss technique was performed: 10 patients used the scope at the axilla; the bar needed hyperconvex modeling and extended internal curving of its extremities before rotation at the thorax. A new metallic bar was designed with a 30% larger thickness at its central segment, used in the last 5 patients. Two stabilizers fixed the bar to the thoracic wall. Some cases with advanced costal margin required external dynamical compression after 6 months. Two patients with moderate scoliosis used spinal straightening devices. The data of group 1 patients were compared to a series of 26 teenagers operated on before 20 years of age (group 2) at the same period.

**RESULTS:** All operations could be performed despite the more intense rigidity of the anterior thoracic wall in group 1, by applying the described modifications on bar bending. It was easier in the last patients who received thicker bars. After the third postoperative day, the operations were more painful in group 1 requiring more potent analgesic drugs, however the older patients were more tolerant and did not complain

as most of group 2. Patients from group 1 were more enthusiastic to perform the operations. There was no difference comparing operative times, complications or time of hospitalization. By the time of removal of the bar after at least 30 months (4 patients group 1, 3 cases group 2), also there was no difference in the same parameters. One patient in group 2 but none in group 1 have shown a tendency for recurrence after bar removal is being followed clinically. One patient from group 1 does not want to remove his bar after 3.5 years.

**CONCLUSIONS:** Patients with pectus excavatum can be operated on during the third decade of life by Nuss technique, facilitated by compensating bending of the bar, thickening of the central part of the bar and use of potent analgesics, leading to outcomes similar to younger patients.

**P014 PEDIATRIC LAPAROSCOPIC CHOLECYSTECTOMY USING 2-3 MINIPTS WITHOUT CLIPS: ANALYSIS OF 310 CASES** Edward Esteves, MD, Denny C Lima, MD, Humberto B Sousa-Filho, MD, Calebe P Souza, MD, Eriberto Clemente-Neto, MD Pediatric Surgery Division, University of Goias, Goiania, Brazil

**INTRODUCTION:** There are many techniques for laparoscopic cholecystectomy (LC) in children and adults, most of them using metallic or plastic clips at cystic duct and cystic artery, also using 4 ports. Nowadays some surgeons are already using one single port or NOTES, with controversial advantages. Clips are not so safe, are expensive, remain as foreign bodies, require 5mm or larger ports and can lead to some known complications. The authors present their series of LC using 2 or 3 miniports eliminating the use of clips.

**PATIENTS & METHODS:** During the last 12 years, 310 patients aged 8 months to 17 years were submitted to LC for several etiologies (table 1). One girl presented situs inversus and one boy had double gallbladder. Sickle cell disease (n=33) required special management and had associated appendectomy. In 26 cases with hypersplenism or sequestration (hemolytic diseases), total splenectomy was associated, requiring additional port in 8. Usually 2 or 3 small incisions were used, including the umbilical 5-10mm port and other 2-5 mm trocar or without trocar (stab wound). To use 2 ports, in 28 cases a single scope with working channel was used, in 45 children two instruments were introduced at the umbilicus, in 17 cases transparietal traction sutures moved the gallbladder. In all other cases we used two 2-3 mm instruments at epigastrium and right flank or other port when associated to splenectomy. Cystic arteries were treated with cautery or Ligasure (splenectomy cases). Cystic duct was ligated with a sliding or internal knot. Skin wounds were closed with adhesive tapes.

**Results:** Operative time average of 26 minutes (range 16-90) excluding splenectomy or choledocolithiasis cases. Choledocolithiasis treated surgically in 2. No conversion or major postoperative complication. Fast track surgery in 18 cases. Mild keloids in 2 children. Most of the tiny scars have disappeared after some years.

**Conclusions:** LC is the gold standard treatment for gallbladder diseases, feasible and safely performed by many techniques without clips through few fine incisions in children and adolescents.

**P015 SPLENOmegaly INDEX: A PREDICTIVE VALUE FOR LAPAROSCOPIC SPLENECTOMY IN PEDIATRIC PATIENTS** Juan I. Camps, MD, Joel F. Bradley III, MD, Michael J. Yost, PhD, Timothy Z. Brock, MD, Palmetto Health Children's Hospital and University of South Carolina Department of Surgery, Columbia, SC

**INTRODUCTION:** Laparoscopic splenectomy, rather than open splenectomy, has become the preferred treatment for nearly all diseases

of the spleen. Splenomegaly was once thought to be a contraindication for laparoscopic splenectomy. In the adult population there have been references to spleen size limitations precluding laparoscopic splenectomy. However, in the pediatric population, an absolute number cannot be defined because of the diversity in body size. The purpose of this study is to define a splenomegaly index comprised of the size of spleen and the size of the child.

**METHODS:** A retrospective review was done of 24 consecutive children who underwent laparoscopic splenectomy from 2003 to 2008. All operations were performed by the same pediatric surgeon. All cases were completed following standard laparoscopic technique. Medical records were reviewed to determine the height and weight of the patients at the time of surgery. Spleen size was determined by preoperative imaging or pathology report. The size of the spleens was calculated by multiplying length, height, and width. The body surface area (BSA) of the patients was calculated with the Mosteller formula,  $BSA (m^2) = ([Height (cm) \times Weight (kg)]/3600)^{.5}$ . A splenomegaly index was then calculated using the following formula:  $(spleen\ size/1000)/BSA$ . Total time of the operation was also recorded.

**RESULTS:** Ages ranged from 2 to 18 with a mean of 9.7. Disease processes necessitating splenectomy included sickle cell disease 12, congenital spherocytosis 6, idiopathic thrombocytopenic purpura 4, malignant histiocytosis sarcoma 1, and autoimmune lymphoproliferative syndrome 1. There were no conversions to open splenectomy. Spleen sizes ranged from 144 to 2,688 cm<sup>3</sup> with a mean of 1,011 cm<sup>3</sup>. The spleen with the largest diameter was 23 cm. Body surface areas ranged from 0.52 to 2.16 m<sup>2</sup> with a mean of 1.20 m<sup>2</sup>. Splenomegaly indexes ranged from 0.17 to 2.45 with a mean of 0.81. The splenomegaly index is also predictive of the length of the case using linear regression ( $p < 0.001$ ). In 22/24 cases the spleen was able to be extracted by manual morcellation through a 12 mm port. The other two cases required a separate incision for spleen removal. In one case the splenomegaly index was 2.45. This was the only case with a splenomegaly index over 2 in our series. The other case requiring a separate incision was in a patient with multiple prior abdominal surgeries, including a gastrostomy tube that limited the area in the abdomen in which to maneuver the spleen into the bag.

**CONCLUSIONS:** Laparoscopic splenectomy in children may be safely accomplished if the splenomegaly index is less than 2. Complete laparoscopic splenectomy may prove to be difficult in patients with an index over 2 or in patients with prior abdominal operations, especially feeding tubes. A separate incision may be required in these patients for removal of the spleen. The higher the index the longer the case will take to complete. The splenomegaly index may help operative planning and in counseling parents about expectations for children with splenomegaly. Future prospective studies will need to be undertaken to validate the splenomegaly index.

**P016 LATE LAPAROSCOPIC REPAIR OF HIGH ANORECTAL MALFORMATIONS IN CHILDREN OVER 4 YEARS OLD** Edward Esteves, MD, Maria Marcela Bailez, MD, Daniel Carauni, MD, Luis H Zea-Salazar, MD, Carlos V Beckmann, MD, Humberto B Sousa-Filho, MD, Aluisio Mello-Filho, MD Pediatric Surgery Division, University of Goia, Goiania-Brazil, Pediatric Surgery Service of Kennedy Alborada Hospital, Guayaquil, Ecuador; Hospital de Niños de Corrientes, Argentina

**BACKGROUND:** The treatment of high anorectal malformations (ARM) has been traditionally performed through posterior sagittal approach with or without combined laparotomy before one year of age. Videosurgery has been a new tool to treat these anomalies,

avoiding laparotomy and reducing damage to the perineal structures of continence. The authors present a series of abnormal cases of children coming with colostomy for more than 4 years waiting for anorectal reconstruction, now successfully treated laparoscopically.

**PATIENTS & METHODS:** From January 2006 to June 2009, five children were operated on laparoscopically to repair high ARM, aging 4.2 to 11 years of age in 3 different countries by the same author. The anomalies included 2 prostatic fistulas, 2 bladder fistulas and one at the bulbar-prostate transition. All patients had associated anomalies: extremities' deformities, Down syndrome, VACTER (2) and partial Currarino. Two had a large rectum which had grown down beyond the fistula, forming a great pouch reaching the perineum. All patients had adequate preoperative management to clean the distal colon, except one who was found to have such old calcified stools and dense mucus at the rectal pouch. All operations were performed with 3 ports, helped by transperitoneal stay sutures at the bladder, rectum and ovaries for exposure. A rigid instrument inside the distal colon through the colostomy helped rectal mobilization. The fistula was identified and ligated with transfixating sliding sutures (Esteves knots). A small incision at the anal impression determined by eletroestimulation allowed introduction of a 10mm trocar forming a transperineal oblique tunnel in the center of the estriated complex. The large rectum was tapered extracorporeally through the perineum in 2 cases and plicated in one case before anastomosis to the skin. The fistula (neo-anus) was sutured to the external sphincter and skin. Three or four prolene stitches fixed the rectum to intrapelvic fascia laterally and at presacral periosteum to prevent rectal prolapse. Postoperative broad-spectrum antibiotics were used for 2-7 days. All children started feeding the next day. Colostomy was already closed in 4 of the patients and all patients are being followed prospectively.

**RESULTS:** All operations could be safely performed laparoscopically, despite evident signs of chronic peri-rectitis or pouchitis and large rectum at the limited pelvic space. One child (VACTER) with bad preoperative colonic cleansing had mucus extravasation during operation, however no infection or other complication developed. No conversions, no bleeding, no transfusions. The children with VACTER and Down syndrome have some unilateral small mucosal prolapse. Total continence is actually evident in 2 patients (prostatic and bulbar-prostate fistulas), mild incontinence in 1 (Down syndrome with bladder fistula), incontinence in 1 (1 year follow-up, Currarino).

**CONCLUSIONS:** Old patients presenting ARM can be benefited by the laparoscopic repair of the anomaly, reducing morbidity of eventual laparotomy and extensive perineal dissection that they would undertake in conventional approach, evolving with the expected functional results for these types of malformations.

**P017 BALLOON DILATATION IS AN MINIMAL INVASIVE AND EFFECTIVE MODE OF TREATMENT IN CHILDREN WITH CONGENITAL CRICOPHARYNGEAL ACHALASIA** Coskun Kose, MD, Esra Temeltas, MD, Ufuk Ates, MD, Huseyin Dindar, MD, Meltem Bingol-Kologlu, MD, Ankara University, Faculty of Medicine, Department of Pediatric Surgery Cebeci

**INTRODUCTION:** Congenital cricopharyngeal achalasia consists of a failure of the cricopharyngeus muscle to relax at the appropriate time during the swallowing process. The exact etiology of this condition remains unknown although in some patients it can be attributed to central nervous system or neuromuscular disorders. The treatment options for this condition include classical surgical myotomy of the muscle, dilatations, and injection of botulinum toxin.

**RESULTS:** We report 4 cases of primary cricopharyngeal achalasia presented with feeding difficulties. 3 of the 4 patients were diagnosed in early infancy and associated with severe gastroesophageal reflux. None of these 3 patients had a neurological disorder. The remaining patient was presented at 3 years of age with both mental and growth retardation. The diagnosis was established by contrast swallow and esophageal manometry. 3 or 4 endoscopic balloon dilatation was performed in all patients. Of the three patients with associated gastroesophageal reflux, 2 required fundoplication and 1 responded conservative treatment. Symptoms were relieved in all patients and they were able to swallow both liquid and solid food without any difficulty.

**CONCLUSIONS:** Congenital cricopharyngeal achalasia is a rare clinical entity but needs to be included in the differential diagnosis of feeding difficulty and choking in infants. Whether the spasm of the cricopharyngeus is because of its hyperreactivity secondary to GER is unclear. The diagnosis is usually made on contrast swallow and esophageal manometry. Endoscopic balloon dilatation is a safe, effective and minimal invasive procedure in treatment of congenital cricopharyngeal achalasia.

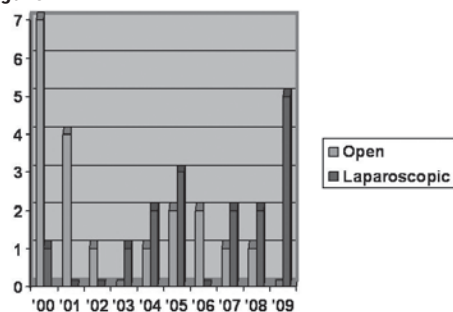
**P018 THE INTRODUCTION OF LAPAROSCOPIC MANAGEMENT FOR SUSPECTED MECKEL'S DIVERTICULUM IN CHILDREN - A SINGLE CENTRE EXPERIENCE** Mairi Steven, MD, Andrew Watt, MD, Atul J. Sabharwal, MD, Royal Hospital for Sick Children, Glasgow, United Kingdom

**INTRODUCTION:** A Meckel's diverticulum (MD) is said to be "frequently suspected, often looked for and seldom found" and poses a diagnostic challenge for paediatricians and surgeons alike. In the last decade laparoscopy has been proposed as the diagnostic tool of choice as well as means of definitive treatment. We decided to review our management of such cases.

**METHODS:** We analysed our theatre and radiology databases between January 2000 and October 2009 and performed a retrospective case-note analysis. This identified all children who underwent surgery for suspected MD and all those referred for a technetium Tc 99m-labelled pertechnetate scan (MS). Case notes were then analysed for patient demographics, clinical presentation, investigations including MS, surgical procedure, operative time, pathology and length of stay.

**RESULTS:** 35 children underwent surgery for suspected MD during this time, 12 girls and 23 boys. The median age at surgery was 4 years (0.05-13.6 years). Of the 35, 14 had painless rectal bleeding as their primary symptom, 9 had abdominal pain and rectal bleeding and 12 had abdominal pain. 3 of the 35 patients had an intussusception and one had a volvulus. 10 required a blood transfusion prior to surgery. Of the 35, three patients underwent laparoscopy and no MD was found. 20 underwent laparotomy, of which 19 had a MD excised, and 12 underwent a laparoscopic-assisted Meckel's diverticulectomy (LAMD). 69% were emergency procedures. The use of laparoscopy increased over the study period (see Figure1).

**Figure 1**



Of the 12 who underwent LAMD, 5 had the MD delivered through the supraumbilical port site and two through a separate Pfannenstiel incision. 5 cases were converted to laparotomy. Nineteen diverticuli were excised by means of a small bowel resection and primary anastomosis, 4 were excised at the base of the diverticulum and 8 by wedge resection. Of the 35 patients who underwent surgery 17 patients had a pre-operative Meckel's scan. 3 of these were indeterminate and no Meckel's was found at laparoscopy. Of the 31 Meckel's removed 65% had heterotopic gastric mucosa on histopathology. The four patients that had a false-negative scan had heterotopic gastric mucosa on subsequent pathology. Over the study period 190 Meckel's scans were performed and only 10 were positive. There were four false-negatives and one false-positive. No post-operative complications were encountered in either the open or LAMD group. The median length of stay was 6 days in the LAMD group and 7 days in the open group. The median operative time was 114 minutes in the LAMD group and 84 minutes in the open group.

**CONCLUSION:** At our institution laparoscopic management has become the preferred mode of management for suspected MD. The results from radioisotope scans have asked us to question their usefulness and we recommend laparoscopy as the diagnostic modality of choice and management of Meckel's diverticulum.

**P019 SINGLE INCISION LAPAROSCOPIC SURGERIES IN CHILDREN** Wendy Su, MD, Trevor Boswell, Thomas Hui, MD Children's Hospital and Research Center Oakland

**PURPOSE:** Single incision laparoscopic surgery (SILS) has emerged as a new technique with the availability of reticulating laparoscopic instruments. This study aims to assess the safety and effectiveness of single incision laparoscopic surgeries in children in comparison to traditional multi-port laparoscopic surgeries, with special emphasis on SILS splenectomies.

**METHODS:** Consecutive patients who were candidates for elective laparoscopic operations were enrolled in the study from October 2008 to July 2009. All laparoscopic operations were performed with a single periumbilical incision with three 5 mm low profile ports. Reticulating laparoscopic instruments were utilized to facilitate the single incision technique. Intraoperative and postoperative outcome parameters were collected for all patients. Specific comparison was made between patients undergoing SILS splenectomies versus the historical control group of multi-port laparoscopic splenectomies performed by the same surgeons.

**RESULTS:** Eleven patients underwent twelve SILS procedures during the study period. Four patients had cholecystectomies, three patients had interval appendectomies, and four patients had splenectomies (one of which had concomitant splenectomy and cholecystectomy). There were no conversions to multi-port laparoscopy or open surgery. Patients' ages ranged from 2 to 16 years old. Mean operative time was 62 minutes for the interval appendectomies; 80 minutes for the cholecystectomies and 145 minutes for the splenectomies. Further comparison was made between four patients with SILS splenectomies and three control patients with multi-ports laparoscopic splenectomies. The patients' age ranged from 2 to 7 years. The mean operative time was 145 minutes for patients who underwent SILS splenectomies; and for the control group the mean was 130 minutes. Median length of hospital stay was 6.5 days in the SILS group compared with 4 days in the control group. The numbers of postoperative morphine injections for pain control were equivalent in both groups. There were no complications in any of the cases.

**CONCLUSIONS:** Single incision laparoscopic surgeries are feasible in children without significant increase in operation time. The postoperative length of stay, pain, and narcotic use are less or equal

when compared to traditional laparoscopic procedures. Despite the learning curve for SILS, and the increase in difficulty performing the operation through a single incision, the overall result is promising.

#### **P020 THE COOLEST WAY TO FIX A TROCAR IN PEDIATRIC MIS**

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**INTRODUCTION:** Fixing trocars in MIS is of utmost importance, particularly in children, because of the limited working space and the thin body wall in comparison to the adult patient. Diverse methods of trocar fixation including tying, intracorporeal button, adhesive tape and tegaderm have been reported. We present a simple, fast, cheap and secure method of fixing trocars of any size in pediatric MIS.

**MATERIALS & METHODS:** A multicentric retrospective review of patients younger than 18 years old (n=920) was done between 2005 and 2009. An average of 3 plastic seals per patient, costing U\$S 0,02-0,04 each, were used to fix each trocar. We proceeded as follows: (1) after the trocar insertion, a stitch was placed near its base (2) one of the thread ends was positioned parallel to the trocar; (3) depending on the trocar's size a sterile plastic seal of the proper size, was adjusted around its base including the thread (4) then both ends of the thread were tied around the fixed plastic seal.

**RESULTS:** Our proposed method proved to be effective in preventing trocar dislodgment during the entire MIS ranging from 20 to 120 minutes (median 60 minutes). No trocars were seen to slip in or out of the body. Plastic seals resulted easy to handle and suitable for all trocar sizes. They saved time; mean time of fixation per trocar was 25 seconds (range: 20–30 seconds). Advantages over other methods were: two size of seals fitted all the range of trocars (3 to 13mm), no glue was left on the instrument's surfaces and no specially prepared devices were needed.

**CONCLUSION:** Plastic seals proved to be a simple, fast, inexpensive and secure solution to the chronic problem of fixing trocars in pediatric MIS.

#### **P021 THE RESULTS OF PRIMARY LAPAROSCOPIC-ASSISTED ENDORECTAL PULL-THROUGH FOR HIRSCHSPRUNG DISEASE IN NEWBORN**

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**OBJECTIVE:** The aim of this study was to present the results of primary laparoscopic-assisted endorectal pull-through for Hirschsprung disease (HD) in newborn.

**METHODS:** Between January 2003 and August 2009, 47 patients (38 males, 9 females) who suffered from HD underwent primary laparoscopic surgery. Ages ranged from 3 days to 30 days, average age 21 days. The operation was performed through the abdominal laparoscopy and assisted endorectal pull-through. The ganglionic and aganglionic segments were initially identified by seromuscular biopsies obtained intraoperation. We left a short rectal seromuscular sleeve 2cm from the dentate line.

**RESULTS:** The aganglionic segment was located in the rectum in 31 patients, in the sigmoid colon in 15 patients in the left colon in 1 patients. The median operative time was 124 minutes. There were no intraoperative and postoperative complications nor deaths. There was minimal blood loss during surgery. The median hospital stay was 5.1 days. Spontaneous defaecation occurred in all patients before discharge.

Follow-up obtained in 42 infants (89.4%). The duration of follow-up ranged from 4 to 72 months (averaged, 56.5 months). Thirty patients had 1 to 2 stools per day (71.4%). Ten patients had 3 to 4 stools per day (23.8%). One patients had more than 4 stools per day (2.4%). One patient had persistent constipation (2.4%). Enterocolitis occurred in one patients (2.4%). Intermittent urinary didn't occur in all. Erectile function, evaluated by infant's parent, was presented in all 34 males who was followed up.

**CONCLUSION:** The primary laparoscopic-assisted endorectal pull-through is a safe and effective procedure for HD in newborn.

#### **P022 LAPAROSCOPIC TREATMENT OF TOTAL COLONIC AGANGLIONOSIS**

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**INTRODUCTION:** Total colonic aganglionosis (TCA) represents between 5 and 12 % of the patients with Hirschsprung's disease. These patients have higher morbidity than those with shorter segments and need more complex surgical management. We present our initial experience in the early minimal invasive management of this infrequent entity in two patients.

**MATERIALS & METHODS:** Report of 2 cases of TCA. Age, sex, clinical presentation, image studies, method of diagnosis, type and time of surgical intervention, pathology and post operative outcome were analyzed.

**RESULTS:** One patient was male (1) and the other female (2). Both were full term babies. Consult for lack of meconium elimination and abdominal distention. Contrast enema suggested TCA. Rectal suction biopsy confirmed aganglionosis. At 20 and 25 days of life a laparoscopic mapping was performed, confirming TCA and an ileostomy was created at 10 and 15 cm proximal to the ileocecal valve. After 50 and 30 days the gain of weight was 800g and 1150g respectively. At 50 and 55 days of life, definitive surgical procedure was scheduled: laparoscopic total colectomy with endoanal pullthrough and ileoanal anastomosis without ileostomy. Enteral feedings started at 2nd and 3rd PO day and parenteral nutrition was discontinued at 5 days PO. The two patients had minimal perianal dermatitis. Patient 2 had rotavirus enteritis on 20th postoperative day. Patient 1 was discharged on 8th day PO and the pt 2 stayed for 35 days because of social reasons. At 6,3 and 4 months of follow up, both patients are gaining weight, with no complications.

**DISCUSSION:** The laparoscopic approach is a safe option for the management of TCA with the advantages of minimal invasive surgery, although this procedure requires high laparoscopic skills. Direct ileoanal pullthrough seems to be a good alternative in the neonatal period. Further experience must be gathered.

#### **P023 LAPAROSCOPIC DUHAMEL OPERATION TECHNIQUE FOR TOTAL COLONIC AGANGLIONOSIS**

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**PURPOSE:** To present surgical technique and early outcomes of laparoscopic Duhamel technique for total colonic aganglionosis.

**PATIENTS & METHODS:** The operation was carried out using 4 ports. The total colon was freed. The rectum was divided at the level of peritoneal reflexion using EndoGIA. The ileostomy was released, and then pulled through the rectum via the retrorectal space. An end-to-side recto-ileal anastomosis was performed using interrupted sutures. A side-to-side recto-ileal anastomosis was carried out using EndoGIA.

**RESULTS:** From August to September 2009, 4 patients with an age range of 11 to 14 months were operated on using the same technique.

Operative time was 150 minutes, 180 minutes, 150 minutes, and 210 minutes respectively. Operative blood loss was not significant. There were no operative complications or death during and after operation. Postoperative stay ranged from 4 days to 6 days. Follow-up was obtained from 1 to 2.5 months. All patients had spontaneous defecation. Number of bowel movements varied from 4 to 7 times per day.

**CONCLUSION:** Laparoscopic Duhamel operation technique is feasible and effective for total colonic aganglionosis.

**P024 OUR EXPERIENCE WITH LAPAROSCOPY IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE** Alok Godse, Dr, Thomas Tsang, Mr, Ashish Minocha, Mr, Milind Kulkarni, Mr Norfolk and Norwich University Hospital

**AIMS:** To review our experience with laparoscopy in children with Inflammatory Bowel Disease.

**METHODS:** To review the clinical and surgical data of all children with Inflammatory Bowel disease (IBD) who had laparoscopy used in their surgical management at our centre.

**RESULTS:** 11 patients of IBD were identified where laparoscopy was used in management. 9 children had Crohn's disease and 2 had Ulcerative colitis. Indications for surgery were stricture in 8 patients, non response to medical therapy in 2 patients and a colonic perforation in 1 case. 9 had excision of a diseased segment while in 1 patient laparoscopy was used to treat a complication. In all patients who had excision of the diseased segment, laparoscopy was used for complete mobilisation and excision of the diseased segment. Extracorporeal anastomosis was carried out through a small extended umbilical port incision. 1 patient had an anastomotic stricture 5 years after a Right hemicolectomy which responded to balloon dilatation. 1 patient who had a colonic rent after colonoscopy sutured laparoscopically had adhesive bowel obstruction which required a laparotomy. 1 patient was taken up with a plan of resection of the diseased ileal segment, but was found to have no stricture on laparoscopy - further trial of medical treatment was agreed with the Paediatric Gastroenterologist. 1 patient had excision of 2 colonic strictures 6 years apart and laparoscopic adhesiolysis.

**CONCLUSION:** With our limited experience of 11 cases, we have found laparoscopy to be a useful procedure in patients with both Ulcerative colitis and Crohn's disease. It also helps in assessing the extent of the disease and planning the appropriate management. Removal of the diseased segment and extracorporeal anastomosis can be performed safely using a small umbilical incision.

**DECLARATION:** The authors wish to declare that an abstract based on the above clinical data has been submitted for oral presentation in British Association of Paediatric Endoscopic Surgeons annual meeting, Nov 2009. We further confirm that this data is not yet published or submitted for publication.

**P025 MINIMALLY INVASIVE COLOPEXY FOR CHILADITI SYNDROME** Wayne A Blevins, MD, Minela Fernandez, MD, Danielle E Cafasso, MD, Mary J Edwards, MD Tripler Army Medical Center

Chilaiditi sign is the finding on plain roentgenogram of colonic interposition between the liver and diaphragm, and is typically asymptomatic. Chilaiditi syndrome is a rare disorder characterized by varying symptoms of abdominal pain, anorexia, respiratory distress, constipation, and vomiting in association with Chilaiditi sign. Surgery is typically reserved for cases of catastrophic colonic volvulus or perforation as a result of the syndrome. We present a case of a 6 year old boy who presented with Chilaiditi syndrome and resulting failure to

thrive due to severe abdominal pain and vomiting which did not improve with laxatives and dietary changes. He underwent a laparoscopic gastrostomy tube placement and laparoscopic colopexy of the transverse colon to the falciform ligament and anterior abdominal wall. Post operatively, his symptoms resolved completely, as did his failure to thrive. His gastrostomy tube was removed 3 months following surgery and never required use. This is the first case of Chilaiditi's syndrome we are aware of which was treated with an elective, minimally invasive colopexy. In cases of severe Chilaiditi syndrome refractory to medical treatment, a minimally invasive colopexy should be considered as a possible treatment option, and potentially offered prior to development of life threatening complications such as volvulus or perforation.

**P026 LAPAROSCOPIC GASTRIC TUBE INTERPOSITION FOR LONG GAP ESOPHAGEAL ATRESIA** Edward Esteves, MD, Kelly C Paiva, MD, Marcelo Calcagno-Silva, MD, Humberto B Sousa-Filho, MD, Roneyara R Valamiel, MD, Celio C Chagas, MD Pediatric Surgery Division, University of Goias; Pediatric Surgery Division, Joao Penido Hospital. Goiania, Brazil.

**BACKGROUND:** Gastric tube interposition is one of the surgical options in children when esophageal replacement is necessary. The main advantages over total gastric pullup and colonic interposition include the elimination of future mediastinal compression or redundancy, resistance to acid reflux, maintaining mediastinal physiology, upper GI tract morphology and a gastric reservoir. Traditional open surgery and blind mediastinal dissections present reasonable morbidity, which can be reduced by videosurgery. Objective: The authors present novel techniques and preliminary outcomes in two cases of laparoscopic gastric tube interposition (LAGATI) in children.

**PATIENTS & METHODS:** Two children aged 6 and 11 months underwent LAGATI due to pure esophageal atresia. One boy had esophagostomy. The patients were operated on laparoscopically using 3 ports, including the gastrostomy site. The stomach at the gastrostomy site was freed and closed, followed by extramucosal pyloroplasty. Transhiatal mediastinal dissection was carried out laparoscopically up to the neck, concomitantly to cervical release of esophagostomy (case 1). The greater curvature was stapled to fashion a fundus-based 12 to 18-cm long tube with a laparoscopic linear stapler introduced through the gastrotomy site. In one case the stomach could be exteriorized through this incision for extracorporeal stapling. The conduit was pulled up through the posterior mediastinal tunnel for cervical esophagus-tube anastomosis, over a transanastomotic nasogastric tube. Case 1 had previously a left sided esophagostomy and in case 2 a right sided esophagus-tube anastomosis was performed in a virgin neck.

**RESULTS:** Operative times were 2.8 and 4 hours, there were no conversions and no complications related to laparoscopy. Feedings could be started by day 3. Case 1 needed postoperative intubation due to agitation, which caused cervical fistula requiring surgical revision at the neck. Later he presented pneumonia. Case 2 evolved uneventfully. After a follow-up period of 6-18 months, all patients are asymptomatic in percentile 50 and 70.

**CONCLUSIONS:** These first cases suggest that LAGATI is feasible and can be safely performed using a few ports with very low morbidity in children. Other studies with larger series and follow-up are expected in future.

**P027 OSTEOSCOPY FOR PERCUTANEOUS CURETTAGE AND GRAFTING IN SYMPTOMATIC UNICAMERAL BONE CYSTS** Jerry Kieffer, MD, Paul Philippe, MD, Monika Glass, MD Clinique Pédiatrique de Luxembourg

Unicameral bone cysts (UBC) are benign, fluid filled bone lesions, most commonly found in the metaphysis of long bones in skeletal immature patients.

Usually asymptomatic, they can cause a pathologic fracture due to increased fragility of the bone. Treatment options include observation, fluid aspiration and steroid or bone marrow injection, open or percutaneous curettage and grafting under fluoroscopic guidance and elastic stable intramedullary nailing for stabilization and decompression.

We present two patients aged 6 and 5,6 years, one with a proximal, one with a distal metaphyseal UBC of the tibia. Both were symptomatic, one having a non displaced pathologic fracture. Cyst index according to Kaelin (cyst surface / square of diaphysis diameter) was 5,29 respectively 4,29, treatment being recommended for an index above 3,5.

Initial treatment consisted of fluid aspiration, percutaneous bone marrow injection and elastic stable intramedullary nailing.

After a mean observation period of 19 month, no satisfactory healing was observed. Both patients were then treated by percutaneous curettage of the cyst walls and grafting with a combination of homologous cancellous bone chips and

Hydroxyapatite pellets under direct intraosseous vision with the aid of a 5mm 30° scope. Complete healing was observed after a mean period of 5 month.

In patients eligible for curettage and grafting, the introduction of a scope into the cystic cavity permits complete visualization of the working space and thus a complete removal of the cyst walls and grafting without the risk of leaving a gap.

**P028 LAPAROSCOPIC REPAIR OF TRAUMATIC BOWEL INJURIES IN CHILDREN WITH NITINOL U-CLIP SUTURES: 2 CASE REPORTS** Katrine M Lofberg, MD, Audrey Durrant, MD, Garret Zallen, MD Oregon Health and Sciences University

**BACKGROUND:** Blunt abdominal trauma can be a potentially devastating injury in children. Compared to adults, they are more susceptible to rupture of abdominal viscera given their smaller frames and thin abdominal wall do not absorb energy as well, leading to higher rates of injury with less force. Until recently, exploratory laparotomy was the only option for management of children with abdominal trauma leading to perforation of hollow abdominal organs. Yet the morbidity associated with laparotomy can be significant. Minimally invasive management of traumatic injuries is a comparatively new concept within the field of trauma, but has the potential to decrease these complications. Although data is still sparse, a handful of studies have demonstrated that laparoscopic repair of traumatic abdominal injuries in children is not only feasible, but results in less pain, fewer ICU and hospital days, and faster return to daily activities without increase in missed injuries, morbidity or mortality. Yet, laparoscopic management of traumatic rupture of abdominal organs has to date required advanced laparoscopic skills. Here, we present two case studies demonstrating that traumatic perforation of bowel in children who are otherwise stable can be managed using a simple laparoscopic technique accessible to most surgeons.

**CASE 1:** A 13 year old boy sustained a traumatic small bowel injury while riding his bike. He was transferred to our Level 1 Trauma Center approximately 5 hours after injury. A CT scan and abdominal ultrasound were performed which demonstrated high-density fluid within the hepatorenal space and along the right lateral colonic gutter, indicative of small hemoperitoneum. Laparoscopic examination was performed 12 hours post-injury revealing succus within the abdomen, a

full thickness injury to jejunum and a small tear in the mesentery. Both injuries were repaired using a U-clip suture (see Figure 1). He was discharged on post-operative day 6 after an uneventful hospital stay.

**Figure 1**



**CASE 2:** An 11 year old girl sustained a rectal injury in a jet-ski accident. She was transferred to our institution after a CT scan showed free intra-abdominal air. Sigmoidoscopy was performed and a tear in the anterior rectum was noted approximately 15 centimeters from the anal verge. Laparoscopy confirmed a 6 centimeter full thickness tear in her anterior sigmoid colon just proximal to the peritoneal reflection with only slight peritoneal contamination. The tear in the sigmoid colon was again repaired with U-clips. Her hospital course was uneventful and she was discharged on post-operative day 4.

**CONCLUSION:** These cases demonstrate that laparoscopic management of traumatic bowel injury in children is a viable option. Furthermore, U-clip sutures may offer a reasonable alternative as they do not require the ability to execute intra-corporeal or extra-corporeal knots and enables repairs to be performed in less time. Given the morbidity associated with laparotomy, the time sensitive nature of many of these cases and that many such injuries occur in areas without access to surgeons who have advanced laparoscopic skills, this technique may be preferable in stable pediatric patients with less extensive injuries to the bowel.

**P029 RETRACTION OF THE GALLBLADDER PROVIDING EXCELLENT EXPOSURE OF THE CALOT'S TRIANGLE DURING SINGLE INCISION LAPAROSCOPY (SILS): OUR TECHNIQUE**

Ismael Alejandro Salas De Armas, MD, Ashwin Pimpalwar, MD Texas Childrens Hospital, Houston, Texas, 77030

**BACKGROUND:** Laparoscopic cholecystectomy requires adequate retraction in order to expose Calot's triangle; this is achieved by grasping the fundus of the gallbladder and elevating it over the dome of the liver during standard laparoscopy. This critical step becomes a technical problem during single incision laparoscopic surgery (SILS). We propose a new technique of optimal cephalad retraction of the gallbladder during SILS and also the 3 port laparoscopic cholecystectomy.

**MATERIAL METHODS:** We used this technique on 3 children (age range 12 - 16 years) in 2009. Under general anesthesia and open Hassan's technique, three 5 mm ports were placed through a single trans-umbilical incision in 2 children and a trans-umbilical Triport (Olympus surgical) was used in the 3rd child. The abdomen was inspected with a 5mm 30 degree scope. Then, the table was placed in the reverse Trendelenburg position with the right side up. The dome of the gallbladder was grasped with an atraumatic grasper passed through one of the umbilical port and retracted over the dome of the liver till the Calot's triangle wall fully exposed. This position was marked on the inside of the chest wall. Under laparoscopic visualization, 2-0 vicryl suture or 2-3 T-Fastners were passed from the right upper quadrant below the costal margin and the superficial layer (peritoneum) of the dome of the gallbladder without penetrating the wall. A Grantee needle

was then passed through the same point advanced subperitoneally to the previously marked point on the chest wall. The vicryl suture that was placed through the dome of the gall bladder was then grasped and pulled out through this new point. This retracted the gallbladder cephalad as a grasper would do in standard laparoscopy and provide excellent exposure of the Callot's triangle. There was no blood loss, biliary leakage or gallbladder wall disruption as may happen with other described techniques of retraction. The rest of the procedure then proceeded in the standard fashion.

**RESULTS:** There was no bile leakage during the retraction of the gallbladder. All children were discharged on the next day morning with no analgesia requirement. At follow up in 2-4 weeks all had almost invisible scars at the umbilicus and no other scars.

**DISCUSSION:** The use of our technique for optimal cephalic retraction of the gallbladder with exposure of the Callot's triangle during single incision (SILS) cholecystectomy represents a modification that simplifies this challenging surgical technique. This retraction facilitates the identification of critical structures and greatly helps the dissection in the Callot's triangle.

**CONCLUSION:** The initial limited experience from cephalad retraction of the gallbladder using our technique in selected patients demonstrates that SILS cholecystectomy could become a safer, more easily replicated and almost similar to standard laparoscopy procedure with theoretically less gallbladder disruption and bile leakage during the procedure; maintaining the advantages of SILS, which include excellent cosmetic results and less postoperative pain.

## **P030 A NOVEL TECHNIQUE FOR PERITONEAL DIALYSIS CATHETER INSERTION THAT ALLOWS FOR IMMEDIATE USE**

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**INTRODUCTION:** Traditional peritoneal dialysis catheter placement techniques are accompanied by a 10-14 day delay before catheter use may be started thus preventing their use in the acute setting.(4-5) This delay, designed to minimize leakage, means that hemodialysis must often be used as an interim support for these patients. Unfortunately, hemodialysis carries a number of hazards including the need for anticoagulation, increased morbidity in hemodynamically compromised patients and increased risk of Disequilibrium Syndrome. Here we describe a novel technique for PD catheter placement which allows for immediate use in the acute setting.

**TECHNIQUE:** A 5cm incision is made on the abdominal wall transversely to the left of the umbilicus, carried sharply down to the anterior rectus sheath. The anterior rectus sheath is opened transversely, the muscle fibers are spread and the posterior sheath is opened into the peritoneal cavity. The omentum is grasped and exteriorized. An omentectomy is performed. A peritoneal dialysis catheter is introduced into the pelvis until the cuff rests just above the posterior rectus sheath. The catheter is secured in the posterior rectus sheath with a running, locking 4-0 Maxon suture. Next, a flap is created over the superior edge of the anterior rectus sheath to approximately 2cm back by dissecting off the overlying fat and a pursestring suture of 4-0 Maxon is placed. An opening is made in the anterior rectus sheath in the middle of the pursestring. The peritoneal dialysis catheter is then drawn through the muscle and out through this opening with the catheter being secured with the suture. The cuff remains in the muscle. The original transverse incision made on the anterior rectus sheath is then closed with a running, locking 4-0 Maxon suture. A separate stab incision is made in the left flank and the catheter is brought out through that location

with the end of the catheter pointing inferiorly. The skin is closed with interrupted subcuticular 4-0 Vicryl. Prior to closing the skin, 0.5 L of saline is run through the catheter and when no leak is identified, it is easily drawn off through the catheter by gravity.

**DISCUSSION:** In the technique described here, the catheter is inserted in a "Z" shape entry through the two levels of fascia. This allows for the immediate use of the catheter preventing treatment delays and possible need for hemodialysis.

## **P031 THE 120-DEGREE LAPAROSCOPE: IMPROVED VISUALIZATION OF THE CONTRALATERAL INTERNAL**

**INGUINAL RING** Kim G Mendelson, MD PhD, Timothy J Fairbanks, MD, Duane S Duke, MD, Lindsay G Arthur, MD, Rajeev Prasad, MD St. Christopher's Hospital for Children

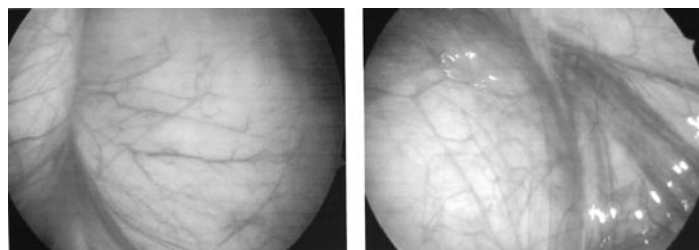
**INTRODUCTION:** Examination of the contralateral internal inguinal ring to identify the presence of a patent processus vaginalis (PPV) is commonly performed in children undergoing a unilateral inguinal herniorrhaphy. This can be done through the umbilicus, through a separate stab incision, or by instrumenting the hernia sac itself with a laparoscope. Visualization through the hernia sac requires an unobstructed view of the contralateral pelvis, which is commonly obscured by overlying bowel or the adjacent bladder. We felt that the use of a laparoscope with a reverse angle might improve visualization of this area. The purpose of this study was to compare the views offered by the 70° vs. the 120° laparoscope.

**METHODS:** Ten consecutive children had laparoscopy performed through the hernia sac during unilateral inguinal herniorrhaphy to evaluate for the presence of a contralateral PPV. In each case, both 70° and 120° laparoscopes were utilized. Those patients who had a contralateral PPV underwent a contralateral groin exploration and closure of the PPV. Operative photographs were taken to document the results and are submitted here.

**RESULTS:** In all cases, the 120° laparoscope provided better visualization of the contralateral internal inguinal ring. Various scenarios were noted. In the majority of cases, the PPV was seen with both laparoscopes but was more clearly visualized with the 120° telescope. In one case, the view with the 70° telescope was obscured by the bladder, but a PPV was clearly visualized using the 120° laparoscope. In another case using the 70° laparoscope, there appeared to be a PPV behind a fold of peritoneum, but upon viewing with the 120° laparoscope it was determined to be a closed ring beyond the flap of peritoneum.

**CONCLUSION:** It has been reported that up to 52% of children undergoing a unilateral inguinal herniorrhaphy have a contralateral PPV. When discovered, these are often treated by a contralateral groin exploration and high ligation. For surgeons choosing to evaluate the contralateral internal inguinal ring by laparoscopy during unilateral herniorrhaphy, the 120° reverse-angle laparoscope may offer superior visualization.

**Figure 1:** Left: 70° laparoscope. View is obscured by the bladder. Right: 120° laparoscope. Inguinal ring is well visualized.



**P032 LAPAROSCOPIC MORGAGNI HERNIA REPAIR IN THE NEONATAL PERIOD** Kaushik Mukherjee, MD, Harold N. Lovvorn III, MD, FACS, Monroe Carell, Jr. Children's Hospital at Vanderbilt University Medical Center - **WITHDRAWN**

**P033 MINIMALLY INVASIVE SURGERY IN PEDIATRIC TRAUMA: AN EXPERIENCE LEARNED** Miguel Guelfand, MD, Marcela Santos, MD, Exequiel González Cortés Hospital for Children - Chile

**OBJECTIVE:** Review our experience with minimally invasive surgery (MIS) in pediatric trauma.

**PATIENTS & METHODS:** Retrospective review of all patients that underwent MIS for diagnosis and treatment with the diagnosis of abdominal trauma.

**RESULTS:** 3 patients with abdominal trauma were operated with MIS for the diagnosis and treatment due to an abdominal trauma in the last 4 years. Age ranged between 2 and 13 years old and weight between 10 to 55 kilos. All patients had the diagnosis of complicated abdominal trauma. All patients were hemodinamically stabilized before surgery. Diagnosis were: (a) gastric perforation due to an abdominal blunt trauma, (b) bladder perforation due to abdominal blunt trauma and (c) 3 intestinal perforations due to gun shot trauma. The first 2 patients were repaired laparoscopically. The last patient the intestinal perforations were externalized through the umbilical trocar site and repaired extracorporeally. All 3 patients recover uneventfully.

**CONCLUSIONS:** Minimally invasive surgery approach is an extraordinary surgical tool in abdominal trauma for diagnosis and treatment in patients with complicated abdominal trauma that are hemodinamically stabilized.

**P034 LAPAROSCOPIC ASSISTED CHOLEDOCHAL CYST EXCISION WITH ROUX EN Y HEPATICOJEJUNOSTOMY** Boma T Adikibi, MD, Gillian H M Duthie, MD, Fraser D Munro, MD, Gordon A MacKinlay, MD Royal Hospital for Sick Children, Edinburgh, UK.

**AIM:** We present our experience of laparoscopic resection of choledochal cysts in one institution.

**METHODS:** Data was retrieved from surgical audit, our laparoscopic database and case note review of all choledochal cysts treated laparoscopically in our institution between 2000 and the present day. We collected data on patient demographics, operative details, conversion and complications encountered.

**RESULTS:** Data from 5 sequentially treated children were reviewed retrospectively. There were 2 female and 3 male. The ages ranged from 1 month to 13 years (median age 7 months). The commonest type was type I (n=3) choledochal cyst, with the remaining patients having a type II and a type IV choledochal cyst. The operative time ranged from 120 minutes to 440 minutes (median 255 minutes). The conversion rate was 20% (n=1), the first attempt at laparoscopic excision was converted. The female patient had adhesions from a previous laparotomy and there was significant fibrosis around the biliary tree due to preoperative cholangitis. The complication rate was 40% (n=2). One complication was a reoperation on the eighth day post surgery. At laparotomy there was a 180 degree volvulus of the Roux loop. This was reduced and the anastomosis redone, the hepatico-jejunostomy was left undisturbed. The second complication was an anastomotic leak requiring drainage until the 15th post operative day. The median post operative hospital stay was 10 days (range 4- 42 days) The median follow up for this cohort of patients is 3 years and 5 months (range 1-5 years)

**CONCLUSION:** The median operating time is approximately 4 hours.

The only conversion that occurred was in a patient who had undergone previous open abdominal surgery. There were no intra operative complications. Morbidity associated with the procedure are recognised complications and not related to the minimally invasive mode of operating. With a median follow up of 3 years we have demonstrated short term results comparable to the open procedure with benefits of MIS however long term follow up is essential to ascertain if the outcome remains comparable with time.

**P035 PERCUTANEOUS ENDOSCOPIC GASTROSTOMY PLACEMENT IN A HUMAN IMMUNODEFICIENCY VIRUS POSITIVE PAEDIATRIC POPULATION** Ram M Nataraja, MBBS BSc MRCSEd, Julia R Fishman, MBBS BSc, Aisha Naseer, MBBS, Jo Dodge, Sam M Walters, MB BChir MA FRCP, Simon A Clarke, MBBS FRCS Paeds Surg, Munther J Haddad, MBBS FRCS Paeds Surg Department of Paediatric Surgery, Chelsea and Westminster Hospital NHS Foundation Trust, 369 Fulham Road, London SW10 9NH, United Kingdom. Family Clinic, Imperial College Healthcare NHS Trust, Praed Street London W2 1NY, United Kingdom

**AIM:** The development of effective multiple drug regimens for treating human immunodeficiency virus (HIV) are associated with non-adherence in children. HIV-positive children also have a higher incidence of malnutrition. A solution for this is the placement of a percutaneous endoscopic gastrostomy (PEG). Primary outcome was to determine the complications of PEG placement in a paediatric HIV-positive population.

**METHODS:** Retrospective data analysis, over 10 years, of HIV-positive children undergoing insertion of a PEG at 2 centres. Parameters examined included infections, leakage, displacement, reasons for removal, total time in situ, HIV stage, CD4 count, and pathological investigation. Data was compared against published data for PEG insertion in paediatric oncology patients using Fishers exact test.

**RESULTS:** 18 children were identified; median age was 35 months and median follow-up period of 58 months. 100% had vertical transmission. The majority had stage C disease(65%) and 35% stage B(Centres for Disease Control and Prevention Clinical Classification). 47% of PEGs were inserted for feeding supplementation and 100% used for the administration of medications. 41% had been removed as they were no longer needed, median time in situ 763 days. Median time of change to a button was 107 days. 59% experienced a complication; infection (29.4%), leakage (11.8%), granulation (5.9%), and dislodgement (5.9%). Stage of HIV did not affect the incidence of bleeding or infection: 5/11(Stage C) vs. 1/7(Stage B) (p=0.3). The overall complication rate was similar to the paediatric oncology patients 10/18 vs. 34/54(p=0.78). None of the complications required surgical intervention.

**CONCLUSIONS:** There is low rate of serious complications with PEG insertion in our patients, and the rate is comparable to that seen in paediatric oncology patients. The minor complication rate is however higher than a normal population; the most common complication was minor infection. These results suggest there is no contra-indication for PEG placement in HIV-positive children.

**P036 OUR EXPERIENCE IN SURGICAL TREATMENT OF CHOLEDOCHAL CYSTS** Nikica Andromako, E. Gadzijev, M. Horvat, Z. Koren UKC MARIBOR, Department of abdominal surgery

Choledochal cysts are congenital anomalies of the bile ducts. They consist of cystic dilatations of the extrahepatic biliary tree, intrahepatic biliary radicles, or both. Choledochal cysts are relatively rare in Western countries, most common in Japan, 80% present in

childhood, male : female ratio is 1:4, aetiology unknown. The authors present the experience in surgical treatment of choledochal cysts over the period from 2000 -2009 in which time seven patients with confirmed choledochal cysts at the ward for abdominal surgery of the SB Maribor. The mean age of the patients was 16, male:female ratio is 1:6. Pre-operative diagnosis was established based on anamnesis, clinical findings, blood test and radiology studies (readily made by US), delineation of operative anatomy with CT, ERCP, PTC, cholangiography, MRI/MRCP. Dominant symptoms were pain in the upper right quadrant of the abdomen, icterus, palpable abdominal mass, vomiting, fever and pancreatitis. Once the diagnosis was established, all patients underwent surgery. Four of our patients had type 1 (B, C, C, C) and three patients with type 4 (A, B, B) choledochal cysts according to Todani classification. The preferred procedure today is to completely remove (excise) the dilated duct system outside the liver and to drain the common bile duct as it exits the liver into a loop of intestine designed to prevent backflow of intestinal contents into the liver, thus protecting the patient from cholangitis. All anastomosis were performed in single layer with individual sutures. Mean time spent in hospital was 15 days and the patients were discharged on average 11 days after the operation. In the post-operative period, we recorded complications with three patients. One patient was operated again because of recurrent icterus, frequent cholangitis and failed multiple percutaneous stenting. In the new surgery, the left hepatectomy was performed with no post-operative complications. Choledochal cysts are very rare with our population and are diagnosed only sporadically. According to full diagnosis and pre-operative preparations, all patients were operated because of potential complications (recurrent cholangitis, hepatic fibrosis, biliary cirrhosis and portal hypertension, pancreatitis, hepatic abscess, gall stones and carcinoma of the biliary tree 10-15%). We are monitoring all patients and so far there are no complications. Prognosis is poor if advanced disease with portal hypertension.

**P037 LAPAROSCOPIC MANAGEMENT OF LARGE SPLENIC CYSTS** Laura J Coates, MB BS MRCS, Timothy N Rogers, MBChB FCS FRCS, Robin G Garrett-Cox, MB BChir MA MS FRCS Bristol Royal Hospital for Children

We present two cases of laparoscopic management of large splenic cysts; one decapsulation and one partial splenectomy. Non-parasitic splenic cysts are rare, but seem to be increasing in incidence. This may be due to the growing use of ultrasonography in investigating abdominal pain, and in the rise in conservative management of splenic trauma.

Historically, the management of large (>15cm) splenic cysts was limited mainly to conservative management, percutaneous drainage, open fenestration or open decapsulation, all of which carry high risks of recurrence. Recurrence rates with these methods have been reported over 80%<sup>1</sup> even with repeated percutaneous drainage, although there seems to have been some success with percutaneous aspiration and use of sclerosing agents for recurrent cysts<sup>2</sup>. Some large splenic cysts used to be routinely treated with total splenectomy, which obviously carried serious risks of overwhelming post-splenectomy infection (OPSI).

Partial splenectomy carries a higher risk of peri-operative bleeding than the above methods but a lower risk of recurrence than these and a lower risk of OPSI than total splenectomy.

Patient 1 was a thirteen year old boy who sustained blunt trauma to the left side of his abdomen. He subsequently developed a 20cm splenic cyst with calcification and a significant mass effect. The majority of the necrotic cyst was excised laparoscopically although due to proximity to the hilar vessels, a small residual portion of cyst wall was left. He was discharged home four days later. At follow up he

was found to have a healthy residual spleen and a 3cm residual cyst which was unchanged twelve months later.

Patient 2 was a fourteen year old gymnast with a vague history of potential blunt trauma. She was found subsequently to have a 19cm splenic cyst with necrosis of the cyst capsule. She underwent a partial splenectomy using the harmonic scalpel and was discharged home on day five post-operatively. Follow-up scans showed no evidence of recurrent cyst.

In neither case was there major peri-operative bleeding or difficulties.

These cases demonstrate that large splenic cysts, although challenging, can be treated safely and effectively via the laparoscopic method. From the available evidence, the aim should be to completely excise the cyst and its wall with a partial splenectomy. This may not always be feasible due to proximity of the cyst to the hilar vessels.

<sup>1</sup> Wu et al, Am J Surg 2006;191:631-634

<sup>2</sup> Czauderna et al, Eur J Ped Surg 2006;16:415-419

**Figure 1:** CT showing a 19cm splenic cyst.



**P038 OPEN VERSUS LAPAROSCOPIC PYLOROMYOTOMY FOR HYPERTROPHIC PYLORIC STENOSIS; A SYSTEMATIC REVIEW AND META-ANALYSIS** R Bakx, MD PhD, M.W.M. Oomen, MD, D.T. Ubbink, MD PhD, L.T. Hoekstra, MD, H. Heij, Prof MD PhD Academic Medical Center

**INTRODUCTION:** the presumed superiority of laparoscopic pyloromyotomy over open pyloromyotomy for hypertrophic pyloric stenosis remains debatable.

**AIM:** to compare the results of both surgical strategies by means of a systematic review and meta-analysis of the available literature.

**METHODS:** Randomised clinical trials (RCTs) comparing open and laparoscopic pyloromyotomy were systematically reviewed. Eligible trials were searched and reviewed by two investigators independently for design, inclusion and exclusion criteria, quality, and outcomes. Primary outcome was major post-operative complications (i.e. incomplete pyloromyotomy, perforation, need for re-operation). Secondary outcomes were time to full feed and post-operative hospital stay.

**RESULTS:** four RCTs with a total of 502 patients (open pyloromyotomy 255, laparoscopic pyloromyotomy 247) fulfilled the inclusion criteria. Trial quality was good. As they addressed the same patients, interventions, and outcomes, a meta-analysis of the results was possible. Major post-operative complication rates did not differ between both treatment groups (absolute risk reduction [ARR]: 3%, 95% Confidence Interval [CI]: -3 to 8%; random-effects model used because of an I<sup>2</sup>=55%, p=0.35), i.e. not significantly different between the two treatments. The mean difference in time to full feed was 2.24 hours longer in the open than in the laparoscopic treatment group (95% CI: 0.15 to 4.34 hours, I<sup>2</sup> =16%, P=0.04). Mean difference in post-operative hospital stay did not differ significantly (2.5 hours, 95% CI: -1.18 to 6.21 hours, I<sup>2</sup> = 0%, P=0.18).

**CONCLUSION:** Based on all available high-level evidence, major post-operative complication rates after laparoscopic pyloromyotomy for hypertrophic pyloric stenosis do not differ from open pyloromyotomy. The two hour shorter time to full feed appears insufficient evidence to appoint laparoscopic pyloromyotomy as standard of care.

### **P039 LAPAROSCOPY IS A GOLD STANDART IN DIAGNOSIS AND MANAGEMENT OF MECKEL'S DIVERTICULUM**

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**INTRODUCTION:** Although Meckel's diverticulum is the most common congenital abnormality of the gastrointestinal tract and modern imaging techniques are available, its diagnosis remains problematic, especially in complicated disease. Laparoscopy assists in the early diagnosis and can offer definitive treatment of patients with complicated Meckel's diverticulum

**RESULTS:** Of the 7 children with complicated Meckel's diverticulum, 3 presented with gastrointestinal bleeding, 3 had intestinal obstruction secondary to omphalomesenteric band and blind ileal loop due to a transversely torsed Meckel's diverticulum and 1 had abdominal pain mimicking acute appendicitis as a result of Meckel's diverticulitis. The Tc-99 m Perchnetate scan and upper and lower gastrointestinal endoscopies were negative for the 3 patients who presented with gastrointestinal bleeding. Diagnostic laparoscopy was performed for all the patients, and laparoscopically assisted transumbilical Meckel's diverticulectomy was performed successfully in all 7 children. The operative time ranged from 50 to 90 min (mean, 65 min). All the children had an uneventful recovery with starting of the bowel movements on the first postoperative day.

**CONCLUSIONS:** Laparoscopy is a safe and effective surgical modality for diagnosis of complicated Meckel's diverticulum and has a therapeutic role that results in an excellent cosmetic outcome. Laparoscopy should immediately be performed in patients with lower gastrointestinal bleeding and with negative endoscopy and Technetium 99m Perchnetate scintigraphy. Laparoscopically assisted transumbilical Meckel's diverticulectomy is a safe and cost-effective technique which avoids usage of staplers.

### **P040 COMPARISON OF MICROLAPAROSCOPIC PYLOROMYOTOMY TO PARAUMBILICAL APPROACH (BIANCHI) AND WEBER-RAMSTEDT APPROACH FOR IDIOPATHIC HYPERTROPHIC PYLORIC STENOSIS**

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**PURPOSE:** To compare the microlaparoscopic approach for pyloromyotomy in infants to the open approaches, periumbilical approach (Bianchi) and the Weber-Ramstedt, with respect to perioperative parameters and postoperative complications.

**METHOD:** The study includes 112 children (87 boys and 25 girls, aged from 10 to 98 (average 28) days from two departments of pediatric surgery (Mainz and Trier), Germany. Out of 30 laparoscopic pyloromyotomies, 20 were performed microlaparoscopically (exclusive use of 2 mm instruments and miniscopes, 1.9 to 2.4mm in diameter). 26 children were operated open with Weber-Ramstedt. The periumbilical approach (Bianchi) was performed in 56 children. There was no significant difference in age, weight or sex between the three groups.

The data were analysed by Mann-Whitney U-Test concerning differences between the three groups using SPSS ver. 15.

**RESULTS:** Between the Bianchi approach and the microlaparoscopic approach, there was a significant difference in operative time (average 38,5min vs 20,5 min,  $p < 0,0001$ ) and in time to full enteral feedings (average 2,3 vs. 1,45 days,  $p = 0,001$ ). There was no significant difference in length of stay (7 vs 4 days,  $p = 0,08$ ).

In the group of microlaparoscopy, the operative time was significantly shorter with surgeons experienced with microlaparoscopy (range 9 min. to 20 min), when compared to inexperienced surgeons (average: 15 min vs 30 min,  $p < 0,0001$ ). No relevant operative time difference was noted in Bianchi group.

Comparing the Weber-Ramstedt procedure and microlaparoscopy, laparoscopy resulted shorter operative time (50 min vs 20 min,  $p < 0,0001$ ), shorter time to full enteral feedings (3,87 days vs 1,45 days,  $p < 0,001$ ) and shorter length of stay (8,5 days vs 4,3 days,  $p = 0,01$ ).

Postoperative feeding started four hours after surgery and was increased to ad libitum feeding the following day in microlaparoscopy and Bianchi groups. Median time to full enteral feeding was one day in the microlaparoscopy group (range 0,5 – 4 days) and two days in Bianchi (range 1 – 6 days), respectively.

Prolonged vomiting occurred in 13 patients in the periumbilical approach, in four patients in microlaparoscopy and five patients after Weber-Ramstedt procedure. There were no cases of mucosal perforation or incomplete pyloromyotomy, duodenal stenosis or readmission within 4 weeks after surgery in all three groups. There were 4 cases of small wound hematoma periumbilically and 1 case of wound infection in the group of periumbilical approach and 2 cases of SIRS in Weber-Ramstedt group. No such complications occurred in the microlaparoscopy.

The cosmesis was compared by surgeon and parents subjectively at follow up, but not standardised for statistical comparative analysis.

**CONCLUSION:** In terms of operative time and time to full feedings, microlaparoscopy was significantly superior to the Bianchi approach and both procedures superior to Weber-Ramstedt. The cosmetic results for microlaparoscopy and Bianchi were comparable and both significantly superior to the Weber-Ramstedt approach. Bianchi approach also shows satisfactory results. The Weber Ramstedt approach was associated with longer operative time and length of stay, a higher complication rate and inferior cosmetic results.

In experienced hands, the microlaparoscopic pyloromyotomy seems to be superior.

### **P041 TOUPET FUNDOPLICATION: A BETTER OPTION IN HELLER MYOTOMY IN ESOPHAGEAL ACHALASIA**

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**AIM:** To review a single institution experience of Laparoscopic Heller myotomy and to demonstrate why to choose Toupet funduplication to prevent reflux after myotomy in pediatric patients with achalasia.

**PATIENTS & METHODS:** A retrospective chart review and video archives of 7 children who underwent laparoscopic Heller myotomy and Toupet funduplication was performed.

**RESULTS:** The median age for the patients was 10 (3-13 years). There were no intraoperative complications. Mean operative time was 58 minutes (35-75 mins). All 7 children had Toupet funduplication. Median length of hospital stay was 3 days. None of the patients developed reflux symptoms postoperatively and there were no recurrences.

**CONCLUSION:** A complete mobilization of esophagus in order to do a posterior fundoplication facilitated performing a satisfactory (long enough) cardiomyotomy. Lateral stretching the sides of myotomy with this anti-reflux procedure enabled an effective treatment of symptomatic achalasia and prevented recurrences. Laparoscopic Heller myotomy with Toupet fundoplication is a safe and effective treatment option with excellent resolution of dysphagia symptoms and affording a full protection of gastroesophageal reflux.

**P042 LAPAROSCOPIC RECTAL SUSPENSION WITH PERITONEAL-STRIPS FOR COMPLETE RECTAL PROLAPSE IN CHILDREN** Suoli LI, MD, Yingchao LI, MD Department of Pediatric Surgery, 2nd Hospital of Hebei Medical University, Shijiazhuang

**Objective** To explore the feasibility and clinical effect of laparoscopic rectal suspension with peritoneal-strips for serious complete rectal prolapse (SCRP) in children. **Methods** The clinical data of 6 patients with SCRPs were investigated from August 2004 to October 2008. Under the laparoscope, two L-shaped peritoneal strips with pedicle were cut from the incassated and slack peritoneum of pelvic cavity on bilateralis of the rectum respectively, and they were folded and sewed at the lateral walls of the free rectum, then their ends were stitched on the fascia in front of the sacral promontory for suspending the rectum. Finally, the incisal margin of the peritoneum was sutured together with the anterior wall of the rectum in order to embed the peritoneal strips and reconstruct the pelvic peritoneum. **Results** All of 6 laparoscopies were performed successfully. The operative time lasted 95min~210min (mean 120±24 min). The estimated bleeding was lesser than 10ml. During a follow-up period of 6 to 54 months (mean 28 months), no recurrences were observed and the bowel movements were normal. **Conclusions** Laparoscopic rectal suspension with peritoneal-strips is satisfactory and effective for SCRPs. It is minimally invasive, quickly recover and low-recurrence. It provides a novel surgical method with a high value of clinical application.

**P043 EARLY EXPERIENCE WITH LAPAROSCOPIC CHOLECYSTECTOMY AT A SINGLE CENTRE** Alison Campbell, MD, Timothy J Bradnock, MD, Charles Keys, MD, Graham Haddock, MD, Gregor M Walker, MD, Atul J Sabharwal, MD The Royal Hospital for Sick Children, Glasgow

**INTRODUCTION:** We began performing laparoscopic cholecystectomies (LC) in March 2000. We have taken a measured approach to the introduction of this technique and report our experience.

**METHOD:** All patients undergoing LC over a 9-year period from March 2000- August 2009 were reviewed retrospectively. Cases were identified from a prospectively recorded theatre database and standardised data extracted including demographics, pre-operative imaging, underlying diagnosis, indications for surgery, grade of surgeon, complications and post-operative recovery.

**RESULTS:** 33 LCs were performed (23 girls, median age 12 years, range 5 to 19). Underlying diagnoses were hereditary spherocytosis (16), idiopathic gallstones (6), other haemoglobinopathies (3), cystic fibrosis (2) and other (6). Indications for cholecystectomy were biliary colic (18), acute cholecystitis (6), obstructive jaundice (4), gallstone pancreatitis (3) and asymptomatic gallstones in patients undergoing splenectomy (2). All patients underwent pre-operative ultrasound, which confirmed the presence of gallstones and in addition demonstrated a dilated CBD in 3 patients. 27 patients underwent LC alone; 6 had simultaneous laparoscopic splenectomy. A consultant was the primary operator for the first 16 LCs. 3 of the early cases were performed under the mentorship of a visiting surgeon from an established adult

laparoscopic centre. Thereafter, there was gradual transition from a 2 consultant to a single consultant operation. Trainees under consultant supervision have performed 5 of the last 11 LCs. There were two conversions to an open procedure, one due to adhesions and one due to bleeding during splenic mobilisation after successful LC. There were no other significant intra-operative or post-operative complications. Two patients had chest infections after LC, one experienced a transient ileus and one had mild pancreatitis. Median post-operative stay was 60 hours (range 36 – 204).

**CONCLUSION:** We have adopted a measured approach to the introduction of LC in our centre. This enabled us to avoid potential complications associated with the early part of the learning curve. The laparoscopic approach is now the procedure of choice in all children undergoing elective cholecystectomy in our centre. This procedure is safe and effective, even during the early part of a centre's experience, with or without simultaneous splenectomy.

**P044 LAPAROSCOPIC REPAIR OF LARGE HITATUS HERNIA WITH THE INTRATHORACIC STOMACH IN INFANTS** Hideki Soh, MD, Mitsugu Oowari, MD, Yuuichi Takama, MD, Masafumi Kamiyama, MD, Noriaki Usui, MD, Hisayoshi Kawahara, MD, Masahiro Fukuzawa, MD Department of Pediatric Surgery, Osaka University Postgraduate School of Medicine

**BACKGROUND & PURPOSE:** Hiatus hernia in which the stomach lies in the thorax is a rare condition in infants. We evaluate the clinical application of laparoscopic approach for large hiatus hernia with the intrathoracic stomach in infants.

**CASES:** Three infants with large hiatus hernia with intrathoracic stomach underwent laparoscopic repair. Case #1 was a 1-year-old female. She presented frequent vomiting and feeding disorder with severe failure to thrive with weight of 6 kg. The herniated stomach into the thorax was observed at Chest X-p. Case #2 was an 11-month-old boy who had demonstrated repeated respiratory infection. Chest X-p showed abnormal shadow in the right thoracic lesion. The intrathoracic stomach was observed in CT scan. In both cases, barium study showed a herniation of all part of the stomach into the thoracic space. And then they were diagnosed as large paraesophageal hernia (type III). The Case #3 was 2-year-old female. She diagnosed as congenital heart anomaly (SA and SV), asplenia, situs inversus and huge hiatus hernia with the short esophagus and the small stomach in neonatal period. She had been growing by duodenal tube feeding until cardiac repair was completed. Bidirectional Glenn procedure was performed at 6 month-old, and Fontan operation was completed at 1 year old successfully. Then she was underwent laparoscopic hiatus hernia repair and fundoplication.

**PROCEDURE:** The operation was performed in elective setting. The cardiopulmonary status was carefully monitored intraoperatively especially in Case #3. In all cases, the pneumoperitoneum was created with a 2-L/min flow and 6-mmHg pressure of CO2 insufflation at Case #1 and #2, and with 4-mmHg at Case #3. One camera port, 2 working ports and one accessory port were placed. The phrenoesophageal ligament was resected and the stomach was pulled down into the abdominal cavity. The enlarged hiatus was repaired by intraabdominal suturing technique with non-absorbable sutures. The abdominal esophagus was wrapped with the mobilized fundus by Nissen fundoplication procedure. In Case #3, Gastrostomy was created.

**RESULT:** All procedures were completed laparoscopically. In Case #3, the reduction of the herniated stomach was hazardous under lower intra-abdominal pressure. The intrathoracic stomach could be retrieved from

the thorax laparoscopically into the abdominal cavity completely, and no perioperative complications in all cases. In each case, postoperative course was rapid and uneventful. The preoperative symptom was completely relieved in all cases. Symptomatic gastroesophageal reflux and radiographic recurrence of hernia were not seen in any case. Postoperative Growth was satisfactory and cosmesis is also acceptable in all cases.

**CONCLUSION:** Laparoscopic repair of large hiatus hernia is feasible and safe in infants. This approach is one of the surgical options.

**P045 LAPAROSCOPIC REPAIR VERSUS OPEN LAPAROTOMY IN CONGENITAL DUODENAL OBSTRUCTION** Hossein Allal, Ph D MD, Jean C Gouli, MD, Froylan Paniagua, MD, Gustave Andrianandraina, MD, Sonia Perez, MD (1) Pediatric Visceral Surgery Department. Video surgery Unit. CHU Montpellier, France

**BACKGROUND:** Congenital duodenal obstruction (CDO) is one of the most common anomalies in newborns. Laparoscopic approach nowadays is perform for CDO treatment, we present our results comparing laparoscopic repair (LR) vs open laparotomy (OL).

**PATIENTS & METHODS:** Retrospective analysis taken from records of all newborns admitted to our center from January 2000 to December 2008 with diagnosis of CDO, dividing into 2 groups according to the operative approach. Operative time, hospitalization length, baby's weight at entry and at discharged, time of initial and full oral feeding were analyzed statistically according to student t test. The remaining data was listed as descriptive statistic.

**RESULTS:** 20 patients were enrolled, from 1 to 17 days (three boys, 17 girls). Six babies (30%) were born prematurely (31 through 36 weeks gestation). Group 1 (LR) = 8 patients and group 2 (OL) = 12. The average weight at surgery was: group 1 = 2897.5gr and group 2 = 2369.1gr. Twelve patients (60%) had associated anomalies. The mean of the operative time was longer with group 1 (136.5 vs 99 minutes). The length of hospitalization was similar between groups (15,3 vs 16,8 days). Time of initial feeding (4,5 vs 7,36 days) was statistically different. Two patients in group 2 presented obstruction by intestinal band after 2.5 and 4 years.

**CONCLUSIONS:** Hospitalized time is similar with both approaches, feeding was earlier using LR. The cosmetic advantage and prevention of intestinal bands encourage the use of laparoscopy.

**KEYWORDS:** Duodenal atresia, laparoscopic repair

**P046 TWO-PORT LAPAROSCOPIC PYLOROMYOTOMY FOR CONGENITAL HYPERTROPHIC PYLORIC STENOSIS IN 360 CASES** Ren hongxia, Chen lanping, Wu xiaoxia children's hospital of Snanxi province

**OBJECTIVE:** To explore the complication and its prevention measures. of two-port laparoscopy in the treatment of congenital hypertrophic pyloric stenosis (CHPS).

**METHODS:** To analysis the clinical data of 360 children with CHPS underwent two-port laparoscope pyloromyotomy from March 2004 to April 2009 retrospectively.

**RESULTS:** There were 2 patients convert to 3-port laparoscope pyloromyotomy and 10 cases of 360 have complications including 7 cases which convert to laparotomy because of the ruptured mucosa, 1 case of omenta prolapse which sewed the incision after 2 days postoperative, 1case of delayed rupture of pyloric which operated again nine days later, and 1 case of incision hernia after operation which recovery spontaneous after 4 months.

**CONCLUSIONS:** Two-port laparoscopic pyloromyotomy is safe, reliable. Ruptured mucosa is its main complication. Paying attention to main points of operation especially the specific types of pyloric stenosis could avoid or reduce the occurrence of complications.

**P047 APPLICATION OF LAPAROSCOPIC PARTIAL AND TOTAL FUNDOPLICATION IN CHILDREN WITH GASTROESOPHAGEAL REFLUX DISEASES** Yeming Wu, MD, Zhilong Yan, MD, Jun Wang, MD Xinhua hospital and Shanghai Children's Medical Center, Shanghai Jiaotong University, Shanghai, China

**PURPOSE:** This retrospective study reports our experience in application of laparoscopic partial and total fundoplication in children with gastroesophageal reflux diseases(GERD) in two children's medical center in Shanghai.

**METHODS:** From Oct. 2000 to Jan. 2009, 52 children with GERD, included 48 hiatal hernia and 4 simple severe gastroesophageal reflux(GER), were treated. There were 32 boys and 20 girls. Range age was 25 days to 11 years old.. 2 of 52 patients were recurrence of GER after Fundoplication procedure.

**RESULTS:** 53 laparoscopic fundoplication (LF) were performed in 52 patients (one child was underwent two LF procedures because of recurrence of hiatal hernia after first LF one month late. Two transfered to open surgery . 27 of 52 patients were underwent Laparoscopic Nissen-Rossetti's procedure, and 22 of 52 were underwent Laparoscopic Thal's antireflux procedure. GI was performed on all patients before leaveing hospital. 4 of 27 patients, who underwent Nissen-Rossetti's procedures, presented a middle or slight stenosis on the low segment of esophagus and resolved by 1—2 times of balloon catheter dilatation. 3 of 22 patients, who was underwent laparoscopic Thal's antireflux procedures, occurred a slight GER. 35 children who finished LF procedure were followed up for 3 months to 6 years after operation. One recurred a hiatal hernia caused by suture relaxed one month later after LF and was redone LF. One child with neurologically impaired (NI) refused to be fed by months and was fed by nosogastric catheter for 3 years. 2 had a slight symptom of GER during follow-up. Other 31 of 35 (88.6%) had good results.

**CONCLUSION:** (1) We suggest to use the Thal's procedure for the patient with hiatal hernia. Our experience demonstrate that laparoscopic Thal's procedure will prevent the stenosis caused by the total fundoplication and also can get good antireflux result for most patients with hiatal hernia. (2) We recommend to laparoscopic Nissen-Rossetti's procedure for patient with severe GER and no hiatal hernia, especially for child with neurologically impaired.

**P048 VIDEOASSISTED ILEO-CECAL-COLON RESECTION FOR CROHN DISEASE** Claudio Vella, MD, Giorgio Fava, MD, Luciano Maestri, MD, Enrica Caponcelli, MD, Giovanna Riccipetioni, MD Department of Pediatric Surgery Children's Hospital "V. Buzzi" - MILAN - (Italy)

**CASE REPORT:** A 10 years old boy affected by Crohn's disease was referred to our centre because of a ileo-cecal stenosis. The patient at the beginning was treated with steroid therapy (prednisone) and subsequently with immunosuppressor (mercaptopurine).

The child developed several episodes of abdominal pain suggestive for intestinal subocclusion. An MRI study was performed, detecting an ileal stricture 11 cm in length. Contrast enema and pancolonoscopy showed, in addition to the ileal stricture, cecal-ascending colon stenosis but it was not possible to go beyond it with the endoscope.

The patient underwent to video-assisted ileo-cecal-colon resection with termino-terminal anastomosis. 4 laparoscopic port site were necessary: one 10 mm umbilical trocar, a 5 mm suprapubic trocar, one 5 mm trocar in the left hypocondrium, and one 5 mm in the left iliac fossa. The terminal ileum, the appendix and the ascending colon until the splenic flexure. The bowel was exteriorized thorough a lap-disk device placed in the in the right iliac fossa including the suprapubic trocar. The bowel affected by the inflammatory disease was resected and an ileo-colic anastomosis performed.

**RESULTS:** The operating time was 180 minutes, it was possible to carry out the procedure without any major difficulty or major perioperative complication. Postoperative recovery was uneventfull. The bowel was open on the second postoperative day and the patient discharged the 7th day with a small suprapubic scar of 6 cm. Histologic specimen assesed presence of Chron's disease in the bowel that was resected, with high grade inflammatory activity including the appendix and associated fibrinous peritonitis.

**DISCUSSION:** Laparoscopy in patient affected by Chron's Disease is feasible without any difficulty if performed by an experienced surgeon, moreover there are evident advantages for the patient in terms of low invasivity and faster recovery. Mininvasive technique represent a good choice in immunodepressed patient, like our patient, reducing the postoperative distress.

**P049 THE APPENDIX POSITION AT THE TIME OF LAPAROSCOPIC APPENDICECTOMY** Amanda J McCabe, Gordon A MacKinlay, Fraser D Munro Department of Paediatric Surgery, Royal Hospital for Sick Children, Edinburgh, UK

**AIM:** To assess the appendix position at the time of laparoscopic appendicectomy, and to ascertain if position confers protection against perforation.

**METHOD:** A prospective study was carried out over a 39 month period. All patients who presented with clinical signs of acute appendicitis and who underwent laparoscopic appendicectomy were entered. 6 appendix locations were defined, para-caecal, pelvic, retro-caecal, pre and post ileal, and adherent to the anterior abdominal wall. Details of inflammation and perforation were also noted.

**RESULTS:** A total of 233 laparoscopic appendicectomies were carried out. 33 were excluded due to insufficient documentation (26), conversion (6), and autoamputation (1). The perforation rate was 41% (82). The most common location was para-caecal 35.5%, followed by pelvic 30%. True retro-caecal position accounted for only 10% of cases. Appendix position did not differ between perforated and non-perforated groups.

**CONCLUSIONS** It seems that the position of the appendix does not influence the risk of perforation. The retro-caecal position is a relatively uncommon place to find the appendix in the presence of inflammation. If the appendix is not immediately obvious at laparoscopy it is more likely to be found lateral to the caecum and ascending colon than behind them. This is important in anatomical detailing and therefore for training purposes. When faced with a true retro-caecal appendix laparoscopic mobilisation is often difficult and we would advise the junior surgeon to seek more experienced help, or proceed to early conversion if experienced help is not available.

**P050 LAPAROSCOPIC EXCISION OF RETROPERITONEAL TUMOR IN 2 CHILDREN** Mitsugu Owari, MD, Hideki Soh, PhD MD, Takaharu Oue, PhD MD, Masahiro Fukuzawa, PhD MD Division of Pediatric Surgery, Department of Surgery Osaka University Graduate School of Medicine

**INTRODUCTION:** Laparoscopic surgery has expanded during the past decade because of its minimal invasiveness and better cosmetic results. Pediatric surgeons have been employing this innovative technology and increase number of laparoscopic surgery has been performed due to the improvements of laparoscopic technique in the field of pediatric surgery. However, laparoscopic resection for retroperitoneal tumors has rarely been attempted, because of the variability in location and the required mobilization of surrounding structures that lie around the lesion. In the right side, inferior vena cava (IVC) running adjacent to the tumor and in the left upper side, pancreas and spleen make the resection more difficult. In this report, we present two cases of retroperitoneal benign tumor that was successfully removed using a laparoscopic surgical technique.

**CASE REPORT:** Case 1; An 11-year-old girl presented with a homogeneous right retroperitoneal-large-tumor (5 cm in diameter). Nonfunctioning benign neurogenic tumor was suspected, and a laparoscopic retroperitoneal tumor resection was performed. The inferior vena cava ran just behind the tumor, and there were small vessels between the tumor and inferior vena cava. To create a space behind the tumor, we suspended the tumor by using a traction suture, and to obtain adequate hemostasis, we used a vessel-sealing device. The tumor was safely removed and the pathological diagnosis was ganglioneuroma. Postoperative recovery was uneventful and the patient left the bed and started a regular diet on the first postoperative day. Case 2; A 6-month-old girl was presented with a homogeneous right retroperitoneal-large-tumor (9 cm in diameter). Computed tomographic scan revealed a 9-cm solid inhomogeneous tumor located in the left upper retroperitoneal lesion. Cystic, solid, and calcificated lesions were noted in the tumor. Tumor marker such as alphafetoprotein was not elevated. Laparoscopic resection of the retroperitoneal-large-tumor was performed without incident. The tumor was behind the transverse-descending colon, pancreas and spleen, which were easily dissected from the tumor. No bleeding occurred during surgery. Pathologic examination of the tissue confirmed a mature teratoma that measured 9cm in diameter and weighed 143 g. Postoperative recovery was uneventful and the patient left the bed and started a regular diet on the first postoperative day.

**DISCUSSION & CONCLUSIONS:** Laparoscopic resection of retroperitoneal tumors was technically feasible and results in a short hospital stay, rapid postoperative recovery, and good cosmesis. Tumor resection under laparoscopic surgery seemed to be performed more completely and easily than under open surgery because the surgical view is magnified and can be extended to the structures behind the tumor. Our contemporary series suggest that the laparoscopic surgical technique should be considered for the diagnosis and treatment of retroperitoneal benign localized tumors.

**P051 HEPATOPTOSIS-LAPAROSCOPIC HEPATOPEXY** Birte Detlefsen, MD, Martin Duebbers, MD, Thomas Boemers, Prof MD Department of Pediatric Surgery and Urology, Amsterdamer Strasse, Cologne

**INTRODUCTION:** In case of hepatoptosis the ligaments of the liver are loose and elongated so that the liver can move away from the right side of the spinal column without difficulty. Complete hepatoptosis is a rare entity more common in women than in men. The affection may be congenital or aquired. Hepatoptosis has to be distinguished from Chiari syndrome. A 11-year old boy presented in our out-patient-department with recurrent abdominal pain suggestive of malrotation. An upper GI-study, a barium enema and an ultrasound were performed. A hepatoptosis was diagnosed by the ultrasound.

**METHODS:** For the laparoscopic procedure a 10- mm, 30° optic and 2 5-mm trocars in the right and left upper abdomen were used. The laparoscopic hepatopexy was performed by fixation of the falciform ligament to the right part of the diaphragm by an Ethybond 2-0 suture. Then by percutaneous puncture an Ethybond 0-0 suture was inserted in the abdomen. The distale falciforme ligament and the teres hepatis ligament were grabbed and then tied to the abdominal wall. The suture was buried under the skin. Inspection of the small intestine and the colon was performed. Closure of the skin. The postoperative course was uneventful, prophylactic antibiotics were given. Hospital stay 7 days. Ultrasound check-up after 3 months and 1 year demonstrated a normal finding, liver in the right position.

**CONCLUSION:** In this solitary case the operative technique was safe and effective for the treatment of hepatoptosis. Further operations have to be carried out.

**P052 POSTOPERATIVE TUBE-RELATED COMPLICATIONS AFTER GASTROSTOMY PLACEMENT IN CHILDREN** Jessica A Naiditch, MD, Tim Lautz, MD, Katherine Barsness, MD Children's Memorial Hospital, Chicago, IL

**BACKGROUND:** Gastrostomy tube placement is a common surgical procedure in children that is associated with frequent tube-related complications, including granulation tissue and tube dislodgement. These tube-related complications can lead to higher resource utilization. The purpose of this study was to determine if early postoperative gastrostomy tube-related complications could be predicted based on patient age, preoperative co-morbidities, socioeconomic class or operative technique (laparoscopic vs. open).

**METHODS:** A retrospective review was conducted on children who underwent gastrostomy tube placement from June 2006 through August 2009. Data collection included age, co-morbidities, operative technique, health insurance status, postoperative health care visits and postoperative complications. Data analyzed by Chi-squared analysis,  $P < 0.05$  significant.

**RESULTS:** One hundred and one patients were evaluated. The majority of patients were  $< 2$  years of age (80/101). The most frequent co-morbidities were cardiac anomalies (29/101), neurologic disease (38/101) and genetic disorders (39/101). Many children had multiple co-morbidities. Operative technique varied, with 62 patients undergoing an open approach and the remaining 39 patients a laparoscopic approach. The majority of patients had Medicaid insurance (52/101). The most frequent tube-related complication was granulation tissue, occurring in 58/101 patients. Tube dislodgement was the second most common complication occurring in 25/101 patients a total of 41 times. These accidental dislodgements resulted in 31 emergency department visits, 3 additional clinic visits and 2 interventional radiology visits. No gastrostomy tubes required operative replacement. There was no difference in granulation tissue or tube dislodgement based on age. There was no difference in granulation tissue or tube dislodgement for children with or without a genetic disorder or neurologic disease. Children with cardiac disease had a higher incidence of tube dislodgement ( $p < 0.01$ ), but no difference in granulation tissue ( $p = 0.77$ ). There was no difference in granulation tissue ( $p = 0.33$ ) or tube dislodgement ( $p = 0.73$ ) when comparing open versus laparoscopic techniques for gastrostomy tube placement. Using health insurance status as a proxy for socioeconomic status, granulation tissue ( $p = 0.65$ ), early tube dislodgement ( $p = 0.29$ ) and utilization of the emergency room did not differ among Medicaid patients compared to private/HMO insurance patients.

**CONCLUSION:** Tube-related complications are frequent after gastrostomy tube placement in children, with granulation tissue occurring in 57% of patients and early tube dislodgement occurring in 25% of patients. Age, neurologic or genetic co-morbidity, operative technique and socioeconomic status had no effect on tube-related complications or resource utilization. More importantly, early tube dislodgement resulted in 36 additional health care visits, with the majority of these occurring in the emergency department. Additional investigative efforts are required to improve parent/caregiver education in order to reduce this excessively high utilization of health care resources for an avoidable complication.

**P053 GASTROSTOMY PLACEMENT IN PAEDIATRIC PRACTICE: COMPARISON OF 2 TECHNIQUES** JF lecompte, MD, M Durand, MD, H Steyaert, MD, JS Valla, PhDMD Lenval Foundation for Children

**INTRODUCTION:** Nutritional supplementation by gastrostomy is frequently necessary in children particularly in case of neurological impairment, and it is often associated with a high complication rate and /or multiple general anaesthesia. The purpose of the study was to analyse the complication and redo rate comparing endoscopic (EG) and laparoscopic gastrostomy (LG).

**METHODS:** A retrospective review of seventy gastrostomies was undertaken in our institution between 1993 and 2009. Data collected included: initial pathology (neurologic impairment, esophagus atresia, Pierre Robin sequence, other pathology), associated pathology (GER, scoliosis), type of procedure (laparoscopic, endoscopic), demographic description of patients, operative time, type of complication, number of anaesthetic procedures. When GER was diagnosed Nissen was associated during the same anaesthesia.

The groups were compared for each parameter using X2 or non parametric tests, and then a multivariable analysis using linear or nominal logistic regression was used to see the effect of those two techniques on complication rate and redo.

**RESULTS:** Seventy gastrostomy tubes were inserted: forty one (58.5%) LG, twenty nine (41.5%) EG. Thirty (43%) Nissen were associated during the procedure (70,7% in LG and 3,5% in EG). 81.5% of the patients were neurologically impaired. The rates of severe complications and need for a second procedure under general anaesthesia were higher in the endoscopic group (27% vs 14% for complications (close to significant  $p = 0.0995$ ), and 58% vs 29% for anaesthesia ( $p < 0.02$ )). Within the operated patient without pre-operative diagnosis of GER (57%), we found a 20.5% of GER occurrence (7/34) from which 5 patients needed a Nissen (25% in EG vs 10% in LG (not significant)). Outcomes were not different in the two groups.

**CONCLUSIONS:** Gastrostomy confirms to be a procedure with a high rate of complications in a fragile population. Laparoscopic approach presents fewer complications and redo than percutaneous endoscopic gastrostomy. Furthermore, the rate of severe GER after gastrostomy placement suggests the need for reflux exploration before surgery.

**P054 LAPAROSCOPIC ASSISTED INTESTINAL RESECTION IN YOUNGSTERS WITH CROHN'S DISEASE** Dragan Kravarusic, Elad Feigin, Raanan Shamir, Enrique Freud Schneider Children's Medical Center

**BACKGROUND:** Surgery for Crohn's disease in pediatric population is seldom indicated and literature is mostly focused in the "open" procedures. This pilot study reviews our experience with laparoscopic-assisted bowel resection in pediatric patients with Crohn's disease.

Special attention was paid to the adequacy and safety of this procedure, with assessment of the impact of laparoscopy on postoperative recovery, morbidity and cosmetic results.

**METHODS:** A retrospective review of twelve selected patients with isolated ileal or ileocolic Crohn's disease where laparoscopic-assisted intestinal resection was performed. Mean age at surgery was 14.5 years and indications for surgery included stricture / partial bowel obstruction (10 cases) and abdominal abscess refractory to medical therapy / drainage ( 2 cases).

**RESULTS:** In all patients extracorporal anastomosis was performed through extended umbilical incision ( 7 end to end and 5 end to side – stapled) with no conversions. Average length of resected specimens was 37 cm respectively, and none of the specimens had microscopically positive margins for active Crohn's disease. All patients were tolerating a liquid diet on the third postoperative day and postoperative length of hospital stay was 4.7 +/- 2.4 days. In relatively short follow up ( average 26 months) we had no significant complications, no relapses and patient/parents satisfaction with cosmetic results (appraisal scale 1-3) was excellent. All but one patient were successfully weaned from intensive steroid therapy.

**CONCLUSIONS:** Laparoscopic-assisted intestinal resection can be performed safely in selected pediatric patients with segmental Crohn's disease. Low morbidity, quick postoperative recovery and excellent cosmetic results are especially important for adolescents, who desperately look for the reaffirmation of their body image and self esteem.

**P055 OMENTAL INFARCTION: PREOPERATIVE DIAGNOSIS AND LAPAROSCOPIC MANAGEMENT** Ankush Gosain, MD PhD, John K Uffman, MD MPH, Rupa Seetharamaiah, MD, Martin Blakely, MD, Eunice Huang, MD, Sherman Hixson, MD, Max Langham, MD, James W Eubanks III, MD University of Tennessee Health Science Center

**BACKGROUND:** Omental infarction (OI) is an unusual, poorly characterized cause of abdominal pain in children and is often mistaken for appendicitis preoperatively. We present our experience with this disease process over a five-year period to identify preoperative factors to aid in timely diagnosis and treatment.

**METHODS:** We retrospectively reviewed the medical records of all children that underwent laparoscopic omentectomy from November 2004 to June 2009. Medical records were reviewed for demographic data, preoperative, intraoperative and postoperative hospital course.

**RESULTS:** Ten patients with the diagnosis of omental infarction (OI) were identified. There was one case of recurrent OI 22 months after the initial presentation. OI occurred in 9 boys and 1 girl, with a median age at presentation of 8.5 years (range, 7-11). Complete height and weight information for calculation of body mass index (BMI) was available for 7 patients. Median BMI at presentation was 23.7 (range, 17-29), with one child categorized as healthy weight-for-age, one child as overweight-for-age and 5 children as obese-for-age based on Centers for Disease Control criteria. All patients complained of right-sided abdominal pain; 4 patients complained of predominantly right-upper-quadrant (RUQ) pain, 3 patients of right-lower-quadrant (RLQ) pain, and 3 of combined right-upper and lower-quadrant pain. On examination, 6 patients had RUQ tenderness and 4 patients had RLQ tenderness. The median duration of symptoms prior to seeking medical attention was 3 days (range, 2-7). The average temperature at presentation was  $37.0 \pm 0.7^{\circ}\text{C}$  and the average white blood cell count was  $10.3 \pm 2.6$  (thousand/mcL). All patients underwent preoperative computed tomography and the preoperative diagnosis of OI was

established in 9/10 cases. Operative time was  $48 \pm 14$  minutes. The infarcted omentum was divided with LigaSure in 2 cases, Harmonic scalpel in 7 cases, and with an endoscopic stapler in 1 case. Two patients underwent concurrent appendectomy. Median length of stay was 2 days (range, 2-4).

**CONCLUSIONS:** Omental infarction occurs predominantly, but not exclusively, in preadolescent, obese males. Omental infarction can be reliably distinguished from appendicitis on preoperative history, physical examination, laboratory analysis and imaging. Laparoscopic omentectomy results in prompt resolution of symptoms and discharge.

**P056 LAPAROSCOPIC VERSUS OPEN SPLENECTOMY** Dragan Kravarusic, Radoica Jokic, Georgios Konstantinidis, Enrique Freud Schneider Children's Medical Center of Israel, Institute for Child and Youth Health Care of Vojvodina

**BACKGROUND:** Laparoscopic total / partial splenectomy is a relatively new surgical approach and many procedural and outcome factors are under continuous evaluation and are still controversial.

**METHODS:** Hospital records of 70 patients (39 F, 31M) who underwent elective procedures between 2002 and 2007 were reviewed retrospectively for the indications and implications on operative approaches, complications, and postoperative courses. Chi-square and t tests were used to compare measured differences regarding the statistical significance.

**RESULTS:** Average age was 11.4 years (ranging from 3.8–18.5 years). Out of the 59 complete splenectomies, 35 were open (OS) and 24 laparoscopic (LS ). The indications were: beta-thalassemia (n = 16), hereditary spherocytosis (n =18), idiopathic thrombocytopenic purpura (n = 13), and Gaucher's disease (n = 13). A partial splenectomy was done in 11 patients, 7 were open (POS) and 4 laparoscopic (PLS ). The indications were: solid/cystic lesions (n = 4) and Gaucher's disease (n =7).

There was no statistical difference between the groups in terms of sex, age or weight. The mean operative time for total splenectomy was 185 min. (LS) versus 110 min. (OS) ( $p < 0.05$ ). For partial splenectomies OR time was not significant ( POS- 145min vs PLS-132min). Concomitant cholecystectomy was performed in 8 LS and 4 OS. In the LS group, we had 3 conversions for bleeding and in the PLS group we had one re-do for a recurrent cyst. Statistical significance ( $p < 0.05$ ) was reached in LS / PLS groups for an average time to oral intake (0.8 vs 1.5 days), duration of hospitalization ( 3 vs 7.5 days), and postoperative narcotic use ( $p < 0.001$ ).

**CONCLUSIONS:** Laparoscopic splenic procedures are safe and effective, associated with low conversion rate, significantly shorter hospitalization with earlier oral intake and fewer narcotic requirements. In our two centers majority of the laparoscopic procedures 21/28 were performed in the second half of the study period and this review is aimed at highlighting the "shifting" from the open to the laparoscopic approach in the wide spectrum of splenic disorders.

**P057 ORCHIOPEXY: LAPAROSCOPY OR TRADITIONAL SURGICAL TECHNIQUE IN PATIENTS WITH AN UNDESCENDED PALPABLE TESTICLE** Pastor Escarcega-Fujigaki, MD, Guillermo Hernández-Peredo-Rezk, MD, Edgar Huerta-Murrieta, MD, Nancy Lezama, MD, Gerardo Kuri, MD, Abimael Bañuelos-Montano, MD Centro de Especialidades Médicas del Estado de Veracruz. "Dr. Rafael Lucio"

**OBJECTIVE:** To compare orchiopexy by laparoscopy versus traditional surgical technique in patients with an undescended palpable testicle in the inguinal canal.

**MATERIAL & METHODS:** A prospective, comparative, observational, longitudinal and double blind research was done in the month of August of 2006 to March of 2009 in the CEME V "Dr. Rafael Lucio "Hospital; 63 patients went through surgery, age 1 to 10 years, all with the diagnosis of palpable undescended testicle in the inguinal canal; in 33 patients the traditional surgical technique and in 30 patients laparoscopy were done. An EVA scale was used to evaluate post surgery pain. A testicle ultrasound was practiced before surgery and at 6 months after it.

**RESULTS:** The majority of patients were 1 to 4 years old with a median age of 2.3 years ; 51 cases were unilateral and 12 cases were bilateral; 37 testicles were descended with the open traditional surgical technique and 38 through laparoscopy ( 75 testicles ); 44 on the right side and 31 on the left side , there was a hernia associated with 37 undescended testicles, 23 with open surgical technique and 14 by laparoscopy , without relapsing in any patient. The median surgery time with the open surgical technique was 38 minutes and by laparoscopy 45 minutes. The gubernaculum testis was sectioned by laparoscopy in 23 descended testicles to facilitate the procedure , in the remaining 11 it was not necessary; while in the open technique all the gubernaculum testis were sectioned. In 80 percent of cases the laparoscopy caused less pain when compared with the other technique. All patients regardless of the technique used left hospital during the first 24 hours. All have had follow up for more than 6 months with a median of 18 months, with satisfactory results in relation to size and location of the testicle , with a good ultrasound correlation and not finding any statistical differences between surgical techniques. There were not accidents with any of the techniques and one patient with the open technique had an important hematoma, the patient was later diagnosed as being a hemophiliac. The esthetical aspect was better with laparoscopy but the cost was 15 percent more expensive with the open technique.

**CONCLUSION:** Both techniques had satisfactory results without any significant differences to make us choose one over the other. It is the surgeons' decision based on experience and training on laparoscopy to choose any of the techniques

**P058 ESTABLISHING OPERATIVE REFERENCE COST FOR PAEDIATRIC LAPAROSCOPIC SURGERY** Anthony D Phippard, ODP, Ram M Nataraja, MBBS BSc MRCSEd, Anies A Mahomed, MBBCh FCS SA FRCSGlasEd FRCS Paeds Department of Paediatric Surgery, Royal Alexandra Children's Hospital, Brighton, BN2 5BE, United Kingdom.

**AIM:** Laparoscopic paediatric surgery is routine in many centres. Information on baseline costs in adult practice has been widely reported but data for the paediatric context is lacking. This information is critical for pricing in both the private and state health sectors where budgets are under increasing pressure. The aim of the study was to establish the theatre reference cost for paediatric laparoscopic procedures and to institute a cost-minimising protocol.

**MATERIAL/METHODS:** Exclusively, the theatre cost of laparoscopic procedures, were prospectively monitored over 18 months. To estimate the cost per procedure a spreadsheet of items contributing to overall expense were monitored. To ensure accuracy all data entry was performed by a dedicated senior operating department practitioner. The list included 18 separate items such as disposable laparoscopic instruments, camera covers, suction / irrigation tubing, specialist equipment such as anti-fog solution and also the number of instrument sets that were used and hence had to be re-sterilised. In addition, the type of procedure, the operating surgeon and operating time were documented. The cost of the post operative stay was not part of the study as this information is generic.

**RESULTS:** A total of 130 laparoscopic procedures undertaken by 4 surgeons were recorded during the study period. A total of 25 different procedures were performed and included patients of age ranging from 7 months to 16 years. The five most frequent procedures included; laparoscopic appendicectomies (25/130), laparoscopic funduplications (12/130), therapeutic thoracoscopy (12/130), laparoscopic-assisted gastrostomy placement (11/130) and laparoscopic Fowler-Stephens procedure (9/130). The respective mean costs for the procedures were; £495.21 (standard deviation (SD) 197.83), £762.35 (SD. 376.04), £351.61 (SD. 136.61), £356.36 (SD. 205.09), and £371.90 (SD. 238.29).

**CONCLUSION:** Laparoscopic surgical costs would appear to be correlated to the complexity of the procedure and the use of specialised instrumentation. Maintaining data for costing is dependant on a senior member of staff being dedicated to the task. However the data thus generated is accurate and can be relied on to establish baseline costs which can be utilised to influence pricing in both the private and state health sectors. The power and duration of the study did not allow for vital inter surgeon comparisons to be made or for the impact of cost reducing measures to be noticeable.

**P059 LAPAROSCOPIC SLEEVE GASTRECTOMY IN A PEDIATRIC PATIENT: THE PERFECT INDICATION** Abdalla E Zarroug, MD, Seema Kumar, MD, James M Swain Mayo Clinic Rochester

**INTRODUCTION:** Laparoscopic sleeve gastrectomy (LSG) is a novel technique in the armamentarium of pediatric bariatric surgery. We report the rational and outcome of a 16 year-old boy who underwent LSG as his only surgical bariatric intervention.

**REPORT:** This patient was managed in our comprehensive multi-disciplinary pediatric bariatric clinic for the past 2 years. His obesity was medically complicated by obstructive sleep apnea, acanthosis nigricans, and hypertension. His past medical history is remarkable for two small bowel resections at age 2 and multicystic renal dysplasia status post kidney transplantation at age 7. He also had two peritoneal dialysis catheter infections. We felt gastric banding was contraindicated due to previous foreign body infections and the need for immunosuppression and steroids. Roux-en-Y gastric bypass would be higher risk given his previous abdominal operations and possible medication absorption issues. After all other medical comorbidities were maximally treated, evaluation by child psychiatry and completing the LEARN program, he underwent LSG without any complications (images available). We used a 5-trocar technique and placed a gastroscope along the lesser curve during gastric resection from the antrum to the fundus with the EndoGIA stapler. The hospital stay was 3 days. His pre-surgical BMI was 44.84 KG/M2 (height: 173.0 cm, weight: 134.20 kg). At six months follow-up his BMI was 34.15 KG/M2 having lost 46% of his excess weight and has come off of all hypertensive medications.

**CONCLUSIONS:** LSG can be a safe and effective alternative in bariatric surgery in well selected adolescents, but long-term follow up is needed.

**P060 A NEW COMPACT HIGH-DEFINITION VIDEO MICROSCOPE: A PARADIGM SHIFT IN CLINICAL AND RESEARCH MICROSURGERY?** Philip K Frykman, MD PhD FACS, Lifu Zhao, MD MSc, Toshiko Nobuto, MD, Khawar Siddique, MD, Adam Mamelak, MD, Sharo Raissi, MD, George Berci, MD FACS Division of Pediatric Surgery and The Pediatric Surgery Laboratory, Division of Cardiothoracic Surgery, Department of Surgery; Department of Neurosurgery, Cedars-Sinai Medical Center

# Poster Abstracts

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**BACKGROUND:** Widespread dissemination of minimally invasive surgery (MIS) has been accelerated by the magnified view of anatomy from a convenient working distance. Continual improvements in video technology and ergonomic design have led to high definition (HD) television images with the goal of reducing operator fatigue and stress. These were the principles that led to the design of a new sterilizable, compact (< 900 grams) HD video microscope.

Optical magnification is routinely used in many surgical disciplines. Traditionally, surgeons have used loupes requiring continuous movement of the neck and head to remain in focus. Alternatively, the standard operating microscope has been employed to provide magnified binocular view, but requires frequently focusing and hours of use lead to operator fatigue. Further drawbacks include large unit size (200+ kg) occupying significant OR space and substantial capital investment. The compact, new HD video microscope can be attached to the OR table and placed 20-25 cm above the operating field, thereby enabling the surgeon to work without interference. Furthermore, it utilizes full HD video image combined with superb illumination, variable magnification and wide depth of field applicable for a variety of surgical applications.

**METHODS:** We have tested this HD video microscope using 3 small animal surgical models (colon pull-through surgery in mice, cardiac transplants in rats and CABG in mini-pigs). Once shown to be successful in the laboratory setting, we then applied this technology to clinical surgery. Operations chosen for testing were spine and intracranial operation and thoracic aortic reconstruction.

**RESULTS:** Three research teams that routinely performed experimental animal survival operations using the traditional operating microscope, utilized the HD video microscope in their experimental animal operations performing a total of 20 procedures (12 colon pull-through, 2 cardiac transplants, 6 CABG's). Their subjective evaluation indicated that it took approximately 2 procedures to "feel comfortable" utilizing the HD video microscope with similar survival rates and results to the traditional operating microscope.

Three surgeons applied the new HD video microscope in 32 procedures: 20 spine operations (cervical fusion, cervical laminectomy, lumbar discectomy/decompression, lumbar fusion), 10 intracranial operations (glioma resection, meningioma resection, pituitary adenoma resection) and 2 thoracic aorta grafts. All operations were completed with the exclusive use of the HD video microscope.

Through our combined initial experience we have the following observations: 1) image quality is exquisite combined with a depth of field that virtually eliminated the need for focus adjustment of the HD video microscope; 2) more comfort during the operation with less fatigue or neck pain; 3) intraoperative teaching was greatly enhanced through the use of large flat-panel video monitor; 4) HD recording of the microsurgical procedure was very convenient and high quality.

**CONCLUSION:** The new HD video microscope has been applied successfully to a wide variety of surgical disciplines. We believe that its portability combined with excellent image quality will make a significant impact in surgical fields requiring optical magnification, especially in pediatric surgical fields. (HD video and still images will be presented)

**P061 LAPAROSCOPIC TRAINING IN PAEDIATRIC SURGERY: A SINGLE CENTRE EXPERIENCE** G H Duthie, MRCS, B T Adikibi, MRCS, F D Munro, MD, G A MacKinlay, MD Royal Hospital for Sick Children, Edinburgh

**AIM:** To review the exposure paediatric surgery trainees have in our unit to laparoscopic surgery. Laparoscopic appendicectomy was

chosen as the index procedure as it exposes the trainee to a wide range of laparoscopic skills and is the commonest laparoscopic procedure undertaken in our unit.

**METHODS:** Data was retrieved from our locally held laparoscopic database and cross referenced with data obtained from the Lothian Surgical Audit System. An eleven year period was analysed (01/01/1998 – 31/12/2008).

**RESULTS:** A total of 590 laparoscopic appendicectomies were performed over an eleven year period. Eight per cent were interval appendicectomies. 33% of total procedures had a Consultant as the primary operator, 39% had a senior registrar (StR 6-8 or SpR 4-6) and 28% had a junior registrar (StR 1-5 or SpR 1-3). Over the eleven year period there was a trend towards a decreasing percentage of operations being performed by the Consultant. A peak in 2003 coincided with a change in staffing resulting in a relatively junior workforce. In the first six years 81% of procedures involved a Consultant. This has decreased in the last five years to 62%. Apart from 1998, registrars have been the primary operator in the majority of cases. In total 31% of procedures were performed by a registrar assisted by someone other than a Consultant. Over the last four years there has been a trend towards more procedures being done by a registrar without a Consultant at the operating table. We can make no comment on whether or not a Consultant was present in theatre during the case. In the first six years of laparoscopic appendicectomy in Edinburgh, 38% of procedures were undertaken with a Consultant as the primary operator. In the past five years this has decreased to 30%. Junior registrars undertook 33% of procedures in the first six years and 26% of procedures in the past five years. Senior registrars performed 21% of laparoscopic appendicectomies in the first six years compared with 44% in the last five years. A total of 39 procedures were performed with both the Consultant and registrar documented as being the principal operators. The conversion rate in this series was 1.7%. A Consultant was present during all of the converted cases. In our unit we have a dedicated daytime emergency theatre which facilitates trainee supervision by a Consultant or senior trainee.

**CONCLUSION:** Recent studies have suggested that paediatric surgery trainees' exposure to laparoscopic surgery is suboptimal. This review highlights that in our unit trainees have ample opportunity to participate in laparoscopic appendicectomy.

**P062 LAPAROSCOPIC INTRACORPOREAL SUTURING COMPETENCE AMONG RESIDENTS: CAN WE PREDICT SUCCESS?** Joanne E Baerg, MD, Marcos Michelotti, MD, A. Jose Tamez, MD, Mark E Reeves, MD PhD Loma Linda University Children's Hospital

**AIM:** To examine factors associated with residents who attained a predetermined level of competence in laparoscopic intracorporeal suturing.

**METHODS:** IRB approval was obtained. Data was gathered prospectively between July 1 and October 1, 2009. A goal was set that residents would practice intra-corporeal suturing in a simulator until they could perform one surgeon's knot and five more throws in under 5 minutes. Residents from 5 postgraduate years presented individually for a tutorial with one pediatric surgeon. Residents first practiced the movements outside the simulator. When they could produce the movements with a needle driver and forceps, they proceeded to the simulator. They practiced individually with one pediatric surgeon until they could perform an intracorporeal suture. Baseline times were recorded. A survey about previous laparoscopic experience was given to each resident. Each was then instructed to continue to return to the

simulator to practice until they could perform an intracorporeal suture within the goal time of 5 minutes. Besides this predetermined speed, they were instructed to practice until they did not drop the needle and could keep the instrument tips within a 4 by 4 inch area. Logs to keep track of practice dates and times were administered. Data from surveys, official case logs, and practice time logs were analyzed by student t-test. P-values <0.05 were considered significant.

**RESULTS:** Twenty residents presented for tutorials. Eight of 20 (40%) reached the goal during the study period. They required between 1 and 21 (median: 3) practice sessions to reach the goal.

	Post Graduate Year 3,4 or 5	Complex Laparoscopic Cases*	Baseline Time (min)*
Reached Goal 8 (40%)	7/8 (88%)	21+/-17.2	11+/-4.43
Goal Not Reached 12( 60%)	2/12 (17%)	7+/-5.6	21.7+/-12.3
p-value	0.001	0.015	0.035

\*denotes mean and standard deviation

**CONCLUSION:** Residents that achieved competence in laparoscopic intracorporeal suturing (as compared to those that did not) were 1) significantly more likely to have had 3 or more years of post-graduate training, 2) significantly more experienced with complex laparoscopic cases, and 3) sutured twice as fast at the time of their initial tutorial.

### **P063 ENDOSURGERY FOR CHILDREN WITH TUMOR** Wang Jian, Li Long The Capital Institute of Pediatrics

**PURPOSE:** To evaluate the feasibility and safety of endosurgery in children.

**MATERIALS & METHODS:** 45 patients undertaken endosurgery from January 2001 to March 2009. Of the patients, there were 35 patients with benign tumor, and 10 patients with malignant tumor. Their age ranged 28 days to 12 years (mean 39.4±26.4m). Of the patients, there were 27 boys and 18 girls. The diameter of tumors ranged from 3cm to 15cm (mean 6.5±2.5cm). Of the patients, there were 4 patients with thyroid adenoma, 13 with ovarian cyst, 1 with pancreatic cyst, 2 with renal cyst, 3 with mediastinal mass, 2 with adrenal neuroblastoma, 2 with Wilms' tumor, 6 with adrenal adenoma, 3with pulmonary metastases.

**RESULTS:** Average duration of operation was 112.6±41.7min (ranged, from 30 to 185 hours) without intraoperative complications. Intraoperative bleeding was 5 to 50 ml without necessity for blood transfusion. Return of oral food intake was 1 day (range, from 1 to 3 days) postoperative. The postoperative course was uneventful in 45 patients with hospital stay 6.5±2.5days (ranged, from 3 to 10 days) after the operation. There was no postoperative complication during followed-up visits.

**CONCLUSIONS:** Endosurgery for children with tumors is feasible ,safe and effective.

**KEY WORDS:** tumor; endoscope; children; endosurgery

### **P064 DEVELOPMENT OF A VIRTUAL LAPAROSCOPIC TRAINER USING ACCELEROMETER AUGMENTED TOOLS TO ASSESS PERFORMANCE IN SURGICAL TRAINING** Shabnam Parkar, MBBS BScHons MRCSEng AISCN, Dean Mohamedally, BSc PhD, Munther Haddad, MBBS FRCS, Chris Child, Ricardo Doroana Paediatric Surgery Department, Chelsea and Westminster Hospital, London; Tigerlilly Digital Ltd, London; Department of Computing, City University, London

Previous research suggests that virtual reality (VR) may supplement conventional training in laparoscopy. It may prove useful in the selection of surgical trainees in terms of their dexterity and spatial awareness skills in the near future. Current VR training solutions provide levels of realism and in some instances, haptic feedback, but they are cumbersome by being tethered and not ergonomically close to the actual surgical instruments for weight and freedom of use factors. In addition, they are expensive hence making them less accessible to departments than conventional box trainers. The box trainers in comparison, although more economical, lack tangible feedback and realism for handling delicate tissue structures. We have previously reported on the development of a modified digitally enhanced surgical instrument for laparoscopic training, named the Parkar Tool. This tool contains wireless accelerometer and gyroscopic sensors integrated into actual laparoscopic instruments. By design, it alleviates the need for both tethered and physically different shaped tools thereby enhancing the realism when performing surgical procedures. Additionally the software (Valhalla) has the ability to digitally record surgical motions, thereby enabling it to remotely capture surgical training data to analyse and objectively evaluate performance. We have adapted and further developed our initial single training tool method as used with a laparoscopic pyloromyotomy scenario, to an enhanced method using multiple Parkar wireless tools simultaneously, for use in several different case scenarios. This allows the use and measurement of right and left handed dexterity with the benefit of using several tasks of differing complexity. The development of a 3D tissue-surface deformations solution written in OpenGL gives us several different virtual surgical training scenario approximations to use with the instruments. The trainee can start with learning simple tasks e.g. incising tissue, grasping, squeezing and stretching tissue, to more complex procedures such as suturing, herniotomies, bowel anastomoses, as well as the original pyloromyotomy as used in the first model.

The ultimate aim of producing this training tool is to facilitate the training of surgeons in laparoscopic surgery prior to operating. We will assess the ability of the training tool to acquire, measure and report on surgical trainees' spatial awareness skills. Group 1 will incorporate 10 junior/novice trainees of similar experience matched via a questionnaire assessing previous experience and exposure to surgery. Group 2 will involve 10 senior surgeons matched with a similar level of surgical experience e.g. Year 4 surgical registrars. The groups will perform a simple task e.g. incise and open an organ and a more complex task e.g. pyloromyotomy 10 times in the 1st trial and 10 times in the 2nd trial after a predetermined break period. Skill acquisition, loss and reacquisition will be assessed for each group and also compared between the two, thereby allowing definition of a criterion level. This study will ultimately evaluate our virtual laparoscopic training methodology, and demonstrate its potential to be an easily accessible and economically sound method in training and preparing laparoscopic surgical trainees of the future.

### **P065 EXPERIENCE WITH LAPAROSCOPIC TRANSPERITONEAL ADRENALECTOMY IN CHILDREN** Horacio Bignon, MD, Enrique Buela, MD, Carolina Millan, MD, Aldo Vizcaino, MD, Marcelo Martinez-Ferro, MD Fundación Hospitalaria Private Children's Hospital and Dr. Ricardo Gutiérrez Children's Hospital.

**INTRODUCTION:** Many authors support the emergence of Laparoscopic Adrenalectomy (LA) as the standard of care for the surgical management of adrenal masses smaller than 15 cm of diameter. They believe it is superior to open surgery as it is associated with less pain,

a shorter hospital stay, faster return to normal activities and better cosmetic results. We report our past 4 year experience in pediatric patients (n=10) with retroperitoneal tumors who were operated on laparoscopically at Fundación Hospitalaria and Dr. Ricardo Gutierrez Children's Hospitals.

**MATERIALS & METHODS:** Clinical records and LA videos of 7 male and 3 female patients were reviewed retrospectively. The median age was 7.97 years (range 1 month – 15 years). The median weight was 28.6 Kg (range 3-55 kg). The preoperative diagnosis was 4 right, 3 left and 3 bilateral tumors. The transperitoneal approach was used in all cases.

**RESULTS:** The median tumor size was 4.5 cm of diameter. The median operative time was 113 minutes (range 50-240 minutes). There were no intraoperative or postoperative complications. Only one patient was converted due to the proximity between the tumor and the vena cava. Oral feeds were started immediately after surgery. The median hospital stay was 2.9 days. The anatomopathologic diagnosis was pheochromocytoma (n = 9) and neuroblastoma (n = 4). Follow-up time ranged from 4 years to 3 months with normal clinical and laboratory parameters.

**CONCLUSIONS:** We believe that LA is a viable and technically feasible procedure for treating adrenal disease, with all the benefits of minimally invasive procedures. The transperitoneal approach offers a better visualization of the retroperitoneal space, particularly in the case of bilateral tumors. Randomized multicentric studies would define the benefit of LA in the pediatric population.

## **P066 IS LAPAROSCOPY CAN BE USED SAFELY IN THE REMOVAL OF THE LARGE RETROPERITONEAL MASSES?**

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A case of 13 years old boy who applied for a thick walled cystic mass with dense fluid involvement and located to the base of mesentery is reported. Preoperative evaluation has not clarified the nature of the mass without a trauma history.

The mass was located close to the anterior of the inferior vena cava and abdominal aorta and both ureters, displacing laterally the right ureter leading to grade I hydronephrosis on ultrasound examination and CT images revealed.

A transperitoneal laparoscopic approach was planned. A well pseudocapsulated mass was exposed under the mesentery that was dissected easily and removed completely without any damage to the surrounding structures. Histologic examination revealed a chronic and well organised hematoma.

Especially, in the masses that are difficult to remove or located at difficult area to access and detaching the surrounding structures, robotic surgery has an important place.

Currently, the possibility of removing retroperitoneoscopically, masses in children smaller than 6 cm and in infants smaller than 4 cm in diameter have been reported with increasing rate, in this case a mass 9-10 cm in diameter has been removed by minimal invasive technique.

Resecting the mass completely remains the most important factor of local recurrence and overall survival in retroperitoneal tumors. Thus, the success of radical surgical treatment is very important.

Though the present case is a benign conditions confirmed after surgery, the laparoscopic approach with experienced surgical team is

technically safe and successful in maintaining oncologic principles and avoiding recurrences in retroperitoneal tumors, representing a feasible alternative to open surgery.

## **P067 DOES INSURANCE TYPE, ETHNICITY, OR ATTENDING SURGEON CORRELATE WITH WHETHER A CHILD UNDERGOES OPEN OR LAPAROSCOPIC APPENDECTOMY?**

Julie McKee, PNP, Marla Matar, MD, David Bliss, MD Oregon Health and Science University and Legacy Health Systems

**BACKGROUND:** During an IRB-approved study of laparoscopic versus open appendectomy at two independent regional children's hospitals, patients were not enrolled either because of parental refusal, state guardianship, or primary language other than English or Spanish. We sought to determine if insurance type, race, or attending surgeon correlated with the type of operation chosen.

**METHODS:** The charts of all children operated upon for appendicitis by a single group of board-certified Pediatric Surgeons at two independent regional children's hospitals during the period December 2007 through September 2009 were analyzed for demographic information, attending surgeon, and choice of operation. Statistical significance was determined by the McNemar test.

**RESULTS:** 223 consecutive operations conformed to this study's criteria. All relevant information was successfully obtained for each patient. 72% of children overall underwent laparoscopy. 65% of patients were identified as White, 28% Hispanic, and 7% Asian, Black, Pacific Islander, or unknown. Payment methods were 43% indemnity, 32% Medicaid, 20% Kaiser Permanente, and 5% private pay. 86% of Hispanic and 13% of White patients had Medicaid.

Ranked percentages of patients in subcategories who underwent laparoscopic appendectomy are as follows: No insurance (89%), indemnity (80%), White (76%), Kaiser (71%), Hispanic (66%), Medicaid (61%), race "other"(60%).

The total number of appendectomies and the percent performed laparoscopically by surgeon are: #1(n=49,78% lap), #2(n=50,94% lap), #3(n=41,63% lap), #4(n=50,90% lap), #5(n=33,15% lap).

When Whites were compared to Hispanics, the odds ratio of undergoing laparoscopic surgery was 5.2(95%CI 3.2-8.5, p=.000001). Children with either indemnity insurance or Kaiser had an odds ratio of receiving laparoscopy of 1.6 (95% CI 1.0-2.5, p=.04) over children with Medicaid or no insurance. Patients operated upon by surgeons #2 and #4 had an odds ratio of undergoing laparoscopy of 1.6 (95%CI=1.1-2.1, p=.006) as compared to patients treated by surgeons #1 and #3.

**CONCLUSIONS:** Ethnicity, insurance type, and attending surgeon appear to be associated with the choice of procedure type for appendicitis in the population studied. Further evaluation is required to determine whether other factors may influence either the family or surgeon in these choices.

## **P068 ULTRASONICALLY LOCALIZED, MINIMAL INVASIVE REMOVAL OF POSTAPPENDECTOMY-RETAINED COPROLITHS IN CHILDREN**

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**BACKGROUND:** Retained coproliths after appendectomy are an uncommon complication in perforated appendicitis, frequently associated with intra-abdominal abscess-formation. The imaging modalities to diagnose a retained intraabdominal coprolith are MRI, CT and ultrasound scans. However, sometimes the postoperative search for a retained coprolith is a very demanding procedure. Treatments

options include the administration of antibiotics, usually insufficient, laparoscopic or open removal of the coprolith with following drainage of the abscess.

**METHOD:** We report on two children with postoperative persistent abdominal pain after an appendectomy for perforated appendicitis. Postoperativ they had elevated CRP values, clinical and ultrasonic signs for an intraabdominal abscess formation, despite intravenous antibiotic treatment. The diagnosis and removal of the retained coprolith was facilitated by ultrasound.

**RESULTS:** In both children the ultrasound scan identified an intraabdominal abscess-formation sourrounding a hyperechogenic structure, representing the coprolith. Intraopertiv the coprolith was ultrasonically located und removed by a minimal invasive laparotomy using a small incision. The abscess cavity was drained and a short course of postoperative antibiotics was administered. The further clinical course was uneventful.

**CONCLUSION:** Ultrasonic diagnosis and minimal invasive removal represents a save and effective treatment in retained intraabdominal coproliths after appendectomy for perforated appendicitis.

#### **P069 EVALUATION OF ENDOSCOPIC SURGICAL PLANNING IN AN INTERACTIVE 3D VISUALIZATION ENVIRONMENT**

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While current medical advances allow many surgeries to be minimally invasive, there are cases in which open surgery is required instead of the endoscopic alternative. Ideally, minimizing the number of open surgeries is desirable to reduce pain, recovery time, and overall cost of patient care. This paper presents the results of a study looking at whether the use of interactive 3D volume representation software for surgical planning can lead to more efficient minimally invasive procedures and even the reduction of open surgeries in favor of minimally invasive ones. The study focused on two primary research questions:

- Can tumor resections that presented surgical challenges be performed more effectively and efficiently when planned with 3D imaging software?
- Can surgeries, initially thought to be open procedures, be performed in an endoscopic manner if planned with 3D imaging software?

The procedure for evaluating these research questions required the testing of 3D volume visualization software with surgical planning capabilities. The software allows a user to place virtual surgical instruments (e.g., trocars) in actual patient data using a gamepad for interaction. The evaluation process had a group of surgeons familiarize themselves with the interaction and capabilities of this software and then plan an endoscopic tumor resection utilizing the features they learned. The surgeons planned their surgery by placing the desired number of trocars in strategic locations necessary to perform the resection. "Expert" surgeons also performed the virtual actions as a benchmark to measure other participants against. Qualitative data was acquired through a post-experience interview consisting, but not limited to, ten questions concerning the software, its usefulness to them, and the gamepad interaction. The surgeons were asked to assess their experience, focusing on the practicality of using 3D visualization technology to prepare for a procedure. They also envisioned the future uses of this software or a similar interactive 3D visualization environment for surgical planning and training of surgeons.

Evaluations demonstrated the benefit of access to on-demand

visualization capabilities intraining and surgical procedures, particularly those involved in complex tumor resection cases. The ability to visualize and analyze patient data in the software became especially useful in these complex procedures, rather than attempting to perform the 3D reconstruction mentally. These surgeons had minimal past experience to reference, and 3D visualization allowed them to investigate critical abdominal and thoracic structures for optimal trocar placement.

3D visualization is useful during complex endoscopic surgical planning, where the placement of the trocars within the anatomy of the patient is critical to the success of the surgery and recovery time of the patient. 3D reconstruction and visualization software provides representations of the patient that surgeons find more intuitive for surgical planning than 2D medical images. Even though the gamepad controls seem unfamiliar at first, users all agreed the system was intuitive and fast after a short period of learning and use.

#### **P070 STRENGTHS AND WEAKNESS OF PORCINE MODELS IN MINIMALLY INVASIVE PAEDIATRIC SURGERY**

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**AIM:** To evaluate the Strengths and Weakness of porcine model in minimally invasive paediatric surgery.

**METHODS:** Following the approval of ethics committee, 15 different operations were carried out in 23 pigs and 6 piglets by 8 different paediatric surgeons in vivarium with excellent facilities and wide range of laparoscopic equipment.

A detail description of procedure was recorded, including difficulties faced for the procedure and measures undertaken to overcome them. Intraoperative complications were recorded and post procedure autopsy was performed when needed. Subjective criticism was also noted along with objective hurdles.

**RESULTS:** Animal models have previously been described for laparoscopic work in Paediatric patients. However, there is no study in the literature which completely summarises all models and their strengths and weaknesses. This paper aims at amalgamating the findings and summarising its strengths and weaknesses for a given laparoscopic procedure. Various laparoscopic procedures, were then summarised for size, side, innovations required, procedure/s performed and complications encountered.

**CONCLUSION:** Strengths and weaknesses of each are stated.

**KEY WORDS:** Animal model, laparoscopy, thoracoscopy, paediatric surgery, single-incision laparoscopic surgery, cholecystectomy, splenectomy, nephrectomy, cardiomyotomy, fundoplication, adrenalectomy, pyeloplasty.

#### **P071 LAPAROSCOPY IN SUSPECTED ABDOMINAL TUBERCULOSIS IS AN USEFUL AND EARLY DIAGNOSTIC METHOD**

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Establishing a diagnosis in abdominal tuberculosis can be difficult, frequently delaying treatment. Laparoscopic examination and biopsy of the peritoneal lesions remains the gold standard for diagnosis. We present 3 patients with chronic abdominal pain and diagnosed as tuberculosis peritonitis by laparoscopy. All of the 3 patients presented with chronic abdominal pain associated with slowly increasing abdominal distention in 2 patients and fever in 1 patient. None of them

had the findings of pulmonary tuberculosis. Laparoscopic examination showed that all surfaces of the peritoneum were studded with multiple whitish nodules of tubercles. Peritoneal biopsies revealed granulomas in all of the patients and cultures were positive for acid-fast bacilli in 2 of the cases. After antituberculous chemotherapy, all children had an uneventful recovery

Tuberculous peritonitis has to be clinically suspected in all children with history of chronic abdominal pain, fever and slowly progressive abdominal distension. Laparoscopy and peritoneal biopsy are still the most reliable, quick and safe methods for the diagnosis of tuberculous peritonitis.

**P072 LAPAROSCOPY-ASSISTED SURGERY FOR BENIGN ABDOMINAL MASS IN CHILDREN** Hiroyuki Koga, MD, Tadaharu Okazaki, MD, Yoshifumi Kato, MD, Akihiro Shimotakahara, MD, Tsubasa Takahashi, MD, Geoffrey J Lane, MD, Atsuyuki Yamataka, MD Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine

**PURPOSE:** Laparoscopy is being used more extensively in pediatric surgery to reduce surgical stress, minimize morbidity and improve cosmesis. We report our experience of using laparoscopy during surgery for benign abdominal mass (AM) in children.

**METHODS:** Under general anesthesia, a 5 or 10mm trocar was inserted using an open technique. The location of the AM, its exact nature, and anatomic relations were viewed directly allowing the provisional diagnosis to be confirmed. After laparoscopic evaluation and identification of the AM, the abdomen was incised appropriately for conventional surgical treatment of AM.

**RESULT:** We reviewed our AM cases treated by laparoscopy- assisted surgery between 1998 and 2008. AM treated by laparoscopy alone, prenatally diagnosed AM, and malignant AM were excluded, leaving 27 cases. Of these, 13 could not be diagnosed preoperatively. Mean age at surgery was 6.4 years (range: 5 days to 15 years). Indications for surgery were ovarian tumor (n=14), intestinal duplication cyst (n=3), retroperitoneal tumor (n=3), intestinal torsion due to Meckel's diverticulum (n=2), Meckel's diverticulitis (n=1), omental cyst (n=2), intussusception (n=1), and testicular tumor (n=1). Incisions were planned to provide the best exposure and access with minimal scarring and were umbilical in 9, Pfannenstiel in 12, and limited transverse abdominal incision in 6. Incisions were generally smaller compared with conventional incisions. Mean operating time was 180 minutes (range: 70-360). There were no intraoperative complications. After an average follow-up period of 4.5 years, all are well except for 2 patients with mild bowel distention.

**CONCLUSION:** Although our experience is limited, laparoscopy performed prior to open surgery enhances surgical planning by allowing the diagnosis and anatomic relations to be confirmed with safety. The optimal incision can be planned to minimize surgical stress. Use of laparoscopy facilitates treatment and minimizes scars. There would appear to be no added risks associated with performing laparoscopy.

**P073 LAPAROSCOPIC TREATMENT TO HYDROCELE IN CHILDREN** Li GuiBin, MD, Qiu Yun, MS The 5th Central Hospital of TianJin

**OBJECTIVE:** To evaluate the value of laparoscopic surgery application in treating children with hydrocele.

**METHODS:** 46 children with hydrocele had been cured by laparoscopic suture around internal rings in our hospital from July 2003 to January 2009.

**RESULT:** All of cases recovered uneventfully. The mean operating time was from 30 minutes to 45 minutes. The mean postoperative hospital stay was 2 days. All cases were followed up at 6th month and 1st year postoperatively, all cases recovered and no case recurred. The curative effect is satisfied.

**CONCLUSIONS:** To compare with traditional operation, The treatment of hydrocele by laparoscopic operation has the benefits of less invasiveness, giving satisfactory cosmetic results, early resumption of normal activities and assured curative effect.

**P074 NOBODY DOES IT BETTER? - SHO TRAINING IN LAPAROSCOPIC APPENDICECTOMY** Sumita Chhabra, Dr, Richard Lindley, Mr, Brian Davies, Mr Nottingham University Hospitals NHS Trust, QMC campus, Derby Road, Nottingham, NG7 2UH

**AIMS:** The aim of this study was to determine whether laparoscopic appendicectomy (LA) in paediatric surgery is a suitable training operation for FY2, ST1 and ST2 (SHO) trainees, by comparing operating time, length of hospital stay and complication rates with LA performed by paediatric surgery SpRs and consultants.

**METHODS:** Using previous audit data, 122 children undergoing LA within the Department of Paediatric Surgery at Queens Medical Centre were included in the study. Data were available from a 30 month time period and were analysed using Graphpad InStat 3.06 for Windows. The Kolmogorov-Smirnov test was used to assess data for normality and two-tailed t test, Fisher's exact test or Mann-Whitney U test used as appropriate. A p value of <0.05 was considered statistically significant.

**RESULTS:** A total of 172 appendicectomies were performed in the study period. 122 (71%) were laparoscopic and are analysed here. The overall negative appendicectomy rate was 15% and at operation an alternative diagnosis was found in 11 cases. 28 (23%) of LA were performed by an SHO. There were no significant differences in age between the two groups (median 11.5 years (range 2-15) in the SHO group and 12 years (2-16 years) in the SpR/consultant group. There were also no significant differences in the number of cases with acute appendicitis (43% vs. 46%), perforated appendicitis (25% vs. 36%) or a normal appendix on histology (32% vs. 17%). Mean total operating time in the SHO group was 72 mins (SD +/- 26) and 85 (+/-35) minutes in the SpR/consultant group (p=0.06, Mann-Whitney U test). Mean total length of hospital stay was 4 days (+/-2.5) in the SHO group and 6 (+/-2.3) days in the SpR/consultant group (p<0.01, Mann-Whitney U test). There were no major post-operative complications (wound infection, intra-abdominal collection or adhesional obstruction) in either group.

**CONCLUSIONS:** This study demonstrates that SHO surgical trainees can perform laparoscopic appendicectomy safely under appropriate supervision, with no increase in operating time, length of stay, or complication rate. This is an important consideration at a time of reduced training opportunities.

**P075 LAPAROSCOPIC EVALUATION AND MANAGEMENT OF PERINEAL IMPALEMENT TRAUMA IN CHILDREN** Kyle N Cowan, MD, Claudio De Carli, MD, Shirley Chou, MD, Marcos Bettolli, MD Division of Paediatric General Surgery, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, Ontario, Canada

Rectal/perineal impalement is an uncommon entity in childhood. Management to date has been based on experience in adults. Fecal diversion has remained a mainstay of therapy with controversy as to whether primary repair and/or presacral drainage may be indicated.

More recently, laparoscopy has been increasingly employed as a valuable tool for the diagnosis and treatment of patients with penetrating trauma. Here we report two paediatric patients with perineal and transrectal impalement trauma complicated by peritoneal penetration who were successfully managed laparoscopically. In both cases, we found that laparoscopy was an advantageous method for the assessment of and potential therapeutic intervention in these patients. Thus, we believe that in carefully selected patients, laparoscopy should be strongly considered as part of the initial approach to the management of perineal trauma in children.

**P076 ROBOTIC PEDIATRIC SURGERY IN FRANCE : WHAT FUTURE AFTER 2 YEARS OF EXPERIENCE?** Guenolee de Lambert, MD, Karim Braik, MD, Michel Robert, MD PhD, Hubert Lardy, MD PhD Department of General Pediatric Surgery and Pediatric Urology, Hospital of Tours, Tours, France

**INTRODUCTION:** France is the birthplace of minimally invasive surgery with teams pioneers in adult as well as pediatric surgery. Robotic surgery exists since 2002. We are the only team taking part in robotic pediatric surgery. Considering our 2 year experience, we ask the question : what future is there for pediatric robotic surgery in France ?

**MATERIAL & METHOD:** Pediatric robotic surgery began in November 2007 at the hospital of Tours. 25 pediatric patients have undergone robotic surgery that is to say 1,3 operations per month. Mean age of patients was 8,7 years old. Mean follow-up is of 10 months. 3 patients underwent pyeloplasty, 2 patients underwent inferior renal polar vessels' transposition, 2 patients underwent splenectomy, 6 patients underwent nephro-ureterectomy, 9 patients underwent Nissen fundoplication, 1 patient underwent adrenalectomy for pheochromocytoma, 2 patients underwent choledocal cyst resections.

**RESULTS:** Mean operation time was increased compared to open surgery but decreased with the surgeon's experience. Mean hospital stay was not modified compared to open surgery. There was no complication during surgery nor need to convert to open surgery. 1 encephalopathic patient had a recurrence of gastroesophageal reflux and underwent robotic surgery again. Patients suffered less after robotic surgery than open or laparoscopic surgery though it was not assessed by analgesic consumption.

**DISCUSSION:** After 2 years of experience, we feel that robotic pediatric surgery has been beneficial to our patients in our day-to-day practice. Robotic surgery has known advantages such as 3 dimensional vision, greater magnification, additional degrees of freedom and precision, tremor filtration, comfort for the surgeon and a shorter learning curve.

Furthermore, the introduction of the da Vinci Surgical System® (Intuitive Surgical, Mountainview, California) has facilitated subtle dissection, especially when complete absence of tumor mobilization was needed as in the patient who underwent adrenalectomy. It also facilitated spatulation in pyeloplasty as well as intracorporeal suturing in pyeloplasty and complex hepatobiliary anomalies. Nissen fundoplication, nephro-ureterectomy and splenectomy had no advantage for the patient, other than reduced pain after surgery, but enabled training and built the team's confidence.

Since 2002, published data on robotic pediatric surgery counts 69 articles, 29 case reports, 39 evaluation of results and only 1 prospective study. Feasibility is proven. Acknowledged procedures exist in urology, general, thoracic, neonatal and cardiac surgery. Though other pediatric teams were interested, we remain the only team who has the da Vinci Surgical System® and who is trained for robotic surgery,

that is to say 2 senior surgeons and 4 chief operating room nurses. Selected procedures should be those that necessitate subtle dissection and intracorporeal sutures like pyeloplasty and complex hepatobiliary anomalies. We wish to expand our indications to more complex procedures as well as to thoracic and neonatal surgery. However, fundoplication and nephro-ureterectomy need to be maintained for the training of younger surgeons. Benefice in children has to be proven by assessment of results. More teams need to be trained and obtain the da Vinci Surgical System®.

**P077 COMPARISON OF ROBOTIC AND LAPAROSCOPIC NISSEN FUNDOPLICATION IN CHILDREN** Brice Antao, MRCS, Tricia Merrigan, MD, Craig Nemecek, MD, Oneybuchi Ukabiala, MD, Thom Lobe, MD, Michael Irish, MD Blank Children's Hospital, Des Moines, Iowa, USA

**BACKGROUND:** Laparoscopic Nissen fundoplication is a well-established minimally invasive approach for treatment of gastroesophageal reflux disease in children. More recently, this procedure has been performed using robotic assistance. The aim of this study was to compare the outcome of robotic-assisted Nissen fundoplication (RNF) with laparoscopic Nissen fundoplication (LNF) in children.

**METHODS:** A retrospective review of all cases of Laparoscopic (33 cases, 15 male: 18 female) and Robotic Nissen fundoplication (19 cases, 8 male: 11 female) that were performed over a 10-year period (1999-2009). In LNF group, 15 patients were neurologically impaired and 19 cases required a gastrostomy and in the RNF group 6 were neurologically impaired and 9 required a gastrostomy. Outcome measures were operative time, total operating room time, conversions, complications, analgesic requirement and hospital stay. Data is presented as Mean  $\pm$  SD, and statistical analysis was done using Chi square test and ANOVA test, where  $p < 0.05$  was considered significant.

**RESULTS:** The age at surgery was  $19.54 \pm 42.42$  months (LNF) and  $87.63 \pm 74.53$  months (RNF). The operating time was  $120.91 \pm 60.75$  minutes (LNF) versus  $170.89 \pm 47.95$  minutes (RNF) [ $p = 0.003$ ] and total operation room time was  $170.18 \pm 59.80$  minutes (LNF) versus  $225.74 \pm 50.23$  minutes (RNF) [ $p = 0.001$ ]. There were 5 conversions (15%) in LNF group compared to one (5%) in RNF group ( $p = 0.033$ ). Sixteen patients (48%) in the LNF group and 9 patients (47%) in RNF group required parenteral analgesics for more than 48 hours duration ( $p = 0.086$ ). There were no intraoperative or immediate post-operative complications in either group. There were 2 recurrences (6%) in LNF group and one (5%) in the RNF group ( $p = 0.105$ ). The hospital stay was  $5.58 \pm 6.01$  days (LNF) versus  $12.15 \pm 14.59$  days (RNF) [ $p = 0.068$ ].

**CONCLUSIONS:** Robotic Nissen fundoplication is a safe and feasible alternative to Laparoscopic Nissen fundoplication in children. The conversions seen with laparoscopic surgery, is related to difficulties encountered when operating in confined spaces especially in smaller children. This may be overcome by the technical advantages offered by the robotic system. There is a significant increase in operating room time with robotic surgery mainly related to robotic set-up. With increasing experience and training, this could be reduced still further.

**P078 SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) APPENDECTOMY IN CHILDREN** Ismael Alejandro Salas de Armas, MD, Ashwin Pimpalwar, MD Texas Childrens Hospital, Houston, Texas, 77030

**BACKGROUND:** Laparoscopy is a gold standard technique for appendectomy. With advent of newer laparoscopic instruments which are articulating and provide 7 degrees of freedom it is now possible to do these operations through the single umbilical incision rather

than the standard 3-4 incisions. The newer reticulating telescopes provide excellent exposure and makes this easy. Recently ports (LESS ports/SILS ports) have appeared in the market which are particularly designed for single incision surgery. We describe our experience with SILS/LESS appendectomy in children.

**MATERIAL:** This is a retrospective cohort study of children who underwent single incision laparoscopic appendectomy between June and August 2009 at our institute by a single surgeon. Charts were reviewed for demographics, type of procedure, operative time, early or late complications, outcome and cosmetic results. A total of twelve appendectomies (used only for early appendicitis) were done using this new minimally invasive approach. The average age was 13 years with a range of 6 to 17 years of age.

**SURGICAL TECHNIQUE:** We used three ports through a single umbilical incision in 10 patients and a Triport (Olympus surgical) in 2 patients. 5mm 30 deg scope was used for visualization. A reticulating grasper was used to grasp the appendix. Harmonic scalpel was used to take down the mesentery and for dissection of the appendix. Reticulating Endo GIA stapler/2-0 PDS Endo-loupes was used to resect the appendix and an endo-catch bag was used to retrieve the appendix.

**RESULTS:** The average operative time for SILS appendectomy was 54 minutes with a range of 48 and 66 minutes. All patients were discharged home the next day. All patients were followed up in the clinic after 3-4 weeks. No complications were noted and the patients had excellent cosmetic results. None were converted to standard laparoscopy or open operation. Parents were extremely satisfied with the cosmetic results.

**CONCLUSIONS:** SILS/LESS is a safe, minimally invasive approach for appendectomy in children. This new approach is performed in a comparable operative time with good outcomes and great cosmetic result.

## **P079 TRANSUMBILICAL LAPAROSCOPIC ASSISTED APPENDECTOMY (TULAA) VERSUS OPEN APPENDECTOMY - PRELIMINARY RESULTS FROM A CASE CONTROL STUDY**

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**BACKGROUND:** Aim of our study was to evaluate the short term outcome of single port transumbilical laparoscopic assisted appendectomy (TULAA) compared to open appendectomy (OA) in a case control study.

**MATERIAL & METHODS:** 22 children operated on by transumbilical laparoscopic assisted appendectomy (TULAA) were matched with a control group of 22 children operated on during the same period of time by open appendectomy (OA) according to age, sex and histology of the resected appendix.

Patients were evaluated retrospectively for time to first and full oral intake, operative time, duration of hospital stay, intraoperative or postoperative complications and discharge criteria (full enteral feeds and fully mobile without the need for intravenous analgesia).

**RESULTS:** There were no differences between the groups according to sex, age and histology, representing a good matching quality. The mean operating room time for TULAA was 63.29mins and 42.94mins for OA - the learning curve showed a decrease in operating room time for TULAA. There were no intraoperative or postoperative complications and no conversions in TULAA and one postoperative wound infection in OA with fever of 40°C without any additional focus. Time to first oral

intake was 0.94 days for TULAA and 0.81 days for OA. All patients were on full oral feeds on mean postoperative day 1.82 in TULAA and 1.65 in OA. The mean duration of hospital stay was 3.76 and 3.41 days for TULAA and OA (range 2-7 days for TULAA and 1-10 for OA). All results showed no significance between the groups.

Discharge criteria as defined above were met by both groups on day 2, but most patients were discharged one day later.

**DISCUSSION:** TULAA appears to be a safe and successful alternative to three-port laparoscopic appendectomy in children. It yields the advantage of reducing the costs for surgery, because no cost intensive additional ports, stapling or endo-loop devices are needed. The postoperative course is similar as expected in open appendectomy. Interestingly, in both groups children were discharged one day later than their discharge criteria were met. This may be attributed to an occasional need for i.v. antibiotics, as one of our protocols employs a three day course of cefazoline and metronidazole for perforated appendicitis. Regarding surgical technique, any additional procedure is harder to perform with only one instrument at hand. Performing larger scale prospective trials should be encouraged.

## **P080 SINGLE INCISION LAPAROSCOPIC SURGERY IN CHILDREN** Brice Antao, MRCS, Luke Farrow, Medical Student, Michael Irish, MD Blank Children's Hospital, Des Moines, Iowa, USA

**BACKGROUND:** Single port transumbilical laparoscopy has emerged as an attempt to further enhance the cosmetic benefits and reduce morbidity of minimally invasive surgery. Single incision laparoscopic surgery (SILS) has recently been described in adults. We report our early experience of SILS in children.

**METHODS:** Since July 2009, 8 children (4 female, 4 male) underwent laparoscopic appendectomy using a Single Incision Laparoscopic Surgery (SILS™, Covidien, Connecticut, USA) device. Three cases were performed as an interval procedure and five cases were done as an emergency [non-ruptured appendicitis (3 cases), ruptured appendicitis (2 cases)]. All cases were done using a SILS™ port through a single 2 cm umbilical incision. Through the SILS™ port, one 10 mm and two 5 mm ports were inserted. Reticulator™ instruments (Covidien, Connecticut, USA) were used in one case and standard laparoscopic instrument in the other 6 cases. The appendectomy was done using a 10 mm Endo GIA stapler (Covidien, Autosuture, USA) and the mesoappendix was ligated using LigaSure (Valleylab, Colorado, USA).

**RESULTS:** Mean age at surgery was 14 years (range, 13-16 years). All cases were successfully completed without the need for any additional incisions. Average operating time was 20 minutes (range, 14-25 minutes). One interval appendectomy was converted to an open procedure because of dense adhesion scarring. There were no peri-operative or post-operative complications. All but the converted case was managed with simple oral analgesics post-operatively. Average hospital stay was 1 day (range, 1-2 days). All cases made a good recovery, and an excellent cosmetic outcome was seen at out-patient clinic review.

**CONCLUSIONS:** Preliminary experience with the Single Incision Laparoscopic Surgery (SILS™) device in children is safe and effective. There does not appear to be much of a learning curve for this procedure. With increasing experience, this device could be used to perform a variety of pediatric surgical procedures.

## **P081 LAPAROENDOSCOPIC SINGLE SITE SURGERY IN COLOMBIAN CHILDREN** Fernando Arias, MD FACS, Isabel Canon, MD, Monica Rdriguez, PHA, Armando Rojas, MD Hospital Universitario Fundación SantaFé de Bogotá, Bogotá, Colombia.

**OBJECTIVE:** To show the experience with single incision laparoscopic surgery (SILS) in pediatric patients at Hospital Universitario de la Fundación Santa Fe de Bogotá.

**METHODS:** We report a series of 11 consecutive patients (10 females, 1 male; ages 12-17 years) from September 2008 to August 2009. Outcome measures included surgical procedure, surgical site infection, operative time, device, length of hospitalization, surgical pain, need for conversion, cosmetic outcome and drain requirement.

**RESULTS:** 10 appendectomies and 1 mesenteric cyst resection were done. The average operative time was 63 minutes for appendectomies and the mean hospital stay was 10 hours. The operative time for the mesenteric cyst resection was 176 minutes and 21 hours of hospitalization. The cosmetic outcome was 5/5 for 10 patients (91%). Pain was rated 4/10 on a VAS after 24 hours for 6 patients (64%). Jackson Pratt drain was used in case of peritonitis. All surgeries were successfully performed and no conversions or complications were found.

**CONCLUSIONS:** SILS is a feasible, safe and reproducible technique with similar results to conventional laparoscopy. It has an additional advantage of excellent cosmetic results leaving an imperceptible scar and less hospital stay.

**KEY WORDS:** Laparoscopic appendectomy in children, single port laparoscopic surgery, single port laparoscopic appendectomy, laparoscopic single site (LESS).

#### **P082 COMBINED SILS CHOLECYSTECTOMY AND CHOLANGIOGRAPHY - FEASIBLE AND SAFE IN CHILDREN**

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Cholecystectomy in children is generally rare, but we encounter cases because of the specialized pediatric hepatology and liver transplant surgery in our hospital. Intraoperative cholangiography is usually indicated to exclude anatomical variants and other causes of biliary obstruction. Since starting the single-incision laparoscopic surgery (SILS) program in our department we have performed 20 SILS procedures: most of these have been appendectomies but we have also carried out SILS cholecystectomies combined with intraoperative cholangiography. We report our experience and our technical approach.

In symptomatic and sonographically proven gallstones with enlargement of the intra- and extrahepatic bile ducts, ERCP is the initial investigation. If this is inconclusive or technically impossible, intraoperative cholangiography is mandatory at cholecystectomy.

A single umbilical port is used for the procedure. After exposure of the gall bladder hilum and identification of the cystic duct, the duct is clipped at the gall bladder. A small round incision is then made in the cystic duct using electrocautery and a blunt catheter is inserted. The cystic duct is clamped around the catheter with the dissector and contrast medium is injected. The intra- and extrahepatic ducts shown on the cholangiogram are checked to make sure that they are satisfactory. Finally the system is flushed with saline, the catheter removed, the cystic duct double clipped and the cholecystectomy is completed.

We have been able to confirm the patency of the ducts in all three cases, and there have been no complications. The procedure is technically feasible and safe. We discuss details of our cases.

In the future, a specially designed introducer will allow us to insert a flexible cannula for cholangiography. This is currently being assessed using our EndoPaed trainer, which was presented in 2009 at the Phoenix meeting.

#### **P083 LAPAROSCOPIC SINGLE PORT SURGERY IN CHILDREN: OUR EARLY EXPERIENCE**

Ismael Alejandro Salas De Armas, MD, Ashwin Pimpalwar, MD Texas Childrens Hospital, Houston, Texas, 77030

**BACKGROUND:** Laparoscopy has become a gold standard technique for appendectomy and Cholecystectomy. With advent of newer laparoscopic instruments which are articulating and provide 7 degrees of freedom it is now possible to do these operations through the single umbilical incision rather than the standard 3-4 incisions. The newer articulating telescopes provide excellent exposure and make this easy. Recently ports (LESS ports/SILS ports) have appeared in the market which are particularly designed for single incision surgery. We describe our experience with laparoscopic single port surgery in children.

**MATERIAL & METHODS:** This is a retrospective cohort study of children who underwent single incision laparoscopic surgery between June and August 2009 at our institute by a single surgeon. Charts were reviewed for demographics, type of procedure, operative time, early or late complications, outcome and cosmetic results. Sixteen patients underwent Single incision laparoscopic (SILS) surgery. A total of twelve appendectomies (used only for early appendicitis) and three cholecystectomies were done using this new minimally invasive approach. The average age was 13 years with a range of 6 to 17 years of age.

**RESULTS:** The average operative time for SILS/LESS appendectomy was 54 minutes with a range of 48 and 66 minutes, while operative time for SILS cholecystectomy was 183 minutes, with a range of 165 to 196 minutes. All patients were discharged home the next day. All patients were followed up in the clinic after 3-4 weeks. No complications were noted and all patients had excellent cosmetic results. None were converted to standard laparoscopy or open operation. Parents were extremely satisfied with the cosmetic results.

**CONCLUSIONS:** SILS/LESS is a safe, minimally invasive approach for appendectomy and cholecystectomy in children. This new approach is performed in an acceptable operative time with good outcomes and great cosmetic result.

#### **P084 CHOLECYSTECTOMY USING SINGLE-INCISION PEDIATRIC ENDOSURGERY (SIPES): TECHNIQUE AND INITIAL EXPERIENCE IN THE FIRST 25 CASES**

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**BACKGROUND:** Laparoscopic cholecystectomy has become the standard in most pediatric surgery centers. In the search of a yet less invasive procedure, a single-incision laparoscopic approach has been reported in adults and very few children.

**OBJECTIVE:** The aim of this study was to present our initial experience of cholecystectomy using single incision pediatric endosurgery (SIPES), including the technique, the intraoperative challenges, and the outcome.

**METHODS:** All pediatric patients who underwent SIPES cholecystectomy from March through September 2009 were prospectively evaluated.

**RESULTS:** Twenty-five children underwent SIPES cholecystectomy. Most frequent indications were symptomatic cholelithiasis in 17 patients (68%), and biliary dyskinesia in 5 (20%). Five patients had sickle-cell anemia. The mean operative time was 73 minutes (range, 30-122 minutes). Median hospital stay was 1 day. In 17 patients (68%), a

percutaneous 2 mm grasper was used to retract the gallbladder over the liver. No complications were noted and no conversion to an open procedure was required. In 5 patients, additional trocars were added. On follow-up 3 days to 2 months later, no complications were noted. None were readmitted, and there were no wound infections.

**CONCLUSIONS:** Cholecystectomy using the SIPES approach in children is a safe and reasonable alternative to conventional laparoscopy, leaving an inconspicuous scar. Whether SIPES offers any further benefit to the patient besides improved cosmesis should be evaluated in future studies.

## **P085 WORKFLOW -ANALYSIS FOR ERGONOMIC EVALUATION OF CONVENTIONAL VERSUS SINGLE INCISION LAPAROSCOPIC SURGERY (SILS)**

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**OBJECTIVE:** Workflow Analysis is a powerful tool in the examination of operative procedures. Based on a standardised new established experimental training model we performed workflow analysis for evaluation of new laparoscopic techniques like SILS and new laparoscopic instruments.

**MATERIAL & METHOD:** Three different operative tasks were performed under standardised conditions. First task included a simple ablative task which consists of cutting a special designed plastic model. The second task was the performance of a running suture as a simple reconstructive task, and the third incorporates a running anastomosis suture as a complex reconstructive task.

Laparoscopic technique included: Conventional Instruments in 3 trocar technique, conventional instruments in SILS Technique (Single Port), TAM -Instruments ( specially angled hand instruments) in 3 trocar technique, TAM- Instruments in SILS technique (Single Port)

Every task was repeated 5 times per proband. According to this 15 iterations of each proband were analysed for one laparoscopic technique. For every test person 60 Sets of Data were available.

**RESULTS:** We found that performance of conventional 3 trokar technique with TAM -Instruments was 4 times faster than with conventional instruments in the same quality.

The Duration of the exercise with TEM instruments in single Port Technique was 3 times longer than by conventional instruments in 3 trokar technique. There was no difference in the quality. Duration of single port by using Tem instruments was significant shorter than by using conventional instruments –also with no difference in quality.

**CONCLUSION:** Workflow analysis offers new and detailed insights into ergonomics of laparoscopic tasks. It seems to be a powerful tool for the expressiveness of different parameters. Therefore objective results can be evaluated to compare different laparoscopic approaches and new types of instruments in terms of their effectiveness and quality.

## **P086 SINGLE INCISION LAPAROSCOPICALLY ASSISTED RESECTION OF MECKEL'S DIVERTICULUM : EASY AND ESTHETIC**

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A 9- year- old boy was transferred from another hospital to our pediatric intensive care unit (PICU) because of massive rectal bleeding. On admission the patient was shocked, Hb level was 5.4.gm/

dl. Initial treatment consisted of blood transfusion and hemodynamic stabilization. An emergent colonoscopy was performed but didn't show a bleeding source. Technetium Tc 99m- labeled pertechnetate scan was negative but a barium swallow showed a large Meckel's diverticulum. Single incision laparoscopy (SILS) was performed : through a curved transverse umbilical incision two 5mm ports were inserted, one for the camera , one for the instruments. A 4.5 mm endograsp was introduced and the small bowel was explored, beginning at the cecum and running the terminal ileum. The Meckel's diverticulum was identified, grasped and exteriorized through the umbilical incision. It was a large based diverticulum and a small bowel resection with end-to-end anastomosis was performed extra corporally. The bowel was reinserted in the abdominal cavity and the umbilicus was closed. Drinks were allowed the same day, oral feeds at the first postoperative day. Patient was discharged 48 hours after the operation. Follow-up now is one month , no complications occurred. The abdomen seems scarless , the scar being inside the umbilicus and thus invisible.

## **P087 SILS CHOLECYSTECTOMY IN CHILDREN- PRELIMINARY EXPERIENCE**

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**INTRODUCTION:** Laparoscopic cholecystectomy has become gold standard for cholecystectomy, since Mouret introduced it, in 1987. In 1997 Navarra described "one incision" cholecystectomy, but only recent Single Incision Laparoscopic Surgery (SILS) gained wider acceptance, mostly due to technologic development. The primary SILS goals are avoiding visible scarring and minimizing surgical trauma. We present our first experiences in three cases of children treated with SILS cholecystectomy.

**METHOD:** In June 2009 we performed SILS cholecystectomy and modified SILS cholecystectomy in 3 children (2 females, 1 males; ages 2,5-17 years). One child underwent previous open left adrenalectomy for neuroblastoma. We used Covidien SILS Port in one case and 3 single use low-profile ports in the others. Suture was used to suspend the gallbladder, and standard cholecystectomy was performed using an articulating instruments. There were no postoperative complications, average operating time was 70 minutes. Hospital stay varied from 2 to 4 days.

**CONCLUSIONS:** An early experience with SILS cholecystectomy in children appears to be safe and effective, however further studies and greater numbers will be required to investigate the benefit of this approach.

## **P088 OPTIMAL ANIMAL MODEL FOR SINGLE INCISION PAEDIATRIC LAPAROSCOPIC SURGERY**

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**OBJECTIVE:** Single Incision Laparoscopic surgery is rapidly gaining popularity. The advanced level of skill involved compounded by the limited number of patients, necessitates the use of training models. An animal training model is considered superior to a simulator, as it creates a working field similar to that in a human patient. Several animals have been tried for training purposes in the past. Each posed inherent limitations as a training model. The objective of this study is to evaluate pig as a model for training in Single Incision Laparoscopic Surgery in paediatric population.

**METHODS:** Four adult pigs weighing approx 20 kg each were anaesthetised at different intervals in time. Different SILS procedures were performed

in each. The subjects were observed for adequacy of visualisation, working space, operative time, intra-operative and anaesthetic complications including death, and need for additional port/s.

**RESULTS:** 1 cardiomyotomy, 4 cholecystectomy, 1 splenectomy and 1 nephrectomy each were performed. All procedures were completed successfully. It was found that a female pig weighing 20 kg was easy to anaesthetise. It provided good visualisation and working space. The trial of additional port did not change this in cholecystectomy but certainly helped in other procedures. The average operative time was comparable. No intra-operative complications or deaths were encountered.

**CONCLUSION:** This study concluded that female pigs weighing approximately 20 kg is an optimal model for training in paediatric Single Incision Laparoscopic procedures.

**KEY WORDS:** Animal model, laparoscopy, paediatric surgery, single-incision laparoscopic surgery, cholecystectomy, splenectomy, nephrectomy, cardiomyotomy.

**P089 INITIAL EXPERIENCE IN SINGLE INCISION LAPAROSCOPIC APPENDECTOMIES IN A SINGLE SMALL CENTRE** Nadav Slijper, MD, Marcos Bettolli, MD, Jorge Mogilner, MD, Ibrahim Matter, MD Pediatric surgery1 and General Surgery2, Bnai-zion medical centre, Haifa, Israel

**INTRODUCTION:** Laparoscopy has changed the face of surgery in the last two decades. In the current era, surgeons are pushing the limits to improve the cosmetic results, reducing the numbers of scars while keeping surgery safe. Although natural orifice transluminal endoscopic surgery (NOTES) is promising, the learning curve and specialized equipment requirement are still areas of concern. Single incision laparoscopic surgery (SILS) is slowly evolving as an alternative procedure. We report our initial experience with this latter technique.

**METHODS:** Five appendectomies were performed, three in children and two in adults. Using two 5mm ports through a single transumbilical skin incision; a 30° scope and regular straight instruments were used. A traction suture was placed in the right lower quadrant through the mesoappendix to achieve tension and facilitate the dissection. Regular ties were used on the appendiceal base, and an Endobag was used to extract the specimen.

**RESULTS:** The operative time for the SILS was longer than the average laparoscopic appendectomy in our institute. There were no intraoperative or postoperative complications, the use of postoperative analgesia and the hospital stay was the same as for regular laparoscopic appendectomies.

**CONCLUSION:** In our initial experience, we found SILS to be a feasible alternative to the regular laparoscopic approach in carefully selected patients. The learning curve does not present a risk to the patients, as long as the procedure is done by experienced laparoscopic surgeons. Performing these procedures on adults should lead to a reduction in the length of the learning curve for application to pediatric cases.

**P090 TRANS-UMBILICAL LAPAROSCOPIC-ASSISTED APPENDECTOMY AS AN ALTERNATIVE TO BOTH CONVENTIONAL AND LAPAROSCOPIC APPENDECTOMIES IN THE PEDIATRIC POPULATION** Shant Shekherdimian, MD MPH, Daniel DeUgarte, MD Department of Surgery, Division of Pediatric Surgery, University of California, Los Angeles

**PURPOSE:** Recently, the use of a single umbilical incision to perform an appendectomy has been described. The purpose of this study was to review our initial experience with trans-umbilical laparoscopic-

assisted appendectomy (TULAA) for the treatment of appendicitis in the pediatric population.

**METHODS:** A retrospective review of all pediatric patients treated for appendicitis with a trans-umbilical laparoscopic-assisted appendectomy was performed. The surgical technique involved using a 3mm or 5mm trocar for visualization and insufflation. A dissecting/grasping instrument was used adjacent to the trocar through the same fascial incision. Patient demographics, operative findings and time, as well as post-operative course were reviewed.

**RESULTS:** Eleven patients who underwent TULAA were identified. The mean age was  $9.1 \pm 2.1$  years and 36% of the patients were female. Three patients had appendicoliths, two patients had perforated appendicitis, and one patient had a retrocecal appendix. The average total operative time was  $49 \pm 13$  minutes. The use of additional incisions/trocars was not required, and conversion to a conventional "open" procedure was not needed in any case. An infra-umbilical incision was used in all but one patient, who had a prior umbilical hernia repair and for whom the old supra-umbilical incision was used. The operating surgeon did not report difficulty with reaching the base of the appendix for any of the cases, but blunt mobilization of retroperitoneal attachments was performed prior to retrieving the appendix through the umbilicus. Overall, the average length of stay was  $1.3 \pm 0.95$  days; however, all patients with non-perforated appendicitis were discharged the day after surgery. All patients were followed postoperatively, and none reported post-operative complications of abscess or wound infection. In some patients, the umbilicus was no longer an 'innie' post operatively. Nevertheless, all of the patients and their parents were very satisfied with the cosmetic outcome of the procedure.

**CONCLUSIONS:** TULAA is a safe and effective single-incision approach for early appendicitis that incorporates both open and laparoscopic techniques to provide excellent exploration of the abdomen, short hospital stay, minimal pain, and an excellent cosmetic result. The technique described is cost-effective, as it does not utilize any special laparoscopes, trocars, or staplers. When performed as described in this study, only a single trocar and a standard laparoscopic setup are required.

**P091 SINGLE INCISION LAPAROSCOPIC SPLENECTOMY: FEASIBLE IN SOME CASES, SAFER AFTER SPLEEN EMBOLISATION** E. Van Der Veken, MD, M. Laureys, MD, A. Ferster, MD, C. Devalck, MD, G. Rodesch, MD, C. Lermينياux, MD, M. Dassonville, MD Hôpital des Enfants Reine Fabiola, Brussels, Belgium

In our institution we practice spleen embolisation preoperatively in order to make laparoscopic splenectomy a safer procedure. Between January 2008 and June 2009 we performed laparoscopic splenectomy in 5 children with hypersplenism due to sickle cell anemia (1), spherocytosis (3) or idiopathic thrombocytopenic purpura (1). Ages varied from 3 to 13 years. All underwent preoperative spleen embolisation immediately followed by laparoscopic splenectomy. There were no per-operative complications, none of the patients needed a blood transfusion. The two last cases were performed by the SILS technique. Both were done through a curved transverse umbilical incision. In the first case three 5 mm ports were inserted separately, in the second one we used the Single™ Port (Covidien®). The first procedure took 180 minutes without technical difficulties. In the second case the left liver lobe was hanging over the most proximal short gastric vessels making their ligation (by LigaSure, Valleylab®) impossible. After several hours a 3.5 mm instrument was inserted through a small epigastric skin incision, without port, in order to lift up the left liver lobe. After this maneuver the operation was accomplished without further technical problems.

**CONCLUSION :** from our small series we conclude that SILS splenectomy is feasible. Patient selection for this procedure can not been made in advance as feasibility depends on per-operative findings. Our policy is to start by SILS technique but to add an instrument as soon as the procedure gets time consuming. Preoperative spleen embolisation facilitates SILS splenectomy in our opinion.

## **P092 SINGLE INCISION LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN-LESSONS LEARNED IN FIRST 25 CASES**

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**PURPOSE:** Laparoscopic cholecystectomy has become a standard procedure for gallbladder diseases. Typically, the operation is performed via a 4-trochar technique. Single incision laparoscopy has gained popularity. The purpose of this study is to evaluate the safety and feasibility of single incision laparoscopic (SIL) cholecystectomy in children.

**METHODS:** The procedure was performed with the patients in the lithotomy position. A single infra-umbilical semi-circumference incision was made whereby three 5mm-ports were placed, one trochar at mid-inferior and the other two were placed on each side of the umbilicus. The canulae were "staggering" at different heights to avoid collisions. A 0.0 Prolene suture was placed through the abdominal wall to retract the gallbladder. The dissection was performed using standard straight laparoscopic instruments. After the approval of the Institutional Review Boards, we performed a retrospective chart review of our SIL cholecystectomy from 1/08-10/09. Pertinent clinical data were extracted. The outcomes were reported as OR time, intra-operative and postoperative complications, length of stay and narcotic use.

**RESULTS:** We identified 25 patients (20 females and 5 males). Mean age was 15 years (10-19 yrs). Most patients had symptomatic cholelithiasis. Two patients had gallstone pancreatitis, three had acute cholecystitis and one had hydropic gallbladder. Three patients had pigmented stones from sickle cell anemia. 23 patients underwent cholecystectomy without intra-operative cholangiograms. Two patients had intra-operative cholangiograms performed. Two patients had intense inflammation required an additional 5 mm epigastric port to facilitate the dissection. Average OR time was 97.9 min (40 -145 min). Blood loss was reported as minimal for all cases, ranging from 5-25 ml. There were no intra-operative complications. Mean length of hospital stays was 1.47 days (1-3 days) with sickle cell anemic patients and patients with pancreatitis required longer hospital stay. All patients had minimal (1-3 doses) requirement for IV narcotics during their inpatient course except for one patient, who required additional dosing. There were no incisional hernias noted. One patient developed superficial wound infection which resolved with topical antibiotic ointment. All patients had excellent cosmetic results on postoperative follow-up.

**CONCLUSION:** We learn that SIL cholecystectomy in children is safe and feasible, even in the settings of acute cholecystitis or pancreatitis and even when cholangiograms were needed. The operation can be done using standard laparoscopic instruments. "Staggering" the trochars is the key to avoid equipment collisions. Our early results indicate that this approach yields excellent results. In comparison to the standard 4-port technique, the single incision method has the advantage of being more cosmetically pleasing.

## **P093 A FEW AND FAR BETWEEN TRIPLE ASSOCIATION: CONGENITAL DIAPHRAGMATIC HERNIA, PULMONARY SEQUESTRATION AND GASTRIC DUPLICATION CYST**

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The concomitant diagnosis diaphragmatic hernia and a pulmonary sequestration is known, though very rare. Herein we present one singular case which a gastric duplication was added on this particular association.

Diagnosis of diaphragmatic hernia was coincidentally made during observation of an upper respiratory tract infection in a 2 year old girl. A CT scan demonstrated a solid mass on the diaphragmatic rim and a cystic structure posterior to the stomach. During laparoscopy, the cyst was found to be a gastric duplication and excised. At the time of removing the diaphragmatic hernia sac, the solid mass was found to be an extrapulmonary sequestration and excised. Finally the diaphragmatic defect was successfully repaired.

Association of broncho-pulmonary malformations with anomalies of the foregut can be considered a direct proof of the theory of "the accessory lung".

## **P094 THORACOSCOPIC REPAIR OF LONG GAP ESOPHAGEAL ATRESIA FOLLOWING MULTISTAGED EXTRATHORATIC ESOPHAGEAL ELONGATION: A CASE REPORT**

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**INTRODUCTION:** To date several large series of thoracoscopic repair of esophageal atresia have been reported. However, few reports of thoracoscopic repair of long gap esophageal atresia have been reported. Herein we report a case of long gap esophageal atresia without tracheoesophageal fistula in which thoracoscopic repair was performed following the multistaged extrathoratic esophageal elongation.

**CASE:** A baby girl was born at 30 gestational weeks, and her birth weight was 1146g. Cervical esophagostomy was made at 3 months of age because of the long gap (5 vertebral bodies) and frequent respiratory insufficiency due to saliva aspiration. After twice extrathoratic esophageal elongation, thoracoscopic repair of esophageal atresia was performed at 10 months of age. After freeing the proximal esophagus from the anterior chest wall, the esophagus was dissected to the level of the cricoid cartilage. A space was bluntly developed between the vertebra and the right carotid vessels, through which the proximal esophagus was brought into the upper part of the posterior mediastinum. A 3mm camera port and 2 working port (3mm x 2) were placed in the right chest. Under the thoracoscopic guidance, the mediastinal pleura was incised to create a communication between the neck and the right chest. After several dilatation of this communication with Hegar dilator, the proximal esophagus was introduced into the right chest. The thoracoscopic ports were removed and the neck wounds were closed temporarily. The patient was positioned prone with the right side slightly elevated. A 3mm camera port and 3 working ports (5mmx1, 3mmx2) were placed again in the right chest. The distal esophageal was easily found at the posterior mediastinum just above the diaphragm with the aid of a bronchofiber inserted in the esophageal pouch. The distal 1cm of the elongated proximal esophagus was discarded because of scarring. Thoracoscopic esophageal reconstruction was performed by interrupted one-layer anastomosis with 5-0 monofilament absorbable sutures under slight tension. Anastomotic leakage occurred on the 8th postoperative day, and was managed conservatively. Oral feeding was started 3 weeks after the operation. One balloon dilataion was required to manage the anastomotic stricture.

**CONCLUSIONS:** Usually wide and multiple thoracotomy is necessary for the repair of long gap esophageal atresia because the operation field includes both upper and lower mediastinum. Thoracoscopic repair

of esophagus following the multistaged extrathoracic esophageal elongation, which does not require thoracotomy, could be a minimally invasive treatment strategy for infants with long gap esophageal atresia.

**P095 EASY WAY TO REMOVE THE BAR AFTER CORRECTION OF PECTUS EXCAVATUM** Edward Esteves, MD, Humberto B Sousa-Filho, MD, Denny C Lima, MD, Calebe P Souza, MD Pediatric Surgery Division, University of Goias. Goiania, Brazil

**BACKGROUND:** After the surgical treatment of pectus excavatum by implantation of a metallic bar, the removal of this bar is programmed to be accomplished after around 3 years. The most used techniques for bar removal involve unbending the hard tips of the bar and or changing the position of the patient laterally, uncomfortable for the patient and the team with an additional risk of contamination. Objectives: to show an easy way for positioning of the patients and removal of the bar after Nuss technique.

**MATERIALS & METHODS:** The technique was applied to remove the bars since 2007. The patient is normally positioned on the table, however occupying mainly the right side of the table. The surgeon must keep the lateral side of the right thoracic wall almost floating in the air, about 5-10 cm beyond the limits of the mattress. Both arms are kept open over comfortable armrests. After release of both tips and stabilizers, both extremities of the bar are exteriorized. A Nogushi unbender or any surgical plier is applied to unbend only the left tip of the bar. Then, in some seconds the bar can simply be removed by pulling the right tip downwards following the natural curve of the lateral thoracic wall. The position of the patient is not modified during the whole operation, until the intradermic suture of the wounds.

**RESULTS:** Our last 12 bars have been removed using this technique with absolutely no complication. Even adult patients presented no major difficulty, except for the ossification process over the tips, bothering release of the stabilizers. The right extremity and the central part of the bar did not have to be straightened to be pulled out. The left extremity should have only the last 3-4 cm unbended.

**CONCLUSIONS:** The pectus bar can be easily removed by unbending only the tip of its left extremity, keeping the patient over the lateral side of the table, requiring no change of the position during the whole procedure.

**P096 ENDOVIDEOSURGERY IN TREATMENT OF LUNGS ECHINOCOCCOSIS IN CHILDREN** Damir Dzhenaev, Vladimir Kotlobovski, Erbol Mussin, Omar Mamlin National Research Centre of Maternity and Childhood, Astana, Kazakhstan

Echinococcosis – one of the parasitic diseases of human being representing a serious problem for medicine and national economy.

Generally accepted that traditional methods of treatment of echinococcosis has a high level of traumacy, due to this fact the searching of less invasive and effective ways of solving this problem is reasonable and endovideosurgery belongs to one of them.

The purpose of our work is studying the results of the surgical treatment of lung echinococcosis using endovideosurgery.

There have been treated 21 patients with lung echinococcosis in the department of children surgery. We have used the methods of endovideosurgery in 14 of them.

We've applied separate lung intubation at carrying out thoracoscopic operations. The operative intervention consisted of cyst puncture, disinfecting and opening it, removing chitinous cover by the aid of the

vaccum extractor. To determine the presence of bronchial fistulas the intubation tube was pulled up and residual cavity was filled up with liquid. The operation has been finished by liquidation of residual cavity by capitanaige and draining the pleural cavity.

The comparative analysis with group of patients (n=7) which were passed through the traditional open intervention has been maken. For the comparative analysis we used the following methods:

- the dynamic of "stress hormones" rates in reply on operative trauma
- the condition of simpaticoadrenalic system
- the variability of the number of heart beats
- the studying the parameters of external breath
- the currency of postoperative period

The comparative analysis have shown that the endovideosurgical operations being as radical as traditional open intervention allow to decrease significantly the level of traumacy, drugs waste, postoperative stay in a hospital and have good cosmetic effect.

Thus the endovideosurgical methods can and should be the alternative in treatment of lung and liver echinococcosis.

**P097 EASILY REPRODUCE TRAINING MODEL IN LAPAROSCOPIC SURGERY FOR ESOPHAGEAL ATRESIA** Hossein Allal, PhD MD, Froylan Paniagua (2), MD, Gustave Andrianandraina, MD, Dominique Forges, MD (1) Pediatric Visceral Surgery Department. Video surgery Unit. CHU Montpellier, France. (2) Hospital Para el Nino Poblano. Puebla. Mexico

**INTRODUCTION:** Through time, the training and development of technical skills have been performed in the operating room. Clinical training using simulated environments may improve the efficiency and safety of laparoscopic surgery. We present a training model in laparoscopic surgery for esophageal atresia (EA) which is easily reproduce.

**MATERIAL & METHODS:** To confine the training model , we divide it in three parts: A) Video surgery equipment. A video endoscopic unit with an image integrated module, three 3.5mm trocar, one 5.5 mm trocar, 3mm instruments. B) A mannequin is used, which simulated a term newborn having a longitudinal anterior and posterior opening of 10 cms long and 2cms wide, through which a separator is introduced. C). Rabbit tissue is used (you can use synthetic material such as silicone). We proceed to place the videosurgery unit just like a real procedure. Placing the optic, visualizes the first image of esophagus and trachea. Afterwards, performing a meticulous dissection the separation of the tracheoesophagean partition is done, a suture thread 5/0 is placed around the esophagus, making an intracorporeal knot. The same surgical technique, end to end anastomosis is performed.

**CONCLUSION:** Since the beginning of laparoscopy, the use of simulators have proven a great potential for training and acquiring skills , shortening the learning curve and the early use in real procedures. This model which perfectly simulates the environment of an EA has been used by pediatric surgeons in the unit, allowing them to acquire skills that could then be applied during surgery.

**KEYWORDS:** Training model, esophageal atresia.

**P098 THORACOSCOPIC PULMONARY SEQUESTRECTOMY IN NEONATES: EXPERIENCE FROM RUSSIA** Yury Kozlov, MD, Vladimir Novogilov, MD, Pavel Yurkov, MD, Alexey Podkamenev, MD, Elena Weber, MD, Pavel Krasnov, Nikolay Sirkin Department of Neonatal Surgery, Pediatric Hospital, Irkutsk, Russia

**BACKGROUND:** Pulmonary sequestration is a rare developmental abnormality characterized by nonfunctioning isolated lung masses. VATS provides a parents- and patients-friendly approach to the surgical management of this condition. This report from Russia details our experience with thoracoscopic sequestrectomies in regional neonatal surgical department.

**METHODS:** From September 2004, to September 2009, four patients underwent thoracoscopic pulmonary sequestrectomy. There were 2 boys and 2 girls. Prenatal diagnosis was made by ultrasound scan between 20 and 30 weeks gestation. 2 pulmonary masses located in the right pleural cavity and 2 in the left pleural cavity. All neonates were born at term asymptomatic. Age and weight at operation were 20 days (range, 14-28) and 3,1 kg. (range, 2,8-3,4). Extralobar sequestration was confirmed in all patients by postnatal computed tomography. One hybrid malformation (CCAM and sequestration) was identified. A standard 3-trocar technique was used. In each case a combination of the endoclips and Harmonic scalpel were used to seal the pulmonary vessels. All pulmonary remnants were extracted from the chest through a posterior port site. A posterior chest tube was placed under direct visualization.

**RESULTS:** There were no intraoperative and postoperative complications. Operative time ranged from 40 to 60 minutes (median, 50). Chest tubes were removed on next postoperative day. The mean hospital stay was 7 day (range, 6-8). The cosmetic results were excellent by visual inspection. Conclusion. Thoracoscopic pulmonary sequestrectomy is technically easier and faster endoscopic procedure in neonates. The aesthetic and functional outcomes after video-assisted thoracoscopic sequestrectomy are generally better than those after an open surgery. Our series supports such studies in which pulmonary sequestration can be treated with thoracoscopy in very young neonates.

**P099 LAPAROSCOPIC REDO SURGERY FOR DIAPHRAGMATIC HERNIA RECURRENCE** Baran Tokar, MD, Huseyin Ilhan, MD Eskisehir Osmangazi University, School of Medicine, Department of Pediatric Surgery, Eskisehir, Turkey

Congenital posterolateral diaphragmatic hernia is mostly diagnosed during newborn period. In some patients, the pathology is silent, or symptoms and signs appearing later may lead a misdiagnosis or a delayed diagnosis. This case shows laparoscopic primary and redo surgery of diaphragmatic hernia repair of an eight year old boy. Case presentation: An eight year old boy was admitted with a left upper abdominal and lumbar pain following each meal since the last 4 days. He had similar symptoms with intervals in the past. Physical examination, chest X-ray, and upper GIS contrast studies showed a congenital posterolateral diaphragmatic hernia and a laparoscopic repair was performed. Six months later, a hernia recurrence was determined, and redo surgery was done laparoscopically. In second operation the procedure was challenging due to adhesions. Intra-abdominal, diaphragmatic and intra-thoracic adhesions of omentum and appendix epiploica of colon caused difficulty of reduction. Endoscopic vessel sealing device and aspirator-irrigator made dissection and reduction easier. Closure of the defect was done with 2/0 polypropylene 3 interrupted stitches. As a second layer, a polypropylene mesh was placed on the defect with fixation at the corners. Postoperatively he did well, and is now in the third year of the follow up. Conclusion: Although there are some difficulties of dissection and tissue handling during reduction, laparoscopic repair is possible in redo surgery of diaphragmatic hernia recurrence.

**P100 EFFICACY OF VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR THE MANAGEMENT OF CHILDHOOD EMPYEMA: EXPERIENCE IN TWO CENTERS** Brice Antao, MRCS, Mark Powis, FRCS, Oneybuchi Ukabiala, MD, Thom Lobe, MD, Ricardo Flores, MD, Michael Irish, MD Blank Children's Hospital, Des Moines, Iowa, USA & Leeds Teaching Hospitals NHS Trust, Leeds, UK

**BACKGROUND:** The optimal treatment of children with empyema remains controversial. Various treatment options include pleural drainage with/without fibrinolytic therapy, video assisted thoracoscopic surgical (VATS) debridement and open thoracotomy and decortication. In complicated effusions, dense fibrinous septations and loculations lead to ineffective pleural drainage. The aim of our study is to evaluate the efficacy of video assisted thoracoscopic surgery (VATS) in the management of empyema in children in two centres.

**MATERIAL AND METHODS:** All children who underwent VATS for childhood empyema at Leeds Teaching Hospital NHS Trust, England (n=12) and Blank Children's Hospital, Iowa, USA (n=40) from 2000 to 2009 were evaluated. Patient demographics, age at presentation, duration of antibiotic therapy, pre-operative chest drain and operating time were documented. All cases underwent a thoracoscopic evaluation followed by either break down of loculations, debridement or complete decortication. All cases were managed post operatively with a chest drain and antibiotics and 12 cases also received fibrinolytic therapy (Urokinase) via the chest tube. Outcome measures were duration of hospitalization, complications and conversion. Data is presented as Mean  $\pm$  Standard Deviation (SD) and statistical analysis was done using Chi square test and ANOVA test, where  $p < 0.05$  was considered significant.

**RESULTS:** In a 9-year period, 52 children (32 Male: 20 Female) underwent VATS for empyema in both centres. Age at surgery was  $67.98 \pm 51.94$  months. All cases failed initial management with intravenous antibiotics for a total duration of  $4.49 \pm 3.55$  days. In addition 14 cases (27%) had prior placement of chest drain without any success. Following thoracoscopic evaluation, 16 cases (31%) underwent a simple breakdown of loculations, 10 cases (19%) debridement and 26 cases (50%) a complete decortication. Operating time was  $65.25 \pm 25.85$  minutes. There were no technical difficulties encountered and no intra-operative complications or need for conversion to open procedure. The chest drain was removed  $4.49 \pm 3.55$  days after surgery. One case required subsequent thoracotomy and decortication, due to ineffective pleural drainage. Duration of post-operative hospital stay was  $7.69 \pm 4.50$  days. There was no statistical significant difference in recurrence in the group that received urokinase ( $p = 0.580$ ). Like wise, hospital stay was  $6.25 \pm 2.63$  days (urokinase group) versus  $8.12 \pm 4.88$  (no urokinase) [ $p = 0.466$ ]. In those cases with a pre-operative chest drain, hospital stay was  $13.64 \pm 4.79$  days compared to  $5.5 \pm 1.27$  days for the rest of the cohort ( $p < 0.001$ ). Similarly, hospital stay was  $8.89 \pm 5.73$  days (prolonged pre-operative antibiotics  $> 3$  days) versus  $6.75 \pm 3.04$  days (pre-operative antibiotics  $< 3$  days) [ $p = 0.013$ ]. The duration of hospital stay for the various VATS treatment modalities were  $8.77 \pm 4.97$  days (breakdown of loculations) versus  $5.30 \pm 0.82$  days (debridement) and  $7.44 \pm 4.65$  days (complete decortication) [ $p = 0.320$ ].

**CONCLUSIONS:** VATS facilitates intraoperative decision-making and is a safe and effective minimally invasive approach for the management of empyema in children. Early VATS leads to shorter hospitalization. The authors propose a treatment algorithm for the effective management of empyema in children.

**P101 THORACOSCOPIC LUNG RESECTIONS** Boma T Adikibi, MD, Gillian H M Duthie, MD, Fraser D Munro, MD, Gordon A MacKinlay, MD Royal Hospital for Sick Children, Edinburgh, UK.

**AIM:** The first thoracoscopic procedure was performed in our institution in 1999. Over the past decade the breadth and complexity of thoracoscopic procedures has grown. There is a higher conversion rate with thoracoscopic procedures compared to laparoscopic in our institution. We review our thoracoscopic lung resections since 2000.

**METHODS:** Data was retrieved from surgical audit, our laparoscopic database and case note review of all thoracoscopic lung resections performed in our institution between 2000 and the present day.

We collected data on patient demographics, operative details, conversion and complications encountered.

**RESULTS:** There were 137 thoracoscopic cases between 1999 and the present day. Of these 24 were lung resections for underlying pulmonary pathology.

There were 24 patients, 13 female and 11 male. The ages ranged from 5 months to 17 years (median age 3 years and 7 months).

There was a range of pathology encountered with congenital cystic adenomatoid malformation being the commonest indication for lobectomy; all the underlying pathologies are listed:

- CCAM- 10
- Sequestration-5
- Bronchiectasis- 4
- Bronchogenic cyst- 2
- Other – 3 (Pulmonary mycosis mucor, Cyst, fibrotic lesion)

There were 14 lobectomies performed (5 right lower lobe, 4 left lower lobe, 3 left upper lobe, 1 right upper lobe and 1 right middle lobe) and 5 excisions of lesions.

Operative time ranged from 80 minutes to 360 minutes (median operative time of 165 minutes). There were no intra-operative complications.

The conversion rate was 25% (6cases). The complication rate was 8.3% with 2 patients requiring a chest drain under a subsequent anaesthetic for persisting pneumothorax.

The median post operative hospital stay is 3 days (range 1–13 days)

The median follow up for this cohort of patients is 3 years and 8 months (range 1.5 months- 9 years and 8 months)

**CONCLUSION:** Our conversion rate of 25% comprised of elective conversions undertaken for timelier or safer completion of the procedure. There were no enforced conversions due to intraoperative complications.

We have demonstrated that thoracoscopic lung resection is feasible in the paediatric population. In our experience the median operating time is approximately 2.5 hours, there were no intraoperative complications and 1 in 4 patients required a conversion.

Procedure related morbidity was low at 8.3% and the median post operative stay of 3 days is shorter than one would expect post thoracotomy. The associated morbidity of thoracotomy is well documented. Thoracoscopic surgery enables reduced post operative stay, pain and earlier resumption of normal activities.

**P102 MINIMALLY INVASIVE DIAPHRAGMATIC REPAIR: OUR NEW GOLD STANDARD** Miguel Guelfand, MD, Marcela Santos, MD, Pedro-Jose Lopez, MD Exequiel González Cortés Hospital for Children - CHILE

**OBJECTIVE:** To evaluate the results of minimally invasive surgery (MIS) for diaphragmatic defects.

**PATIENTS & METHODS:** Retrospective evaluation of all patients that had diaphragmatic defect repaired by minimally invasive surgery (Laparoscopic or Thoracoscopic).

**RESULTS:** 45 patients with diaphragmatic defect were repaired with minimally invasive surgery either laparoscopic and thoracoscopically between 2004 to 2008. Diaphragmatic defects were: 21 congenital diaphragmatic hernias of the new born (CDH), 19 Morgagni hernias (MH) and 5 diaphragmatic eventrations (DE). CDH age patients ranged between 2 days and 3 years old, and weight between 2,5 to 15 kilos. Mean operative time for minimally invasive repair was 88 minutes. 16/21 CDH were repaired minimally invasive, 13 laparoscopically and 3 thoracoscopically. 5/21 were converted to open surgery; 1 due to lack of abdominal space, 1 due to a lung-hepatic fusion, 1 due to a serosal laceration and 2 due to the size of the diaphragmatic defect. All 19 MH were successfully repaired by laparoscopic approach. MH age ranged between 5 months to 8 years old and weight ranged between 6 to 28 kilos. MH mean operative time was 35 minutes. All 5 eventration patients were repaired by thoracoscopic approach. Age ranged between 2 months and 6 years old and weight between 3,5 to 23 kilos. There were no morbidity or mortality associated to the minimally invasive approach.

**CONCLUSION:** Minimally invasive diaphragmatic repair was effective and safe in this group of patients, avoiding laparotomies and thoracotomies and all the morbidity associated. MIS is now our gold standard for diaphragmatic defects.

**P103 SINGLE INCISION VIDEO ASSISTED THORACIC SURGERY (SIVATS) FOR PARAPNEUMONIC THORACIC EMPYEMA** E. Van Der Veken, MD, E. Van Hoorde, MD, F. Mergan, MD, E. Wijtenburg, MD, P. Van Laer, MD, P. Corouge, MD, F. Otte, MD, J. Papadopoulos, MD, L. Van Obbergh, MD PhD Centre Hospitalier Jolimont-Lobbes, Haine-St-Paul, Belgium

**INTRODUCTION:** In this series of parapneumonic thoracic empyema we emphasize the interest of combining single incision with endobronchial blocker and gasless VATS.

**MATERIALS & METHODS:** A retrospective single center study of 40 consecutive cases between January 2003 and October 2009 was performed. Indication, medical history, preoperative imaging, laboratory findings, operative technique and results were recorded.

**RESULTS:** All 40 patients were admitted at our pediatric intensive care unit (PICU), 31 of them (77%) were transferred from other hospitals. Mean age was 55 months (range 8-90), mean WBC count was 18.300/microliter, mean CRP was 27,5 mg/dl. General anesthesia with endobronchial blocking device (Arndt Pediatric Endobronchial Blocker, Cook® or Fogarty 4F, Edwards Lifesciences®) was used in all except one case. A single incision of 2 cm was made on the mid-axillar line just below the inferior angle of the scapula and gasless VATS was performed. Camera and instruments were introduced directly through the incision (no port). There were no per-operative complications, there was no conversion to thoracotomy. Most patients (38/40) were extubated in the operating room. Mean PICU stay was 7 days (range 4-21). We noticed one recurrence which was treated by redo (SIVATS). Long term results are excellent.

**CONCLUSION:** SIVATS with endobronchial blocker and without carbon dioxide insufflation is a safe and effective method for treatment of parapneumonic empyema. We propose an algorithm for

the management of this pathology based on our experience and on literature review.

**P104 THORACOSCOPIC PERICARDIAL WINDOW AND PLACEMENT OF TUNNELED PLEURAL DRAIN** David Rothstein, MD, Children's Memorial Hospital

A 19 year old male with a terminal, metastatic thoracic peripheral nerve sheath tumor developed a symptomatic pericardial effusion, requiring urgent tube pericardiocentesis. Because of ongoing pericardial drainage, a thorascopic right pericardial window was created for palliation. To manage the expected resulting chronic right pleural effusion, a tunneled silastic pleural drainage catheter was placed at the same time to allow intermittent sterile drainage of the right pleural space. A chronic left-sided hydropneumothorax resulting from a malignant pleural effusion, resistant to talc pleurodesis, had been previously treated by placement of tunneled drainage catheter on the left side.

Thorascopic pericardial window creation has been previously described in adult patients but not in the pediatric population. Similarly, several series have described placement of tunneled catheters for outpatient management of malignant pleural effusions in adults, but not in children.

**P105 MINIMAL ACCESS SURGERY AS PRIMARY APPROACH FOR REPAIR OF THE CONGENITAL DIAPHRAGMATIC DEFECTS** Dragan Kravarusic, Elad Feigin, Lohfa Chirdan, Margarita Martinez, Enrique Freud Schneider Children's Medical Center

**BACKGROUND:** Congenital diaphragmatic defects CDD ( hernias / eventrations) may present with either chronic or acute clinical manifestation. The purpose of this series is to evaluate our experience with the use of MAS for the repair of CDD

**METHODS:** We retrospectively reviewed 18 consecutive children with CDD who underwent MAS repair over the last 4 years. Their ages ranged from 5 days to 6 years. Three were found incidentally at chest x-ray, 10 presented with sudden onset of dyspnea and 5 had history of intermittent vomiting. Chest x-ray was diagnostic in all cases and additional contrast study was performed in 5 cases that presented with obstructive symptoms.

**RESULTS:** At operation 5 were found to have Morgagni hernia , 6 had rolling hiatal hernia, Bochdalek type hernia was found in 3 cases and 4 patients had eventration.

Thirteen underwent laparoscopic repair, one had combine thorascopic/laparoscopic repair and 4 underwent thorascopic plaction for diaphragmatic eventration. Primary repair was done in all but one patient, whose large defect was reinforced with prosthetic mesh. In 3 patients with rolling hiatal hernia, anti-reflux procedure was performed as well.

There were no complications and follow up chest radiograph demonstrated complete resolution in all cases. Median time to full diet was 36 hours, narcotics were given only in first 24 hours and median hospital stay was 3 days.

**CONCLUSIONS:** Primary MAS approach for repair of the CDD is safe, with rapid recovery, superior cosmetic results and satisfactory outcome.

**P106 THORACOSCOPIC DECORTICATION FOR MANAGEMENT OF EMPYEMA IN CHILDREN** R Rai, Y Low, TL Yap, CPC Ong, AS Jacobsen Department of Paediatric Surgery, K K Women's and Children's Hospital, Singapore

**AIM:** Video-assisted thorascopic decortication has been established as an effective treatment option for the management of empyema in children. We present our experience with thorascopic decortication in the management of pleural empyema in children.

**METHODS:** A retrospective review was performed on all the cases of empyema that underwent thorascopic decortication from January 2002 to december 2008. Data collected included demographics, duration of symptoms, radiographic studies, medical management, operative findings and post operative course and the outcome and complications were analyzed.

**RESULTS:** 91 consecutive patients (55 males and 36 females) aged 3 months to 12 years (median 4 years) underwent thorascopic decortication for empyema. The duration of symptoms at presentation was 2 to 30 days (Median 7 days) and the period of in-patient medical management was 2-12 days (median 5 days) before surgery. All patients underwent surgery through 2 or 3 ports. Only 2 patients needed minithoracotomy for completion of decortication and none needed pulmonary resection although lung abscess cavities were deroofted. The operative duration was 38 to 240 minutes (median, 99 mins). There were no operative complications. The chest tubes were removed after a period 2 to 10 days (median, 4 days) from surgery. The duration to reach afebrile status was 1 to 14 days (median, 6 days) and the postoperative hospital stay was 5 to 17 days (median, 9 days). 2 patients had persistent air leak with pneumothorax after removal of chest tubes. Both were managed conservatively with reinsertion of chest tube and long term antibiotics. One patient has wound infection, managed with antibiotics.

**CONCLUSIONS:** Thorascopic decortication is a safe and effective method of treatment for thoracic empyema in children.

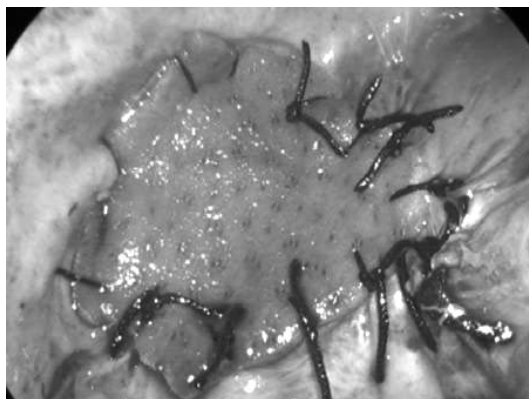
**P107 THORACOSCOPIC REPAIR OF A RECURRENT CONGENITAL DIAPHRAGMATIC HERNIA IN AN INFANT USING XENMATRIX™, A NON-CROSS-LINKED PORCINE DERMAL COLLAGEN MATRIX** Timothy J Fairbanks, MD, Kim G Mendelson, MD PhD, Rajeev Prasad, MD St. Christopher's Hospital for Children, Philadelphia, PA

**INTRODUCTION:** The operative approach to the repair of a recurrent congenital diaphragmatic hernia (CDH) can be challenging. Primary closure of a recurrence may be impossible, and so a prosthetic patch may need to be employed. Furthermore, there are many choices as to what type of patch to use, either synthetic or biologic. We present a case of a recurrent left-sided CDH successfully repaired using XenMatrix™, a useful biologic non-cross-linked acellular porcine dermal collagen matrix graft.

**METHODS:** An 8-month old male with a history of a left-sided CDH repair done at another institution via an open abdominal approach was admitted to our hospital with severe respiratory syncytial virus pneumonia. Of note is that his initial CDH repair was complicated by necrotizing enterocolitis (NEC) requiring an abdominal re-exploration and bowel resection. A CXR done after admission to our hospital demonstrated a recurrent CDH. Subsequently, a CT scan confirmed intestine and the left kidney to be in the left hemithorax. After an appropriate period of medical management to optimize his respiratory status, the patient was taken to the operating room for a thorascopic repair of his recurrent left-sided CDH using a XenMatrix™ patch.

**RESULTS:** Using a thorascopic approach adhesions were lysed and the intestine and left kidney were reduced through the defect. A XenMatrix™ graft was used to bridge the defect as a primary closure was impossible. The XenMatrix™, which does not require rehydration

and has no sidedness, was easy to manipulate and suture into place without worry regarding the adjacent viscera. The operation itself was uncomplicated, and thus far after a six-month period of follow-up, the patient remains asymptomatic without evidence of recurrence, either clinically or by chest radiograph.



**CONCLUSION:** The thoracoscopic approach to CDH repair has several advantages including smaller incisions, less postoperative pain, improved respiratory function, and better cosmesis. In this case of a recurrent left-sided CDH in a patient with a prior abdominal repair complicated by severe NEC requiring a bowel resection, the thoracoscopic approach allowed us to avoid an extensive abdominal exploration and lysis of adhesions. Our other concern was the selection of an appropriate patch. We preferred to avoid a synthetic patch as we expected to have to lyse adhesions and mobilize previously inflamed intestine. Some commercially available biologic patches are difficult to use as they are somewhat rigid, even after rehydration. Also, that these patches have sidedness poses a distinct problem with CDH repair as vital structures lie on both sides of the repair. XenMatrix™ is an acellular structurally intact porcine non-cross-linked dermal collagen matrix. This dermal matrix has been shown to induce revascularization and tissue remodeling and regeneration by two weeks. The burst strength of the material also may be superior to other porcine grafts. XenMatrix™ appears to have been an ideal choice for the closure of this recurrent left CDH in our complex patient. We believe that XenMatrix™ should be considered as an option for the repair of CDH when a patch is being considered.

**P108 THORACOSCOPIC RESECTION OF A CYSTIC THYMOMA IN A PEDIATRIC PATIENT** Shawn Larson, MD, [Bradley J Segura, MD](#), St. Louis Children's Hospital

**INTRODUCTION:** A 10 year old girl with dyspnea and a family history of hypertrophic cardiomyopathy underwent an echocardiogram and cine MRI which revealed a large anterior mediastinal mass, predominantly on the right side. Further characterization with chest CT suggested a cystic teratoma. Serologies including  $\beta$ -HCG, LDH, AFP, and a complete blood cell profile were unremarkable. The patient was scheduled for thoracoscopic evaluation with possible resection if amenable.

**METHODS:** After selective ventilation was obtained, the procedure was performed with four 5-mm STEP interchangeable working ports and a 5 mm 30° camera to maximize exposure through the posterolateral right chest using a combination of sharp and blunt dissection and a ligasure device. A large, primarily cystic, mass was removed in conjunction with the surrounding normal-appearing thymus gland, taking caution to avoid injury to adjacent neurovascular structures. Given concern for possible malignancy, the lesion was removed through an endocatch bag without violating its capsule via a port site enlarged several centimeters. Local

anesthetic and an intercostal block were administered to encompass the wounds (T3-T8) and a 20 Fr chest tube was left in an anterior port site at the completion of the operation. Wounds were closed with absorbable suture and dressed with Dermabond. The child was admitted for further observation to the general care pediatric ward in good health.

**RESULTS:** The patient tolerated the procedure well and recovered quickly. Her chest tube was removed on post-operative day #1 and she was discharged home the following day. Her pathology returned as a rare cystic thymoma (WHO type B1), with no microscopic infiltration of the capsule (T1/N0/M0). Thus far, she has been seen in follow-up at 2 weeks and is healing nicely. She will undergo follow-up chest imaging with CT in 3 months to determine whether contralateral exploration or other intervention are warranted for potential residual thymus or other evidence of left-sided disease.

**CONCLUSION:** Large mediastinal lesions are amenable to thoracoscopic resection if anatomy is favorable. Caution and adherence to oncologic principles are imperative for all lesions given the possibility of malignancy. Further follow-up is necessary, particularly in the event of rare lesions such as thymomas, for which there is little pediatric data.

**P109 POUCH NEUMOVESICOSCOPIC IS FEASIBLE** [Sonia I Guzman-Martinez, MD](#), Alfonso Galvan-Montañó, MD, Sergio Landa-Juarez, MD, Alfredo Martinez-Hernandez, MD, Carlos Garcia-Hernandez, MD, Lourdes Carvajal-Figueroa, MD, Jonathan Figueroa, MD, Itze Aguirre, MD, Cesar Jasso, MD, Hospital General "Dr. Manuel Gea Gonzalez" Mexico City- [drasoniaguzman@hotmail.com](mailto:drasoniaguzman@hotmail.com)

**BACKGROUND:** Urolithiasis is a frequent complication of augmentation cystoplasty, many factors influence the incidence of stone formation like urinary stasis, abnormal pH, bacteriuria, mucus production etc.

The cystoplasty reservoirs were frequent procedures made in neurogenic bladder.

**OBJETIVES:** Show an option to approach pouch reservoir when the bladder neck is closed.

**METHODS:** An 15 year old boy . The patient had history of previous spina bifida. She was underwent to augmentation ileocystoplasty, bladder neck closure, mitrofanoff principle, five pouch lithotomy and complained of abdominal pain located in the lower abdomen, fever, vomit, gastric bleeding. Abdominal ultrasound showed multiple lithos into reservoir. Endoscopy proved hiatal hernia, esophagitis severe. The Gastrointestinal contrast study demonstrated gastroesophageal reflux.

**CASE:** The informed consent was obtained. Under general anesthesia, we introduced a 8fr catheter into mitrofanoff, and became filled the pouch with 0.9% saline solution slowly raised to a higher level was necessary. The 5mm first port was introduced in the middle line lower abdomen (hypogastrium) and replaced the saline solution by CO2 gas. The other two 5mm port were lateral above the reservoir. The Pouch pneumovesicoscopic was made to extract the lithos. On the average the CO2 was 26 mmHg. It was gauged each 10 minutes. The Fundoplication could not be performed by the adhesions due to previous surgery and finally the laparoscopic procedure was converted to open surgery.

**DISCUSSION:** Patient with multiple abdominal surgeries for lithiasis and in those that it is not possible approach by urethral due to bladder neck closure, patient with meningocele sequel, who had hyperflexion position and it is not possible shock-wave lithotripsy, neither percutaneous suprapubic approach for a hard, big or multiples calculi ; it is a good therapeutic option, little invasive, and that it doesn't increase the morbidity and it can be highly resolutive.

## **P110 INSTRUMENTAL BREAKAGE AS AN IMPORTANT COMPLICATION IN LAPAROSCOPIC SURGERY**

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**BACKGROUND:** Breakage of instruments during surgery is an important complication of laparoscopic procedures. Excessive burden on flexible parts of instruments may lead to breakage, and the broken parts may be dispersed in the abdominal cavity. Herein, we report 2 cases of intraprocedural instrument breakage and discuss the necessity of improving instrumental qualities so as to prevent such complications.

**CASE 1:** A small axis that supports the tips of the 3-mm grasper was broken and doubled during laparoscopic Nissen fundoplication. The fragments were scattered and lodged in the omentum and were located by fluoroscopy. With a skilled manipulation of laparoscopy as well as the aid of fluoroscopy and various endoscopic instruments, they could be removed from the abdomen, and conversion to laparotomy was avoided.

**CASE2:** A 5-mm Kelly dissector was broken during laparoscopic excision of the cystic urachal remnant. The broken part was the head of the shaft supporting the axis. The fragments were not scattered in the abdominal cavity, and were found inside the shaft and on the floor of the operating room.

**CONCLUSION:** Repeated sterilization with autoclave reduces the working life of reusable instruments. Once broken during laparoscopic surgery, the fragment of the instruments must be found and compulsorily removed using all possible procedures, including fluoroscopy, and even laparotomy, if necessary. However, such maneuvers will prolong the operating period. On the basis of our experience with the presented cases, we emphasize the importance of careful inspection and maintenance of fine instruments used in laparoscopic surgery. On the other hand, the product providers should seek the quality improvements of the instruments.

## **P111 DOES LAPAROSCOPY CONSTITUTE AN ADDITIONAL RISK FOR CHILDREN WITH A VENTRICULOPERITONEAL SHUNT?**

Michael Kohl, MD, Salmai Turial, MD, Wolfgang Wagner, Professor, Felix Schier, Professor Department of Pediatric Surgery and Section of Pediatric Neurosurgery, Department of Neurosurgery, University Hospitals, University Medical Center, Mainz, Germany

**PURPOSE:** To study whether a VP-shunt constitutes an additional risk for children undergoing a laparoscopic procedure.

**METHOD:** Retrospective analysis of the patient charts of children with VP-shunt who received a laparoscopic operation between Jan 2004 and Oct 2009.

**RESULTS:** 48 laparoscopic operations were performed in 46 children with a VP-shunt (21 f, 25 m). Age range was from 31 days to 27 years (median age 4.48 years). 12 children were younger than 1 year and 5 patients older than 16 years. In 15 cases microlaparoscopic techniques have been applied (exclusive use of 2 mm instruments and miniscopes with a diameter of 1.9 or 2.4 mm). 35 surgeries were conducted for abdominal causes (16 inguinal hernias, 3 adhesiolyses, 5 laparoscopic assisted gastrostoma placements, 2 funduplications, 1 chole-cystec-tomy, 1 laparoscopically assisted rectopexy, 2 diagnostic laparoscopies in neurologically impaired children, 2 appendectomies, 1 aspiration of ascites). In 13 cases shunt problems led to laparoscopy

(7 removals of the abdominal catheter of the VP-shunt, 5 inspections under the suspicion of shunt malfunction with subsequent shortening of the catheter and 3 new placements of the abdominal catheter of the VP-shunt were performed). Six operations were converted to an open approach. 4 times due to extensive adhesions, one because of a dilated colon disrupting the view during a laparoscopically assisted gastrostoma placement and one due to anaesthesiological problems. There have been no shunt-related complications intra- or postoperatively. During one adhesiolysis a perforation of the jejunum occurred and was repaired laparoscopically without further morbidity. In one of the laparoscopically assisted gastrostomies a minor skin wound infection occurred postoperatively and was treated conservatively.

**CONCLUSION:** A preexisting VP-shunt does not constitute an additional risk factor in patients undergoing laparoscopy. The laparoscopic technique offers an excellent option to assess location, condition and function of the abdominal segment of the shunt and to repair it if required. The abdominal catheter can be placed, replaced or removed easily; thus greatly reducing the trauma for implantation or explantation, particularly if microlaparoscopic techniques are used. The superior visibility offers an excellent way to diagnose and treat complications of the shunt like adhesions or inguinal hernias.

## **P112 TWO PORT LAPAROSCOPIC PLACEMENT OF PERITONEAL DIALYSIS CATHETER WITH AN EASY TECHNIQUE OF ABDOMINAL WALL FIXATION**

Ufuk Ates, MD, Esra Temeltas, MD, Berkutug Bahadir, MD, Huseyin Dindar, MD, Meltem Bingol-Kologlu, MD Ankara University, Faculty of Medicine, Department of Pediatric Surgery

**INTRODUCTION:** Continuous ambulatory peritoneal dialysis (CAPD) is a well established modality for treating children with end-stage renal disease. Catheter insertion is accomplished through various methods including open surgical technique and laparoscopic or fluoroscopic guidance. The laparoscopic technique offers the major advantage of direct vision aiding placement of the catheter in the proper place. However catheter malfunction due to catheter tip migration is still an important complication of the procedure. We used a different laparoscopic technique with placement of two ports and lower abdominal wall fixation to overcome the common problem of migration of the catheter.

**SURGICAL TECHNIQUE:** Following insertion of a 5 mm umbilical port, an other 5mm port was placed through a second incision in the left lower quadrant. First omentum is brought to the umbilical port and partial omentectomy was performed. Then, a 2/0 nylon loop was prepared by passing tips of nylon suture through a sharp end of 20 g needle and the needle was inserted into the abdominal cavity in the suprapubic region, then the nylon loop was advanced through the needle. PDC with a guide was passed into the abdominal cavity through the umbilical 5 mm port side and through the nylon loop. The catheter was directed into the pouch of Douglas in females and the rectovesical pouch in male. Than the guide wire of the catheter was removed and the catheter was secured to the lower abdominal wall by tying the free ends of the nylon loop. The external end of the catheter was brought out through the lateral 5 mm port side by subcutaneous tunneling.

**CONCLUSION:** This is a minimal invasive and feasible technique which allows placement of the peritoneal dialysis catheter under direct vision and fixation of the catheter only with a puncture. By using this technique, complication rate can be decreased and catheter survival can be prolonged.

**P113 STAB-INCISION LAPAROSCOPIC PYELOPLASTY: A SINGLE INSTITUTION EXPERIENCE** Goutham Vemana, MD, Paul H Noh, MD Cincinnati Children's Hospital Medical Center

**PURPOSE:** This review evaluated an innovative method of performing laparoscopy that did not utilize trocars to facilitate the passage of working instruments for the purpose minimizing morbidity and improving cosmesis.

**MATERIALS & METHODS:** A retrospective chart review was performed for all stab-incision laparoscopic transperitoneal pyeloplasty procedures from May 2008 to August 2009. The following factors were considered: operative time, blood loss, post-operative analgesic requirements (normalized to intravenous morphine equivalent), length of hospitalization, complications, need for readmission, and subsequent procedures. All patients undergoing this procedure had a single trocar placed for use of the camera. Two stab incisions were utilized to introduce 3 mm instrumentation.

**RESULTS:** A total of 8 procedures were performed and successfully completed during the study period. The age of the patients ranged between 3 months and 15 years old. The median age was 10 months old. Period of follow up ranged from 2 months to 17 months. There were no open conversions from the use of the stab-incision access. Blood loss in all cases was negligible. Median operative time for the laparoscopic portion of the procedure was 228.5 minutes. The median hospital stay was 1.5 days. Average use of parenteral narcotics was 0.2 mg/kg and for oral narcotics was 0.16 mg/kg for the entire hospital stay. One patient was readmitted approximately one month after the pyeloplasty for a urinary tract infection while the ureteral stent was present but did not have any further infections once the stent was removed. Complications consisted of one patient with an iatrogenic ureteropelvic junction stricture requiring a Cohen ureteral reimplantation and another patient with proximal stent migration requiring percutaneous removal. Follow up renal ultrasound evaluation has demonstrated stable or improved hydronephrosis in all patients. There has been no recurrence of pain for symptomatic obstruction.

**CONCLUSIONS:** Short-term review of this innovative method of performing laparoscopic pyeloplasty indicates encouraging results without compromise of the surgical procedure, minimal use of narcotics, and succinct hospital stay.

**P114 PRETRANSPLANT LAPAROSCOPIC NEPHRECTOMIES IN PEDIATRIC PATIENTS** Brent J. Goslin, MD, James M. DeCou, MD, Daniel J. Robertson, MD, Timothy E. Bunchman, MD, Helen DeVos Children's Hospital, Grand Rapids, Michigan

**INTRODUCTION:** Pediatric renal transplant patients with high output renal failure, nephrotic syndrome, and other conditions may require native nephrectomy to avoid complications at the time of kidney transplantation. We have performed unilateral and bilateral pretransplant laparoscopic nephrectomies (PLN) in selected patients, followed by living-related renal transplantation approximately one month later.

**METHODS:** We retrospectively reviewed our experience with unilateral and bilateral PLN performed by two pediatric surgeons at one institution. A transperitoneal approach was employed in all patients, using four midline ports for bilateral PLN and three or four ports for unilateral cases. Hemodialysis (HD) catheters were placed in all cases. Patient demographics, disease information, and operative and postoperative data were analyzed.

**RESULTS:** Eight patients underwent PLN between May, 2006 and April, 2009. Five cases were bilateral. Four patients were female. The average age was 91 months (range 9 - 199 months). Indications for bilateral nephrectomy included congenital nephrotic syndrome (two patients), high output renal failure, vesicoureteral reflux with recurrent pyelonephritis, and cystinosis. Indications for unilateral nephrectomy included dysplastic kidney disease, non-functional pelvic kidney, and renal failure secondary to posterior urethral valves. Average operating times, including HD catheter placement and other procedures, were 4.93 hours (range 4.25 - 5.97) for bilateral PLN, and 3.93 hours (range 2.57 - 5.48) for unilateral. Average intraoperative blood loss was 53 milliliters. The average hospital stay was 5.9 days. One patient required transfusion due to a HD catheter complication. No other complications occurred related to PLN, HD, or transplantation. All patients underwent successful renal transplantation an average of 33 +/- 4 days following PLN. Allograft survival is 100% with no rejection at an average 2.3 years follow-up.

**Conclusions:** PLN appears to be an effective, safe method of removing potentially problematic diseased kidneys prior to planned renal transplantation. The one month period of HD allows for correction of fluid shifts and protein loss prior to transplantation. For bilateral PLN, the transperitoneal technique using four midline ports affords excellent access to both kidneys.

**P115 RETROPERITONEOSCOPIC HEMINEPHRECTOMY: DIFFERENT APPROACH, SAME RESULTS; THE NEW GOLD STANDARD?** Renato Gana, MD, Pedro-Jose Lopez, MD, Danielle Reyes, MD, Guillermo Concha, MD, Francisco J Reed, MD, Nelly Letelier, MD, Ricardo Zubieta HOSPITAL EXEQUIEL GONZALEZ CORTES

**OBJECTIVE:** Laparoscopic procedures in urological surgery have been successful with children and have shown low morbidity and quick recovery. The heminephrectomy & heminephroureterectomy is evaluated with the retroperitoneal laparoscopic technique in patients who were operated on in three medical centers.

**METHODS:** The histories between January 2002 and June 2009 of all patients were checked retrospectively in accordance with protocol. The age at the time of the surgery, gender, indication of heminephrectomy, function and characteristics of the renal moiety, surgery time, surgical technique, number of in-hospital days and complications were registered.

**RESULTS:** During the 7 years of the study there were 19 patients, 8 boys and 11 girls and 21 renal moieties were involved. The average age of the children was 12 months (the youngest was 2 months old and the oldest 9 years old). The main diagnostics associated with the double system were ureterocele in 7 cases, ectopic ureter in 2 cases and massive ureteral bladder reflux to the lower system in 6 cases and 4 patients had other pathologies. In 8 cases there had been antenatal diagnoses. The function of the renal moieties measured by scintigram in all 19 patients was no more than 10% of the total renal function of the patient. 15 upper 6 lower heminephrectomies were carried out; 7 out of 21 were complete heminephroureterectomy. The technique used was one of three 5 mm ports in triangulation; the first one was inserted blindly in the costo-lumbar angle. After creating the retroperitoneum space with the camera, as no balloon was used, the other ports were located in the iliac crest line and in the flank. On average the procedure last 151 minutes (minimum 75 and maximum 210 minutes). In 6 cases drainage was left. These corresponded to the first procedures of the series. The hospital stay fluctuated between 1 and 7 days with an average of 3 days. One case evolved

with a secondary urinoma due to filtration of the distal stump, which was managed with bladder drainage. There was one conversion in the series due to bleeding. After an average follow-up of 13 months (r 1 to 48 months) from both clinical and ultrasonographic point of view there are no major complications.

**CONCLUSIONS:** The retroperitoneoscopic approach has proved to be a good approach for heminephrectomy and heminephroureterectomy as it is a safe, reproducible technique with a minimum morbidity, better cosmetics and short hospital stay. The heminephrectomy and heminephroureterectomy by retroperitoneoscopy may be carried out for benign diseases in children, taking care of complete ureteral resection in presence of VUR. With advanced laparoscopic training, this technique might be the gold standard for heminephrectomy or heminephroureterectomy in infants and children.

**P116 URINARY BLADDER AGENESIS AND LAPAROSCOPIC URETEROCUTANEOSTOMY** Baran Tokar, MD, Ozgur Aktas, MD Eskisehir Osmangazi University, School of Medicine, Department of Pediatric Surgery, Eskisehir, Turkey

Urinary bladder agenesis is a very rare pathology. It has high morbidity and mortality rate. There are approximately 45 cases up to date. Urogenital and gastrointestinal system pathologies are frequently associated. Case presentation: Two months old female patient having anterior ectopic anus was referred us. Physical examination showed anterior ectopic anus and urogenital sinus abnormality with a very narrow orifice having passage of a 3 Fr catheter. Left renal agenesis was determined by abdominal ultrasound and scintigraphy. A pouch colon was found with a contrast study. Urogenital sinus was a continuation of the right ureter. Urinary bladder was not present. Laparoscopic exploration showed left renal agenesis, bladder agenesis, rudimentary uterus and ovaries on the right iliac fossa and sigmoid colonic pouch. Colostomy was performed and then anal transposition was done. Laparoscopic ureterocutaneostomy was performed at one-year-old age. The next step in her future management will be a urinary reservoir formation with a detubularized sigmoid colonic segment and Mitrofanoff procedure. This study presents a diagnostic laparoscopy specific to this case and laparoscopic ureterocutaneostomy. Conclusion: In congenital urogenital pathologies, if physical examination and radiological evaluation can not give enough data, laparoscopy may help in diagnosis. In cases who need ureterocutaneostomy, laparoscopic approach is an easily applicable and could be preferred.

**P117 LAPAROSCOPIC TWO STAGE FOWLER-STEPHENS ORCHIDOPEXY: OUTCOMES IN A SINGLE CENTRE 2000-2008** Roland W. Partridge, Atul J. Sabharwal, Department of Paediatric Surgery, Royal Hospital for Sick Children, Yorkhill, Glasgow. UK.

**AIMS:** To audit the percentage of patients undergoing laparoscopic two-stage orchidopexy who have a normal sized testis in the scrotum at follow-up after the final procedure.

**METHODS:** A retrospective case-note review of patients identified on the operating department database as having first and second-stage laparoscopic procedures between 2000-2008.

**RESULTS:** 35 intra-abdominal testes (13 left, 14 right, 4 bilateral) were identified in 31 patients. Four consultants undertook a total of 62 procedures. Mean age at presentation was 27 months (5-91).

Mean age at first stage was 37 months (10-99). The site of the testis was described as "intra-abdominal" in 19, "at the deep ring" in 13 and "peeping" in 3. Testis size was "good" in 16, "small" in 3, and

not recorded in 16. 33 pairs of vessels were clipped and the harmonic scalpel used on 2. The primary operator was a Consultant in 17 and Registrar in 14 cases. 10% (3/31) were discharged the same day, 87% (27/31) were discharged on the first postoperative day and 1 patient stayed for 2 days because of ooze from his umbilical wound. The mean interval between first and second stages was 10 months (5-24).

At the second stage, two testes had atrophied completely and the remnants excised. A combined laparoscopic and scrotal approach was used in all but three cases, in which a further groin incision was made to assist testicular descent. Primary operator ratio at the second stage was Consultant 21: Registrar 10. After the second stage 13% (4/31) were discharged home on the day of surgery, 80% (25/31) were discharged on the first postoperative day, 1 patient stayed 2 days because of oozing at a port site, and one patient stayed for 3 days because of postoperative nausea and vomiting. Complications consisted of two superficial scrotal wound infections, which responded to oral antibiotics; and one patient who returned to theatre with persistent ooze from the umbilical port site. In theatre no bleeding point was found and the wound re-closed.

Follow-up was at a mean of 5 months (2-12). One testis had undergone complete atrophy, while all others were described as "scrotal" and of "satisfactory" or "good" volume. The overall testicular survival rate was therefore 92% (32/35).

**CONCLUSION:** The testicular survival rate in this series is comparable with other published data, and supports the use of two-stage laparoscopic orchidopexy as a safe and effective means of dealing with an intra-abdominal testis.

**P118 ROBOTIC URETERAL REIMPLANTATION: AN INITIAL EXPERIENCE** Christina Kim, MD, David Chalmers, MD, Katherine Herbst, PhD Connecticut Children's Medical Center

**ABSTRACT:** Vesicoureteral reflux is a challenging disorder. The choice of management ranges from observation, endoscopic injection, open ureteral reimplantation, and minimally invasive ureteral reimplantation.

Using the same principles of open surgery, robotic surgery works to elongate the detrusor tunnel for the affected ureter. Some concerns with a minimally invasive approach include its efficacy, its complication rates, and recovery for the patients. Since open ureteral surgery has success rates greater than 90%, the standard for minimally invasive surgery is high.

**MATERIAL & METHODS:** We present our initial experience with robotic extravesical ureteral reimplantation. A retrospective review of patients from January 2005 until July 2009 was performed. 13 patients had this repair performed by one surgeon at our institution. We assessed operative times, hospital stays, and postoperative results.

**RESULTS:** Mean age at surgery was 75 months. All patients were female. Four patients had prior Deflux injections. The primary indication for surgery was febrile urinary tract infections (77%). The grade of reflux ranged from 2 to 4. The majority of patients had grade 3 reflux (62%). 5 patients had bilateral reimplantations (38%). Mean time for robotic manipulation was 127 minutes for a unilateral repair and 181 minutes for a bilateral repair. There were no intraoperative complications. Follow up VCUG was ordered on all patients. One patient was lost to follow up. 10 patients had resolution of reflux on the side treated (83%). 2 patients had downgrading of their reflux but not complete resolution (16%). One patient did develop contralateral vesicoureteral reflux.

**CONCLUSION:** Robotic ureteral reimplantation is a new surgical approach to an old problem. The principles of the repair are the same as the open approach. As with all minimally invasive surgery, the goal is to provide alternative therapies with fast recovery, favorable cosmesis, and high success rates. Although the initial results are encouraging, our sample size is small. When looking at anti-reflux ureteral surgery, we need to prospectively analyze the results of open, endoscopic, laparoscopic and robotic techniques.

#### **P119 MANUAL INJECTABLE TREATMENT FOR HIGH GRADES REFLUX WITH A PERMANENT BULKING SUBSTANCE**

Roberto Vagni, MD, Edurne Ormaechea, MD, Ricardo Soria, MD, Andres Villegas, MD, Juan Moldes, MD, Eduardo Ruiz, MD, Francisco Debadiola, MD Hospital Italiano de Buenos Aires

**OBJECTIVE:** To evaluate the results of the endoscopic treatment of high grade vesicoureteral reflux HGVUR (IV - V) in children through a subureteral injection of polyacrylate polyalcohol copolymer (Vantris®).

**MATERIALS & METHODS:** Prospective review of 33 pediatric patients with HGVUR treated with a subureteric injection of Vantris®. Eighteen male and 15 female were injected, the median age was 36 month (7-180). VUR were demonstrated on video-urodynamic studies. Exclusion criteria included anatomic alterations, infravesical obstruction, prior surgical or endoscopic procedures, signs of obstruction and neurogenic bladder. Pre studies included: Urinalysis, renal and bladder ultrasound, DMSA, and voiding cystovideourography. The endoscopic procedure was performed under general anesthesia with a 10 Fr cystoscope.

The number of ureters injected was 36 (20 right and 10 left units, 3 bilateral). Six renal units (RU) were grade V (16,6%) and 30 grade IV (83,3%). Post-operative studies included: ultrasound 10 days after and every 3 months, renal scintigraphy and voiding cystourethrography at 1 year.

**RESULTS:** Reflux grade IV was eliminated in 86,66%, and 100% reflux grade V. Complications included urinary infection in 7 patients (21%); myunctional dysfunction in 5 patients (15%) all had an early spontaneous resolution. Ureteral dilatation (more than 5 mm) within 3 months was seen in 10 (27%). Four of this persisted after 3 month, and require a double J catheter for 4 months. Two resolve and 2 receive an open ureteral reimplantation. If we consider the 2 RU who require reimplantations the final success of the endoscopic treatment with Vantris® reach 83,33% (30 of 36), with one procedure injection.

**CONCLUSION:** Vantris® intra ureteral injection is effective in eliminating high grade VUR. Vantris® is our first line treatment to eliminate high grades VUR.

#### **P120 ONE TROCAR ASSISTED PYELOPLASTY: OUR EXPERIENCE**

Maria Grazia Scuderi, MD, Salvatore Arena, MD, Vincenzo Di Benedetto, MD Pediatric Surgery department -- "Policlinico-Vittorio Emanuele" Hospital, Catania University- Italy.

**PURPOSE:** One trocar assisted pyeloplasty (OTAP) is a new minimally invasive technique for treatment of ureteropelvic junction obstruction (UJO). The first step of this procedure is to identify the pyeloureteral junction through a retroperitoneal laparoscopic approach using one trocar, while the pelvic-ureteric anastomosis is carried out in "open" surgery. We present our experience with OTAP, an innovative technique in paediatric surgery.

**MATERIAL & METHODS:** From October 2005 to July 2009, 31 paediatric patients with pyeloureteral junction underwent OTAP (22 boys and 9 girls). The age of these patients ranged from 1,5 month to

18 years, (mean age 5,3 years). The OTAP carried out were 33 because in 2 patients the UJO was bilateral. Despite the age difference, the technique was carried out according to the same procedure: patient laid in a flank position, the pyeloureteral junction was identified by laparoscopic retroperitoneal approach. Dissection is accomplished by a single instrument, inserted through the operative telescope, generally this is a endo peanut ( 5 mm) that can be alternated to endo dissect or endo shear with unipolar cautery. The UPJ exposition is obtained by identifying the proximal ureter in the retroperitoneum. The UPJ is exteriorized by a vessel-loop through the trocar and a dismembered pyeloplasty is performed in traditional surgery.

**RESULTS:** All patients successfully underwent OTAP. An aberrant crossing vessel was found in 5 patients, in 1 patient we found an ureteral valve and in 1 patient had UJO of the lower moiety. The mean operative time was 78 min (range 65-90 min) and the mean hospital stay 2,5 (2-4) days. All children returned to full activities within 7 days of surgery. The mean follow-up is 24 months (range 1- 44 months) and all patients were asymptomatic.

**CONCLUSION:** Video-assisted pyeloplasty has been of great interest since it was first presented. This technique allows to combine the advantages of laparoscopic methods with those of traditional surgery. Our medium-term results confirm that the OTAP is a innovative technique, that allow a safe approach to children and, moreover, is applicable to the entire range of ages. However, a good practical experience of surgeon is required.

#### **P121 LAPAROSCOPIC ASSISTED PYELOPLASTY IN CHILDREN**

Mustafa Kucukaydin, Prof., Mustafa Erman Dorterler, MD, Kadri Cemil Sulubulut, MD, Ali Aslan, MD, Ahmet Burak Dogan, MD, Serkan Arslan, MD, Ozlem Yandim, MD Department of Pediatric Surgery, Erciyes University, School of Medicine Kayseri /Turkey

**AIM:** To present the results of an innovative minimally invasive technique of performing dismembered pyeloplasty in children.

**MATERIAL & Methods:** Between December 2008 and July 2009, 16 children underwent laparoscopic assisted dismembered pyeloplasty. The children (11 male, 5 female) were in the age range of 25 days to 12 years—3 were right sided and 12 were left sided and one in bilateral. Only 6 patients were symptomatic, whereas the remaining 10 were detected to have UPJ obstruction during evaluation for antenatally. Using a 3/ 5 mm camera and 3/5 mm working ports, the ureteropelvic junction (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 duration was 80 minutes (range, 60–100 minutes). Incision was smaller than 2 cm in all, and the average postoperative hospital stay was 4, 4 days (range, 3-6 days). Follow-up ranging from 3 to 8 months showed reduction in hydronephrosis and improvement in renal function of all the operated units.

**CONCLUSION:** It is our impression that this technique has results comparable with that of open pyeloplasty and, hence, may be considered a good option for surgeons making the transition to laparoscopic pyeloplasty. It is especially recommended in small babies where laparoscopic pyeloplasty is difficult.

# Additional Information

## IPEG SOCIAL ACTIVITIES

**Wednesday, June 9, 2010**  
**IPEG Welcome Reception**

ATTIRE: Resort Casual

**5:00 pm – 7:00 pm**  
*Exhibit Hall/Kohala Ballroom*

**Friday, June 11, 2010**  
**IPEG Luau**

ATTIRE: Resort Casual

**7:00 pm – 11:00 pm**  
*Hilton Waikoloa/Lagoon Lanai*

TICKETS FOR ADDITIONAL GUEST: \$120

Join IPEG for a night of food, drinks, music and dancing! Kick off the night by watching the sunset. The Lagoon Lanai overlooks the 4-acre of salt-water lagoon and the waterfall.



## TOURS/ACTIVITIES

**A great way to give back to your Surgical Society, while enjoying an adventure in the Big Island!** When you book your Tour or Activity through Destinations in Paradise, Destinations in Paradise will donate a portion of the proceeds back to IPEG. Proceed will go towards the IPEG Long-Term Research Fund.

Representatives will be on site to book your tours, activities, transportation, etc:

<b>Wednesday, June 9</b>	1:00 pm – 6:00 pm
<b>Thursday, June 10</b>	7:00 am – 5:00 pm
<b>Friday, June 11</b>	7:00 am – 5:00 pm

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The official IPEG tour/activities service provider.

PHONE: **808.883.8587** FAX: **808.883.0766**


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Below are some activities provided by Destinations in Paradise. Staff will be on-site to for inquires and reservation including airport transportation inquiries.


 = TRANSPORTATION INCLUDED


**ATV Rides:** Ride your own All-Terrain Vehicle (ATV) on the Kohala Mountainside, Waipio Valley or Parker Ranch. Enjoy lush green country rich in tropical beauty. (2-3 hrs.)

**Catamaran Sails** (Snorkel, Diving, or Sunset): Experience a wonderful Catamaran adventure viewing a myriad endemic and introduced colorful tropical fish and gorgeous coastal views. Snorkel Sail includes gear, picnic lunch, and bar. Sunset Sails include pupus and open bar. (2-4 hrs.) 

**Circle Island Tour:** Visit coffee plantations, macadamia nut orchards, orchid and anthurium nurseries, waterfalls, black sand beaches. Volcano National Park, Lava Tube, steam vents, sulfur banks, and Halemaumau Fire Pits. (10-11 hrs.) 


**Cycle Adventure:** Cycling begins in Waimea Village and ends at the Waipio Valley Lookout. Experience "old Hawaii" while cruising tropical landscapes and rolling green pastures. (5 hrs. total, 15 easy miles) 

**Helicopter Full & Partial Island Volcano Tours:** Experience Madame Pele's lava and volcanic badlands, explore lush rain-forests, Hamakua Coast, immense tropical valleys with cascading waterfalls, the ultimate Big Island adventure. (1½-2 hrs.) 

**Hike:** Kohala Waterfalls Adventure or Waipio Valley Rim Immerse yourself in Hawaiian countryside, old Hawaii and extraordinary natural beauty. Cross-streams, discover waterfalls and traverse bridges while exploring the famous Kohala or Hamakua Ditch trail. Easy walk, cool mountain, and stream swim. 

**Horseback Riding:** Take a leisurely ride on horseback, with awesome Big Island views.

**Kayak & Snorkel:** Enjoy a mile or two of paddling and some snorkeling along the beautiful Kohala Coast. (2 hrs.)

**Pintrek:** A rugged off-road journey to a secret, cool mountain world on Hualalai Volcano. Tour landscapes of forest, lava flows, and enormous craters. 

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June 8-12, 2010



Name: \_\_\_\_\_

TIME	ACTIVITY	CREDITS AVAILABLE	HOURS ATTENDED
<b>Tuesday, June 8, 2010</b>			
12:00 pm – 6:00 pm	<b>ADVANCE ENDOSCOPIC COURSE: Lecture</b>	5.5	
<b>Wednesday, June 9, 2010</b>			
7:00 am – 11:00 am	<b>ADVANCE ENDOSCOPIC COURSE: Lab</b>	2.5	
<b>Thursday, June 10, 2010</b>			
7:00 am – 7:45 am	<b>SCIENTIFIC SESSION: Gastrointestinal &amp; Hepatobiliary – Part I</b>	.75	
7:45 am – 8:45 am	<b>PANEL: “The Great Gonad Debate”</b>	1.0	
8:45 am – 9:00 am	<b>Welcome Address</b>	0	
9:00 am – 10:00 am	<b>SCIENTIFIC SESSION: Basic Science</b>	1.0	
10:30 am – 11:30 am	<b>SCIENTIFIC SESSION: Coolest Tricks</b>	1.0	
11:30 am – 12:00 pm	<b>IPEG Presidential Address &amp; Lecture: Why IPEG?</b>	0.5	
1:00 pm – 2:15 pm	<b>SCIENTIFIC SESSION: Thorax</b>	1.25	
2:15 pm – 3:00 pm	<b>KARL STORZ LECTURE: NOTES® – The Next or the Past Evolution?</b>	0.75	
3:30 pm – 5:00 pm	<b>PANEL: MIS vs. Open – Controversies in Minimally Invasive Surgery</b>	1.5	
5:00 pm – 6:30 pm	<b>SCIENTIFIC SESSION: Top 20 Posters</b>	1	
	<i>Total Credits Available For Thursday</i>	8.75	
<b>Friday, June 11, 2010</b>			
7:00 am – 8:00 am	<b>MORNING VIDEO SESSION: Colorectal &amp; Unexpected Findings</b>	1.0	
8:00 am – 9:30 am	<b>SCIENTIFIC SESSION: Gastrointestinal &amp; Hepatobiliary – Part II</b>	1.5	
9:30 am – 10:00 am	<b>KEYNOTE LECTURE: “The Toll of Turning Impossible Dreams to Tangible Realities”</b>	0.5	
10:30 am – 11:30 am	<b>SCIENTIFIC SESSION: Alternative Technologies</b>	1.0	
11:30 am – 12:30 pm	<b>Poster Tours</b>	1.0	
1:00 pm – 3:00 pm	<b>PANEL: Re-Do MIS Surgery – Why &amp; How?</b>	1.0	
3:15 pm – 5:15 pm	<b>PANEL: Morbid Obesity in Pediatrics – Difficult Cases</b>	2.0	
	<i>Total Credits Available For Friday</i>	8.0	
<b>Saturday, June 12, 2010</b>			
8:15 am – 9:15 am	<b>General Assembly</b>	0	
9:15 am – 10:15 am	<b>SCIENTIFIC SESSION: Urology</b>	1.0	
10:30 am – 10:45 am	<b>IPEG Awards Session</b>	0	
10:45 am – 11:00 am	<b>2008 IRCAD Award Winner Abstract Presentation</b>	.25	
11:00 am – 12:00 pm	<b>SCIENTIFIC VIDEO SESSION: Miscellaneous</b>	1.0	
12:00 pm	<b>Closing Remarks</b>	0	
	<i>Total Credits Available For Saturday</i>	2.25	
	<b>Total Possible Credits</b>	<b>27</b>	

To receive a **CME Certificate** for this meeting, please complete a **CME Request Form** and turn it in at the registration desk prior to the end of the meeting or mail the complete form to be received by IPEG no later than **July 14, 2010**:

**IPEG – CME Department**, 11300 W. Olympic Blvd. Suite 600, Los Angeles, CA, 90064

An additional charge of **\$25.00** Will be assessed for requests received after **July 14, 2010**





# IPEG 2010 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 at the Hilton Waikoloa or fax it to (310) 437-0585.

Your feedback will be shared with a member of the Program Committee, who will make the faculty and course chair(s) aware of these concerns.

### COMMERCIAL BIAS

The International Pediatric 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)

### Commercial Bias by: \_\_\_\_\_

(ie faculty name, company rep)

### Promotion via: \_\_\_\_\_

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

### 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**  
11300 W. Olympic Blvd. Suite 600, Los Angeles, CA, 90064,  
or fax to **310.437.0585**.



2010-2011 Series

# Live International Webinar Education

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Webinar Director: **Todd Ponsky, MD**, Assistant Professor of Surgery, Division of Pediatric Surgery, Case Western Reserve University, Rainbow Babies & Children's Hospital, Cleveland, Ohio

### Necrotizing Enterocolitis

June 17, 2010

This international "Web Symposium" on Necrotizing Enterocolitis (NEC) will be directed towards pediatric surgeons, neonatologists, pediatric gastroenterologists, pediatricians, and family practitioners from the United States or international, who have an interest in discussing some of the controversies that exist in the diagnosis and treatment of pediatric NEC. This symposium will begin with interactive discussions, led by leaders in the field from around the world, addressing the diagnosis, work-up and treatment of NEC. This will be followed by debates on NEC controversies among the leaders in the field. Participants will have the opportunity to discuss these issues or their own questions with the faculty.

### Pediatric Hernia, Hydroceles and More.....

August 11, 2010

This virtual symposium will address the current concepts and controversies of some of the more common issues of pediatric surgery. Topics will include inguinal hernias, umbilical hernias, hydroceles, undescended testicles, and circumcision. Specifically, issues will include different options of inguinal hernia repair, a live laparoscopic inguinal hernia procedure, the appropriate age to repair umbilical hernias, how to manage giant umbilical hernias, and controversies in the management of hydroceles and undescended testicles.

### 2nd Annual Tricks of the Trade: Pediatric Surgery

March 4, 2011

This pediatric surgery web symposium will be directed towards pediatric surgeons from around the world who have an interest in presenting and / or discussing some of the newest innovative techniques or therapies in pediatric surgery. This symposium will allow surgeons from around the world to demonstrate any innovative tools and techniques that they are utilizing at their institution. Following each presentation there will be an open forum among the participants to discuss the new techniques.

Add your name to our email list and/or receive information

[rita.rys@uhhospitals.org](mailto:rita.rys@uhhospitals.org)

For all course listings: [www.isi-case.org](http://www.isi-case.org)



# IPEG's 19<sup>th</sup> ANNUAL CONGRESS *for Endosurgery in Children*

*Save the Dates!*



## **IPEG's 20<sup>th</sup> Annual Congress for Endosurgery in Children**

May 3-7, 2011

Hilton Prague  
Prague, Czech Republic

*Voted the Best Hotel in the Czech Republic in 2008 and 2009 by TTG  
2nd Best Business Hotel in Eastern Europe in 2009 by the Business Traveler UK Magazine*

## **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, California, USA

[www.ipeg.org](http://www.ipeg.org)