

# IPEG's 27<sup>th</sup> Annual Congress *for Endosurgery in Children*



Held in conjunction with SAGES & CAGS

**April 11-14, 2018**

**Seattle, Washington, USA**

**WASHINGTON STATE CONVENTION CENTER**



**FINAL PROGRAM 2018**





# IPEG's 27<sup>th</sup> Annual Congress for Endosurgery in Children

April 11-14 2018 Seattle, Washington USA

WASHINGTON STATE CONVENTION CENTER  
705 Pike Street, Seattle, Washington 98101

## International Pediatric Endosurgery Group (IPEG)

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International Pediatric Endosurgery Group (IPEG)  
is managed by BSC Management, Inc.

*Please note: The official language  
of the meeting is English.*

## TABLE OF CONTENTS

Accreditation	3
General Information	3
Meeting Hours	3
2018 Program & CME Chairs	4
2017 Award Winners	5
2018 Commercial Supporters	5
2018 Meeting Leaders	6
2018 Faculty	7
IPEG Schedule at a Glance	8
SAGES Schedule at a Glance	9
CME Worksheet	10
Commercial Bias Reporting Form	11
Faculty & Presenter Disclosures	12
Floor Plans	13
IPEG/SAGES/CAGS Exhibit Hall	14
Exhibitor Profiles	15
2018 IPEG/ SAGES Learning Center	27
Complete Schedule	30
Long Term Research Fund Donors	50
New Members	51
Accommodations	52
Registration	53
Future Meetings Save the Date	55
Full Quickshot Abstracts	56
Full Innovations Abstracts	121
Full Poster Abstracts	128
Full Oral Abstracts	146

## Welcome Message

Dear Friends & Colleagues:

It is an honor to serve as the President of the 2018 Annual Meeting and I would like to personally invite you to attend IPEG's 27th Annual Congress for Endosurgery in Children April 11-14 2018, in Seattle, Washington, USA. This year's meeting is jointly held with SAGES & CAGS, who are hosting the 2018 World Congress of Endoscopic Surgery.

I am very excited about the growth of IPEG as an inclusive international organization that fosters new ideas, innovation, and education in pediatric minimally invasive surgery. At the 2017 annual meeting, held in conjunction with the British Association of Paediatric Surgeons in London, IPEG launched its Learning Center and Quick Shot presentations, both focused on expanding the meeting venue to junior surgeons and trainees. We continue to search for ways that will lead to more opportunities for our members to reap the benefits of IPEG. I believe that we have arranged an outstanding meeting that will fulfill this goal. This April, in Seattle you can expect:

- Internationally recognized surgeon leaders and innovative keynote lectures
- The return of the IPEG Learning Center
- The first Ultrasound Hands-On course offered at IPEG
- The Mastery Learning Series Hands-On Course taught by leaders in pediatric MIS from around the world
- Joint IPEG/SAGES Expert panels in Bariatric and Colorectal MIS surgery
- International expert pediatric panels in Chest Wall Deformities, Airway, and complicated esophageal atresia repair
- Opportunities to network with colleagues, academic leaders, and Industry partners
- A combined SAGES and IPEG welcome reception in the exhibit hall and a closing main event on Friday night
- Award opportunities for basic science and clinical research, IRCAD, and recognition of the Coolest Trick

For those of you new to IPEG, welcome to the family! We encourage you to get involved and be part of the innovation and education experience. To all of our current members, we thank you for being part of the journey and we look forward to seeing you in Seattle!

Daniel J. Ostlie  
IPEG President & CEO



# Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and IPEG. SAGES is accredited by the ACCME to provide continuing medical education for physicians.

The Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) designates this live activity for a maximum of **17.5 AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Date	Total Credits
Thursday, April 12, 2018	7.25
Friday, April 13, 2018	8.25
Saturday, April 14, 2018	2
<b>TOTAL Meeting Credits</b>	<b>17.5</b>

# General Information

## Who Should Attend?

The 27th 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.

## 2018 Meeting Objectives

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

### Specific Objectives include:

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

At the conclusion of the activity, pediatric surgeons and urologists will be able to safely incorporate minimally invasive surgical techniques into their practice by applying the evidence-based medical knowledge and skills learned, recognizing pitfalls and monitoring patient outcomes.

## Event Dress Code

Please note that the dress code for the entire conference is business casual.

# Meeting Hours

### Registration

Convention Center Atrium Lobby

Tuesday, April 10	12:00 pm – 5:00 pm
Wednesday, April 11	6:30 am – 6:30 pm
Thursday, April 12	6:30 am – 5:30 pm
Friday, April 13	6:30 am – 5:30 pm
Saturday, April 14	7:00 am – 2:00 pm

### Exhibit & Learning Center

Exhibit Hall 4A-C

Wednesday, April 11	5:30 pm – 7:30 pm
Thursday, April 12	10:00 am – 4:00 pm
Friday, April 13	10:00 am – 4:00 pm

### Speaker Ready Room

Room 310

Tuesday, April 10	8:00 am – 5:00 pm
Wednesday, April 11	5:30 am – 5:30 pm
Thursday, April 12	5:30 am – 5:30 pm
Friday, April 13	5:30 am – 5:30 pm
Saturday, April 14	6:00 am - 2:30 pm

### Posters

Tahoma Foyer

(Setup) Wednesday, April 11	4:00 pm – 7:00 pm
Thursday, April 12	7:30 am – 5:30 pm
(Breakdown) Friday, April 13	4:00 pm – 6:00 pm

# 2018 Program & CME Chairs



## Shawn D. St. Peter, MD | PROGRAM CHAIR

Shawn D. St. Peter, M.D., has been on staff in the Department of Surgery at Children's Mercy Hospital since 2006. He currently holds the Thomas Holder and Keith ASHcraft Endowed Chair and serves as Surgeon-in-Chief. He is currently the Katherine Berry Richardson Surgeon-in-Chief, the Program Director of the Pediatric Surgery Fellowship Program at Children's Mercy Hospitals and Clinics, where he is also the Program Director of the Surgical Scholars Program and the Director of the Center for Prospective Trials.

Along with numerous past national and local professional responsibilities, Dr. St. Peter currently serves on committees for APSA, IPEG, AAP and ACS. He is the recipient of several honors and awards, the including the Golden Apple Mercy Mentor Award.

Dr. St. Peter has coauthored over 300 original publications, in addition to the extensive publication of reviews, chapters, abstracts, posters, and the national and international contribution of lectures and presentations.



## Sameh Shehata, MD | PROGRAM CO CHAIR

Dr. Sameh Shehata is professor and past chairman of pediatric surgery department, faculty of medicine, university of Alexandria, Egypt. He is the past president of the Egyptian association of pediatric surgeons (EPSA). Dr. Shehata is the president-elect of the world federation of associations of pediatric surgery (WOFAPS), and the Current president of the IPEG middle east chapter.

Dr. Shehata is the innovator of the technique of laparoscopic traction for the intra-abdominal testis known as Shehata technique that is widely practiced now in many centers worldwide.

Dr. Shehata is the founder of the largest online pediatric surgery forum (The pediatric surgeon's lounge) where over 1500 pediatric surgeons around the world are discussing and exchanging experience every day.

Dr. Shehata is among the editorial board of many national and international pediatric surgery journals including the JPS, PSI and international journal of urology.



## Samir Pandya, MD | PROGRAM CO CHAIR & CME CHAIR

Dr. Samir Pandya was awarded his Bachelor's of Science with honors in Biomedical Engineering at the University of Miami. He completed his medical training at the Medical College of Virginia and then General Surgery residency at the New York Medical College / Westchester Medical Center Campus. He went on to train in Pediatric General Surgery at Emory University / Children's Healthcare of Atlanta. Upon completion of his fellowship training in 2011 he returned to his residency program as Assistant Professor in the Department of Surgery and Pediatrics where he further developed and vastly improved the pediatric minimally invasive pediatric surgery program. Academically he enjoys working with medical students, residents and fellows and has received numerous teaching awards during his career. As a result, he was appointed to be the Associate Program director of the General Surgery residency.

His clinical focus is on advanced minimally invasive pediatric surgery with minilaparoscopy and single-incision procedures. He has a strong interest in thoracic diseases as related to pediatric patients such as chest wall

anomalies, congenital lung lesions as well as surgical oncology.

In 2017, he was recruited to join the faculty at University of Texas Southwestern at Children's Medical Center in Dallas, Texas as an Associate Professor of Surgery.

Dr. Pandya is actively on the IT and Emerging Technology committees of IPEG and also serves as the CME Co-Chair. Outside of pediatric surgery, Dr. Pandya enjoys running, skiing, diving, digital photography and target shooting.



## Matthew Clifton, MD | CME CO CHAIR

Dr. Matthew Clifton earned his undergraduate degree in Physiology from the University of California, Los Angeles. He completed medical school at Georgetown University and returned to California for his adult general surgery residency at the University of California, San Francisco. During his residency he spent two years as a research resident in the Fetal Treatment Center at UCSF. He completed his pediatric surgery fellowship at Emory University in Atlanta.

Dr. Clifton is currently an Associate Professor and Interim Division Chief of Pediatric Surgery at Emory University/Children's Healthcare of Atlanta. He assumed the role of fellowship program director in 2013, which has dovetailed nicely with his interest in surgical education, simulation, and clinical research. He has received multiple awards for teaching. He is now the Editor in Chief of The Journal of Laparoendoscopic and Advanced Surgical Techniques, Part B Videoscopy and is an ad hoc reviewer for several other journals. His interests include advanced minimally invasive surgery, hepatobiliary surgery, and surgical oncology.

# 2017 Award Winners

## Basic Science Award

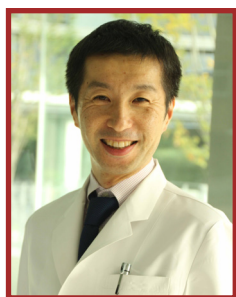
The Best Science Award winner is awarded a complimentary registration to IPEG's 26th Annual Congress and 1 night hotel stay (room and tax), total value of over \$1000. It is based on a blind review and the winner will be selected by the IPEG Program Committee.

## 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 Research Committee to receive the 2018 IRCAD Award. The Award recipients will travel to Strasbourg, France to participate in a course in pediatric minimally invasive surgery at the world famous European Institute of Telesurgery. This center at the University of Strasbourg is a state-of-the-art institute for instruction in all aspects of endoscopic surgery that is now providing a series of courses in pediatric surgery.

## Research Grant

The purpose of the Research Grant is to stimulate and support high quality original research from IPEG members in basic and clinical science. Junior faculty are encouraged to apply and the proposal should place an emphasis on basic science research. One winner will receive a certificate of award and a \$5,000 grant.



BASIC SCIENCE  
Tetsuya Ishimaru, MD, PhD



COOLEST TRICKS  
Keith Kuenzler, MD



IRCAD  
Clare Skerritt, MSc



RESEARCH  
Steffi Mayer, MD

## 2018 Commercial Supporters

*IPEG would like to thank the following for their support of the 2018 Congress:*

### DIAMOND LEVEL

Karl Storz Endoscopy

### PLATINUM LEVEL

Ethicon

JustRight Surgical

### Additional Support:

Applied Medical & Olympus

# 2018 Meeting Leaders

## Program Committee

CHAIR - Shawn St. Peter, MD  
CO CHAIR - Samir Pandya, MD  
CO CHAIR - Sameh Shehata, MD

Aayed R. Al-Qahtani, MD  
Maria Marcela Bailez, MD  
Katherine Barsness, MD  
Nicole Chandler, MD  
Simon Clarke, MD  
Ciro Esposito, MD  
Alan W. Flake, MD  
James D. Geiger, MD  
Miguel Guelfand, MD  
Anna Gunnarsdottir, MD  
Munther J. Haddad FRCS  
Carroll M. Harmon, MD, PhD

George W. Holcomb III, MD  
Celeste Hollands, MD  
Satoshi Ieiri, MD  
Romeo Ignacio, MD  
Saleem Islam, MD  
Tadashi Iwanaka, MD  
David Juang, MD  
Pablo Laje, MD  
Dave Lal, MD  
Marc A. Levitt, MD  
Sean S. Marven FRCS  
John J. Meehan, MD  
Go Miyano, MD  
Oliver J. Muensterer, MD  
Nathan Novotny, MD  
Daniel J. Ostlie, MD

Todd A. Ponsky, MD  
Olivier Reinberg, MD  
Fred Rescorla, MD  
Drew Rideout, MD  
Steven Rothenberg, MD  
Atul J. Sabharwal, MD  
Avraham Schlager, MD  
Sohail Shah, MD  
Ryota Souzaki, MD  
Philipp O. Szavay, MD  
Tomoaki Taguchi, MD  
Benno Ure, MD, PhD  
Kenneth K. Wong, MD  
Mark L. Wulkan, MD  
Atsuyuki Yamataka, MD  
C.K. Yeung, MD

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## Executive Committee

PRESIDENT: Daniel J. Ostlie, MD  
PRESIDENT-ELECT: Aayed R. Al-Qahtani, MD  
1<sup>st</sup> VICE PRESIDENT: Holger Till, MD, PhD  
2<sup>nd</sup> VICE PRESIDENT: Todd A. Ponsky, MD  
SECRETARY: Shawn St. Peter, MD  
TREASURER: Katherine Barsness, MD  
EDITOR: Mark Wulkan, MD

AMERICA'S REPRESENTATIVE: Matthew Clifton, MD  
EUROPE REPRESENTATIVE: Philipp Szavay, MD  
WORLD-AT-LARGE REPRESENTATIVE: Carolina Millan, MD  
WORLD-AT-LARGE REPRESENTATIVE: Go Miyano, MD  
WORLD-AT-LARGE REPRESENTATIVE: Suad Abul, MD  
CME CHAIR: Samir Pandya, MD  
IMMEDIATE PAST PRESIDENT: David van der Zee, MD, PhD

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## Past Presidents

David van der Zee, MD (2017)  
Maria Marcela Bailez, MD (2016)  
Mark Wulkan, MD (2015)  
Benno Ure, MD, PhD (2014)  
Tadashi Iwanaka, MD, PhD (2013)  
Carroll M. Harmon, MD, PhD (2012)  
Gordon A. MacKinlay, OBE (2011) – *Retired*  
Marcelo Martinez Ferro, MD (2010)  
George W. Holcomb III, MD (2009)  
Jean-Stephane Valla, MD (2008)  
Atsuyuki Yamataka, MD (2007)  
Keith Georgeson, MD (2006)

Klaas (N) M.A. Bax, MD (2005) – *Retired*  
C.K. Yeung, MD (2004)  
Craig Albanese, MD (2003)  
Vincenzo Jasonni, MD (2002) – *Retired*  
Peter Borzi, MD (2001)  
Steven Rothenberg, MD (2000)  
Juergen Waldschmidt, MD (1999) – *Deceased*  
Hock L. Tan, MD (1998) – *Retired*  
Takeshi Miyano, MD (1997) – *Retired*  
Steven Rubin, MD (1996) – *Retired*  
Gunter-Heinrich Willital, MD (1995)

# 2018 Faculty

Suad Abul, MD - Safat, Kuwait  
Jean Ashburn, MD - Winston-Salem, NC, USA  
Aayed R. Al-Qahtani, MD - Riyadh, Saudi Arabia  
Joanne E. Baerg, MD - Loma Linda, CA USA  
Maria Marcela Bailez, MD - Buenos Aires, Argentina  
Katherine A. Barsness, MD - Chicago, IL USA  
Juan Calisto, MD - Miami, FL USA  
Casey Calkins, MD - Milwaukee, WI USA  
Nicole M. Chandler, MD - St. Petersburg, FL USA  
Mike K. Chen, MD - Birmingham, AL USA  
Simon Clarke, MD FRCS PA - London, Chelsea, United Kingdom  
Matthew S. Clifton, MD - Atlanta, GA USA  
Karen A. Diefenbach, MD - Columbus, OH USA  
Alexander Dzakovic, MD - Chicago, IL, USA  
Ciro Esposito, MD - Naples, Italy  
Jason D. Fraser, MD - Kansas City, MO USA  
Julie Freischlag, - Winston-Salem, NC USA  
Jason S. Frischer, MD, FAAP, FACS - Cincinnati, OH USA  
Samir Gadepalli, MD - Ann Arbor, MI USA  
Carlos Giné, MD - Barcelona, Spain  
Miguel Guelfand, MD - Santiago, Chile  
Munther Haddad, MD - London, United Kingdom  
Frank-Martin Haecker, MD - Muttentz, Switzerland  
Carroll M. Harmon, MD, PhD - Buffalo, NY USA  
Andre Hebra, MD - Orlando, FL USA  
George (Whit) Holcomb, MD - Kansas City, MO USA  
Celeste Hollands, MD - Spanish Fort, AL USA  
Saleem Islam, MD - Gainesville, FL USA  
Marcus D. Jarboe, MD - Ann Arbor, MI USA  
Dawn E. Jaroszewski, MD - Phoenix, AZ USA  
David Juang, MD - Kansas City, MO USA  
Yury Andreevitsh Kozlov, MD - Irkutsk, Russia  
Shaun M. Kunisaki, MD - Ann Arbor, MI USA  
Pablo Laje, MD - Philadelphia, PA USA  
Dave R. Lal, MD - Milwaukee, WI USA  
Charles M. Leys, MD - Madison, WI USA  
Aaron Michael Lipskar, MD - New Hyde Park, NY USA  
Manuel Lopez, MD - Barcelona, Catalunya, Spain  
Maximiliano Maricic, MD - Buenos Aires, Argentina  
Marcelo Martinez Ferro, MD - Buenos Aires, Argentina  
John J. Meehan, MD - Seattle, WA USA  
Carolina Millan, MD - Buenos Aires, Argentina  
Doug Miniati, MD - San Francisco, CA USA  
Go Miyano, MD - Tokyo, Japan  
Oliver J. Muensterer, MD - Mainz, NY Germany  
Nathan Michael Novotny, MD - Royal Oak, MI USA  
Matthijs W.N. Oomen, MD - Amsterdam, The Netherlands  
Daniel J. Ostlie, MD - Phoenix, AZ USA  
Samir R. Pandya, MD - Dallas, TX USA  
Dariusz Patkowski, MD - Wroclaw, Poland  
Eduardo Perez, MD - Miami, FL USA  
Lena Perger, MD - Salado, TX USA  
Todd A. Ponsky, MD - Akron, OH USA  
D. Dean Potter, Jr., MD - Rochester, MN USA  
Matthew Ralls, MD - Ann Arbor, MI USA  
Giovanna Riccipetioni, MD - Milan, Italy  
Drew Rideout, MD - St. Petersburg, FL USA  
Steven Rothenberg, MD - Denver, CO USA  
David H. Rothstein, MD - Buffalo, NY USA  
Atul J. Sabharwal, MD - Glasgow, United Kingdom  
Avraham Schlager, MD - Akron, OH USA  
Stefan Scholz, MD - Pittsburgh, PA USA  
Sohail R Shah, MD, MSHA - Houston, TX USA  
Sameh Shehata, MD - Alexandria, Egypt  
Bethany Slater, MD - Chicago, IL USA  
Karen Elizabeth Speck, MD - Ann Arbor, MI USA  
Shawn D. St Peter, MD - Kansas City, MO USA  
Henri Steyaert, MD - Brussels, Belgium  
Philipp O. Szavay, MD - Lucerne, Switzerland  
Holger Till, MD - Graz, Austria  
David C. Van Der Zee, MD, Phd - Utrecht, The Netherlands  
Ghassan T. Wahbeh, MD - Seattle, WA USA  
Tonia M. Young-Fadok, MD - Phoenix, AZ USA

# Schedule-at-a-Glance



## PRE-MEETING COURSE

### Wednesday, April 11<sup>th</sup>

- 8:00 am – 5:00 pm **IPEG MASTERY LEARNING SERIES HANDS-ON COURSE: Thoracoscopic Lobectomy and Thoracoscopic Esophageal Atresia with Tracheoesophageal Fistula Repair** [NON CME](#)
- 5:30 pm – 7:30 pm **JOINT SAGES/IPEG/CAGS Opening Reception** [NON CME](#)

## IPEG'S 27<sup>th</sup> ANNUAL CONGRESS

### Thursday, April 12<sup>th</sup>

- 7:30 am – 8:30 am **SCIENTIFIC VIDEO SESSION I**
- 8:30 am – 9:45 am **SCIENTIFIC SESSION: Basic Science and Innovation**
- 9:45 am – 10:00 am **Break**
- 10:00 am – 12:00 pm **JOINT SAGES/IPEG EXPERT SESSION: Are You Kidding? You Want to be a Pediatric Bariatric Surgeon? Everything You Need to Know But Were Afraid to Ask**
- 12:00 pm – 12:45 pm **Lunch**
- 12:45 pm – 2:00 pm **SCIENTIFIC SESSION: Gastrointestinal**
- 2:00 pm – 2:30 pm **PRESIDENTIAL ADDRESS & LECTURE: Surgeons as Leaders** [NON CME](#)
- 2:30 pm – 3:30 pm **EXPERT PANEL: Chest Wall Deformities**
- 3:30 pm – 3:45 pm **Break**
- 3:45 pm – 4:30 pm **INNOVATIONS SESSION** [NON CME](#)
- 4:30 pm – 5:15 pm **IPEG/ESPES JOINT SCIENTIFIC SESSION: Urogenital**

### QUICK SHOTS [NON CME](#)

#### Thursday, April 12<sup>th</sup>

- 8:30 am – 9:45 am **QUICKSHOTS 1**
- 10:00 am – 12:00 pm **QUICKSHOTS 2**
- 4:30 pm – 5:30 pm **QUICKSHOTS 3**

#### Friday, April 13<sup>th</sup>

- 2:45 pm – 3:45 pm **QUICKSHOTS 4**
- 4:15 pm – 5:15 pm **QUICKSHOTS 5**

### Friday, April 13<sup>th</sup>

- 7:30 am – 8:45 am **SCIENTIFIC SESSION: Colorectal & Hepatobiliary**
- 8:45 am – 9:45 am **SCIENTIFIC SESSION: Thorax**
- 9:45 am – 10:00 am **Break**
- 10:00 am – 11:30 am **JOINT EXPERT PANEL: Colorectal Controversies**
- 11:30 am – 12:00 pm **KEYNOTE LECTURE: Yury Kozlov, MD "I Was in Siberia and Survived"**
- 12:00 pm – 1:00 pm **Lunch**
- 1:00 pm – 2:00 pm **SCIENTIFIC SESSION: Video - Coolest Tricks and Extraordinary Procedures**
- 2:00 pm – 2:30 pm **EXPERT PANEL: Endoscopically Crossing the Long Gap**
- 2:30 pm – 2:45 pm **Break**
- 2:45 pm – 3:45 pm **SCIENTIFIC SESSION: Miscellaneous**
- 3:45 pm – 4:15 pm **KARL STORZ KEYNOTE LECTURE: Julie Freischlag, MD**
- 4:15 pm – 5:15 pm **SCIENTIFIC SESSION: Miscellaneous II**
- 8:00 pm – Midnight **Friday Night Main Event** [NON CME](#)

### Saturday, April 14<sup>th</sup>

- 8:30 am – 9:30 am **EXPERT PANEL: Congenital Pulmonary Airway Malformations - Operation or Observation?**
- 9:30 am – 10:15 am **General Assembly** [NON CME](#)
- 10:15 am – 10:25 am **IPEG Awards** [NON CME](#)
- 10:25 am – 10:30 am **2017 Research Award Winner Abstract Update** [NON CME](#)
- 10:30 am – 11:30 am **VIDEO SESSION WITH EXPERT PANEL DISCUSSION: "My Worst Nightmare" – The Management of Unexpected Complications and Strategies for Future Avoidance**
- 11:30 am **Closing Remarks** [NON CME](#)



# World Congress 2018 Schedule at a Glance

“Mastering the Art of Surgery”

Program Chairs: John H. Marks, MD (SAGES), COL Robert B. Lim, MD (SAGES) and Liane S. Feldman, MD (CAGS)

TIME	PROGRAM	Location
<b>WEDNESDAY, APRIL 11, 2018</b>		
7:30 AM - 9:30 AM	Magnets in Surgery: What's the Attraction?	6A
7:30 AM - 9:00 AM	Hernia Session	615-617
7:30 AM - 9:00 AM	Outcomes/Quality Session	6B
7:30 AM - 10:00 AM	Tele Us: Mentoring, Consultation, and Surgery	606-607
7:30 AM - 10:30 AM	Academic Boot Camp	608-609
7:30 AM - 12:00 PM	Masters Bariatrics: Revision and Reversal	6C
7:30 AM - 12:00 PM	Postgraduate Course: Total Mesorectal Excision - Optimizing Surgery and Managing Challenges	6E
8:00 AM - 4:30 PM	Military Surgical Symposium	602-604
9:00 AM - 10:30 AM	Biliary Session	6B
9:00 AM - 10:30 AM	Bariatrics I Session	615-617
9:30 AM - 11:00 AM	Devil's in the Details: Paraesophageal Hernia Repair	6A
10:00 AM - 12:00 PM	SAGES/ASE Symposium: Building Your State-of-the-Art Simulation Curriculum: Best Strategies	606-607
10:30 AM - 12:00 PM	Masters Flexible Endoscopy: Endoscopic Dilatation and Stent Placement	6B
10:30 AM - 12:00 PM	Symposium de las Americas: When and How We Treat Motility Problems	608-609
10:30 AM - 12:00 PM	Liver/Pancreas Videos Session	615-617
11:00 AM - 12:00 PM	SAGES/JSES Session: Similarities And Differences Between Surgical Approaches in Japan and the USA	6A
12:00 PM - 1:30 PM	SAGES Foundation Awards Luncheon	611-614
1:00 PM - 5:00 PM	Hands-On Course: Total Mesorectal Excision (Paid Registrants Only)	4F
1:30 PM - 3:00 PM	Small Bowel Obstruction/Common Bile Duct Exploration/Incarcerated Hernia: Always or Never Lap	6C
1:30 PM - 2:30 PM	Complications/Interesting Cases Session	615-617
1:30 PM - 3:00 PM	Colorectal I Session	6B
1:30 PM - 3:30 PM	New Gadgets And Gizmos - Advanced Technologies For Surgeons	6A
1:30 PM - 5:00 PM	IFSES Member Societies Update Symposium - Presentation of Each Society's Expertise - A World Congress Extravaganza!	606-607
1:30 PM - 5:00 PM	Masters Hernia: Recurrent Hernias - Making the Best of a Bad Situation	6E
1:30 PM - 5:00 PM	Postgraduate Course: The Fundamental Use of Surgical Energy (FUSE)	608-609
3:00 PM - 5:00 PM	SAGES/ASMBS Session: Reflux After Sleeve Gastrectomy	6C
2:30 PM - 5:00 PM	SAGES Advocacy Program Summit	615-617
3:00 PM - 5:00 PM	Foregut Videos Session	6B
3:30 PM - 5:00 PM	Surgical Options in Gastroparesis	6A
5:00 PM - 5:30 PM	Opening Session & Welcome Ceremony	6E
5:30 PM - 7:30 PM	Exhibits Opening Welcome Reception	4ABC
6:00 PM - 7:00 PM	Faculty Intro Session: Lap Colon ADOPT HO Course (Paid Attendees Only)	606-607
<b>THURSDAY, APRIL 12, 2018</b>		
7:30 AM - 8:30 AM	Champions Town Hall	611-614
7:30 AM - 9:00 AM	Augmented Virtual Reality And Other Cool Things In Surgery	6C
7:30 AM - 9:00 AM	Expect The Unexpected In The Top 21	608-609
7:30 AM - 9:00 AM	Intestinal Anastomosis: Hand Sewn To Intracorporeal - Newest Techniques to Improve Outcomes	6B
7:30 AM - 9:00 AM	Solid Organs Videos Session	6A
7:30 AM - 9:00 AM	Bariatrics II Session	602-604
7:30 AM - 9:00 AM	Foregut Session	606-607
7:30 AM - 9:00 AM	Mesh: Must Avoid Or Must Have?	6E
7:30 AM - 5:00 PM	i3 Summit (non-CME)	400
9:00 AM - 9:45 AM	Karl Storz Lecture: Richard K. Reznick, MD - "15 Years In The Making...Changes To Residency Education Taking Shape"	6E
10:00 AM - 4:00 PM	Exhibits/Posters/Learning Center Open	4ABC
10:00 AM - 12:00 PM	Diverticulitis Consensus Conference	608-609
10:00 AM - 11:00 AM	Colorectal Videos Session	606-607
10:00 AM - 11:00 AM	POEM Coming Of Age: What Have We Learned and What Are We Still Learning?	6B
10:00 AM - 11:00 AM	SAGES/KSELS Session: What Can We Learn From Each Other in MIS of Biliary and Pancreas Disease?	6C
10:00 AM - 12:00 PM	Exhibit Hall Theater Video Session 1 (non-CME)	4AB



SAGES & CAGS 16<sup>TH</sup> WORLD CONGRESS OF ENDOSCOPIC SURGERY

# World Congress 2018 Schedule at a Glance (continued)



SAGES & GAGS 16<sup>TH</sup> WORLD CONGRESS OF ENDOSCOPIC SURGERY

TIME	PROGRAM	Location
10:00 AM - 12:00 PM	SAGES/IPEG Session: Are You Kidding? You Want To Be a Pediatric Bariatric Surgeon? Everything You Need to Know But Were Afraid to Ask	602-604
10:00 AM - 12:00 PM	When Bad Things Happen To Good People: "Emergency Bile Spill Response"	6A
10:00 AM - 12:30 PM	Video Perfection From SAGES U	6E
10:30 AM - 12:00 PM	Robotics I Session	615-617
11:00 AM - 12:00 PM	Endoscopic Alternatives To Fundoplication	6B
11:00 AM - 12:00 PM	Liver/Pancreas Session	6C
11:00 AM - 12:00 PM	Instrumentation/Devices/Technologies Session	606-607
11:00 AM - 5:00 PM	Hands-On Course: Lap Colon ADOPT (Paid Registrants Only)	4F
12:00 PM - 1:30 PM	Educators Luncheon: Teaching Today's Learners	611-614
12:00 PM - 1:30 PM	<b>FREE GRAB AND GREET LUNCH FOR ALL ATTENDEES</b>	4AB
1:00 PM - 5:00 PM	Hands-On Course: Primary Procedures in Bariatric Endoscopy And Endoscopic Management of Complications (Paid Registrants Only)	4F
1:30 PM - 3:00 PM	Acute Care Session	608-609
1:30 PM - 3:00 PM	Flexible Endoscopy Session	615-617
1:30 PM - 3:00 PM	MIS Approaches to Complications of EsophagoGastric Surgery	6C
1:30 PM - 3:00 PM	MIS Approaches to Pancreatitis	602-604
1:30 PM - 3:30 PM	Emerging Technology Session (non-CME)	6A
1:30 PM - 4:00 PM	Exhibit Hall Theater Video Session 2 (non-CME)	4AB
1:30 PM - 4:30 PM	Postgraduate Course: Minimally Invasive Advances in Complex Hernia Repair	6E
1:30 PM - 4:30 PM	Shining In Your Practice Right From The Start - Tools for Success	606-607
1:30 PM - 5:30 PM	Masters Colorectal: MIS Approaches to the Right Colon	6B
3:00 PM - 3:30 PM	Happy Half Hour in the Exhibit Hall	4AB
3:30 PM - 5:00 PM	Image Is Everything: NIR Fluorescence In Every OR?	602-604
3:30 PM - 5:00 PM	MIS Education Session	615-617
3:30 PM - 5:30 PM	Managing Long Term Complications Of Bariatric Surgery: Weight Regain and Long-Term Nutrition	608-609
3:30 PM - 5:30 PM	Masters Robotic Panel	6C
3:30 PM - 5:30 PM	SAGES/ILLS Session: Laparoscopic Liver Surgery	6A
4:30 PM - 5:30 PM	Surgical Emergencies In The Pregnant Patient: The Role Of MIS	6E
6:00 PM - 8:00 PM	Industry Education Events	
6:00 PM - 8:00 PM	Boston Scientific	Sheraton, Willow Room
6:00 PM - 8:00 PM	Intuitive/Bard/Davol	Convention Ctr, Room 615-617
<b>FRIDAY, APRIL 13, 2018</b>		
7:30 AM - 8:30 AM	Plenary I	6E
8:30 AM - 9:15 AM	Presidential Address: Daniel B. Jones, MD - "It's Better To Be Lucky"	6E
9:15 AM - 10:00 AM	Gerald Marks Lecture: Yuman Fong, MD - "Gene Surgery And The Next Generation Of MIS/Robotic Surgeons"	6E
10:00 AM - 4:00 PM	Exhibits/Posters/Learning Center Open	4ABC
10:00 AM - 10:30 AM	Morning Mimosas In The Exhibit Hall	4AB
10:00 AM - 12:00 PM	Robotic Colorectal Surgery Tips and Tricks: How to Safely Incorporate Robotics Into Your Practice and What's With All These New Robots?	6E
10:00 AM - 12:00 PM	We R SAGES - Celebrating Diversity	608-609
10:00 AM - 12:00 PM	Exhibit Hall Theater Video Session 3 (non-CME)	4AB
10:30 AM - 12:00 PM	Devil's In The Details: MIS Retrorectus Approaches	6A
10:30 AM - 12:00 PM	Devil's In The Details: Splenic Fixture/Middle Colics	606-607
10:30 AM - 12:00 PM	MIS vs. Endolumenal Approaches For Early Gastric Cancer	602-604
10:30 AM - 12:00 PM	Timing And Treatment Of Cholelithiasis	6C
10:30 AM - 12:00 PM	When Bad Things Happen To Good People: Managing Bariatric Mishaps	6B
10:30 AM - 12:00 PM	"Live Free Or Die" (non-CME)	615-617
12:00 PM - 1:30 PM	Fellowship Council Luncheon: Video Assessment For Ensuring Competency	611-614
12:00 PM - 1:30 PM	<b>FREE GRAB AND GREET LUNCH FOR ALL ATTENDEES</b>	4AB
12:15 PM - 1:15 PM	Community Practice Town Hall	615-617
1:30 PM - 3:00 PM	Foregut/Gastric Session	615-617
1:30 PM - 3:00 PM	Devil's In The Details: Getting That Critical View of Safety	6E

# World Congress 2018 Schedule at a Glance (continued)

TIME	PROGRAM	Location
1:30 PM - 2:30 PM	CAGS Keynote Lecture: Carol-Anne Moulton, MD - "Culture And Teamwork In Surgery"	608-609
1:30 PM - 3:30 PM	Devil's In The Details: Gastro-Jejunal Anastomosis	6A
1:30 PM - 3:30 PM	Emerging Treatment For Diverticulitis: Making Sense of the Evidence Amidst the Controversy	602-604
1:30 PM - 3:30 PM	Robotics II Session	606-607
1:30 PM - 3:30 PM	What's New In ERAS: Best Perioperative Care for MIS	6B
1:30 PM - 3:00 PM	Robotic Surgery: Real Indications and Trends	6C
1:30 PM - 4:00 PM	Exhibit Hall Theater Video Session 4 (non-CME)	4AB
2:30 PM - 4:00 PM	Achalasia Management: Nuanced Care for a Rare Disease	608-609
3:00 PM - 4:00 PM	Groin Pain And Sports Hernia	6C
3:00 PM - 5:30 PM	Masters Foregut: Mastering GERD	6E
3:00 PM - 4:00 PM	Diversity And Innovation Session	615-617
3:30 PM - 5:00 PM	The Future of Bariatrics, Diabetic Care, and Metabolic Surgery: No Weight Loss Required	6B
3:30 PM - 5:30 PM	Minimally Invasive Pancreatic Resection: Present and Future	602-604
3:30 PM - 5:30 PM	The Great Video Debate: Perfect Inguinal Hernia Repair	6A
4:00 PM - 5:30 PM	ERAS Session	615-617
4:00 PM - 5:30 PM	Colorectal II Session	608-609
3:30 PM - 5:30 PM	Residents & Fellows Session	606-607
4:00 PM - 5:30 PM	SAGES Stories: Shaking the Tree of Tradition	611-614
5:30 PM - 6:00 PM	Candidate Networking Townhall at the Sheraton Seattle	Willow Rm
6:00 PM - 7:00 PM	Meet the Leadership Reception for Residents/Fellows & New Members at the Sheraton Seattle	Willow Rm
7:30 PM - 11:30 PM	Main Event & International Sing-Off at the Museum of Flight	
<b>SATURDAY, APRIL 14, 2018</b>		
8:00 AM - 9:30 AM	Evidence Based Pathways In Bariatrics: Are You in Step with the Best?	6A
8:00 AM - 9:00 AM	Solid Organs Session	6B
8:00 AM - 9:30 AM	Single Incision Colon Resection	608-609
8:00 AM - 9:30 AM	What's Next? New Techniques And Technologies In Bariatric Surgery	606-607
8:00 AM - 11:00 AM	Masters Acute Care: Perforated Viscus Call - You Never Want It But You're Going to Get It	602-604
8:00 AM - 11:00 AM	Masters Biliary: Help! Severe Acute Cholecystitis - How to Recognize, And What To Do!	6C
8:00 AM - 1:00 PM	SAGES Mini Medical School and Boot Camp (non-CME)	611-614
9:00 AM - 11:00 AM	International Hernia Symposium 2018: "You Did What?"	6B
9:30 AM - 11:00 AM	Percutaneous Image Guided Treatments - The New MIS	608-609
9:30 AM - 11:00 AM	Robots, Robots, Robots - Vision of the Past, Present, and Future	6A
9:30 AM - 11:00 AM	When Bad Things Happen To Good People - Endoscopy: Being FLEXible	606-607
11:00 AM - 12:30 PM	Plenary II Session	6C
12:30 PM - 2:00 PM	Hernia Videos Session	6B
12:30 PM - 1:30 PM	The Symptomatic Patient After Anti-Reflux Surgery: Causes, Work-Up, and Management Strategies	6C
12:30 PM - 1:30 PM	Flexible Endoscopy Videos Session	602-604
12:30 PM - 2:30 PM	Bariatrics Videos Session	608-609
12:30 PM - 2:30 PM	Go Global: MIS Incorporation Around The World	6A
12:30 PM - 2:30 PM	Why Should I Care? Advocacy, Health Policy & Reimbursement	606-607
1:30 PM - 2:30 PM	SAGES/CSLES Session: Learning From Each Other - Hot Topics in GI Surgery From China and America	6C
1:30 PM - 2:30 PM	Biliary Videos Session	602-604

## SAGES PROGRAM COMMITTEE

**Chair:** Jon Gould, MD

**Co-Chair:** Melissa Lapinska, MD

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Horacio Asbun, MD

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Sivamainthan Vithianathan, MD

Manabu Yamamoto, MD

Alexandr Zhuruk, MD

Natan Zundel, MD

SAGES & CAGS 16<sup>TH</sup> WORLD CONGRESS OF ENDOSCOPIC SURGERY



# CME Worksheet

TIME	ACTIVITY	Credits	Hours
<b>WEDNESDAY, APRIL 11, 2018</b>			
8:00 am – 5:00 pm	IPEG MASTERY LEARNING SERIES HANDS-ON COURSE: Thoracoscopic Lobectomy and Thoracoscopic Esophageal Atresia with Tracheoesophageal Fistula Repair	0	
5:30 pm – 7:30 pm	JOINT SAGES/IPEG/CAGS Opening Reception	0	
<b>Total credits available for Wednesday</b>		<b>0</b>	
<b>THURSDAY, APRIL 12, 2018</b>			
7:30 am – 8:30 am	SCIENTIFIC VIDEO SESSION I	1	
8:30 am – 9:45 am	SCIENTIFIC SESSION: Basic Science and Innovation	1.25	
8:30 am – 9:45 am	QUICKSHOTS 1	0	
10:00 am – 12:00 pm	JOINT SAGES/IPEG EXPERT SESSION: Are You Kidding? You Want to be a Pediatric Bariatric Surgeon? Everything You Need to Know But Were Afraid to Ask	2	
10:00 am – 12:00 pm	QUICKSHOTS 2	0	
12:45 pm - 2:00 pm	SCIENTIFIC SESSION: Gastrointestinal	1.25	
2:00 pm - 2:30 pm	PRESIDENTIAL ADDRESS & LECTURE: Surgeons as Leaders	0	
2:30 pm – 3:30 pm	EXPERT PANEL: Chest Wall Deformities	1	
3:45 pm - 4:30 pm	INNOVATIONS SESSION	0	
4:30 pm - 5:15 pm	IPEG/ESPES JOINT SCIENTIFIC SESSION: Urogenital	.75	
4:30 pm - 5:30 pm	QUICKSHOTS 3	0	
<b>Total credits available for Thursday</b>		<b>7.25</b>	
<b>FRIDAY, APRIL 13, 2018</b>			
7:30 am – 8:45 am	SCIENTIFIC SESSION: Colorectal & Hepatobiliary	1.25	
8:45 am – 9:45 am	SCIENTIFIC SESSION: Thorax	1	
10:00 am – 11:30 am	JOINT EXPERT PANEL: Colorectal Controversies	1.5	
11:30 am - 12:00 pm	KEYNOTE LECTURE: Yury Kozlov, MD “I Was in Siberia and Survived”	.5	
1:00 pm – 2:00 pm	SCIENTIFIC SESSION: Video - Coolest Tricks and Extraordinary Procedures	1	
2:00 pm – 2:30 pm	EXPERT PANEL: Endoscopically Crossing the Long Gap	.5	
2:45 pm - 3:45 pm	SCIENTIFIC SESSION: Miscellaneous	1	
2:45 pm - 3:45 pm	QUICKSHOTS 4	0	
3:45 pm - 4:15 pm	KARL STORZ KEYNOTE LECTURE: Julie Freischlag, MD	.5	
4:15 pm – 5:15 pm	SCIENTIFIC SESSION: Miscellaneous II	1	
4:15 pm – 5:15 pm	QUICKSHOTS 5	0	
8:00 pm – Midnight	Friday Night Main Event	0	
<b>Total credits available for Friday</b>		<b>8.25</b>	
<b>SATURDAY, APRIL 14, 2018</b>			
8:30 am – 9:30 am	EXPERT PANEL: Congenital Pulmonary Airway Malformations - Operation or Observation?	1	
9:30 am – 10:15 am	General Assembly	0	
10:15 am – 10:25 am	IPEG Awards	0	
10:25 am - 10:30 am	2017 Research Award Winner Abstract Update	0	
10:30 am – 11:30 am	VIDEO SESSION WITH EXPERT PANEL DISCUSSION: “My Worst Nightmare” – The Management of Unexpected Complications and Strategies for Future Avoidance	1	
11:30 am	Closing Remarks	0	
<b>Total credits available for Saturday</b>		<b>2</b>	
<b>TOTAL POSSIBLE CREDITS</b>		<b>17.5</b>	

To receive a **CME Certificate** for this meeting please visit [www.ipeg.org/cme](http://www.ipeg.org/cme)  
 An additional charge of \$25.00 USD will be assessed for requests received after **Friday, June 30<sup>th</sup>, 2018**.

# Commercial Bias Reporting Form

*You are encouraged to...*

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

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

## COMMERCIAL BIAS

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

**Presentation:** (eg session name, etc)

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**Commercial Bias by:** (ie faculty name, company rep)

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**Promotion via:** (eg handouts, slides, what they said, actions)

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**Commercial Bias about:** (check all that apply)

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

Please return this form to Nicole Von Husen at [nicolevh@ipeg.org](mailto:nicolevh@ipeg.org) or fax to +1 310.437.0585.

# Faculty & Presenter Disclosures

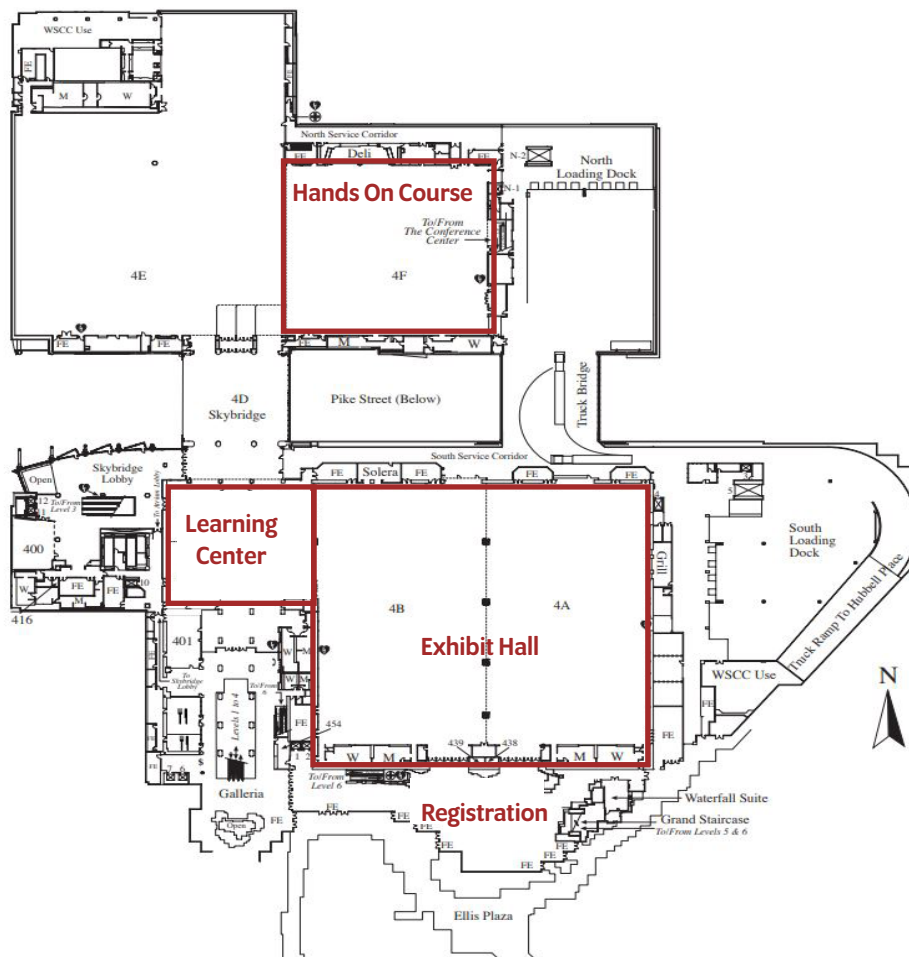
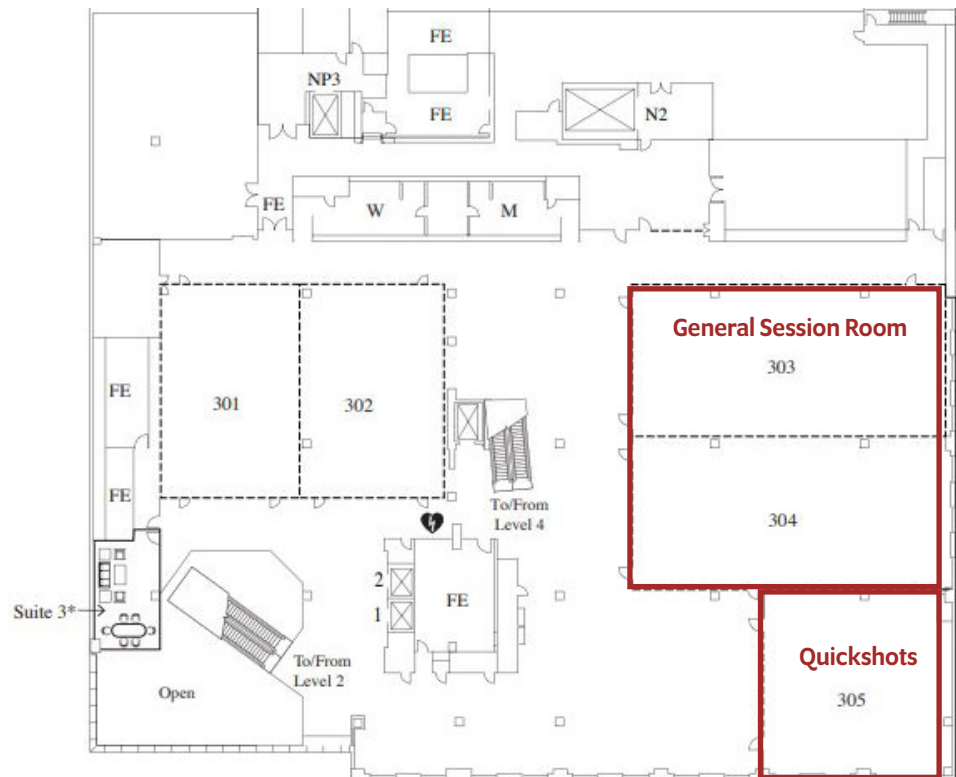
The following presenters, faculty, IPEG Program and Executive Committee Members provided information indicating they have a financial relationship with a commercial interest, which is defined as any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on patients. (Financial relationships can include such things as grants or research support, consultant, major stockholder, member of speaker's bureau, etc.) Unless indicated below, the planners, reviewers, staff or faculty for this CME Activity do not have any financial relationships to disclose relating to the content of this activity (i.e., relevant financial relationships).

\* Denotes Program Committee

\*\* Denotes Executive Committee

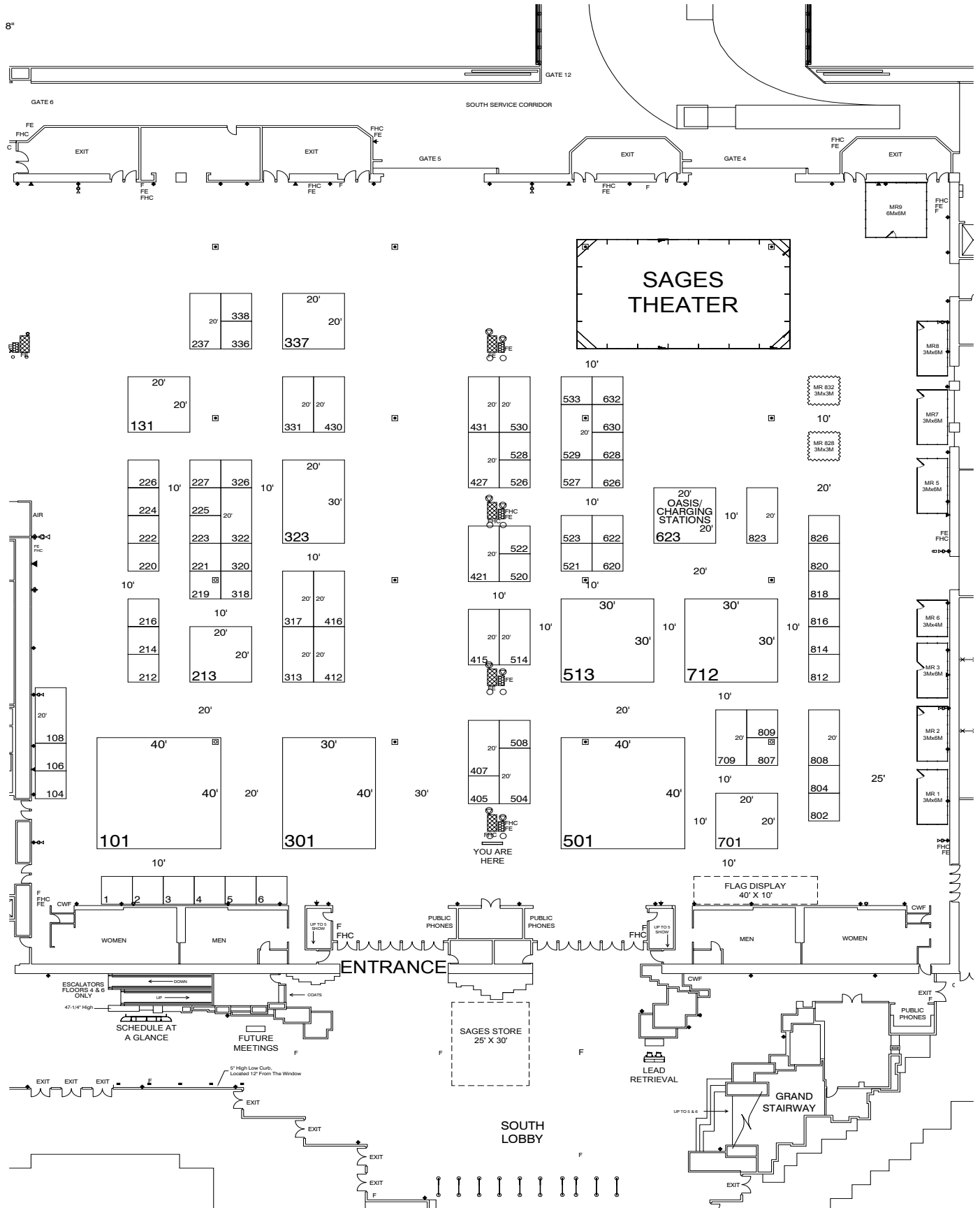
## DISCLOSURES

<b>NAME</b>	<b>COMMERCIAL INTEREST</b>	<b>WHAT WAS RECEIVED</b>	<b>ROLE</b>
George W. Holcomb III, MD	JustRight Surgical	Ownership Interest	Consultant
Dawn Jaroszewski, MD	Zimmer BioMet	IP Rights	Consultant
Marcelo Martinez Ferro, MD	Pampamed SRL	IP Rights	Consultant
Steven Rothenberg, MD	JustRight Surgical	Ownership Interest	Consultant
	Karl Storz Endoscopy	Consulting Fee	Consultant
Ghassan T. Wahbeh	Abbvie	Research Grant to Institution	Other
	Janssen	Research Grant to Institution	Other
	Takeda	Research Grant to Institution	Other
Tonia M. Young - Fadok	Pacira Pharmaceuticals	Honoraria	Consultant



# IPEG/SAGES/CAGS Exhibit Hall

LEVEL 4, 4A-4B - WSCC - SEATTLE, WASHINGTON





# Exhibitor Profiles

## 3D Systems Symbionix

5381 South Alkire Circle  
Littleton, CO 80127

[www.symbionix.com](http://www.symbionix.com)

430

Demo the Symbionix medical and surgical simulators from 3D Systems. Whether you are interested in training solutions for gastrointestinal upper and lower endoscopic procedures, laparoscopic, robotic surgery, or portable, lower cost training solutions, we have a simulator for you. Request a demo at your institution by emailing [healthcare@3dsystems.com](mailto:healthcare@3dsystems.com)

## 3-Dmed

255 Industrial Dr.  
Franklin, Ohio 45005

[www.3-dmed.com](http://www.3-dmed.com)

113

3-Dmed manufactures real-time laparoscopic training systems that are used by educators and medical device companies around the world! Practice FLS Skills and beyond! Excellent sales tool for instrument demonstration. 3-Dmed has been making laparoscopic simulation and custom models for over 20 years. Come to our booth for a hands-on experience.

## Aesculap, Inc.

3773 Corporate Parkway  
Center Valley, PA 18034

[www.aesculapusa.com](http://www.aesculapusa.com)

504

Aesculap, Inc., a B. Braun company, is part of a 180-year-old global organization focused on meeting the needs of an ever-changing healthcare community. Through close collaboration with its customers, Aesculap provides industry leading technologies that include the CaimanR Vessel Sealers and a comprehensive line of laparoscopic instrumentation. Aesculap continues a proud heritage of leadership and responsiveness and strives to deliver products and services that improve the quality of patients' lives. For more information on Aesculap's laparoscopic portfolio, call 800-282-9000 or visit [www.aesculapusa.com/products/surgical-instruments/laparoscopy](http://www.aesculapusa.com/products/surgical-instruments/laparoscopy)

## Allergan

95 Corporate Drive  
Bridgewater, NJ 8807

[www.allergan.com](http://www.allergan.com)

405

Allergan develops and markets innovative tissue repair products for reconstructive, plastic, and general surgery. STRATTICE™ Reconstructive Tissue Matrix is indicated for use as a soft tissue patch to reinforce soft tissue where weakness exists, and for the surgical repair of damaged or ruptured soft tissue membranes. Indications for use include the repair of hernias and/or body wall defects which require the use of reinforcing or bridging material to obtain the desired surgical outcome.

## Apollo Endosurgery, Inc.

1120 S. Capital of Texas Hwy Bldg 1,  
Suite 300  
Austin, TX 78746

[www.apolloendo.com](http://www.apolloendo.com)

427

Apollo Endosurgery, Inc. is a medical device company focused on less invasive therapies for the treatment of obesity, a condition facing over 600 million people globally, as well as other gastrointestinal disorders. Our device based therapies are an alternative to invasive surgical procedures, thus lowering complication rates and reducing total healthcare costs. Apollo's products are offered in over 70 countries today.

## Applied Medical

22872 Avenida Empresa  
Rancho Santa Margarita, CA 92688

[www.appliedmedical.com](http://www.appliedmedical.com)

213

Applied Medical is dedicated to developing and providing technologies that enable advanced surgical procedures and optimize patient outcomes. It is our mission to achieve this while also reducing healthcare costs and offering unrestricted choice. Applied is committed to advancing minimally invasive surgery by offering clinical solutions and sophisticated training, including workshops, symposia and our simulation-based training programs.

# Exhibitor Profiles

## Arthrex

6801 Park Terrace Dr,  
Los Angeles, CA 90045

[www.arthrex.com](http://www.arthrex.com)

701

Arthrex, a global leader in product development and medical education, has developed more than 9,000 products and surgical procedures to advance minimally invasive orthopaedics worldwide.

## Automated Medical Products Corp.

PO Box 759  
Woodbridge, NJ 07095

[www.ironintern.com](http://www.ironintern.com)

318

Automated Medical Products Corp. develops, manufactures and distributes surgical instruments. Its principle product is the automatic retractor holder, the Iron Intern®, a single and a double arm that simulates the function of a human arm, but is always steady. The Iron Intern® is a perfect choice for any type of surgery including laparoscopic and bariatric. The Stieber Rib Grip Kit is our perfect solution for superior exposure in open abdomen surgery. We were the first company to introduce Nathanson Hooks Liver Retractors to the US market. The Iron Intern® has become the leader in bariatric surgery, both laparoscopic and open procedures.

## Axcess Surgical Innovations

141 California Ave. Suite #102  
Half Moon Bay, CA 94019

[www.axcesssurgical.com](http://www.axcesssurgical.com)

527

Axcess Surgical Innovations is a leader in the creation of advanced solutions that anticipate and meet the needs of the market. Our U.S. based state-of-the-art manufacturing facility creates contemporary designs geared to achieve optimum surgical results.

## Bard Davol

100 Crossings Blvd,  
Warwick, RI 02886

[www.crbard.com/davol](http://www.crbard.com/davol)

431

## Baxter

[www.baxter.com](http://www.baxter.com)

816

## BD

1 Becton Drive  
Franklin Lakes, NJ 07417-1880

[www.bd.com](http://www.bd.com)

530

BD is a global medical technology company advancing health by improving discovery, diagnostics and care delivery. Our innovative product portfolio, leadership and partnerships help make a difference for global healthcare.

## Boston Scientific

300 Boston Scientific Way  
Marlborough, MA 01752

[www.bostonscientific.com](http://www.bostonscientific.com)

409

For more than 25 years, Boston Scientific has been dedicated to transforming patient lives by developing diagnostic and therapeutic devices that support less invasive, more efficient procedures for a variety of GI conditions. Through innovation and partnership, we are advancing important clinical research, supporting education programs and helping healthcare institutions deliver high quality healthcare while managing costs.

## Brainchild Surgical Devices

997 Horan Drive,  
Fenton, MO 63026

[www.lapros shark.com](http://www.lapros shark.com)

226

Brainchild Surgical Devices is an innovative, class leading manufacturer of cutting edge surgical devices. We are proud to introduce the newest addition to our lineup; the Lapro-Shark™ port site closure system. We invite you to take the Lapro-Shark™ for a spin and finally stop the port closure struggle.

## CapsoVision, Inc.

18805 Cox Ave  
Suite 250  
Saratoga, CA 95070

[www.capsovision.com](http://www.capsovision.com)

620

CapsoVision, Inc. is a Silicon Valley-based gastrointestinal medical device innovator. Our flagship product is the CapsoCam Plus®, the only capsule endoscopy system that doesn't require a data recorder or capital equipment. CapsoCam Plus also offers a 360-degree panoramic view, offering a more complete visualization of the small bowel mucosa during endoscopy.

# Exhibitor Profiles

## CDx Diagnostics

Two Executive Boulevard  
Suite 102 - Suffern, NY 10901  
[www.cdxdiagnostics.com](http://www.cdxdiagnostics.com)

WATS3D (Wide Area Transepithelial Tissue Sample with 3D Computer-Assisted Pathology Analysis), a new advance in routine screening and surveillance EGD, has been shown in large academic and community studies to be an easily-adopted practical adjunct that addresses the major limitations of random esophageal forceps biopsy.

## Cine-Med, Inc.

PO Box 1007 127 Main St N  
Woodbury, CT 6798  
[www.cine-med.com](http://www.cine-med.com)

Ciné-Med partners with SAGES to produce and distribute the SAGES video library, including SAGES Postgraduate Courses, SAGES Top 21, and the SAGES Pearls series. Stop by booth #313 for more information and to view samples of these videos and more. Visit [cine-med.com/sages](http://cine-med.com/sages)

## Con Med

525 French Road  
Utica, Ny 13502  
[www.conmed.com](http://www.conmed.com)

CONMED is a global medical technology company that develops and markets both devices and equipment for minimally invasive procedures in wide variety of specialties, including orthopedics, general surgery, gynecology and gastroenterology. CONMED is dedicated to providing high quality, market-leading products to healthcare professionals, enhancing clinical outcomes for patients, and improving economic outcomes for healthcare providers and payors.

## Cook Medical

P.O. Box 4195  
Bloomington, IN 47402  
[www.cookmedical.com](http://www.cookmedical.com)

Since 1963, Cook Medical has worked with physicians to develop minimally invasive technologies. Today we offer medical devices, biologic materials, and cellular therapies to deliver better patient outcomes more efficiently. We remain family owned so we can focus on what we care about: patients, our employees, and our communities.

322

## CooperSurgical

75 Corporate Drive  
Trumbull, CT 06611  
[www.coopersurgical.com](http://www.coopersurgical.com)

Since our founding in 1990, CooperSurgical has researched, developed and manufactured a wide range of trusted brands that have advanced the standard of care for families. Our highly reliable and clinically relevant products and services facilitate the delivery of enhanced outcomes for your patients regardless of the clinical setting. Visit [www.coopersurgical.com](http://www.coopersurgical.com) or call 1.800.243.2974 to learn more

320

313

## EndoGastric Solutions

18109 NE 76th Street  
Suite 100  
Redmond, WA 98052  
[www.endogastricsolutions.com](http://www.endogastricsolutions.com)

Performed endoscopically, the TIF procedure provides an anatomical GEV repair to treat the underlying cause of GERD. Over 80 peer-reviewed papers indicate, most patients' symptoms are controlled without dependence on daily PPIs and dramatically improved quality of life measurements remain steady up to five years. More than 20,000 TIF patients have been treated worldwide.

514

806

## Erbe USA

2225 Northwest Parkway  
Marietta, GA 30067  
[us.erbe-med.com](http://us.erbe-med.com)

Erbe USA offers the premier ESU for advanced endoscopic procedures. The VIO® 300 D/APC™ 2 workstation utilizes Power Dosing / Spark Recognition technology, offering multiple possibilities for endoscopic surgery featuring ENDO CUT®; proprietary modes PRECISE®, PULSED®, and FORCED™ APC. Additionally, Erbe presents the evolution of ERBEJET® 2 technology including integrated hybrid capabilities.

212

416

# Exhibitor Profiles

## Fortimedix Surgical B.V.

Daelderweg 20  
Nuth, Limburg 6361HK,  
Netherlands

[www.fortimedixsurgical.com](http://www.fortimedixsurgical.com)

### About Fortimedix Surgical

Fortimedix Surgical is a fast growing medical device company, aiming to challenge the status quo in minimally invasive surgery by creating novel devices that capture the claimed benefits of single-port surgery. The company is headquartered in Nuth, The Netherlands, and has a U.S. subsidiary in San Diego, CA. With a strong history as a global market leader in contract stent manufacturing, Fortimedix has been a trusted partner in the medical device industry for almost two decades.

Fortimedix Surgical is committed to driving the evolution of minimally invasive surgery through smart innovation across surgical specialties to improve the quality of life of patients throughout the world. For more information, please visit [www.fortimedixsurgical.com](http://www.fortimedixsurgical.com).

### About symphonX™

symphonX™ is the world's lowest profile single-port surgery solution for use in minimally invasive abdominal laparoscopic surgery. The symphonX™ Instruments portfolio includes various products for grasping, mobilizing, dissecting, retracting, cutting, cauterizing, ligating, and suction/irrigation of tissues and vessels. It is the first single-port surgery solution compatible with a standard 15mm laparoscopic trocar. Emulating conventional, multi-port laparoscopy makes symphonX™ easy to use and enables surgeons to perform procedural steps ergonomically, allowing for a comfortable and secure single-port approach. symphonX™ is poised to deliver on the promise of single-port surgery, including fewer port-site complications, less post-operative pain, faster recovery and exceptional cosmesis, elevating the standard of care in laparoscopy.

## General Surgery News

545 W. 45th Street  
8th Floor  
New York, NY 10036

[www.generalsurgerynews.com](http://www.generalsurgerynews.com)

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

317

## Gore & Associates

P.O. Box 2400  
Flagstaff, Arizona 86003  
[www.goremedical.com](http://www.goremedical.com)

Gore Medical Products Division engineers devices that treat a range of cardiovascular and other health conditions. With more than 40 million medical devices implanted over more than 40 years, Gore builds on its legacy of improving patient outcomes through research, education and quality initiatives. Product performance, ease of use and quality of service provide sustainable cost savings for physicians, hospitals and insurers. Gore is joined in service with clinicians and through this collaboration we are improving lives.

## HCA

2000 HealthPark Drive  
Brentwood, TN 37027  
[www.practicewithus.com](http://www.practicewithus.com)

HCA owns and operates over 170 hospitals across the United States, which makes us one of the nation's leading providers of healthcare services. We believe exceptional patient outcomes only come through a dedicated community of care, placing our physicians at the forefront.

## Heron Therapeutics Inc.

4242 Campus Point Court, Suite 200  
San Diego, CA 92121  
[www.herontx.com](http://www.herontx.com)

Heron's mission is to improve patient's lives by developing best-in-class medicines that address major unmet medical needs. We are developing novel, patient-focused solutions that apply our innovative science and technologies to proven pharmacological agents.

Our portfolio includes two products approved by the US Food and Drug Administration, SUSTOL® (granisetron) extended release injection and CINVANTITM (aprepitant) injectable emulsion, as well as one product in development, HTX-011, a long-acting formulation of bupivacaine in a fixed-dose combination with meloxicam currently being studied for the prevention of postoperative pain.

## IFSES

[www.ifses.org](http://www.ifses.org)

415

520

814

5

# Exhibitor Profiles

## Indiana University Kelley School of Business

801 West Michigan Street  
BS 3024  
Indianapolis, IN 46202

[www.kelley.iupui.edu/programs/physician-mba](http://www.kelley.iupui.edu/programs/physician-mba)

IU Kelley's Physician MBA is tailored to the physician learning style. Our one-of-a-kind curriculum, focused at the intersection of business and medicine, combines business and leadership fundamentals with specialized, strategic healthcare courses. Our 21-month MBA at our top ranked business school blends online on-demand learning with monthly Indianapolis weekend sessions.

## Intuitive Surgical

1020 Kifer Road  
Sunnyvale, CA 94086

[www.intuitivesurgical.com](http://www.intuitivesurgical.com)

Intuitive Surgical is the global leader in minimally invasive, robotic-assisted surgery. Its da Vinci® System – with a 3D-HD vision system and EndoWrist® instrumentation – enables surgeons to offer a minimally invasive approach for a range of complex procedures. With more than 3,500 systems installed in hospitals worldwide bringing minimally invasive surgery to over 3 million patients to date, the da Vinci System is enabling surgeons to redefine the standard-of-care in a range of specialties: urology, gynecology, head and neck, general surgery, cardiac and thoracic surgery.

## IRCAD Taiwan

No.6-1, Lugong Rd., Lukang Township,  
Changhua County, 505, Taiwan, R.O.C.

[www.aits.tw](http://www.aits.tw)

## JET Surgical

2525 S Telegraph Rd, Suite 306  
Bloomfield Hills, Michigan 48302

[www.jetsurgicaldevices.com](http://www.jetsurgicaldevices.com)

JET Surgical is a women-owned business that manufactures sterile operating room fire and burn safety devices. The JET Safety Holster is made in the USA.

533

## Johnson & Johnson Medical Devices Companies

One Johnson and Johnson Plaza  
Brunswick, NJ 8933

[www.jnj.com/healthcare-products/medical-devices](http://www.jnj.com/healthcare-products/medical-devices)

Having made significant contributions to surgery for more than a century, the Johnson & Johnson Medical Devices Companies are in the business of reaching more patients and restoring more lives. The group represents the most comprehensive surgical technology and specialty solutions business in the world.

## JustRight Surgical

357 S. McCaslin Blvd Suite 120  
Louisville, CO 80027

[www.justrightsurgical.com](http://www.justrightsurgical.com)

JustRight Surgical has redefined minimally invasive surgery. Our 3mm Vessel Sealer, the only electrosurgical device with FDA clearance for pediatrics and our 5mm Stapler, effective in laparoscopic appendectomy, provide greater access, visibility, and efficiency; promoting better patient outcomes. We are the new standard of care in MIS.

## Karl Storz Endoscopia-Latino America

815 NM 57th Ave, Suite 480  
Miami, FL 33126

[www.karlstorz.com](http://www.karlstorz.com)

KARL STORZ Endoscopia Latino America, Inc. is a leader in Minimal Invasive Surgery and offers from mobile compact solutions to high-end video endoscopic systems in HD quality through to individual documentation solutions for the clinic and practice, the portfolio offers a product range that meets all market demands.

The SILVER SCOPE® Series in particular combines advanced technology, ergonomics, and durability to create a video endoscope that sets new standards.

323

712

326

622

4

522

# Exhibitor Profiles

## **KARL STORZ Endoscopy-America, Inc.**

513

Karl Storz Endoscopy-America, Inc.  
2151 E. Grand Ave.  
El Segundo CA 90245  
[www.karlstorz.com](http://www.karlstorz.com)

KARL STORZ is a leading provider of minimally invasive surgical products to support hospital and office-based gynecological procedures. Our technologies include the ENDOCAMELEON® laparoscope, offering a variable direction of view. And, in addition to flexible and rigid hysteroscopes, we offer Minilaparoscopy sets that help reduce trauma by requiring smaller incisions.

## **LEXION Medical**

337

545 Atwater Circle  
St. Paul, MN  
[www.lexionmedical.com](http://www.lexionmedical.com)

LEXION Medical has developed the first and only intelligent CO2 Insufflator (AP 50/30) utilizing real-time intracavitary flow and pressure sensing to deliver the optimum pneumoperitoneum. This system introduces only CO2. The AP 50/30 comprehensive pneumo-management improves surgeon visibility, improves patient pain and recovery time and minimizes overall cost. This is done by delivering CO2 that is warmed (95o F) and humidified (95% RH) with the InsufFlowPort®. The InsufFlowPort® device coordinates function of the AP 50/30 insufflator. CO2 that is 95o F and 95% RH is clinically proven to reduce tissue desiccation, incidence of hypothermia and post-operative pain and nausea improving recovery time and patient outcomes and satisfaction. The AP 50/30 has Standard, Pediatric, Bariatric and High Flow modes. InsufFlowPort® devices are available in 5 mm, 8 mm, 10 mm and 12 mm and Bariatric sizes. LEXION's PneuVIEW® smoke evacuation device is easily incorporated into the AP 50/30 Insufflator set-up. PneuVIEW® is designed to safely remove virtually 100% of all hazardous smoke, gases, smoke by-products, carcinogens and undesirable odors generated during minimally invasive surgery. PneuVIEW® can also be used separately connecting to any and all smoke evacuation sources for robotic or straight stick laparoscopy. The PneuVIEW® smoke evacuator allows customization of flow settings to provide complete control of pneumoperitoneum at all times. LEXION Medical develops and manufactures all products in the USA.

## **LifeLike BioTissue**

2

700 Collip Circle  
Suite 112-113  
London, ON, Canada  
N6G 4X8  
[www.lifelikebiotissue.com](http://www.lifelikebiotissue.com)

LifeLike BioTissue manufactures artificial tissues and organs for medical and surgical training that have the same feel, texture and mechanical properties as real tissues. Our products and custom solutions are sold and marketed to medical, veterinarian, and nursing schools, surgical skills training centers and medical device companies worldwide.

## **Limbs and Things**

632

P.O. Box 15669,  
Savannah, GA 31416, USA  
[www.limbsandthings.com](http://www.limbsandthings.com)

With over 25 years of research and experience in healthcare simulation, Limbs & Things is a leader in the medical education field. Recognized globally for our superior and comprehensive product offering, our trainers provide a realistic hands-on learning experience for academic and clinical professionals. With distributors in over 80 countries, offices in the UK, USA & Australia, and UK manufacturing, Limbs & Things provides hand-crafted, quality task trainers that aid in the improvement of patient outcomes.

## **LIVSMED**

125

304, D-dong, Pangyoro 700, Bundang-gu  
Seongnamsi, Gyeonggi-do, South Korea  
[www.livsmmed.com](http://www.livsmmed.com)

LIVSMED is a medical device manufacturing company in South Korea. We are manufacturing unique articulating laparoscopic instrument. It is newly developed the multi-joint and articulating laparoscopic surgical instrument that can overcome the drawbacks of a straight-type device and allow intuitive manipulation. This product is a manual laparoscopic surgical instrument with intuitive multi-joint function. Product name is ArtiSential.

# Exhibitor Profiles

## Lumendi LLC

Abbey Place  
24 – 28 Easton Street  
High Wycombe  
Buckinghamshire  
HP11 1NT, England  
[www.lumendi.com](http://www.lumendi.com)

Founded in December 2014, Lumendi holds a worldwide exclusive license to certain intellectual property developed by Minimally Invasive New Technologies (MINT), a joint program of Weill Cornell Medical College and NewYork-Presbyterian Hospital. In collaboration with MINT and other partners, Lumendi is developing devices to enable less invasive endolumenal procedures in the GI tract, primarily in the colon. These devices have the potential to replace many invasive laparoscopic and open surgical procedures currently performed in the hospital setting, and may also facilitate performance of these procedures in the outpatient setting. We're also working on additional less invasive techniques that can lead to better patient outcomes and make procedures easier and more comfortable for clinicians.

We partner with leaders in healthcare to understand their needs and the needs of patients, and work to develop new solutions that will improve their lives.

## Mauna Kea Technologies

9 rue d Enghien  
Paris, France 75010  
France  
[www.maunakeatech.com](http://www.maunakeatech.com)

Mauna Kea Technologies is a global medical device company leading innovation in probe-based endomicroscopy (pCLE). Its flagship product Cellvizio, allows real-time cellular and vascular identification during endoscopy. Clinical studies have demonstrated pCLE's ability to help physicians evaluate Barrett's Esophagus and define neoplasia location prior to therapy (K.K. Wang 2015).

331

## MediCapture Inc

2250 Hickory Rd.  
Plymouth Meeting, PA 19462  
[www.medicapture.com](http://www.medicapture.com)

Since 2002, MediCapture has been the leader in designing and manufacturing advanced digital video recorders for the medical industry.

Powered by the new iMave Pro Platform, MediCapture's next-generation digital video recorders offer a new integrated suite of options: 4K clarity, easy-touch screen control, WiFi and networking cloud capabilities.

## Mediflex

250 Gibbs Road  
Islandia, NY 11749  
[www.mediflex.com](http://www.mediflex.com)

Since 1969, Mediflex has been committed to bringing innovative products to the market which optimize work-flow, reduce OR time/costs and enhance patient safety/surgical outcomes. Mediflex's portfolio offers a wide variety of solutions for holding/positioning scopes and instruments, port-free dynamic liver/organ retraction, ergonomic laparoscopic instrumentation/devices as well as includes a full line of table mounted retractor systems.

## Medrobotics

475 Paramount Drive  
Raynham, MA 02767, USA  
[www.medrobotics.com](http://www.medrobotics.com)

Medrobotics Flex® Robotic System is a surgical platform with a steerable and shapeable robotic scope. Surgeons have the ability to navigate complex anatomy while operating in hard-to-reach locations. The Flex® Robotic System received FDA clearances for ENT applications in July 2015, colorectal surgery in May 2017, CE mark in March 2014.

108

227

629

# Exhibitor Profiles

## Medtronic

555 Long Wharf Drive  
New Haven CT 06511

[www.medtronic.com](http://www.medtronic.com)

301

As a global leader in medical technology, services and solutions, Medtronic improves the lives and health of millions of people each year. We use our deep clinical, therapeutic and economic expertise to address the complex challenges faced by healthcare systems today. Let's take healthcare Further, Together. Learn more at Medtronic.com.

## neoSurgical, Inc.

275 Grove Street, Suite 2-400,  
Newton, MA 02466,

[www.neosurgical.com](http://www.neosurgical.com)

526

neoSurgical® is focused on being the global leader in advancing surgical wound healing. The company's neoClose® product brings a simple, intuitive and reliable solution to assist the surgeon in closing Laparoscopic port site defects with up to 75% less tension than conventional closure methods. To learn more, visit [www.neosurgical.com](http://www.neosurgical.com)

## Novuson

11824 North Creek Parkway N.  
Suite 103  
Bothell, WA 98011

[www.novuson.com](http://www.novuson.com)

818

NOVUSON SURGICAL, INC. is a pre-FDA stage Washington corporation developing the world's first Direct Therapeutic Ultrasound, DTU™, surgical instrument platform for endoscopic and minimally invasive surgery. Founded in 2014 by University of Washington Applied Physics Lab researchers, Novuson holds exclusive license to 7 granted US patents, and has developed functional prototypes of the first product systems to be built on the Novuson platform.

Our first product will be the 3MM ULTRASTAT™ MINI LS - The world's first 3mm Mini LS sealer/divider capable of sealing and dividing vessels up to 7mm. Ergonomically designed to fit and function comfortably in both small and large hands.

## Olympus America Inc.

3500 Corporate Parkway  
Center Valley, PA 18034

[www.medical.olympusamerica.com](http://www.medical.olympusamerica.com)

501

Olympus Medical Systems Group, a division of global technology leader Olympus, develops solutions for healthcare professionals that help improve clinical outcomes, reduce overall costs and enhance quality of life for their patients. By enabling less invasive procedures, innovative diagnostic and therapeutic endoscopy, and early stage lung cancer evaluation and treatments, Olympus is transforming the future of healthcare.

## Pacira

11011 N Torrey Pines Rd,  
La Jolla, CA 92037

[www.pacira.com](http://www.pacira.com)

626

Pacira is a specialty pharmaceutical company dedicated to postsurgical innovation. Our flagship product, EXPAREL® (bupivacaine liposome injectable suspension), is a non-opioid medication administered at the time of surgery to control pain and reduce—or in some cases eliminate the need for opioids.

## PenBlade, Inc.

Salt Lake City, UT  
(801) 903-1113

[www.penblade.net](http://www.penblade.net)

630



# Exhibitor Profiles

## PRIMEQUAL

Rue des Pierres du Niton 17  
Geneva, GE 1207  
Switzerland  
[www.primequal.com](http://www.primequal.com)

Talent IH - World's first versatile Adhesive applicator kit

### Intended Use

Primequal Talent IH M.I.S. adhesive applicator kit is a groundbreaking cyanoacrylate micro dosing delivery system developed to allow a safer, faster and solid bonding of surgical mesh.

### Inspiring award-winning design

Talent IH is the first of a next-generation of adhesive applicator designed for surgeons to look into new, simple and reliable solutions to improve patient care and safety.

### Versatile

Talent IH is the world's first versatile adhesive applicator kit. This is because it can be used with multiple glues\*1, it can fix multiple meshes and based on its cumulated skills, it will adapt to any situation.

### Safer

Talent IH innovative patented technology controls the precision and recurrence of the micro dose simply and comfortably. It has the unique ability to produce a Contactless Delivery, administering a dose safely and precisely without being in contact with the mesh or the tissue.

### Faster

Talent IH automatic single button operation enables a faster procedure, including Rapid Multipoint Delivery under time pressure. Micro dosing delivers a thin layer which is an accelerating factor for polymerization of the cyanoacrylates.

### Automatic dose per dose precision

AutoInject patented technology enables Talent IH to deliver a precise micro dose each time the lever is pressed. It is a fully automatic dose per dose delivery from the first to the last dose. AutoInject produces a « click » sound after every dose, enabling the surgeon to effectively monitor the correct dosage: 1 click = 1 dose. The treatment is therefore greatly simplified to a click based procedure.

### No air bubble

Talent IH has been designed to ensure that no air bubble can disturb the procedure.

826

No wastage

Talent IH should be filled with the required dose for the surgery. Liquid path has been optimised to minimise dead space and wastage.

No training required

Talent IH enables surgeons to perform a precise delivery immediately without any training, saving time and money and providing increased comfort and precision for themselves.

Overpressure safety

Talent IH is equipped with an overpressure safety feature that will avoid administering glue incorrectly.

## Queen Charlotte Lodge

219

3600 Lysander Ln #180  
Richmond, British Columbia V7B 1C3  
Canada  
[www.queencharlottelodge.com](http://www.queencharlottelodge.com)

Queen Charlotte Lodge is a luxury Canadian Fishing and Adventure Resort. Located on Haida Gwaii, British Columbia this amazing location hosts guests from the world over that are seeking the ultimate in amenities, service, fishing and an "edge of the earth" experience. You have to see it to believe it!

## ReShape Lifesciences, Inc.

336

236 Avenida Fabricante  
San Clemente, CA 92672  
[www.reshapelifesciences.com](http://www.reshapelifesciences.com)

ReShape Lifesciences is a medical device company focused on technology to treat obesity and metabolic diseases. The FDA-approved ReShape Balloon™ System involves a non-surgical weight loss procedure that uses advanced balloon technology designed to take up room in the stomach to help people with a 30-40 Body BMI, and at least one co-morbidity, lose weight. ReShape vBloc™ Therapy, delivered by an FDA-approved pacemaker-like device called the ReShape vBloc System, is designed to help patients with a 35-45 Body Mass Index (BMI) feel full and eat less by intermittently blocking hunger signals on the vagus nerve. The ReShape Vest™ System is an investigational, minimally invasive, laparoscopically implanted medical device that wraps around the stomach, emulating the gastric volume reduction effect of conventional weight-loss surgery, and is intended to enable rapid weight loss in obese and morbidly obese patients without permanently changing patient anatomy.

# Exhibitor Profiles

## Restech

114 Holmes Rd, Ste 201  
Houston, TX 77045  
[www.restech.com](http://www.restech.com)

Restech's Dx-pH Measurement System™ helps assess acid and non-acid reflux activity, leading to a more personalized, targeted treatment plan. With a 90% PPV for anti-reflux surgery, this tool helps identify surgery candidates. A sensitive microsensor rests in the oropharynx or esophagus, recording pH levels for analysis in our specialized software.

## Richard Wolf Medical Instruments Corporation

353 Corporate Woods Pkwy  
Vernon Hills, IL 60061  
[www.richardwolfusa.com](http://www.richardwolfusa.com)

Richard Wolf Medical Instruments is dedicated to improving patient outcomes through innovation in endoscopy. For over 100 years, Richard Wolf has pursued endoscopic solutions focused on improving surgical results while reducing patients' trauma. In the pursuit of the spirit of excellence, Richard Wolf prides itself on quality and innovation.

## Shire

300 Shire Way  
Lexington, MA 02421  
[www.shire.com](http://www.shire.com)

Shire is the global leader in serving patients with rare diseases. We strive to develop best-in-class therapies across a core of rare disease areas, supplemented by diversified capabilities in highly specialized conditions. We feel a strong sense of urgency to address the high unmet medical needs of these patient communities.

823

## Standard Bariatrics

4362 Glendale Milford Road  
Cincinnati, Ohio 45242  
[www.standardbariatrics.com](http://www.standardbariatrics.com)

Standard Bariatrics is committed to creating superior Bariatric Surgery clinical and economic outcome solutions through the development of a portfolio of medical devices designed specifically for Bariatric Surgeons. We are leading the charge to harmonize the laparoscopic sleeve gastrectomy procedure with the Standard Clamp, an anatomy-based approach to sleeve gastrectomy. This combination of repeatable technique and a purpose-built, disposable device empowers surgeons to plan, visualize, hold, and create consistent sleeve anatomy every time.

## Stryker Endoscopy

2825 Airview Boulevard  
Kalamazoo, MI 49002 USA  
[www.stryker.com](http://www.stryker.com)

Stryker's visualization platform enables you to distinguish anatomy across all minimally invasive procedures, while providing a simple, yet personalized experience. Our long history of innovation and constant development in advanced imaging and OR connectivity is driven by the desire to allow you to see and do more. The 1588 AIM platform demonstrates our focus in a single, multi-specialty solution.

## Suture Ease, Inc.

1735 N. First St, Suite 300  
San Jose, CA 95112  
[www.sutureease.com](http://www.sutureease.com)

Suture Ease develops and markets novel technologies that combine efficacy and ease of use for laparoscopic procedures. The CrossBow Fascial Closure System utilizes an innovative "snare guide" technology to enable reliable port site wound closure.

812

101

6

# Exhibitor Profiles

## Symmetry Surgical

3034 Owen Drive  
Antioch, TN 37013

[www.symmetrysurgical.com](http://www.symmetrysurgical.com)

523

Symmetry Surgical is dedicated to developing high-quality surgical instruments that respond to clinicians' needs as they arise, making a real difference in the lives of patients.

## Synapse Biomedical

300 Artino St.,  
Oberlin, OH 44074

[www.synapsebiomedical.com](http://www.synapsebiomedical.com)

628

Synapse Biomedical Inc., markets the NeuRx Diaphragm Pacing System® a surgically implanted neurostimulator. The system is FDA approved for treating ventilator dependency from high spinal cord injury and chronic hypoventilation from ALS (Lou Gehrig's disease). The system is CE marked for treating respiratory insufficiency outside the US.

## Teleflex

3015 Carrington Mill Blvd.  
Morrisville, NC 27560

[www.teleflex.com](http://www.teleflex.com)

421

Teleflex is a global provider of medical technologies designed to improve the health and quality of people's lives. We apply purpose-driven innovation – a relentless pursuit of identifying unmet clinical needs – to benefit patients and healthcare providers. Our Surgical portfolio provides Percutaneous, Ligation, and Fascial Closure solutions to push the limits of minimally invasive surgery.

## TransEnterix, Inc.

Global Headquarters  
635 Davis Drive Suite 300 Morrisville,  
NC 27560 USA

[www.transenterix.com](http://www.transenterix.com)

131

## Twistle

1617 Boylston Ave  
Seattle, WA 98122

[www.twistle.com](http://www.twistle.com)

214

Twistle is changing the way patients engage with their care. Through clinically validated protocols/pathways/ERAS, and population health initiatives the Twistle platform is automating much of the tedious messaging and ongoing surveillance that is required to help keep patients on track. The automated collection of patient reported outcomes and IoT integrations allow Twistle to shape the way results are captured and reimbursement measures are collected. Twistle, keeping patient on track.

## Via Surgical Ltd

Mitzpe Kineret St. 22/1,  
Amirim 20115, Israel

[www.viasurgical.com](http://www.viasurgical.com)

804

Via Surgical Ltd. provides next-generation fixation for hernia repair. Realizing that many hernia repairs make use of multiple means for mesh fixation – anchor/helical hernia tacks, manually applied transfascial sutures – Via Surgical has developed its FasTouch™ system to provide deployable transfascial suture fixation that is strong and consistent, yet easily and rapidly deployed.

## Wolters Kluwer

2001 Market Street  
Philadelphia, PA 19103

[www.wolterskluwer.com](http://www.wolterskluwer.com)

216

Wolters Kluwer Health is a leading global provider of information and point of care solutions for the healthcare industry. Our solutions are designed to help professionals build clinical competency and improve practice so that healthcare organizations can succeed in value-based care delivery models. Product solutions include Lippincott, Ovid®, and UpToDate®

# Exhibitor Profiles

## **Xenocor Incorporated**

220

630 Komas #200

Salt Lake City, Utah 84108

[www.xenocor.com](http://www.xenocor.com)

Xenocor's revolutionary Xenoscope with Clear View Technology provides unparalleled surgical imaging and safety. Xenoscope-CVT's HD-imaging system offers universal plug-and-play monitor connectivity. The Xenoscope-CVT sees through cautery smoke and eliminates fogging, scope-arc-injuries and burns. Our reimbursable, single-use, low-cost Xenoscope-CVT also eliminates scope cross-contamination, service contracts, reprocessing delays, light-cord use and white-balancing.

# 2018 IPEG/SAGES Learning Center

OPEN DURING EXHIBIT HALL HOURS IN HALL 4 A/B THURSDAY & FRIDAY 10:00 am – 4:00 pm

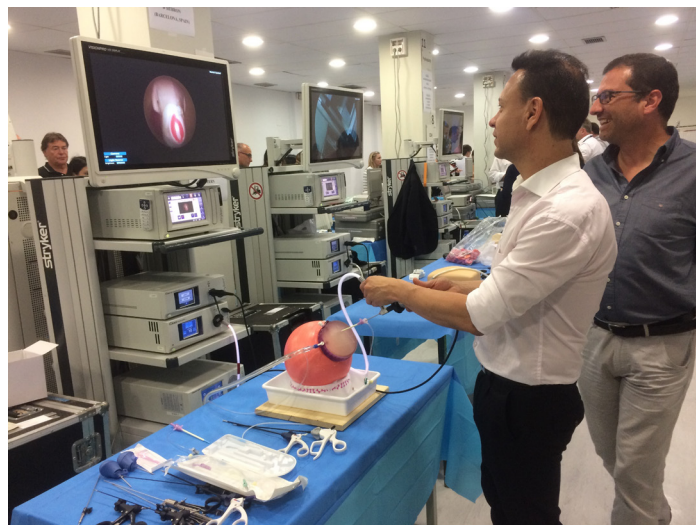
IPEG ACKNOWLEDGES ETHICON, JUSTRIGHT SURGICAL & KARL STORZ ENDOSCOPY FOR THEIR IN KIND SUPPORT OF THE LEARNING CENTER

## FEATURED IPEG STATIONS:



### FETOSCOPIC MODEL OF MYELOMENINGOCELE REPAIR

Station Coordinator: **Carlos Gine, MD**  
Hospital Universitari Vall d'Hebron  
Barcelona, Spain



The fetoscopic approach of myelomeningocele, although controversial, is becoming more and more popular among the groups performing fetal surgery and will probably be the standard of care in the near future. However, this procedure requires expertise not only in the endoscopic technique but also in particular aspects of treating and entering the uterus. For this reason and for the lack of suitable patients in highly developed countries we have designed this model to discover, get deeper and optimize the performance of a highly realistic fetoscopic closure of the myelomeningocele.

To confine the training model, we divide it in three parts:

1. Video surgery equipment and 2 and 3 mm instruments.
2. The designed uterus with capability to infuse warm CO2 and introduce the cannulas in the way as we exactly do in real surgery.
3. The designed 24 weeks fetus with myelomeningocele-like defect in which several techniques can be practiced, like direct skin closure or the reconstruction with synthetic patches after the meticulous dissection of the placode.

This model is designed for groups with an already consistent expertise in fetal medicine, as the procedure is just one small part of a complex process that requires a highly specific pre and postoperative infrastructure and care.

### Background

Barcelona. European Symposium & Hands on Course in Pediatric, Neonatal and Fetal MIS. Hospital Universitari Vall d'Hebron. April 2017.

London. IPEG's 26th Annual Congress for Endosurgery in Children. July 19-22, 2017. Learning Center.



### PEDIATRIC LAPAROSCOPIC SURGERY (PLS) SIMULATOR

Station Coordinator: **Georges Azzie, MD**  
Toronto, Canada

The Pediatric Laparoscopic Surgery (PLS) simulator has been developed over several years, the emphasis being on tasks proven to benefit in the performance of Minimal Access Surgery (MAS) and for which construct validity (the ability to differentiate between novices, intermediates and experts) has been established.

The model is a box trainer tailored to represent the size constraints (limited domain) faced by a pediatric surgeon. Performance with regard to time for completion and precision on individual tasks, as well as total score, allow one to discriminate between novice, intermediate and expert. The simulator's simple design makes it very practical, whether using the validated tasks or a model of your choice.



The development of hardware and software to allow the analysis of motion and force during the performance of defined tasks are the latest innovations. We will highlight some of the capabilities with regard to the analysis of force, and discuss possible educational implications regarding the teaching and assessment of technical skills.

# 2018 IPEG/SAGES Learning Center

OPEN DURING EXHIBIT HALL HOURS IN HALL 4 A/B THURSDAY & FRIDAY 10:00 am – 4:00 pm

## FEATURED IPEG STATIONS:



HIGH-FIDELITY SIMULATOR FOR THORACOSCOPIC REPAIR OF OESOPHAGEAL ATRESIA/TRACHEO-OESOPHAGEAL FISTULA

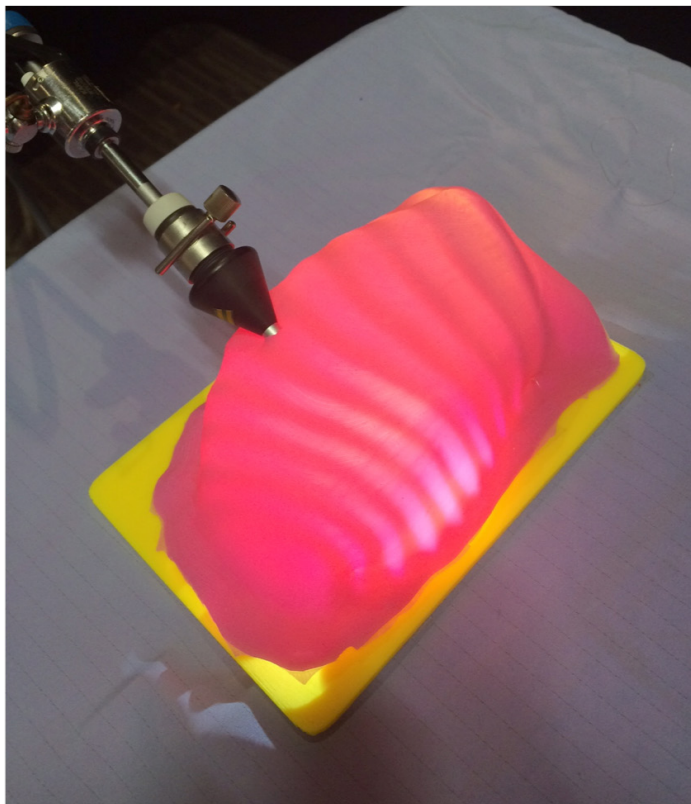
Station Coordinator: Jonathan Wells, MD  
Christchurch Hospital  
Canterbury, New Zealand

Minimally invasive surgery (MIS) is beneficial for patients as it reduces post-operative pain and the need for large incisions, as well as providing a magnified operative view – a particular advantage in neonatal surgery. However, MIS is challenging within the neonatal thoracic cavity due to the small working space available.

The operative steps of the MIS approach can be practiced on a simulator. There are no commercially available models for the neonatal thoracic cavity so we have developed our own.

We would like to share our medium-fidelity simulator for thoracoscopic repair of oesophageal atresia/ tracheo- oesophageal fistula. Fidelity of scale was attained using ribcage data from a neonatal chest CT scan and designing and printing a 3-D model of the chest wall. A silicone skin replicating the “feel” of the soft tissue of the neonate covers the model. In designing the internal structures of the model we aimed to avoid the use of animal tissues to alleviate the philosophical, ethical, cost and logistic issues around animal tissue use. 3-D printing technology allowed accurate replication of the anatomy of OA/TOF to scale using silicone. We are in the process of developing a double layer insert to replicate the mucosal and muscular layers of the oesophagus.

We are soon to trial our first iteration of a specific force and movement tracking device for this model. The learning objectives for delegates would be to practice performing some or all of the steps of OA/TOF repair within the confines of the neonatal thoracic cavity using our model.



REPAIR OF SMALL INTESTINAL ATRESIA WITHIN LAPAROSCOPIC TRAINER BOX

Station Coordinator: Karen Diefenbach, MD  
Nationwide Children’s Hospital  
Columbus, Ohio

Molded silicone bowel is used to simulate repair of small intestinal atresia within a laparoscopic trainer box. Learners will be presented with dilated proximal and narrow-caliber distal segments and will employ a combination of bowel tailoring, side-to-side, functional end-to-end anastomosis or end-to-end anastomosis. Technique and tool selection will encompass hand-sewn and stapled methods, to suit the learner’s interest and skill set.



# 2018 IPEG/SAGES Learning Center

OPEN DURING EXHIBIT HALL HOURS IN HALL 4 A/B THURSDAY & FRIDAY 10:00 am – 4:00 pm

## FEATURED IPEG STATIONS:



PEDIATRIC LAPAROSCOPIC PYELOPLASTY (THREE IN ONE)  
SIMULATOR BOX 1 – Suture, Dissection, Intra and extracorporeal knots  
SIMULATOR BOX2 – Transference  
Station Coordinator: Carolina Millan, MD  
Fundacion Hospitalaria Children's Hospital

In minimally invasive surgery, basic simulators constitute the first step in the learning process of surgical trainees. They promote the acquisition of abilities, temporospatial orientation and technical proficiency in a safe, controlled and standardized environment, avoiding the possibility of harming the patient. The purpose of simulation consists in that acquired abilities may be transferred to the operation room thus decreasing the learning curve.

We present an original idea that includes a single simulation box (MT-BOX1) with several exchangeable, low cost, simulation models.

Simulators are divided in two groups:

Group A. Suture. Dissection. Intra and extracorporeal knots. Group B. Transference.

A major characteristic is cost:

- Simulation Box: USD 60 each.
- Simulators Group A: USD 1 each.
- Simulators Group B: USD 5 each.

These simulators are being submitted to a validation process and promise to be a useful tool for basic simulation.

### Pediatric Laparoscopic Pyeloplasty (three in one)

Inanimate models provide a safe environment by increasing technical performance and cognitive knowledge of surgical procedures without compromising patient's safety. This is the main reason for their rising popularity amongst pediatric urologists and surgeons.

We have designed a novel simulator of ureteral pyeloplasty in pediatrics, with a particularity that makes it unique because it allows to exchange three different models of this pathology in the same training box (MT-BOX1).

1. Intrinsic pyeloureteral stenosis.
2. Abnormal ureteral insertion.
3. Pyeloureteral stenosis per polar vessel.

This simulator targets the acquisition of cognitive and psychomotor skills necessary in the performance of a pediatric laparoscopic pyeloplasty. It is a low-cost model that strives to reproduce the anatomic features of the procedure, thus promoting the development of familiarity with the operation, and the development of the technical skills required to perform it.

Other important features of the model:

1. Portable, can be moved to any training place.
2. Low cost, materials have a fabrication value of 10 USD approximately.
3. Lightweight, ergonomic and animated.
4. It uses instruments of 3 mm, 20 cm of laparoscopy.

Further development and validation are still needed to assess its true benefits though.



# Complete Schedule



## PRE-MEETING COURSE

8:00 am – 5:00 pm

**MASTERY LEARNING\* SERIES HANDS ON CLASS & LECTURE** NON CME

LEVEL 4 - HALL 4F

**Thoracoscopic Lobectomy and Thoracoscopic Esophageal Atresia with Tracheoesophageal Fistula Repair**

CHAIR: Katherine Barsness, MD

CO-CHAIR: Manuel Lopez, MD

*IPEG THANKS KARL STORZ ENDOSCOPY AND JUSTRIGHT SURGICAL FOR THEIR SUPPORT OF THE MASTERY LEARNING SERIES*

**DESCRIPTION:** This course is designed for pediatric surgeons seeking advanced minimally invasive skills for thoracoscopic lobectomy and tracheoesophageal fistula repair. Participants will dive deep into the specific skills and techniques of expert minimally invasive pediatric surgeons – spending a total of 8 hours concentrating on two advanced operations. Participant to faculty ratio will be 2:1 – and all participants will receive personalized instruction, feedback and debriefing – according to their individual knowledge and skills. Participants will be provided with a detailed curriculum prior to the course – including relevant videos of specific skills and techniques. At the end of the all-day course, participants will discuss opportunities to continue advancing their skills with their instructors – with individualized plans provided to each participant.

\*Mastery learning is an educational approach that has two central tenets, first, educational excellence is expected and can be achieved by all learners, and second, little or no variation in measured outcomes will be seen among learners in a mastery environment. While achievements are expected to be equivalent among learners, the time to achieve mastery is not uniform. Some learners will take longer than others to achieve a mastery level of performance.

### FACULTY:

Suad Abul, MD; Maria Marcela Bailez, MD; Juan Calisto, MD; Matthew Clifton, MD; Karen Diefenbach, MD; Alex Dzakovic, MD; Samir Gadepalli, MD; Carlos Giné, MD; Charles M. Leys, MD; Maximiliano Maricic, MD; Carolina Millan, MD; Go Miyano, MD; Nathan Novotny, MD; Matthijs Oomen, MD; Samir Pandya, MD; Dariusz Patkowski, MD; Eduardo Perez, MD; Drew Rideout, MD; Sameh Shehata, MD; Stefan Scholz, MD; Karen Elizabeth Speck, MD; Philipp Szavay, MD; Holger Till, MD



5:30 pm – 7:30 pm

**Welcome Reception in conjunction with SAGES & CAGS** NON CME

LEVEL 4 - HALL 4 A/B

**IPEG MASTERY LEARNING SERIES** *In collaboration with Karl Storz Endoscopy - America and Just Right Surgical*

**Missed us in Seattle?  
Catch the next Mastery  
Learning Course this summer!**

**August 23-24, 2018**

**Emory Conference Center in Atlanta, GA**

*Chairs: Matt Clifton & Samir Pandya*

### GENERAL AGENDA:

*Thursday, August 23<sup>rd</sup>*

7:00pm - 9:00 pm Arrivals and Welcome Dinner

*Friday, August 24<sup>th</sup>*

8:00am - 9:00am Breakfast

9:00am - 6:00pm Lectures & Hands on Course

### Registration Fee \$1200

*Includes:*

(2) nights shared lodging (Thursday and Friday)

Welcome dinner, breakfast, lunch, and snacks during breaks

*Registration opens soon! To reserve a seat please contact Jacqueline Narváez (jacqueline@ipeg.org)*



# Complete Schedule

## IPEG'S 27<sup>th</sup> ANNUAL CONGRESS

7:30 am – 8:30 am

### SCIENTIFIC VIDEO SESSION I

MODERATORS: Saleem Islam, MD &amp; Pablo Laje, MD

TAHOMA LEVEL 3 Room 303/304

**V001 LAPAROSCOPIC-ASSISTED ANORECTAL PULL-THROUGH FOR HIGH IMPERFORATE ANUS IN A FEMALE** [Sophia Abdulhai, MD<sup>1</sup>](#), Steve Rothenberg, MD<sup>2</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Rocky Mountain Hospital for Children

**V002 THORACOSCOPIC RESECTION OF LARGE THYMIC CYST EXTENDING INTO THE LEFT NECK** [Sophia Abdulhai, MD](#), Scott Boulanger, MD, Avraham Schlager, MD; Akron Children's Hospital

**V003 MANAGEMENT OF VARIATIONS IN CHOLEDOCHAL CYST ANATOMY DURING LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION IN CHILDREN** Ashwin Pimpalwar, MD<sup>1</sup>, [Danielle Severns<sup>2</sup>](#); <sup>1</sup>Division of Pediatric Surgery, Department of Surgery, University of Missouri and Children's Hospital University of Missouri, Columbia, Missouri, <sup>2</sup>University of Missouri School of Medicine, Columbia, Missouri

**V004 LAPAROSCOPIC HAND-ASSISTED BILATERAL ADRENALECTOMY FOR CARNEY COMPLEX IN A CHILD** [Richard E Overman, MD](#), Christa Grant, MD, Peter Ehrlich, MD, K. Elizabeth Speck, MD; University of Michigan

**V005 VALIDATION OF THE FIRST PEDIATRIC LAPAROSCOPIC SIMULATOR OF LICH-GREGOIR URETERAL REIMPLANTATION TECHNIQUE (LAP SPUR)** [Carolina Millan, MD](#), Manuel Lopez, MD, Jorge L Martinez, MD, Luzia Toselli, MD, Fernando Rabinovich, MD, Soledad Valverde, MD, Santiago Calello, MD, Horacio Bignon, Enrique Buella, MD, Gaston Bellia, MD, Maximiliano Maricic, MD, Marcelo Martinez Ferro, MD; Fundacion Hospitalaria Children's Hospital

**V006 LAPAROSCOPIC LIGATION OF MIDDLE SACRAL ARTERY AND DISSECTION OF SACROCOCCYGEAL TERATOMA TO DECREASE INTRAOPERATIVE HEMORRHAGIC RISK** [Gustavo Villalona, MD, FACS, FAAP](#), Armando Salim Munoz Abraham, MD, MBEE, Saurabh Saxena, MD, Hector Osei, MD, Rachele Damle, MD, MS, Clint Cappiello, MD; Saint Louis University

**V007 SUBPLEURAL PLACEMENT OF ELASTOMERIC PAIN CATHETERS IN PECTUS EXCAVATUM SURGERY** [Amir Alhajjat, MD](#), Lisa McMahon, MD; Phoenix Children's Hospital

**V008 ROBOTIC REPAIR OF LATE PRESENTATION CONGENITAL DIAPHRAGMATIC HERNIAS: A CASE SERIES** [Shelby D Flanagan<sup>1</sup>](#), Mohamed Arafah, MD<sup>2</sup>, Michael J Leinwand, MD<sup>3</sup>; <sup>1</sup>Western Michigan University, <sup>2</sup>Western Michigan University, Homer Stryker M.D. School of Medicine, <sup>3</sup>Bronson Children's Hospital

**V009 PERCUTANEOUS EMBOLIZATION AND LAPAROSCOPIC LIGATION OF A CONGENITAL UMBILICAL ARTERIOVENOUS MALFORMATION** [Phillip B Ham, MD, MS<sup>1</sup>](#), Spencer R Anderson, MD<sup>2</sup>, Lucas P Neff, MD<sup>3</sup>, Anne E Gill, MD<sup>4</sup>, C Matthew Hawkins, MD<sup>4</sup>, Amina M Bhatia, MD, MS<sup>3</sup>; <sup>1</sup>Medical College of Georgia at Augusta University, <sup>2</sup>Mercer University School of Medicine, <sup>3</sup>Division of Pediatric Surgery, Department of Surgery, Emory University School of Medicine, Children's Healthcare of Atlanta, <sup>4</sup>Division of Interventional Radiology, Department of Radiology, Emory University School of Medicine, Children's Healthcare of Atlanta

**V010 LAPAROSCOPIC CONVERSION OF PRIOR REVERSED GASTRIC TUBE FOR ESOPHAGEAL ATRESIA TO ROUX-EN-Y TO CORRECT GASTRIC OUTLET OBSTRUCTION** [Andrew T Strong, MD<sup>1</sup>](#), Jeffrey L Ponsky, MD<sup>1</sup>, Matthew Kroh, MD, FACS<sup>2</sup>, John Rodriguez, MD<sup>1</sup>; <sup>1</sup>Cleveland Clinic, <sup>2</sup>Cleveland Clinic Abu Dhabi

8:30 am – 9:45 am

### SCIENTIFIC SESSION: Basic Science and Innovation

MODERATORS: Lena Perger, MD &amp; Katherine Barsness, MD

TAHOMA LEVEL 3 Room 303/304

**S001 MASTERY LEARNING FOR PEDIATRIC SURGEONS: THE CORRELATION BETWEEN BASELINE ADVANCED SKILL METRICS AND SUMMATIVE PERFORMANCE** [Katherine A Barsness, MD, MS<sup>1</sup>](#), Philipp Szavay, MD<sup>2</sup>, Holger Till, MD<sup>3</sup>, Maria Marcela Bailez, MD<sup>4</sup>; <sup>1</sup>Lurie Children's Hospital, <sup>2</sup>Children's Hospital Lucerne, <sup>3</sup>Vorstand der Univ.Klinik für Kinder- und Jugendchirurgie, <sup>4</sup>Garrahan Children's Hospital

**S002 EVALUATION OF AN ADVANCED NEONATAL MINIMALLY INVASIVE SKILLS COURSE: ENHANCING EDUCATIONAL OPPORTUNITIES FOR PEDIATRIC SURGICAL TRAINEES** [Lauren M Baumann, MD](#), Katherine A Barsness, MD; Ann & Robert H. Lurie Children's Hospital

**S003 OVARIAN TISSUE HEALTH AFTER LAPAROSCOPIC UNILATERAL OOPHORECTOMY: A PORCINE MODEL FOR ESTABLISHING OPTIMIZED FERTILITY PRESERVATION TECHNIQUES IN CHILDREN** [Kristine S Corkum, MD](#), Kelly A Even, Monica M Laronda, PhD, Erin E Rowell, MD; Ann & Robert H. Lurie Children's Hospital of Chicago

**S004 ARE CARDIAC ANOMALIES AND PERSISTENT FETAL CIRCULATION A RISK FACTOR FOR CARDIOVASCULAR EVENTS DURING MINIMALLY INVASIVE SURGERY IN NEONATES? -PERSONAL EXPERIENCE AND REVIEW OF THE LITERATURE** [Christine Burgmeier, Dr<sup>1</sup>](#), Felix Schier, Prof, Dr<sup>2</sup>; <sup>1</sup>Department of Surgery, Alb Fils Kliniken, Göppingen, <sup>2</sup>Department of Pediatric Surgery, University Center Mainz, Germany

# Complete Schedule

**S005 THE IMPACT OF SIMULATOR SIZE ON THE FORCES MEASURED IN THE PERFORMANCE OF A DEFINED INTRA-CORPOREAL SUTURING TASK: A PILOT STUDY** [Aodhnait S Fahy, MD, PhD<sup>1</sup>](#), Luai Jamal, MD<sup>1</sup>, Bojan Gavrilovic, PhD<sup>2</sup>, Brian Carillo, PhD<sup>2</sup>, Justin T Gerstle, MD<sup>1</sup>, Ahmed Nasr, MD<sup>3</sup>, Georges Azzie, MD<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>University of Toronto, <sup>3</sup>Children's Hospital of Eastern Ontario

**S006 ANALYSIS OF FORCE IN SIMULATORS OF SMALLER DOMAIN ALLOW GREATER DISCRIMINATION BETWEEN PARTICIPANTS OF VARYING EXPERTISE: IMPLICATIONS FOR EDUCATION.** [Aodhnait S Fahy, MD, PhD<sup>1</sup>](#), Luai Jamal, MD<sup>1</sup>, Bojan Gavrilovic, PhD<sup>2</sup>, Brian Carillo, PhD<sup>2</sup>, Justin T Gerstle, MD<sup>1</sup>, Ahmed Nasr, MD<sup>3</sup>, Georges Azzie<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>University of Toronto, <sup>3</sup>Children's Hospital of Eastern Ontario

**S007 SHOULD WE REFINER THE TRADITIONAL METHODOLOGY OF DEFINING LAPAROSCOPIC EXPERTISE?** [Aodhnait S Fahy, MD, PhD<sup>1</sup>](#), Luai Jamal, MD<sup>1</sup>, Bojan Gavrilovic, PhD<sup>2</sup>, Brian Carillo<sup>2</sup>, Justin T Gerstle, MD<sup>1</sup>, Ahmed Nasr, MD<sup>3</sup>, Georges Azzie<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>University of Toronto, <sup>3</sup>Children's Hospital of Eastern Ontario

**S008 A SYSTEMATIC REVIEW OF SIMULATION-BASED TRAINING IN PEDIATRIC SURGERY** [Shinichiro Yokoyama<sup>1</sup>](#), Yo Kurasima<sup>1</sup>, Kenichi Mizunuma<sup>1</sup>, Yusuke Watanabe<sup>1</sup>, Tomoko Mizota<sup>1</sup>, Saseem Poudel<sup>2</sup>, Toshiaki Shichinohe<sup>1</sup>, Satoshi Hirano<sup>1</sup>; <sup>1</sup>Department of Gastroenterological surgery II, Hokkaido University Graduate School of Medicine, <sup>2</sup>Department of Surgery, Steel Memorial Muroran Hospital

**S009 TRANSMEMBRANE G PROTEIN-COUPLED RECEPTOR (TGR5) MAY WORK IN OPPOSITION TO THE EFFECTS OF NUCLEAR FARNESOID X RECEPTOR (FXR) IN THE SMALL INTESTINE** [Michael Mallicote, MD](#), Oswaldo Escobar, BS, Avafia Dossa, MD, Christopher Gayer, MD, PhD; Children's Hospital Los Angeles

**S010 CAN REVIEW OF INTRAOPERATIVE VIDEO RECORDINGS IMPROVE SURGICAL TECHNIQUE? A PILOT STUDY USING LAPAROSCOPIC PERCUTANEOUS EXTRAPERITONEAL CLOSURE IN CHILDREN WITH INGUINAL HERNIA.** [Go Miyano, MD<sup>1</sup>](#), Katsuhiko Tabata, MD<sup>1</sup>, Katherine A Barsness, MD<sup>2</sup>, Toshiaki Takahashi, MD<sup>3</sup>, Nana Nakazawa-Tanaka, MD<sup>4</sup>, Junichi Kusafuka, MD<sup>5</sup>, Koji Fukumoto, MD<sup>3</sup>, Eiji Miyazaki, MD<sup>5</sup>, Geoffrey J Lane, MD<sup>1</sup>, Tadaharu Okazaki, MD<sup>6</sup>, Masahiko Urao, MD<sup>4</sup>, Naoto Urushihara, MD<sup>3</sup>, Atsuyuki Yamataka, MD<sup>1</sup>; <sup>1</sup>Juntendo University School of Medicine, <sup>2</sup>Ann and Robert H. Lurie Children's Hospital of Chicago, <sup>3</sup>Shizuoka Children's Hospital, <sup>4</sup>Juntendo Nerima Hospital, <sup>5</sup>Seirei Hamamatsu General Hospital, <sup>6</sup>Juntendo Urayasu Hospital

**S011 LAPAROSCOPY CAN ASSIST SURGICAL DECISION-MAKING IN NECROTIZING ENTEROCOLITIS.** [Kristine Bach Korsholm Knudsen, MD<sup>1</sup>](#), Joergen Mogens Thorup, Professor<sup>1</sup>, Thomas Thymann, Master, PhD<sup>2</sup>, Rune Strandby, MD<sup>1</sup>, Nikolaj Nerup, MD<sup>1</sup>, Michael Achiam, MD, PhD<sup>1</sup>, Per Torp Sangild, Professor<sup>2</sup>, Torsten Lauritsen<sup>1</sup>, Inge Boetker Rasmussen Ifaoui, MD, PhD<sup>1</sup>; <sup>1</sup>Rigshospitalet, University Hospital of Copenhagen, <sup>2</sup>University of Copenhagen

**S012 PERSONAL LEARNING STYLE MAY AFFECT THE ABILITY TO LEARN LAPAROSCOPIC SURGERY: A PRELIMINARY STUDY** [Giuseppe Retrosi, MD, MEd<sup>1</sup>](#), Melanie Morris, MD, MSc<sup>1</sup>, Jonathan McGavock, PhD<sup>2</sup>; <sup>1</sup>Department of Surgery, Division of Pediatric Surgery, Health Sciences Centre Children's Hospital of Winnipeg, University of Manitoba, Winnipeg, Manitoba, Canada, <sup>2</sup>Department of Pediatrics, University of Manitoba, Winnipeg, Manitoba, Canada

8:30 am – 9:45 am

**QUICKSHOT 1** NON CME

TAHOMA LEVEL 3 Room 305

MODERATORS: David Rothstein, MD &amp; Nicole Chandler, MD

**QS001 LAPAROSCOPIC VERSUS OPEN SURGICAL MANAGEMENT OF ADHESIVE BOWEL OBSTRUCTION IN CHILDREN: A RETROSPECTIVE STUDY COMPARING THE OUTCOMES AT A TERTIARY CARE CENTER FOR PEDIATRIC SURGERY.** [Sunil Kumar, MBBS, MS, MRCS, MCh, Pediatric Surgery](#), Yousuf Khan, MBBS, FICS, FCPS, Pediatric Surgery, Vipul Gupta, MBBS, MS, MCh Pediatric Surgery, Aisha Khan, MD, MSc, Pediatric Surgery, Suad Abul, FRCSC, Abdulla Ali, FRCSC, Esmaeel Taqi, FRCSC, Ashraf Alkholi, MD; Ibn Sina Hospital Kuwait

**QS002 TWO-STAGE THORACOSCOPIC REPAIR OF LONG GAP ESOPHAGEAL ATRESIA, WITHOUT TEMPORARY GASTROSTOMY** [Bartosz Bogusz, MD<sup>1</sup>](#), Dariusz Patkowski, Prof<sup>2</sup>, Sylwester Gerus, MD<sup>2</sup>, Marcin Maslanka, MD<sup>1</sup>, Wojciech Górecki, Prof<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Jagiellonian University Medical College, in Kraków, <sup>2</sup>Department of Pediatric Surgery and Urology, Medical University, Wrocław

**QS003 COMPLICATIONS ASSOCIATED WITH SURGICAL TECHNIQUE USED FOR PERITONEAL DIALYSIS CATHETER PLACEMENT** Diana Alejandra Holguin Sanabria, MS<sup>1</sup>, [Ivan Darío Molina Ramírez, MSc<sup>2</sup>](#), Lorena Lamprea, MD<sup>1</sup>; <sup>1</sup>Hospital de la Misericordia, <sup>2</sup>Universidad Nacional de Colombia

**QS004 THORACOSCOPIC CLOSURE OF TRACHEOESOPHAGEAL N-FISTULAS - A SERIES OF 4 CASES** [Anne-Sophie Holler, MD](#), Christina Oetzmann von Sochaczewski, MD, Oliver J Muensterer, MD, PhD; Department of Pediatric Surgery, University Medical Center of the Johannes Gutenberg University Mainz

**QS005 THORACOSCOPIC PULMONARY LOBECTOMY FOR DENSELY FUSED PULMONARY LOBES IN CHILDREN WITH CPAM: TECHNICAL TIPS.** [Hiroyuki Koga, MD](#), Hiroki Nakamura, MD, Hiroshi Murakami, MD, Geoffrey J Lane, MD, Manabu Okawada, MD, Go Miyano, Takanori Ochi, MD, Atsuyuki Yamataka, MD; Department of Ped Surgery, Juntendo University

**QS006 MODIFICATION TO LAPAROSCOPIC INGUINAL HERNIA REPAIR: THE DOUBLE NEEDLE TECHNIQUE** [Adam Mezziani, MD](#), Richy Lee, MD, Rob Weinsheimer, Angela M Hanna, MD; Swedish Medical Center

# Complete Schedule

**QS007 COMPARATIVE EVALUATION OF TAN S, MARVEN S AND MODIFIED MARVEN S APPROACHES USING MYRINGOTOMY KNIFE IN OF LAPAROSCOPIC PYLOROMYOTOMY** Ahmed Abo Elyazid, MCh, Mohamed Shalaby, MD, AbdelMotalieb Effat, MD, Ahmed Eissa, MD, [Sherif M Shehata, MCh, CST, MD, PhD](#); Section of Pediatric Surgery, Faculty of Medicine, Tanta University, Tanta, Egypt

**QS008 LAPAROSCOPIC-ASSISTED PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IS RECOMMENDED FOR OLDER PATIENTS AND PATIENTS WITH SEVERE SCOLIOSIS** [Shinya Takazawa, MD, PhD](#), Akira Nishi, MD, Yukiko Tani, MD, PhD, Tsubasa Goshima, MD, Yasuyuki Uchida, MD; Gunma Children's Medical Center

**QS009 THE COMPARISON OF THE TREATMENT OF THE OPENING SURGERY VERSUS LAPAROSCOPIC SURGERY OF THE DUODENAL OBSTRUCTION IN NEONATAL PATIENTS** [Jingbin Du, Drpediatric surgern](#); Captial Medical Science College, beijing Children's Hospital

**QS011 CLINICAL APPLICATION OF THORACOSCOPIC SURGERY ON LATE-PRESENTING CONGENITAL DIAPHRAGMATIC HERNIA IN CHILDREN** [Miao Yuan](#); Department of pediatric surgery, West China Hospital of Sichuan University

**QS012 SINGLE-INCISION LAPAROSCOPIC REPAIR FOR INTRAOPERATIVE DUODENAL INJURY IN CHILDREN WITH CHOLEDOCHAL CYSTS** [Mei Diao, Professor, Doctor](#), Long Li, Professor, Doctor; Department of Pediatric Surgery, Capital Institute of Pediatrics

**QS013 LAPAROSCOPIC TREATMENT FOR ABERRANT HEPATIC DUCT IN CHILDREN WITH CHOLEDOCHAL CYSTS** [Mei Diao, Professor, Doctor](#), Long Li, Professor, Doctor; Department of Pediatric Surgery, Capital Institute of Pediatrics

**QS014 LAPAROSCOPIC ADRENALECTOMY OF ADRENAL MASSES > 5 CM IN SIZE: A SINGLE-CENTRE EXPERIENCE WITH 7 PEDIATRIC PATIENTS** [Jiangbin Liu](#); Shanghai Children's Hospital

**QS015 EFFICACY OF TOPICAL MITOMYCIN C FOR TREATING REFRACTORY CAUSTIC ESOPHAGEAL STRICTURES IN CHILDREN: A PROSPECTIVE CLINICAL TRIAL** Ahmed Wishahy, MD, Omar Mansor, MD, [Wesam Mohamed, MD](#), Khaled Salah, MSc, Mohamed Qinawy, MBChC; Cairo University Specialized Pediatric Hospital

**QS016 MINIMALLY INVASIVE SURGERY (MIS) CORRECTION OPPORTUNITY FOR BOCHDALEK-TYPE CONGENITAL DIAPHRAGMATIC HERNIA (CDH) WITH PRENATAL COUNSELLING AND PERINATAL INTENSIVE CARE.** [H.C Yang, MD](#), C Cannizzaro, MD, T Mazzuchelli, MD, A Reusmann, MD, M Boglione, P Nemer, J Chichizola, G Falcioni, L Senyk, M Barrenechea, G Goldsmit, M Bailez; Garrahan Children's Hospital

**QS017 ESOPHAGEAL STENTS PLACED IN CHILDREN WITH ESOPHAGEAL ATRESIA - A CASE SERIES AND SYSTEMATIC REVIEW** [Oliver J Muensterer, MD, PhD](#); University Medicine Mainz, Germany

**QS018 APPROPRIATE SKILLS AND TIMING OF SURGERY FOR NEONATES WITH CONGENITAL HIATAL HERNIA: A SINGLE-CENTER EXPERIENCE** [Lishuang Ma, MD](#), Cuizhu Feng, Yue Zhang, Ying Wang, Yanxia Zang, Chao Liu, Yandong Wei, Simiao Yu, Jingna Li; Capital Instiute of Pediatrics, Peking University Teaching Hospital

**QS019 HYPERINSULINEMIC HYPOGLYCEMIA OF INFANCY [LAPAROSCOPIC PANCREATECTOMY] MANSOURA EXPERIENCE** [Adham Elsaied, MD, PHD](#), Mohamed Sherbiny, MD, PHD, Mohamed El-Gazaly, MD, PHD, Ashraf Sharkawy, MD, PHD; Mansoura University Children Hospital, Mansoura, Egypt

**QS020 SEOS: A NON-CT-RELIANT INDEX FOR EVALUATING PECTUS EXCAVATUM** Nahom Kidane, MS<sup>1</sup>, Mohammad F Obeid, MS<sup>1</sup>, Robert E Kelly, MD<sup>2</sup>, Qi Zeng, MD<sup>3</sup>, Chenghao Chen, MD<sup>3</sup>, Frederic D McKenzie, PhD<sup>1</sup>, [Michael J Goretsky, MD, FACS, FAAP<sup>2</sup>](#); <sup>1</sup>Old Dominion University, <sup>2</sup>Children's Hospital of The King's Daughters, <sup>3</sup>Beijing Children's Hospital

**QS021 MID-TERM RESULTS OF LAPAROSCOPIC REPAIR FOR CONGENITAL DUODENAL ATRESIA AND STENOSIS.** [Phi Duy Ho, MD<sup>1</sup>](#), Thanh Tri Tran, MD<sup>1</sup>, Thien Kim Lam, MD<sup>1</sup>, Hai Trung Bui<sup>1</sup>, Tan Son Le, Assoc Prof<sup>2</sup>, Tan Cuong Nguyen, Assoc Prof<sup>2</sup>; <sup>1</sup>Children's Hospital No.2, <sup>2</sup>University of Medicine and Pharmacy at HCM city

**QS022 THORACOSCOPIC ANATOMICAL SEGMENTECTOMY FOR ADENOID CYSTIC CARCINOMA OF THE PERIPHERAL LUNG: A CASE REPORT.** [Makoto Suzuki, MD, PhD<sup>1</sup>](#), Ryota Koyama, MD<sup>1</sup>, Yasuyuki Uchida, MD<sup>1</sup>, Kenjiro Ogushi, MD<sup>1</sup>, Sayaka Otake, MD<sup>1</sup>, Ken Shirabe, MD, PhD, FACS<sup>2</sup>, Hiroyuki Kuwano, MD, PhD, FACS<sup>2</sup>; <sup>1</sup>Div of Pediatric Surgery, Dept of General Surgical Science, Gunma Univ Graduate School of Medicine, <sup>2</sup>Dept of General Surgical Science, Gunma Univ Graduate School of Medicine

**QS023 STUDY OF RISK FACTORS OF COMPLICATIONS AFTER GASTROSTOMY AT CHILDRENS** [Yury Kozlov, PhD<sup>1</sup>](#), Polina Baradieva<sup>1</sup>, Konstantin Kovalkov<sup>2</sup>, Vladimir Novozhilov, PhD<sup>1</sup>; <sup>1</sup>Children's Hospital Irkutsk, <sup>2</sup>Children's Hospital Kemerovo

**QS024 THE EFFECT OF GASTROSTOMY PLACEMENT ON HEALTH-RELATED QUALITY OF LIFE IN CHILDREN.** J Franken, MD<sup>1</sup>, [S H A J Tytgat, MD, PhD<sup>2</sup>](#), F A Mauritz, MD, PhD<sup>1</sup>, R K Stellato, Msc<sup>1</sup>, D C Van der Zee, MD, PhD, Prof<sup>1</sup>, Mya Van Herwaarden-Lindeboom, MD, PhD<sup>1</sup>; <sup>1</sup>University Medical Centre Utrecht, <sup>2</sup>Wilhelmina Children's Hospital

**QS025 MINIMALLY INVASIVE PEDIATRIC SURGERY DURING REMOTE HUMANITARIAN MISSIONS IS FEASIBLE, SAFE AND EFFECTIVE** [Jeffrey R Lukish, MD<sup>1</sup>](#), Jasmine Ellis, MD<sup>2</sup>, Bharati Datta, MD<sup>2</sup>, David Lanning, MD<sup>3</sup>; <sup>1</sup>Johns Hopkins University, Baltimore, Maryland, USA, <sup>2</sup>Milton Cato Memorial Hospital, St Vincent and the Grenadines, UK, <sup>3</sup>Medical College of Virginia, Virginia Commonwealth University, Richmond, Virginia, USA

# Complete Schedule

9:45 am – 10:00 am **Break**

10:00 am – 12:00 pm **JOINT SAGES/IPEG EXPERT SESSION: Are You Kidding?** LEVEL 6 Room 602-604

**You Want to be a Pediatric Bariatric Surgeon? Everything You Need to Know But Were Afraid to Ask**

CHAIR: Carroll M. Harmon, MD, PhD (IPEG) & Janey Pratt, MD (SAGES)

DESCRIPTION: This session is for anyone who has ever thought about operating on obese children or who currently practices pediatric and/or bariatric surgery. We will cover new guidelines, accreditation, current operations and new procedures, complications, long term outcomes and an expert panel on the pitfalls and things to avoid. This session will have something for everyone in SAGES or IPEG.

## OBJECTIVES

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

- Describe how to start a pediatric bariatric surgery program
- Articulate the most recent long term outcomes for adolescent bariatric surgery
- Identify patients who would benefit from bariatric surgery as children

10:00 am	Indications for Bariatric Surgery in Children the Newest Guidelines: Age, BMI, Co-morbidities, Psychosocial Issues	Mary Brandt, MD
10:15 am	Q&A	
10:20 am	Setting Up a Pediatric Bariatric Program: Team and Accreditation	Kirk Reichard, MD
10:35 am	Q&A	
10:40 am	Operations in Children, Band, Bypass, Sleeve and Beyond	Marc P. Michalsky, MD
10:55 am	Q&A	
11:00 am	Outcomes Following Bariatric Surgery in Children - Longterm Weight Loss, HRQOL and Co-Morbidities	Thomas Inge, MD
11:15 am	Q&A	
11:20 am	Reflux After Weight Loss Surgery - Medications, Endoscopic Therapies or Bypass?	James Ellsmere, MD
11:35 am	Q&A	
11:40 am	Interesting Case #1	Janey S. A. Pratt, MD
11:45 am	Discussion	
11:50 am	Interesting Case #2	Carroll M. Harmon, MD, PhD
11:55 am	Discussion	

10:00 am – 12:00 pm **QUICKSHOT 2** NON CME  
 MODERATORS: Celeste Hollands, MD & Aayed Al-Qahtani, MD

TAHOMA LEVEL 3 Room 305

**QS026 APPROPRIATE METHODS AND TIMING OF SURGERY FOR NEONATES WITH SEVERE CONGENITAL DIAPHRAGMATIC HERNIA.** [Lishuang Ma](#), Jingna Liu, Chao Liu, Yandong Wei, Cuizhu Feng, Ying Wang, Yue Zhang, Yanxia Zhang, Bin Sun; Capital Institute of Pediatrics, Peking University Teaching Hospital

**QS027 FEASIBILITY STUDY ON SINGLE-PORT LAPAROSCOPIC REPAIR OF CONGENITAL DUODENAL OBSTRUCTION IN NEONATES.** [Lishuang Ma](#), Cuizhu Feng, Yue Zhang, Ying Wang, Yanxia Zhang, Chao Liu, Simiao Yu, Jingna Liu, Yandong Wei; Capital Institute of Pediatrics, Peking University Teaching Hospital

**QS028 THE APPLICATION OF PERCUTANEOUS SUTURING TECHNIQUE IN THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA** [Bartosz Bogusz](#), MD, [Oskar Zgraj](#), MD, [Marcin Maslanka](#), MD, [Wojciech Górecki](#), Prof; Department of Pediatric Surgery, University Children's Hospital, Jagiellonian University Medical College, Kraków,

**QS029 CLINICAL AND SURGICAL OUTCOMES OF SLEEVE GASTRECTOMY IN CHILDREN AND ADOLESCENTS WITH BARDET-BIEDL SYNDROME** [Yara Alqahtani](#), MD, [Aayed R Alqahtani](#), MD, FRCS, FACS, [Mohamed O Elahmedi](#), MBBS; Obesity Chair, King Saud University

# Complete Schedule

**QS030 DISPARITIES IN PEDIATRIC AND ADOLESCENT WEIGHT LOSS SURGERY IN THE UNITED STATES** [Numa P Perez, MD<sup>1</sup>](#), [Cornelia L Griggs, MD<sup>1</sup>](#), [David C Chang, PhD, MPH, MBA<sup>1</sup>](#), [Cassandra M Kelleher, MD<sup>2</sup>](#), [Janey Pratt, MD<sup>1</sup>](#); <sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Massachusetts General Hospital for Children

**QS031 TRANSUMBILICAL MINILAPAROTOMY FOR NEONATAL ABDOMINAL SURGERY: AN ALTERNATIVE MINIMALLY INVASIVE SURGERY FOR COMPLEX CONDITIONS** [Chin-Hung Wei](#); Shuang Ho Hospital

**QS032 EXTRACORPOREAL AND INTRACORPOREAL APPROACHES OF SINGLE-INCISION LAPAROSCOPIC APPENDECTOMY IN CHILDREN: IS ONE SUPERIOR TO ANOTHER?** [Chin-Hung Wei](#); Shuang Ho Hospital

**QS033 LAPAROSCOPICALLY ASSISTED VAGINAL PULL THROUGH IN SEVEN CASES OF CONGENITAL ADRENAL HYPERPLASIA WITH HIGH UROGENITAL CONFLUENCE: EARLY RESULTS** [Ahmed e Fares, PhD<sup>1</sup>](#), [Khalid Salah<sup>2</sup>](#), [Mahmoud Marei, MD<sup>2</sup>](#), [Shrif Kadah<sup>2</sup>](#), [Gamal El Tagy<sup>2</sup>](#); <sup>1</sup>Fayoum University, <sup>2</sup>Cairo University

**QS034 ROBOT-ASSISTED EXTRAVESICAL URETERAL REIMPLANTATION (REVUR) FOR UNILATERAL VESICO-URETERAL REFLUX IN CHILDREN: RESULTS OF A MULTICENTRIC INTERNATIONAL SURVEY.** [Ciro Esposito<sup>1</sup>](#), [Maria Escolino<sup>1</sup>](#), [Lorenzo Masieri<sup>2</sup>](#), [Henri Steyaert<sup>3</sup>](#), [Chiara Cini<sup>2</sup>](#), [Francesco Turrà<sup>1</sup>](#), [Mariapina Cerulo<sup>1</sup>](#), [Giovanni Severino<sup>1</sup>](#), [Thomas S. Lendvay<sup>4</sup>](#); <sup>1</sup>Federico II University of Naples, Italy, <sup>2</sup>Meyer Children Hospital, Florence, Italy, <sup>3</sup>Université Libre de Brussels, Belgium, <sup>4</sup>Seattle Children's Hospital, Seattle, USA

**QS035 THORACOSCOPIC REPAIR OF RECURRENT TRACHEOESOPHAGEAL FISTULA** [Jinshi Huang, MD](#); BeiJin Children's Hospital

**QS036 LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN. NEW TECHNIQUE. EFFICIENT AND SAFE** [Ricardo Alba, PhD](#), [Daniela Gonzalez](#), Student; Morelos Childrens Hospital

**QS037 LAPAROSCOPIC VS OPEN CHOLECYSTECTOMY IN PEDIATRIC PATIENTS: A PROPENSITY SCORE MATCHED ANALYSIS.** [Jun Tashiro, MD, MPH](#), [Eduardo A Perez, MD](#), [Juan E Sola, MD](#), [Ali Mokdad, MD](#), [Samir Pandya, MD](#); University of Miami Miller School of Medicine

**QS038 VALUATION OF THORACOSCOPIC SURGERY IN MANAGEMENT OF ESOPHAGEAL ASTRESIA IN VIETNAM NATIONAL HOSPITAL OF PEADIATRICS** [Linh Nguyen Van, MD](#); Vietnam National hospital of peadiatrics

**QS039 TEN-YEARS-EXPERIENCE WITH LAPAROSCOPIC TRACTION FOR INTRA-ABDOMINAL TESTIS (SHEHATA TECHNIQUE) , LESSONS LEARNED.** [Sameh Shehata, Prof<sup>1</sup>](#), [Mohamed Abouheba<sup>1</sup>](#), [Rafik Shalaby<sup>2</sup>](#); <sup>1</sup>Alexandria University, <sup>2</sup>Azhar University

**QS040 PEDIATRIC INGUINAL HERNIAS, ARE THEY ALL THE SAME? A PROPOSED CLASSIFICATION AND TAILORED TREATMENT** [Sameh Shehata, Prof<sup>1</sup>](#), [Sherif Shehata, Prof<sup>2</sup>](#), [Mohamed Abouheba, Dr<sup>1</sup>](#); <sup>1</sup>Alexandria University, <sup>2</sup>Tanta University

**QS041 LAPAROSCOPIC HEPATECTOMY FOR LIVER TUMOR IN CHILDREN** [Shuguang Jin](#), [Bo Xiang](#), [Zhicheng Xu](#); West China Hospital, Sichuan University

**QS045 USEFUL LAPAROSCOPIC SURGERY FOR CONGENITAL EXTRAHEPATIC PORTOSYSTEMIC SHUNT IN CHILDREN.** [Keigo Yada, MD, PhD, FACS](#), [Hiroki Ishibashi](#), [Hiroki Mori](#); Tokushima University Hospital

**QS046 POTENTIAL OF INTRACORPOREAL KNOTTING TRAINING WITH SNS (SOCIAL NETWORK SERVICE) FOR STUMP CLOSURE IN LAPAROSCOPIC APPENDECTOMY.** [Yusuke Yamane, MD](#), [Yasuaki Taura](#), [Takuya Yoshida](#), [Tomoyuki Tetsuo](#), [Shota Shinohara](#), [Taiichiro Kosaka](#), [Mitsuhisa Takatsuki](#), [Susumu Eguchi](#), [Takeshi Nagayasu](#); Nagasaki University Hospital

**QS047 HOW TO REACH NIL-RISK OF IPSILATERAL RECURRENCE AFTER LAPAROSCOPIC INGUINAL HERNIA REPAIR IN CHILDREN? A NEW TAKE ON AN OLD CONCEPT** [Soo Min Ahn, MD](#), [Tae Ah Kim, MD](#); Division of Pediatric Surgery, Pediatric Specialized Center, Hallym University Sacred Heart Hospital

**QS048 LONG TERM EFFICACY OF LAPAROSCOPIC FUNDOPLICATION IN CHILDREN WITH GASTROESOPHAGEAL REFLUX DISEASE.** [Femke V.M. Mulder, Bsc<sup>1</sup>](#), [Stefaan H. A. J. Tytgat, MD, PhD<sup>2</sup>](#), [Tycho S Oudman, Bsc<sup>1</sup>](#), [Femke A Mauritz, MD, PhD<sup>1</sup>](#), [David C Van der Zee, MD, PhD<sup>1</sup>](#), [Maud Y.A. Van Herwaarden-Lindeboom, MD, PhD<sup>1</sup>](#); <sup>1</sup>University Medical Centre Utrecht, <sup>2</sup>Wilhelmina Children's Hospital

**QS049 LAPAROSCOPIC GASTROSTOMY FIXATION: STAMM VERSUS FULL-THICKNESS U STITCH.** [Erin Ward, MD<sup>1</sup>](#), [Andrew Wang, MD<sup>2</sup>](#), [Sneha Nicholson<sup>3</sup>](#), [Divya Sood, MD<sup>1</sup>](#), [Stephen Bickler, MD<sup>1</sup>](#), [Karen Kling, MD<sup>1</sup>](#); <sup>1</sup>UCSD, <sup>2</sup>Balboa Naval Hospital, <sup>3</sup>Rady Children's Hospital

**QS050 EARLY OUTCOMES OF ROBOT-ASSISTED SOAVE PROCEDURE FOR CHILDREN WITH HIRSCHSPRUNG DISEASE: EXPERIENCE A CENTER** [Tran A Quynh, PhD](#), [Pham D Hien, PhD](#), [Bui D Hau](#), [Le T Hai](#), [Le Q Du](#); National Children's Hospital

**QS051 LAPAROSCOPIC APPROACH ON EPIGASTRIC HERNIAS: OUR NEW GOLD STANDARD** [Maria Soledad Valverde](#), [Fernando Rabinovich](#), [Santiago Calello](#), [Jorge Martinez](#), [Luzia Toselli](#), [Carolina Millan](#), [Guillermo Dominguez](#), [Horacio Bignon](#), [Gaston Bellia](#), [Enrique Buela](#), [Marcelo Martinez Ferro](#); Fundación Hospitalaria

# Complete Schedule

**QS052 THE LAPAROSCOPIC APPROACH FOR REDUCTION OF INTUSSUSCEPTION IN INFANTS AND CHILDREN: AN UPDATED INSTITUTIONAL EXPERIENCE** Leo Andrew O Benedict, MD, Derrick Ha, [Joseph Sujka, MD](#), Justin Sobrino, MD, Tolulope Oyetunji, MD, MPH, Shawn D St. Peter, MD, Jason D Fraser, MD; Children's Mercy Hospital- University Of Missouri Kansas City

**QS053 LAPAROSCOPIC WIDENED PORTOENTEROSTOMY FOR CHOLEDOCHAL CYSTS WITH NARROW HILAR DUCT** Shao-tao Tang, [Li Yang](#), Xiaopan Chang, Xi Zhang; Department of Pediatric Surgery, Union Hospital, Tongji Medical College

**QS054 CAUTIONARY TALES IN LAPAROSCOPIC URETERAL LIGATION** [Damir Ljuhar](#), MBBS, MPH<sup>1</sup>, Annette D Chang, MBBS<sup>2</sup>, Michael Ee, FRACS, Paed<sup>1</sup>, Nathalie Webb, FRACS, Urol<sup>2</sup>; <sup>1</sup>Royal Hobart Hospital, <sup>2</sup>Monash Children's Hospital

**QS055 ELONGATION OF ESOPHAGEAL SEGMENTS BY STRETCHING TECHNIQUE FOR PURE ESOPHAGEAL ATRESIA TO ACHIEVE DELAYED PRIMARY ANASTOMOSIS BY THORACOSCOPIC REPAIR** [Jun Wang](#), Suna Sun, Wenji Wu, Yiming Gong, Jia Shi, Weihua Pan; Xinhua Hospital affiliated Shanghai Jiaotong University School of Medicine

**QS056 ANALYSIS OF EFFICACY OF SINGLE-SITE UMBILICAL LAPAROSCOPY IN THE TREATMENT FOR CHILDREN WITH CRYPTORCHIDISM** [Li Gui Bin](#); the 5th central hospital of Tianjin

**QS057 A NOVEL TREATMENT FOR TYPE II ABERNETHY MALFORMATION IN CHILDREN** [Jinshan Zhang](#), Long Li; Capital Institute of Pediatrics

**QS058 DOES THE GLYPH VIDEO HEADSET IMPROVE LAPAROSCOPIC MOTOR SKILLS?** [Semiu E Folaranmi](#), FRCS, MB, BS, BSc, Hons, Iain A Hennessey, FRCS, MBChB, MSc; Alder Hey Children's Hospital, Liverpool, UK

**QS059 SIMULTANEOUS DUAL MINILAPAROSCOPY IN PYGOPAGUS TWINS WITH CROSS CIRCULATION** [Danny Lascano, MD](#)<sup>1</sup>, J P Sara, MD<sup>1</sup>, Sam Barst, MD<sup>1</sup>, Whitney McBride, MD<sup>2</sup>, Samir Pandya, MD<sup>3</sup>; <sup>1</sup>New York Medical College, <sup>2</sup>Eastern Maine Medical Center, <sup>3</sup>UT Southwestern

**QS060 TRANSUMBILICAL LAPAROSCOPIC ASSISTED SINGLE PORT APPENDECTOMY A SYSTEMATIC REVIEW AND META-ANALYSIS** [Raghavendra Rao](#), Sophia Abdulhai, Todd Ponsky; Akron Children Hospital

**QS061 THE ROLE OF LAPAROSCOPIC BIOPSY IN THE DIAGNOSTICS AND TREATMENT OF CHRONIC LIVER DISEASES IN CHILDREN** Polina V Khrolenko, Elena Y Dyakonova, Maksim M Lokhmatov, Andrey N Surkov, [Alexsey A Gusev](#), Tatyana A Prudnikova, Kirill K Kulikov, Aleksandr S Bekin, Ekaterina A Romanova; Federal State Autonomous Institution National Medical Research Center of Children's Health of the Ministry of Health of the Russian Federation.

12:00 pm – 12:45 pm **Lunch**

LEVEL 4 - HALL 4 A/B

12:45 pm – 2:00 pm **SCIENTIFIC SESSION: Gastrointestinal**  
MODERATORS: Simon Clarke, MD & Sohail Shah, MD

TAHOMA LEVEL 3 Room 303/304

**S013 LAPAROSCOPIC VERSUS OPEN APPENDECTOMY IN PAEDIATRIC PATIENTS WITH COMPLICATED APPENDICITIS: A META-ANALYSIS** [Zhi Xuan Low](#)<sup>1</sup>, Jun Liang Teh<sup>2</sup>, Wee Boon Tan<sup>2</sup>, Sharon Zhiling Koh<sup>2</sup>, Jun Jie Ng<sup>2</sup>; <sup>1</sup>National University of Singapore, <sup>2</sup>National University Hospital

**S014 CONGENITAL PARAESOPHAGEAL HERNIA: CONTEMPORARY RESULTS AND OUTCOMES OF LAPAROSCOPIC APPROACH TO REPAIR IN INFANTS AND CHILDREN** Mikael Petrosyan, MD, [Adil A Shah, MD](#), A. Alfred Chahine, MD, Philip C Guzzetta, MD, Anthony D Sandler, Timothy D Kane, MD; Children's National Medical Center

**S015 NATIONAL TRENDS IN PEDIATRIC AND ADOLESCENT WEIGHT LOSS SURGERY IN THE UNITED STATES** Cornelia Griggs, MD, [Numa Perez, MD](#), Robert Goldstone, MD, David Chang, PhD, MBA, MPH, Cassandra Kelleher, MD, Janey Pratt, MD; Massachusetts General Hospital

**S016 TRENDS IN HOSPITAL LENGTH OF STAY AND 30-DAY MORBIDITY IN PEDIATRIC PATIENTS UNDERGOING LAPAROSCOPIC ILEOCECAL RESECTION, 2012-2016** [Sarah B Cairo, MD, MPH](#), Kristen A Calabro, MD, MBS, Carroll M Harmon, MD, PhD, Kaveh Vali, MD, David H Rothstein, MD, MPH; John R. Oishei Children's Hospital

**S017 POSTOPERATIVE ADHESIVE SMALL BOWEL OBSTRUCTION FOLLOWING LAPAROSCOPIC OR OPEN FUNDOPLICATION FOR GASTROESOPHAGEAL REFLUX IN CHILDREN** [Michimasa Fujitogi, MD](#)<sup>1</sup>, Nobuaki Michihata, MD, MPH<sup>2</sup>, Hideo Yasunaga<sup>2</sup>, Jun Fujishiro, MD, PhD<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Graduate School of Medicine, The University of Tokyo, <sup>2</sup>Department of Clinical Epidemiology and Health Economics, School of Public Health, The University of Tokyo

# Complete Schedule

**S018 ENDOLOOP VERSUS ENDOSTAPLER: WHAT IS THE BEST OPTION FOR APPENDICEAL STUMP CLOSURE IN CHILDREN WITH COMPLICATED APPENDICITIS? RESULTS OF A MULTICENTRIC INTERNATIONAL SURVEY.** [Maria Escolino](#)<sup>1</sup>, Francois Becmeur<sup>2</sup>, Giovanni Severino<sup>1</sup>, Amulya Saxena<sup>3</sup>, Francesco Turrà<sup>1</sup>, Mariapina Cerulo<sup>1</sup>, Holger Till<sup>4</sup>, George W Holcomb 3rd<sup>5</sup>, [Ciro Esposito](#)<sup>1</sup>; <sup>1</sup>Federico II University of Naples, Italy, <sup>2</sup>Hopitaux Universitaires de Strasbourg, France, <sup>3</sup>Chelsea Children Hospital, London, UK, <sup>4</sup>Medical University of Graz, Austria, <sup>5</sup>Mercy Children's Hospital, Kansas City, Missouri, USA

**S019 LAPAROSCOPIC NISSEN FUNDOPLICATION: AN EXCELLENT TREATMENT OF GERD-RELATED RESPIRATORY SYMPTOMS IN CHILDREN. RESULTS OF A MULTICENTRIC STUDY.** [Ciro Esposito](#)<sup>1</sup>, [Maria Escolino](#)<sup>1</sup>, Amulya Saxena<sup>2</sup>, Francesco Turrà<sup>1</sup>, Mariapina Cerulo<sup>1</sup>, Sabine Irtan<sup>3</sup>, Giovanni Severino<sup>1</sup>, Holger Till<sup>4</sup>; <sup>1</sup>Federico II University of Naples, Italy, <sup>2</sup>Chelsea Children Hospital, London, UK, <sup>3</sup>Hopital Trousseau, Paris, France, <sup>4</sup>Medical University of Graz, Austria

**S020 SAFETY AND EFFICACY OF ENDOSCOPIC SLEEVE GASTROPLASTY IN CHILDREN AND ADOLESCENTS** [Aayed R Alqahtani, MD, FRCSC, FACS](#), Mohamed O Elahmedi, MBBS; Obesity Chair, King Saud University

**S021 COMPARISON OF PERI-OPERATIVE VARIABLES AND PATIENT OUTCOMES BETWEEN USE OF POLYETHYLENE CLIPS VERSUS STAPLERS FOR SIPES (SINGLE INCISION PEDIATRIC ENDOSURGERY) APPENDECTOMY** [Lena Perger, MD](#)<sup>1</sup>, [Camille Graham, MD](#)<sup>1</sup>, [Luka Komidar, PhD](#)<sup>2</sup>; <sup>1</sup>McLane's Children's Hospital, <sup>2</sup>University of Ljubljana, Slovenia

**S022 A RANDOMIZED TRIAL TO COMPARE THE CONVENTIONAL THREE-PORT LAPAROSCOPIC APPENDECTOMY PROCEDURE TO SINGLE INCISION AND ONE PUNCTURE PROCEDURE THAT WAS SAFE AND FEASIBLE, EVEN FOR SURGEONS IN TRAINING** [Motoi Mukai, MD, PhD](#), Tomoe Moriguchi, MD, Seiro Machigashira, MD, Koshiro Sugita, MD, Keisuke Yano, MD, Masato Kawano, MD, Shun Onishi, MD, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, MD, Takafumi Kawano, MD, PhD, Kazuhiko Nakame, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

**S023 RETROSPECTIVE ANALYSIS OF LAPAROSCOPIC LADDS PROCEDURE THROUGH SINGLE UMBILICAL APPROACH** [Yingzi Li, MD](#), [Jinshi Huang, MD](#), [Yongwei Chen](#); Capital Medical University

2:00 pm – 2:30 pm

**PRESIDENTIAL ADDRESS: Surgeons as Leaders** NON CME

TAHOMA LEVEL 3 Room 303/304

SPEAKER: Daniel J. Ostlie, MD, 2018 President

INTRODUCTION: Shawn St. Peter, MD



As Surgeon-in-Chief and Chair of Surgery, Dr. Ostlie is accountable for the Hospital's surgical services and leadership within all surgical divisions, including General Surgery, ENT, Dermatology, Urology, Congenital Heart Surgery, Orthopedics, Neurosurgery, Ophthalmology, Plastic Surgery, Trauma, Anesthesiology and Transplant.

Dr. Ostlie also provides administrative and clinical leadership to four clinical program centers that encompass multiple divisions. These include the Neurosciences Institute, the Heart Center and the hospitalists and critical care program. He remains committed to education and research, and has administrative oversight for both the research and educational endeavors at Phoenix Children's Hospital.

Prior to joining Phoenix Children's Hospital, Dr. Ostlie served as Surgeon-in-Chief at American Family Children's Hospital in Madison, WI, and held Professor of Surgery and Professor of Pediatrics positions at University of Wisconsin School of Medicine and Public Health from 2012 through 2016. Dr. Ostlie completed his residency in general surgery at Mayo Clinic Scottsdale from 1995 to 2000, during which time he also spent one year as a research fellow at Cambridge University, Cambridge, UK. After general surgery residency, he completed his pediatric surgery fellowship and surgical critical care fellowship at Children's Mercy Hospital, Kansas City, MO. During his 12 years with the institution, he rose through numerous leadership roles including vice chair of the Department of Surgery and program director of both the Pediatric Surgery Residency and Surgical Critical Care Fellowship.

Dr. Ostlie remains clinically active with special interest in minimally invasive surgery, chest wall abnormalities, neonatal surgery and oncology. He continues his academic focus primarily in outcomes research, has authored more than 200 peer-reviewed publications, 20 book chapters, and is the editor of two books. He has served as the Pediatric Editor of the Journal of Laparoendoscopic and Advanced Surgical Techniques and is the current Editor of Seminars in Pediatric Surgery.

# Complete Schedule

2:30 pm – 3:30 pm

## EXPERT PANEL: Chest Wall Deformities

TAHOMA LEVEL 3 Room 303/304

CHAIRS: Marcello Martinez Ferro, MD &amp; Dawn Jaroszewski, MD

DESCRIPTION: This 1 hour session includes presentations on State of the Art surgical and non-surgical treatments of chest wall deformities such as pectus excavatum and carinatum both in children and adults. The panel will also be focused in complications (prevention and management)

### OBJECTIVES

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

- Describe the current surgical and non-surgical approach for pectus carinatum and excavatum.
- Prevent surgical and post surgical complications and manage them efficiently
- Understand the importance of the interaction between pediatric and adult thoracic wall surgeons and distinguish the different management between adults and children

2:30 pm	Reported and Unreported Mortality	Andre Hebra, MD
2:45 pm	Non-surgical Treatment for Pectus Excavatum	Frank-Martin Haecker, MD
3:00 pm	Non-surgical Treatment for Pectus Carinatum	George (Whit) Holcomb, MD
3:15 pm	Pectus Surgery in the Adult Patient	Dawn Jaroszewski, MD

3:30 pm – 3:45 pm

## Break

3:45 pm – 4:30 pm

## INNOVATIONS SESSION NON CME

TAHOMA LEVEL 3 Room 303/304

MODERATORS: Mike Chen, MD &amp; Todd Ponsky, MD

**ISP001 STAY CURRENT IN SURGERY: DEMOCRATIZING KNOWLEDGE THROUGH A GLOBAL MULTIMEDIA APPLICATION** [Sophia Abdulhai, MD<sup>1</sup>](#), [Abdulraouf Lamoshi, MBBCh, MPH, ABPS, MS, CTS<sup>1</sup>](#), [Marc Schwacter, MD<sup>2</sup>](#), [Todd A Ponsky, MD<sup>1</sup>](#); <sup>1</sup>Akron Children's Hospital, <sup>2</sup>GlobalCastMD

**ISP002 A SAFE AND VERSATILE APPROACH TO CREATE MAGNETIC COMPRESSION BOWEL ANASTOMOSES UTILIZING MAGNAMOSIS** [Veeshal H. Patel, MD, MBA](#), [Dillon Kwiat, BS](#), [Jill Imamura-Ching, RN](#), [Michael R Harrison, MD](#); UCSF

**ISP003 AUGMENTED REALITY: AN EMERGING TECHNOLOGY FOR IMAGE GUIDED SURGERY** [Daniel von Allmen, MD](#), [John Racadio, MD](#); Cincinnati Children's Hospital

**ISP004 DEVELOPMENT OF A POLYMERIC SELF-EXPANDING SURGICAL SMART PATCH FOR PRENATAL FETOSCOPIC SPINA BIFIDA REPAIR AND OTHER POTENTIAL ENDOSCOPIC INDICATIONS.** [Jose L Peiro, MD, PhD<sup>1</sup>](#), [Rigwed Tatu, PhD<sup>2</sup>](#), [Marc Oria, PhD<sup>1</sup>](#), [Chia-Ying Lin, PhD<sup>2</sup>](#); <sup>1</sup>The Center for Fetal, Cellular and Molecular Therapy. Pediatric General and Thoracic Surgery Division. Cincinnati Children's Hospital Medical Center (CCHMC). Cincinnati, OH. USA., <sup>2</sup>Department of Biomedical, Chemical, and Environmental Engineering, The University of Cincinnati, Cincinnati, Ohio. USA.

**ISP005 "ZIP TO THE RIB" STERNAL PULL-BACK (ZIP-BACK): INNOVATIVE APPROACH FOR PECTUS CARINATUM. VIDEO.** [Gaston Bellia-Munzon, MD](#), [Jorge L Martinez, MD](#), [Carolina Millan, MD](#), [Meximiliano Nazar-Peirano, MD](#), [Luzia Toselli, MD](#), [Fernando Rabinovitch, MD](#), [Soledad Valverde, MD](#), [Santiago Caello, MD](#), [Enrique Buela, MD](#), [Horacio Bignon, MD](#), [Marcelo Martinez-Ferro](#); Fundacion Hospitalaria

**ISV006 3-DIMENSIONAL OPTICAL IMAGING FOR EVALUATION OF CHEST WALL DEFORMITIES: MEASUREMENT OF INTER-RATER RELIABILITY** [Jordan Taylor, MD<sup>1</sup>](#), [Dalia Szafer<sup>1</sup>](#), [Allison Pei<sup>1</sup>](#), [Enrico Danzer, MD<sup>2</sup>](#), [James Wall, MD<sup>2</sup>](#), [Stephanie Chao, MD<sup>2</sup>](#); <sup>1</sup>Stanford University, <sup>2</sup>Lucile Packard Children's Hospital

**ISP007 LAPAROSCOPIC LIVER RESECTION WITH AUGMENTED REALITY: A PRE-CLINICAL EXPERIENCE** [Lung W Lau, MD<sup>1</sup>](#), [Xinyang Liu, PhD<sup>1</sup>](#), [William Plishker, PhD<sup>2</sup>](#), [Karun Sharma, MD, PhD<sup>1</sup>](#), [Timothy D Kane, MD<sup>1</sup>](#), [Raj Shekhar, PhD<sup>1</sup>](#); <sup>1</sup>Children's National Health System, <sup>2</sup>IGI Technologies

**ISP008 3D CLOACA IMAGING INNOVATIONS IMPROVE ANATOMIC UNDERSTANDING AND SURGICAL PLANNING** [Alessandra C Gasior, DO<sup>1</sup>](#), [Devin Halleran, MD<sup>1</sup>](#), [Jayanthi Parthasarathy, BDSMSPhD<sup>2</sup>](#), [Robert Strouse, MFA<sup>3</sup>](#), [Jeremy Patterson<sup>3</sup>](#), [Carlos Reck, MD<sup>1</sup>](#), [Alejandra Vilanova-Sanchez, MD<sup>1</sup>](#), [Richard J Wood, MD<sup>1</sup>](#), [Marc A Levitt, MD<sup>1</sup>](#); <sup>1</sup>Center for Colorectal and Pelvic Reconstruction, Nationwide Children's Hospital Columbus OH, <sup>2</sup>Department of Radiology, Nationwide Children's Hospital Columbus OH, <sup>3</sup>Research Information Solutions & Innovation (RISI) The Research Institute at Nationwide Childrens Hospital



# Complete Schedule

4:30 pm – 5:15 pm

**IPEG/ESPES SCIENTIFIC SESSION: Urogenital**

TAHOMA LEVEL 3 Room 303/304

MODERATORS: Philipp Szavay, MD; Giovanna Riccipetoni, MD &amp; Ciro Esposito, MD

**S024 TRANS-UMBILICAL LAPAROENDOSCOPIC SINGLE SITE SURGERY FOR INGUINAL HERNIA AND HYDROCELE IN CHILDREN** [Tran N Son, PhD](#), Hoang V Bao, MD, Tran V Quyet, MD, Nguyen T Hong Van, MD; Saint Paul Hospital

**S025 EARLY CLINICAL OUTCOME OF STAGED LAPAROSCOPIC TRACTION ORCHIDOPEXY FOR ABDOMINAL TESTES** [Mohamed A Abouheba, MD](#); University of Alexandria

**S026 SIMULTANEOUS ROBOT-ASSISTED LAPAROSCOPIC BOWEL AND BLADDER RECONSTRUCTION** [Devin R Halleran, MD](#), Richard J Wood, MD, Alejandra Vilanova-Sanchez, MD, Rebecca M Rentea, MD, Christopher Brown, MD, Molly Fuchs, MD, Venkata R Jayanthi, MD, Christina Ching, MD, Marc A Levitt, MD, Daniel Dalusta, MD; Nationwide Children's Hospital

**S027 LAPAROSCOPIC CLOSURE OF A CONTRALATERAL PATENT PROCESSUS VAGINALIS TO PREVENT METACHRONOUS INGUINAL HERNIAS OVERTREATMENT OR USEFUL PREVENTION? A META-ANALYSIS** [Christina Oetzmann von Sochaczewski, MD](#), Oliver J Muensterer, MD; Department of Pediatric Surgery, Universitätsmedizin Mainz, Mainz, Germany

**S028 APPROACH TO THE MANAGEMENT OF PEDIATRIC OVARIAN MASSES IN THE 21ST CENTURY: SYSTEMATIC REVIEW AND META-ANALYSIS** [Saqib H Qazi, FACS<sup>1</sup>](#), Sarah M Jeelani<sup>1</sup>, Jai K Das<sup>1</sup>, Amulya K Saxena<sup>2</sup>; <sup>1</sup>Aga Khan University, <sup>2</sup>Chelsea Children's Hospital Chelsea and Westminster Healthcare NHS Fdn Trust

**S029 RISK FACTORS FOR COMPLICATIONS AFTER OPEN AND LAPAROSCOPIC EXCISIONS OF THE URACHUS IN CHILDREN** [Aurelien Scalabre, MD<sup>1</sup>](#), Elodie Delorme<sup>1</sup>, Olivier Abbo, MD, PhD<sup>2</sup>, Quentin Ballouhey, MD<sup>3</sup>, Nicolas Berte, MD<sup>4</sup>, Marie-Berence Popelin<sup>5</sup>, Sabine Irtan, MD, PhD<sup>5</sup>, Aurelien Binet, MD, PhD<sup>6</sup>, Ciro Esposito, MD, PhD<sup>7</sup>, Pierre-Yves Rabattu, MD<sup>8</sup>, François Varlet, MD, PhD<sup>1</sup>; <sup>1</sup>CHU de Saint Etienne, <sup>2</sup>CHU de Toulouse, <sup>3</sup>CHU de Limoges, <sup>4</sup>CHU de Nancy, <sup>5</sup>Assistance Publique Hôpitaux de Paris, <sup>6</sup>CHU de Tours, <sup>7</sup>Napoly University, <sup>8</sup>CHU de Grenoble

**S030 INCIDENCE OF PEDIATRIC METACHRONOUS CONTRALATERAL INGUINAL HERNIA AND THE RELATIONSHIP WITH CONTRALATERAL PATENT PROCESSUS VAGINALIS** Yang Wu, [Miao Yuan, MD](#); West China hospital, China

4:30 pm – 5:30 pm

**QUICKSHOT 3: Video** NON CME

TAHOMA LEVEL 3 Room 305

MODERATORS: John Meehan, MD &amp; Bethany Slater, MD

**QV062 SINGLE SITE LAPAROSCOPIC COMPLETION PROCTECTOMY USING A MAGNETIC SURGICAL SYSTEM** [Anthony L DeRoss, MD](#), Meagan M Costedio, MD; Cleveland Clinic

**QV063 TOTALLY LAPAROSCOPIC PARTIAL SPLENECTOMY IN CHILD WITH HAMARTOMA** [Diego Biondini, MD<sup>1</sup>](#), Francesco Serra, MD<sup>2</sup>, Francesca Cabry, MD<sup>2</sup>, Lorena Sorrentino<sup>2</sup>, Roberta Gelmini, MD<sup>2</sup>, Pler Luca Ceccarelli, MD<sup>1</sup>; <sup>1</sup>Policlinico of Modena, Pediatric surgery Unit, <sup>2</sup>Policlinico of Modena, University of Modena e Reggio Emilia, Dep. of General Surgery

**QV064 UTILIZING THE TAPP REPAIR IN ADOLESCENTS: A REVIEW OF LITERATURE AND CASE-SERIES PRESENTATION** [Jacob D Campbell, DO, MPH<sup>1</sup>](#), Meghna Misra, MD, MS, FACS<sup>2</sup>, Chike Chukwumah, MD, FACS<sup>3</sup>, Shefali Thaker, MPH<sup>2</sup>, Christine Rader, MD, FACS<sup>2</sup>; <sup>1</sup>University of Connecticut, <sup>2</sup>Connecticut Children's Medical Center, <sup>3</sup>Hartford Hospital

**QV065 LAPAROSCOPIC SPLENIC-SPARING DISTAL PANCREATECTOMY FOR PANCREATIC TRANSECTION** [Melissa D Kanack, MD<sup>1</sup>](#), [Nam Nguyen, MD<sup>2</sup>](#); <sup>1</sup>University of California, Irvine, <sup>2</sup>Miller Children's and Women's Hospital, Long Beach and University of California, Irvine

**QV066 MINIMALLY INVASIVE TREATMENT FOR COMPLICATED GASTRIC DUPLICATION.** [Fernando P Rabinovich, MD](#), Bignon Horacio, Gaston Bellia Munzon, Carolina Millan, Toselli Luzia, Soledad Valverde, Enrique Buela, Santiago Calello, Jorge Martinez, Juliana Rebollo, Veronica Salernou, Marcelo Martinez Ferro; Fundacion Hospitalaria - Salud Materno Juvenil

**QV067 SUCCESSFUL LAPAROSCOPIC DISTAL PANCREATECTOMY FOR A HUGE SOLID PSEUDO-PAPILLARY NEOPLASM WITH SPLEEN AND VESSEL PRESERVATION IN AN 11-YEAR-OLD GIRL - A CASE REPORT** [Toshio Harumatsu, MD](#), Yuto Nonaka, MD, Keisuke Yano, MD, Motoi Mukai, MD, PhD, Takafumi Kawano, MD, PhD, Masato Kawano, MD, Shun Onishi, MD, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, MD, Sero Machigashira, MD, Kazuhiko Nakame, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

**QV068 INEXPENSIVE AND NOVEL METHOD FOR LAPAROSCOPIC PYLOROMYOTOMY IN THE DEVELOPING WORLD** [Ziad Bataineh, MD<sup>1</sup>](#), Pradeep Johns<sup>2</sup>, Nathan M Novotny, MD<sup>3</sup>; <sup>1</sup>Jordan University of Science and Technology, <sup>2</sup>Michigan State University School of Medicine, <sup>3</sup>Jordan University of Science and Technology and Beaumont Children's

# Complete Schedule

**QV069 THORACOSCOPIC POSTERIOR TRACHEOPEXY** [Lindel Dewberry, MD<sup>1</sup>](#), Raphael Vuille-Dit-Bille, MD<sup>2</sup>, David Mong, MD<sup>2</sup>, Melissa Masaracchia, MD<sup>2</sup>, Jeremy D Prager, MD<sup>2</sup>, Todd Wine, MD<sup>2</sup>, Norah Janosy, MD<sup>2</sup>, Stig Somme, MD<sup>2</sup>; <sup>1</sup>University of Colorado, Department of Surgery, <sup>2</sup>Children's Hospital Colorado

**QV070 A NOVEL APPROACH TO LAPAROSCOPIC MORGAGNI HERNIA REPAIR ON AN INFANT USING PERCUTANEOUS SUTURING TECHNIQUE** [Rachel E Hanke, MD](#), Nathan T Froelich, BS, Anthony Y Tsai, MD; Penn State Health Milton S. Hershey Medical Center

**QV071 FINGER DISSECTION NUSS BAR PLACEMENT: A THORACOSCOPIC VIEW** [Cristine S Velazco, MD, MS<sup>1</sup>](#), Erin M Garvey, MD<sup>2</sup>, Daniel J Ostlie, MD<sup>2</sup>, Justin Lee, MD<sup>2</sup>; <sup>1</sup>Mayo Clinic, <sup>2</sup>Phoenix Children's Hospital

**QV072 LAPAROSCOPIC GRAHAM PATCH REPAIR FOR PERFORATED DUODENAL ULCER** [Armando Salim Munoz Abraham, MD, MBEE](#), Hector Osei, MD, Saurabh Saxena, MD, Rachele Damle, MD, MS, Clint Cappiello, MD, Gustavo Villalona, MD, FACS, FAAP; Saint Louis University

**QV073 LAPAROSCOPIC REDO SURGERY FOR CHOLEDOCHAL CYST WITH CONVERSION OF HEPATICO-DUODENOSTOMY TO HEPATICO-JEJUNOSTOMY** [Tran N Son, PhD](#), Pham D Hiep, Nguyen T Hong Van, Hoang V Bao; Saint Paul Hospital

## FRIDAY APRIL 13, 2018

7:30 am – 8:45 am

**SCIENTIFIC SESSION: Colorectal & Hepatobiliary**

**TAHOMA LEVEL 3 Room 303/304**

MODERATORS: Go Miyano, MD & Sameh Shehata, MD

**S032 COMPLICATIONS OF COMPLETE LAPAROSCOPIC CYST EXCISION AND ROUX-EN-Y HEPATICOJEJUNOSTOMY FOR CHOLEDOCHAL CYST** [Pham D Hien, PhD<sup>1</sup>](#), Nguyen T Liem, Prof<sup>2</sup>, Vu M Hoan<sup>1</sup>, Tran X Nam<sup>1</sup>; <sup>1</sup>National Children's Hospital, <sup>2</sup>Vinmec International Hospital

**S033 LAPAROSCOPIC KASAI PORTOENTEROSTOMY HAS A FAVORABLE ADVANTAGE OVER OPEN KASAI PORTOENTEROSTOMY IN SUBSEQUENT LIVER TRANSPLANTATION** [Chiyoe Shirota, MD](#), Hiroo Uchida, MD, Yasuyuki Ogura, Hideya Kamei, MD, Yujiro Tanaka, MD, Takahisa Tainaka, Wataru Sumida, MD, Kazuki Yokota, MD, Kazuo Oshima, Ryo Shirotaki, MD, Kosuke Chiba, Akinari Hinoki, MD; Nagoya University Graduate School of Medicine

**S034 PROGNOSTIC CLASSIFICATION USING INDOCYANINE GREEN FLUORESCENCE CHOLANGIOGRAPHY IN KASAI PORTOENTEROSTOMY FOR BILIARY ATRESIA** [Chiyoe Shirota](#), Hiroo Uchida, Yujiro Tanaka, Takahisa Tainaka, Wataru Sumida, Kazuki Yokota, Kazuo Oshima, Ryo Shirotaki, Kosuke Chiba, Akinari Hinoki; Nagoya University Graduate School of Medicine

**S035 PRIMARY LAPAROSCOPIC ENDORECTAL PULL-THROUGH PROCEDURE WITH OR WITHOUT A POSTOPERATIVE RECTAL TUBE FOR HIRSCHSPRUNG DISEASE: A MULTICENTER STUDY** [Li Yang<sup>1</sup>](#), Xi Zhang<sup>1</sup>, Shao-tao Tang<sup>1</sup>, Long Li<sup>2</sup>, Suo-lin Li<sup>3</sup>, Shui-xue Li<sup>4</sup>, Xiao-ye Wang<sup>5</sup>; <sup>1</sup>Department of Pediatric Surgery, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China, <sup>2</sup>Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing, People's Republic of China, <sup>3</sup>Department of Pediatric Surgery, The Second Hospital of Hebei Medical University, Shijiazhuang, Hebei, China, <sup>4</sup>Department of Pediatric Surgery, People's Hospital of Xinjiang Uygur Autonomous Region, Urumqi, Xinjiang, China, <sup>5</sup>Department of Pediatric Surgery, Tianjin Children's Hospital, Tianjin, China

**S036 LAPAROSCOPIC TECHNIQUES IN THE MANAGEMENT OF ANORECTAL MALFORMATIONS: A PROPENSITY SCORE-MATCHED OUTCOME STUDY USING A LARGE INPATIENT DATABASE.** [Jun Tashiro, MD, MPH](#), Juan E Sola, MD, Chad M Thorson, MD, MSPH, Samir Pandya, MD, Eduardo A Perez, MD; University of Miami Miller School of Medicine

**S037 LAPAROSCOPIC REVISION OF PORTOENTEROSTOMY FOR BILIARY ATRESIA HAS A LIMITED BUT POSITIVE EFFECT IN PREVENTING PROGRESSIVE LIVER FAILURE AFTER INITIAL PORTOENTEROSTOMY** [Hiroo Uchida, MD](#), Yujiro Tanaka, MD, Chiyoe Shirota, MD, Takahisa Tainaka, MD, Wataru Sumida, MD, Kazuki Yokota, Ryo Shirotaki, MD, Kazuo Oshima, MD, Kosuke Chiba, MD, Akinari Hinoki, MD, Naruhiko Murase, MD; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

**S038 THIRTY-DAY OUTCOMES OF LAPAROSCOPIC VERSUS OPEN TOTAL PROCTOCOLECTOMY WITH ILEOANAL ANASTOMOSIS IN CHILDREN: A NSQIP PEDIATRIC ANALYSIS** [Jeremy D Kauffman, MD](#), Paul D Danielson, MD, Nicole M Chandler, MD; Johns Hopkins All Children's Hospital

**S039 RESULT OF PEDIATRIC LAPAROSCOPIC LIVER RESECTION: A REPORT OF 15 CASES** [Ya Gao, PhD, MD](#), Hui Yu, MD, Baijun Zheng, Wei Gong, Xinkui Guo, Jiwen Cheng, Huaijie Wang, Weikang Pan; Department of Pediatric Surgery, The Second Affiliated Hospital, Xi'an Jiaotong University

# Complete Schedule

**S040 THE OUTCOMES OF LAPAROSCOPY-ASSISTED OPERATIONS FOR RECTOSIGMOID HIRSCHSPRUNGS DISEASE IN JAPAN: COMPARISON TO NON-LAPAROSCOPY-ASSISTED OPERATIONS** [Satoshi Obata, MD<sup>1</sup>](#), Ryota Souzaki, MD, PhD<sup>1</sup>, Satoshi Ieiri, MD, PhD<sup>2</sup>, Takashi Akiyama, MD, PhD<sup>2</sup>, Naoto Urushihara, MD, PhD<sup>2</sup>, Hisayoshi Kawahara, MD, PhD<sup>2</sup>, Masayuki Kubota, MD, PhD<sup>2</sup>, Miyuki Kono, MD, PhD<sup>2</sup>, Yuji Nirasawa, MD, PhD<sup>2</sup>, Shohei Honda, MD, PhD<sup>2</sup>, Masaki Nio, MD, PhD<sup>2</sup>, Makoto Hashizume, MD, PhD, FACS<sup>3</sup>, Tomoaki Taguchi, MD, PhD, FACS<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Kyushu University, <sup>2</sup>The Japanese Study Group for Hirschsprung's disease, <sup>3</sup>Department of Advanced Medicine and Innovative Technology, Kyushu University Hospital

**S041 LAPAROSCOPICALLY ASSISTED ANORECTOPLASTY FOR INTERMEDIATE TYPE OF IMPERFORATE ANUS: COMPARISON OF SURGICAL OUTCOMES WITH THE SACROPERINEAL APPROACH** [Tetsuya Ishimaru, MD, PhD<sup>1</sup>](#), Hiroshi Kawashima, MD<sup>1</sup>, Takahisa Tainaka, MD, PhD<sup>1</sup>, Keisuke Suzuki, MD<sup>1</sup>, Shohei Takami, MD<sup>1</sup>, Tomo Kakiyama<sup>1</sup>, Reiko Katoh, MD<sup>1</sup>, Tomohiro Aoyama, MD<sup>1</sup>, Hiroo Uchida, MD, PhD<sup>2</sup>, Tadashi Iwanaka, MD, PhD<sup>1</sup>; <sup>1</sup>Saitama Children's Medical Center, <sup>2</sup>Nagoya University

**S042 COMBINED-LAPAROSCOPIC-ENDOSCOPIC-PROCEDURES: ITS VALUE TO REMOVE THE STONE IN COMMON CHANNEL OF CHOLEDOCHAL CYST IN CHILDREN** [Jiangbin Liu, Zhibao Lv, professor](#); Shanghai Children's Hospital

8:45 am – 9:45 am

**SCIENTIFIC SESSION: Thorax**

TAHOMA LEVEL 3 Room 303/304

MODERATORS: Karen Diefenbach, MD &amp; Oliver Muensterer, MD

**S043 A NOVEL TECHNIQUE FOR THORACOSCOPIC INTERCOSTAL NERVE CRYOABLATION DURING THE NUSS PROCEDURE** [Veeshal H Patel, MD, MBA<sup>1</sup>](#), Claire E Graves, MD<sup>2</sup>, Benjamin E Padilla, MD<sup>1</sup>; <sup>1</sup>University of California, San Francisco, <sup>2</sup>Columbia University

**S044 RECURRENT TRACHEOESOPHAGEAL FISTULA AND TRACHEAL DIVERTICULUM; TRACHEOSCOPIC ABLATION WITH TCA** Rocio Soledad Gutiérrez, MD<sup>1</sup>, Manuel Lopez, MD, PhD, HDR<sup>2</sup>, Eduardo Leopold, MD<sup>3</sup>, [Patricio Varela, MD, PhD<sup>3</sup>](#); <sup>1</sup>Department of Pediatric Surgery, University Hospital Dr. Pedro de Elizalde. Buenos Aires, Argentina, <sup>2</sup>Department of Pediatric Surgery, University Hospital Vall d'Hebron, Barcelona, España, <sup>3</sup>Department of Pediatric Surgery, University Hospital Calvo Mackenna. Santiago, Chile

**S045 THORACOSCOPIC CARDIAC SYMPATHETIC DENERVATION: ADJUNCT THERAPY FOR SECONDARY PREVENTION OF LIFE-THREATENING VENTRICULAR ARRHYTHMIAS IN CHILDREN** [Erin M Garvey, MD](#), Andrew L Papez, MD, J. Craig Egan, MD, David M Notrica, MD, Mark Molitor, MD, Mitchell I Cohen, MD, Kathleen van Leeuwen, MD; Phoenix Children's Hospital

**S046 METICULOUS TREATMENT OF THORACOSCOPIC LOBECTOMY IN INFANTS AND CHILDREN** [Chang Xu](#); Department of pediatric surgery, West China Hospital of Sichuan University

**S047 OUTCOMES USING CRYOABLATION FOR POST-OPERATIVE PAIN CONTROL IN CHILDREN FOLLOWING MINIMALLY INVASIVE PECTUS EXCAVATUM REPAIR** [Joseph Sujka, MD](#), Leo A Benedict, MD, Jason D Fraser, MD, Pablo Aguayo, MD, Daniel L Millsbaugh, MD, Shawn D St. Peter, MD; Children's Mercy Hospital

**S048 THORACOSCOPIC POSTERIOR TRACHEOPEXY DURING PRIMARY ESOPHAGEAL ATRESIA REPAIR. INTRODUCTION OF A NEW APPROACH TO PREVENT TRACHEOMALACIA COMPLICATIONS.** [Stefaan H Tytgat, MD, PhD](#), Maud Y van Herwaarden, MD, PhD, David C van der Zee, Prof, MD; Wilhelmina Children's Hospital University Medical Center Utrecht

**S049 THORACOSCOPIC VERSUS OPEN RESECTION IN CHILDREN WITH ASYMPTOMATIC LUNG MALFORMATIONS: A REPORT FROM A MULTI-INSTITUTIONAL RESEARCH COLLABORATIVE** [Shaun M Kunisaki<sup>1</sup>](#), Shawn D St. Peter<sup>2</sup>, Jacqueline M Saito<sup>3</sup>, Mary E Fallat<sup>4</sup>, Kevin N Johnson<sup>1</sup>, Rodrigo A Mon<sup>1</sup>, Ronald B Hirschl<sup>1</sup>, On Behalf of the Midwest Pediatric Surgery Consortium<sup>5</sup>; <sup>1</sup>C.S. Mott Children's Hospital, University of Michigan, <sup>2</sup>Children's Mercy Kansas City, <sup>3</sup>St. Louis Children's Hospital, <sup>4</sup>Norton Children's Hospital, Louisville, <sup>5</sup>Midwest Pediatric Surgery Consortium

**S050 MINIMALLY INVASIVE SURGICAL APPROACH FOR POSTERIOR TRACHEOPEXY TO TREAT SEVERE TRACHEOMALACIA: LESSONS LEARNED FROM INITIAL CASE SERIES** [A Kamran, MD](#), T E Hamilton, MD, B Zendejas, MD, R W Jennings, MD, C J Smithers, MD; Boston Children's Hospital

**S051 ECHOCARDIOGRAPHIC PREDICTORS OF MORTALITY IN CDH PATIENTS WITH PULMONARY HYPERTENSION** [Sophia Abdulhai, MD<sup>1</sup>](#), Ian C Glenn, MD<sup>1</sup>, Dave Gothard, MS<sup>2</sup>, Pamela Lally, MD<sup>3</sup>, Avraham Schlager, MD<sup>1</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Biostats Inc, <sup>3</sup>The University of Texas McGovern Medical School, Department of Pediatric Surgery, and Children's Memorial Hermann Hospital

**S052 NO MORTALITY BENEFIT IN DELAYED CONGENITAL DIAPHRAGMATIC HERNIA REPAIR IN PATIENTS WITH SUPRASYSTEMIC PULMONARY HYPERTENSION** [Sophia Abdulhai<sup>1</sup>](#), Ian C Glenn, MD<sup>1</sup>, Dave Gothard, MS<sup>2</sup>, Pamela Lally, MD<sup>3</sup>, Avraham Schlager, MD<sup>1</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Biostats Inc, <sup>3</sup>The University of Texas McGovern Medical School, Department of Pediatric Surgery, and Children's Memorial Hermann Hospital

# Complete Schedule

9:45 am – 10:00 am

**Break**

10:00 am – 11:30 am

**JOINT SAGES/IPEG EXPERT PANEL: Colorectal Controversies around the Management of Complex Colorectal Problems Including Familial adenomatous polyposis, ulcerative colitis and Crohn Disease**

TAHOMA LEVEL 3 Room 303/304

CHAIR: Aaron Lipskar, MD, FAAP, FACS (IPEG) & Tonia Young-Fadok, MD, MS, FACS, FASCRS (SAGES)

DESCRIPTION: This session will explore controversies around the management of complex colorectal problems including familial adenomatous polyposis, ulcerative colitis and Crohn colitis. This is for adult and pediatric surgeons who are involved in the management of these conditions.

**OBJECTIVES**

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

- Better understand the argument for proctectomy and IPAA for Crohn colitis.
- Have an improved understanding of the arguments for and against routine diversion after IPAA.
- Review the consequences of the different techniques for IPAA and understand the medical management of subsequent cuffitis and pouchitis.

10:00 am	Is Routine Proximal Diversion Necessary after IPAA for Ulcerative Colitis? <i>The Argument FOR Routine Proximal Diversion</i>	Tonia M. Young-Fadok, MD, MS, FACS, FASCRS
	<i>The Argument AGAINST Routine Proximal Diversion</i>	Aaron M. Lipskar, MD, FAAP, FACS
10:20 am	Ileal Pouch Anal Anastomosis - Does Method of Anastomosis Matter?	Jason S. Frischer, MD, FAAP, FACS
10:35 am	Management of the Rectum in Children and Adolescents with Familial Adenomatous Polyposis	D. Dean Potter, Jr., MD
10:50 am	Management of the Rectum in Crohn Colitis	Jean Ashburn, MD
11:05 am	Medical Management of Pouchitis and Cuffitis after IPAA	Ghassan T. Wahbeh, MD
11:20 am	Panel Discussion	

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# Complete Schedule

11:30 am – 12:00 pm

## KEYNOTE LECTURE: I WAS IN SIBERIA AND SURVIVED

### *How to Build Empire of MIS for Small Babies*

SPEAKER: Yury Kozlov, MD

INTRODUCTION: Daniel J. Ostlie, MD, 2018 President

TAHOMA LEVEL 3 Room 303/304

DESCRIPTION: It will talk about a role of IPEG and its leaders in formation of the center of minimally invasive surgery for small babies in Siberia, to submit data on a large number of the MIS procedures performed at newborns here in Irkutsk, to present of advantages of MIS at newborns vs standard surgery, to show results of treatment of small children after application of new directions in laparoscopic neonatal surgery – single-port surgery and 3D laparoscopy.

#### OBJECTIVES

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

- Demonstrate of many cases of MIS at small babies
- Compare results of MIS and open surgery at small babies
- Recommend for building of MIS empires for small babies



**Chief of Pediatric Surgery and Head of Department of Neonatal Surgery at the City Clinical Hospital for Children, Irkutsk, Siberia, Russian Federation  
Clinical Professor of Pediatric Surgery at Irkutsk State Medical University and Academy of Postgraduate Medical Education, Irkutsk, Russian Federation**

Dr Yury Kozlov is a national leader in the field of endoscopic surgery in infants and children and has pioneered many of MIS procedures at small babies in Russia. He focuses in complex neonatal surgical diseases, difficult problems with the esophagus and diaphragm, and surgical critical care of infants and children.

Dr Yury Kozlov is also the Member of the Board of Russian Association of Pediatric Surgery and Main Pediatric Surgeon of Siberian Federal District. He has authored over 150 publications on minimally invasive surgery in children, edited four textbook on the subject of minimally invasive surgery at children and has given more lectures and master classes. He is a member of the editorial board a four nationally and internationally surgical journals - Journal of Laparoendoscopic Surgery and Advanced Surgical Technique, Russian Journal of Pediatric Surgery, Russian Journal of Endoscopic Surgery and Russian Messenger of Pediatric Surgery. He spends most of his free time in the Sayani mountains, Gobi desert and Lake Baikal of hiking, driving and fishing.

12:00 pm – 1:00 pm

## Lunch

LEVEL 4 - HALL 4 A/B

1:00 pm – 2:00 pm

## SCIENTIFIC SESSION: Video II -

### Cooler Tricks and Extraordinary Procedures

MODERATORS: Miguel Guelfand, MD &amp; Atul Sabharwal, MD

TAHOMA LEVEL 3 Room 303/304

**V011 SUCCESSFUL THORACOSCOPIC TREATMENT FOR KLUTH IV2 ESOPHAGEAL ATRESIA COMBINED WITH TRACHEAL BRONCHUS: A CASE REPORT OF RARE VARIANT ESOPHAGEAL ATRESIA** Masakazu Murakami, MD, Keisuke Yano, MD, Seiro Machigashira, MD, Yuto Nonaka, MD, Motoi Mukai, MD, PhD, Takafumi Kawano, MD, PhD, Shun Onishi, MD, Masato Kawano, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, Kazuhiko Nakame, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

**V012 MINIMALINVASIVE DUODENODUODENOSTOMY USING A MINIATURE STAPLER** Oliver J Muensterer, MD, PhD; University Medicine Mainz

**V013 ENDOSCOPIC-ASSISTED PERCUTANEOUS ANO-RECTO-PLASTY (EPARP)** Oliver J Muensterer, MD, PhD, Stephan Rohleder, MD, Ahmad Alsweed, MD, Jan Gödeke, MD; Pediatric Surgery, University Medicine Mainz, Germany

**V014 THORACOSCOPIC DIVISION OF A VASCULAR RING** Sophia Abdulhai, MD<sup>1</sup>, Steven Rothenberg, MD<sup>2</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Rocky Mountain Hospital for Children

**V015 THORACOSCOPIC AORTOPEXY FOR SEVERE TRACHEOMALACIA** Jason D Fraser, MD, Jason R Axt, MD; Children's Mercy Hospital

**V016 LAPAROSCOPIC RIGHT NEPHROPEXY FOR NEPHROPTOSIS** Adil Shah, MD, Mikael Petrosyan, MD, Philip Guzzetta, MD, Timothy Kane, MD; Children's National Medical Center

# Complete Schedule

**V017 THORACOSCOPIC RESECTION OF CONGENITAL ESOPHAGEAL STRICTURE** Jeremy G Fisher, MD, Dominic Papandria, MD, Christopher M Carter, MD, Karen A Diefenbach, MD; Nationwide Children's Hospital

**V018 LAPAROSCOPIC MEDIAN ARCUATE LIGAMENT RELEASE** Eveline H Shue, MD, Nam X Nguyen, MD; Children's Hospital of Los Angeles, Miller Children's Hospital of Long Beach

**V019 RIGHT THORACOSCOPIC REPAIR OF AN H-TYPE TRACHEOESOPHAGEAL FISTULA** Sophia Abdulhai, MD<sup>1</sup>, Steven Rothenberg, MD<sup>2</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Rocky Mountain Hospital for Children

**V020 ELONGATION OF BOTH ENDS BY STRETCHING TECHNIQUE FOR TREATMENT OF PURE ESOPHAGEAL ATRESIA BY THORASCOPIC SURGERY** Jun Wang, MD, PhD, Suna Sun, Wenji Wu, Weihua Pan; Xinhua Hospital affiliated Shanghai Jiaotong University School of Medicine

2:00 pm – 2:30 pm

**EXPERT PANEL: Endoscopically Crossing the Long Gap**

TAHOMA LEVEL 3 Room 303/304

CHAIRS: Steven Rothenberg, MD & Dave Lal, MD

DESCRIPTION: This session will focus on novel endoscopic therapies for the treatment of long gap esophageal atresia.

OBJECTIVES

At the conclusion of this session, participants will:

- Learn about thoroscopic repair of LGEA and its outcomes.
- Learn about the thoroscopic traction technique for delayed primary anastomosis in infants with LGEA.
- Learn about the controversies regarding surgical repair of LGEA.

2:00 pm	Thoroscopic management of Long Gap Esophageal Atresia	Dariusz Patkowski, MD
2:10 pm	Thoroscopic Traction Technique with Delayed Primary Anastomosis in infants with LGEA	David van der Zee, MD
2:20 pm	Questions and Answers	Steven Rothenberg, MD & Dave Lal, MD

2:30 pm – 2:45 pm

**Break**

2:45 pm – 3:45 pm

**SCIENTIFIC SESSION: Miscellaneous**

TAHOMA LEVEL 3 Room 303/304

MODERATORS: Matthew Clifton, MD & Nathan Novotny, MD

**S053 USE OF VENOVENOUS EXTRACORPOREAL MEMBRANE OXYGENATION PREFERENTIALLY IN INFANTS WITH CONGENITAL DIAPHRAGMATIC HERNIA** Heather L Short, MD<sup>1</sup>, Matthew S Clifton, MD<sup>1</sup>, Sarah Keene, MD<sup>2</sup>, Adarsh Patel, BS<sup>1</sup>, Curtis Travers<sup>3</sup>, Avraham Schlager<sup>4</sup>; <sup>1</sup>Emory University School of Medicine, Department of Surgery, Atlanta, GA, <sup>2</sup>Emory University School of Medicine, Department of Neonatology, Atlanta, GA, <sup>3</sup>Emory University School of Medicine, Department of Pediatrics, Atlanta, GA, <sup>4</sup>Akron Children's Hospital, Department of Pediatric Surgery, Akron, OH

**S054 EFFECT AND SIGNIFICANCE OF RA ON VEGF AND ET EXPRESSION IN THE LUNGS OF THE NITROFEN-INDUCED CONGENITAL DIAPHRAGMATIC HERNIA RAT MODELS** Lishuang Ma, Bin Sun, Jingna Liu, Cuizhu Feng, Yue Zhang, Ying Wang, Yanxia Zhang, Yandong Wei, Chao Liu; Capital Institute of Pediatrics, Peking University Teaching Hospital

**S055 DOES THORACOSCOPIC CONGENITAL DIAPHRAGMATIC HERNIA REPAIR CAUSE A SIGNIFICANT INTRA-OPERATIVE ACIDOSIS WHEN COMPARED TO AN OPEN ABDOMINAL APPROACH?** Maricarmen Olivos<sup>1</sup>, Christine Lam<sup>2</sup>, Alex Scarlet<sup>1</sup>, Muhammad Choudhry<sup>1</sup>, William Sherwood<sup>1</sup>, Amulya Saxena<sup>1</sup>, Diane De Caluwe<sup>1</sup>, Munther Haddad<sup>1</sup>, Simon Clarke<sup>1</sup>; <sup>1</sup>Chelsea and Westminster Hospital, <sup>2</sup>Imperial College of London

**S056 UTILIZATION TRENDS IN MINIMALLY INVASIVE PEDIATRIC ABDOMINAL SURGERY - EVIDENCE FROM U.S. TRAINING PROGRAMS** Dominic Papandria, Jeremy G Fisher, MD, Andrew B Nordin, MD, Karen A Diefenbach, MD; Nationwide Children's Hospital

**S057 BLEEDING AT REMOVAL OF NUSS BAR: RARE BUT SOMETIMES SIGNIFICANT** Nina S Cohen, MD<sup>1</sup>, Robert J Obermeyer, MD<sup>2</sup>, Robert E Kelly Jr, MD<sup>2</sup>, M Ann Kuhn, MD<sup>2</sup>, Frazier W Frantz, MD<sup>2</sup>, Margaret M McGuire, MD<sup>2</sup>; <sup>1</sup>Eastern Virginia Medical School, <sup>2</sup>Children's Hospital of the King's Daughters

**S058 BASELINE ASSESSMENT METRICS (BAM) OF INTRACORPOREAL SUTURING AND LAPAROSCOPIC VESSEL SEALING IN PEDIATRIC MIS. EXPERIENCE IN ONE CENTER.** H Yang, MD, G Falcioni, J Chichizola, M Maricic, M Bailez; Garrahan Children's Hospital

# Complete Schedule

**S059 THE DEVELOPMENT OF AN IDEALIZED TROCAR LAYOUT DECISION SYSTEM FOR LAPAROSCOPIC SURGERY FOR NEUROLOGICALLY IMPAIRED CHILDREN BASED ON INTRA- AND EXTRA-ABDOMINAL WORKING SPACE CALCULATIONS MADE USING A THREE-DIMENSIONAL SCANNER** [Koji Yamada, MD](#)<sup>1</sup>, Keisuke Yano, MD<sup>1</sup>, Masato Kawano, MD<sup>1</sup>, Shun Onishi, MD<sup>1</sup>, Waka Yamada, MD, PhD<sup>1</sup>, Ryuta Masuya, MD<sup>1</sup>, Takafumi Kawano, MD, PhD<sup>1</sup>, Seiro Machigashira, MD<sup>1</sup>, Kazuhiko Nakame, MD, PhD<sup>1</sup>, Motoi Mukai, MD, PhD<sup>1</sup>, Tatsuru Kaji, MD, PhD<sup>1</sup>, Munenori Uemura, PhD<sup>2</sup>, Satoshi Ieiri, MD, PhD, FACS<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Kagoshima University, <sup>2</sup>Kyushu University

**S060 FETOSCOPIC TWO LAYERS CLOSURE OF OPEN NEURAL TUBE DEFECTS** [Carlos Gine, MD, PhD](#), Silvia Arevalo, MD, PhD, Nerea Maiz, MD, PD, Carlota Rodó, MD, Jose A Molino, MD, Susana Manrique, MD, Elena Carreras, MD, Manuel Lopez, MD, PhD; Hospital Universitari Vall d'Hebron

**S062 LAPAROSCOPY AT THE TIME OF FIRST VENTRICULOPERITONEAL SHUNT REVISION RESULTS IN FEWER SUBSEQUENT PERITONEAL SHUNT REVISIONS A RETROSPECTIVE COHORT STUDY OF 148 PEDIATRIC PATIENTS.** [Aodhnait S Fahy, MD, PhD](#)<sup>1</sup>, Stephanie Tung, MD<sup>2</sup>, Maria Lambert-Pasculli, RN<sup>2</sup>, James Drake, MD<sup>2</sup>, Abhaya Kulkarni, MD, PhD<sup>2</sup>, Justin T Gerstle, MD<sup>2</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>Hospital for Sick Children

2:45 pm – 3:45 pm

**QUICKSHOT 4** NON CME

TAHOMA LEVEL 3 Room 305

MODERATORS: Joanne Baerg, MD &amp; Munther Haddad, MD

**QS074 THE UTILITY OF MUSCLE-SPARING AXILLAR SKIN CREASE INCISION WITH THORACOSCOPIC SURGERY IN CHILDREN** [Ryota Souzaki, MD](#)<sup>1</sup>, Naonori M Kawakubo, MD<sup>1</sup>, Kina Miyoshi, MD<sup>1</sup>, Satoshi Obata, MD<sup>1</sup>, Yoshiaki Kinoshita, MD<sup>1</sup>, Junkichi Takemoto, MD<sup>2</sup>, Kenichi Kohashi, MD<sup>2</sup>, Yoshinao Oda, MD<sup>2</sup>, Tomoaki Taguchi, MD<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan, <sup>2</sup>Department of Anatomic Pathology, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

**QS075 EFFECTS OF GREAT OMENTAL SUBTOTAL EXCISIONS ON PERITONEAL DIALYSIS IN CHILDREN WITH CHRONIC RENAL FAILURES** [Bo Xiang](#); Department of Pediatric Surgery, West China Hospital, Sichuan University

**QS076 OUTCOMES OF OSTOMY LOCATION IN CHILDREN: PLACEMENT OF THE OSTOMY AT THE UMBILICUS** [Joseph Sujka, MD](#), Hanna Alemayehu, MD, Leo Andrew Benedict, MD, Justin Sobrino, MD, Shawn St. Peter, MD, Jason D Fraser, MD; Children's Mercy Hospital

**QS077 MINIMIZING OPIOID EXPOSURE THROUGH UTILIZATION OF REGIONAL ANALGESIA IN CHILDREN UNDERGOING LAPAROSCOPIC INGUINAL HERNIA REPAIR** [Michelle P Kallis, MD](#), Pratik Shah, BA, Amarinder Sidhu, MD, Caroline W Maloney, MD, Oonagh Dowling, PhD, Natalie Barnett, MD, Michelle Kars, MD, John Hagen, MD, Aaron M Lipskar, MD; Cohen Children's Medical Center

**QS078 INITIAL EXPERIENCE IN THORACOSCOPIC APPROACH FOR THIMECTOMY IN MIASTENIA GRAVIS IN CHILDREN IN A PEDIATRIC HOSPITAL IN MEXICO CITY** [Carmen M Licona, MD](#), [Adriana Calderón, MD](#); Instituto Mexicano del Seguro Social

**QS080 PARAPNEUMONIC EMPYEMA: ADVANTAGES OF THORACOSCOPIC APPROACH. EXPERIENCE OF TWO ITALIAN CENTERS WITH THE SAME PROTOCOL.** [Claudio Vella](#)<sup>1</sup>, Francesca Destro<sup>1</sup>, Sara Costanzo<sup>1</sup>, Giovanni Di Iorio<sup>1</sup>, Andrea Pansini<sup>1</sup>, Maria Luisa Conighi<sup>2</sup>, Cosimo Bleve<sup>2</sup>, Fabio Chiarenza<sup>2</sup>, Giovanna Riccipetoni<sup>1</sup>; <sup>1</sup>Pediatric Surgery Department, V.Buzzi Childrens Hospital, Milan - Italy, <sup>2</sup>Pediatric Surgery Department San Bortolo Hospital Vicenza Italy

**QS081 LAPAROSCOPIC VASCULAR HITCHING IN CHILDREN WITH EXTRINSIC URETERO-PELVIC JUNCTION OBSTRUCTION IN TWO ITALIAN INSTITUTIONS. A DEBATED TECHNIQUE OR AN EFFECTIVE AND VALID SOLUTION?** [Salvatore Fabio Chiarenza](#)<sup>1</sup>, [Claudio Vella](#)<sup>2</sup>, Cosimo Bleve<sup>1</sup>, Maria Luisa Conighi<sup>1</sup>, Giovanni Di Iorio<sup>2</sup>, Giorgio Selvaggio<sup>2</sup>, Giovanna Riccipetoni<sup>2</sup>; <sup>1</sup>Pediatric Surgery Department San Bortolo Hospital Vicenza Italy, <sup>2</sup>Pediatric Surgery Department, V.Buzzi Childrens Hospital, Milan - Italy

**QS082 TWO BIRDS WITH ONE SHOT: A NEW SIMULATOR FOR PEDIATRIC LAPAROSCOPIC PYELOPLASTY** [Carolina Millan, MD](#), Juan Corbetta, MD, Javier Ruiz, MD, Santiago Weller, MD, Jorge L Martinez, MD, Luzia Toselli, MD, Fernando Rabinovich, MD, Soledad Valverde, MD, Santiago Calello, MD, Horacio Bignon, Gaston Bellia, MD, Marcelo Martinez Ferro, MD; Fundacion Hospitalaria Children's Hospital

**QS084 THORACOSCOPIC MANAGEMENT OF PERSISTENT PNEUMOTHORAX IN ONE YEAR OLD PATIENT WITH LANGERHANS CELL HISTIOCYTOSIS** [Linda Li](#)<sup>1</sup>, Eva Notis<sup>2</sup>, Andrew Silverman<sup>1</sup>, Alexey Abramov<sup>1</sup>, Michael Weiner<sup>1</sup>, Vincent Duron, MD<sup>1</sup>; <sup>1</sup>Morgan Stanley Children's Hospital-Columbia University Medical Center, <sup>2</sup>Touro College of Osteopathic Medicine

**QS085 THE SPACED LEARNING CONCEPT SIGNIFICANTLY IMPROVES TRAINING FOR LAPAROSCOPIC SUTURING: A PILOT RANDOMIZED CONTROLLED LONG-TERM STUDY** [Michael Boettcher, MD, PhD](#), Stefan Mietzsch, MD, Konrad Reinshagen, MD, PhD, [Thomas Krebs, MD](#); UKE Medical School

**QS086 ENDOSURGICAL TREATMENT OF ADOLESCENT GYNecomastia** [François Varlet, MD, PhD](#), Sophie Vermersch, MD, Aurelien Scalabre, MD; CHU de Saint Etienne

# Complete Schedule

**QS087 FIRST REPORT OF ROBOT-ASSISTED THORACOSCOPIC POSTERIOR TRACHEOPEXY TO TREAT SEVERE TRACHEOMALACIA** [A Kamran, MD](#), R N Yu, MD, PhD, T E Hamilton, MD, B Zendejas, MD, R W Jennings, MD, C J Smithers, MD; Boston Children's Hospital

**QS088 RURAL PEDIATRICIANS START REFERRING PATIENTS TO ADULT SURGEONS AT A SIGNIFICANTLY YOUNGER AGE COMPARED TO NON-RURAL PROVIDERS** [Danial Hayek, Sophia Abdulhai, MD](#), Ian C Glenn, MD, Todd A Ponsky, MD; Akron Children's Hospital

**QS089 MODIFIED UNIPORTAL VIDEO-ASSISTED THORACIC SURGERY VERSUS THREE-PORT APPROACH FOR LUNG NODULE BIOPSY IN PEDIATRIC CANCER PATIENTS** [Israel Fernandez-Pineda, MD<sup>1</sup>](#), Aaron D Seims, MD<sup>1</sup>, Lisa VanHouwelingen, MD<sup>1</sup>, Hafeez Abdelhafeez, MD<sup>1</sup>, Huiyun Wu, PhD<sup>2</sup>, Jianrong Wu, PhD<sup>2</sup>, Andrew J Murphy, MD<sup>1</sup>, Andrew M Davidoff, MD<sup>1</sup>; <sup>1</sup>Department of Surgery, St Jude Children's Research Hospital, <sup>2</sup>Department of Biostatistics, St Jude Children's Research Hospital

**QS090 LAPAROSCOPIC ASSISTED ANO RECTOPLASTY WITHOUT LIGATION OF THE RECTO-URINARY FISTULA : IS IT SAFE ?** [Guillaume Rossignol](#), Thomas Gelas, Frederic Hameury, Rémi Dubois, Pierre Yves Mure; Department of Pediatric Surgery CHU-HFME Lyon, France

**QS091 LAPAROSCOPIC APPROACH FOR THE ACUTE OVARY IN GIRLS AGED 15 YEARS OR LESS: OUR EXPERIENCE.** [Constanza Harding, MD](#), Francisca Moreno, MD, Alejandra Ríos Rubio, MD, Miguel Guelfand, MD; Universidad de Chile

**QS092 THORACOSCOPIC APPROACH IN MANAGEMENT OF SEVERE CONGENITAL DIAPHRAGMATIC HERNIA IN NEONATES.** [Lishuang Ma](#), Jingna Li, Yandong Wei, Cuizhu Feng, Yanxia Zhang, Ying Wang, Yue Zhang, Chao Liu, Bin Sun; Capital Institute of Pediatrics, Peking University Teaching Hospital

3:45 pm – 4:15 pm

## **KARL STORZ KEYNOTE LECTURE : Breakthrough to Brave**

TAHOMA LEVEL 3 Room 303/304

SPEAKER: Julie Frieschlag, MD FRCS Ed (Hon)

INTRODUCTION: Daniel J. Ostlie, MD, 2018 President

DESCRIPTION: This presentation will address health and wellness, burnout and how to be brave going forward as a leader in healthcare.

### OBJECTIVES

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

- Recognize burnout in themselves and others
- Develop tactics to prevent and treat burnout
- Implement brave actions as a leader



### **Chief Executive Officer - Wake Forest University Baptist Medical Center Interim Dean - Wake Forest School of Medicine**

Julie A. Freischlag joined Wake Forest Baptist Medical Center in April 2017 as Chief Executive Officer. Consistently ranked among the nation's top 50 medical centers, Wake Forest Baptist includes Wake Forest Baptist Health, a growing, multi-hospital health system and physician network, the state-of-the-art and highly competitive Wake Forest School of Medicine, and Wake Forest Innovations, its technology transfer, commercialization enterprise. As CEO, she has the overall responsibility for the Medical Center's clinical, academic and innovation enterprises and its

annual operating budget of \$2.5B. On July 1, 2017, Dr. Freischlag became the Interim Dean of Wake Forest School of Medicine.

She has published more than 250 manuscripts, abstracts and book chapters. Dr. Freischlag has received numerous teaching awards, an achievement award from the Department of Veterans Affairs, and was elected to the National Academy of Medicine in 2015. She has mentored students, residents and young faculty and is a frequent speaker on topics ranging from her expertise in vascular diseases, teamwork and patient safety, leadership and work-life balance to women succeeding in health professions. Dr. Freischlag has dedicated her career to serving as a role model for her students, a respected colleague across health professions, a strong community leader and a national voice for improving health and health care.



# Complete Schedule

4:15 pm – 5:15 pm

**SCIENTIFIC SESSION: Miscellaneous II**

TAHOMA LEVEL 3 Room 303/304

MODERATORS: Samir Pandya, MD &amp; Jason Fraser, MD

**S063 PAIN MANAGEMENT IN PECTUS EXCAVATUM SURGERY: A COMPARISON OF SUBCUTANEOUS CATHETERS VS. EPIDURALS IN A PEDIATRIC POPULATION** Shefali Thaker, MPH, Elise McKenna, MD, PhD, Christine Rader, MD, [Meghna V Misra, MD, MS](#); Connecticut Children's Medical Center

**S064 TECHNIQUES OF STERNAL ELEVATION TO IMPROVE SAFETY DURING THE NUSS PROCEDURE** [Frank-Martin Haecker, MD](#); Pediatric Surgery, University of Basel

**S065 POSTOPERATIVE ENLARGEMENT AND PROGNOSTIC EFFECTS OF PORTAL VENOUS BYPASS GRAFTS IN CHILDREN** [Jinshan Zhang](#), Long Li; Capital Institute of Pediatrics

**S066 ENGAGING SOCIAL MEDIA MEDICAL JOURNAL POSTS, SUCH AS INFOGRAPHICS AND VIDEO REVIEWS, LEAD TO LESS ARTICLE VIEWS** [Sophia Abdulhai, MD](#), Abdulraouf Lamoshi, MBBCh, MPH, ABPS, MS, CTS, Todd A Ponsky, MD; Akron Children's Hospital

**S067 PEDIATRIC ENDOSCOPIC PILONIDAL SINUS TREATMENT (PEPSIT), A REVOLUTIONARY TECHNIQUE TO ADOPT IN CHILDREN WITH PILONIDAL SINUS FISTULAS: A COMPARATIVE STUDY WITH CLASSIC OPEN REPAIR.** [Ciro Esposito](#), Maria Escolino, Serena Izzo, Francesco Turrà, Mariapina Cerulo, Giovanni Severino, Alessandro Settini, Giuseppe Cortese; Federico II University of Naples, Italy

**S068 3D VS. 2D LAPAROSCOPY IN THE HANDS OF NOVICES** [Sabine Zundel](#), Marie Heyne-Pietschmann, Philipp Szavay; Luzerner Kantonsspital

**S069 LEARNING CURVE OF LAPAROSCOPIC KASAI PORTOENTEROSTOMY FOR BILIARY ATRESIA WITH 100 CASES** [Zhicheng Xu](#); West China Hospital of Medicine, Sichuan University

**S070 SILS SPLENECTOMY** Ali Elsayed, Specialist, Yazeed Owiwi, Specialist, [Ameen Alsaggaf, PHD](#), Alaa Ghallab, PHD, Mohammed Fayez, Specialist, Enaam Raboe, PHD; KFAFH

**S071 CT-GUIDED LOCALISATION FOR THORACOSCOPIC RESECTION OF SMALL LUNG NODULES IN CHILDREN** [S T Seitz](#), M Besendoerfer; Department of Paediatric Surgery, University Hospital Erlangen

4:15 pm – 5:15 pm

**QUICKSHOT 5: Video** [NON CME](#)

TAHOMA LEVEL 3 Room 305

MODERATORS: David Juang, MD &amp; Avi Schlager, MD

**QV093 TREATMENT OF AN ISOLATED RENAL HYDATID DISEASE: COLLABORATIVE USAGE OF LAPAROSCOPIC SURGERY AND INTERVENTIONAL RADIOLOGY** [Haluk B Güvenc, MD<sup>1</sup>](#), Nevin Hatipoglu, MD<sup>2</sup>, Aysun F Erbahceci, MD<sup>3</sup>; <sup>1</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Surgery, <sup>2</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Infectious Diseases, <sup>3</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Interventional Radiology

**QV094 MODIFIED TRANSUMBILICAL SINGLE INCISION TWO-PORT LAPAROSCOPIC VARICOCELECTOMY IN ADOLESCENTS** [Xiaoyan Feng, MD](#), Chunsheng Hao, MD; Pediatric surgery department, Capital Institute Pediatric

**QV095 THORACOSCOPIC EXCISION OF DISTAL ESOPHAGEAL DUPLICATION CYST** [Rebecca M Rentea, MD](#), Shawn D St. Peter, MD; Children's Mercy Hospital - Kansas City

**QV096 LAPAROSCOPIC MANAGEMENT OF CONGENITAL ABDOMINAL WALL HYPOPLASIA** [John M McClellan, MD<sup>1</sup>](#), Joshua Dilday, DO<sup>2</sup>, John Horton, MD<sup>1</sup>; <sup>1</sup>Madigan Army Medical Center, <sup>2</sup>William Beaumont Medical Center

**QV097 SINGLE INCISION LAPAROSCOPIC SMALL BOWEL RESECTION FOR TREATMENT OF MECKEL'S DIVERTICULITIS: A SAFE, MINIMALLY INVASIVE APPROACH** [Timothy M Ullmann, MD<sup>1</sup>](#), Cheguevara Afaneh, MD<sup>1</sup>, Iskander Bagautdinov<sup>1</sup>, Alexandra C Baker<sup>1</sup>, Aaron R Turkish<sup>2</sup>, Tsang Kim<sup>2</sup>, Melissa L Rose, MD<sup>2</sup>, Stephen P Oh<sup>1</sup>; <sup>1</sup>New York Presbyterian, Weill Cornell Medicine, <sup>2</sup>New York Presbyterian Queens

**QV098 THORACOSCOPIC AORTOPEXY FOR THE TREATMENT OF SEVERE TRACHEOMALACIA IN CHILDREN** [Carlos García-Hernández, MD](#), Lourdes Carvajal-Figueroa, MD, Sergio Landa-Juarez, MD, Cesar Calderon-Alipi, MD; Universidad Nacional Autónoma de México

**QV099 ROBOTIC NEPHROPEXY FOR THE TREATMENT OF NEPHROPTOSIS** Charles W Concodora, MD, [Paul H Noh, MD](#); Cincinnati Children's

**QV100 LAPAROSCOPIC RESECTION OF A 13 CM ADRENAL MASS IN A 13 YEAR OLD GIRL** Eveline H Shue, MD, [Nam X Nguyen, MD](#); Children's Hospital of Los Angeles, Miller Children's Hospital of Long Beach

**QV102 LAPAROSCOPIC REMOVAL OF GASTRIC TRICHOBEZOAR BY A NOVEL MINIMALLY INVASIVE TECHNIQUE** [Ifikhar M Jan](#), Mokhtar Ali Hassan, DR, Muna Al Shehhi, Zahid Saqi; Mafraq Hospital Abu Dhabi UAE

# Complete Schedule

**QVI03 MINIMALLY INVASIVE, LARYNGOSCOPICALLY-ASSISTED MANAGEMENT OF AN ENLARGING FOURTH BRANCHIAL REMNANT.** [Etienne St-Louis, MD](#), Robin Petroze, MD, Hussein Wissanji, MD, Sam Daniels, MD, Kenneth Shaw, MD; McGill University Health Centre

**QVI04 THORACOSCOPIC RESECTION OF A UPPER MEDIASTINUM ESOPHAGEAL**

**DUPLICATION CYST IN A 2-MONTH-OLD INFANT ONE CASE REPORT WITH RETROSPECTIVE OTHER 5 CASES** [Kuiran Dong, MD<sup>1</sup>](#), Xianming Xiao, MD<sup>1</sup>, Zhongxi Zhang, MD<sup>2</sup>, Jialiang Zhou, MD<sup>2</sup>, Jun Li<sup>1</sup>; <sup>1</sup>Children's Hospital of Fudan University, <sup>2</sup>Children's Hospital of Xiamen

**QVI05 LEFT THORACOSCOPIC APPROACH FOR A BRONCHOGENIC CYST ORIGINATING FROM THE LOWER ESOPHAGUS IN THE POSTERIOR**

**MEDIASTINUM IN A 9-MONTH-OLD BOY - A CASE REPORT** [Keisuke Yano, MD](#), Takafumi Kawano, MD, PhD, Yuto Nonaka, MD, Shun Onishi, MD, Masato Kawano, MD, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, MD, Seiro Machigashira, MD, Kazuhiko Nakame, MD, PhD, Motoi Mukai, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

7:30 pm – 11:30 pm

**Friday Night Main Event & SAGES Sing Off!** NON CME

THE MUSEUM OF FLIGHT

SHUTTLES WILL LOAD FROM THE CONVENTION CENTER, CONVENTION PLACE ENTRANCE AT 6:45PM



## SATURDAY APRIL 14, 2018

8:30 am – 9:30 am

**EXPERT PANEL: Congenital Pulmonary Airway Malformations Operation or Observation?**

CHAIRS: Shaun Kunisaki, MD & Henri Steyaert, MD

DESCRIPTION: In this session we will review the scientific evidence to support operative vs. non-operative management for asymptomatic congenital pulmonary airway malformation.

OBJECTIVES

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

- Assess the literature arguing for operative management compared to those who advocate non-operative management
- Demonstrate the gaps in knowledge are largely a function of the relative rarity of the condition, long follow up required, and need for prospective studies
- Identify patients with CPAMs where one treatment strategy may be favored over the alternative

8:30 am	Introduction	Shaun Kunisaki, MD
8:35 am	Early Resection	Steven Rothenberg, MD
8:45 am	Delayed Resection	Casey Calkins, MD
8:55 am	Observation	Doug Miniati, MD
9:05 am	Review MWPC	Shaun Kunisaki, MD
9:15 am	Questions	Henri Steyaert, MD & Shaun Kunisaki, MD

TAHOMA LEVEL 3 Room 303/304

# Complete Schedule

9:30 am – 10:15 am	<b>General Assembly &amp; Presentation of 2019 Slate of Officers</b> <span style="border: 1px solid #00aaff; padding: 2px;">NON CME</span> COMMITTEE UPDATES: <ul style="list-style-type: none"> <li>• CME</li> <li>• Program</li> <li>• Development</li> <li>• Research</li> <li>• Education</li> <li>• Information Technology</li> <li>• JLAST Pediatric Editorial Board</li> <li>• Membership</li> <li>• Latin American Chapter</li> <li>• Middle East Chapter</li> <li>• President – Presentation of IPEG's 2019 President</li> </ul>	TAHOMA LEVEL 3 Room 303/304
10:15 am – 10:25 am	<b>IPEG Awards</b> <span style="border: 1px solid #00aaff; padding: 2px;">NON CME</span> Presented By: Lena Perger, 2017 Research Committee Co Chair <ul style="list-style-type: none"> <li>• Coolest Tricks</li> <li>• Basic Science/Innovation</li> <li>• IRCAD</li> <li>• Research</li> </ul>	TAHOMA LEVEL 3 Room 303/304
10:25 am – 10:30 am	<b>2017 Research Award Winner Abstract Update</b> <span style="border: 1px solid #00aaff; padding: 2px;">NON CME</span> Presenter: Steffi Mayer, MD	TAHOMA LEVEL 3 Room 303/304
10:30 am – 11:30 am	<b>VIDEO SESSION WITH EXPERT PANEL DISCUSSION: “My Worst Nightmare”</b> <b>The Management of Unexpected Complications and Strategies for Future Avoidance</b> CHAIRS: Carroll M. Harmon, MD, PhD & Shawn St. Peter, MD  DESCRIPTION: This session will review difficult and unusual cases which will allow for the group to expand their knowledge of complication management.  OBJECTIVES <ul style="list-style-type: none"> <li>• Articulate the types of complications and problems surgeons may encounter</li> <li>• Allow surgeons to predict problems and recognize contributing factors</li> <li>• Allow surgeons to be prepared for difficult cases and to manage complex complications</li> </ul>	TAHOMA LEVEL 3 Room 303/304
<b>RE-EXPLORATION FOLLOWING LAPAROSCOPIC SLEEVE GASTRECTOMY</b> Jeffrey L Zitsman, MD <sup>1</sup> , Arun Thenappan, MD <sup>2</sup> , Daniel M Relles, MD <sup>3</sup> ; <sup>1</sup> Morgan Stanley Children's Hospital of NY Presebyterian, <sup>2</sup> Children's National Medical Center, Washington, DC, <sup>3</sup> Lehigh Valley Health Network		
11:30 am	<b>Closing Remarks</b> SPEAKER: Shawn St. Peter, MD	TAHOMA LEVEL 3 Room 303/304

# Long Term Research Fund Donors

This year, IPEG members donated over \$30,000 to the Long Term Research Fund (LTRF), surpassing our previous year's numbers! We want to thank everyone for their generosity. The goal of the LTRF is to award grants to IPEG members for research, and you help to make that happen.



## A Special Thank You to our Donors!

*Donations made June 2017 - March 2018*

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# Accommodations

## HEADQUARTER HOTEL

**W Seattle** ■ 1112 4th Ave. Seattle, WA 98101 ■ T: 206-264-6000

The W is the headquarter hotel for IPEG's 27th Annual Congress for Endosurgery in Children, located steps away from the Washington State Convention Center where the congress will be held. The W has provided a special discounted rate for the registrants attending IPEG. The discounted group rates apply until the reservation deadline of March 13, 2018 or until all rooms in the block have been reserved, whichever occurs first. After March 13, 2018 the discounted group rate will no longer be available. We encourage you to confirm your reservations early. To make your hotel reservations please "click" on the link below and select "Make a Reservation" tab or contact the W directly and mention you are attending the IPEG congress.

### *The IPEG hotel block is now closed*

**Please note:** If you receive a "sold out" message when trying to reserve a room. Please click the "notify hotel" button. This will allow you to provide contact information to the hotel for them to reach out to you directly and assist with your reservation. Rooms booked outside of the IPEG room block are not guaranteed at the above rates. The special IPEG rates are on first-come-first served basis.

### **Early Departure Fee**

An early departure fee of \$75.00 will apply if an attendee/guest checks out prior to the confirmed checkout date.

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Any changes or cancellations are available through the online reservation page. You may be subject to cancellation fees. Check your hotel confirmation letter for individual hotel policy.

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### **Airport Proximity**

Seattle-Tacoma International Airport (SEA) is 14.3 miles away.

#### **Transportation Options:**

- **Link Light Rail:** Train that runs between SeaTac Airport and Downtown Seattle  
Approx. Cost: \$3  
Approx. Travel Time: 45 minutes with trains running every 15 minutes  
*Get off at the University Street Station, which is located one block away, take the exit that directs you to 3rd Avenue & Seneca Street*
- **Uber or Lyft:** Pick-up directly from the SeaTac Airport  
Approx. Cost: \$40 - \$50  
Approx. Travel Time: 25 minutes depending on traffic
- **Shuttle Express:** Guests can book the shuttle in advance or purchase a ride at the airport – signs are posted at the airport that direct travelers where to go.  
Approx. Cost: \$18 per person for a shared ride/downtown airporter  
Approx. Travel Time: 25 minutes depending on traffic



# 2018 Registration Form

## IPEG's 27<sup>th</sup> Annual Congress for Endosurgery in Children

Held in Conjunction with SAGES & CAGS

April 11-14, 2018 ■ Washington State Convention Center ■ Seattle, Washington USA



### PERSONAL CONTACT INFORMATION

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IPEG registration includes:

- Wednesday Welcome Reception
- Thursday-Saturday Scientific Sessions
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- Breaks and lunches
- Quickshot sessions
- Main Event
- Keynote Lectures

**IPEG Hands-On courses will be charged additionally.**

STEP 1 (required): Register under the appropriate category			US\$
Registration Type	Member*	Non-Member	
Surgeon	<input type="checkbox"/> US\$750	<input type="checkbox"/> US\$1050	
Surgeon in Training & Allied Health	<input type="checkbox"/> US\$450	<input type="checkbox"/> US\$550	
SAGES Cross Over Rate	<input type="checkbox"/> US\$200	<input type="checkbox"/> US\$200	

\*Membership will be verified; all registrations at the member rate without valid corresponding membership record will be charged the non member fee.

\* You may register as a member as long as you complete an IPEG membership application by March 1, 2018. If you register as a Non Member and complete an application by March 1st, you may be refunded the difference.

STEP 2: Register Guests (US\$150 per ticket; Complimentary for children under 14)		US\$
Guest ticket includes welcome reception and main event		
Guest 1 (Full Name): _____	<input type="checkbox"/> US\$150	
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\*Guests cannot be eligible for regular registration and will not receive a certificate of attendance

STEP 3: Register for a Hands On Course— SPACE IS LIMITED!		US\$
<b>Mastery Learning for Neonatal Minimally Invasive Surgery</b> Wednesday, April 11, 2018 ■ 8:00 am – 5:00 pm <i>This course is designed for pediatric surgeons seeking advanced minimally invasive skills for thoracoscopic lobectomy and tracheoesophageal fistula repair. Participants will dive deep into these specific skills and techniques of expert minimally invasive pediatric surgeons.</i>	<input type="checkbox"/> US\$1000	





Save the Date



# IPEG 2019

March 19-23, 2019 • Hotel Santiago • Santiago, Chile

*Save the Date!*



# EUPSA & IPEG 2020 Congress

June 9-13, 2020 • Austrian Convention Center, Vienna, Austria

# Quickshots Abstracts

**QS001 LAPAROSCOPIC VERSUS OPEN SURGICAL MANAGEMENT OF ADHESIVE BOWEL OBSTRUCTION IN CHILDREN: A RETROSPECTIVE STUDY COMPARING THE OUTCOMES AT A TERTIARY CARE CENTER FOR PEDIATRIC SURGERY.** Sunil Kumar, MBBS, MS, MRCS, MCh, Pediatric Surgery, Yousuf Khan, MBBS, FICS, FCPS, Pediatric Surgery, Vipul Gupta, MBBS, MS, MCh Pediatric Surgery, Aisha Khan, MD, MSc, Pediatric Surgery, Suad Abul, FRCSC, Abdulla Ali, FRCSC, Esmaeel Taqi, FRCSC, Ashraf Alkholy, MD; Ibn Sina Hospital Kuwait

**Background:** Laparoscopic approach for management of adhesive bowel obstruction has become an established technique both in adults and children. But still most of the literature regarding laparoscopic management of adhesive bowel obstruction is coming from adult practice. There is an increased need of reporting of the outcome using this method of treatment in pediatric practice.

**Aim:** To compare the outcome of laparoscopic versus open surgery with adhesive bowel obstruction in children.

**Methods:** Data were collected on children with adhesive bowel obstruction who were surgically managed at a tertiary care level center for pediatric surgery from January 2007 to September 2017. During the first half of the study period (January 2007- August 2012) all the patients were managed by open surgery while laparoscopic management was adopted during second half of the study period (September 2012 – September 2017). Children who were successfully managed conservatively without any surgery and those where laparoscopic procedure was converted into an open surgical procedure were excluded from the study. Outcome of laparoscopically managed children was compared with those managed by open surgery. Factors like operative time, need for total parenteral nutrition, time to resume oral feeds, post-operative length of hospital stay and complications during or after surgery were studied in laparoscopic and open group.

**Results:** A total of 80 children with adhesive intestinal obstruction were admitted. Eight patients who were managed without any surgical intervention were excluded from this study. Out of remaining 72 patients 42 were managed by open surgery and laparoscopic management was done for 30 patients. In 4 out of these 30 (10.3%) laparoscopic procedure was converted into an open surgery hence they were also excluded from our study. Mean age were 6.5 years and 5.4 years in open and laparoscopic group respectively. Operative time was not significantly different between open (122 minutes) versus Laparoscopic group (138 minutes). Serosal tear during adhesion lysis occurred in 10 cases in open surgery group while no one in laparoscopic group had this complication. Average time to resume oral feeds was shorter in laparoscopic group (3.5 days) than the open surgical group (5.5days). Wound complications like seroma, gaping and infection was observed in 4 cases in open group while none of the laparoscopic group had these complications. Length of the hospital stay was significantly shorter ( $p<.05$ ) in laparoscopic (group 5 days) group than open group (7 days). 10 patients with open group needed central venous catheter and total parenteral nutrition. In laparoscopic group TPN was not required for any patient. Overall complication rate was lower ( $P<.05$ ) in laparoscopic group.

**Conclusion:** Laparoscopic management for adhesive bowel obstruction in children is safe and is associated with early post-operative recovery, shorter hospital stay and lower complication rate in comparison to open surgical management of these cases.

**QS002 TWO-STAGE THORACOSCOPIC REPAIR OF LONG GAP ESOPHAGEAL ATRESIA, WITHOUT TEMPORARY GASTROSTOMY** Bartosz Bogusz, MD<sup>1</sup>, Dariusz Patkowski, Prof<sup>2</sup>, Sylwester Gerus, MD<sup>2</sup>, Marcin Maslanka, MD<sup>1</sup>, Wojciech Górecki, Prof<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Jagiellonian University Medical College, in Kraków, <sup>2</sup>Department of Pediatric Surgery and Urology, Medical University, Wrocław

**Background:** Long gap esophageal atresia (LGEA), is usually defined as a situation, when primary repair is considered technically impossible. The number of surgical treatment options, shows the difficulty of this pathology. The majority of them require temporary gastrostomy and several surgical interventions. Thoracoscopic repair of EA has proven to be feasible, safe and effective, showing the superiority of this technique to open thoracotomy. The initial observations after the introduction of a technique using internal traction sutures suggested, that most patients require only a two-stage procedure, and that prolonged time interval between consecutive procedures does not increase the chance of performing esophageal anastomosis.

**Aim:** The aim of the study is to present two patients with LGEA, successfully treated with a two-stage thoracoscopic procedure, without gastrostomy.

# Quickshots Abstracts

**Material and methods:** Case report concerning two patients with long gap esophageal atresia (Gross types A and B), focusing on surgical management, short-time treatment efficacy and safety, as well as the influence of associated malformations and observed complications. Patients were treated in two pediatric surgery departments.

**Results:** The first patient – with birthweight 2320 g, 33 Hbd, diagnosed with Gross type A esophageal atresia (EA) on the first day of life. Associated anomalies included hydrocephalus. Bronchoscopy and thoracoscopy performed on the second day of life confirmed the diagnosis. Thoracoscopic internal traction allowed to approximate the ends of the esophagus with a remaining gap of about 1 cm. Consecutive thoracoscopic intervention was undertaken after 8 days and esophageal anastomosis was achieved.

The second patient – birthweight 2550 g, 35 Hbd, diagnosed with Gross type B esophageal atresia without any associated anomalies. Ligation of upper TEF (tracheoesophageal fistula) and internal traction were performed on the 2nd day of life. The second intervention took place after 9 days, resulting in successful anastomosis of the esophagus.

In both presented cases, no gastrostomy was performed, because, in the opinion of the authors, gastric wall fixation can increase the tension on the lower esophagus, reducing the chance for anastomosis, and prolonging the treatment. Feeding was started in both patients on the 5th and 8th postoperative day. The children achieved satisfactory tolerance of oral diet between 3 – 4 weeks after the second operation. Postoperative course was complicated by a moderate stricture of esophageal anastomosis, treated successfully with 3 and 4 endoscopic dilatations.

**Conclusion:** We propose a novel attitude to the treatment of patients with long-gap esophageal atresia. Presented observations suggest that in LGEA, short-time internal traction can allow to perform esophageal anastomosis without the need for gastrostomy or prolonged total parenteral nutrition. The use of thoracoscopy is a major advantage to the newborn, offering improved technical feasibility of repeated chest access.

**QS003 COMPLICATIONS ASSOCIATED WITH SURGICAL TECHNIQUE USED FOR PERITONEAL DIALYSIS CATHETER PLACEMENT** Diana Alejandra Holguin Sanabria, MS<sup>1</sup>, Ivan Darío Molina Ramírez, MSc<sup>2</sup>, Lorena Lamprea, MD<sup>1</sup>; <sup>1</sup>Hospital de la Misericordia, <sup>2</sup>Universidad Nacional de Colombia

**Background/Purpose:** Peritoneal dialysis (PD) is a successful method of renal replacement therapy for children. However, placement of PD catheters risks and complications are frequent. Operative technique, catheter selection, and age or weight of the patient may influence the outcomes. The purpose of this study was to review surgical outcomes after placement of peritoneal dialysis (PD) catheters in the past three years and its association with the surgical technique (open vs laparoscopic)

**Methods:** We conducted a retrospective chart review of children with a PD catheter placed between January 2013 and June 2016. Therapeutic success was defined as the PD catheter which didn't have any complication and didn't require re-operation until it was removed or at the last date of follow up.

**Results:** We identified 92 children with PD catheters. Primary PD catheter failure occurred in 21.74% and 17.39% required re-operation. The most common complication was poor drainage (13.04%), followed by leak (8.70%). Age < 1 years was a significant risk factor for catheter malfunction; they had 3,75 greater odds of returning to the operating room for procedures related to their catheter ( $p=0,04$ ), 5,7 greater odds of developing a leak ( $p=0,04$ ), 3,44 greater odds of PD occlusion ( $p=0,03$ ), 2,9 greater odds of developing hernia ( $p=0,005$ ) y 2,18 greater odds of death ( $p=0,015$ ). Catheter placement in children < 10 kg had 3 greater odds of returning to the operating room ( $p=0,03$ ), 9 greater odds of developing a leak ( $p=0,005$ ), 2,8 greater odds of PD occlusion ( $p=0,023$ ). Regarding the technique, the risk of the re-operation when PD catheter is implanted by open technique is 63% more than when it is made by laparoscopic technique ( $p<0,05$ ). The odds of leak is 2.48 times greater when the procedure is made by open technique versus laparoscopic technique ( $p<0,05$ ). Placement of the catheter by laparoscopic technique reduces the odds of poor drainage by 38% ( $p=0,006$ ). There is twice the risk of peritonitis when an open surgery is made ( $p<0,05$ ).

**Conclusions:** PD placement is a safe procedure with a high complication rate, specially in children under 1 year, weighing less than 10 kg and premature, who also have higher mortality. More studies should be done evaluating the outcomes of laparoscopic technique in this group of patients.

# Quickshots Abstracts

We have proven that by an open technique the risk of leak, poor drainage and peritonitis is higher, what leads us to recommend making the procedure via laparoscopic and also using the introducer kit with Seldinger video-assisted technique with pigtailed catheter which proved to have less rates of complications and re-operation.

**QS004 THORACOSCOPIC CLOSURE OF TRACHEOESOPHAGEAL N-FISTULAS - A SERIES OF 4 CASES** Anne-Sophie Holler, MD, Christina Oetzmann von Sochaczewski, MD, Oliver J Muensterer, MD, PhD; Department of Pediatric Surgery, University Medical Center of the Johannes Gutenberg University Mainz

**Background:** Tracheoesophageal N-fistulas are rare with an estimated incidence of 1:87,000 live births. The contemporary management consists of an open operation via a right cervical approach with ligation and subsequent division of the fistula. Although highly successful, this procedure goes hand in hand with temporary vocal cord paresis in up to 50% of all cases. Only few isolated cases of thoracoscopic closure have been reported so far.

**Material and methods:** We retrospectively analyzed our experience with thoracoscopic closure of N-type tracheoesophageal fistula (without esophageal atresia) between December 2016 and August 2017.

**Results:** Four cases of thoracoscopic N-type fistula repair were undertaken in 3 patients. One patient recurred and underwent a second thoracoscopic repair. The patients' ages were two, seven, nine, and 26 weeks (recurrent fistula closure). By our hospital standard, all cases were prepared by bronchoscopic fistula identification and localization with a flexible guidewire. In the patient with recurrence, the initial closure was performed with a 5.8mm miniature stapler and without interposition of a flap. The fistula recurred 3 months after the initial closure. Endoscopic closure with fulgurization and injection of fibrin glue was only temporarily successful for 10 days. All other procedures were performed by suture ligation of the fistula on both sides, fistula division and interposition of a pleural flap. The patient with the recurrent fistula had temporary vocal cord paresis after the second operation. No other complications were noted, and the patients were asymptomatic on follow-up.

**Conclusions:** Thoracoscopic fistula repair is feasible for N-fistula, although the current evidence is limited by the small number of cases performed and described in the literature. We would currently advise against using a miniature stapler without interposition of a tissue flap. Like with open surgery, vocal cord paresis is a possible complication of thoracoscopic closure that must be mentioned when obtaining consent, particularly with recurrence.

**QS005 THORACOSCOPIC PULMONARY LOBECTOMY FOR DENSELY FUSED PULMONARY LOBES IN CHILDREN WITH CPAM: TECHNICAL TIPS.** Hiroyuki Koga, MD, Hiroki Nakamura, MD, Hiroshi Murakami, MD, Geoffrey J Lane, MD, Manabu Okawada, MD, Go Miyano, Takanori Ochi, MD, Atsuyuki Yamataka, MD; Department of Ped Surgery, Juntendo University

**Aim:** Interlobar pulmonary arteries (PAs) cannot be identified when severe incomplete fissure causes densely fused pulmonary lobes (DFPL) in children with congenital pulmonary airway malformation (CPAM). Thoracoscopic pulmonary lobectomy (TPL) is extremely challenging in such cases, since interlobar PAs are buried and completely concealed by DFPL. Here, we describe TPL for DFPL including a technical tip to prevent pitfalls.

**Methods:** We present 3 CPAM cases and DFPL. CPAM was present in the left upper lobe (n=2) and the right middle lobe (n=1). No cases were diagnosed prenatally and two cases had repeated pulmonary infections. TPL was performed between the ages of 24 to 35 months, when cases weighed 9-11 kg. During TPL, DFPL prevents interlobar PAs from being identified and searching for them only promotes bleeding and air leakage, serious pitfalls that affect the safety and success of TPL. Our tip is to ligate and divide the pulmonary veins at the pulmonary hilum and the hilar PA supplying the CPAM lobe to expose the bronchus of the CPAM lobe which is then ligated and divided. Thus, the main interlobar PA supplying the CPAM lobe running underneath the DFPL is exposed and visible from the pulmonary hilum allowing the interlobar PA supplying the CPAM lobe to be ligated and divided safely. Once divided, a line demarcating the fused fissure becomes apparent and an endoscopic stapler or Enseal® device can be used to divide the DFPL along the line of demarcation taking great care not to injure the main interlobar PA or interlobar PAs supplying the undiseased lobes.

# Quickshots Abstracts

**Results:** There were no intra- or post-operative complications in any case. Blood loss was less than 1mL in each case. No air leakage was detected after TPL in any case. All cases were discharged after a chest tube inserted intraoperatively was removed on days 1 or 2 after TPL. Currently, all are well without respiratory tract related symptoms after a mean follow-up of 4.1 years (0.5, 4.3 and 7.5 years, respectively).

**Conclusions:** TPL for DFPL in children with CPAM may be performed safely and successfully as a virtually bloodless procedure without air leakage by ligating and dividing the interlobar PA after dividing the pulmonary veins and bronchus to the CPAM lobe.

**QS006 MODIFICATION TO LAPAROSCOPIC INGUINAL HERNIA REPAIR: THE DOUBLE NEEDLE TECHNIQUE** Adam Meziani, MD, Richy Lee, MD, Rob Weinsheimer, Angela M Hanna, MD; Swedish Medical Center

**Purpose:** Needle assisted laparoscopic inguinal hernia repair is a new technique for pediatric indirect inguinal hernia repair that is gaining wide acceptance. The technique involves use of hydrodissection and extracorporeal needle manipulation with only the need for a camera port to be placed. Techniques of tissue manipulation are limited and sometimes redundant peritoneum makes dissection difficult, necessitating placement of additional working trocars or conversion to an open procedure. We have found a novel technique involving use of a concurrent second needle through the same incision which permits tissue retraction to be able to complete the circumferential dissection of the internal ring.

**Methods:** We describe a variation of the needle assisted laparoscopic inguinal hernia repair using a dual needle technique to assist in difficult steps of the procedure.

**Results:** Images demonstrating the dual needle technique will be shown with a brief description of the operative technique.

**Conclusion:** Use of a second needle during needle assisted laparoscopic inguinal hernia repair is a safe, easy strategy to perform difficult maneuvers and avoid necessity of placement of additional working ports or conversion to open procedure.

**Key Words:** Herniorrhaphy/methods; herniorrhaphy/instrumentation; hernia, inguinal/surgery, laparoscopic

**QS007 COMPARATIVE EVALUATION OF TAN S, MARVEN S AND MODIFIED MARVEN S APPROACHES USING MYRINGOTOMY KNIFE IN OF LAPAROSCOPIC PYLOROMYOTOMY** Ahmed Abo Elyazid, MCh, Mohamed Shalaby, MD, AbdelMotalieb Effat, MD, Ahmed Eissa, MD, Sherif M Shehata, MCh, CST, MD, PhD; Section of Pediatric Surgery, Faculty of Medicine, Tanta University, Tanta, Egypt

**Purpose:** To assess in a prospective manner three laparoscopic pyloromyotomy techniques in order to find the most suitable one in regards to short term outcomes.

**Patients & Methods:** Forty infants with IHPS were treated along the last 30 months. All cases were subjected to laparoscopic pyloromyotomy based on random allocation and surgeon's preference. Babies less than 3 days or Infants more than 3 months were excluded from the current study. Cases will be evaluated for operative time, surgeon's satisfaction and any operative complication. Post operatively, patients will be assessed for postoperative vomiting, time of return of peristalsis, time of tolerance of oral feeding and subjective cosmetic score. The umbilical port position and Rt hypochondrial port are fixed while change is in others.

**Results:** We have 40 cases with age ranged between 15 and 42 days. Ten cases managed by Tan's approach, 13 cases by Marven's approach and 17 by modified Marven's approach. Seromuscular incision is done in all cases using myringotomy knife. Operative time ranged between 15 and 50 min (30 and 50 min in Tan's, 20 and 45 min in Marven's and 15 and 40 min in modified Marven's), with one conversion. We observed more difficulty in Tan's approach as the incision is not direct over the mass as compared to modified Marven's with better fixation. Post operatively; vomiting is reported to be higher in Tan's subgroup, better cosmesis in Marven's subgroup despite no statistical significances. Two cases of recurrent vomiting; one with incomplete pyloromyotomy in the early learning curve in Tan's subgroup and the other with missed complete Ladd's band where both managed operatively.

**Conclusion:** Laparoscopic pyloromyotomy is an excellent technique in IHPS cases with superior cosmesis, technique is feasible and safe. Modified Marven's approach showed the best outcome in our study. Experience of the whole team is a must and larger numbers are needed to make the real validation of results in evidence based warranty.

# Quickshots Abstracts

**QS008 LAPAROSCOPIC-ASSISTED PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IS RECOMMENDED FOR OLDER PATIENTS AND PATIENTS WITH SEVERE SCOLIOSIS** Shinya Takazawa, MD, PhD, Akira Nishi, MD, Yukiko Tani, MD, PhD, Tsubasa Goshima, MD, Yasuyuki Uchida, MD; Gunma Children's Medical Center

**Purpose:** Percutaneous endoscopic gastrostomy (PEG) is a common procedure because it is easy and safe to perform. However, this procedure is difficult or impossible to perform in patients who have an anatomical problem of the stomach due to cerebral palsy or scoliosis. We performed laparoscopic-assisted percutaneous endoscopic gastrostomy (LAPEG) for these patients. The aim of this study was to compare PEG and LAPEG in the pediatric surgical field.

**Methods:** A retrospective chart review was performed on patients who underwent PEG or LAPEG at a single children's hospital between 2006 and 2015. The procedure was decided based on the barium upper gastrointestinal studies and the intraoperative findings. In both procedures, the Funada-kit II device was used to fix the stomach and abdominal wall. The patient characteristics, degree of scoliosis (Cobb angle) and perioperative results were compared between the PEG and LAPEG groups. Receiver operating characteristic (ROC) curves were used to determine whether patient characteristics are useful to select the operating method.

**Results:** A total of 51 patients underwent PEG or LAPEG. The patient characteristics and perioperative data are shown in Table 1. The LAPEG group was significantly older than the PEG group. There were no significant differences in the rates of perioperative complications between the two groups. ROC analysis showed that the optimal cut-off values were 13 years old for age at operation [area under the ROC curve (AUC)=0.79], 17.2 kg for body weight (AUC=0.82), and 75 degrees for Cobb angle (AUC=0.67).

**Conclusions:** The operating time of LAPEG was longer than that of PEG, but the duration of the postoperative hospital stay and complication rate were similar between patients who underwent LAPEG or PEG. It is recommended that LAPEG be performed in older patients and patients with more severe scoliosis.

**Table 1. Patient characteristics and perioperative data**

	PEG (n = 33)	LAPEG (n = 18)	P-value
Age (yr)	6.4 ± 6.6	16.4 ± 10.5	<0.01
Weight (kg)	12.8 ± 5.8	22.9 ± 9.5	<0.01
Cobb angle (degree)	20 ± 32	52 ± 53	<0.01
Operating time (min)	18 ± 7.7	50 ± 15	<0.01
Return to full feeding (day)	4.6 ± 4.4	5.1 ± 2.7	ns
Postoperative hospital stay (day)	12.5 ± 11.2	9.7 ± 3.5	ns

Demographic data are expressed as mean ± standard deviation and were analyzed using the Student's t test. ns, not significant

**QS009 THE COMPARISON OF THE TREATMENT OF THE OPENING SURGERY VERSUS LAPAROSCOPIC SURGERY OF THE DUODENAL OBSTRUCTION IN NEONATAL PATIENTS** Jingbin Du, Drpediatric surgern; Capiatal Medical Science College,beijing Children's Hospital

**Objective:** To evaluate and to compare the prognosis of the opening surgery versus the laparoscopic surgery for neonates with congenital duodenal obstruction(CDO).

**Methods:** From Jan. 2012 to Oct. 2017, we retrospectively analyzed the clinical data of 150 cases with CDO. In these case, 92 curing with traditional opening surgery and 58 case with laparoscopic surgery. We compare the the operation time , postoperative hospital stay time for postoperative feeding, hospital cost, and postoperative complications between the two groups.

The laroscopic group recovered postoperative feeding earlier, much more longer time in operation in laproscopic surgery. No significantly differences in the postoperative hospital stay , hospital cost, and rate of postoperative complications between the two groups (P > 0.05).

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**Conclusion:** Laparoscopic surgery in treatment for duodenal obstruction in neonatal patients is effective, and it has more advantage than the opening surgery in treatment of CDO.

**Key Words:** Laparoscopy ;opening surgery; Congenital duodenal obstruction;

## **QS011 CLINICAL APPLICATION OF THORACOSCOPIC SURGERY ON LATE-PRESENTING CONGENITAL DIAPHRAGMATIC HERNIA IN CHILDREN** Miao Yuan; Department of pediatric surgery, West China Hospital of Sichuan University

**Purpose:** Given that the application of thoracoscopic surgery on late-presenting congenital diaphragmatic hernia in children is in controversy, we aimed to discuss the security and feasibility through summarizing the experience on choice of operative time and manipulative details from patients who accepted the operation in our hospital.

**Methods:** The cases that accepted thoracoscopic surgery from October 2012 to March 2017 were reviewed retrospectively. Surgical method was thoracoscopic minimally invasive technique. During the procedure, three valved endoscopic ports were used. A 5mm trocar was placed in the midaxillary line in the fourth interspace. Then CO<sub>2</sub> pneumothorax was established by inflating pressure to 4 mmHg, flow 1 L/min. After checking the thorax through thoracoscopy, the herniated contents were pushed back into abdominal cavity. The diaphragmatic defect was closed with interrupted non-absorbable sutures. A knot pusher was used to assistant tie in thorax. As for triangular defect close to chest wall, hernia repair needle was used. Periphery of the defect was burned by monopolar electrocautery hook. At the end of the procedure, CO<sub>2</sub> was aspirated from the thorax through the stopcock of one of the ports, which will expand the lung. Chest tube drainage was required.

**Results:** Total 38 cases were included in this study, 22 were girls and 16 were boys. The ages ranged from 2 months to 8 years (mean, 18 months). 17 patients presented symptoms including shortness of breath and dyspnea and 21 cases were found occasionally. 29 hernias were left-sided and 9 cases were right-sided. 16 cases performed emergency surgery and 22 patients were delayed surgery. Hernial sac existed in 10. Extralobar pulmonary sequestrations that 4 cases combined with were resected by thoracoscopic surgery at the same time. 7 cases underwent appendectomy simultaneously for appendix herniating into thorax. Mean operative time was 30-80 min (mean, 50 min) and bleeding was 3-5 ml (mean, 3.5 ml). The size of diaphragmatic defect ranged 2×2 to 5×6 cm. All of these repairs were successful via a thoracoscopic approach. The chest tubes were taken out within 24 hours. Average length of hospital stay was 5.2±0.4 days (range, 4–6 days). Except abdominal distension was occurred in 19 cases, there were no other complications. The patients had mild postoperative pain and superior cosmetic results. The follow-up period ranged from 6 months to 4 years (mean, 21 months). All subjects survived without recurrence.

**Conclusion:** Thoracoscopic repair on late-presenting congenital diaphragmatic hernia is a safe and efficacious technique. It can facilitate the procedure and decrease the recurrent rate by focus on some techniques. The prognosis is excellent once the correct operative details are made.

## **QS012 SINGLE-INCISION LAPAROSCOPIC REPAIR FOR INTRAOPERATIVE DUODENAL INJURY IN CHILDREN WITH CHOLEDOCHAL CYSTS** Mei Diao, Professor, Doctor, Long Li, Professor, Doctor; Department of Pediatric Surgery, Capital Institute of Pediatrics

**Purpose:** Conventionally, it often converts to open approach to repair duodenal injury in laparoscopic definitive surgery of choledochal cysts (CDC). The current study is to evaluate efficacy of single-incision laparoscopic repair for intraoperative duodenal injury in CDC children.

**Methods:** CDC children who successfully underwent single-incision laparoscopic repair for intraoperative duodenal injury between October 2013 and October 2017 were reviewed. According to pathophysiology, the duodenal injuries were categorized into 2 subtypes: 1) injury caused by perforation and severe adhesions; 2) distal CDC shares the common wall with the duodenum. A transabdominal suture was placed through distal end of CDC. Relying on the adhesion between distal CDC and duodenum, the injured duodenum can be clearly exposed when the assistant pulled on the retraction suture. The duodenal injury was repaired by a double-layer 5-0 PDS running suture. The distal CDC was transected after repair was accomplished.

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**Results:** Five children were assessed (Type 1: n=4, Type 2: n=1). Mean age at surgery was 1.92 years (range: 4.3 months - 5.05 years). Average operative time was 4.41 hours (range: 3.75-5.33 hours). Mean postoperative hospital stay was 7.2 days (range: 6-8 days). Mean duration of full diet resumption was 5.0 days (range: 3-6 days). Mean duration of drainage was 5.0 days (range: 3-6 days). The median follow-up period was 19 months. Postoperative liver function tests and serum amylase levels were normalized within 1 year. None of patients had intestinal leak, anastomotic stenosis, bile leak, cholangitis, intrahepatic reflux, pancreatic leak, pancreatitis, Roux-loop obstruction, or adhesive intestinal obstruction.

**Conclusion:** In experienced hands, single-incision laparoscopic repair for intraoperative duodenal injury in CDC children is safe and effective.

**QS013 LAPAROSCOPIC TREATMENT FOR ABERRANT HEPATIC DUCT IN CHILDREN WITH CHOLEDOCHAL CYSTS** Mei Diao, Professor, Doctor, Long Li, Professor, Doctor; Department of Pediatric Surgery, Capital Institute of Pediatrics

**Purpose:** To evaluate efficacy of laparoscopic treatment for aberrant hepatic duct (AHD) in children with choledochal cysts (CDC).

**Methods:** Children with CDCs and AHDs who successfully underwent laparoscopic ductoplasties and hepaticojejunostomies between October 2001 and October 2017 were reviewed. The individualized surgical strategy was adopted according to different subtypes of AHD: 1) The AHD shares a common wall with the common hepatic duct (CHD): The anterior wall of AHD was split. A wide hepaticojejunostomy was carried out; 2) The AHD does not share a common wall with the CHD but locates close to CHD: the lateral walls of AHD and CHD were anastomosed by a 5-0 PDS running suture to form an enlarged anastomotic stoma. A wide hepaticojejunostomy was conducted; 3) The cystohepatic duct: the anastomosis of cystohepatic duct to jejunum and CHD to jejunum were carried out separately; 4) The duplication of cystic duct: the cystic duct with orifice in the distal CHD was incised. The duplication of cystic duct with orifice in proximal CHD was ligated before incised to prevent bile leak; 5) Associated aberrant right hepatic artery: 5a) anteriorly compressing both proximal CHD and AHD: the aberrant right hepatic artery was repositioned behind proximal CHD and AHD. The AHD and CHD were combined as one anastomotic stoma; 5b) anteriorly compressing proximal CHD alone: in case that AHD shares a common wall with the CHD, the connection between aberrant hepatic duct and CHD was transected. After repositioning the aberrant right hepatic artery behind CHD, the lateral walls of AHD and CHD were sutured to form an anastomotic stoma. A wide hepaticojejunostomy was carried out.

**Results:** Sixty children were assessed (F/M: 46/14, Type 1: n=32, Type 2: n=15, Type 3: n=6, Type 4: n=3, Type 5a: n=1, Type 5b: n=3). Mean age at surgery was 3.91 years (range: 27 days-15.5 years). Two (3.3%) patients in Type 3 suffered from bile leaks after primary surgeries because of unsolved cystohepatic ducts. They underwent laparoscopic anastomosis of cystohepatic duct to jejunum in redo surgeries. The drain tubes were placed for 7 and 9 days respectively. The patients were discharged at Day 11 after primary surgeries respectively. In the remaining 58 patients, the average operative time was 3.75 hours (range: 1.5-6 hours). Mean postoperative hospital stay was 6.02 days (range: 4-12 days). Mean duration of full diet resumption was 2.25 days (range: 2-7 days). Mean duration of drainage was 4.04 days (range: 3-11 days). The median follow-up period was 30 months (range: 1-204 months). Postoperative liver function tests and serum amylase levels returned to normal within 1 year. Two (3.4%) patients with giant CDCs had fluid collections because of extensive dissection. They were cured by 9 and 11 days drainage respectively. One (1.7%) patient encountered duodenal injury because of perforation induced severe adhesions. She underwent laparoscopic repair. None of patients had bile leak, anastomotic stenosis, cholangitis, intrahepatic reflux, pancreatic leak, Roux-loop obstruction, or adhesive intestinal obstruction.

**Conclusion:** Individualized laparoscopic ductoplasty and hepaticojejunostomy is safe and effective for children with CDCs and AHDs.



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## **QS014 LAPAROSCOPIC ADRENALECTOMY OF ADRENAL MASSES > 5 CM IN SIZE: A SINGLE-CENTRE EXPERIENCE WITH 7 PEDIATRIC PATIENTS** Jiangbin Liu; Shanghai Children's Hospital

**Purpose:** Laparoscopic adrenalectomy is considered the a safe and feasible treatment for small adrenal tumors in children. An open question still discussed is the use of laparoscopy in case of large adrenal masses because of technical challenging. In this study we report our experience in laparoscopic adrenalectomy for adrenal masses larger than 5 cm in size.

**Methods:** Between January 2013 and May 2017, 7 cases of adrenal masses were submitted to laparoscopic adrenalectomy for lesions > 5 cm in size. The patients treated were 4 boys and 3 girls with the mean age of 3.45 years (rang, 1.7 to 5.5 years old). The mean size of lesions in greatest diameter was 5.5-7.5cm in CT scanning with no local invasion, vascular infiltration or distant metastases. And one patient had hypertension as 150/110 mmHg before surgery.

**Results:** All the cases were completely performed by laparoscopic excision without open conversion. The mean operative time was  $125 \pm 55$  (65-275) minutes and the average intra-operative blood loss was 5-15ml. No major intraoperative complications occurred. The mean hospital stay was 3.5 days (3-5 days) and average follow-up time was 2.5 years (0.5-4.5years) without recurrence. Histopathology revealed paraganglioma (1, with hypertension preoperatively), neuroblastoma (2), ganglioneuroma (3) and enterogenous cyst(1) . 1 patient followed chemotherapy according to COG protocol. The blood pressure of patient with hypertension became normal postoperatively.

**Conclusions:** Size criteria are still the subject discussed for the laparoscopic approach to adrenal tumors. our experience suggest that laparoscopic adrenalectomy is a safe and feasible excision for adrenal masses larger than 5 cm. In presence of local invasion or vascular infiltration laparoscopy is contraindicated.

## **QS015 EFFICACY OF TOPICAL MITOMYCIN C FOR TREATING REFRACTORY CAUSTIC ESOPHAGEAL STRICTURES IN CHILDREN: A PROSPECTIVE CLINICAL TRIAL** Ahmed Wishahy, MD, Omar Mansor, MD, Wesam Mohamed, MD, Khaled Salah, MSc, Mohamed Qinawy, MBChB; Cairo University Specialized Pediatric Hospital

**Introduction:** Oesophageal strictures in children as a complication of caustic ingestion are a major cause of morbidity and mortality worldwide, especially in developing regions. The traditional initial treatment of oesophageal strictures is intraluminal dilation. However, in some patients, conservative dilation therapy alone, even if frequent, will not provide adequate oesophageal lumen capacity or give significant symptom-free intervals. Favorable clinical responses to the local application of mitomycin-C in reducing scar formation have recently been reported in the treatment of refractory esophageal stricture.

**Objectives:** The aim of this study is to investigate the efficacy of topical application of mitomycin C after dilation in pediatric patients having post corrosive esophageal stricture.

**Methods:** Twenty patients with post corrosive esophageal strictures that results in symptoms or signs such as dysphagia, regurgitation, oxygen desaturation during feeding, aspiration and failure to thrive after previous 5 or more sessions of endoscopic dilatation were selected for this study. After esophagoscopy and dilatation, endoscopic needle is introduced with injection of mitomycin C submucosally at 12, 3, 6 and 9 o'clock position(4 quadrant) 1 ml each in a dose of 1 mg/ml.

Response, periodic dilatation index and dysphagia score were measured, complications were reported. Complete response was complete resolution of symptoms with no further intervention required. Partial response was incomplete resolution of symptoms with continued need for intervention but with reduced frequency, such as increased interval between dilatations. No response was no reduction in need for therapy with no increase in stricture size or interval between dilatations. Periodic dilatation index (PDI) was defined as number of dilatations divided by months of follow up, whereas dysphagia score was recorded prior to mitomycin C application and at 1, 3 and 6 months after application (0=no dysphagia, 1=tolerance to some solid food, 2= tolerance to semisolid food, 3=tolerance to liquids only, 4= complete dysphagia)

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**Results:** There was a highly significant difference in the improvement of dysphagia grade at the end of follow up (mean from 3.05 before application of mitomycin C to 0.65 at 6 months after application) ( $p < 0.001$ ). Although the mean PDI decrease from 1.04 before application to 0.84 after mitomycin C application, it was not statistically significant ( $p=0.074$ ). 95% of patients showed complete response after 6 months ( $n=19$ ). 15% suffered from post dilatation self limited retrosternal pain that responded to analgesics ( $n=3$ ), mild haemorrhage occurred in 20% ( $n=4$ ). There were no major adverse effects from the topical application of the mitomycin C.

**Conclusions:** Topical application of mitomycin C after oesophageal dilation can be beneficial in improving dysphagia and overall clinical response in patients with refractory post corrosive oesophageal stricture.

**QS016 MINIMALLY INVASIVE SURGERY (MIS) CORRECTION OPPORTUNITY FOR BOCHDALEK-TYPE CONGENITAL DIAPHRAGMATIC HERNIA (CDH) WITH PRENATAL COUNSELLING AND PERINATAL INTENSIVE CARE.** H C Yang, MD, C Cannizzaro, MD, T Mazzuchelli, MD, A Reusmann, MD, M Boglione, P Nemer, J Chichizola, G Falcioni, L Senyk, M Barrenechea, G Goldsmit, M Bailez; Garrahan Children's Hospital

CDH patients with prenatal diagnosis have been born in our pediatric institution (inborn) as strategy to avoid transfer or a neonatology transfer team has attended the delivery in selected maternity (outborn). Clinical care strategies showed improvement in perinatal outcome and pediatric surgical team increased approach by MIS.

**Objective:** To analyze the prenatal, clinical and surgical data after thoracoscopic approach of CDH neonates with prenatal follow up.

**Materials and Methods:** descriptive chart study of newborns with prenatal counseling during a period of 9 years (2008-2017).

**Results:** the institution has counseled 108 CDH patients with prenatal diagnosis. 78 (52 inborn and 26 outborn) were admitted to our neonatal intensive care unit. 61 reached the surgical stage and 23% were boarded by MIS ( $n = 14$ ). In this group, we analyzed:

Variables	?	?	Range
o/e LHR	47	52	(27-93)
Gestational age at birth	37	37	(35-38)
Weight at birth	2840	0887	(2510-3205)
Oxygenation index	3.05	3	(0.6-5.6)
FiO2	35	30	(21-50)
Age at surgery (days)	3.5	3.9	(2-6)
Days on mechanical ventilation	7.5	7.42	(0-22)
Surgical time (minutes)	89	113	(62-220)
Stay days in NICU	33	37.2	(20-103)

Surgical variables	n	%
CDHSG type B	8	57
CDHSG type C	6	43
Conversion to laparotomy	2 (type C), for technical issues	14.2
Prosthetic Material	2 (type C)	14.2
Liver up	4	28.4
Recurrence	1 (reoperated 68 days after first intervention)	7.1

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Surgical variables	n	%
Surgical-site infection	1	7.1
Pneumothorax	3	21.3
Pleural effusion	3	21.3
Chylothorax	0	0
Sepsis	1	7.1
Death	1 (cause not associated to the approach)	7.1

Patients that were operated by MIS all shared consensus of clinical conditions: left-sided isolated CDH, more than 2500g at birth, none required extracorporeal membrane oxygenation, adequate ventricular function, fraction inspired oxygen below 50%, oxygenation index below 6, no requirement of epinephrine when entering the surgical room. However, there were 15 other surgical candidates that accomplished those demands and the approach was by laparotomy.

Discussion: MIS was feasible and secure in this group of patients. We believe that prenatal follow up, in-utero transfer and protocolized neonatal clinical management contribute to more opportunities to select CDH neonatal thoracoscopic approach. We feel encouraged by MIS for CDH with our patient selection criteria.

## **QS017 ESOPHAGEAL STENTS PLACED IN CHILDREN WITH ESOPHAGEAL ATRESIA - A CASE SERIES AND SYSTEMATIC REVIEW** [Oliver J Muensterer, MD, PhD; University Medicine Mainz, Germany](#)

**Background:** Management of complex congenital or acquired esophageal pathology ranks among the most difficult tasks in pediatric surgery. In some cases of recalcitrant strictures, perforations, or esophageal leaks, endoscopic stent placement may seem an attractive alternative to more invasive procedures. Most studies on esophageal stents in children, however, report anecdotal, conflicting, and sometimes biased results. We report the complications and outcome of children who underwent esophageal stent placement and performed a systematic review of the pertinent literature on complications and outcome.

**Methods:** Patients who had an esophageal stent placed either in our own institution or referred after stent placement elsewhere were included in this study. A literature review was performed in pubmed using the search terms [esophagus AND stent AND child]. Case reports (n<3) were excluded. Abstracts were screened and relevant outcome data was extracted from the corresponding full-text articles.

**Results:** Twelve clinical cases were identified (6 referred from other institutions, 6 stent placed by our department). Only 6 had long-term resolution of symptoms after stent placement only, 6 required subsequent interventions. Complications included erosion/perforation (n=3), dislocation (n=3), restenosis (n=3). Stents were more likely to resolve the symptoms long-term if they were placed later in the course of the disease (>6 versus <6 months after anastomosis, p<0.05). The literature search turned up 12 citations, including a total of 95 patients. Long-term success after stent placement without any further interventions was reported in 42%.

**Conclusions:** Esophageal stenting can cure esophageal strictures and leaks in select patients, but more likely, subsequent interventions are necessary. Our experience is very similar to results documented in the literature. In our patients, stenting later in the course of the disease seemed to be associated with higher success rates. Complications of esophageal stents range from innocuous to catastrophic and should be discussed at length with patients and caregivers before the procedure. All patients with an esophageal stent in place should be monitored closely for the development of any adverse events.

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## **QS018 APPROPRIATE SKILLS AND TIMING OF SURGERY FOR NEONATES WITH CONGENITAL HIATAL HERNIA: A SINGLE-CENTER**

**EXPERIENCE** Lishuang Ma, MD, Cuizhu Feng, Yue Zhang, Ying Wang, Yanxia Zang, Chao Liu, Yandong Wei, Simiao Yu, Jingna Li; Capital Institute of Pediatrics, Peking University Teaching Hospital

**Objective** Analyze clinical data of neonatal esophageal hiatal hernia in past 11 years in our hospital and explore the timing and safety of the clinical application of laparoscopic repair in hiatus hernias.

**Methods** The 18 cases (11 males and 7 females) of newborn children with hiatal hernia treated in our hospital were reviewed retrospectively from Feb 2006 to May 2017. All cases were diagnosed as congenital hiatal hernia by upper gastrointestinal contrast and CT before operation, with 10 prenatally diagnosed. In these patients, 12 were type two, 6 were type three, and 3 cases were complicated with gastroesophageal reflux disease. All patients were given laparoscopic hiatal hernia repair and Nissen fundoplication.

**Results** All patients were successfully performed laparoscopic esophageal hiatus repair and Nissen fundoplication with no one converted to open surgery. One patient was operated at 3 months after birth, one was 11 months, and the others were operated at the average of  $18 \pm 2.3d$  (22h-31d). The average weight was  $2.8 \pm 1.2kg$  (1.6-3.5kg). During the operation, 17 cases were operated the fundoplication of 360 degree. 1 patient was failed to encircle the esophagus because of the small gastric fundus in neonates, so the encircle of 270 degree were replaced. The mean operation time was  $121 \pm 26 min$  (93-210min). The mean blood loss was 1.4ml (0.8-3 ml). The average postoperative hospital stay was  $7-13d$  ( $9 \pm 1.8d$ ). Drinking started at 24h after surgery and feeding at 24~48h. All patients were survived. All patients were followed up from 1 month to 10 years, and 2 cases recurred. 1 case cured after the redo laparoscopic hiatus hernia repair and the other was cured after conservative treatment with no symptoms. The rest ones recovered smoothly, without any symptoms. Growth, development and activity levels of all cases were similar to those of the same age.

**Conclusions** Early surgery should be considered when a definite diagnosis of symptomatic hiatal hernia is made in neonates. Laparoscopic repair for neonates hiatus hernia is safe and effective, which also has the advantages of flexible operation, fast recovery, and cosmetic outcomes.

## **QS019 HYPERINSULINEMIC HYPOGLYCEMIA OF INFANCY [LAPAROSCOPIC PANCREATECTOMY] MANSOURA EXPERIENCE**

**Adham Elsaied, MD, PHD, Mohamed Sherbiny, MD, PHD, Mohamed El-Gazaly, MD, PHD, Ashraf Sharkawy, MD, PHD; Mansoura University Children Hospital, Mansoura, Egypt**

**Background/purpose:** Nesidioblastosis and islet dysregulation syndrome were used to describe Persistent Hyperinsulinemic Hypoglycemia of Infancy (PHHI). It is the most common cause of persistent hypoglycemia in neonates (>55%) with consequences such as seizures and brain damage. When medical therapy fails or complications are anticipated; early pancreatectomy is recommended to maintain euglycemia. The aim of this study is the evaluation of Mansoura experience of near total pancreatectomy, both open and laparoscopic for PHHI.

**Patient and Methods:** During the period of May 2002 to May 2017. 68 patients diagnosed with persistent Hyperinsulinaemic Hypoglycemia were accommodated at Mansoura university children hospital. 45 patients responded to medical treatment and 23 patients (13 females and 10 males) were treated by near total (90-95%) pancreatectomy. This study only included the patients that were treated surgically.

**Results:** 22 cases were operated by open approach and only our last case was performed laparoscopically. Primary success occurred in 6 cases (26%). 7 cases (30%) suffered temporary diabetes mellitus and one case (4%) had a temporary pancreatic fistula. Eventually total cure occurred in 14 cases (60%). 9 cases (40%) suffered a variety of complications. The case that was operated laparoscopically had an uneventful postoperative course.

**Conclusion:** Near total (90-95%) pancreatectomy is ideal for treatment of PHHI that doesn't respond to medical treatment and should be performed as early as possible. Laparoscopy should take the place of open technique in performance of surgery.

**Keywords:** Persistent Hyperinsulinemic Hypoglycemia, near total pancreatectomy, Mansoura.

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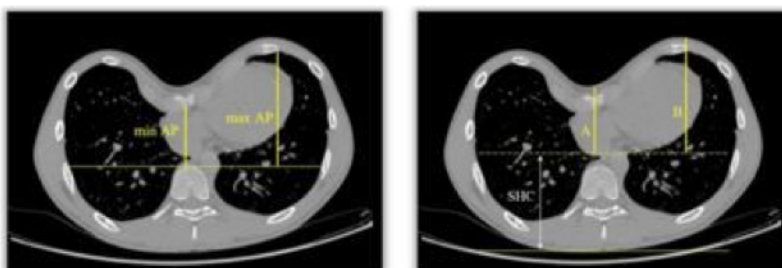
**QS020 SEOS: A NON-CT-RELIANT INDEX FOR EVALUATING PECTUS EXCAVATUM** Nahom Kidane, MS<sup>1</sup>, Mohammad F Obeid, MS<sup>1</sup>, Robert E Kelly, MD<sup>2</sup>, Qi Zeng, MD<sup>3</sup>, Chenghao Chen, MD<sup>3</sup>, Frederic D McKenzie, PhD<sup>1</sup>, Michael J Goretsky, MD, FACS, FAAP<sup>2</sup>; <sup>1</sup>Old Dominion University, <sup>2</sup>Children's Hospital of The King's Daughters, <sup>3</sup>Beijing Children's Hospital

**Background:** Among the severity indices used to quantify pectus excavatum (PE) is the correction index (CI) [1] which, unlike the Haller index (HI) [2], doesn't rely on the width of the chest and is a more accurate indicator of the severity [3] (Figure 1-left). We showed in [4] that external chest profiles, generated from optical surface scans, can be used to calculate an external equivalent of CI, namely, the external correction index (XCI). In this work, we modify this index with an adjustment that is anticipated to increase its sensitivity to severity changes. This new Supine External Optical Scan (SEOS) index promises to be an effective and reliable PE severity measure without the need for CT.

**Patients and Methods:** Pre- and postoperative CT scan data for 30 Nuss procedure patients was obtained from the \*\*\*\*\* Hospital. The dataset included 22 males and 8 females with an average age of  $9.9 \pm 4$  years at the time of surgery. We calculate the traditional and external correction indices (CI and XCI) for each patient. Additionally, the proposed SEOS index is evaluated using external landmarks similar to XCI, but, in order to amplify its detection of changes in chest surface scans, a modified posterior baseline is used for the measurements. This baseline is obtained by adjusting the line placed on the examination table with an age-specific spine height coefficient (SHC) (Figure 1-right). The SHC is approximated using the mean spine-to-table distance calculated from 60 patients of three age groups (<11 years old, 11-15 years, >15 years).

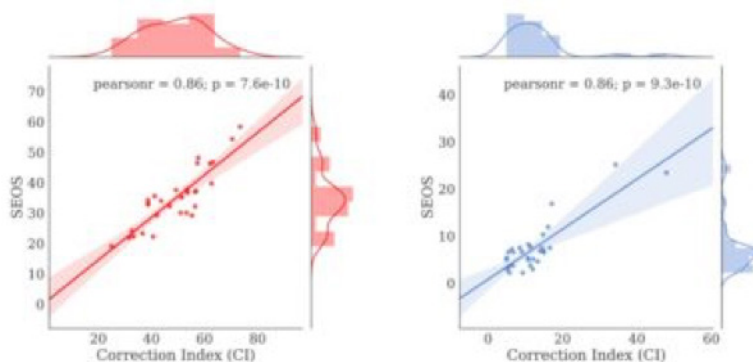
**Results:** Surgical candidacy was justified with preoperative HI of  $5.9 \pm 3.4$  and CI of  $49\% \pm 12\%$  for all patients; which were higher than the cut-off value of 3.2 and 28% [1-2], respectively. Mean preoperative SEOS index values showed similarly high trends with  $35\% \pm 9\%$ . For statistical analysis (Figure 2), Pearson's correlation coefficient was evaluated between CI and SEOS resulting with 0.86 ( $p < 0.01$ ) for both pre- and postoperative data. Using linear regression, an equivalent of the standard 28% CI severity cut-off points was evaluated as 18% for SEOS.

**Conclusion:** We proposed an externally measured Supine External Optical Scan index, SEOS, to quantify PE severity using a supine surface scan of the chest to overcome the need for CT. SEOS attempts to infer a severity indication at least as accurate as the traditional correction index, otherwise obtained with CT. Using an age-specific coefficient adjustment of the measurement baseline, SEOS provides a wider range of values which promises to increase its sensitivity. Regression analysis is performed to recommend a severity cut-off value.



**Figure 1:** Calculation of correction index (CI) left and SEOS (right). SEOS is the percent difference between the distance from the most anterior external skin margin of the chest wall to the line placed a distance of SHC millimeters away from the examination table; and that from the most depressed skin margin.

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**Figure 2:** Pearson's correlation test to compare CI vs. SEOS for pre (left) and post-operative (right) data.

**QS021 MID-TERM RESULTS OF LAPAROSCOPIC REPAIR FOR CONGENITAL DUODENAL ATRESIA AND STENOSIS.** Phi Duy Ho, MD<sup>1</sup>, Thanh Tri Tran, MD<sup>1</sup>, Thien Kim Lam, MD<sup>1</sup>, Hai Trung Bui<sup>1</sup>, Tan Son Le, Assoc Prof<sup>2</sup>, Tan Cuong Nguyen, Assoc Prof<sup>2</sup>; <sup>1</sup>Children's Hospital No.2, <sup>2</sup>University of Medicine and Pharmacy at HCM city

**Background:** Over the past few decades, diamond-shaped anastomosis and web resection have become the treatment of choice for congenital duodenal atresia and stenosis (CDAS). In our center, we have been performing these techniques via laparoscopy since 2010. This study was to review the mid-term morbidity and mortality of the treatment.

**Patients/Methods:** In early 2017, we contacted the parents of all the patients, who were operated from 2010 to 2015, to have them bring their children to our hospital for re-examination.

**Results:** Among 53 cases operated in 6 years, 3 had died before discharging. We lost contacts of 13 out of 50 survivors. We could only collect data from 37 remaining cases. Eight of them showed up and got re-examination at the hospital. Data of the rest 29 cases were collected via phone calls.

There were 15 males and 22 females. Nineteen cases had cardiac defects (51.3%), 5 had Down syndrome (13.5%). Follow-up time ranged from 24 to 81 months. None of them needed any additional abdominal intervention. One died for severe heart disease (2.7%). Eight cases suffered from malnutrition (21.6%): 4 severe and 4 moderate (no correlation with cardiac defects or Down syndrome). No persistent abdominal pain or vomiting was presented in any case. Upper gastrointestinal contrast radiography in 8 patients showed good intestinal motility and no sign of dilated stomach or duodenum.

**Conclusion:** The most notable late morbidity was malnutrition. Mid-term mortality rate was low. In our center, laparoscopic repair for CDAS gave quite satisfying mid-term results.

**QS022 THORACOSCOPIC ANATOMICAL SEGMENTECTOMY FOR ADENOID CYSTIC CARCINOMA OF THE PERIPHERAL LUNG: A CASE REPORT.** Makoto Suzuki, MD, PhD<sup>1</sup>, Ryota Koyama, MD<sup>1</sup>, Yasuyuki Uchida, MD<sup>1</sup>, Kenjiro Ogushi, MD<sup>1</sup>, Sayaka Otake, MD<sup>1</sup>, Ken Shirabe, MD, PhD, FACS<sup>2</sup>, Hiroyuki Kuwano, MD, PhD, FACS<sup>2</sup>; <sup>1</sup>Div of Pediatric Surgery, Dept of General Surgical Science, Gunma Univ Graduate School of Medicine, <sup>2</sup>Dept of General Surgical Science, Gunma Univ Graduate School of Medicine

**BACKGROUND:** Thoracoscopic lobectomy for congenital and acquired lung lesions has become an accepted modality in pediatric thoracic surgery. On the one hand, anatomic sublobar resection is currently being assessed as an alternative to lobectomy for primary lung cancers. With the increased use of thoracoscopy, a video-assisted thoracoscopic surgery (VATS) segmentectomy may be as safe and effective as an open segmentectomy.

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Adenoid cystic carcinoma (ACC) of the lung is a relatively rare lung cancer arising from the bronchial glands and accounting for about 0.04-0.2% of all lung cancers. ACC has a slow growing and prolonged clinical course, and thus is considered a low-grade malignancy.

We report the young ACC case of the peripheral lung that was treated with thoracoscopic anatomical segmentectomy.

**CASE REPORT:** The patient was 14-year-old boy who had been observed in other clinic with a history of a nodular lesion in the left upper lung field on the chest radiography. After 2 years of observation, follow-up chest radiography showed an increase in size to 20 mm. So, the patient was introduced to our department for diagnosis and treatment. He had no other findings during the physical examination. The biochemical examination of blood did not revealed abnormalities, and levels of tumor markers neuron-specific enolase (NSE) was 13.2 ng/ml. Pulmonary function tests showed that percentage of predicted VC was 109.1 % and percentage of predicted FEV1 was 78.86 %. Chest computed tomography (CT) demonstrated a partially serrated border solid nodule 24 mm in diameter nodular in the left S5 region. (18)F-fluorodeoxyglucose (FDG) positron emission tomography (PET)-CT was mild positive (Max-SUV 3.7). Malignancy could not be excluded based on these findings, so thoracoscopic left S4+5 segmentectomy was planned.

Under combined intravenous general anesthesia, double-lumen endotracheal intubation and contralateral one-lung ventilation were performed. A total of four incisions were made for the ports and 2cm mini thoracotomy. The lingual segmental artery (A4+5) was isolated in the intralobar space and was ligated and divided using a vessel sealing device. Then, the lingual segmental vein (V4+5) was divided as same manner. We used electrocautery to divide the intersegmental plane and the border was detected by selective jet ventilation. The lingual segmental bronchus (B4+5) was divided using endstapler. The total operation time was 210 minutes, and total blood loss was 0 mL.

The postoperative course was uneventful, and the chest drainage tube was removed on postoperative day 2. The patient was discharged from the hospital on postoperative day 4 without any complications.

Histopathological examination showed ACC. On immunohistochemical analysis, these tumor cells were positive for TTF-1. This tumor was diagnosed primary ACC of the lung and pT1aN0M0 stage 1A. Because of surgical margin was free, it didn't do radiotherapy and chemotherapy.

**DISCUSSION & CONCLUSION:** Thoracoscopic anatomical segmentectomy is a safe procedure which has fewer complications and a reduced hospital stay when compared with an open segmentectomy. This approach may be the ideal oncologic procedure for patients with small lung cancers and effective means of lung parenchymal preservation in pediatric patients.

**QS023 STUDY OF RISK FACTORS OF COMPLICATIONS AFTER GASTROSTOMY AT CHILDRENS** Yury Kozlov, PhD<sup>1</sup>, Polina Baradieva<sup>1</sup>, Konstantin Kovalkov<sup>2</sup>, Vladimir Novozhilov, PhD<sup>1</sup>; <sup>1</sup>Children's Hospital Irkutsk, <sup>2</sup>Children's Hospital Kemerovo

**Introduction:** The purpose of this research is development of complex assessment of risk of a failure of gastrostomy at children and creation on the basis of multiple-factors model of the calculator allowing to allocate group of patients with high risk of gastrostomy.

**Material and methods:** Between January 2002 and December 2016, we have performed 90 operations of laparoscopic insertion gastrostomy tubes and 44 operations with using laparotomy. The regression analysis in the form of binary logistic regression was applied to search of the most significant factors influencing emergence of complications after gastrostomy. As the factors which are presumably influencing complications of gastrostomy have been selected: age, weight, diagnosis of the child, method of surgical intervention (open operation or laparoscopy), existence of simultaneous operations (antireflux Nissen procedure, ventriculoperitoneal shunting, tracheostomy).

**Results:** The regression analysis used in a research has preferred as the factors which are significantly influencing probability of development of complications after gastrostomy - age and the patient's weight, diagnosis, method of operation and existence of simultaneous Nissen operation. It has been established that influence of all selected factors, except the diagnosis ( $p=0,467$ ) is significant ( $?<0,05$ ). The calculator created on the basis of multiple-factors model has allowed to estimate probability of complications after gastrostomy.

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**Conclusion:** Thus, the binary logistic model used in research successfully solved a problem of classification of patients to whom the gastrostomy tube was established, and helped to create a predictive scale which gives an opportunity to define probability and risk of emergence of complications after gastrostomy, and also the forecast of outcomes of disease.

**QS024 THE EFFECT OF GASTROSTOMY PLACEMENT ON HEALTH-RELATED QUALITY OF LIFE IN CHILDREN.** J Franken, MD<sup>1</sup>, S H A J Tytgat, MD, PhD<sup>2</sup>, F A Mauritz, MD, PhD<sup>1</sup>, R K Stellato, Msc<sup>1</sup>, D C Van der Zee, MD, PhD, Prof<sup>1</sup>, Mya Van Herwaarden-Lindeboom, MD, PhD<sup>1</sup>; <sup>1</sup>University Medical Centre Utrecht, <sup>2</sup>Wilhelmina Children's Hospital

**Introduction:** A gastrostomy placement (GP) is frequently performed in pediatric patients who require long-term enteral tube feeding. GP in children aims to improve nutritional status and health-related quality of life (HRQoL). This is the first study to prospectively evaluate the effect of GP on HRQoL.

**Methods:** A prospective, longitudinal cohort study was performed including patients referred for laparoscopic GP between May 2012 and April 2014. To assess HRQoL, children and/or caregivers were asked to fill out the validated PedsQoL™ 4.0 Generic Core Scale before GP and 3 months after surgery. In this questionnaire, HRQoL is subdivided into a physical and a psychosocial health score (psychosocial contains the domains emotional, social and functional health). Pre- and postoperative values were compared using the paired samples t-test. Multiple linear regression analysis was performed in order to identify predictors of HRQoL and predictors of postoperative changes in HRQoL.

**Results:** Fifty patients were included (median age 3.4 years (IQR 1.4 – 5.6); male gender 58.0%). After GP, total HRQoL did not significantly increase:  $54.23 \pm 18.6$  to  $56.28 \pm 20.5$  ( $p=0.302$ ) on a 100-point scale. The postoperative psychosocial HRQoL health score was significantly higher compared to the preoperative psychosocial health score ( $55.75 \pm 20.8$  to  $61.20 \pm 19.6$ ;  $p=0.009$ ). This was mainly due to an increase in social HRQoL ( $58.18 \pm 32.3$  to  $68.31 \pm 27.9$ ;  $p=0.038$ ). Emotional and functional HRQoL did not increase significantly compared to preoperative values. HRQoL both before and after GP was significantly lower in children with neurologic impairment ( $p<0.001$ ). No predictors of improvement in HRQoL after GP were identified.

**Conclusion:** After gastrostomy placement in children, total HRQoL did not change. Psychosocial HRQoL, however, significantly improved. This was mainly due to an improvement in social HRQoL.

**QS025 MINIMALLY INVASIVE PEDIATRIC SURGERY DURING REMOTE HUMANITARIAN MISSIONS IS FEASIBLE, SAFE AND EFFECTIVE** Jeffrey R Lukish, MD<sup>1</sup>, Jasmine Ellis, MD<sup>2</sup>, Bharati Datta, MD<sup>2</sup>, David Lanning, MD<sup>3</sup>; <sup>1</sup>Johns Hopkins University, Baltimore, Maryland, USA, <sup>2</sup>Milton Cato Memorial Hospital, St Vincent and the Grenadines, UK, <sup>3</sup>Medical College of Virginia, Virginia Commonwealth University, Richmond, Virginia, USA

**Purpose:** There remains a critical need for the provision for pediatric humanitarian aid worldwide. Historically, the emphasis of global pediatric health needs has been focused on infectious diseases. Today, we are witnessing a shift in this paradigm, with growing attention being paid toward the surgical needs of children. The use and deployment of minimally invasive surgery (MIS) in these austere environments with its concomitant reduction in length of hospitalization, pain and morbidity is logical. The goal of this study was to report our deployment strategy and review our experience with pediatric MIS during humanitarian missions to determine if it is safe, feasible and efficacious.

**Methods:** As part of the World Pediatric Project (WPP), data were collected retrospectively from the general pediatric surgery (GPS) team missions from January 2007 to January 2017. All cases were performed at a single medical center in the Eastern Caribbean Island of St Vincent's and the Grenadines. Data included patient demographics, diagnosis, procedure, conversion to open procedure, complications, and post-operative course. The teams utilized a dedicated WPP operating theatre, and pre-positioned and deployed GPS supplies and MIS resources. All anesthesia, surgical and nursing personal were board certified trained professionals functioning as part of the WPP team.



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**Results:** One hundred and thirty four children (134) underwent general pediatric surgical procedures during the study period. Mean age 9.2 (2 – 19) years. Thirty seven (37) children underwent a MIS procedure from this cohort representing 27% of the cases. Laparoscopic cholecystectomy (N=14), Laparoscopic pull-through procedure for Hirshsprung's disease (N=3), Laparoscopic appendectomy (N=3), Diagnostic laparoscopy (N=3), Laparoscopic inguinal hernia repair (N=3), Laparoscopic orchiopexy (N=3), Laparoscopic appendicostomy for antegrade colonic enemas (LACE)(N=2), Laparoscopic colon biopsy (N=2), Laparoscopic oophorectomy (N=1), Laparoscopic splenectomy (N=1), Laparoscopic Nissen Fundoplication (N=1) and Thoracoscopic thymectomy (N=1) represented the MIS cases. There were no conversions to open procedures. Both of the LACE procedures developed cellulitis at the appendicostomy site. They required intravenous antibiotics and were discharged on a course of oral antibiotics. They did not require reoperative surgery or drainage procedures and both children initiated antegrade enemas on post-operative day 4. There were no other complications in the MIS group. Interestingly, two of the inguinal hernias were recurrent inguinal hernias after failed open herniorrhaphy from prior missions. They underwent uneventful laparoscopic hernia repairs and are without recurrence (1 and 2 year follow up respectively). The post-operative course for all children was uneventful and no child required readmission. There were no technical failures in the MIS systems or instrumentation.

**Conclusions:** Our retrospective review supports the use of minimally invasive surgical techniques as part of general pediatric surgery humanitarian missions. We have found it to be a safe, feasible and effective modality that may reduce length of stay, pain and morbidity compared to open procedures in these remote environments. Although our MIS systems and instrumentations functioned effectively, concerns regarding the storage and sustainability for future missions is significant. Onsite healthcare partners, redundant systems and remote technical support access could potentially alleviate these concerns.

**QS026 APPROPRIATE METHODS AND TIMING OF SURGERY FOR NEONATES WITH SEVERE CONGENITAL DIAPHRAGMATIC HERNIA.** [Lishuang Ma](#), Jingna Liu, Chao Liu, Yandong Wei, Cuizhu Feng, Ying Wang, Yue Zhang, Yanxia Zhang, Bin Sun; Capital Institute of Pediatrics, Peking University Teaching Hospital

**Objective** The purpose of this study is to explore appropriate methods and timing of surgery for neonates with severe congenital diaphragmatic hernia.

**Methods** Clinical data of 31 neonatal severe congenital diaphragmatic hernia cases who underwent surgical procedures were reviewed from September 2007 to April 2017. All cases were diagnosed as severe CDH based on the accepted evidence such as the occurrence of respiratory distress syndrome within 6 hours after birth. This study include two parts. Firstly, they were divided into two groups, minimally invasive surgery group (n=15) and open surgery group (n=16) based on different ways of operation. Basic information and prognosis of the two groups were compared. Secondly, according to the timing of surgery, they were divided into three groups, A group (t≤24h, n=17), B group (24<t≤48h, n=6) and C group (t>48h, n=8). Different prognosis of the three groups were compared. Analysis of variance, t-test, chi-square and rank-sum test were performed.

**Results** Compared to open surgery group, both hospitalization[17(12~28)d vs. 25(17~55.8)d, P=0.043]and ventilator support time[(4±1.3)d vs. (6±2.5)d, P=0.032]of minimally invasive surgery group decreased, but the operative duration[180(120~200)min vs. 90(67.5~142.5)min, P=0.708]increased, having significant statistical differences. But the general conditions, patch utilization rate, survival rate and recurrence rate showed no inter-group difference. Among the survival patients, the lowest birth weight was 1.84kg, the earliest gestational age of prenatal diagnosis is 17w, the minimum gestational age was 31W, the minimum operation age was 6h after birth, and the maximum was 8.3d. 3 cases were complicated by pleural effusion and were cured after conservative treatment. 2 cases recurred after the patch repair, and were recurred after the endoscopic and open surgery. Comparing the different timing groups, age of prenatal diagnosis(P=0.017)and 1min Apgar score(P=0.015)had positive correlations with timing of surgery respectively, showing significant statistical differences. However, the prenatal diagnosis rate, gestational age, birth weight, treatment duration and prognosis showed no significant statistical differences.

**Conclusions** Thoracoscopic repair of severe congenital diaphragmatic hernia in neonates are safe and feasible. With regards to severe neonates, early surgery can be performed.

# Quickshots Abstracts

Table 1 Comparison of basic data between two groups

Group	Cases	Gender (M:F)	Left: Right	Gestational age (w)	Birth weight (kg)	Thoracic approach (cases,%)	Operation age (d)	Prenatal diagnosis (cases,%)	Prenatal diagnosis age (w)	Apgar score (1min)
MIS	15	8:7	14:1	37.4 ± 2.2	2.9 ± 0.6	14(93.3)	1.5(0.8-2.1)	13(86.7)	28.6 ± 5.9	7.1 ± 1.7
Open	16	8:8	14:2	37.4 ± 2.4	2.8 ± 0.5	2(12.5)	0.5(0.3-1.6)	11(68.8)	24.9 ± 5.2	6.7 ± 2.0
<i>p</i>	—	0.853	0.579	0.964	0.603	0.000	0.086	0.358	0.120	0.611

Table 1 Comparison of basic data between two groups

Group	Cases	Gender (M:F)	Left: Right	Gestational age (w)	Birth weight (kg)	Thoracic approach (cases,%)	Operation age (d)	Prenatal diagnosis (cases,%)	Prenatal diagnosis age (w)	Apgar score (1min)
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Table 3 Comparison of basic data and postoperative treatment among three groups

Group	Cases	Prenatal diagnosis (cases,%)	Prenatal diagnosis age (w)	Gestational age (w)	Birth weight (kg)	Apgar score (1min)	Hospitalization (d)	Ventilation (d)	ICU duration (d)	90-day survival (cases,%)
A	17	15(88.2)	25.7 ± 5.0	37(35.5-38.5)	2.7 ± 0.6	6.1 ± 1.9	21(15-53)	5.9 ± 2.3	12.0 ± 4.8	11(64.7)
B	6	5(83.3)	27.4 ± 4.6	38(37.0-38.8)	2.9 ± 0.3	7.3 ± 1.0	18(12-28)	4.7 ± 1.5	11.0 ± 4	3(50.0)
C	8	4(50.0)	34.3 ± 4.3	39(36.8-39.8)	3.1 ± 0.6	8.3 ± 1.3	18(13-30)	4.1 ± 1.5	10.5 ± 3.3	7(87.5)
<i>p</i>	—	0.116	0.017	0.191	0.393	0.015	0.585	0.383	0.112	0.306

**QS027 FEASIBILITY STUDY ON SINGLE-PORT LAPAROSCOPIC REPAIR OF CONGENITAL DUODENAL OBSTRUCTION IN NEONATES.** Li-shuang Ma, Cui Zhu Feng, Yue Zhang, Ying Wang, Yanxia Zhang, Chao Liu, Simiao Yu, Jingna Liu, Yandong Wei; Capital Institute of Pediatrics, Peking University Teaching Hospital

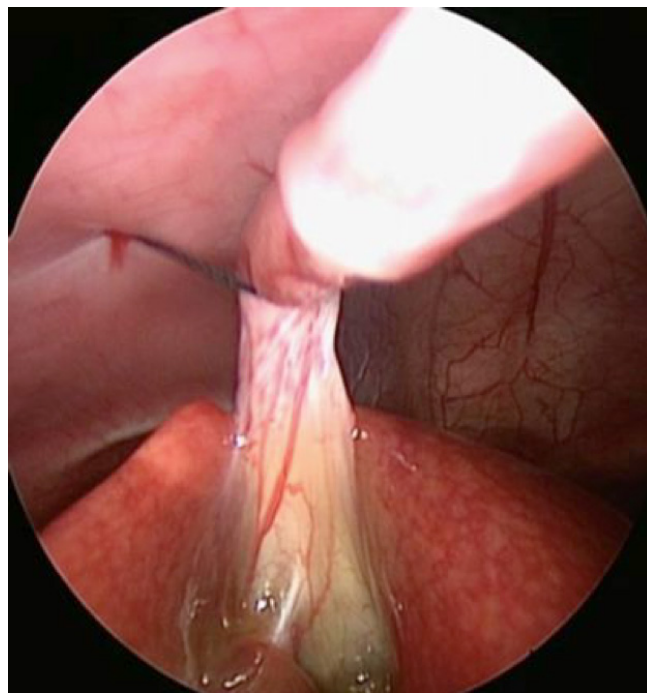
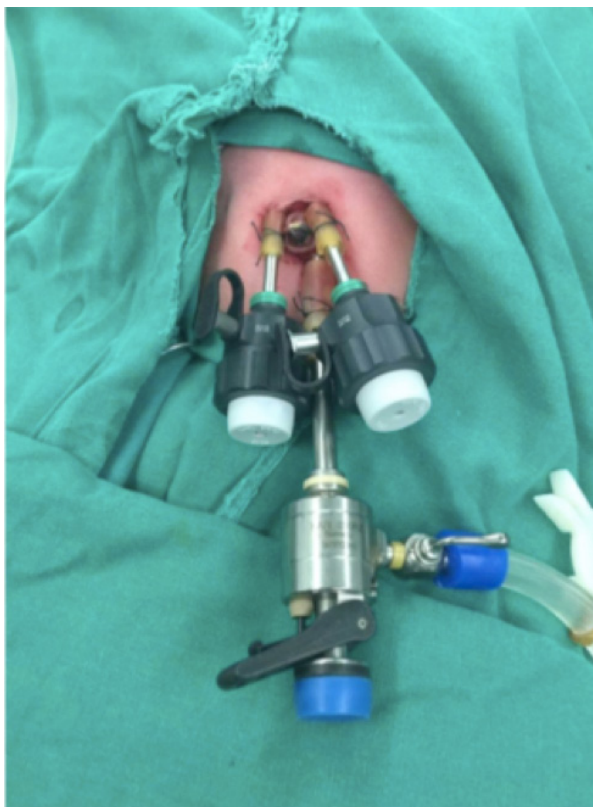
**Objective** The aim of this report was to explore the feasibility of single-port laparoscopic repair of congenital duodenal obstruction(CDO) in neonates.

**Methods** A retrospective review was conducted on 17 neonates (≤28 days) with CDO from September 2016 to June 2017. There were 10 males and 7 females. Ages range from 0d to 26d, weight from 2.7kg to 4.4kg, and gestational ages from 36w+1 to 39w+5. 12 fetus were found double bubble symptoms before birth. 17 cases were all diagnosed as CDO by upper gastrointestinal contrast before operation, of which 3 patients were diagnosed as congenital intestinal malrotation, 8 patients as annular pancreas and 6 patients as duodenal atresia postoperatively.

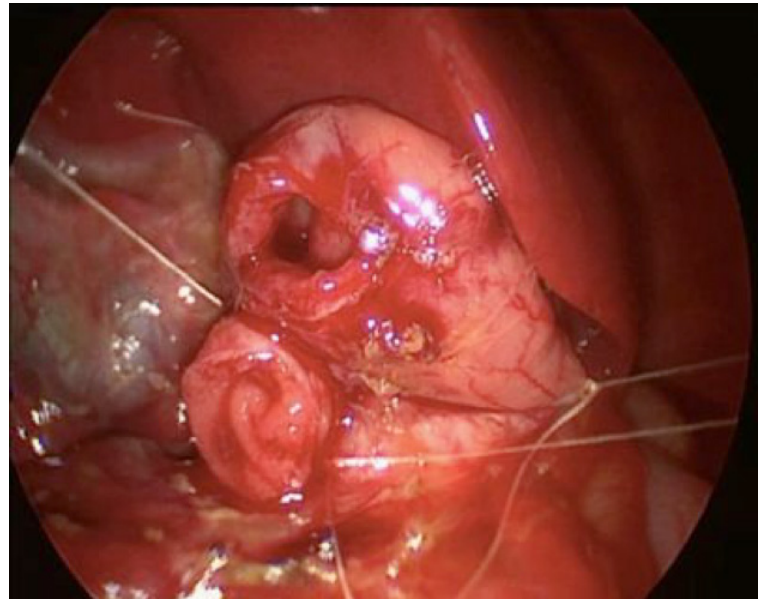
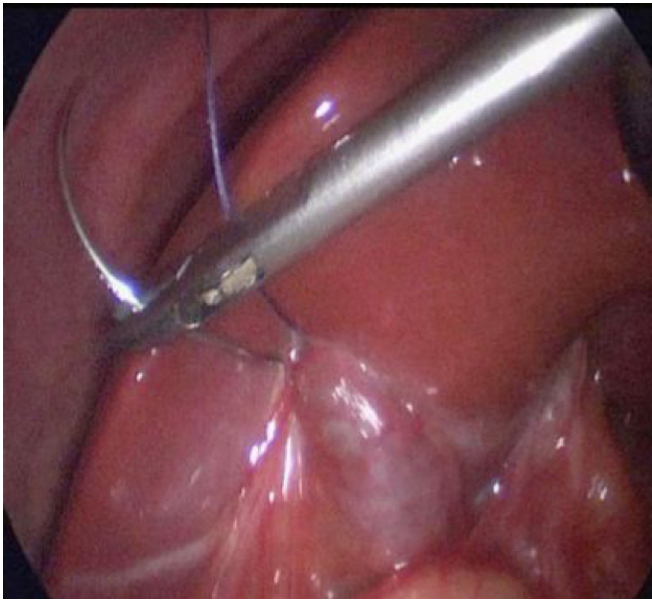
**Results** All patients were successfully performed single-port laparoscopic repair without conversion to open procedure. 8 cases of annular pancreas was performed through duodenal diamond anastomosis, 3 cases of intestinal malrotation through volvulus reduction and ladd 's operation, 5 cases of type I duodenal atresia through duodenal longitudinal joints operation, and 1 case of type II duodenal atresia through side to side anastomosis. The mean operation time was 126mins(90~185 mins). Feeding started at about 6.1 days(4~17 days) after surgery. The average postoperative hospital stay was 12.6 days(9~24 days). There were no complications of anastomotic leakage and anastomotic stenosis after operation. Umbilical incision recovered smoothly. All cases were followed up from 1 month to 9 months without any complication. The surgical scar was covered by the umbilical ruffle. No significant scar was observed on the surface of abdomen after operation.

**Conclusions** Single-port laparoscopic repair of congenital duodenal obstruction in neonates is safe and effective, which also has the advantages of minimal trauma, fast recovery, and cosmetic outcomes. But surgeons should be experienced in laparoscopic operations.

# Quickshots Abstracts



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**QS028 THE APPLICATION OF PERCUTANEOUS SUTURING TECHNIQUE IN THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA** Bartosz Bogusz, MD, Oskar Zgraj, MD, Marcin Maslanka, MD, Wojciech Górecki, Prof; Department of Pediatric Surgery, University Children's Hospital, Jagiellonian University Medical College, Kraków,

**Background:** Thoracoscopic repair presents nowadays the preferred strategy of surgical treatment for children with congenital diaphragmatic hernia (CDH). However, in patients with CDH, a higher incidence of recurrence is reported after thoracoscopic repair, than after open surgical access. Most of those complications result from the dehiscence of diaphragmatic suture within its posterolateral part, close to the chest wall. At this site the tension on the approximated margins of the muscle defect is usually higher, while the thoracoscopic suturing is less feasible. To achieve more effective fixation of the diaphragm to the chest wall, the authors decide to adopt the original technique of Percutaneous Internal Ring Suturing (PIRS), described by D. Patkowski in 2006.

**Aim:** The purpose of this study was to present and evaluate the efficacy of percutaneous suturing technique for the treatment of congenital diaphragmatic hernia in children.

**Material and methods:** Retrospective analysis was performed, concerning medical data of 45 patients with CDH, treated in the Department of Pediatric Surgery, of the University Children's Hospital of the Jagiellonian University Medical College in Kraków, between January 2013 and October 2017.

Percutaneous suturing method was used, when in the surgeon's opinion, the completion of thoracoscopic repair of the diaphragm defect with simple interrupted sutures was possible, but produced excessive tension within its part adjacent to the chest wall. The muscular margin of the posterolateral part of the defect was anchored directly to the corresponding rib with a percutaneous suturing technique, adopted from PIRS. Non-absorbable braided 2.0 sutures, introduced through a 1.2 mm injection needle were used.

Patch repair was the procedure of choice in large defects, where the approximation of muscular margins was impossible.

**Results:** Medical data of 45 children with CDH admitted within the study period were identified. Eleven of them died before surgical intervention, one after correction, and 33 were operated and survived (73%). Thoracoscopic access was applied in 22 of them, with 3 conversions. The overall recurrence rate was 9%.

Percutaneous suturing technique was used during thoracoscopic procedures in 10 cases operated between January 2015 – October 2017. In this group, there was 1 observed recurrence detected by ultrasound examination on the 5th day after surgery and treated immediately with the same method with no further complications.

The follow-up period in the presented group of patients varies from 1 to 52 months.

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**Conclusions:** The technique of percutaneous suturing allows for the safe and effective closure of the posterolateral part of diaphragm defect in CDH. It enables a feasible repair under acceptable tension, and can be listed among countermeasures against recurrence. The technique can be considered in cases, where because the size or morphology of the defect, simple intermittent suturing does not secure uneventful recovery, reducing the number of necessary mesh repair.

## **QS029 CLINICAL AND SURGICAL OUTCOMES OF SLEEVE GASTRECTOMY IN CHILDREN AND ADOLESCENTS WITH BARDET-BIEDL SYNDROME** Yara Alqahtani, MD, Aayed R Alqahtani, MD, FRCSC, FACS, Mohamed O Elahmedi, MBBS; Obesity Chair, King Saud University

**Background:** Bardet-Biedl Syndrome (BBS) is a genetic disorder characterized by severe, early-onset obesity and five main features: rod-cone dystrophy, polydactyly, learning disability, and genitourinary and renal abnormalities. Obesity is a major cause of morbidity and mortality in BBS patients, and debates exist on whether bariatric surgery is suitable in patients with learning disabilities. Our group has had successful experience with laparoscopic sleeve gastrectomy (LSG) in patients with syndromic forms of obesity. However, evidence on the safety and efficacy of bariatric surgery in BBS patients is limited to few case series.

**Methods:** Our pediatric bariatric surgery clinical outcomes study database was queried for data on all children and adolescents who were diagnosed with Bardet-Biedl syndrome at the time of surgery. Safety and efficacy outcomes were assessed via analyzing in-hospital and post-discharge complications, co-morbidity resolution, and weight loss in the first six years after surgery.

**Results:** Twelve BBS patients aged  $14 \pm 4$  years (range: 9.6-19.5) underwent LSG with a BMI of  $43 \pm 4$ . Mean % excess weight loss (%EWL) at the first (n=12), second (n=10), third (n=10), fourth (n=9), fifth (n=6) and sixth (n=5) years after LSG was  $55.1 \pm 15$ ,  $60 \pm 18$ ,  $62 \pm 19$ ,  $61 \pm 24$ ,  $60 \pm 30$ ,  $59 \pm 45$  respectively. Before surgery, all BBS patients had dyslipidemia, seven (58.3%) were hypertensive, and none had diabetes mellitus, prediabetes, obstructive sleep apnea, or prehypertension. All cases of hypertension and 11 cases of dyslipidemia (91.7%) were in remission after surgery, and the last patient with dyslipidemia experienced improvement in triglyceride levels. There was no prolonged hospital stay, readmission, reoperation, or mortality in either group.

**Conclusions:** LSG is safe and effective in BBS patients, inducing significant weight loss and resolution of co-morbidities with no significant morbidity or mortality.

## **QS030 DISPARITIES IN PEDIATRIC AND ADOLESCENT WEIGHT LOSS SURGERY IN THE UNITED STATES** Numa P Perez, MD<sup>1</sup>, Cornelia L Griggs, MD<sup>1</sup>, David C Chang, PhD, MPH, MBA<sup>1</sup>, Cassandra M Kelleher, MD<sup>2</sup>, Janey Pratt, MD<sup>1</sup>; <sup>1</sup>Massachusetts General Hospital, <sup>2</sup>Massachusetts General Hospital for Children

**Purpose:** According to data from the National Health and Nutrition Examination Survey (NHANES) 2011-2014, the prevalence of obesity (BMI >95 percentile) in Hispanics (21.9%) and blacks (19.5%) ages 2-19 significantly exceeds that of whites (14.7%). Additionally, the annual rate of increase in the incidence of type 2 diabetes from 2002-2012 was lower among whites (0.6%) than among Hispanics (3.1%) or blacks (6.3%). Nevertheless, most pediatric patients who undergo bariatric surgery are white. The objective of this study was to characterize disparities in pediatric bariatric surgery in the US.

**Methods:** The Kids' Inpatient Database (KID) and the National Inpatient Sample (NIS) database were used to identify pediatric patients (age <21) undergoing bariatric surgery from 2005-2014. Patients were identified using ICD-9-CM procedure codes for bariatric operations with a confirmatory diagnosis code for obesity. National population estimates were calculated using weights provided by the Healthcare Cost and Utilization Project (HCUP), and statistics were obtained using a chi-square analysis for type of procedure, patient characteristics, and in-hospital complications.

**Results:** 14,178  $\pm$  690 bariatric operations were performed from 2005-2014 among patients age <21; 59% were white, 18% Hispanic, and 15% black (p<0.001). This difference was more pronounced at Hospitals located in the Midwest and specifically within the West North Central census division, rural, and non-teaching Hospitals (p<0.02 for all). Primary insurance varied by race, with 73% of white patients having private insurance vs. 66% blacks and 53% Hispanics, with corresponding increases in the use of Medicaid (p<0.001).

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**Conclusion:** Pediatric obesity is a national health crisis that disproportionately affects ethnic minorities, yet most pediatric patients who undergo bariatric surgery are white. Further studies are required to ascertain whether this disparity is due to inherent cultural or socioeconomic differences, disparities in the access to surgery, or a combination of multiple factors.

	White	Black	Hispanic	P value
Observed bariatric surgery cases, ages 2-19, n (%)	5,154 (58.9)	1,330 (15.2)	1,553 (17.7)	p<0.001
Expected bariatric surgery cases, ages 2-19, n (%) *	903 (11.2)	2,009 (25.0)	5,126 (63.8)	
O/E ratio <sup>‡</sup>	5.7	0.7	0.3	p<0.001 <sup>‡</sup>
<b>Subpopulations with most pronounced disparity, ages &lt;21</b>				
Midwest region, n (%)	895 (73.7)	227 (18.7)	47 (3.9)	p<0.001
West North Central division, n (%)	216 (82.2)	34 (13.0)	<11 (3.0)	p<0.001
Rural hospitals, n (%)	275 (91.2)	<11 (3.0)	<11 (3.3)	p<0.020
Non-teaching hospitals, n (%)	3,300 (67.2)	552 (11.3)	745 (15.2)	p<0.001
* Based on obesity rates per NHANES 2011-2014 for ages 2-19				
‡ O/E ratio calculated for ages 2-19 to allow for direct comparison to NHANES data, but calculation using age <21 yields identical ratios				
‡ p values calculated for each O/E ratio as compared to 1.0				

## QS031 TRANSUMBILICAL MINILAPAROTOMY FOR NEONATAL ABDOMINAL SURGERY: AN ALTERNATIVE MINIMALLY INVASIVE SURGERY FOR COMPLEX CONDITIONS Chin-Hung Wei; Shuang Ho Hospital

**Purpose:** The purpose of this study is to examine the outcome of transumbilical minilaparotomy for infants with complex conditions in our institution.

**Methods:** With IRB approval, between July 2010 and March 2017, infants who underwent abdominal surgery through transumbilical minilaparotomy were enrolled. Medical records were retrospectively reviewed.

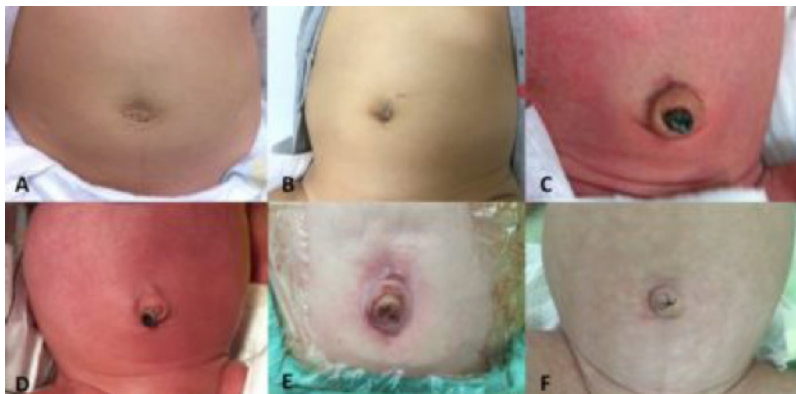
**Results:** A total of 16 patients were included. The diagnosis included intestinal atresia(n=3), meconium peritonitis(n=4), bowel infarction/necrosis(n=4), spontaneous intestinal perforation(n=2), segmental volvulus(n=1), necrotizing enterocolitis(n=1), and malrotation(n=1). The median gestational age and body weight were 32(24~40) weeks and 1731(560~4200) grams respectively. The median age at operation was 3(1~4) days. Fourteen (87.5%) patients received primary repair of the intestine, of which 4 received additional intestinal tapering, and one had an additional ileostomy. One patient had ileostomy only and one patient received Ladd's procedure. Postoperative complications occurred in 4 patients, comprising of anastomotic leakage in 2 patients, adhesion ileus in one patient, and missed rectal atresia in one patient. There was one mortality due to extremely low bodyweight and poor lung maturation. Re-operation was required in 3 patients, for anastomotic leakage(n=2) and missed rectal atresia(n=1).

**Conclusion:** Transumbilical minilaparotomy is technically feasible, and also an alternative option for minimally invasive surgery in newborns.

# Quickshots Abstracts



**Fig. 1** Operative findings. A&B. Meconium peritonitis. C. Meconium peritonitis. D. Malrotation. White arrow indicates duodenum with Ladd's band, and black arrow indicates appendix.



**Fig. 2** Wound cosmesis. A. 2.5 years postoperatively. B. 1 year postoperatively. C. 1 month postoperatively. D. 1 month postoperatively. E. Immediately postoperatively. F. 2 weeks postoperatively.

## QS032 EXTRACORPOREAL AND INTRACORPOREAL APPROACHES OF SINGLE-INCISION LAPAROSCOPIC APPENDECTOMY IN CHILDREN: IS ONE SUPERIOR TO ANOTHER? Chin-Hung Wei; Shuang Ho Hospital

**Background:** Single-incision laparoscopic surgery has been widely popularized for pediatric appendicitis. Various techniques have been proposed with two main approaches: extracorporeal and intracorporeal. The purpose of this study is to compare the result of different approaches in single-incision laparoscopic appendectomy (SILA) in children as well as an intraoperative algorithm for procedure selections.

**Materials and Methods:** With IRB approval, patients under 18 years of age who underwent SILA were enrolled from July 2012 to December 2015. The patients were divided into three groups based on surgical approaches: extracorporeal (Extra), mixed (Mix), and intracorporeal (Intra) approaches.

# Quickshots Abstracts

**Results:** A total of 161 patients were included. There were 32, 32, and 24 patients with simple appendicitis in Extra, Mix, and Intra respectively. There were 27, 15, and 31 patients with complicated appendicitis, respectively. A higher percentage of patients with complicated appendicitis received intracorporeal approach than those with simple appendicitis (42.5% vs. 27.3%,  $p=0.044$ ). No significant difference was noted in mean age and WBC (table 1). Mean LOS, time to diet, and complications were similar, except significantly shorter LOS in Mix of simple appendicitis ( $p=0.043$ ). Mean operation time was similar between groups of simple appendicitis (56.5±19.5, 63.6±23.5, and 70.1±23.1 mins,  $p=0.08$ ), whereas it was significantly shorter in Extra of complicated appendicitis (67.6±16.4, 86.6±19.0, and 89.9±23.4 mins,  $p<0.001$ ). Multivariate analysis showed that Intra is an independent factor for prolonged operation time (table 1). Appendix ruptures occurred during appendix exteriorization in two patients of simple appendicitis in Extra and Mix groups, respectively.

**Table 1**

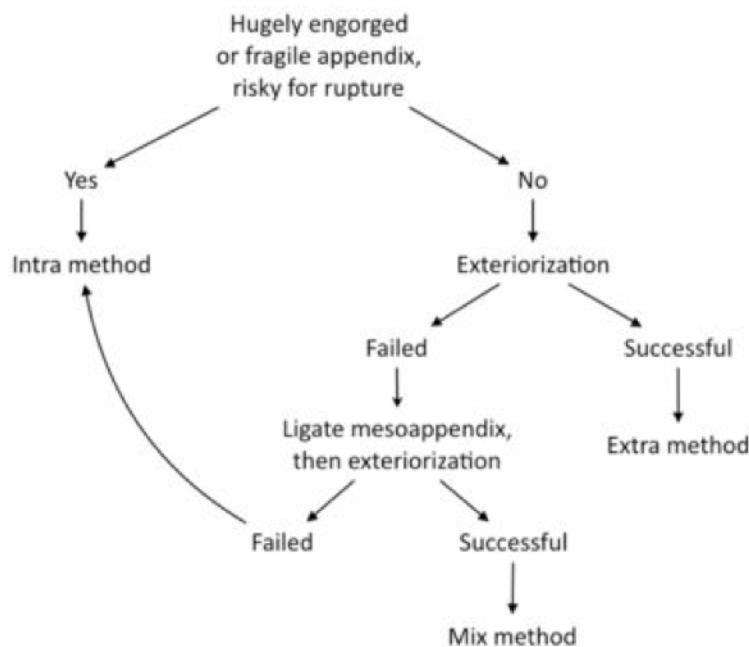
simple/complicated	Extra	Mix	Intra	p
Age(year)	12.8±3.5/10.7±3.9	12.9±3.3/10.7±3.9	11.6±3.6/10.9±3.6	NS
WBC×10 <sup>3</sup> /ul	16.5±4.6/16.8±4.2	15.5±4.2/17.1±7.9	16.0±3.9/17.3±4.4	NS
OP time(min)	56.5±19.5/67.6±16.4*	63.6±23.5/86.6±19.0	70.1±23.1/89.9±23.4	NS/0.01
Diet(hour)	20.3±14.3/60.9±30.2	19.3±7.1/88.6±39.5	24.7±16.3/88.6±39.5	NS
LOS(hour)	59.1±24.9/129.8±44.9	49.0±11.8*/149.5±71.5	49.0±11.8/168.1±89.1	0.04/NS
Wound infection	3.1%/11.1%	3.1%/0	8.3%/6.5%	NS
Abscess	0/0	0/0	4.2%/9.7%	NS
Adhesion	0/3.7%	0/0	0/0	NS

	Simple	Complicated
Age	0.02*	0.12
WBC	0.27	0.60
Bandemia	0.89	0.78
Irrigation	<0.01*	0.15
Extra	REF	REF
Mix	0.14	0.02*
Intra	0.02*	<0.01*

**Conclusions:** Different approaches of SILA in children have similar outcomes for both simple and complicated appendicitis. Extracorporeal is the most time-efficient. When complex situations are confronted, surgeons should flexibly switch to Mix method, or further to Intra method to avoid intraoperative complications (fig. 1).



# Quickshots Abstracts



**QS033 LAPAROSCOPICALLY ASSISTED VAGINAL PULL THROUGH IN SEVEN CASES OF CONGENITAL ADRENAL HYPERPLASIA WITH HIGH UROGENITAL CONFLUENCE: EARLY RESULTS** [Ahmed e Fares, PhD<sup>1</sup>](#), Khalid Salah<sup>2</sup>, Mahmoud Marei, MD<sup>2</sup>, Shrif Kadah<sup>2</sup>, Gamal El Tagy<sup>2</sup>; <sup>1</sup>Fayoum University, <sup>2</sup>Cairo University

**Purpose:** Surgical management of the high urogenital sinus is challenging. Separation of the vagina from the urogenital sinus is the most challenging portion of the operation. [1] Presence of short urethra is a contra indication for urogenital sinus mobilization as this will jeopardize urinary continence. [2] Also vaginal reconstruction of high suprasphincteric UGS is complex and prone to complications with high failure rate. [1,3]

In this study we report our initial results with four cases of high urogenital sinus treated by laparoscopically assisted vaginal pull through technique in the last two years.

**Materials and Methods:** This study included seven girls undergoing laparoscopically assisted vaginal pull through. All have the diagnosis of congenital adrenal hyperplasia with high urogenital sinus and short urethra above the urogenital confluence 15 mm or less. The seven patients were preoperatively assessed by genitography.

We performed this mobilization of the vagina till the confluence became visible and vaginal size become tapered at its junction with the urethra. Then the connection is sutured or clipped then divided (fig.1). The tract for pullthrough is created from the perineum and a clamp is passed from down to the peritoneal cavity. The vagina is grasped and pulled outside then sutured to the skin (fig.2). The round ligament of the uterus is divided on both sides. Good vaginal mobilization and direct perineal anastomosis can be performed without skin flap augmentation of the vaginal wall. The clitoroplasty and labioplasty were performed at another time after 3 months.

**Results:** seven patients had laparoscopically assisted vaginal pull through. Mobilization of the vagina has been possible on all cases attempted without injuries to the near structures in the pelvis.

Dilatation started 2 weeks postoperative and showed patency and good diameter .

At 6 months follow up all have good cosmetic out come and can retain urine with no dripping of urine or urinary incontinence.

# Quickshots Abstracts

**Conclusions:** The laparoscopically assisted vaginal pull through approach provides optimal exposure, facilitates vaginal dissection and separation from the urethra, avoids injuries to the urinary structures. It also allows reconstruction of the vagina without tension. Only two cases of high urogenital sinus confluence treated by this approach are reported in literature. [1,4]

Early results showed good vaginal size and that urinary functions are not impaired.

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**QS034 ROBOT-ASSISTED EXTRAVESICAL URETERAL REIMPLANTATION (REVUR) FOR UNILATERAL VESICO-URETERAL REFLUX IN CHILDREN: RESULTS OF A MULTICENTRIC INTERNATIONAL SURVEY.** [Ciro Esposito](#)<sup>1</sup>, [Maria Escolino](#)<sup>1</sup>, Lorenzo Masieri<sup>2</sup>, Henri Steyaert<sup>3</sup>, Chiara Cini<sup>2</sup>, Francesco Turrà<sup>1</sup>, Mariapina Cerulo<sup>1</sup>, Giovanni Severino<sup>1</sup>, Thomas S. Lendvay<sup>4</sup>; <sup>1</sup>Federico II University of Naples, Italy, <sup>2</sup>Meyer Children Hospital, Florence, Italy, <sup>3</sup>Université Libre de Brussels, Belgium, <sup>4</sup>Seattle Children's Hospital, Seattle, USA

**Background:** Robot-assisted extravesical ureteral reimplantation (REVUR) is becoming more widely adopted all over the world as an alternative to open reimplantation. We report the results of a multicentric international experience with REVUR in patients with unilateral vesico-ureteral reflux (VUR) in order to evaluate the long-term outcomes and the pitfalls of this innovative technique.

**Methods:** We retrospectively reviewed the records of 55 patients who underwent REVUR in 4 international centers of Pediatric Robotic Surgery for treatment of primary and previously untreated unilateral VUR. There were 35 girls and 20 boys with an average age of 4.9 years (range 3-7.9) and an average weight of 23.6 Kg (range 13-35). The preoperative grade of reflux was grade III in 7 patients (12.7%), grade IV in 26 patients (47.3%) and grade V in 22 patients (40%). Twenty-six patients (47.3%) presented a loss of renal function preoperatively and 10 of them (18.1%) presented a duplex system.

We adopted 4 trocars, 3 robotic trocars of 8-mm and one 5-mm assistant trocar for the bedside surgeon.

**Results:** Average robot docking time was 16.2 minutes (range 5-30). Average operative time was 92.2 minutes (range 70-120). We reported no conversions neither intra-operative complications. Average time for full oral feeding was 8 hours and average analgesic requirements was 28.5 hours. All patients had a bladder Foley catheter for at least 24 hours post-operatively. Average hospital stay was 2 days (range 1-3). Average follow-up length was 28 months (range 9-60). We recorded 3 (5.4%) postoperative complications: 1 small urinoma detected with US and resolved spontaneously and 2 persistent reflux, only one requiring redo-surgery using endoscopic injection (IIIb Clavien-Dindo).

**Conclusion:** REVUR is a safe and effective option for patients with primary VUR requiring surgery. Using 3D robotic technology, the technique is easy and fast to perform thanks to the 6° of freedom of robotic arms. The learning curve is short also if it is mandatory at the beginning of the experience to have a surgeon expert in robotic surgery as proctor on your side on the 2nd console. The high cost and the diameter of instruments remain the main problems of robotic surgery in pediatric urology.

# Quickshots Abstracts

## **QS035 THORACOSCOPIC REPAIR OF RECURRENT TRACHEOESOPHAGEAL FISTULA** Jinshi Huang, MD; Beilin Children's Hospital

**Aim:** With advances in minimally invasive surgery, thoracoscopic repair of oesophageal atresia has become popular in many centres worldwide and indeed has been described as the pinnacle of neonatal surgery. Here, we report our experience about thoracoscopic repair of recurrent tracheoesophageal fistula.

**Methods:** The procedures of thoracoscopic repair recurrent tracheoesophageal fistula were performed on 33 patients from April 2014 to September 2016. There were 21 males and 12 females, aged from 2 months to 10 years. In all the cases, the diagnosis was made based on the bronchoscopy or gastroscopy. The procedure was performed using three trocars. At the end of the procedure, the chest tube was left.

**Results:** The thoracoscopic procedures were completed without intraoperative complication in all patients. Two patients need to conversions. The operating time ranged from 136 to 380 minutes. Amount of bleeding was less than 15ml. Seven patients had anastomotic leak. the days of mechanical ventilation were 3-11d. time to initial feeding 7-13days. The hospitalization time was 17-45days. Follow-up upper gastrointestinal tests show 11 patients stricture, 3 patient was recurrence.

**Conclusion:** The thoracoscopic repair of recurrent tracheoesophageal fistula is effective and safe.

## **QS036 LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN. NEW TECHNIQUE. EFFICIENT AND SAFE** Ricardo Alba, PhD, Daniela Gonzalez, Student; Morelos Childrens Hospital

**Introduction:** Experience with laparoscopic cholecystectomy in children drags numbers from adults and remains poorly reported. Therefore, we review our experience with this approach.

**Material and Methods:** A cross-sectional retrospective review of six years with laparoscopic cholecystectomy was performed at the Hospital between January 1, 2010 and January 1, 2016. The revised points included patient demographics, indication for surgery, surgical technique (3 trocars use of Ligasure), operative time, complications and recovery time.

**Results:** During the study period, 323 patients underwent laparoscopic cholecystectomy. The mean age was 12.9 years (range, 0-18) with an average weight of 58.3 kg (range 3-121). The indications for laparoscopic cholecystectomy were gallstones in 266 children, biliary dyskinesia in 35, biliary pancreatitis in 7 gallstones indicating splenectomy in 6 gallstone cholecystitis in 5, coledocolitiasis 1, polyps gallbladder 1, cholecystitis acalculous 1, and congenital duct obstruction in 1. the average operating time was 40 minutes (range, 30- 70 min). Two patients required postoperative endoscopy to retrieve the common bile duct stones (CBC). There were no conversions, ductal lesions, bile leaks, or mortality. Biliary dyskinesia was diagnosed in 10% of the first 30 patients in this series and 40% of the most recent 30 patients. The mean ejection fraction of these patients was 21%. All experienced improvement in their symptoms after cholecystectomy.

**Conclusions:** Laparoscopic cholecystectomy with Ligasure is safe and effective in children. Biliary dyskinesia is being diagnosed more frequently in children, and these patients respond favorably to cholecystectomy. Unlike the adult population, the incidence of complicated biliary disease is less common in children, since most are presented with symptomatic cholelithiasis without active inflammation, which represents the low rate of ductal complications.

**Key words:** laparoscopic cholecystectomy, children.

# Quickshots Abstracts

**QS037 LAPAROSCOPIC VS OPEN CHOLECYSTECTOMY IN PEDIATRIC PATIENTS: A PROPENSITY SCORE MATCHED ANALYSIS.** Jun Tashiro, MD, MPH, Eduardo A Perez, MD, Juan E Sola, MD, Ali Mokdad, MD, Samir Pandya, MD; University of Miami Miller School of Medicine

**Background:** As minimally invasive pediatric surgery becomes a standard approach to many surgical solutions, access has become an important point for improvement in pediatric surgery. Laparoscopic cholecystectomy (LC) is currently the gold standard for many conditions affecting the gallbladder; however, open cholecystectomy (OC) is offered as the initial approach in a surprisingly high percentage of cases.

**Methods:** The Kids' Inpatient Database (1997-2009) was searched for ICD-9-CM procedure code (51.2x). LC and OC performed in patients < 20 years old were identified. Propensity score (PS)-matched analyses using 39 variables were performed to isolate the effects of race, income group, facility location, gender, payer status, and hospital size on the percentage of LC and OC offered. Cases were weighted to provide national estimates.

**Results:** A total of 78,578 cases were identified, comprised of LC (88.1%) and OC (11.9%).

When comparing gender, our analysis demonstrated that girls were 1.6 (1.4, 1.7) times more likely to undergo LC vs. boys. Procedures performed at large facilities were 1.4 (1.3, 1.7) times more likely to have LC vs. those performed at small facilities. Children in the lower income quartiles were 1.2 (1.1, 1.3) times more likely to undergo LC compared to those in the higher income quartiles.

Rates of LC were not affected by race (Caucasians vs. other), hospital location (urban vs. rural), or payer status (insured vs. self-pay).

**Conclusions:** On a risk-adjusted analysis of a large, population-based dataset, we have found evidence that confirms, but also refutes, traditionally held disparities in access to minimally invasive surgery. While a standard has been established, open cholecystectomy is the initial approach in a surprisingly high percentage of cases. Additional research is required to identify factors affecting the distribution of LC and OC within the US pediatric population.

**QS038 VALUATION OF THORACOSCOPIC SURGERY IN MANAGEMENT OF ESOPHAGEAL ASTRESIA IN VIETNAM NATIONAL HOSPITAL OF PEDIATRICS** Linh Nguyen Van, MD; Vietnam National hospital of paediatrics

**Objectives:** The aim of this study was to determine the outcome of thoracoscopic surgery in management of esophageal astresia in children.

**Methods:** A retrospective study of all children who had esophageal astresia and underwent thoracoscopy repair from May/2014 to May/2016 was undertaken. Recorded details included demographic data, mode of presentation, preoperative investigations, operative details, postoperative course, follow-up data and complications.

**Results:** 54 children had been operated by thoracoscopy for management of esophageal astresia. According to Gross classification, we had 50(92.6%) cases in type C, 3(5.5%) cases in type A and 1(1.9%) in type H. Their mean birth weight was  $2.7 \pm 0.6$  kg (1.9 – 4 range). The mean time of operation was  $82 \pm 19$  (mins). Thoracoscopy was successes in 52(96.3%) cases which were performed anastomosis. In this series we successfully managed 3 cases of type A esophageal astresia, 1 case had performed primary anastomosis, the others were performed Forker modifying technique in the first stage and was performed anastomosis after 7 days. The mean hospital stay was  $16 \pm 9$  days.

Complication include: 3 cases (5.5%) had leakage, which had been treated successfully by drainage. 2 cases (3.7%) who did not have leakage, died because of sepsis.

The mean time follow up is 9.3 months, 6 cases (11%) had esophageal stenosis and had been perform dilated by balloon endoscopy, 2 cases (3.7%) had tracheoesophageal fistula and need to close by thoracoscopy.

**Conclusions:** Thoracoscopy for management of esophageal astresia is a safe, novel technique in children.

# Quickshots Abstracts

## **QS039 TEN-YEARS-EXPERIENCE WITH LAPAROSCOPIC TRACTION FOR INTRA-ABDOMINAL TESTIS (SHEHATA TECHNIQUE) , LESSONS LEARNED.** Sameh Shehata, Prof<sup>1</sup>, Mohamed Abouheba<sup>1</sup>, Rafik Shalaby<sup>2</sup>; <sup>1</sup>Alexandria University, <sup>2</sup>Azhar University

**Background:** Several studies have shown the intrinsic testicular damage when testicular vessels [TV] are divided during Fowler-Stephens laparoscopic orchiopexy. We present a novel technique for bringing down the high intra abdominal testis (IAT) with gradual traction for elongation of the TV.

**Patients and methods:** patients with IAT not amenable to one stage Laparoscopic assisted orchiopexy confirmed by laparoscopy are selected for the technique of testicular traction. The laparoscopic technique entails fixation of the testis with non-absorbable stitch to a point one inch above and medial to the anterior superior iliac spine on the other side. After a waiting period of 12 weeks to allow lengthening of the spermatic vessels, another laparoscopy is performed for division of the traction stitch and the testis is brought down to the scrotum. cases were followed up after 6 months and success is defined as scrotal testis of adequate size and good vascularity by Doppler.

**Results:** One hundred forty testes were operated upon in two centers. The mean follow up period was 16 months [ranged from 6 months – 36 months] and the total success rate was 84%. Success rate was affected by age and by the distance from the internal deep ring, with better results for younger age and cases nearer to the internal ring.

**Conclusion:** The technique of laparoscopic traction (Shehata technique) is safe and effective for cases of abdominal testis not amenable to laparoscopic assisted orchiopexy. It results in significant elongation of without division of the TV. The possible mechanism of elongation is the weight of the intestines causing gentle and gradual elongation of the TV.

## **QS040 PEDIATRIC INGUINAL HERNIAS, ARE THEY ALL THE SAME? A PROPOSED CLASSIFICATION AND TAILORED TREATMENT** Sameh Shehata, Prof<sup>1</sup>, Sherif Shehata, Prof<sup>2</sup>, Mohamed Abouheba, Dr<sup>1</sup>; <sup>1</sup>Alexandria University, <sup>2</sup>Tanta University

**Aim of the study:** To propose a new classification for pediatric inguinal hernias based on clinical and operative findings as well as to propose a tailored repair for each type.

**Methodology:** This prospective and retrospective cross-sectional study was conducted in two tertiary teaching university hospitals in Egypt (Alexandria and Tanta University Children's Hospitals) from January 2013 to December 2014 on children below 12 years of age with indirect inguinal hernias who were divided into two groups:

a prospective classified group I (Subgroups A open & B laparoscopic surgery), and  
a retrospective unclassified group II.

Hernias in the prospective group I were classified according to the modified Nyhus classification as follows:

Nyhus 1 (N1) were assigned for herniotomy alone.

Nyhus 2 (N2) were assigned for herniotomy plus internal ring narrowing.

Nyhus 3 (N3) were assigned for herniotomy plus posterior inguinal wall repair.

In the retrospective group II, the classification was not applied and the defacto 'classic herniotomy alone' was performed for all cases. Data about patient characteristics, assigned Nyhus type, operative findings, procedures done, and post-operative complications were documented and analyzed by comparing the outcomes of the two groups.

**Results:** A total of 392 children were included in the study (226 group I and 166 group II), boys outnumbered girls being 79.3% (311/392) of all patients [80.1% (181/226) in group I and 78.3% (130/166) in group II] with a ratio of M:F= 3.8:1. The majority were infants making 73.2% (287/392) of the series [58.4% (132/226) in group I and 93.4% (155/166) in group II].

A total of 443 herniotomies and herniorrhaphies were done including fresh, recurrent and irreducible hernias. Children with unilateral right-sided inguinal hernias were the commonest making 54.8% (215/392) of the whole series [59.3% (134/226) in group I and 48.8% (81/166) in group II] followed by unilateral left inguinal hernias making 32.1%, (126/392) of the whole series [26.5% (60/226) in group

# Quickshots Abstracts

I and 39.8% (66/166) in group II]. Nyhus type 2 hernias formed the largest cluster, making 42.6% (110/258), followed by Nyhus type 1 hernias making 31.8% (82/258). All 11 irreducible hernias were Nyhus type 2, while the operated 14 recurrent hernias were distributed as 2, 5 and 7 of types 1, 2 and 3 respectively. Pre-classification according to the proposed modified Nyhus classification was found accurate intraoperatively in 98.1% (156/159).

The average diameter of the internal inguinal ring was 9.0 mm $\pm$ 1.6 SD (range:5-11mm), 14.8mm $\pm$ 3.4 SD (range:10-22mm) and 24.8mm $\pm$  4.8 SD (range:16-37mm) for Nyhus types 1, 2 and 3 hernias respectively. The pooled recurrence rate was 1.8% (8/443) of the whole series, a weighted mean of the individual recurrence rates of 0% (0/258) of group I and 4.3% (8/185) of group II patients, all males. Such remarkable difference in the recurrence rates between the two groups is statistically significant (P = 0.004).

**Conclusion:** Childhood inguinal hernias are not the same. Applying this modified Nyhus classification system with the proposed individual surgical repair lowers recurrence in both open and laparoscopic repairs.

**QS041 LAPAROSCOPIC HEPATECTOMY FOR LIVER TUMOR IN CHILDREN** Shuguang Jin, Bo Xiang, Zhicheng Xu; West China Hospital, Sichuan University

**Objective:** To summarize the laparoscopic resection of liver tumor in children, and to accumulate clinical experience for further operation.

**Methods:** From August 2016 to June 2017, five cases of liver tumors were carried out by laparoscopy in pediatric surgery, West China Hospital of Sichuan University. Three were males, and two were females; mean age was (6 + 5.3) years old, from 1 year to 12years; mean liver tumor diameter was (6 + 2.2)cm, from 3cm to 9cm. The inclusion criteria were tumor diameter less than 15cm, distance from first and second hepatic porta greater than 3cm, and no significant invasion of main hepatic vessels and bile ducts. Left hemi-hepatectomy was performed in 2 cases, left lateral lobectomy was performed in 1 cases, an irregular liver resection were in 2 cases. Imaging methods were used to evaluate carefully before operation, intraoperative ultrasound were assisted when necessary. The ultrasonic scalpel, ligasure, or laparoscopic CUSA apparatus were used to resect liver lesions precisely.

**Results:** There were no conversions to laparotomy during the operation. The average operation time was (144 + 57.7)min, between 70min to 210min; the average amount of bleeding was (164 + 112.8)ml, between 20ml to 300ml; the average amount of blood transfusion was (90 + 89.4)ml, between 0 to 200ml; the average intraoperative hepatic blood inflow occlusion time was (34 + 32.9)min, between 0 to 70min; postoperative ICU stay time was (25.2 + 15.7)h, between 0 to 38h; and the average hospitalization time was (9 + 0.7) d, between 8d to 10d. The liver function recovered well after operation. Total bilirubin were not significantly elevated, mean alanine aminotransferase value were (245 + 143.5)IU/L, (204.4 + 139.6)IU/L, and (80 + 38.5)IU/L, respectively in 24h, 48h, and 72h. There were no complications such as death, hepatic failure, biliary fistula, intra-abdominal hemorrhage, and abdominal infection. Postoperative pathological diagnosis were three hepatic tumors cases, one focal liver hyperplasia case, and one hepatocellular carcinoma cases.

**Conclusion:** It is safe and feasible for laparoscopic liver tumor resection in children after evaluating and selecting carefully before operation, and the postoperative liver function of children could recovered well.

**QS045 USEFUL LAPAROSCOPIC SURGERY FOR CONGENITAL EXTRAHEPATIC PORTOSYSTEMIC SHUNT IN CHILDREN.** Keigo Yada, MD, PhD, FACS, Hiroki Ishibashi, Hiroki Mori; Tokushima University Hospital

**Background:** Ligation or embolization of the shunt vessel is the first choice for the surgical treatment of Type 2- congenital extra-hepatic portosystemic shunt, which has an intrahepatic portal vein. In recent years, there are some reports about laparoscopic surgery. We report here on our six children with congenital extrahepatic portosystemic shunt performed laparoscopic surgery.

# Quickshots Abstracts

**Cases:** Six children were four male and two female and age was from 2 to 31 months. In all cases, high galactosemia was pointed out in the neonatal period, and shunt vessel (portal vein-left renal vein : 5 cases, portal vein-inferior vena cava : 1 case) was confirmed. In addition, hyperammonemia and high level of total bile acid was detected. In portal scintigraphy used <sup>123</sup>I - iodoamphetamine per rectum, shunt ratio was from 20% to 78.1% (average 62.7%). In all patients, shunt vessel was directly detected by angiography and no elevation of portal pressure was checked in the shunt occlusion test by a balloon catheter. Although all children had no symptoms, laparoscopic surgery was performed prophylactically.

**Results:** Shunt vessel was identified, ligated and dissected by laparoscopic surgery using 3 or 4 ports. In only one case, laparoscopic surgery was converted to open surgery in order to check the blood flow of the portal vein because of the swelling of spleen after ligation of shunt vessel. However, there were no complications after surgery and serum data was also normalized in all cases.

**Conclusions:** Laparoscopic shunt division surgeries for congenital extrahepatic portosystemic shunt in children seemed to be useful though the confirmation of the blood flow of the portal vein was essential pre- and intra-operatively.

**QS046 POTENTIAL OF INTRACORPOREAL KNOTTING TRAINING WITH SNS (SOCIAL NETWORK SERVICE) FOR STUMP CLOSURE IN LAPAROSCOPIC APPENDECTOMY.** Yusuke Yamane, MD, Yasuaki Taura, Takuya Yoshida, Tomoyuki Tetsuo, Shota Shinohara, Taiichiro Kosaka, Mitsuhisa Takatsuki, Susumu Eguchi, Takeshi Nagayasu; Nagasaki University Hospital

**Purpose:** The purpose of this study was evaluation of intracorporeal knotting training with SNS (Social Network Service) for stump closure in laparoscopic appendectomy (LA) before operation.

**Methods:** Between April 2013 and December 2016, acute appendectomy patients who underwent single incisional LA and intracorporeal knotting for stump closure by PGY-3 (postgraduate year 3) surgeons were placed in two groups: an S- group (dry box suture training without SNS) and an S+ group (dry box suture training with SNS). We compared the operative time, the time required for stump closure and the postoperative complications.

**Results:** There were six patients in S- group and five patients in S+ group. Four surgeons were contained in S- group and 3 were contained in S+ group. The average operative times were not significantly different. The average times required for stump closure were 15.2 minutes in S- group and 9.1 minutes in S+ group ( $p=0.038$ ). There were no postoperative complications in both groups.

**Conclusion:** SNS might be common and effective tool because the feedback with SNS was not required an appointed time and place.

**QS047 HOW TO REACH NIL-RISK OF IPSILATERAL RECURRENCE AFTER LAPAROSCOPIC INGUINAL HERNIA REPAIR IN CHILDREN? A NEW TAKE ON AN OLD CONCEPT** Soo Min Ahn, MD, Tae Ah Kim, MD; Division of Pediatric Surgery, Pediatric Specialized Center, Hallym University Sacred Heart Hospital

**Purpose:** Currently various types of laparoscopic inguinal hernia repairs (LHR) have been proven to be efficient and safe for children. Nonetheless, either intracorporeal or extracorporeal/percutaneous LHR shows considerable rate of ipsilateral recurrence regardless various types of suturing methods. We assumed that the recurrence might be attributed to remaining distal sac. We sought to verify the efficacy of LHR with distal hernia sac resection (LHR with DSR) on preventing the recurrence after LHR in children.

**Methods:** Between Sep 2014 and Aug 2016, 150 children aged 11 and younger with inguinal hernia were subjected to LHR with DSR under informed consent. Distal hernia sacs were carefully dissected off after circumferential incision around the internal inguinal ring. The sac was pulled into the abdominal cavity to be completely divided with confirmation of being freed from the spermatic vessels and vas deferens. After removing of the distal sac, the totally intracorporeal suture ligation of the peritoneum was performed. The patient demographics, operation time, complications were evaluated. Re-operation or bulging of each side was monitored by telephone survey to evaluate the ipsilateral recurrence.

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**Results:** Inguinal hernias were repaired laparoscopically in 150 children (98 males and 52 females) without conversion or major adverse event: the mean age was  $3.6 \pm 2.5$  years (range 1 month to 11 years), and 189 sides (137 unilateral hernia, 13 bilateral hernia, 26 CPPV) were repaired. Operative time was  $47.9 \pm 14.8$  min for unilateral hernia,  $56.0 \pm 14.3$  min for bilateral inguinal hernia. All parents have responded to telephone questionnaires and there was no ipsilateral bulging or re-operation during 29 months of mean follow up period (ranges, 14 to 45 months). There was no detectable vas or spermatic vessels injury. All patients were discharged on the same day.

**Conclusion:** Laparoscopic inguinal hernia repair with removal of distal hernia sac could effectively prevent ipsilateral recurrence in children and could be performed safely although it might be technically demanding and take relatively longer operation time.

## QS048 LONG TERM EFFICACY OF LAPAROSCOPIC FUNDOPLICATION IN CHILDREN WITH GASTROESOPHAGEAL REFLUX DIS-

**EASE.** Femke V.M. Mulder, Bsc<sup>1</sup>, Stefaan H. A. J. Tuijthof, MD, PhD<sup>2</sup>, Tycho S Oudman, Bsc<sup>1</sup>, Femke A Mauritz, MD, PhD<sup>1</sup>, David C Van der Zee, MD, PhD<sup>1</sup>, Maud Y.A. Van Herwaarden-Lindeboom, MD, PhD<sup>1</sup>; <sup>1</sup>University Medical Centre Utrecht, <sup>2</sup>Wilhelmina Children's Hospital

**Background:** Gastroesophageal reflux disease (GERD) is a major healthcare problem in infants and children. Laparoscopic antireflux surgery (LARS) aims to reduce reflux symptoms in pediatric patients with severe GERD resistant to long term medical treatment. Studies on short term efficacy of LARS have shown good to excellent results on symptom control and health-related quality of life (HRQoL); however, longer follow-up has shown that the efficacy of symptom control may deteriorate in the years after LARS. The aim of this study is to assess the long term effect on reflux symptoms and HRQoL.

**Methods:** We performed a prospective observational cohort study, including 25 children [12 males, median age 6 (2–18) years] with PPI-resistant GERD. To assess reflux symptoms and HRQoL, patients and/or their parents were asked to fill out the validated age-adjusted reflux symptom questionnaire (GSQ) and Paediatric Quality of Life Inventory (PedsQL™) before, three-to-four months and two years after LARS. For statistical analysis McNemar and Wilcoxon signed rank tests were used.

**Results:** Long-term follow up showed that 26% of patients (6/23) had reflux symptoms compared to 12% (3/25) after short-term follow-up. This effect, however, was not statistically significant ( $p=0,375$ ). The HRQoL scores did not change significantly, in both the parental (71,9 compared to 82,0 ( $p=0,140$ )) as well as the pediatric questionnaires (75,2 compared to 84,6 ( $p=0,182$ )). Also subset analysis on physical ( $p=0,210$ ), as well as psychosocial HRQoL ( $p=0,218$ ) were similar comparing long term to short term follow-up.

**Conclusion:** In pediatric GERD patients increased HRQoL after LARS remains equally high after two years of follow-up, even though recurrence of reflux symptoms tends to increase.

**QS049 LAPAROSCOPIC GASTROSTOMY FIXATION: STAMM VERSUS FULL-THICKNESS U STITCH.** Erin Ward, MD<sup>1</sup>, Andrew Wang, MD<sup>2</sup>, Sneha Nicholson<sup>3</sup>, Divya Sood, MD<sup>1</sup>, Stephen Bickler, MD<sup>1</sup>, Karen Kling, MD<sup>1</sup>; <sup>1</sup>UCSD, <sup>2</sup>Balboa Naval Hospital, <sup>3</sup>Rady Children's Hospital

**Background:** Gastrostomy tube (GT) dislodgement remains a common complication with potentially life threatening repercussions. Variability exists regarding the laparoscopic technique for fixation of the stomach to the abdominal wall. Some use a laparoscopic Stamm technique; some use a transient laparoscopic full thickness U stitch. Pediatric literature is lacking with respect to comparison of these techniques. This study aims to characterize differences in outcome between these different methods of GT fixation.

**Methods:** Retrospective chart review was conducted of all pediatric patients aged less than 21 years who underwent gastrostomy between September 2011 and December 2016. Patient charts were reviewed to determine the manner in which the stomach was fixed to the abdominal wall and to identify complications including dislodgement and return to the operating room for replacement.



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**Results:** The most common reason for ED visits in all gastrostomy patients was dislodged GT (39%). Of the 277 patients who had laparoscopic GT, 227 had lap full thickness (LFT) and 50 patients had lap Stamm (LS) fixation of the gastrostomy. 34% and 30% of the LFT and LS groups, respectively, had at least one ED visit related to GT problems. ED visits within the first 6 months after gastrostomy were 21% and 18% for LFT and LS patients, respectively. Dislodgement within 21 days of placement occurred in 6% in each group. However, 25% of LFT patients with dislodgement required operative intervention for replacement whereas NO patients with LS required operative repair.

**Conclusion:** Approximately one third (33%) of gastrostomy patients had an issue requiring an ED visit. ED visits for gastrostomy complications were similar between both groups. The most common reason for return was dislodgement and this sometimes required reoperation. The rate of early dislodgement (within 21 days postop) was the same in both groups; however, none of the patients with fixation via Stamm technique required return to the operating room for replacement.

## **QS050 EARLY OUTCOMES OF ROBOT-ASSISTED SOAVE PROCEDURE FOR CHILDREN WITH HIRSCHSPRUNG DISEASE: EXPERIENCE A CENTER** Tran A Quynh, PhD, Pham D Hien, PhD, Bui D Hau, Le T Hai, Le Q Du; National Children's Hospital

**Aim:** To report early outcomes of Robotic-assisted colon pull-through leaving a short rectal sleeve for Hirschsprung disease.

**Methods:** Robotic-assisted endorectal colon pull-through was performed using 3 Robotic arms and a further 5-mm trocar. The ganglionic and aganglionic segments were initially identified by seromuscular biopsies obtained Robotically. The rest of the procedure was carried out according to Soave procedure. However, we left a short rectal seromuscular sleeve of 1.5 to 2 cm above the dentate line.

**Results:** From January 2016 to August 2017, 25 patients were operated upon by the same surgeon. Ages ranged from 9 months to 10 years old ( $40 \pm 33,7$  months). The aganglionic segment was located in the rectum in 15 patients, in the sigmoid colon in 8 children, and in the left colon in 2 patients. The median operating time was  $120,3 \pm 43,6$  minutes (range: 60-210 minutes). There were no perioperative deaths and no conversion to open surgery. There was minimal blood loss during the surgery. Oral intakes of clear fluid were started 12 hours after surgery and advanced to formula on the second day. Follow-up ranging from 1 to 20 months was obtained in 25 patients; 21 patients (84%) had 1 to 4 defecations a day, and 4 patients (16%) had 5 to 6 defecations a day. Fecal incontinence occurred in 2 patients (8.0%), and enterocolitis in 4 patients (16 %).

**Conclusion:** Robot-assisted Soave procedure for children with Hirschsprung disease is a safe and effective.

## **QS051 LAPAROSCOPIC APPROACH ON EPIGASTRIC HERNIAS: OUR NEW GOLD STANDARD** Maria Soledad Valverde, Fernando Rabinovich, Santiago Calello, Jorge Martinez, Luzia Toselli, Carolina Millan, Guillermo Dominguez, Horacio Bignon, Gaston Bellia, Enrique Buela, Marcelo Martinez Ferro; Fundación Hospitalaria

Although epigastric hernia (EH) is a common pathology, there are few publications about laparoscopic technique for its resolution. This is the second largest series of children with a laparoscopic epigastric hernia repair.

**Materials and Methods:** 12 patients were consecutively operated laparoscopically, in the same medical center. They all presented a ventral defect in middle line with  $\geq 2$  cm of the superior umbilicus arch.

**Technique:** Trocars were placed (TP) in three different ways:

TP 1: 5mm Umbilical port + 2 trocars of 3 mm on each side

TP 2: 5mm Umbilical port + 5mm trocar in left iliac fossa

TP 3: 10mm Umbilical port (SILS)

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Identification of the defect was done with digital monounering above the area previously marked. Dissection of the defect, and the reduction of its content. We used non absorbable sutures (Prolene/Ethibond) 2/0, abbocath catheter.

Quantitative variables (average and range): age, operative time (minutes), and duration of hospital stay.

Qualitative variables (expressed as +/-) : conversion to laparoscopic surgery, complications during the operation, recurrence, cosmetic satisfaction.

Follow up of 3 years.

**Results:** 12 epigastric hernias were repaired. All procedures were completed laparoscopically.

Mean Operative Time

TP 1 = 55 minutes, TP 2 = 50 minutes, TP 3 = 90 minutes

11 patients were discharged on the day of surgery and 1 patient from TP3 group needed 1 day admission.

Cosmetic Satisfaction

TP1 = Moderate to excellent, TP2 = excellent, TP3 = excellent.

There were no intraoperative or postoperative complications.

There have been no recurrent hernias.

**Conclusion:** This case series demonstrated that laparoscopic approach on epigastric hernias is effective, safe and cosmetically acceptable; independently of the trocars placement. However, we prefer the TP2 as it turns out to be more ergonomic and reduces de mean operative time.

**QS052 THE LAPAROSCOPIC APPROACH FOR REDUCTION OF INTUSSUSCEPTION IN INFANTS AND CHILDREN: AN UPDATED INSTITUTIONAL EXPERIENCE** Leo Andrew O Benedict, MD, Derrick Ha, [Joseph Sujka, MD](#), Justin Sobrino, MD, Tolulope Oyetunji, MD, MPH, Shawn D St. Peter, MD, Jason D Fraser, MD; Children's Mercy Hospital- University Of Missouri Kansas City

**Purpose:** We have previously demonstrated successful laparoscopic management following failed radiographic reduction. The purpose of this study is to assess the effectiveness of our mature experience for laparoscopic reduction of intussusception by evaluating operative success, duration of hospital stay, post-operative complications, and readmissions.

**Materials and Methods:** Following IRB approval, a retrospective review was conducted on children (age 0-18 years) who failed radiographic reduction of intussusception between 1998 and 2017. Cases were classified as open, laparoscopic, or laparoscopic assisted where the bowel is exteriorized by extending the umbilical incision. Demographic data, bowel resections, post-operative length of stay, complications, and readmissions were abstracted from patient medical records. Comparative analysis was performed in STATA with a p value <.05 determined as significant.

**Results:** A total of 109 children were included. Twenty-eight patients (26%) had a laparoscopic reduction, 42 (38%) underwent laparoscopic assisted while 39 (36%) underwent an open operation. Laparoscopic reduction carried the lowest complication rate at 3.5% compared to 8% in open procedures and 14% in laparoscopic assisted procedures, but this did not reach statistical significance (p=.29). Furthermore, both readmissions and returns to the operating room were similar between the three groups (p=.44 and p=.17 respectively). The median post-operative length of stay was shorter in patients utilizing the laparoscopic approach (2 days, IQR, 1, 3) compared to both laparoscopic assisted and open groups (4 days, IQR, 1, 3, p=.001). Finally, children undergoing laparoscopic assisted procedures had increased rates of bowel resected (71% vs. 44%, p=.001) and had a higher likelihood of having a pathological lead point (31% vs. 14% vs. 13%, p=.085).

**Conclusion:** Laparoscopic management of intussusception following failed radiographic reduction yields a reduced hospital length of stay with no increase in hospital readmission rates and returns to the operating room.

# Quickshots Abstracts

**QS053 LAPAROSCOPIC WIDENED PORTOENTEROSTOMY FOR CHOLEDOCHAL CYSTS WITH NARROW HILAR DUCT** Shao-tao Tang, Li Yang, Xiaopan Chang, Xi Zhang; Department of Pediatric Surgery, Union Hospital, Tongji Medical College

**Background:** Complete cyst excision and Roux-en-Y hepaticojejunostomy is the standard procedure for choledochal cysts (CC). With the development of prenatally diagnosed and laparoscopic technique, increasingly more neonates with prenatally diagnosed CC require laparoscopic surgery to avoid complications. However, the caliber of bile duct of neonates is extremely narrow. In addition, the type IV-A CC with intrahepatic ducts dilated not obvious occasionally encountered. In such patients, laparoscopic hepaticojejunostomy is thought to be extremely difficult, and postoperative anastomotic stricture is also a matter for concern. We propose our novel surgical technique - laparoscopic widened portoenterostomy, aiming to prevent anastomotic stricture. Also, mechanisms and effects of this approach are confirmed through animal experiments and clinical applications.

**Methods:** 24 miniature pigs were randomly divided into experimental group and control group, Different operations were performed afterwards. Extent of inflammatory cellular infiltration, condition of scar formation, and size of anastomosis stoma at different time after surgery were observed and compared. Between January 2012 and January 2016, we performed laparoscopic widened portoenterostomy on 29 children confirmed CC with narrow hilar duct. All cases were followed up for 12~48 months, clinical information about surgery effects and complications were collected and evaluated.

**Results:** In animal experiments, at 1 month and 6 months after surgery, experiment group survived well and anastomotic stoma showed complete patency confirmed by bile duct radiography. Less inflammation and fibrotic tissue located around the bile duct were observed histologically. For control group, 7 in 12 pigs developed anastomosis stricture confirmed by cholangiography. Serious inflammation and diffuse fibrosis involved whole layer of the anastomotic stoma were observed. In clinical research, 29 children went through laparoscopic widen portoenterostomy successfully and recovered without any early complications. According to 2~4 years follow-up, no long-term complications occurred such as intrahepatic stones, cholangitis or anastomotic stricture.

**Conclusions:** laparoscopic widened portoenterostomy may be a superior option to prevent anastomotic stricture in treating choledochal cysts with narrow hilar duct.

**QS054 CAUTIONARY TALES IN LAPAROSCOPIC URETERAL LIGATION** Damir Ljuhar, MBBS, MPHTM<sup>1</sup>, Annette D Chang, MBBS<sup>2</sup>, Michael Ee, FRACS, Paed<sup>1</sup>, Nathalie Webb, FRACS, Urol<sup>2</sup>; <sup>1</sup>Royal Hobart Hospital, <sup>2</sup>Monash Children's Hospital

**Background:** Laparoscopic ureteric clipping offers a simple, fast and relatively easy procedure for the treatment of paediatric urinary incontinence due to ectopic ureters associated with non-functioning upper pole renal moieties. It has been described as an alternative to more intricate ablative (upper pole hemi-nephrectomy) and more complex reconstructive (uretero-ureterostomy) treatment if function is preserved. However, it has been proposed that the procedure carries a theoretical increased risk of infection. Romao et al. (2014) published a series of nine girls undergoing laparoscopic ureteral ligation. All patients were immediately dry after surgery and remained asymptomatic. The current abstract describes two cases of ureteric clipping with associated upper pole moiety infection requiring surgical intervention.

**Surgical Technique:** The technique involves cystoscopic examination of the introitus followed by examination of the bladder. The normal lower pole ureter of the affected side is catheterized. Standard laparoscopy is then performed to visualise the ureters. The normal lower moiety ureter is identified and spared. The ectopic ureter is clipped and divided.

Case 1: 8year old girl with urinary incontinence and recurrent urinary tract infections. Ultrasound and Magnetic Resonance Urography confirmed a duplex right kidney with an ectopic right upper moiety ureter inserting into the vaginal vault. The upper pole moiety contributed 2.3% of the total renal function. She proceeded to laparoscopic clipping of her upper moiety ureter and was discharged Day 1. She represented 4 days post operatively with abdominal pain, fever and tachycardia. Investigations showed significantly elevated inflammatory markers and Enterobacter aerogenes growing in her urine. Worsening dilatation of her upper moiety and new echogenic debris within the dilated moiety was noted on ultrasound. A nephrostomy tube was inserted into the right renal upper moiety for urosepsis. She was discharged Day 7 of admission and the nephrostomy tube was removed 10 days after insertion. Follow up ultrasounds have shown persistent right renal upper moiety dilatation with mildly increased, but stable, lower moiety hydronephrosis. Recent MAG3 has not shown any obstructive features with relative renal function maintained.

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Case 2: 4-year old girl with an antenatally diagnosed right duplex system with a right upper pole moiety. Cystoscopy and retrograde pyelography at one year of life that noted an ectopic right upper pole ureter inserting into the urethrovaginal septum. Subsequent DMSA showed minimal function of her right upper pole moiety. At 4 years of age when her urinary incontinence became more problematic, she underwent laparoscopic ligation of right upper pole ureter. Her postoperative recovery was complicated by pyonephrosis requiring laparoscopic heminephrectomy. E. coli was cultured in her urine. Two months subsequently she experienced purulent per urethral discharge and abdominal pain. Ultrasound scans demonstrated a dilated right ureteric stump with a collection that required operative excision.

**Conclusion:** While laparoscopic ureteric clipping offers a novel approach to the treatment of upper pole moieties in children with urinary incontinence, we discuss two cautionary tales of upper pole moiety infection not previously described in the literature.

**Reference:** Romao, RLP, Figueroa, V., Pippi Salle, JL., Lorenzo, AJ. 2014. Laparoscopic ureteral ligation J Ped Urol. 10: 1089-94.

**QS055 ELONGATION OF ESOPHAGEAL SEGMENTS BY STRETCHING TECHNIQUE FOR PURE ESOPHAGEAL ATRESIA TO ACHIEVE DELAYED PRIMARY ANASTOMOSIS BY THORACOSCOPIC REPAIR** Jun Wang, Suna Sun, Wenji Wu, Yiming Gong, Jia Shi, Weihua Pan; Xinhua Hospital affiliated Shanghai Jiaotong University School of Medicine

**Objectives:** The treatment of pure esophageal atresia (pEA) is one of the most challenging congenital malformations in neonatal surgery. A preoperative stretching technique for elongation of the two segments of esophagus is applied to achieve utilizing the native esophagus to establish esophageal continuity by thoracoscopic approach.

**Methods:** From January 2016 to May 2017, 7 neonates suffered from pEA were admitted to our department. Gestational age varied from 32.6-40.9 weeks (M=36.8±3.1). Birth weight ranged from 2150g to 2800g (M=2342.9±284.9). All the 7 infants were accepted gastrostomy a few days later after born. They all accepted stretching technique through mouth and gastrostomy before esophageal anastomosis. And during the elongation period, they were fed by gastrostomy to keep nutritional status remain well controlled.

**Results:** Initially the lengths of esophageal gap in 7 infants were ranged from 4 to 7 vertebral bodies (M=5.9±1.2). The gap lengths became -1 vertebral body after stretching technique and anastomosis were performed successfully for all 7 cases by thoracoscopic approach, 1 by end-to-end and 6 by Livaditis in different extent. During the post-operative follow-up, 3 cases had pulmonary infection and were cured by antibiotics and airway caring. 4 had anastomotic stricture and accepted dilations 3-8 (M=4.8±2.2) times. 1 occurred anastomotic leakage but cured by drainage and conservative treatment. No vomit and no symptoms related to GER by GI appeared in all 7 cases.

**Conclusions:** Stretching technique for pEA is feasible with satisfied clinical results. Thoracoscopic approach is a good choice for primary anastomosis in pEA.

**QS056 ANALYSIS OF EFFICACY OF SINGLE-SITE UMBILICAL LAPAROSCOPY IN THE TREATMENT FOR CHILDREN WITH CRYPTORCHIDISM** Li Gui Bin; the 5th central hospital of Tianjin

**Objective:** To evaluate clinical effect of single-site umbilical laparoscopy in the treatment for children with cryptorchidism.

**Methods:** Retrospective analysis were conducted for the clinical data of the 82 children with cryptorchidism from January 2011 to June 2014. The patients were divided into single-site laparoscopy group (SLG n=35) and conventional laparoscopy group (CLG n=47) and compared. The operation time, intraoperative blood loss, postoperative hospital stay, postoperative pain, level of patient satisfaction with the incision scar were compared between two groups.

**Results:** Operation underwent successfully in both groups. The operation time in SLG was longer than in CLG [(44.89±4.16)min vs (40.85±3.09)min (P<0.01)]. The pain scores (8 hours after operation) in SLG was lower than in CLG [(3.11±0.93) vs (4.09±0.88) (P<0.01)]. The utilization rate of anodyne in SLG was lower than in CLG [11.43% vs 29.79% (P<0.05)]. The level of patient satisfaction with the incision scar in SLG was higher than in CLG [(4.60±0.81) vs (3.96±0.98) (P<0.05)]. Intraoperative blood loss, pain scores (24 hours after

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operation) and postoperative hospital stay were not different between two groups ( $P > 0.05$ ). All patients were followed up for 10-16 months (mean: 13 months), and there was no case of testicular atrophy or ascent, or hernia.

**Conclusion:** Single-site umbilical laparoscopy is safe and efficacious for cryptorchidism in children. It offers advantages of less postoperative pain and no obvious abdominal scar.

## **QS057 A NOVEL TREATMENT FOR TYPE II ABERNETHY MALFORMATION IN CHILDREN** Jinshan Zhang, Long Li; Capital Institute of Pediatrics

**Purpose:** Ligation of abnormal portosystemic shunt could be used to treat type II Abernethy malformation, but it may not be suitable for all of patients. In this study, two surgical approaches were used, according to the portal venous morphology. The outcomes were evaluated postoperatively.

**Methods:** From May 2014 to February 2017, four children (2 boys and 2 girls, age: 4-12 years) with repeated hemafecia and one newborn (girl, 10 days old) with jaundice were diagnosed as type II Abernethy malformation by abdominal ultrasound and computed tomography (CT). A total ligation of portosystemic shunt was performed in three children. Two children with a severe dysplasia of portal vein underwent Rex shunt with ligation of portosystemic shunt in two stages. All children were followed-up postoperatively.

**Results:** The operations were successful in all patients. The duration of operation ranged from 120 to 240 minutes (mean: 168 minutes). The extra-hepatic portal pressure increased after surgery, but the portal pressure was less than 24 cmH<sub>2</sub>O in all patients. The fecal blood loss and frequency of hemafecia decreased after surgery in four children with hemafecia. The total bilirubin normalized after surgery in the previously jaundiced child. The bypass vein was patent in two children undergoing Rex shunt as shown on postoperative ultrasound and CT. The caliber of portal vein was enlarged after surgery in three children undergoing the total portosystemic ligation. No child developed splenomegaly, hypersplenism or esophageal gastric varices after surgery.

**Conclusion:** The surgical management of Abernethy type II malformation should be individualized. Rex shunt with ligation of portosystemic shunt in two stages is feasible and effective in patients with a severe dysplasia of portal vein.

## **QS058 DOES THE GLYPH VIDEO HEADSET IMPROVE LAPAROSCOPIC MOTOR SKILLS?** Semiu E Folaranmi, FRCS, MB, BS, BSc, Hons, Iain A Hennessey, FRCS, MBChB, MSc; Alder Hey Children's Hospital, Liverpool, UK

**Aim:** To quantitatively determine whether the Glyph video headset image improves laparoscopic performance compared to a 2D image and what effect it has on the learning curve, using a validated laparoscopic task and motion capture technology.

**Method:** A prospective study with two groups of participants: Novices(4) and Experts(4). Novices were defined as junior doctors with no prior laparoscopic experience. Experts were defined as surgical trainees or consultants with 50 or more independent laparoscopic cases.

Individuals within each group undertook a validated laparoscopic task on a box simulator, alternating between 2D and a Glyph video headset image until they had repeated the task 5 times with each imaging modality.

Using a dedicated motion capture camera, data collected included time taken to complete the task(s), instrument distance travelled(m), average speed(mm/s), average acceleration (mm/s<sup>2</sup>), average motion smoothness (mm/s<sup>3</sup>), percentage off screen and handedness.

A paired t-test was used to compare the performance on a 2D vs the Glyph video headset within each group. An unpaired t-test was used to compare the performance between the two groups on the Glyph video headset image.

**Results:** Among the novices the mean time taken to perform the task on the Glyph video headset image was significantly quicker compared to the 2D image, 87.5s (63.7-109.8, 95% CI) vs 136.1s (101.8-170.5, 95% CI),  $P = 0.0086$ .

# Quickshots Abstracts

Among the experts the mean task time was quicker with the Glyph video headset image but did not reach statistical significance, 79.8s (49.7-110.0, 95% CI) vs 98s (64.5-131.5, 95% CI),  $p = 0.0531$ .

There was no significant difference in the mean time it took a novice to perform the task using the Glyph video headset compared to an expert using the same imaging modality, 87.5s (63.7-109.8, 95% CI) vs 79.8s (49.7-110.0, 95% CI),  $p = 0.3530$ .

**Conclusion:** The use of the Glyph video headset image confers a significant performance advantage over a 2D camera in quantitatively measured laparoscopic skills for novices but not for experts. The use of the Glyph video headset image appears to improve a novices performance to the extent that it is not statistically different from an expert.

**QS059 SIMULTANEOUS DUAL MINILAPAROSCOPY IN PYGOPAGUS TWINS WITH CROSS CIRCULATION** Danny Lascano, MD<sup>1</sup>, J P Sara, MD<sup>1</sup>, Sam Barst, MD<sup>1</sup>, Whitney McBride, MD<sup>2</sup>, Samir Pandya, MD<sup>3</sup>; <sup>1</sup>New York Medical College, <sup>2</sup>Eastern Maine Medical Center, <sup>3</sup>UT Southwestern

**Background:** Conjoined twins occur in approximately 1:200,000 live births and are classified according to the site of union with pygopagus representing approximately 19%. In addition to shared viscera, pygopagus twins may also have cross-circulation though shared vasculature. Although helpful, non-invasive imaging modalities may not be always completely delineate the internal anatomy.

**Methods and Materials:** We present a case of a 9-month-old pygopagus twins who underwent simultaneous dual laparoscopy for diagnostic purposes. Each infant had it's own anesthetic and surgical team with independent physiologic monitoring. Mini-laparoscopic (3mm) equipment was utilized with insufflation pressures of 12mm starting in the bigger twin (Twin A) followed by insufflation of the smaller twin (Twin B). Subsequently simultaneous diagnostic laparoscopy was performed in both twins and the internal anatomy further delineated.

**Results:** Induction of capoperitoneum in Twin A resulted in appropriate physiologic responses with rises in end tidal CO<sub>2</sub> (ETCO<sub>2</sub>), heart rate, blood pressure and mean arterial pressure (MAP). Of note, twin B also demonstrated a significant rise in the ETCO<sub>2</sub> prior induction of capnoperitoneum in that infant during insufflation of Twin A but prior to insufflation in her own peritoneum. Subsequent simultaneous capnoinsufflation was well tolerated by both twins with and permissive hypercapnea to 50 tolerated without adverse effects immediately and as of 10 months postoperatively.

**Conclusions:** Although careful hemodynamic monitoring is required, simultaneous dual-laparoscopy can be performed in pygopagus conjoined twins with cross circulation.

**QS060 TRANSUMBILICAL LAPAROSCOPIC ASSISTED SINGLE PORT APPENDECTOMY A SYSTEMATIC REVIEW AND META-ANALYSIS** Raghavendra Rao, Sophia Abdulhai, Todd Ponsky; Akron Children Hospital

**Introduction:** The transumbilical laparoscopic assisted appendectomy (Single port appendectomy (SPA)) was recently introduced for its relative technical ease and possible cost savings. However, there is no consensus on its outcomes relative to the traditional 3 port appendectomy (TPA). The goal of this study is to compare the outcomes of the SPA and TPA. While several systematic reviews exist comparing single port and 3 port appendectomies, all of these have inappropriately included techniques where the appendix was dissected/transected intra or extracorporeally.

**Methods:** A Pubmed search was performed for transumbilical one port appendectomies and single incision appendectomies. Initial search retrieved 408 studies and 37 studies were included for meta-analysis (including 28 pediatric and 9 adult studies). Of these, 13 studies compared the SPA with TPA (10) and open (3) appendectomies (OA) head to head. We retrieved data regarding conversions, complications, duration of surgery, demographics of the patient, and the severity of appendicitis (i.e. phlegmonous or perforated appendicitis). Fixed effects model was used for meta-analysis, and  $p < 0.05$  was considered statistically significant. R software was used for analysis.

# Quickshots Abstracts

**Results:** The studies contained a total of 6053 SPAs, 1437 TPAs and 275 OAs. The overall complication rate for SPA and TPA were 7.6 and 7.9% respectively (p=NS) and that for the pediatric studies were 7.6 and 7.6% respectively (p=NS). On Fixed effects model meta-analysis, the complication rate of SPA was not statistically different from TPA although was trending to be less with SPA (RR (Risk Ratio) 0.76 [0.56; 1.03], p=0.07, I<sup>2</sup>=40.8%). A similar result was seen with complications in pediatric studies (RR 0.67 [0.43; 1.05] p=0.08, I<sup>2</sup>=55.2%). The pooled rate of open conversion of SPA was 6.5% and that of TPA was 3.2% (p<0.001) but the event rates were not sufficient to do a head to head comparison using meta-analysis. The SPA also had a higher open conversion rate in the pediatric population (7 vs 0.5%, p<0.001). The overall rate of adding one or more trocars in the SPA group was 4.7% and that in the pediatric population was 4.3%. Less severe appendicitis was more often approached by SPA (RR 0.78 [0.68; 0.89] p<0.001, I<sup>2</sup>=84.8%). Metaregression showed that severity of appendicitis was not related to complication rates in all studies and in the pediatric studies. Abscess rates and rates of wound infection respectively were not different between the two procedures in all patients (RR 0.67, p=0.2; 0.87, p=0.57) and in the pediatric population (RR 0.83, p=0.62; RR 0.83, p=0.54).

**Conclusions:** SPA has a similar complication rate compared to TPA. Less severe appendicitis tends to be approached through SPA. Although formal meta-analysis was not able to be performed, conversion rates of SPA were higher overall. It is not clear as to why the conversion to open with SPAs were high. It is possible that these surgeons were not adept at laparoscopy and hence converted to OA instead. Further controlled studies are needed to confirm this current best evidence.

**QS061 THE ROLE OF LAPAROSCOPIC BIOPSY IN THE DIAGNOSTICS AND TREATMENT OF CHRONIC LIVER DISEASES IN CHILDREN** Polina V Khrolenko, Elena Y Dyakonova, Maksim M Lokhmatov, Andrey N Surkov, Alexsey A Gusev, Tatyana A Prudnikova, Kirill K Kulikov, Aleksandr S Bekin, Ekanerina A Romanova; Federal State Autonomous Institution National Medical Research Center of Children's Health of the Ministry of Health of the Russian Federation.

**Introduction:** In most cases in order to assess pathological changes regardless of the various chronic liver diseases etiology in children require morphological study. Puncture liver biopsy is the main method of obtaining material for histomorphological studies, but in some cases it is complicated by bleeding, traumatization of the bile ducts and insufficiently informative biopsy samples. Laparoscopic liver biopsy is an alternative method of a biopsy material sampling.

**Aim:** The aim of this study is to substantiate the advisability, efficiency and safety of laparoscopic liver biopsy in children.

**Materials and methods:** The study included 30 children aged 2 to 17 who were treated at our center between 2015 and 2016, with the following nosological entities: primary sclerosing cholangitis - 8, autoimmune hepatitis - 7, viral hepatitis (5 – HHV6, 3 - HCV, 1 - HBV, 1 - CMV), drug-induced hepatitis - 1, congenital fibrosis of the liver - 1, Wilson's disease - 2, glycogen storage disease – 1).

Indications for liver biopsy were:

- diagnosis establishing or specification
- process activity evaluation of viral diseases
- autoimmune diseases therapy effectiveness evaluation for the purpose of therapy cessation.

**Results:** All children underwent diagnostic laparoscopy with abdominal and pelvic organs examination, evaluation of the macroscopic picture (liver size, parenchyma structure changes). Further was performed wedge liver resection, with a biopsy specimen 1.5 x 2cm, which allowed sending biopsy material to various studies (virology, metabolic disturbances, morphological and histochemical studies).

The average operative intervention time was 25 minutes. Postoperative pain syndrome - 12 to 36 hours. There are no complications in the early and late postoperative periods. Biopsy material information value was 100%.

# Quickshots Abstracts

**Conclusions:** Laparoscopic biopsy allows to objectify the parenchyma state, evaluate abdominal cavity and pelvic organs condition, take a biopsy from the most modified areas, perform hemostasis under direct vision, increase information value up to 100 percent.

So, the laparoscopic liver biopsy is safe and highly informative and can be used in children with various liver pathologies.

**QV062 SINGLE SITE LAPAROSCOPIC COMPLETION PROCTECTOMY USING A MAGNETIC SURGICAL SYSTEM** Anthony L DeRoss, MD, Meagan M Costedio, MD; Cleveland Clinic

The field of minimally invasive surgery continues to push the envelope for making surgery less traumatic for patients. The associated decrease in post-operative pain levels and recovery times for patients using minimally invasive techniques has been well-described. One additional advantage to minimally invasive surgery of particular benefit to pediatric patients is the improvement in cosmetic outcome. Single incision platforms provide access for a limited number of instruments. The use of extracorporeal magnets to control intracorporeal instruments provides a much higher degree of surgical control without additional incisions. Further, magnetically-controlled instruments increase the directions in which vectors of retraction can be oriented, providing exposure with angles not achieved in traditional minimally invasive techniques. This video illustrates the use of a magnetic surgical system (Levita Magnetics, San Mateo, CA) for additional retraction during a single-site completion proctectomy and ileal pouch anal anastomosis in a pediatric patient with ulcerative colitis.

**QV063 TOTALLY LAPAROSCOPIC PARTIAL SPLENECTOMY IN CHILD WITH HAMARTOMA** Diego Biondini, MD<sup>1</sup>, Francesco Serra, MD<sup>2</sup>, Francesca Cabry, MD<sup>2</sup>, Lorena Sorrentino<sup>2</sup>, Roberta Gelmini, MD<sup>2</sup>, Pler Luca Ceccarelli, MD<sup>1</sup>; <sup>1</sup>Policlinico of Modena, Pediatric surgery Unit, <sup>2</sup>Policlinico of Modena, University of Modena e Reggio Emilia, Dep. of General Surgery

To date laparoscopic surgery plays a key role in the surgical treatment of splenic hematologic pathologies, but also of solid pathologies such as benign and malignant tumors.

Hamartoma, described for the first time by Rokitansky in 1861, is a rare disease, few cases are described in the literature, and only twenty percent of them are of pediatric relevance.

In children it may be associated with other morbid conditions such as sickle cell disease or other haematological alterations.

In July 2017 a 7-year-old child presented at the pediatric ER for lumbar pain and fever; Abdominal ultrasound showed a single solid lesion of 5.5 cm x 6.5 cm with rounded morphology, net margins, and occupying the third middle of the spleen. RMI was performed to better investigate the lesion.

Evaluated the age of the patient and the affected spleen portion, it is proposed to perform a laparoscopic partial splenectomy. Before surgery the patient was subjected to chemoembolization of the upper pole of the spleen to minimize intraoperative blood loss. The post-operative course was devoid of complications, refeeding was obtained in first day after surgery, good pain control obtained with common pain relievers.

The proper integration between radiologists, pediatricians and surgeons has allowed the correct management of a pediatric patient suffering from a rare disease.

Partial laparoscopic splenectomy can be considered a safe, effective and reproducible alternative in these patients suffering from benign solid disease, safeguarding the haematological functions of the organ itself.



# Quickshots Abstracts

**QV064 UTILIZING THE TAPP REPAIR IN ADOLESCENTS: A REVIEW OF LITERATURE AND CASE-SERIES PRESENTATION** [Jacob D Campbell, DO, MPH<sup>1</sup>](#), [Meghna Misra, MD, MS, FACS<sup>2</sup>](#), [Chike Chukwumah, MD, FACS<sup>3</sup>](#), [Shefali Thaker, MPH<sup>2</sup>](#), [Christine Rader, MD, FACS<sup>2</sup>](#); <sup>1</sup>University of Connecticut, <sup>2</sup>Connecticut Children's Medical Center, <sup>3</sup>Hartford Hospital

**Introduction:** Hernia repair is one of the most common surgeries performed by adult general and pediatric surgeons, alike, with annual pediatric incidence between 0.8%-4.4%, and up to 30% in premature infants. Traditional teaching for pediatric surgeons' management of inguinal hernia remains high ligation. However, the management of adolescent inguinal hernias seems to be a particularly grey area. When surveyed, general surgeons choose an adult-type meshed based repair, while pediatric surgeons will choose a pediatric-type repair when given the same, hypothetical patient. Published recurrence rates following high ligation are reported to range between 0.95% - 8.4%, with one cohort followed for up to 52 years. With the introduction of laparoscopic techniques along with the evolution of biodegradable mesh implants, more data is needed to provide the best evidenced-based care for this special patient population.

**Method(s):** We performed a retrospective review of four cases of laparoscopic trans-abdominal pre-peritoneal (TAPP) inguinal hernia repair with mesh.

**Surgical Technique:** After induction of general anesthesia and appropriate surgical site cleansing, a periumbilical incision is made. A Veress needle is inserted in a small incision in the umbilicus and pneumoperitoneum is achieved. A 12mm laparoscope is then inserted. After inspection of the abdomen and identification of the hernia, two additional 5mm trochars are inserted under direct visualization. A small incision in the peritoneum is made 2cm cephalad to the patent processus vaginalis. Dissection is carried out laterally to the ASIS and medially and inferiorly to Cooper's ligament. The hernia sac is dissected off the cord structures. An appropriate size and side mesh is then inserted through a 5mm port and secured with tacks in cooper's ligament medially and the anterior abdominal wall laterally. The peritoneum is then replaced and tacked to close the pre-peritoneal space. The umbilical incision is closed with a single 0 vicryl figure-of-8 suture. The camera is then reinserted into the 5mm trochar and a final inspection of the abdomen is performed. The remaining ports are removed and pneumoperitoneum is released. The 5mm port incisions are closed with 5-0 monocryl sutures.

**Results:** We performed 4 separate surgeries on 3 male patients. One had large, chronic bilateral hernias, and it was decided to perform hernia repair at two separate operations; while the other two had right-sided inguinal hernias. Average follow-up period is 8 months (3.5 – 11 months). Average age of the patients at the time of surgery was 16.25 years (15-17 years) with an average BMI of 21.2 kg/m<sup>2</sup> (17-23.8). Operating time was 105 minutes (59-174 minutes). Two of the patients left the hospital the day of surgery, while one patient stayed overnight for observation due to co-morbidities. There has been no post-operative wound infections, recurrences, nor readmissions.

**Conclusion:** Our series of patients suggests that TAPP repair for inguinal hernias is feasible for pediatric patients. We have had no reported complications, the procedure remains an outpatient procedure, and the operative time is not prohibitive. More data will need to be collected in a prospective, randomized fashion, but our early experience is promising.

**QV065 LAPAROSCOPIC SPLENIC-SPARING DISTAL PANCREATECTOMY FOR PANCREATIC TRANSECTION** [Melissa D Kanack, MD<sup>1</sup>](#), [Nam Nguyen, MD<sup>2</sup>](#); <sup>1</sup>University of California, Irvine, <sup>2</sup>Miller Children's and Women's Hospital, Long Beach and University of California, Irvine

**Introduction:** Pancreatic injury is a rare occurrence in pediatric trauma, with blunt pancreatic trauma reported in only 0.3% of cases. Both operative and conservative management strategies have been described for management of complete pancreatic transection. We present a laparoscopic splenic-sparing distal pancreatectomy.

**Patient and Method:** The patient is a 5-year-old male who sustained a mid-pancreatic transection from an auto versus pedestrian trauma. He was noted on imaging to have a complete transection of his distal pancreas. The procedure was performed using a four 5-mm trocar technique, one at the umbilicus for the camera, one on each side of the umbilicus, just lateral to the mid-clavicular lines, and one at the left subcostal area with the patient in split leg position. To expose the pancreas, first the lesser sac was entered by dividing the gastrocolic ligament using electric cautery. Two 2.0 Prolene® transabdominal sutures were placed, anchoring the posterior aspect of the stomach to maximize exposure of the operative field. A splenic sparing distal pancreatectomy was formed using mainly hook electric cautery. The duct was secured with an endo-GIA stapler.

# Quickshots Abstracts

**Results:** The patient did well and was discharged home on post-operative day 9. Subsequently, he was readmitted with fevers and was found to have two fluid collections in the pancreatic bed concerning for an infected pseudocyst. He was started on antibiotics and underwent CT guided percutaneous drain placement with a culture that grew *S. aureus*. His fevers resolved and he was discharged. He has been seen in clinic and is doing well.

**Conclusions:** Laparoscopic approach is a safe and feasible option for management of children with pancreatic transection.

**QV066 MINIMALLY INVASIVE TREATMENT FOR COMPLICATED GASTRIC DUPLICATION.** Fernando P Rabinovich, MD, Bignon Horacio, Gaston Bellia Munzon, Carolina Millan, Toselli Luzia, Soledad Valverde, Enrique Buela, Santiago Calello, Jorge Martinez, Juliana Rebollo, Veronica Salernou, Marcelo Martinez Ferro; Fundacion Hospitalaria - Salud Materno Juvenil

**Introduction:** Gastric duplication is a rare type of congenital abnormality with an incidence rate of 17 cases per million individuals. The manifestation of gastric duplication varies in children at different ages, and patients may present abdominal pain, vomiting, bloody stools, feeding difficulties or other nonspecific gastrointestinal symptoms. Most publication reported video-assisted or open procedures for complicated gastric duplication. In this video we described the diagnosed and treatment of a complicated gastric duplication approached laparoscopically.

**Material and Methods:** One Year old female presents Bilious vomiting, abdominal pain and fever that persisted for two days. Epigastric mass is palpated. X-ray and ultrasound are performed identifying a heterogeneous tumor located between the anterior face of the pancreas and the posterior face of the stomach. A CT scan is performed confirming the lesion and a laparoscopic approach is decided.

**Surgical findings:** tight adhesion process is found in left upper quadrant. Enterolysis is performed using blunt and sharp maneuvers, hook and bipolar cautery. A palpable tumor is identified at the expense of the posterior wall of the stomach. Dissection is carried out and an abscess is found and drained. The tumor is completely removed. The lesion is placed in an endobag and extracted through the umbilical port by small enlargement of the incision.

**Results:** There were no complications during surgery nor post-operative. Oral feeding starts postoperative day 2 and was discharged day 5. The preoperative symptoms disappeared completely, and the growth and development of the child was normal.

**Conclusion:** Gastric duplication is an unusual pathology. Laparoscopic approach appears to be suitable choice even in complicated presentations.

**QV067 SUCCESSFUL LAPAROSCOPIC DISTAL PANCREATECTOMY FOR A HUGE SOLID PSEUDO-PAPILLARY NEOPLASM WITH SPLEEN AND VESSEL PRESERVATION IN AN 11-YEAR-OLD GIRL - A CASE REPORT** Toshio Harumatsu, MD, Yuto Nonaka, MD, Keisuke Yano, MD, Motoi Mukai, MD, PhD, Takafumi Kawano, MD, PhD, Masato Kawano, MD, Shun Onishi, MD, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, MD, Sero Machigashira, MD, Kazuhiko Nakame, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

**Background:** Solid pseudo-papillary neoplasms of the pancreas are rare in pediatric patients. Recently, there have been reports of laparoscopic approaches to the treatment of pseudo-papillary neoplasms of the pancreas, including tumor enucleation, distal pancreatectomy and pancreatoduodenectomy. We herein report a case in which laparoscopic distal pancreatectomy with spleen and vessel preservation was successfully performed to treat a pediatric patient with a huge solid pseudo-papillary neoplasm.

**Patients and Methods:** The patient was an 11-year-old girl in whom proteinuria was detected in a routine checkup at her school. A left upper abdominal tumor was incidentally detected by ultrasonography, and enhanced computed tomography. The 8 cm tumor was solid and had originated from the pancreas. The patient was transferred to our hospital. Magnetic resonance imaging revealed an area of high intensity on T1 imaging. A solid pseudo-papillary neoplasm was suspected based on the imaging findings.

# Quickshots Abstracts

**The Operative Findings and Procedure:** Under general anesthesia, the patient was placed in a right semi-lateral position, and a 10-mm 30° laparoscope was inserted through an umbilical incision using the open 12-mm Hasson trocar method. The huge tumor was easily recognized in the left upper abdomen. Three additional 5-mm trocars were inserted in the right upper abdomen (operator's left hand), left side of the umbilicus (operator's right hand) and the left lateral abdomen (assistant). The bursa omentalis was opened using the vessel sealing system, and the tumor was confirmed to have originated from the pancreatic tail. The tumor was located 3 cm laterally from the superior mesenteric vein. Thus, transection of pancreatic body was feasible for tumor resection. In order to expose the whole tumor, the gastrosplenic ligament was divided using the vessel sealing system. The retroperitoneum was incised at the inferior border of the pancreatic body. The posterior surface of pancreatic body was carefully dissected with coagulating small branch vessels. The drainage vein of the tumor, which was connected to the splenic tail vein, was ligated using a clip, and divided. The splenic vein was detected and confirmed after tunneling dissection of the pancreatic body. Tiny veins from the splenic vein were coagulated and divided using the vessel sealing system. The retroperitoneum was incised between the superior border of the pancreatic body and splenic vein. The taping of the pancreatic body was performed. The pancreatic body was carefully stapled using a linear stapler and transected without injuring the splenic vessels. The stump of pancreatic body was confirmed to be stapled. The transected distal pancreas was dissected along the splenic vein. The feeding vessel from the splenic artery were also coagulated and divided using the vessel sealing system. The tumor was extracted through a 6-cm Pfannenstiel incision.

**Results and Conclusion:** There were no intraoperative or postoperative complications. Pancreatic fistula was not observed. The postoperative course was uneventful. In the present case laparoscopic distal pancreatectomy with spleen and vessel preservation was a safe and feasible approach to the treatment of a pediatric patient with a huge solid pseudo-papillary neoplasm

**QV068 INEXPENSIVE AND NOVEL METHOD FOR LAPAROSCOPIC PYLOROMYOTOMY IN THE DEVELOPING WORLD** Ziad Bataineh, MD<sup>1</sup>, Pradeep Johns<sup>2</sup>, Nathan M Novotny, MD<sup>3</sup>; <sup>1</sup>Jordan University of Science and Technology, <sup>2</sup>Michigan State University School of Medicine, <sup>3</sup>Jordan University of Science and Technology and Beaumont Children's

**Background:** Since the loss of the protected arthrotomy knife several years ago pediatric surgeons have struggled to find a safe, reliable, and inexpensive way to incise the pyloric serosa prior to spreading the muscle. Working in a resource limited setting, we introduce a novel technique of incising the serosa with a percutaneously inserted needle.

**Methods:** In this case series we describe the experience of a single surgeon with a novel technique of incising the serosa. A retrospective review of consecutive cases. The incision involves using an 18 gauge needle percutaneously inserted and using the tip of the needle to cut the serosa and hypertrophied muscle fibers.

**Results:** Six consecutive patients underwent this technique. There were no conversions to open. Additionally, there were no perforations and no complications related to the alteration in technique.

**Conclusions:** While many manufacturers pursue both disposable and non-disposable solutions to this problem, we believe this is a safe, reliable, and very inexpensive solution that is applicable in any resource setting.

**QV069 THORACOSCOPIC POSTERIOR TRACHEOPEXY** Lindel Dewberry, MD<sup>1</sup>, Raphael Vuille-Dit-Bille, MD<sup>2</sup>, David Mong, MD<sup>2</sup>, Melissa Masaracchia, MD<sup>2</sup>, Jeremy D Prager, MD<sup>2</sup>, Todd Wine, MD<sup>2</sup>, Norah Janosy, MD<sup>2</sup>, Stig Somme, MD<sup>2</sup>; <sup>1</sup>University of Colorado, Department of Surgery, <sup>2</sup>Children's Hospital Colorado

Tracheomalacia refers to collapsibility of the posterior trachea commonly associated with esophageal atresia and tracheoesophageal fistula. There is a wide range of symptomology from mild expiratory stridor to severe respiratory distress. Depending on the severity of tracheomalacia, treatment can include supportive therapy with hypertonic saline nebulizers, inhaled steroids, and respiratory therapy, or it may require surgical intervention. We will focus on tracheobronchopexy or posterior tracheopexy, which is a relatively new procedure. It involves stenting open the trachea through the attachment of the posterior trachea to the anterior longitudinal spinal ligament.

# Quickshots Abstracts

A 3-year-old female presented with severe tracheomalacia. She had an extensive medical history including chromosomal deletion syndrome, cystic lung disease, subglottic stenosis, bilateral vocal cord paralysis, obstructive sleep apnea, eosinophilic esophagitis, and GERD. She underwent extensive evaluation in a multidisciplinary clinic, which included longitudinal flexible and rigid bronchoscopy, swallow study, sleep study, and CT scan.

The CT scan demonstrated no evidence of vascular compression of the trachea and demonstrated tracheomalacia in the midtrachea with narrowing of the AP diameter of the trachea at the level of the brachiocephalic artery with expiratory imaging. The rigid bronchoscopy demonstrated severe tracheomalacia. The patient was brought to the operating room, placed under general anesthesia, and positioned for a right thoracoscopic procedure. Three, 5mm step trocars were placed, insufflated to a pressure of 5 mmHg, and flow was set to 1 l/min. The esophagus was identified with a 16 Fr OG tube placed by anesthesia. The anterior spine was dissected free of loose connective tissue. A plane was developed between the esophagus and the trachea. The Vagus nerve was identified and preserved. The anterior spine was dissected free of loose connective tissue. The posterior membranous portion of trachea was dissected free of connective tissue. With bronchoscopic guidance, three stitches were placed into the posterior membranous trachea and attached to the anterior spinal ligament. The three stitches were placed between the thoracic inlet and the carina. Hemostasis was ensured. A 12 Fr Chest tube was placed under direct visualization. The incisions were closed with monocryl and the chest tube was secured. It is important to pay close attention not to go full-thickness on the tracheal side. Also, make sure the suture is tightened until there was just enough tension to keep trachea from collapsing.

## **QV070 A NOVEL APPROACH TO LAPAROSCOPIC MORGAGNI HERNIA REPAIR ON AN INFANT USING PERCUTANEOUS SUTURING TECHNIQUE** Rachel E Hanke, MD, Nathan T Froelich, BS, Anthony Y Tsai, MD; Penn State Health Milton S. Hershey Medical Center

Morgagni Hernias (MH) are anterior retrosternal diaphragmatic defects that make up 2-4% of all congenital diaphragmatic hernias, wherein abdominal viscera can herniate into the thoracic cavity. Treatment involves surgical repair of the diaphragmatic defect due to the risk of incarceration.<sup>1</sup> Historically, all repairs were performed through open surgery; however, minimally invasive techniques are becoming more widely practiced via either an abdominal or thoracic approach.<sup>1-3</sup> The principles of the repair involve reduction of hernia sac contents, possible resection of the sac, and closure of the defect. Closure of the defect is often completed using interrupted intracorporeal sutures. However, completing this repair via laparoscopic and thoracoscopic approach can be technically challenging given the angle of the field of view.

We present a novel laparoscopic approach with percutaneous suturing that allows for a precise and efficient way of Morgagni hernia repair. This is a 12-month-old male born at 37 weeks gestation with prenatally diagnosed gastroschisis who was found to have suspicion for MH on routine imaging post gastroschisis repair. He subsequently underwent focused CT scan that confirmed MH, without evidence of incarcerated intra-abdominal contents. A laparoscopic repair was performed using three trocars to identify and resect the hernia sac with electrocautery. Subsequently, the diaphragmatic defect was repaired using the seesaw subcutaneous suturing technique, first described by Harrison et al. for endoscopically assisted inguinal hernia repair, along the abdominal wall.<sup>4</sup> The procedure was completed in 54 minutes. The patient tolerated the procedure well, and was discharged on post-operative day one. Follow up chest radiograph at five months showed no hernia recurrence, and he remains symptom-free. Laparoscopic repair of MH with percutaneous suturing is a novel approach that allows for safe, expeditious, and precise repair of a traditionally challenging procedure in small children.

## **QV071 FINGER DISSECTION NUSS BAR PLACEMENT: A THORACOSCOPIC VIEW** Cristine S Velazco, MD, MS<sup>1</sup>, Erin M Garvey, MD<sup>2</sup>, Daniel J Ostlie, MD<sup>2</sup>, Justin Lee, MD<sup>2</sup>; <sup>1</sup>Mayo Clinic, <sup>2</sup>Phoenix Children's Hospital

### **Background**

Pectus excavatum is the most common congenital chest wall deformity. The Nuss procedure is commonly performed to correct pectus excavatum in a minimally invasive approach. Thoracoscopy is often used to perform the procedure, allowing the surgeon to dissect and place Nuss bars under direct visualization. Alternatively, the bars can be safely placed without thoracoscopy using blind blunt finger dissection. We present finger dissection technique during Nuss procedure as visualized via thoracoscopy.

# Quickshots Abstracts

## Surgical method

The patient was taken to the operating room for a Nuss procedure. Bilateral transverse skin and subcutaneous pockets were created at the anterior axillary line and extended posteriorly. A 5-mm thoracoscopy port was introduced through the right chest wall incision. A subxiphoid incision was made to allow for finger dissection of the retrosternal space.

After carrying out sufficient dissection of the retrosternal space, separating the pericardium from the posterior aspect of the sternum, the intercostal space which had been chosen to position the bar in was palpated using the surgeon's finger through the subxiphoid incision. The bar passer was introduced into the ipsilateral thoracic space and brought out of the subxiphoid incision, with finger protection and guidance. This process was then repeated on the contralateral side. The bar was then delivered through this space and inverted providing repair of the chest wall deformity. A bar stabilizer bar was placed on each side and the bar was secured with FiberWire®. The lung was reinflated using positive pressure ventilation while the port was removed and a rubber catheter drained the thoracic space. The deep subcutaneous tissues and skin were reapproximated.

## Conclusion

Blunt finger dissection is a safe alternative to thoracoscopic guidance of Nuss bar placement for pectus excavatum. The finger dissection allows for not only minimal mediastinal dissection but also protection of the heart and palpable guidance of the bar passer and the bar placement. By avoiding thoracoscopy, operating room expense is reduced.

**QV072 LAPAROSCOPIC GRAHAM PATCH REPAIR FOR PERFORATED DUODENAL ULCER** Armando Salim Munoz Abraham, MD, MBEE, Hector Osei, MD, Saurabh Saxena, MD, Rachele Damle, MD, MS, Clint Cappiello, MD, Gustavo Villalona, MD, FACS, FAAP; Saint Louis University

**Introduction:** Demonstrate our technique for laparoscopic omental patch repair for perforated duodenal ulcer in a pediatric patient with unsupervised NSAID use

**Methods:** 16 year old Male with history of right humerus fracture following a motor vehicle accident, who presented to another institution with severe abdominal pain and vomiting. Father reported unsupervised ibuprofen use for 2 months after the accident. At the outside hospital, blood work showed a leukocytosis of 23,000 and computed tomography of the abdomen demonstrated free intraabdominal air. After transfer to our institution, physical exam demonstrated right lower quadrant tenderness with guarding and rigidity. At this point our differential diagnoses included ruptured appendicitis versus bowel perforation. A decision was made to proceed with diagnostic laparoscopy.

**Results:** Upon accessing the abdomen, generalized purulent peritonitis was noted. The cecum and appendix had some inflammation. The appendix was stapled and removed. Then, upon further inspection of the upper abdomen, we identified bilious fluid, and a perforated anterior duodenal ulcer about 5 mm. A Graham patch repair approach was performed after this finding. We placed one figure-of-eight 3-0 vicryl suture to approximate the edges of the perforated ulcer. This was followed by placing a pedicle of omentum without tension over the partially closed ulcer. This was sutured in place with 5 interrupted 3-0 silk intracorporeal sutures. Finally, a closed suction drain through the right upper quadrant port site was placed anterior to the repair. The patient recovered appropriately, and was discharged home 5 days after the procedure

**Conclusion:** Diagnostic laparoscopy is an important diagnostic and therapeutic tool in pediatric patients with acute abdomen transferred from other institutions where prior imaging might not be available. This case demonstrated the presence of a perforated duodenal ulcer, that was successfully repaired with laparoscopic graham patch placement.

# Quickshots Abstracts

## **QV073 LAPAROSCOPIC REDO SURGERY FOR CHOLEDOCHAL CYST WITH CONVERSION OF HEPATICO-DUODENOSTOMY TO HEPATICO-JEJUNOSTOMY** Tran N Son, PhD, Pham D Hiep, Nguyen T Hong Van, Hoang V Bao; Saint Paul Hospital

Laparoscopic redo surgery for late complication after primary surgery for choledochal cyst (ChC) is technically demanding. A case of laparoscopic redo surgery for late anastomotic stenosis of hepatico-duodenostomy is presented. In this case, laparoscopic conversion of hepatico-duodenostomy to hepatico-jejunostomy was performed. This is a 12 year-old girl who had ChC type I and underwent laparoscopic excision of ChC and hepatico-duodenostomy ten years ago. She was asymptomatic till 2015, when she suffered from cholangitis and was successfully treated with antibiotics. In 2017 she had 2 more episodes of cholangitis and was referred to our hospital. Ultrasound showed portal and intrahepatic biliary dilatation with biliary sludge and stones. Preoperative MRI demonstrated severe anastomotic stenosis. Percutaneous transhepatic cholangiography was performed with unsuccessful attempt for balloon dilatation of the anastomosis. The patient then underwent laparoscopic redo surgery. We used 4 ports as the first operation. Laparoscopic exploration showed dense adhesion around the porta hepatic. Careful dissection using scissors, electrocautery was performed to expose the hepatico-duodenal anastomosis. After division the stenotic anastomosis, the duodenal side of the anastomosis was closed by interrupted suture in two layers. Saline irrigation was performed to clear the intrahepatic biliary sludge and stones. The Roux en Y jejunal loop was created extracorporally via umbilical incision and was brought up to the hepatic hilum in retrocolic route. Ductoplasty was performed as the hepatic duct is slit in 12 o'clock position for maximal widening the anastomosis. The hepatico-jejunal anastomosis was performed with running 5.0 PDS suture. Blood loss was minimal. Operative duration was 210 minutes. Patient recovered uneventfully after the operation: started oral feeding on POD 3 and was discharged on POD 5. The patient is currently asymptomatic, with normal liver functional tests, and ultrasound showed no intrahepatic biliary dilatation.

## **QS074 THE UTILITY OF MUSCLE-SPARING AXILLAR SKIN CREASE INCISION WITH THORACOSCOPIC SURGERY IN CHILDREN** Ryota Souzaki, MD<sup>1</sup>, Naonori M Kawakubo, MD<sup>1</sup>, Kina Miyoshi, MD<sup>1</sup>, Satoshi Obata, MD<sup>1</sup>, Yoshiaki Kinoshita, MD<sup>1</sup>, Junkichi Takemoto, MD<sup>2</sup>, Kenichi Kohashi, MD<sup>2</sup>, Yoshinao Oda, MD<sup>2</sup>, Tomoaki Taguchi, MD<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan, <sup>2</sup>Department of Anatomic Pathology, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

**Background:** Thoracoscopic surgery for pediatric benign tumors is a common procedure. However, a large incision is needed to remove large tumors from the thoracic cavity. And, for intrapulmonary sequestration in lower lobe, it sometimes need to large incision to ligate the aberrant vessels. A muscle-sparing axillar skin crease incision (MSASCI) has been introduced for thoracic open surgery, resulting in excellent aesthetic outcomes compared with a standard incision. As for the method of MSASCI technique, a skin incision was made just on the axillar skin crease and the anterior serratus muscle was split along its fibers through the intercostal space. The thoracic cavity was entered through the ICS. We herein report the utility of this MSASCI technique in thoracoscopic surgery to remove huge tumors from the thoracic cavity and to ligate the aberrant vessels in intrapulmonary sequestration in lower lobe.

From 2014 April to 2016 March, we performed the MSASCI technique in thoracoscopic surgeries for five children. This study was approved by the Ethics Committee in of our institution.

The five cases were diagnosed as mediastinal masses (mature teratoma, ganglioneuroblastoma for two cases, extrapulmonary sequestration) and intrapulmonary sequestration. The age at surgery,  $32.0 \pm 25.0$  month (5-58 month). The size of the mediastinal mass was  $9 \times 5 \times 5$  cm,  $4 \times 3 \times 3$  cm,  $5 \times 5 \times 2.5$  cm,  $3 \times 2.5 \times 2$  cm. For intrapulmonary sequestration case, the aberrant vessels were resected under the thoracoscopic surgery using only two 5-mm and one 12-mm trocars and the left lower lobectomy was performed using MSASCI technique. For other 4 cases, the mass was resected under the thoracoscopic surgery using only three or four 5-mm trocars and the mass was removed from the thoracic cavity using the MSASCI technique. All lesions were resected completely. The operation time was  $200.4 \pm 78.1$  min. No cases have surgical complication and show recurrence, and all cases demonstrated good cosmetic outcomes.

**Conclusions:** Performing thoracoscopic surgery using a MSASCI is associated with a good cosmetic outcome. This technique is therefore expected to become one of the approach when performing thoracoscopic surgery for large thoracic benign tumors and intrapulmonary sequestration of lower lobe in children.

# Quickshots Abstracts

## **QS075 EFFECTS OF GREAT OMENTAL SUBTOTAL EXCISIONS ON PERITONEAL DIALYSIS IN CHILDREN WITH CHRONIC RENAL FAILURES** Bo Xiang; Department of Pediatric Surgery, West China Hospital, Sichuan University

**Purpose:** The great omentum plays an important role in substance exchanges and is also a major cause of tube occlusions during peritoneal dialysis. This study intended to investigate the effects of great omental subtotal excisions on peritoneal dialysis in children with chronic renal failures.

**Methods:** A total of 27 children with chronic renal failures who had received surgeries for peritoneal dialysis tube placements from Jan. 2014 to Dec. 2016 at West China medical center for children of Sichuan University were included in this research. From Jan. 2014 to Dec. 2015, 13 children of group I had received tube placement without omental excisions. 8 received bed-side tubings with regional anesthesia and 5 had laparoscopy-assisted tubings. From Jan. 2016 to Dec. 2016, 12 children of group II had placement of peritoneal dialysis tube laparoscopically with great omental subtotal excisions. Subtotal excision included resection of 70% of the total omentum with ultrasonic scalpel along stomach and transverse colon. The tube was placed in the rectovesical pouch. Point of 3-5cm above umbilicus at left lateral border of rectus abdominis and point of right lateral rectus abdominis below the umbilicus were used as fixing sites. Subcutaneous tunnel was used. Regular peritoneal dialysis had been initiated three days after surgery. Tube-associated complications, renal functions and improvements of general states were analyzed.

**Results:** Baseline characteristics of two groups including primary causes of renal failures, ages and degrees of renal failures did not differ significantly. Group I: Dialysis duration after surgery were  $11.45 \pm 2.19$  days. All patients experienced tube occlusions within 30 days. 77% (10 of 13) of them had second tube placements. The rate of wound infection and peritonitis were 31% and 15% respectively. Group II: All patients had been followed up for a median time of 7.8 months. There were no occurrence of tube occlusions and no second placement after great omental subtotal excisions. Wound infection rate was 8% (8 of 12). No peritonitis, abdominal organ injuries or incision hernias had been reported. A rapid decrease of serum creatinine levels had been noted in this group of children ( $729.4 \pm 49.5$  vs.  $438.7 \pm 41.9$ ). There were also improvements of systemic edema, appetite and general state of health of patients. Dialysis at home could effectively prevent severe end-stage renal failure.

**Conclusions:** Great omental subtotal excisions for children with chronic renal failures provided satisfactory clinical outcomes. This technique could effectively prevent tube-related complications for home dialysis.

## **QS076 OUTCOMES OF OSTOMY LOCATION IN CHILDREN: PLACEMENT OF THE OSTOMY AT THE UMBILICUS** Joseph Sujka, MD, Hanna Alemayehu, MD, Leo Andrew Benedict, MD, Justin Sobrino, MD, Shawn St. Peter, MD, Jason D Fraser, MD; Children's Mercy Hospital

**Purpose:** Intestinal diversion in the form of a cutaneous ostomy is a common procedure in children. It is performed most commonly when operating on conditions such as necrotizing enterocolitis (NEC). At our institution, the operative approach for many of these children has changed from a large transverse muscle splitting incision to a much smaller peri-umbilical incision with umbilical ostomy placement. The purpose of our study is to evaluate the short and long-term outcomes of children with ostomy placement at the umbilicus at the time of exploratory laparotomy.

**Methods:** Following IRB approval, a retrospective cohort study was conducted. Children that underwent an exploratory laparotomy with ostomy creation between January 2010 and September 2015 were included. Patients with ostomies were classified according to whether or not placement occurred at the umbilicus. Demographics, anthropometrics, presentation, diagnostic tests, time to initial and full feeding, post-operative complications and all short-term (<30 days) and long-term (>30 days) outcomes were collected. Comparative analysis was performed in STATA with a p value <.05 determined as significant.

**Results:** A total of 54 children were included, 37% (n=20) had stomas at the umbilicus. Of the remaining patients (63%, n=34), right lower quadrant was the most common stoma location. The mean age at the time of surgery was 19.35 days  $\pm$  17.5 for umbilical compared to 33.5 days  $\pm$  99.5 for the children with ostomies at other sites (p 0.51). NEC was the most common indication for surgery in both groups: 11 (55%) umbilical vs 10 (29%) other. This was followed by atresia 3 (15%) umbilical vs 8 (24%) other, perforation 3 (15%) umbilical vs 8 (24%) other, and obstruction 3 (15%) umbilical vs 7 (21%) other. Operative time did not differ significantly based on ostomy location (73.4 min  $\pm$  33.6 vs 87.3 min  $\pm$  75.7, p 0.44).

# Quickshots Abstracts

Days to stoma output was similar between the two groups, ( $5.4 \pm 6.4$  vs  $5.3 \pm 9.79$ ), however days to initiation of feeds was delayed in the umbilical ostomy group ( $20.9 \pm 18.89$  vs  $10.2 \pm 12.6$ ,  $p 0.02$ ).

When comparing only patients who had NEC, initiation of feeds was similar between groups,  $30.09 \pm 20.7$  vs  $25.5 \pm 28$ . ( $p 0.73$ ). Umbilical ostomies had an increase in ostomy appliance complications that neared statistical significance (8 vs 6,  $p 0.07$ ) as well as a statistically significantly increase in prolapse or peri-stomal hernias (7 vs 3,  $p 0.01$ ). No patient required operative intervention for their prolapse or peri-stomal hernia.

**Conclusions:** Placement of the ostomy at the umbilicus is safe and effective. Patients with umbilical ostomies had a similar time to stoma function compared to other sites but had a delay in initiation of oral feeds, likely secondary to a higher percentage of patients with NEC. They also showed an increased rate of appliance complications and rates of prolapse or peristomal hernias.

**QS077 MINIMIZING OPIOID EXPOSURE THROUGH UTILIZATION OF REGIONAL ANALGESIA IN CHILDREN UNDERGOING LAPAROSCOPIC INGUINAL HERNIA REPAIR** Michelle P Kallis, MD, Pratik Shah, BA, Amarinder Sidhu, MD, Caroline W Maloney, MD, Oonagh Dowling, PhD, Natalie Barnett, MD, Michelle Kars, MD, John Hagen, MD, Aaron M Lipskar, MD; Cohen Children's Medical Center

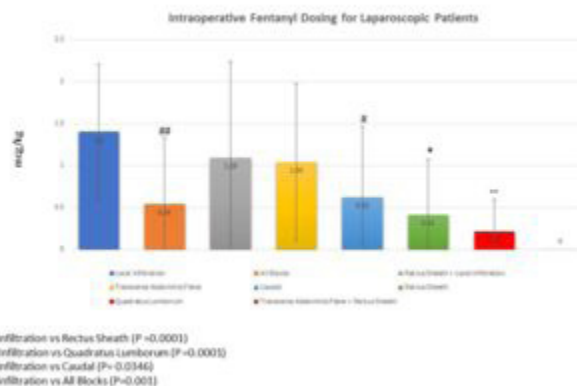
**Background:** Opioid analgesics are commonly used in both the operating room and immediate postoperative period. Opioids produce an array of adverse effects from nausea to respiratory depression, and the long-term effects of opioid exposure in children are poorly understood. Surgical and anesthetic techniques that reduce opioid utilization in pediatric patients are of interest. Regional nerve blocks have been shown to improve perioperative pain management in a variety of different open and laparoscopic procedures. Inguinal hernias are the most common elective pediatric general surgery procedure performed, and laparoscopic approaches have become more common. We sought to investigate the role of regional analgesic techniques in laparoscopic inguinal hernia repair (LIHR) with a focus on perioperative opioid usage.

**Methods:** A retrospective chart review of children 13 years or younger who underwent inguinal hernia repair from January 2015 to May 2017 was performed ( $n=163$ ). 98 patients (60.1%) underwent LIHR. The average age of those patients was 4.5 years (range 2 months to 13 years). We compared patients who received LAI ( $n=34$ ) with those receiving any one of six regional analgesic techniques ( $n=64$ ). Regional techniques utilized included rectus sheath block (RSB) ( $n=24$ ), RSB with LAI ( $n=10$ ), quadratus lumborum (QL) ( $n=15$ ), caudal ( $n=10$ ), transverse abdominis plane (TAP) ( $n=4$ ), and RSB with TAP ( $n=1$ ). Primary outcomes evaluated were intraoperative and postoperative opioid administration. Secondary outcomes measured included anesthesia duration, operative time, post-operative care unit (PACU) pain scores, and time to PACU discharge.

**Results:** Intraoperative opioid consumption was significantly reduced in patients undergoing any preoperative regional block as compared to those receiving conventional LAI, with a mean of 0.54 mcg/kg versus 1.40 mcg/kg ( $p<0.001$ ). QL blocks showed the greatest reduction in intraoperative opioid use with a mean of 0.22 mcg/kg ( $p<0.001$ ) (see figure 1). Focusing specifically on those children that underwent a QL block, 67% of patients did not receive any opioid post-operatively as compared to 35% of LAI patients ( $P=0.0399$ , 95% CI -1.6591 to 58.4111). Total anesthesia times and total operating times were similar in patients undergoing QL block and those receiving only LAI (86.5 vs 83 minutes, 33.8 vs 33 minutes respectively). Time to discharge from the PACU and pain scores in the PACU were not significantly different.



# Quickshots Abstracts



**Conclusion:** Regional analgesia for LIHR in children seems to reduce the need for opioids in the intraoperative and immediate post-operative periods. Of the various regional techniques, QL blocks appear to be the most efficacious and do not add significant time to the anesthesia or operating times. We recognize that administration of intraoperative opioids may be biased in that anesthesiologists are aware the patient has received a block and may inherently use less opioid. Future studies will be focused on prospectively investigating the efficacy of regional anesthetic techniques in a more blinded fashion.

## QS078 INITIAL EXPERIENCE IN THORACOSCOPIC APPROACH FOR THIMECTOMY IN MIASTENIA GRAVIS IN CHILDREN IN A PEDIATRIC HOSPITAL IN MEXICO CITY

Carmen M Licona, MD, [Adriana Calderón, MD](#); Instituto Mexicano del Seguro Social

**INTRODUCTION:** Myasthenia gravis (MG) a well known autoimmune disorder which can cause a uniformly disabling and even fatal, has been managed effectively with current therapeutic strategies. Nowadays, thoracoscopic thymectomy is a more acceptable treatment that has been used successfully in children who have more than mild disease. The purpose of this study is to show the initial experience in this type of approach in a Pediatric Hospital in Mexico city.

**MATERIALS AND METHODS:** Patients with MG, who underwent right-sided thoracoscopic thymectomy at Pediatric Hospital of the National Medical Center XXI Century in México city between 2013 and 2017 were included. The medical records were reviewed for patient demographics, preoperative symptoms, medical treatment, operative data, and postoperative data including length of hospitalization.

Patients were diagnosed with MG based in history, physical examination, positive response to anticholinesterase agents, and positive acetylcholine receptor antibodies. Oserman criteria was used to classify the severity of the disease preoperatively.

**RESULTS:** Five patients underwent thoracoscopic thymectomy for MG during the time frame studied. All of them performed by the same pediatric surgeon with advanced experience in minimal invasion. The median age was 13.2 years (range 3-15 years). The median length of operating time was 115 minutes (range 40-180 minutes). There were no conversions to an open procedure. Feeding was started the same day of surgery in all patients. The median length of hospital stay was 2.2 days (range 1-3 days). There was no 30-day postoperative morbidity, reoperations or mortality. The median length of follow-up was 22.2 months (range 1-43 months).

**DISCUSSION:** As a long-term treatment for MG, thymectomy has been performed successfully in children. Thoracoscopic thymectomy is a widely accepted option for children with generalized MG with low morbidity and shorter hospital stay among other superior results related to the known benefits of minimal invasion.

We prefer the right-sided thoracoscopic approach because the right side provides excellent access to the thymus and technically is more comfortable if the surgeon is right-handed.

Although in this pediatric hospital the thymectomy has been performed for approximately 2 decades for treatment in moderate to severe myasthenia gravis, the thoracoscopic approach started in our hospital 3 years ago with quite good results, concordant to that

# Quickshots Abstracts

described in the literature. 100% of our patients improved clinically following thoracoscopic thymectomy and there were no complications at 30 days. In our study there were no perioperative complications, even though in the literature they have been described in 8%. The results obtained in this study support that thoracoscopic thymectomy is the procedure of choice for myasthenia gravis with generalized symptoms.

We firmly believe this study is the guideline for the beginning of major series study with a considerable time of follow-up and comparative studies since it is a tertiary pediatric referral hospital of the country so it will continue to receive patients for further studies.

**INDEX WORDS:** Juvenile myasthenia gravis, thoracoscopic thymectomy

**QS080 PARAPNEUMONIC EMPYEMA: ADVANTAGES OF THORACOSCOPIC APPROACH. EXPERIENCE OF TWO ITALIAN CENTERS WITH THE SAME PROTOCOL.** Claudio Vella<sup>1</sup>, Francesca Destro<sup>1</sup>, Sara Costanzo<sup>1</sup>, Giovanni Di Iorio<sup>1</sup>, Andrea Pansini<sup>1</sup>, Maria Luisa Conighi<sup>2</sup>, Cosimo Bleve<sup>2</sup>, Fabio Chiarenza<sup>2</sup>, Giovanna Riccipetoni<sup>1</sup>; <sup>1</sup>Pediatric Surgery Department, V.Buzzi Children's Hospital, Milan - Italy, <sup>2</sup>Pediatric Surgery Department San Bortolo Hospital Vicenza Italy

**INTRODUCTION:** Parapneumonic empyema (PPE) is a complication of pneumonia in children. The natural process of organization provides for three consecutive stages: exudative (stage 1), fibrinopurulent (stage 2) and organized (stage 3). In the last few years an increase in number and severity of PPE has been observed, but there is still a lack of consensus regarding the optimal management and the surgical timing. We present the experience of two Italian centers applying the same protocol.

**MATERIALS AND METHODS:** We retrospectively analyzed case-records of patients who presented to our attention during last ten years because of a PPE not responsive to conservative therapy with antibiotics. Collected data include: demographic, empyema stage, microbiological results, imaging, medical therapy, surgical details, post-operative complications and follow-up.

**RESULTS:** Between January 2008 and June 2017, 56 patients affected by PPE underwent a thoracoscopic debridement (aged range: 3 months-17 years). According to imaging (chest X-ray, pulmonary US, CT scan) PPE was classified as stage 2 in 17 cases and stage 3 in 39. Surgery was first line treatment in 45/56 patients, while 11 of them (all stage 2) were initially managed conservatively and then underwent thoracoscopic debridement because of a no response to Urikinase intrapleural instillation. 16/56 patients presented an underlying lung disease: 9 necrotizing pneumonia, involving 1 or 2 pulmonary lobes with parenchymal cavitation; 6 lung abscesses; 1 pneumoblastoma. Thoracoscopic debridement has been achieved with one operative trocar in 37 patients, two trocars in one patient, three trocars in 18 patients. We had a conversion to open thoracotomy, no intraoperative complications occurred, no parenchymal resections were performed. Chest drains (1 or 2) were left in place for a mean time of 8 days (range 4-15). Two patients needed a thoracoscopic second look (revision after one trocar debridement; underlying pneumoplastoma). At a mean follow-up period of 3 months all patients presented a complete recovery of their lung at US and X-ray.

**CONCLUSIONS:** Historically surgical treatment of empyema consisted of open thoracotomy with decortications. Nowadays in literature, there is a lack of consensus regarding the optimal management of PPE: in clinical practice approaches differ about duration of antibiotics therapy, indications for drainage, first-line methods of drainage (pleural puncture, pleural drainage, fibrinolytic agents, surgical debridement by open thoracotomy, VATS or thoracoscopy). It seems that 4-day limit between diagnosis and surgery is a significant prognostic factor. Moreover, the success of thoracoscopic debridement versus chest drain insertion depends on the stage of the disease.

According to recent literature, in our experience thoracoscopic treatment of parapneumonic empyema is safe and effective in the great majority of patients, leading to a faster PPE resolution, a reduction of postoperative fever and a shorter hospitalization. Furthermore, when promptly and properly performed, it avoids invasive procedures such as wide parenchymal resections. However a careful selection of patients based on clinical signs and imaging is mandatory before surgery, indeed pleural drainage and fibrinolytic agents remain the first line approach for simple PPE.

# Quickshots Abstracts

**QS081 LAPAROSCOPIC VASCULAR HITCHING IN CHILDREN WITH EXTRINSIC URETERO-PELVIC JUNCTION OBSTRUCTION IN TWO ITALIAN INSTITUTIONS. A DEBATED TECHNIQUE OR AN EFFECTIVE AND VALID SOLUTION?** Salvatore Fabio Chiarenza<sup>1</sup>, Claudio Vella<sup>2</sup>, Cosimo Bleve<sup>1</sup>, Maria Luisa Conighi<sup>1</sup>, Giovanni Di Iorio<sup>2</sup>, Giorgio Selvaggio<sup>2</sup>, Giovanna Riccipetoni<sup>2</sup>; <sup>1</sup>Pediatric Surgery Department San Bortolo Hospital Vicenza Italy, <sup>2</sup>Pediatric Surgery Department, V.Buzzi Children's Hospital, Milan - Italy

**Background:** Congenital hydronephrosis could be due to intrinsic or extrinsic uretero-pelvic-junction (UPJ) obstruction (UPIO) in childhood. UPIO may be caused by intrinsic disorganization or by extrinsic compression from crossing vessels (CV). We report the results of laparoscopic vascular hitching (LVH) in association with intraoperative diuretic test (DT) in a series of children with extrinsic-UPIO by CV.

**Methods:** We analyzed the data of 42 children (14 girls and 28 boys, median age 10, 7 years) affected by extrinsic-UPIO treated in two Italian institutions with laparoscopic transposition of CV (Hellström Vascular Hitch modified by Chapman). The intraoperative confirmation with diuretic-test was performed in all patients before and after the vessels transpositions. We included in the study only patients with suspicion of vascular extrinsic obstruction of the UPJ. Symptoms at presentation were recurrent abdominal/flank pain, vomiting and haematuria. All patients presented intermittent ultrasound (US) detection of hydronephrosis (range, 18–100 mm). Preoperative diagnostic studies included US/doppler scan, MAG3-renogram, functional-magnetic-resonance-urography (fMRU).

**Results:** all 42 patients had a correct preoperative diagnosis. Median operative time was 95 minutes; median hospital stay: 2 days. All 42 patients had intraoperative-DT. Unique complications: a small abdominal wall hematoma. During follow-up (range, 12–98 months) all patients reported resolution of their symptoms, a decrease in the hydronephrosis grade and improved drainage on diuretic renogram. One needed after two years a laparoscopic-AHDP.

**Conclusions:** according us LVH associated to intraoperative-DT is less technically demanding than laparoscopic pyeloplasty, resulting in a lower complication rate and a significantly reduced hospitalization. The results of our study confirm that this procedure may be a safe, feasible, alternative to AHDP in the management of symptomatic children where CV are deemed the sole etiology. It is mandatory a careful patient selection based on preoperative clinical and radiologic findings that are diagnostic of extrinsic-UPIO, in association with intraoperative-DT to confirm the appropriate selection of corrective procedure.

**QS082 TWO BIRDS WITH ONE SHOT: A NEW SIMULATOR FOR PEDIATRIC LAPAROSCOPIC PYELOPLASTY** Carolina Millan, MD, Juan Corbetta, MD, Javier Ruiz, MD, Santiago Weller, MD, Jorge L Martinez, MD, Luzia Toselli, MD, Fernando Rabinovich, MD, Soledad Valverde, MD, Santiago Calello, MD, Horacio Bignon, Gaston Bellia, MD, Marcelo Martinez Ferro, MD; Fundacion Hospitalaria Children's Hospital

**BACKGROUND:** In recent years, IPEG members have developed numerous inanimate models designed for specific training in pediatric and neonatal MIS. Inanimate models provide a safe environment by increasing technical performance and cognitive knowledge of a surgical procedure without compromising patient's safety. This is the main reason for their rising popularity amongst pediatric urologists and surgeons.

**OBJECTIVE:** Our objectives are 1) present a new simulator of pediatric ureteral pyeloplasty (pyeloplasty MT-BOX1 simulator) with a singular feature that makes it unique: two exchangeable models in the same training box, 2) Evaluate the cost and 3) Recruit initial experience from trainees (pre-validation)

**MATERIALS AND METHODS:** An MT-BOX1 universal simulator box manufactured with polypropylene and 3D printed flexible columns, covered in thermoformed EVA foam simulating the abdominal wall of a neonate.

Disposable: 1) balloons for the renal vessels, the inferior vena cava, the aorta and the renal pelvis; 2) semisolid gel for the kidney and the intestines; 3) nasogastric tube of 2,3 mm in diameter and 105 cm long; 4) three way stop cock and 60 ml syringe; 5) surgical adhesive drape; 6) 0,3 mm EVA foam used as the base for all the structures; 7) 5/0 prolene and 4/0 nylon; and 8) 3 mm laparoscopic surgical instruments.

# Quickshots Abstracts

Two working models were created: 1) Intrinsic pyeloureteral stenosis and 2) Pyeloureteral stenosis due to a polar vessel.

Surveys were delivered to all the operators to begin the validation process.

**RESULTS:** The development of the model cost 65 USD, the MT-BOX1 cost 50 USD and the artificial tissues cost 15 USD.

3 urologists and 3 pediatric surgeons, all experts in minimally invasive surgery tried the simulator. All of them agreed that the simulator reflects many aspects of the real technique.

Other interesting characteristics were its low weight of only 250 grams as well as its portability, ergonomics and animation.

**CONCLUSION:** the pyeloplasty MT-BOX1 simulator is a low cost model that might prove a valuable resource for training in ureteropelvic anastomosis in pediatric patients. A formal validation process will be performed in order to evaluate its real benefits.

**QS084 THORACOSCOPIC MANAGEMENT OF PERSISTENT PNEUMOTHORAX IN ONE YEAR OLD PATIENT WITH LANGERHANS CELL HISTIOCYTOSIS** [Linda Li](#)<sup>1</sup>, Eva Notis<sup>2</sup>, Andrew Silverman<sup>1</sup>, Alexey Abramov<sup>1</sup>, Michael Weiner<sup>1</sup>, Vincent Duron, MD<sup>1</sup>; <sup>1</sup>Morgan Stanley Children's Hospital-Columbia University Medical Center, <sup>2</sup>Touro College of Osteopathic Medicine

**Background:** Langerhans Cell Histiocytosis (LCH) is a rare disease that involves multiple organ systems and may cause secondary pneumothorax in children. Management of LH involves multiple medical disciplines and primarily relies on long-term chemotherapeutic agents. Surgery, namely total pleurectomy, is rarely necessary and to our knowledge, has not been described using the thoracoscopic approach in a one-year old patient.

**Case Presentation:** We discuss a one year old child who initially presented to an outside hospital with respiratory distress and was found to have pneumothoraces, jaundice, and a rash. Bilateral chest tubes were placed and the diagnosis of Langerhans Cell Histiocytosis was secured by skin biopsy. She was started on weekly vinblastine and prednisone, but had a prolonged hospital course due to a persistent right pneumothorax and a continuous air leak for which she was transferred to our institution. Her treatment course was changed to cytarabine however her airleak persisted. Computed tomography of her chest confirmed extensive, bilateral involvement of both lungs with large cystic spaces throughout the lung parenchyma, and a sizeable pneumothorax, despite chest tube drainage. At eight weeks of treatment, she underwent a right video-assisted thoracoscopic total pleurectomy. She was extubated on postoperative day one. She continued to have an air leak and a small pneumothorax for several days after surgery until she achieved pleural apposition and resolution of her air leak at postoperative day seven. We maintained her chest tube to suction for another seven days and her chest tube was removed successfully after a water seal test. She continues on her cytarabine therapy.

**Conclusion:** This case describes the first report of a thoracoscopic total pleurectomy in a one year old child with Langerhans Cell Histiocytosis

**QS085 THE SPACED LEARNING CONCEPT SIGNIFICANTLY IMPROVES TRAINING FOR LAPAROSCOPIC SUTURING: A PILOT RANDOMIZED CONTROLLED LONG-TERM STUDY** Michael Boettcher, MD, PhD, Stefan Mietzsch, MD, Konrad Reinshagen, MD, PhD, [Thomas Krebs, MD](#); UKE Medical School

**Background:** Spaced learning has been shown to be effective in various areas like traditional knowledge or motor skill acquisition. To evaluate the impact of implementation of the spaced learning concept in laparoscopic training was the aim of this study.

**Methods:** To evaluate the effectiveness of spaced learning, subjects were asked to perform 4 surgeon's square knots on a bowel model prior and post 3 hours of hands-on training. All subjects were medical students and novice in laparoscopic suturing. Total time, knot stability (evaluated via tensiometer), suture accuracy, knot quality (Muresan score) and laparoscopic performance (Munz checklist) were assessed. Moreover, motivation was assessed using Questionnaire on Current Motivation (QCM).

**Results:** Twenty students were included in the study; after simple randomization, ten were trained using "spaced learning" concept

# Quickshots Abstracts

and ten conservatively. Both groups had comparable baseline characteristics and improved after training significantly regarding all aspects assessed in this study. Subjects that trained via spaced learning were superior in terms of suture performance, knot quality and suture strength. Ultimately, spaced learning significantly decreased anxiety and impression of challenge compared to controls.

**Conclusion:** The spaced learning concept is very suitable for complex motor skill acquisition like laparoscopic suturing and knot tying. It significantly improves laparoscopic performance and knot quality as shown by the knot score and suture strength. Thus, we recommend to incorporate spaced learning into training courses and surgical programs.

**QS086 ENDOSURGICAL TREATMENT OF ADOLESCENT GYNECOMASTIA** [François Varlet, MD, PhD, Sophie Vermersch, MD, Aurelien Scalabre, MD; CHU de Saint Etienne](#)

**Background:** Open surgery is the standard treatment of gynecomastia. Periareolar incision and transareolar incisions are the most common approaches, although submammary incision can be used for massive breast enlargements. The aim of this study was to report our experience in endosurgical treatment of adolescent gynecomastia.

**Material and methods:** Among 17 adolescents treated for gynecomastia in our center between December 2014 and June 2017, 11 adolescents and their parents accepted to be treated by endoscopic subcutaneous mastectomy. The installation was a supine position with arms abducted to 90° and fixed on a headframe. The first incision of 5 or 10mm was done at the nipple level on the mid-axillary line. The workspace was created with scissors before placing the lens. Two 5mm-trocars were placed in the axillary area after an 8 to 10mmHg insufflation. The dissection was performed with a monopolar hook or an ultrasonic scalpel close to the mammary gland. The nipple-areola complex was maintained at 1cm thickness. The gland was cut into strip-like pieces and extracted through the largest incision. A closed-suction drain was left for 1 or 2 days. The patients were reviewed 2 months and 1 year after surgery.

**Results:** Six patients had bilateral and 5 had unilateral gynecomastia. The median age was 15.4 years (range 13 to 17 years). The median size of the mammary gland was 8.2cm (range 6 to 10cm). The internal portion of the gland was difficult to release in 5 cases. One conversion was required because of poor vision and too long procedure. The median operative time was 90 min (range 90 to 220 min) for unilateral cases and 170 min (range 100 to 210 min) for bilateral cases. The median operative time was longer with a 5mm-lens than a 10mm one (110 min versus 77 min respectively). Complications were 2 small burns on the skin or nipple and 1 retractile nipple, with good evolution for these 3 patients. All patients were discharged after 48 hours. All patients and parents expressed their satisfaction, although the aesthetic result was considered insufficient by the surgeon in 3 cases.

**Conclusion:** Endoscopic subcutaneous mastectomy is feasible and safe for the treatment of gynecomastia in adolescent. This technique is challenging, but permits to reach good aesthetic results and avoids scars on the anterior wall of the thorax.

**QS087 FIRST REPORT OF ROBOT-ASSISTED THORACOSCOPIC POSTERIOR TRACHEOPEXY TO TREAT SEVERE TRACHEOMALACIA** [A Kamran, MD, R N Yu, MD, PhD, T E Hamilton, MD, B Zendejas, MD, R W Jennings, MD, C J Smithers, MD; Boston Children's Hospital](#)

**Introduction:** We have had increasing success with posterior tracheopexy to address posterior tracheomalacia via open and video-assisted thoracoscopic approach. We report the first use of the robot-assisted thoracoscopic approach for posterior tracheopexy.

**Case Description:** A 5-year-old boy born full term began at six months of age with recurrent episodes of spasmodic croup requiring steroids, inhalers, and racemic epinephrine. He continued to have intermittent nocturnal events with barking coughs and respiratory distress, including multiple blue spells.

A dynamic airway evaluation with bronchoscopy confirmed posterior intrusion type tracheomalacia affecting his mid- and lower trachea as well as the carina, especially with coughing.

In the operating room, after achievement of general anesthesia with single-lung ventilation, the patient was positioned in semi-prone left lateral decubitus. A 4-mm trocar was inserted posterior and cephalad to the scapular tip for the thoracoscope, and later replaced

# Quickshots Abstracts

with an 8.5-mm robotic camera port. Then, two 8-mm working robotic ports were inserted under thoracoscopic guidance. The right-hand robotic port was inserted in the 3rd intercostal space along the anterior axillary line and the left-hand robotic port in the 7th intercostal space posterior to the scapula. A 5-mm port was placed anterior and caudad to the working ports and used for lung retraction. After retracting the lung and opening the overlying pleura, we divided the azygos vein between ligatures, resecting a small segment to use as autologous pledget material. The esophagus was dissected from the trachea and pushed to the left of the posterior mediastinum in order to accommodate the space required for the posterior tracheopexy. The anterior spinal ligament was then cleared, and the fatty tissue including lymph nodes and thoracic duct were pushed towards the left chest. The posterior tracheobronchopexy was performed from the thoracic inlet to the carina by placing five pledgeted (azygos) horizontal mattress sutures through the longitudinal midline portion of the posterior tracheal membrane and suturing them to the anterior longitudinal spinal ligament. Flexible bronchoscopic visualization was used continuously throughout this process to confirm that sutures were not placed intraluminally and that the lumen was optimally opened without distortion. The robotic system allowed for picture-in-picture bronchoscopic guidance, such that the view from the bronchoscope was available to the surgeon on the console in real time. A chest tube was placed through one of the thoracoscopic ports at the completion of the procedure. The patient recovered uneventfully and was discharged from the hospital on the fifth postoperative day.

**Conclusions:** The robot-assisted approach for thoracoscopic posterior tracheopexy is safe and feasible in selected patients with severe tracheomalacia. When compared to video-assisted thoracoscopic approach, we feel that the robotic platform allows for more facile suturing with the degree of required precision. As our experience increases, we intend to apply this approach to more complicated procedures and re-operative cases.

## **QS088 RURAL PEDIATRICIANS START REFERRING PATIENTS TO ADULT SURGEONS AT A SIGNIFICANTLY YOUNGER AGE COMPARED TO NON-RURAL PROVIDERS** Danial Hayek, [Sophia Abdulhai, MD](#), Ian C Glenn, MD, Todd A Ponsky, MD; Akron Children's Hospital

**INTRODUCTION:** While most pediatricians will refer newborns with congenital problems to a pediatric surgeon, not all agree at which age a child can be sent to an adult general surgeon. The age of referral to an adult vs pediatric surgeons may be dependent upon the location of the pediatrician. This study explores pediatrician referral patterns for common surgical conditions in rural and non-rural settings.

**METHODS:** A survey assessing demographics and referral patterns for common pediatric surgical conditions (appendicitis, inguinal hernia, umbilical hernia, soft tissue abscess) was posted to "We are Pediatricians" Facebook page, a discussion forum for pediatricians across the USA. Data were analyzed using descriptive statistics and Fischer's exact test.

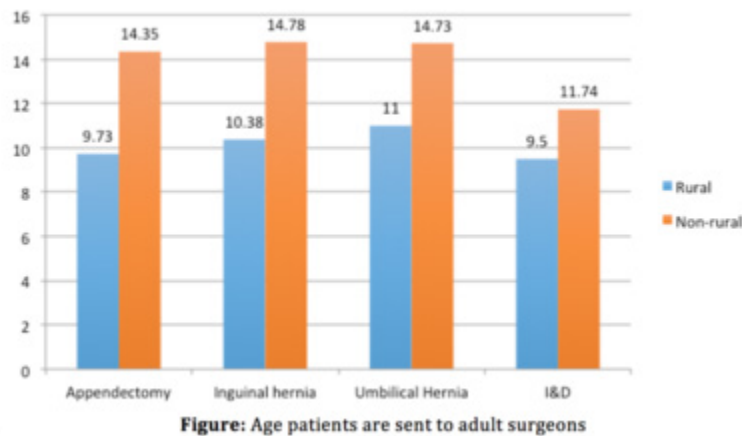
**RESULTS:** There were 105 respondents, of which the majority trained and currently practice in a non-rural setting.

For appendicitis, the largest group of rural respondents (31%) starts referring to adult surgeons at 10 years of age, compared to only 1.3% of non-rural respondents. Most non-rural providers (57%) start at 16 years.

For inguinal hernias, the largest percentage of rural respondents start referring to adult surgeons at 10 years (35%), compared to 5% of non-rural respondents. Most non-rural pediatricians start at 16 years (65%).

This pattern was similar for umbilical hernias. However, for soft tissue abscesses, the majority of rural surgeons (62%) and largest percentage of non-rural surgeons (22%) would refer to an adult surgeon at any age (see Figure). There was a significant association between referral patterns and pediatrician's practice setting ( $p < 0.001$ ).

# Quickshots Abstracts



**CONCLUSION:** Rural providers start referring pediatric patients to adult surgeons at a significantly younger age compared to non-rural providers. This highlights an opportunity to educate pediatricians on the value of pediatric surgical specialists throughout all of childhood.

**QS089 MODIFIED UNIPORTAL VIDEO-ASSISTED THORACIC SURGERY VERSUS THREE-PORT APPROACH FOR LUNG NODULE BIOPSY IN PEDIATRIC CANCER PATIENTS** Israel Fernandez-Pineda, MD<sup>1</sup>, Aaron D Seims, MD<sup>1</sup>, Lisa VanHouwelingen, MD<sup>1</sup>, Hafeez Abdelhafeez, MD<sup>1</sup>, Huiyun Wu, PhD<sup>2</sup>, Jianrong Wu, PhD<sup>2</sup>, Andrew J Murphy, MD<sup>1</sup>, Andrew M Davidoff, MD<sup>1</sup>; <sup>1</sup>Department of Surgery, St Jude Children's Research Hospital, <sup>2</sup>Department of Biostatistics, St Jude Children's Research Hospital

**Background:** Uniportal video-assisted thoracic surgery (VATS) is gaining popularity among thoracic surgeons, but the limited space in the thorax of children makes uniportal VATS difficult to perform. The purpose of this study is to evaluate procedural and outcome differences between a modified uniportal VATS (MU-VATS) and three-port VATS (TP-VATS) for peripheral lung nodule biopsy in pediatric cancer patients.

**Methods:** This is an Institutional Review Board-approved retrospective analysis of all consecutive MU-VATS and TP-VATS peripheral lung nodule biopsies performed at a single institution between June 2014 and December 2016. Patients with diffuse lung disease who underwent a lung biopsy were excluded.

**Results:** Over a 30-month period, 22 patients with a median age of 12 years (range, 7-21) underwent a MU-VATS or a TP-VATS for excisional biopsy of a peripheral lung nodule. MU-VATS lung biopsy was attempted in 11 patients and TP-VATS lung biopsy in the remaining 11. Both groups were comparable with regard to demographics, primary diagnosis, purpose of biopsy and lung nodule location. MU-VATS demonstrated no difference when compared with TP-VATS lung biopsy in operative time (54 vs. 62 min,  $P = 0.899$ ), estimated blood loss (14 vs. 15 mL,  $P = 0.587$ ), pain score (2.8 vs. 2.9,  $P = 0.717$ ) and discharge day (1.3 vs. 1.2 days,  $P = 0.572$ ). No difference existed between groups with regard to conversion, need for intraoperative blood transfusion and duration of chest tube. Complications including pneumothorax ( $n=2$ ) and subcutaneous emphysema ( $n=1$ ), were only seen in the TP-VATS group.

**Conclusions:** MU-VATS can be safely utilized for biopsy of peripheral lung nodules in pediatric cancer patients without increasing procedural duration, hospitalization, pain scores or need for intraoperative blood transfusion. Further studies need to evaluate the theoretical cosmetic advantage from a single surgical scar.

# Quickshots Abstracts

**QS090 LAPAROSCOPIC ASSISTED ANO RECTOPLASTY WITHOUT LIGATION OF THE RECTO-URINARY FISTULA : IS IT SAFE ?** Guillaume Rossignol, Thomas Gelas, Frederic Hameury, Rémi Dubois, Pierre Yves Mure; Department of Pediatric Surgery CHU-HFME Lyon, France

**Background :** Laparoscopic-Assisted Anorectoplasty (LAARP), first described by Georgeson in 2000, is now used as a safe alternative treatment of high Ano-Rectal Malformations (hARM). When compared to Posterior Sagittal Anorectoplasty (PSARP), LAARP gives a better visualization of the recto-urinary fistula. However, there is no consensus regarding the management of this fistula which can lead to urological injuries such as Posterior Urethral Diverticulum (PUD). The aim of this study is to evaluate the safety of the division of the fistula without ligation.

**Methods :** A retrospective review of all LAARP performed in our institution since 2002 was done. The charts of 33 children were analyzed regarding urological complications and midterm outcomes. Out of 33 LAARP, 3 girls were excluded because of 2 cloacal malformations and 1 Recto-Vaginal fistula. Twenty six patients had recto urinary fistula divided without closure of the posterior urethral wall. A urethral catheter was left in place for 8 to 10 days.

**Results :** The main hARM type were Recto-Prostatic (46,6%) and Recto-Bulbar fistula (36,6%). Twenty five children had associated malformations including 15 urological anomalies and 9 syndromic ARM. After a loop colostomy within the first day, the median age of LAARP was 4 months. Mean surgical time was  $175,6 \pm 10$  min with one conversion to open surgery. Mean hospital stay was  $6,1 \pm 0,6$  days. The urethral catheter was left for  $9,1 \pm 0,5$  days. Even though no routine urological examination was performed in asymptomatic patients, no PUD or early urinary fistula was observed. When Cystography (n=7) or Cystoscopic examination (n=5) was required for children with associated uropathy, no urethral anomaly was found. One boy had resection of a symptomatic urethral polyp without clear link to the LAARP procedure performed 10 years earlier. Overall complication rate was 53,3%, mainly represented by anal stenosis (26,6%) and rectal prolapse (16,6%). Two boys required a redo anorectal pull through. Sixty five percent of boys aged over 4 had voluntary bowel movements. Grade 1 soiling was present in half of the cohort and 20% had no soiling.

**Conclusion :** When performing LAARP for hARM, division of the recto-urinary fistula without closure of the posterior urethral wall appeared as a safe and simple procedure. It seems to provide a good urological outcome without any urinary leak or PUD in our series. Systematic radiological examination and further studies may be needed to assess this assumption.

**QS091 LAPAROSCOPIC APPROACH FOR THE ACUTE OVARY IN GIRLS AGED 15 YEARS OR LESS: OUR EXPERIENCE.** Constanza Harding, MD, Francisca Moreno, MD, Alejandra Ríos Rubio, MD, Miguel Guelfand, MD; Universidad de Chile

**INTRODUCTION:** Functional cysts, adnexal masses and ovary torsion are the most frequent ovary pathologies in the emergency surgical paediatric setting. Urgency laparoscopic approach can be challenging due to their low incidence in paediatric age and technical difficulties that it carries; even so in giant masses, due to limited space and malignancy possibility. Our aim is to evaluate our surgical experience in laparoscopic approach for acute ovarian pathology.

**MATERIALS AND METHODS:** We conducted a retrospective study from 2009 to 2017 that included every girl that was admitted to our service with acute ovarian pathology with laparoscopic surgical approach. Age, procedure, diagnosis, surgical time, post-surgical follow up and surgical complications were analysed.

**RESULTS:** Twenty patients were included, 3 of them had previous diagnosis of ovarian mass. Average mass size was of 6.2 cm (1.4-10 cm). Laparoscopic procedures were cyst fenestration (10/20), oophorectomy (3/20) in cases where no signs of reperfusion were observed, and tumor/cyst removal (7/20). The main post-operative histopathological diagnosis were functional cysts (17/20), adnexal necrosis (2/20) and mature teratoma (1/20). Average surgery time was of 70 minutes (30-150) and none required open conversion. Average length of hospital stay was of 1.3 days (1-5 days). As for post-surgical complications, in a mean follow-up of 3.6 years (2 months-8 years), 1 patient developed incisional hernia (umbilical) and 3 patients presented with of functional cysts, 1 of them requiring re-intervention.

**CONCLUSIONS:** Laparoscopic approach for acute ovarian pathology is safe, with optimal post-surgical results, low conversion rates, preservation of ovarian tissue and no malignancy findings, with the cosmetics advantages that it carries. We consider that it should be the treatment of choice when facing an ovary acute abdomen in the emergency setting.



# Quickshots Abstracts

**QS092 THORACOSCOPIC APPROACH IN MANAGEMENT OF SEVERE CONGENITAL DIAPHRAGMATIC HERNIA IN NEONATES.** Lishuang Ma, Jingna Li, Yandong Wei, Cuizhu Feng, Yanxia Zhang, Ying Wang, Yue Zhang, Chao Liu, Bin Sun; Capital Institute of Pediatrics, Peking University Teaching Hospital

**Background and Purpose:** Owing to recent advances in minimally invasive surgery, thoracoscopic repair of a small sized diaphragmatic defect is now widely performed by pediatric surgeons. Our purpose is to analyze the feasibility of thoracoscopic approach in management of severe congenital diaphragmatic hernia (CDH) in neonates.

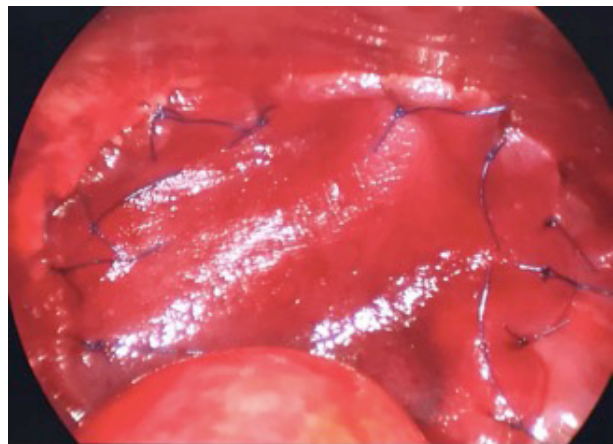
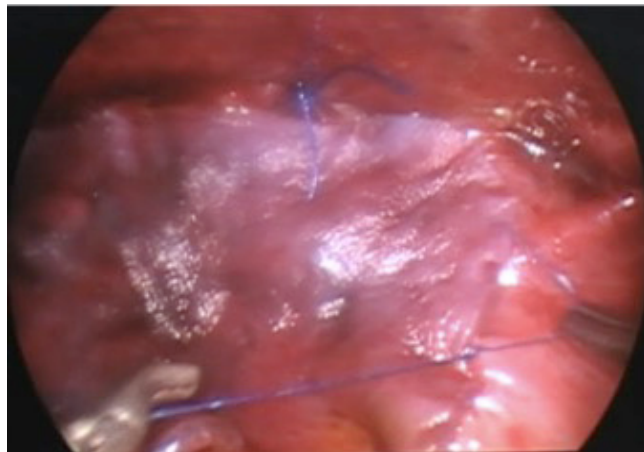
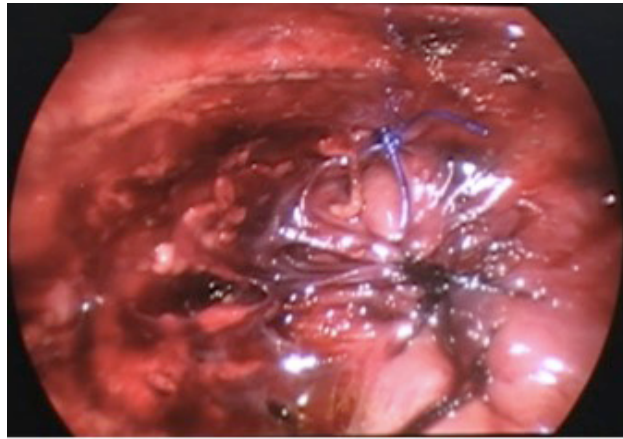
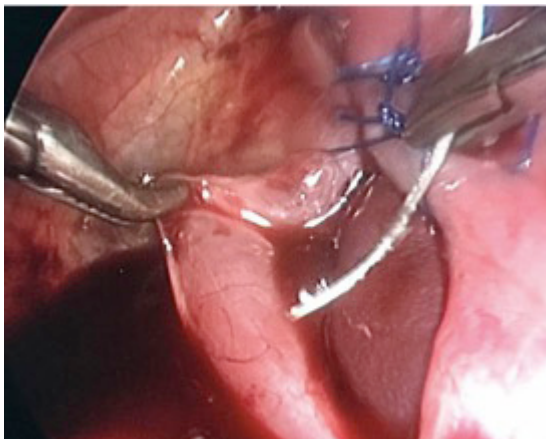
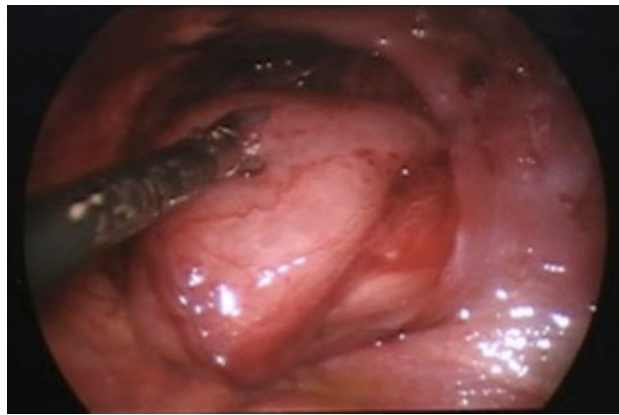
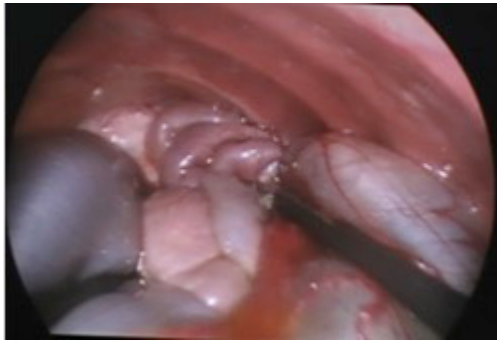
**Methods and Materials:** Systematic review of 13 cases (7 males and 5 females) of severe CDH neonates from 2014.4~2017.4 in our institution was performed. All cases were diagnosed as severe CDH based on the accepted evidence such as the occurrence of respiratory distress syndrome within 6 hours after birth, less than 1.0 of the lung area to head circumference ratio prenatally, larger than 5cm of defect size, or liver herniation.

**Results:** All patients underwent thoracoscopic repair procedures successfully. 12 cases were diagnosed as CDH by ultrasound prenatally, and 1 was diagnosed because of respiratory distress syndrome after birth. 12 patients were operated with tracheal intubations immediately after birth and the other was 2 hours after birth. 12 diaphragmatic defects located at the left side and 1 at the right side. The average birth weight was  $2.9 \pm 0.6$  kg. Mean gestational age of prenatal diagnosis was  $28.6 \pm 5.9$  w. The average age of operation was 1.0 d. Mean operation time was 180 mins. The average ventilator support time and hospitalization were  $4.0 \pm 1.3$  d and 17 d respectively. Among the survival patients, the lowest birth weight was 1.84 kg, the earliest gestational age of prenatal diagnosis is 17 w, the minimum gestational age was 31 w. Because of the giant diaphragmatic defect, 1 patient used a patch for repair and survived. 10 cases were put chest tubes during operations. 2 cases with the complication of chylothorax were cured after the conservative treatment of 7 to 30 days. 1 patient occurred hypercapnia after operation. Of all the cases above, 11 survived, 1 died about 5 hours after operation because of respiratory failure and the other died of renal failure at the second day after operation. All cases were followed up postoperation about 2 months to 3 years with no recurrence.

**Conclusions:** Thoracoscopic repair of severe CDH in neonates is safe and feasible, which also has advantages of fast recovery, improved cosmesis, and low rate of hypercapnia, pneumothorax and intestinal obstruction. Patch can be used safely and feasibly when needed through thoracoscopy. Once operators have rich experience in performing endoscopic surgeries, thoracoscopic procedure can be considered as the first choice.



# Quickshots Abstracts



**QV093 TREATMENT OF AN ISOLATED RENAL HYDATID DISEASE: COLLABORATIVE USAGE OF LAPAROSCOPIC SURGERY AND INTERVENTIONAL RADIOLOGY** Haluk B Güvenç, MD<sup>1</sup>, Nevin Hatipoglu, MD<sup>2</sup>, Aysun F Erbahceci, MD<sup>3</sup>; <sup>1</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Surgery, <sup>2</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Infectious Diseases, <sup>3</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Interventional Radiology

**Aim:** Renal involvement of hydatid disease is extremely rare, bearing an incidence of 2-4%, almost always accompanying neighboring organs. Isolated renal hydatidosis is an even rare insidious disease, where patients often present with nonspecific clinical signs or symptoms. Here in we report an isolated renal case treated initially by laparoscopic approach, accompanied by interventional radiological drainage of postoperative collection.

# Quickshots Abstracts

**Methods and Material:** A 15-year-old girl presented with recurrent abdominal pain for more than two weeks and history of a calcified oval mass 92 x 73 mm in size, visualized on her right hypochondrium during plain x-ray. She had previously sought medical attention for intermittent back pain lasting for three months. Abdominal US and MRI revealed a thick-walled, renal 79 x 63 x 60 mm lesion, neighboring posterior segment of right liver lobe and heterogeneous in appearance including regular-bordered isoechoic cysts, largest one being 26 mm in diameter. The image was compatible with stage 2 echinococcal hydatid disease. Indirect hemagglutinin agglutination (IHA) test was negative and there was no other organ involvement. All basic laboratory tests including urinalysis and renal function tests were within normal range. A laparoscopic intervention was performed one month later while under Albendazole treatment.

The procedure was performed with the patient in semi left lateral decubitus position. Pneumoperitoneum was obtained using 10 mm trocar through open Hasson technique in the umbilicus. Two 5 mm trocars were inserted under vision at the left upper and the right lower quadrant and a liver retractor was inserted through a stab wound. Upon initial inspection, severe inflammation accompanying dense adhesions between the liver and cyst wall was noted. The colon was carefully reflected away from the cyst wall by dissecting these adhesions. The surgical field was packed with (20%) hypertonic saline-soaked gauzes and irrigated intermittently during operation. The dense, thickened wall was opened using hook cautery after initial irrigation with hypertonic saline through a large bore Veress needle. The cyst cavity was repeatedly irrigated/aspirated with hypertonic saline until all daughter vesicles and the fragile germinal membrane was completely removed. Unroofing was performed by wide excision of the cyst wall. No drain was placed in the residual cavity. The patient was discharged 48 hours after surgery in good health. Histopathological examination confirmed hydatid cyst of the kidney.

Four months later control US revealed fluid collection at operation field. Approximately 200 ml of degenerated fluid with no scoleceal material was aspirated, disfavoring recurrence of echinococcosis. At the time of catheterization repeated IHA test rose to 1/320 positivity. The catheter was removed following alcohol ablation. Albendazole therapy was continued for 12 months with acceptable tolerance. The patient is under follow-up and doing well for 18 months with good collaboration to medical therapy and free of recurrence.

**Conclusion:** Organ sparing laparoscopic drainage is a beneficial approach for the patient due to benign nature of the disease. Successful interventional radiology additionally offers safe treatment of a postoperative collection, further sparing the patient from unnecessary surgery.

**QV094 MODIFIED TRANSUMBILICAL SINGLE INCISION TWO-PORT LAPAROSCOPIC VARICOCELECTOMY IN ADOLESCENTS** Xiaoyan Feng, MD, Chunsheng Hao, MD; Pediatric surgery department, Capital Institute Pediatric

**Background:** Varicocele is the most common cause of surgically correctable infertility in adolescents. Though the ideal surgical technique for adolescent varicocele remains controversial, many institutions claimed the safety and efficacy of laparoscopic correction of varicocele. We present a modified laparoscopic technique for the treatment of clinically significant varicocele.

**Objective:** In this study we assess the feasibility and safety of transumbilical single site two-port laparoscopic varicocelelectomy for adolescents.

**Methods:** Consecutive 16 pediatric patients (aged 8 to 17 years) presenting with clinically significant varicocele between Jan 2014 and Sep 2016 were considered for laparoscopic varicocelelectomy. Laparoscopic varicocelelectomy was performed with transumbilical single-incision placement of two ports. Two 2-0 silk sutures were used to ligate the spermatic vessels in a nonartery sparing technique.

**Results:** Sixteen clinically significant varicocele were identified in 16 patients, all of which were ligated with this technique. Mean operating time was 39 minutes (range, 20-60). Twelve hours post operation, the varicocele disappeared. All patients were discharged from surgery unit and returned to their regular physical activity within 2 to 3 days after surgery. Upon clinical follow up at 6 months to 3 years post-surgery, there was no evidence of varicocele recurrence, testis atrophy or persistent hydrocele formation, and no obvious surgical scars were observed.

**Conclusions:** Our single incision two-port laparoscopic varicocelelectomy is feasible and effective in adolescents. This technique is

# Quickshots Abstracts

comparable to previously described laparoscopic approaches, with even less operating time and better cosmetic effect. However, sufficient laparoscopic skills are required to master this technique.

**QV095 THORACOSCOPIC EXCISION OF DISTAL ESOPHAGEAL DUPLICATION CYST** Rebecca M Rentea, MD, Shawn D St. Peter, MD; Children's Mercy Hospital - Kansas City

Esophageal duplication cysts are less compared to other foregut duplication cysts, typically presenting in childhood with dysphagia. We present a 15-year-old with a history of back pain who underwent magnetic resonance imaging of the spine and was discovered to have mediastinal cyst located anterior to the aorta above the diaphragm. The cyst was excised thoracoscopically.

**QV096 LAPAROSCOPIC MANAGEMENT OF CONGENITAL ABDOMINAL WALL HYPOPLASIA** John M McClellan, MD<sup>1</sup>, Joshua Dilday, DO<sup>2</sup>, John Horton, MD<sup>1</sup>; <sup>1</sup>Madigan Army Medical Center, <sup>2</sup>William Beaumont Medical Center

Lumbocostovertebral syndrome is uncommon disorder often associated with congenital abdominal wall hypoplasia resulting in large abdominal wall eventrations. Given the patient's age, size, and other associated anomalies, these defects are often difficult to address. While most of the current literature describes an open approach, we present a case and video in which laparoscopic management was successfully used to repair the patient's abdominal wall.

**QV097 SINGLE INCISION LAPAROSCOPIC SMALL BOWEL RESECTION FOR TREATMENT OF MECKEL'S DIVERTICULITIS: A SAFE, MINIMALLY INVASIVE APPROACH** Timothy M Ullmann, MD<sup>1</sup>, Cheguevara Afaneh, MD<sup>1</sup>, Iskander Bagautdinov<sup>1</sup>, Alexandra C Baker<sup>1</sup>, Aaron R Turkish<sup>2</sup>, Tsang Kim<sup>2</sup>, Melissa L Rose, MD<sup>2</sup>, Stephen P Oh<sup>1</sup>; <sup>1</sup>New York Presbyterian, Weill Cornell Medicine, <sup>2</sup>New York Presbyterian Queens

**PURPOSE:** This video demonstrates a successful Meckel's diverticulectomy with small bowel resection and appendectomy using a single incision laparoscopic assisted technique. This approach represents a safe, minimally invasive, and expedient alternative to traditional laparoscopy without requiring an additional incision to perform a small bowel resection.

**METHODS:** A 8 year-old male with a history of abdominal pain was found to have Meckel's diverticulitis on CT scan treated with antibiotics. He presented for interval diverticulectomy. The abdomen was entered through a single 2cm infraumbilical incision with the aid of a GelPOINT Advanced Access System (Applied Medical). The appendix was removed with a Ligasure electrocautery device and a laparoscopic stapler. The bowel was examined laparoscopically, the Meckel's diverticulum was identified and eviscerated through the incision. A small bowel resection of the segment containing the diverticulum was performed and a stapled, side-to-side small bowel anastomosis was created extracorporeally. The intestine was reduced into the abdomen with laparoscopic confirmation of proper positioning without bleeding, and the incision was closed.

**RESULTS:** The procedure took 92 minutes from incision to closure. The patient was transferred to the pediatric floor post-operatively. He tolerated a liquid diet on post-operative day 1 and was advanced to regular diet on post-operative day 2 after passing flatus. He had a bowel movement and was discharged home on post-operative day 3 without the need for narcotic pain medication. Pathology confirmed Meckel's diverticulitis and appendicitis.

**CONCLUSIONS:** Single incision laparoscopic surgery is a safe and effective method for Meckel's diverticulectomy and small bowel resection in pediatric patients. The technique allows for the creation of an anastomosis using an open technique, which decreases operative time, while still using a minimally invasive approach.

**QV098 THORACOSCOPIC AORTOPEXY FOR THE TREATMENT OF SEVERE TRACHEOMALACIA IN CHILDREN** Carlos García-Hernández, MD, Lourdes Carvajal-Figueroa, MD, Sergio Landa-Juarez, MD, Cesar Calderon-Alipi, MD; Universidad Nacional Autónoma de México

# Quickshots Abstracts

**Introduction:** Tracheomalacia results in tracheal weakness, which may result in its collapse with airway pressure changes. This disorder can be primary or secondary, related to other pathologies such as esophageal atresia or vascular rings.

The symptomatology can exist from birth. Benjamin classifies the latter in acute, moderate and severe, the latter manifested by dying spells, recurrent pneumonia, intermittent respiratory obstruction and inability to extubate. Surgical treatment is only prescribed for the aforesaid cases. Aortopexy has been the main option of surgical therapy for pediatric malacia. The aforesaid technique was described by Filler in 1976, and it prescribes the fixing of the aorta to the sternum in addition to the traction of the anterior section of the trachea, which relieves malacia. This treatment can be developed via a left or right thoracotomy, partial sternotomy or minimum invasive surgery, although this approach is only conducted in 1.3% of the reported cases. The procedure related risks are aortic damage with bleeding, diverticula formation and obstruction of the pulmonary vessels.

**Objective:** to present our experience in the treatment of the severe tracheobronchomalacia using a thoracoscopic approach, the diagnostic methodology, surgical technique, post-operative evolution and complications.

**Methods:** Retrospective study, patients with tracheal malacia or severe tracheobronchomalacia, primary or secondary. Symptomatology, age, weight, ventilator dependence, bronchoscopic findings, tomographic findings and previous procedure were used as analytical variables. An Aortopexy was practiced using left thoracoscopic approach with 3 ports of 5 and 3 mm, 5 mm Hg pressure, placing 3 polyester sutures of the aorta to the sternum with transoperative endoscopic control. In addition, bleeding, infection and post-operative evolution were analyzed.

**Results:** From January 2016 to July 2017, 3 patients were treated. 2 of them with severe tracheomalacia and 1 with severe tracheobronchomalacia. 1 female and 2 male patients of 3, 9 and 12 months. Weight included 3, 4 and 6 kilograms. Patients manifested multiple near sudden death events and had absolute dependence to assisted ventilation. Patients were subject to tracheostomy, Nissen fundoplication and gastrostomy in another hospital previously. Patients were canalized to our hospital upon no improvement in previous treatment. The pre-operative bronchoscopy evinced tracheal and bronchial severe malacia. The thoracic angiotomography discarded other extrinsic tracheal compression causes. Upon the latter, a left thoracoscopic Aortopexy was practiced with surgical times that ranged from 90 to 120 minutes, without bleeding or complications, with bronchoscopic trans-operative control evincing improvement of 80% in tracheal light in the 3 patients. Ventilator assistance was removed upon the 5th, 8th and 10th post-operative day. In two patients, the tracheostomy cannula was removed in the 5th and 7th month after surgery. Only one patient awaits cannula removal, without symptomatology recurrence in a follow up of 3 to 20 months.

**Conclusions:** The thoracoscopic aortopexy is a safe and effective technique for the treatment of primary and severe tracheomalacia in children.

**QV099 ROBOTIC NEPHROPEXY FOR THE TREATMENT OF NEPHROPTOSIS** Charles W Concodora, MD, [Paul H Noh, MD](#); Cincinnati Children's

**Introduction:** Nephroptosis is a rare condition that can result in chronic flank or upper abdominal pain. This pain is likely secondary to either intermittent ischemia or urinary obstruction resulting from acute angulation of the hilar structures. Treatment typically requires nephropexy. Traditionally, Gerota's fascia is fixated to the overlying fascia of the psoas muscle. With this approach, care must be taken to avoid injury to the retroperitoneal nerves overlying the psoas and quadratus lumborum. We describe a novel nephropexy technique for the treatment of nephroptosis that spares the psoas yet still provides excellent fixation.

**Materials and Methods:** Our technique was performed on a 16-year-old female who presented with a palpable mass and intermittent upper abdominal and flank pains. Subsequent imaging provided a diagnosis of nephroptosis. The patient is placed in a modified flank position. The da Vinci Xi<sup>®</sup> Surgical System is utilized. An 8-mm camera port is introduced into the umbilicus, and two additional 8-mm robotic trocars are placed in the midline on either side of the camera port and serve as instrument ports. No assistant ports are utilized. The kidney is completely mobilized and the renal capsule is exposed. The kidney is positioned orthotopically and as cephalad as possible, with care to ensure no acute angulation of the hilar structures. An absorbable V-Loc suture is used to fixate the kidney to the posterior peritoneum and Gerota's fascia. This is performed in a running fashion. Unlike a traditional nephropexy, the psoas is not involved.

# Quickshots Abstracts

**Results:** Operative time for our index case was 135 minutes with minimal blood loss. The patient was discharged home on post-operative day one. At six-week follow-up, the patient was relieved of her previous pain, and the kidney was no longer mobile or palpable. There were no peri-operative complications and no post-operative complications to date.

**Conclusions:** Use of robotic nephropexy by means of running fixation and sparing of the psoas muscle for the treatment of nephroptosis is a safe and effective technique.

**QV100 LAPAROSCOPIC RESECTION OF A 13 CM ADRENAL MASS IN A 13 YEAR OLD GIRL** Eveline H Shue, MD, [Nam X Nguyen, MD](#); Children's Hospital of Los Angeles, Miller Children's Hospital of Long Beach

**Purpose:** Laparoscopic resection of small, benign adrenal tumors has become a standard surgical approach. However, laparoscopic resection of adrenal tumors greater than 6-8 cm has been controversial for both technical considerations and concerns for local recurrence. This video demonstrates that laparoscopic resection of a large left adrenal mass measuring 13 cm is both safe and technically feasible.

**Methods:** The patient was placed in a modified right lateral decubitus position. We used four 5mm ports to perform the operation. One port was placed within the umbilicus. A second port was placed in the epigastrium, and two additional ports were placed in the left upper quadrant and the left lower quadrant. The mass was removed through a Pfannenstiel incision.

**Results:** We successfully performed a laparoscopic left adrenalectomy of a 13 cm adrenal mass. The mass was noted intraoperatively during a planned total proctocolectomy with ileoanal pull-through for FAP. Due to this finding, the patient only had a total abdominal colectomy and an end ileostomy so that further work up of the adrenal mass could be performed prior to the ileoanal pull-through procedure. A CT scan showed a 13 cm left adrenal mass and biochemical studies indicated that it was a nonfunctioning tumor. We proceeded with a laparoscopic left adrenalectomy. Due to the large size of the mass, much of the dissection was facilitated by developing the plane posterior to the mass and reflecting it anteriorly. The final pathology showed an adrenal cortical neoplasm.

**Conclusions:** Laparoscopic adrenalectomy can be safely performed even for extremely large nonfunctioning adrenal tumors in the pediatric population.

**QV101 RE-EXPLORATION FOLLOWING LAPAROSCOPIC SLEEVE GASTRECTOMY** [Jeffrey L Zitsman, MD](#)<sup>1</sup>, [Arun Thenappan, MD](#)<sup>2</sup>, [Daniel M Relles, MD](#)<sup>3</sup>; <sup>1</sup>Morgan Stanley Children's Hospital of NY Presebyterian, <sup>2</sup>Children's National Medical Center, Washington, DC, <sup>3</sup>Lehigh Valley Health Network

A 16 year old female with severe obesity underwent 6 months of multidisciplinary evaluation, after which she was offered laparoscopic sleeve gastrectomy. At surgery, peritoneal access was obtained using a 5mm non-cutting optical port. Sleeve gastrectomy was performed using a 40Fr bougie and multiple staple firings with bioabsorbable staple line reinforcement.

On the second post-operative day she was noted to have a low grade fever and low urine output. Her physical exam was otherwise unremarkable and her wbc = 12,900. That evening a computed tomograph of the abdomen with oral contrast showed pneumoperitoneum, no extravasation of contrast from the gastric sleeve, and thickened bowel loops in the left upper abdomen. The following morning she complained of mild diffuse abdominal pain and return to the operating was carried out. At repeat laparoscopy she was found to have a through-and-through injury to the proximal small intestine. The bowel was repaired primarily.

**QV102 LAPAROSCOPIC REMOVAL OF GASTRIC TRICHOBEZOAR BY A NOVEL MINIMALLY INVASIVE TECHNIQUE** [Iftikhar M Jan](#), [Mokhtar Ali Hassan, DR](#), [Muna Al Shehhi](#), [Zahid Saqi](#); Mafraq Hospital Abu Dhabi UAE

**Introduction:** With the establishment of minimally invasive surgery, It is possible to remove unusual gastrointestinal foreign bodies

# Quickshots Abstracts

by minimally invasive Surgery (MIS) techniques.

We shall share a case of 10 years old girl having a 14x 8 cm Gastric trichobezoar. The whole bezoar was retrieved by a novel laparoscopic assisted technique.

A brief case presentations with video demonstration of the surgical technique shall be presented.

**QV103 MINIMALLY INVASIVE, LARYNGOSCOPICALLY-ASSISTED MANAGEMENT OF AN ENLARGING FOURTH BRANCHIAL REMNANT.** Etienne St-Louis, MD, Robin Petroze, MD, Hussein Wissanji, MD, Sam Daniels, MD, Kenneth Shaw, MD; McGill University Health Centre

**Introduction:** Third and fourth branchial cleft remnants usually present as cysts, sinuses or fistulae. We report an exceptional case of an infected large fourth branchial cleft cyst with extension into the thoracic inlet and the novel therapeutic approach that was used to provide minimally-invasive management of this lesion.

**Case Report:** A premature female twin with known antenatal diagnosis of cystic left neck mass was given a diagnosis of lymphatic malformation following physical exam and postnatal ultrasound evaluation. Following administration of vaccines and development of viral upper respiratory symptoms, the patient's left neck mass enlarged significantly, prompting further investigation with an MRI, which revealed a large infected branchial cyst of type III/IV. This was treated with a combination of endoscopic electro-surgical coagulation and percutaneous drainage, with good success.

**Discussion and Conclusion:** To our knowledge, this is the only example in the literature of a minimally-invasive, laryngoscopically-assisted approach having been used successfully to treat a branchial sinus and cyst extending to the thoracic inlet. Long-term follow-up is needed to ensure there was no cyst recurrence.

**QV104 THORACOSCOPIC RESECTION OF A UPPER MEDIASTINUM ESOPHAGEAL DUPLICATION CYST IN A 2-MONTH-OLD INFANT ONE CASE REPORT WITH RETROSPECTIVE OTHER 5CASES** Kuiran Dong, MD<sup>1</sup>, Xianming Xiao, MD<sup>1</sup>, Zhongxi Zhang, MD<sup>2</sup>, Jialiang Zhou, MD<sup>2</sup>, Jun Li<sup>1</sup>; <sup>1</sup>Children's Hospital of Fudan University, <sup>2</sup>Children's Hospital of Xiamen

Esophagus duplication cysts at the upper mediastinum could course upper airway obstruction and lives threaten. We report one case of upper mediastinum cyst with serious respiratory distress successfully treated by an emergency thoracoscopic operation. The other 5 cases of esophagus duplication cysts were also retrospectively.

The patient was a 2 month old boy with a progressive respiratory distress in the past 5 days before admission. The intubation and ventilation was carried out to sustain his life. The CT scan and GI shows a big cyst between esophagus, trachea and aortic arch. An emergency thoracoscopic operation was done at the second day after admission.

During the operation the cyst was found at the upper mediastinum, above the azygos vein, after the pleura was opened the Vagus nerve was found just at the bottom close to the cyst, and there were muscle could be found at the surface of the cyst. So the diagnosis of esophagus duplication cyst was confirmed. By separating the muscle, the cyst could be mobilized. And the esophagus mucosa protected well. The trachea wall and aorta were divided precisely. Then the cyst was removed. After the operation, the child was recovered uneventfully. And discharged at the day 5 after operation.

We retrospectively reviewed our 5 cases of esophagus duplication in the past 3 years. 1 case was at upper mediastinum with serious upper airway obstruction, needing intubation and ventilation. 3 cases were at the hilum of the esophagus and caused vomiting. And one was asymptomatic. The MIS management (4 thoracoscopic and 1 laparoscopic) were carried out for these cases successfully.

# Quickshots Abstracts

with no rupture of the esophagus or other injury and infection.

Compare with open surgery, MIS management for the esophageal duplicate cysts can reduce the complications such as esophagus / rupture, injury vagus nerve. For the upper one third of the esophagus with Respiratory distress thoracoscopic surgery could salvage the life.

location <sup>4</sup>	Upper mediastinum	Esophageal hiatus	Under the diaphragm
Number of Cases	1	3	1
Surgical Approach	thoracoscopic	1 thoracoscopic, 2 laparoscopic	laparoscopic
Esophagus rupture	-	-	-
injury vagus nerve	-	-	-
infection	-	-	-

**QV105 LEFT THORACOSCOPIC APPROACH FOR A BRONCHOGENIC CYST ORIGINATING FROM THE LOWER ESOPHAGUS IN THE POSTERIOR MEDIASTINUM IN A 9-MONTH-OLD BOY - A CASE REPORT** Keisuke Yano, MD, Takafumi Kawano, MD, PhD, Yuto Nonaka, MD, Shun Onishi, MD, Masato Kawano, MD, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, MD, Seiro Machigashira, MD, Kazuhiko Nakame, MD, PhD, Motoi Mukai, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

**Background:** Bronchogenic cysts may occur anywhere in the mediastinum. Recently, there have been reports of the thoracoscopic treatment of bronchogenic cysts of the mediastinum. However, a left thoracoscopic approach is technically difficult because of the small thoracic space relative to the right side and the beating heart. We herein report a case in which left thoracoscopic extirpation was safely and effectively performed to treat a pediatric patient with a multi-ocular bronchogenic cyst in the posterior mediastinum located in close proximity to the beating heart.

**Patient and Methods:** The patient was a 9-month-old boy with high-grade fever who was transferred to our hospital. A multi-ocular cystic tumor was incidentally detected by enhanced CT. The 2.6 cm tumor originated from the posterior mediastinum. The main location of the tumor was the left side of the mediastinum; thus, a left thoracoscopic approach was planned.

**The Operative Findings and Procedure:** Under general anesthesia in the right three-quarter prone position, a camera port was inserted at the fifth intercostal space (ICS) of the middle axillary line using optical methods. Two working ports were inserted at the sixth ICS (5 mm, operator's right hand) of the anterior axillary line and the fourth ICS (3 mm, operator's left hand) of the posterior axillary line. A 45° 5-mm scope was used to obtain a wide view. A multi-ocular cystic tumor was recognized at the posterior mediastinum just above the diaphragm. The parietal pleura was opened using bipolar scissors (Robi; Karl Storz, Tuttingen, Germany). Careful dissection of the tumor was performed to detect the origin of the tumor preventing the [AI] vagus nerve. The tumor was found to have originated from the lower esophagus. Sharp and blunt dissection was performed for complete resection. Finally, the tumor was extirpated; however, part of the outer sheath and muscle wall was resected. The muscle defect of the esophagus was transversely closed by interrupted 6-0 monofilament absorbable sutures (PDS; Ethicon, Cincinnati, OH, USA) to prevent stenosis. The opened parietal pleura of the mediastinum was closed by continuous suturing using 5-0 monofilament absorbable sutures (PDS; Ethicon, Cincinnati, OH, USA). The tumor was placed into an endosurgical bag and extracted. No drain was inserted.

**Results and Conclusion:** There were no intraoperative or postoperative major complications and no thoracic organ injuries were observed. The postoperative course was uneventful, and the patient showed a good clinical course. Left thoracoscopic extirpation was a safe and feasible approach to the treatment of a pediatric patient with bronchogenic cyst in the posterior mediastinum located in close proximity to the beating heart.



# Innovations Session Abstracts

**ISP001 STAY CURRENT IN SURGERY: DEMOCRATIZING KNOWLEDGE THROUGH A GLOBAL MULTIMEDIA APPLICATION** Sophia Abdulhai, MD<sup>1</sup>, Abdulraouf Lamoshi, MBBCh, MPH, ABPS, MS, CTS<sup>1</sup>, Marc Schwacter, MD<sup>2</sup>, Todd A Ponsky, MD<sup>1</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>GlobalCastMD

**OBJECTIVE:** To provide a free, mobile, multimedia, surgical reference application that can be used by anyone in the world regardless of learning style.

Global healthcare disparities do not just represent unequal access to quality medical care; it also represents unequal access to the most current medical knowledge to practicing providers. This unequal access to the most up to date medical information creates a significant knowledge gap between providers in developed and underdeveloped countries. This knowledge gap is likely due, in part, to the lack of affordability of medical resources, such as continually updated, expensive textbooks, medical journals, and online medical sites that require a subscription to obtain access. We set out to break down these barriers and democratize new medical knowledge.

Stay Current in Surgery is a free multimedia application created to provide medical professionals around the world easy access to the most current surgical knowledge. Because of the variety of learning styles, the application provides information in multiple media options such as videos, audio lectures (i.e. podcasts and webinars), and written text, and is available on any device with Internet access.

## **METHODS:**

The app was created April 2015, and is available for download on all smart devices. It features podcasts, which are discussions on various surgical topics by experts in the field. These podcasts are arranged into chapters with time stops that allow the listener to search an index and choose specific sections to listen to. The podcasts include a written summary of the content and any supplementary images.

A new app was created on October 2017 for the iPhone only that gives the user access to a large database of videos. It allows the user to subscribe to specific topic channels, which will personalize each users experience.

## **PRELIMINARY RESULTS:**

Original Stay Current in Surgery app has been downloaded 5469 times on iOS devices. We currently do not have specific download data for android phones, but we estimate it is similar to iOS data for a rough total estimate of around 11,000 downloads. There have been 57,603 podcast listens, and our listeners are from over 50 countries in the world. Of the listens, 43% occurred in the US, 18% in Europe, 10% in South America, 11% in Asia, 6% in Oceania and 5% in Africa. In the field of pediatric surgery, 29 podcasts have been released, with an average listen of 1667.62 per podcast (range 479-2829).

The new iPhone app has been downloaded 910 times and features a total of 724 videos.

## **CONCLUSION/FUTURE DIRECTIONS:**

Stay Current in Surgery is a free multimedia application designed to solve disparities in access to medical knowledge by providing busy medical professionals convenient access to the most current medical literature, for multiple styles of learning, regardless of where they are in the world. Our next step is to make our new app available to all smartphone users, as well as continue to expand our medical content.

**ISP002 A SAFE AND VERSATILE APPROACH TO CREATE MAGNETIC COMPRESSION BOWEL ANASTOMOSES UTILIZING MAGNAMOSIS** Veeshal H Patel, MD, MBA, Dillon Kwiat, BS, Jill Imamura-Ching, RN, Michael R Harrison, MD; UCSF

**Objective of the device:** Magnamosis is a magnetic compression anastomotic device intended for the creation of a leak-free bowel anastomosis between any two portions of the gastrointestinal tract. Additionally, the goal of the device is to facilitate minimally invasive surgical approaches including laparoscopic and hybrid endoscopic operations.

# Innovations Session Abstracts

**Description of the method of use:** The Magnamosis device consists of two concentric magnetic rings encased in a polycarbonate casing. These rings, when attracted to each other by their magnetic polarity, compress the tissue between them. Over a period of 4-5 days, the compression creates a functional anastomosis anywhere in the gastrointestinal tract.

We have demonstrated the ability to deliver and mate the magnetic rings through several surgical approaches: open surgery, laparoscopic surgery, laparoscopic-assisted endoscopy, and solely endoscopy. The endoscopic delivery is achieved through a standard endoscope and a polypectomy snare through the biopsy channel which tightens around the magnet, and holds it in place – allowing the endoscopist to deliver the magnet to the desired location.

**Preliminary results:** To date, we have created a variety of bowel anastomoses in over 90 swine and 11 monkeys, and most importantly, successfully achieved small bowel-small bowel anastomoses in 8 humans. Additionally, we have not yet had an anastomotic leak or complication secondary to the Magnamosis device in our subjects. All subjects have expelled the magnets in the stool. In animal studies, we have performed minimally invasive colo-colonic anastomoses, gastrojejunostomies, and small bowel-colonic anastomoses.

**Conclusions/Future directions:** The goal is for Magnamosis to be utilized for many more indications. We have created additional Magnamosis sizes to personalize the anastomosis size depending on the indication and patient. Currently, our successful human applications have included ileostomy takedowns, ileal conduit creation, and treatment of a chronic small bowel obstruction through open and endoscopic methods. We intend to expand the uses for the device to include partial small bowel diversions, malignant bowel obstructions, esophageal atresia, gastrojejunostomy creation, and colonic anastomoses. Additionally, we intend to further demonstrate the safety and efficacy of several minimally invasive approaches.

**ISP003 AUGMENTED REALITY: AN EMERGING TECHNOLOGY FOR IMAGE GUIDED SURGERY** [Daniel von Allmen, MD](#), John Racadio, MD; Cincinnati Children's Hospital

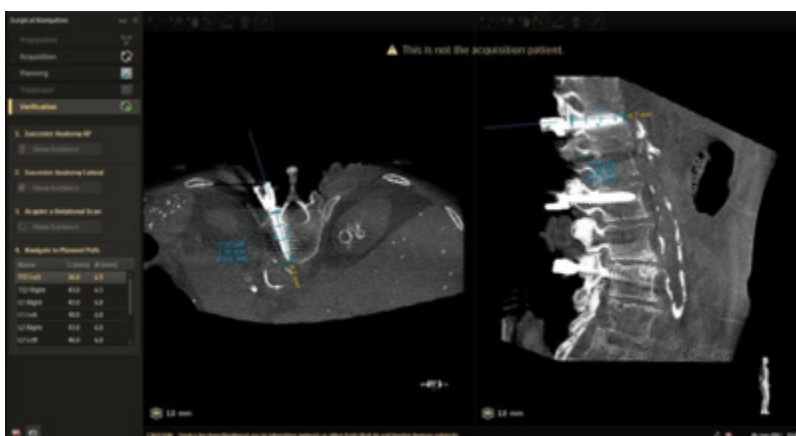
**Purpose:** To describe the use of combined C-arm cone beam CT and video guidance in two clinical applications in a hybrid operating room setting.

**Methods:** Two clinical models were used to test a new image guidance system in our research lab equipped as a hybrid operating room. Four optical cameras embedded in a C-arm system allowed video co-registration with a C-arm cone beam CT. The models consisted of a human cadaver model for spine surgery and a swine model for lung nodule excision. Skin marker fiducials allowed for optical tracking and motion compensation. An integrated navigation system enabled optically guided pedicle screw placement or nodule localization without the need for continuous fluoroscopy. 20 pedicle screws were placed with image guidance and 9 lung nodules were created and localized. Lung nodule localization was performed with microcoils. Pedicle screws were placed using an open technique while thoracoscopic resection of the nodules was accomplished using direct visualization and fluoroscopic guidance after the nodules were successfully localized.

**Results:** Pedicle screw placement and lung nodule localization was achieved with near perfect results that surpass results with traditional methods (fig 1,2)

**Conclusions:** Augmented reality using optical image guidance is an emerging technology that will greatly improve the accuracy and safety of a variety of surgical procedures.

# Innovations Session Abstracts



**ISPO04 DEVELOPMENT OF A POLYMERIC SELF-EXPANDING SURGICAL SMART PATCH FOR PRENATAL FETOSCOPIC SPINA BIFIDA REPAIR AND OTHER POTENTIAL ENDOSCOPIC INDICATIONS.** Jose L Peiro, MD, PhD<sup>1</sup>, Rigwed Tatu, PhD<sup>2</sup>, Marc Oria, PhD<sup>1</sup>, Chia-Ying Lin, PhD<sup>2</sup>; <sup>1</sup>The Center for Fetal, Cellular and Molecular Therapy, Pediatric General and Thoracic Surgery Division, Cincinnati Children's Hospital Medical Center (CCHMC), Cincinnati, OH, USA., <sup>2</sup>Department of Biomedical, Chemical, and Environmental Engineering, The University of Cincinnati, Cincinnati, Ohio, USA.

**Objective of the technology:** Open Spina bifida (SB) is a neural tube defect, where the spinal cord is exposed to amniotic fluid and cerebrospinal fluid is leaking generating progressive neural damage and encephalic anomalies. This permanently disabling defect affects 1-2 neonates per 1000 live births. Besides prenatal open fetal surgery repair, innovative minimally invasive approaches involve fetoscopic patch coverage through small trocar ports. Currently used patches need advanced endoscopic surgical skills for positioning at surgical site and not a perfect one exists for this purpose. We developed a novel "smart" patch that accomplishes all optimal characteristics required for this repair, using a blend of biodegradable polymers such as Poly-lactic-acid (PLA) and Poly-ε-caprolactone (PCL), which are widely used as biomaterials.

**Description and Methods:** Both PLA pellets and PCL microspheres were blended to form films. These biomaterials have adjustable porosity, glass transition temperatures (T<sub>g</sub>), and degradation rates with blending. Our study attempts to use PLA/PCL blends as an alternative patch for SB repair, possessing shape memory in addition to water-tightness, biodegradability, and biocompatibility.

# Innovations Session Abstracts

Surface morphology and thermal properties were measured using Scanning Electron Microscope and Differential Scanning Calorimetry respectively. Self-expansion at activation temperature (37°C) would reduce time and difficulty level of sensitive surgery. Patches were synthesized to attain a Tg of 37°C for in-vivo expansion, and surface morphology was probed for properties on cell adhesion.

Liquid water impermeability was measured using the water cup test method.

In-vitro cytotoxicity was studied using flow cytometry, to ensure complete absence of any toxic products in blend films; and cell viability was examined via fluorescence microscopy. Human foreskin fibroblast cells were cultured with and without patch. In-vitro live/dead staining assay for cell viability was carried out.

Subcutaneous implantation in adult rats was conducted to study inflammatory reactions by hematoxylin and eosin (H&E) staining. Lastly, in-vitro degradation was studied in amniotic fluid (AF), with exposure to PBS as time-paired control. Gravimetric and structural changes were tracked for time points of 4/8/12/16 weeks.

**Results:** The ideal formulation had a Tg of  $37.65 \pm 1.17^\circ\text{C}$  and excellent surface finish. Time of uncoiling via shape memory tests was ~55 seconds in dry, and ~3 seconds in water. Liquid water permeability of patch was  $0.000414 \mu\text{Lcm}^{-2}\text{min}^{-1}\text{H}_2\text{O}^{-1}$ , confirming a watertight barrier. Flow cytometry data showed matching percentages of live cells for the control ( $95.70 \pm 1.09\%$ ,  $n=4$ ) and patch ( $95.24 \pm 0.94\%$ ,  $n=8$ ) wells. Fluorescence microscopy images displayed fibroblasts growing on the film, indicating biocompatible surface properties. H&E staining demonstrated the film embedded within tissue, devoid of any signs of inflammation. From the degradation study, films underwent similar weight loss in PBS ( $13.53 \pm 3.12\%$ ) and AF ( $14.91 \pm 2.19\%$ ), after 16 weeks ( $n=6$ ,  $p=0.9122$ ).

**Conclusions:** Beneficial surface characteristics, favorable self-expansion times, watertight barrier and confirmations of biocompatibility, consolidate the validity of blend films as potential patch alternatives for MMC repair. The in-vitro degradation study denotes hydrolytic degradation, which would eliminate need for secondary removal surgery. As future work, mechanical and barrier performance of these patches will be studied in animal models. This technology can be adapted for other endoscopic surgical purposes.

**ISP005 "ZIP TO THE RIB" STERNAL PULL-BACK (ZIP-BACK): INNOVATIVE APPROACH FOR PECTUS CARINATUM. VIDEO.** Gaston Belia-Munzon, MD, Jorge L Martinez, MD, Carolina Millan, MD, Meximiliano Nazar-Peirano, MD, Luzia Toselli, MD, Fernando Rabinovitch, MD, Soledad Valverde, MD, Santiago Calello, MD, Enrique Buela, MD, Horacio Bignon, MD, Marcelo Martinez-Ferro; Fundacion Hospitalaria

**Background:** Minimally invasive surgery for pectus carinatum (PC) has shown to be an effective surgical procedure, although its mayor drawback is implant fixation.

The authors present a new surgical technique for the minimally invasive correction of pectus carinatum using a novel fixation system and a new intraoperative device called "Pectus Compressor".

**Objective:** Presentation step by step of a novel minimally invasive technique.

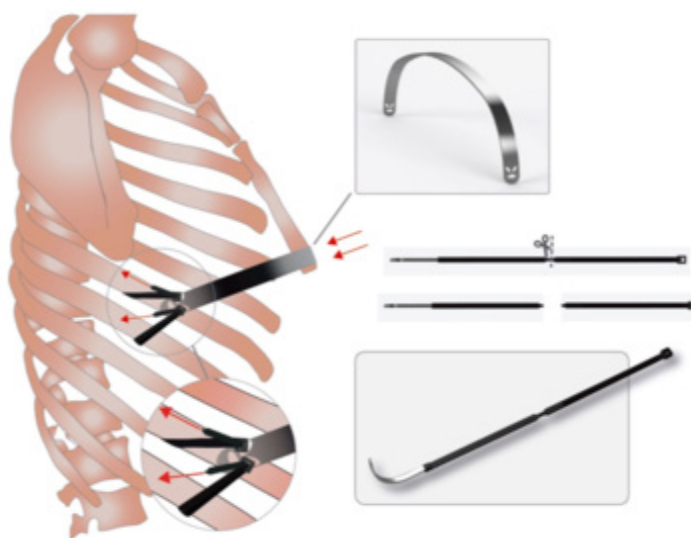
**Before Surgery:** Bar design starts with 3D software processing of the patient's CT scan to produce a 3D plastic printed template. An ambulatory fitting session is scheduled at the pectus-clinic before the final manufacture of a pre-bended/custom-made, personalized metal bar implant.

**Technique:**

- Patient is positioned supine with a roll under the chest for slight elevation.
- The bar entry/exit sites and the position of the ribs that will serve as mooring points are marked.
- Intercostal spaces are selected and bilateral lateral skin incisions are made. Dissection is carried down to the marked ribs.
- A deep submuscular tunnel is created from the anterior aspect of the incision to the highest point of the defect.

# Innovations Session Abstracts

- A medium size pectus introducer is advanced into the subcutaneous tunnel from the right to the left side of the patient.
- An umbilical tape is used to drag the customized bar through the subcutaneous tunnel.
- Specially designed plastic zip-tie sutures are placed around the selected ribs on both sides (avoiding the use of stabilizers and/or lateral fixation plates)
- Zip-ties are passed through specifically designed implant eyelets.
- Downward pressure is applied to the anterior chest wall with a “Pectus Compressor Device” ( specially designed by the authors for this technique) and the zip-ties are fastened (Zip-Back maneuver) providing immediate correction of the defect.
- The incisions are bilaterally closed.



**Conclusions:** Immediate and long-term postoperative results show complete correction of the sternal protrusion with global thoracic re-shaping (flattening & widening). Zip-Back technique is a fast, reproducible and effective minimally invasive surgical procedure for the correction of pectus carinatum.

## ISV006 3-DIMENSIONAL OPTICAL IMAGING FOR EVALUATION OF CHEST WALL DEFORMITIES: MEASUREMENT OF INTER-RATER

**RELIABILITY** Jordan Taylor, MD<sup>1</sup>, Dalia Szafer<sup>1</sup>, Allison Pei<sup>1</sup>, Enrico Danzer, MD<sup>2</sup>, James Wall, MD<sup>2</sup>, Stephanie Chao, MD<sup>2</sup>; <sup>1</sup>Stanford University, <sup>2</sup>Lucile Packard Children's Hospital

**Purpose:** Pectus excavatum and carinatum are two of the most commonly observed chest wall deformities in pediatrics. The standard diagnostic evaluation for these conditions includes either chest radiograph (CXR) or computed tomography (CT). Our research aims to develop a novel and reliable way of quantifying chest wall deformities in the clinic setting without radiation exposure.

**Method:** Using a handheld structured light scanner, we created 3-Dimensional (3D) models of patients with chest wall deformities through an IRB-approved protocol. Raters from a variety of backgrounds were then asked to measure both AP and lateral diameters in patients with pectus excavatum and carinatum utilizing commercially available 3D graphical software. The standard deviation of the measurements and intra-class correlation coefficient (ICC) were then calculated to quantify inter-rater reliability.

**Results:** Five patients with varying degrees of either pectus excavatum or carinatum were imaged in our outpatient clinic using a structured light scanner. Four patients had pectus excavatum, with a mean Haller Index of 4.23 and a range of 2.40 to 6.07. Five raters followed our measurement protocol obtained four measurements per patient, 20 measurements per rater. The standard deviation of all the measurements was 2.2mm. The ICC for absolute agreement was 0.99139, with 1.0 being perfect correlation.

# Innovations Session Abstracts

**Conclusion:** Structured light scanners provide an alternative approach to quantifying chest wall deformities in pediatric patients without radiation exposure. Our protocol for obtaining and measuring chest wall deformities without radiation is highly reliable, even among raters with minimal image processing or 3D modeling experience. Our protocol can potentially be used to track treatment progress in children with chest wall deformities.

**ISP007 LAPAROSCOPIC LIVER RESECTION WITH AUGMENTED REALITY: A PRE-CLINICAL EXPERIENCE** Lung W Lau, MD<sup>1</sup>, Xinyang Liu, PhD<sup>1</sup>, William Plishker, PhD<sup>2</sup>, Karun Sharma, MD, PhD<sup>1</sup>, Timothy D Kane, MD<sup>1</sup>, Raj Shekhar, PhD<sup>1</sup>; <sup>1</sup>Children's National Health System, <sup>2</sup>IGI Technologies

**Background:** Standard laparoscopy cannot visualize anatomy beyond what is present in front of the laparoscope. Intraoperative imaging provides information on sub-surface anatomy, but can only be integrated with the laparoscopic images in the surgeon's mind. Additionally, focus is distracted from the laparoscopy screen to look at ultrasound images on a separate screen. The desire to reduce this distraction and, ultimately, improve intraoperative efficiency has led to the development of a novel, augmented reality (AR) laparoscopic system that integrates real-time ultrasound images with live video. This study provides initial application of utilizing AR in laparoscopic hepatic wedge resection.

**Methods:** The AR system (Figure 1) includes: 1) a standard laparoscopy set (Karl Storz Inc.), 2) a laparoscopic ultrasound scanner (BK Medical Inc.), 3) an electromagnetic tracking system to track the 3D location and orientation of the ultrasound probe and laparoscopy camera (Northern Digital Inc.), and 4) a laptop computer station running image fusion software. After IACUC approval, two liver tumor models were created in a 40-kg swine by percutaneous radiofrequency ablation at two different regions of the liver. Two days post-ablation, the animal underwent non-survival, laparoscopic liver resection. The first tumor model was resected with AR. The second tumor model was resected with laparoscopy and standard intraoperative ultrasound imaging. The overall processes were compared.

**Results:** Anatomic detail from ultrasound was able to be fused with the laparoscopic images in real-time and presented on a single screen (Figure 2). This provided continuous imaging guidance of the resection, allowing the surgeon to correct for depth and direction of resection in real-time without distracting focus from the primary laparoscopy screen. The AR system was reported to be no more difficult to use than standard laparoscopy. The times for resection with and without AR were 7 minutes and 3 minutes, respectively. However, the size of the tumor model resected without AR was smaller (2.5cm vs. 1cm diameter). Gross resection margins of the two resections were considered adequate, with total resection of the coagulated liver parenchyma, grossly equivalent to a solid liver tumor (Figure 3).

**Conclusion:** The use of our AR system in laparoscopic hepatic wedge resections provided real-time integration of ultrasound imaging with standard laparoscopy. The resection with AR took longer. However, given this was our first time experience with using AR technology for resection and the noted difference in tumor size, this time difference was not considered to be significant. This and other metrics will be examined in more detail through our ongoing preclinical testing. Overall, laparoscopic liver surgery performed with Augmented Reality was achievable and successful, and could be used clinically upon further testing.

**ISP008 3D CLOACA IMAGING INNOVATIONS IMPROVE ANATOMIC UNDERSTANDING AND SURGICAL PLANNING** Alessandra C Gasior, DO<sup>1</sup>, Devin Halleran, MD<sup>1</sup>, Jayanthi Parthasarathy, BDSMSPhD<sup>2</sup>, Robert Strouse, MFA<sup>3</sup>, Jeremy Patterson<sup>3</sup>, Carlos Reck, MD<sup>1</sup>, Alejandra Vilanova-Sanchez, MD<sup>1</sup>, Richard J Wood, MD<sup>1</sup>, Marc A Levitt, MD<sup>1</sup>; <sup>1</sup>Center for Colorectal and Pelvic Reconstruction, Nationwide Children's Hospital Columbus OH, <sup>2</sup>Department of Radiology, Nationwide Children's Hospital Columbus OH, <sup>3</sup>Research Information Solutions & Innovation (RISI) The Research Institute at Nationwide Children's Hospital

**Introduction:** Cloacal malformations are complex anomalies that occur when the common urogenital/rectal tract fails to separate. Traditionally, 2D contrast study with fluoroscopy have been used to delineate the anatomy and plan surgical care. Recently 3D imaging has emerged as a promising tool that can improve a surgeon's understanding in many fields, and we hypothesized that it could be used to create custom made anatomically precise models for this purpose in this area of pelvic surgery.

# Innovations Session Abstracts

**Methods:** We assessed the ability of both surgical trainees and faculty to plan a cloaca repair based upon their interpretation of four imaging modalities: (1) 2-D sagittal contrast study with fluoroscopy, (2) 3-D isotopic volume auto-rotating reconstruction using picture archiving and communication system (PACS), (3) a 3d .stl (stereolithography) file (generated from an inferred 1mm coronal plane slices from a CT rotational scan) which allows users to rotate, pan, zoom and otherwise manipulate the complex anatomy in any orientation by using an extensible mesh processing software program (MeshLab) on a workstation and (4) a 1:1 scale physical 3D printed model of the same aforementioned .stl file that the observer can hold and manipulate in their hands. The model was printed using Polylactic Acid (PLA) material and took approximately nine hours to print 0.1 mm thick layers on an Ultimaker 2 3D printer. Questionnaires were used to assess the study participants' understanding of the 2-D and 3-D.

**Results:** 29 trainees and 30 faculty participated in the study. For trainees, the percentage of questions about the cloaca case that they answered correctly for each imaging modality was: 2-D 10.5%, 3-D PACS 46.7%, 3-D Enhanced 67.1%, and 3-D Printed 73.8%. For faculty the percentage of questions answered correctly for each imaging modality was: 2-D 22.2%, 3-D PACS 54.8%, 3D Enhanced 66.2%, 3-D printed 74.0%. Across each modality, there was a significant increase in rates of correctness for both trainees and attendings ( $p < 0.001$ ). Performance for both groups was the lowest for the 2-D imaging and improved as the complexity of the imaging increased. Trainees and faculty had similar levels of correct answers about the cloacaogram when analyzing the more advanced modalities.

**Conclusions:** Mental visualization skills of anatomy and complex 3-D spatial arrangements traditionally have taken years of experience to master. We have shown that newly available imaging innovations of 3-D reconstruction and printed models allow surgeons to make significant strides in their comprehension of intricate cloacal anatomy which can allow them to achieve a higher level of preparedness for surgery. The benefit was more pronounced for trainees, which allows us to conclude that if these imaging techniques are utilized, there may be a shallower learning curve for less experienced surgeons.

# Poster Session Abstracts

**P001 EDUCATION ON ENDORSURGERY THROUGH SIMULATION. EXPERIENCE AT A TRAINING CENTRE AT A PEDIATRIC HOSPITAL** Juan Ignacio Chichizola, MD, Marcela Bailez, MD, Hsien Yang, MD, Georgina Falcioni, Silvia Fontenla, Inst, Patricia Martinez, Lic; Pediatric Hospital Professor Doctor J.P. Garrahan

**Introduction.** Since 2013 Garrahan Children's Hospital has developed progressive skill training in MIS Simulation Hands-On Courses in three levels of proficiency: basic, advanced and neonatal. Mastering intracorporeal suturing and knot-tying taught in the basic course gives manual dexterity. Improvement in their MIS performance was evaluated using an experience-survey 3 months after each course

**Objective.** Our aim is to analyze an objective parameter of the learning curve by measuring the time taken to make a complete extracorporeal and intracorporeal knot.

**Materials and Methods.** The participants get access to a virtual educational platform and supervised training in the surgical simulation center. The step by step instructions of how to make the knots is standardized. We measured the timing to perform 2 knots (extracorporeal Roeder and intracorporeal Square Knot) before and after a mean of 10 hours of specific practice with mentoring. We compared the performance of 2 groups of participants: residents and surgeons. The statistical analysis was made using REDCap database platform and the STATA statistical program.

**Results.** From March of 2013 to September 2016, 130 students (pediatric surgery residents and attendings) participated in the basic courses. The timing of 62 and 99 participants for Roeder and Square Knot, respectively was obtained at the beginning and after the course.

Mean Time	Pre-Course	After-Course
<b>Extracorporeal Roeder Knot</b>	356,27 seconds (IC 95%: 306,70-405,84 seconds)*	233,26 seconds (IC 95%:200,2-266,3 seconds)**
<b>Intracorporeal Square Knot</b>	550,42 seconds (IC 95%: 483,85-616,99 seconds)+	284,19 seconds (IC 95%: 258,83-309,55 seconds)++

Reduction in the timing of Roeder and Square knots was calculated in 34,52% and 48,36% respectively.

For the Roeder knot, the attendings (n=23) performed an average of 343,56 seconds for the first knot and 226 for the second one, while residents (n=39) did an average of 363,76 seconds and 237,48 seconds for the first and second knot respectively. In both cases there was time markdown close to 34%, the difference between both groups was not statistically significant ( $p=0.1921$ ).

The result was slightly different when the variable regarding the Square Knot was analysed. The drop down of the average time of the residents (n=62) was 50,26% (from 574,98 seconds to 285,96 seconds) while the reduction was of 44,78% (from 509,27 seconds to 281,21 seconds) in the group of attendings (n=37). However, this difference was not statistically significant either ( $p=0.4542$ ).

**Discussion.** Making surgical knots is a basic but high value skill. One of the goals of our endosurgical skill training courses is to reduce the stressful learning curve by the acquisition of a correct technique with a standardized coaching. Although the training does not aim at the reduction in the time in which the knots are made, it is taken as an objective measurable parameter and has shown a homogeneous drop down in the timing reflecting the reproducibility of our teaching technique.

**P002 LAPAROSCOPIC DIAMOND ANTRODUEDENOSTOMY FOR POST-CORROSIVE PYLORIC CICATRIZATION; A NOVEL APPROACH.** Hamed M Selem<sup>1</sup>, Ahmed MK Wishahy<sup>2</sup>, Moemen M Farouk<sup>2</sup>, Mohamed Elseoudi<sup>2</sup>, Wissam Mohamed<sup>2</sup>, Ayman H AbdElsattar<sup>2</sup>, Ahmed E Fares<sup>3</sup>, Shereif N Kaddah<sup>2</sup>, Gamal Eltagy<sup>2</sup>; <sup>1</sup>Tanta Univerity, <sup>2</sup>Cairo University, <sup>3</sup>Fayoum University

**Background:** Traditionally, Billroth I procedure or bypass gastrojejunostomy were the recommended approaches for management of post corrosive complete gastric outlet obstruction (GOO), meanwhile, Heineke Mickulicz pyloroplasty was recommended for moderate mucosal injury with partial obstruction. In the presented study, laparoscopic antroduodenostomy was carried out as an alternative approach, for cases with complete pyloric obstruction.



# Poster Session Abstracts

**Patients and methods:** Between January and August 2017, four children were referred to Pediatric Surgery Department, Cairo University Hospital, with the consequences of strong caustic ingestions (one potash, three chloracetic acid). Isolated pyloric cicatrization was evident in 3 cases, meanwhile synchronous insult to thoracic esophagus and pylorus was manifest in the fourth case. Laparoscopic diamond antroduodenostomy was done for the presented cases. Laparoscopic feeding jejunostomy completed the procedure for the case with esophageal stricture.

**Results:** Four cases with post-corrosive GOO were approached with laparoscopic diamond antroduodenostomy. Patients' ages at operation were 1yr 2m, 1yr 6 m, 1yr 9m, 5 yr, weighing 6.2 kg, 8 kg, 7 kg, 22 kg, respectively.

Operative time was 81 min on the average. Contrast study 24hr postoperatively assured no radiologic leaks in the presented cases, where enteral feeding was gradually commenced, and patients discharged home a day later.

After a mean follow up of 24 weeks, neither recurrence of obstructive symptoms nor dumping was displayed. Cosmetic outlook inherent to the minimally invasive approach was appreciated by the parents.

**Conclusion:** Laparoscopic diamond antroduodenostomy is a feasible approach for management of post-corrosive pyloric cicatrization. It allowed early enteral feedings, with no dumping symptoms, in addition to the fundamental advantages of minimally invasive surgery.

**Key words:** corrosive, gastric outlet obstruction, laparoscopy, antroduodenostomy.

**P003 LAPAROSCOPIC DRAINAGE OF PANCREATIC PSEUDOCYST IN CHILDREN: REPORT OF 2 CASES** Isabel Canon, MD, Ana Garces, MD, Julian Castellanos, MD, Carolina Giraldo, MD, I D Molina, MD; Fundacion Hospital la Misericordia, Bogota, Colombia

Pancreatic pseudocyst (PC) may have developed as a result of pancreatitis, trauma or obstruction of the pancreatic duct. Its diagnosis and treatment in children are still controversial. They require drainage in symptomatic cases and decide which is the best option for each case is a challenge.

**Purpose:** The aim of this report is to present the experience of single incision laparoscopic drainage of symptomatic pancreatic pseudocyst in children.

**Methods:** A case report of two children treated with laparoscopic drainage for pancreatic pseudocyst in 2016 was conducted. A 3 and 15 -year-old boys diagnosed with a PC. First case was blunt trauma due to child abuse and second case related with severe alcoholic pancreatitis. The time of pseudocyst development was 3 and 5 weeks. A contrast enhanced CT scan confirmed 10 and 12 cm PC respectively.

**Results:** Single incision transumbilical laparoscopic was performed in both cases. In the second case also had endoscopic treatment failed before laparoscopic approach. The hanging maneuver was used to suspend the previous stomach wall in order to exposed pseudocyst. The drainage was realized and to Jackson Pratt left in the pseudocyst cavity. Octreotide was given for a week and oral intake was resumed 7 postoperative day. They had complete resolution of symptoms and none recurrence in a mean follow-up period of 6 months.

**Conclusions:** laparoscopic drainage is a safe and effective treatment associated with low morbidity, rapid recovery and low recurrence. Randomized controlled trials that compare percutaneous, laparoscopic and endoscopic management should be made to determine the best therapeutic option in pediatric cases.

# Poster Session Abstracts

**P004 LAPAROSCOPIC DUODENOJEJUNOSTOMY FOR SUPERIOR MESENTERIC ARTERY SYNDROME** Vanessa Medina, MD, Fernando Fierro, MD, Juan Valero, MD, Ivan Molina, MD; Universidad Nacional de Colombia

Superior mesenteric artery syndrome (SMAS) is a rare cause of upper intestinal obstruction in children, caused by compression of the third part of the duodenum between the abdominal aorta and the superior mesenteric artery. Diagnosis is made by radiologic findings such as: dilated duodenum and stomach, compression of the duodenum by the superior mesenteric artery and aortomesenteric angle less than 20 degrees. Children present with postprandial emesis, abdominal pain, abdominal distension and often with malnutrition.

We present a case of a 10 years old female child, who developed postprandial fullness, abdominal distension and pain, accompanied by nausea and occasional vomiting, with radiological diagnosis of SMAS. She was initially treated conservatively, but had no adequate response. We performed a laparoscopic duodenojejunostomy with mechanic anastomosis between the third part of the duodenum and the jejunum. The postoperative period was uneventful and the patient was discharged with normal digestive tolerance.

Several surgical treatments including duodenojejunostomy and division of the ligament of Treitz with mobilization of the duodenum have been suggested for SMAS. We present laparoscopic duodenojejunostomy in a pediatric patient, with successful result. Other reports come from adult publish. We consider this procedure safe and resolute and it should be considered a treatment choice in children.

**P005 ESOPHAGEAL STENT IN REFRACTORY STRICTURE AFTER ESOPHAGEAL ATRESIA REPAIR** Irene Isabel P Lim, MD<sup>1</sup>, Paresh C Shah, MD<sup>1</sup>, Howard B Ginsburg, MD<sup>2</sup>; <sup>1</sup>New York University Langone Health, <sup>2</sup>New York University Langone Health, Hassenfeld Children's Hospital

**Introduction:** Anastomotic strictures after esophageal atresia repair occur in approximately one third of patients, with some studies quoting rates as high as 60% depending on the approach. The management of such strictures includes a course of esophageal dilatation. Adjunct therapies such as steroid injection and mitomycin C have been utilized, but are usually ineffective. Esophageal stents have been used in the pediatric population, but the majority of those reported were placed for caustic strictures that failed to resolve after more than 5 dilatations. We report the use of an esophageal stent in an infant with a persistent anastomotic stricture after esophageal atresia repair.

**Case Report:** The patient is a 16 month old female born at 35 weeks gestation with a prenatal course complicated by pre-eclampsia, polyhydramnios and preterm rupture of membranes. She weighed 1600 grams at birth and was found to have esophageal atresia with tracheoesophageal fistula after an orogastric tube coiled in the esophagus (Figure 1a). She underwent primary repair at day of life 2 via a right thoracotomy. The distal esophageal segment was extremely narrow. A primary anastomosis was performed with ligation of the fistula. She was started on feeds on postoperative day (POD) 7, but was noted to be aspirating on POD 17 secondary to an anastomotic stricture (Figure 1b). She underwent a total of 16 esophageal dilations, each with initial success, but eventually the stricture recurred despite maximal antireflux therapy (Figure 1c). The stricture, measuring 2 centimeters in length, was resected eight months after primary repair and an esophago-esophagotomy was performed; however, she subsequently developed another anastomotic stricture (Figure 1d) two months later and required seven additional dilatations. At 16 months of age, she underwent serial dilation of the persistent stricture (Figure 2a) up to a 32-French dilator, followed by placement of a 12mm x 70mm Alimaxx-ES fully covered esophageal stent (Figure 2b-c). The stent was removed after 5 weeks (Figure 2d) and the patient continues to tolerate an appropriate diet.

**Conclusion:** We report the use of an esophageal stent in refractory esophageal stricture after esophageal atresia repair. Stents in children should be considered more frequently, particularly for cases of persistent esophageal strictures.

# Poster Session Abstracts

Figure 1.

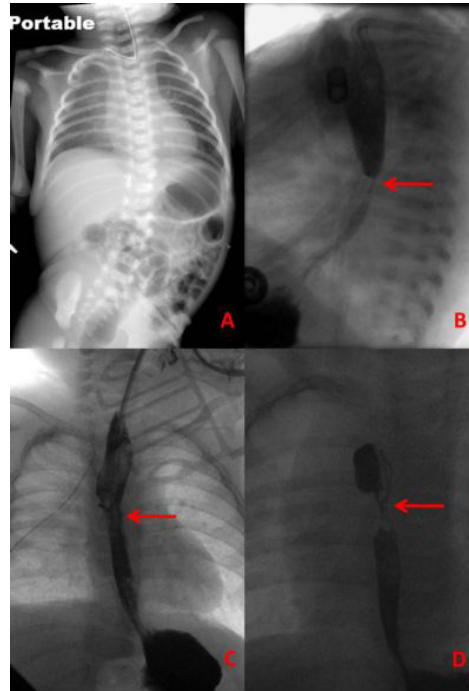
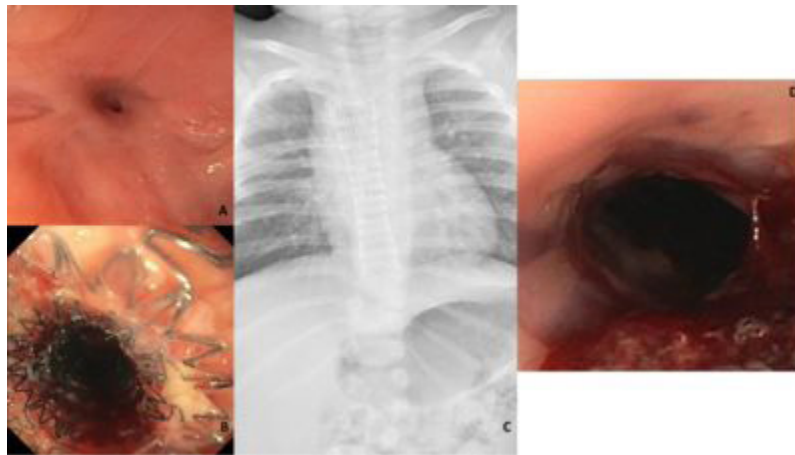


Figure 2.



**P006 THE PREDICTORS FOR POSITIVE YIELD ABDOMINAL COMPUTED TOMOGRAPHY IN PEDIATRIC ABDOMINAL TRAUMA** [Abdulrahman Alzahem, MBBS, MS, FRCSC<sup>1</sup>](#), [Soundappan SV Soundappan<sup>2</sup>](#), [Daniel T Cass<sup>2</sup>](#); <sup>1</sup>King Saud University, <sup>2</sup>University of Sydney

**Objectives:** Abdominal computed tomography (ACT) utility in the initial evaluation of pediatric abdominal trauma (PAT) is liberal in most instances. The aim of this study was to identify the predictors for a positive yield ACT scan in this population.

**Methods:** A prospective, cohort, single center observational study was conducted at Children's Hospital at Westmead, New South Wales, from January 2008 to June 2015 on 240 pediatric abdominal trauma patients who underwent ACT. Clinical, laboratory, imaging, and interventional variables were explored with univariate and multivariate analyses.

# Poster Session Abstracts

**Results:** Out of 240 patients, positive ACT scans were found in 161 (67%) patients, 112(47%) had intraabdominal injury (IAI), and 20 (8%) patients required invasive therapeutic interventions. Mortality rate was 1.7% (4 patients) due to non-abdominal causes. Multivariate analyses revealed that increasing age (OR 1.12, 95% CI: 1.02 - 1.24, P=0.024), high injury severity score (ISS) (OR 1.14, 95% CI: 1.07 - 1.21, P<0.001), abnormal abdominal examination (OR 5.95, 95% CI: 2.08 - 17.01, P=0.001), elevated ALT >125 IU/L (OR 46.28, 95% CI: 2.81-762.49, P = 0.007), abnormal pelvic radiograph (OR 14.03, 95% CI: 2.39 - 82.28, P=0.003) , presence of gross hematuria (OR 4.14, 95% CI: 1.04- 18.23, P=0.044) , low initial hematocrit level <30% (OR 8.51, 95% CI: 1.14 - 63.70, P=0.037) , and positive FAST (OR 2.61, 95% CI: 1.01-7.28, P=0.048) remained significantly associated with abnormal ACT scan. In contrast, those who required scanning of other body region(s) were less likely to have abnormal ACT scan (OR 0.34, 95% CI: 0.14, 0.86, p =0.022).

**Conclusions:** Integrating the abdominal examination findings, relevant laboratory values and FAST results with the clinicians' suspicion may aid in stratifying patients for ACT scan. Further efforts should be made to decrease number of normal ACT scans; yet not to increase the number of delayed or missed injuries with its inherent morbidity and mortality.

**Keywords:** Pediatric Abdominal Trauma; Computed Tomography; Intraabdominal injury

**P007 LAPAROSCOPIC REPAIR OF HIATUS HERNIA IN INFANTS** Lishuang Ma, Cuizhu Feng, Ying Wang, Yanxia Zhang, Chao Liu, Yandong Wei, Zhen Chen, Jingna Li, Simiao Yu; Capital Institute of Pediatrics, Peking University Teaching Hospital

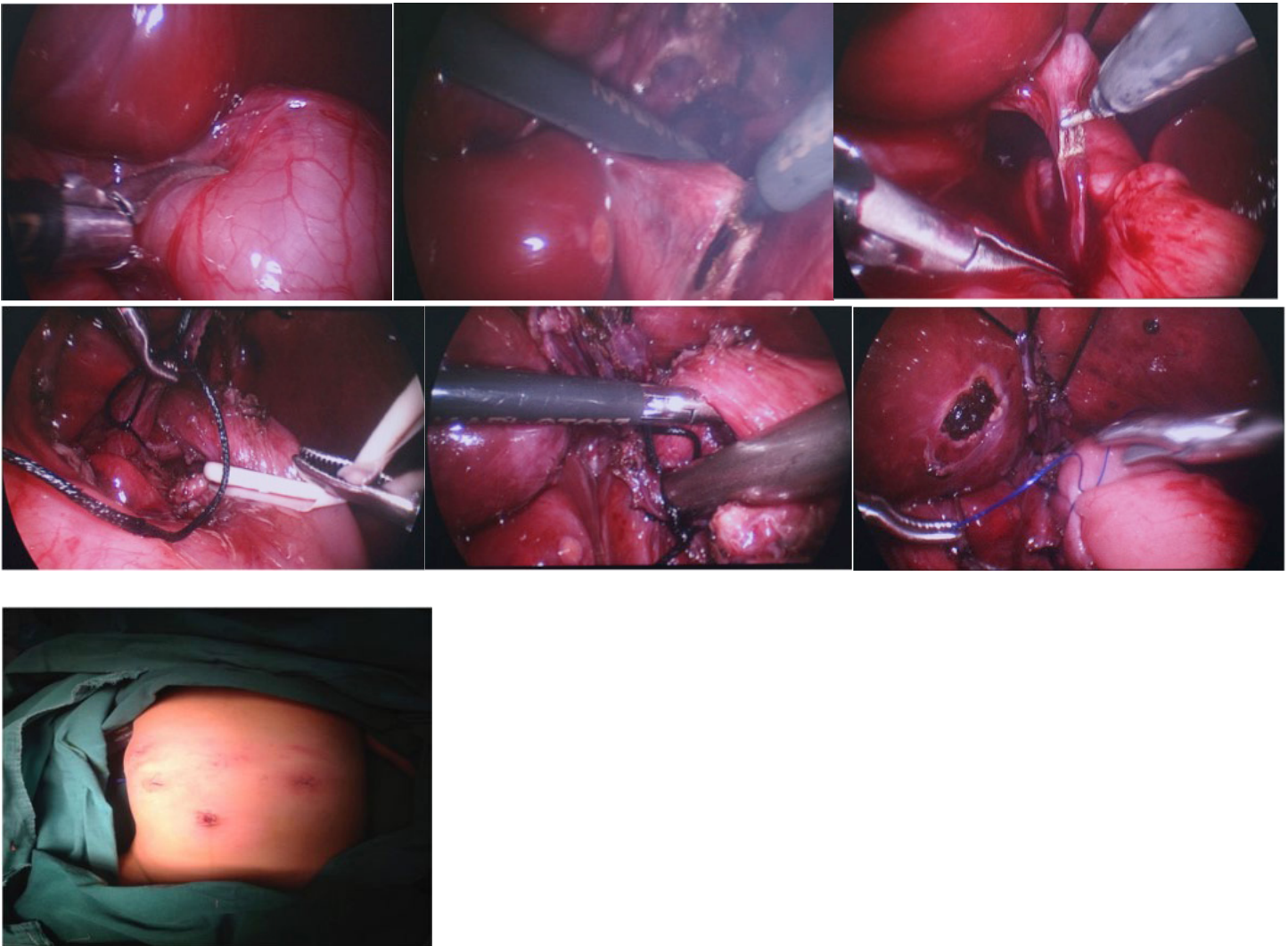
**Objective** To investigate the safety and efficacy of the laparoscopic repair of hiatus hernia in infants.

**Methods** Esophageal hiatus repair and Nissen fundoplication was performed in 42 infants with hiatal hernia during February 2006 to May 2017. Three cases were diagnosed as congenital diaphragmatic hernia by prenatal ultrasonography at 27 weeks, 32 weeks, and 38 weeks gestational age respectively. Their diagnoses were confirmed by gastrointestinal contrast radiography after birth. One of the three patients, whose gastrointestinal contrast radiography showed the signs of paraesophageal hernia, volvulus of stomach and gastroesophageal reflux, were performed laparoscopic repair 22 hours later after birth. Some patients underwent extra operations for other problems complicated with hiatus hernia: 1 patient underwent laparoscopic Ladd's operation for intestinal malrotation; 1 underwent laparoscopic pyloroplasty for delayed gastric emptying; and 1 had laparoscopic hernia sac ligation for right inguinal hernia. Two cases occurred complications of gastroesophageal reflux disease, vomiting, repeated pneumonia and losing weight during the conservative treatment from the age of 6 months. Before operation, gastroscopy examinations were done showing esophageal mucosa cicatricial stenosis and diverticulum.

**Results** The patients were successfully performed laparoscopic esophageal hiatus repair and Nissen fundoplication except 1 converted to open surgery. The youngest patient was only 2 hours after birth. The mean operation time was 122 min(100 min-210 min). The mean blood loss was 5ml(1-10 ml). Feeding started at 24~48 h after surgery. The average postoperative hospital stay was 6.5 days(4~12days). Thirty six patients were followed up from 1 month to 10 years. One patient vomited in the 6th day after operation, and was improved after gastric motility medicine treatment( Domperidone).The recurrence of hiatus hernia was found in 2 patients at 1 and 1.5 years after operation, and cured after the second laparoscopic hiatus hernia repair.

**Conclusions** Laparoscopic repair for infant hiatus hernia is safe and effective. And it can be used during the secondary surgery of the recurrent cases. Paraesophageal hernia and mixed hiatus hernia should be operated early without symptoms. Surgeons should be experienced in laparoscopic operations.

# Poster Session Abstracts



**P008 COMPARISON OF THE LAPAROSCOPIC AND OPEN METHODS OF GASTROSTOMY AT NEONATES AND INFANTS** Yury Kozlov, PhD<sup>1</sup>, Polina Baradieva<sup>1</sup>, Konstantin Kovalkov<sup>2</sup>, Vladimir Novozhilov, PhD<sup>1</sup>; <sup>1</sup>Children's Hospital Irkutsk, <sup>2</sup>Children's Hospital Kemerovo

**Background:** Gastrostomy is a common procedure in children. We report dates of the comparison two methods of insertion of gastrostomy tubes with using laparoscopy (group I) and open surgery (group II).

**Materials and methods:** Between January 2002 and December 2016, we have performed 90 operations of laparoscopic insertion gastrostomy tubes and 44 operations with using laparotomy. The two groups were compared for patients demographics, operative report and postoperative outcomes.

**Results:** There were no statistical differences in the demographics parameters of patients between the two groups. The mean operative time in Group I was 21,95 min. In contrast, the mean duration of the operation in the Group II was 37,84 min ( $p < 0,05$ ). The mean time to beginning and time of full enteral feeding for patients with laparoscopic approach were shorter in group laparoscopy (8,39 hours vs 19,64 hours; 18,81 hours vs 34,27 hours;  $p < 0,05$ ). Shorter mean postoperative hospital stay were registered in patients after using of laparoscopy I (13,97 days vs 29 days;  $p < 0,05$ ). The reliable difference was found in the analysis of minor postoperative complications (13,33% vs 68,81%;  $p < 0,05$ ).

**Conclusions:** Laparoscopy is a simple and effective method of gastrostomy which provides fast postoperative recovery of patients and allows to reduce number of postoperative complications in small babies.

# Poster Session Abstracts

**P009 MIS MANAGEMENT OF FOREGUT DUPLICATION CYSTS: 11 CASES REPORT AND LITERATURE REVIEW** Kuiran Dong, MD, Xianming Xiao, Shan Zhen, Gongbao Liu; Children's Hospital of Fudan University

Foregut duplication cysts are rare congenital cystic masses that may induce various symptoms. Complete surgical resection is the standard treatment. We retrospective our treatment experience of 11 cases of foregut duplication cysts, 6 in MIS group compare with 5 cases of none MIS group.

For MIS group: 6 cases of foregut duplication cysts were dignosed between 2014.1~2016.12. aged from 2month ~ 4years, with 4 male and 2 females.

One case was at upper mediastinum with serous upper airway obstruction, need intubation and ventilation. Three were at the hilum of the esophagus and course vomiting. And 2 cases was under the diaphragm with asymptom. The MIS management ( 4 thoracoscopic and 2 laproscopic ) were carried out for these cases successfully.

For open surgery group: 5 other forgut duplication cysts between 2010.1~2013.12 were also retrospected. In these cases, 3 at mediastinum, 2 at the diaphragm. Open operation were carried out, and there were one case of esophagus rupture, one case of gastric rupture during the operation.

Compare with open surgery, MIS management for the foregut duplication cysts can reduce the complications such as esophagus rupture, injury vigus nerve, mediastinum infection. For the upper one third of the esophagus with Respiratory distress thoracoscopic surgery could salvage the life.

**P010 AN UNNECESSARY SURGICAL REFERRAL: ASYMPTOMATIC UMBILICAL HERNIAS BEFORE THE AGE OF 3, A COST ANALYSIS** Sophia Abdulhai, MD, Karen Skerlong, Todd A Ponsky, MD; Akron Children's Hospital

**INTRODUCTION:** Most pediatric surgeons defer repair of an umbilical hernia until at least 3 years of age. Despite this, pediatricians still regularly refer asymptomatic umbilical hernias to pediatric surgeons below this age. This study will evaluate the incidence of these unnecessary referrals and charges associated with them.

**METHODS:** A retrospective chart review was performed on every umbilical hernia patient below age 3 who presented to our pediatric surgical clinic from April 2011-June 2017. Any patient with multiple diagnoses or history of incarceration was excluded. Age, size of defect, associated symptoms, physical findings, and visit charge were obtained. Data were analyzed using descriptive statistics and Chi2 test.

**RESULTS:** Total of 282 patients were included in the study, of which 240 patients (85%) did not undergo an umbilical hernia repair. Of the 42 that were repaired, 22 had a proboscoid, 9 had a defect greater than 2cm, and 15 had a defect less than 1cm. Those with a proboscoid and a defect greater than 2cm were 3.1 ( $p=0.001$ ) and 10.6 times ( $p<0.0001$ ) more likely to undergo a repair, respectively. History of pain, skin discoloration, and diastasis recti were not associated with higher likelihood of repair.

Average charge for an umbilical hernia surgical clinic visit at our hospital was \$180.66, which resulted in \$7,226.40 total charges per year of unnecessary referrals. This data was extrapolated to national data, and resulted in \$998,234.91 per year of charges for unnecessary umbilical hernia referrals.

**CONCLUSION:** The majority of asymptomatic umbilical hernia surgical referrals under the age of 3 do not lead to surgery (85%), and result in direct charges of \$7,226.40 per year to our hospital, and approximately \$998,234.91 to the nation. This only reflects direct charges, and does not take into account indirect costs, such as patient travel and surgeon's time that could have be used to see another patient.

# Poster Session Abstracts

**PO11 LAPAROSCOPIC PYLOROMYOTOMY: A SINGLE CENTER EXPERIENCE** Mahmoud Elfiky, MD, Ahmed Ezzat, Khaled Hussein, MD, Gamal ElTagy, MD; Cairo University

**Aim:** To report our short and intermediate outcome with Laparoscopic Pyloromyotomy for Infantile Hypertrophic Pyloric Stenosis.

**Materials and Methods:** A Prospective Case-Control study of 50 infants of whom 25 cases underwent Laparoscopic Pyloromyotomy (LP) and the rest underwent Classic Ramstedt Pyloromyotomy (CP) through right upper quadrant incision. LP cases were performed using a 3-mm retractable myotomy knife. After proper preoperative preparation and correction of general status, patients underwent either procedure. Perioperative data was recorded and compared between the two groups.

**Results:** Male to Female ratio 2.3:1. Mean age 53 days (29-52 days). Mean Operative time for LP was  $19.5 \pm 8.27$  minutes vs.  $14.6 \pm 2.79$  minutes for CP ( $p=0.024$ ). There was a mucosal perforation case and an inadequate Pyloromyotomy case that required redo surgery in LP group. One single case of wound site infection occurred in CP group. All complications were effectively handled with minimum morbidity.

Oral feeding was started regularly for all patients 6 hours postoperatively. Infants achieved full feeding with mean 20.56 hours (range 18-30) for the LP group and mean of 21.76 hours (range 18-36) in CP group.

Patients were followed up to 6 months with no further complications and superior cosmetic results for LP group.

**Conclusion:** Laparoscopic Pyloromyotomy is a safe procedure with minimal morbidity and excellent cosmetic results. Complications and operative times decrease as experience increases.

**PO12 FAST-TRACK PATHWAY FOR NON-COMPLICATED PEDIATRIC APPENDICITIS UTILIZING A SINGLE DEDICATED PRE- AND POST-OPERATIVE UNIT** Angela M Kao, MD, Tanu Prasad, MA, Trudy L Marks, BSN, RN, CPN, Labron Chambers, MD, B. Todd Heniford, MD, Graham H Cosper, MD; Carolinas Medical Center

**Introduction:** Fast-track pathways have reduced length of stay (LOS) following surgery in many adult series. Fewer studies in the pediatric population have utilized a standardized protocol that adopts components from the enhanced recovery after surgery (ERAS) bundle described in the adult population. The purpose of this study was to evaluate the implementation of a perioperative, nurse-driven protocol in a single, dedicated pre- and post-operative unit for pediatric patients with non-complicated appendicitis.

**Methods:** A multidisciplinary team of physicians and nurses implemented a quality improvement project to standardize perioperative care for non-complicated pediatric appendicitis in a 240-bed children's hospital. Areas for improvement were identified and included preoperative patient/parent education, standardized antibiotic regimen, urinary catheter utilization, multimodal analgesia, postoperative narcotic use, early mobilization, early feeding, nursing-initiated discharge, and telephone follow-up at one and seven days. To eliminate unnecessary patient transfers and decrease resource utilization, a designated pre- and post-operative unit for fast-track pathway patients was created. The unit was adjacent to the operating room and staffed by nurses trained in ERAS. Fast-track patients were compared to a historical cohort of patients prior to pathway initiation. Primary outcomes included total hospital LOS and postoperative LOS.

**Results:** Seventy-seven patients with non-complicated appendicitis were admitted from June 2016 to October 2017 with implementation of a fast-track pathway in June 2017. Twenty-one patients were treated after the initiation of the fast-track pathway, compared to 58 control patients. Demographics, presenting symptoms, and operative times were statistically similar, with all receiving laparoscopic appendectomy. Compared to pre-intervention patients with variable antibiotic dosing, fast-track patients received standard dosing of 3rd generation cephalosporin and metronidazole in 61.9% (vs. 12.1%,  $p<0.0001$ ). Use of intraoperative urinary catheter decreased from 43.1% to 19.1% ( $p<0.05$ ). In the designated recovery unit, use of multimodal analgesia regimen decreased intravenous narcotic use from 86.2% to 61.9% ( $p<0.02$ ). Nurses in the designated unit facilitated ambulation and feeding within 2 hours after surgery in all pathway patients. Twenty of 21 pathway patients (95.2%) were discharged home from the recovery room either within 8 hours of surgery (66%) or immediately after morning rounds. Six patients were not discharged within 8 hours only due to time of day (between midnight-0700). Mean total hospital LOS decreased from  $27.9 \pm 15.8$  to  $13.8 \pm 7.3$  hours ( $p<0.0001$ ). Postoperative LOS was reduced in fast-track patients ( $20.1 \pm 11.9$  vs.  $7.3 \pm 5.1$  hours,  $p<0.0001$ ), with no difference in postoperative complications or readmissions.

# Poster Session Abstracts

Compared to 100% of pre-pathway patients, only two of 21 pathway patients(9.5%) chose follow-up in the office. The remaining 19 patients(90.5%) received follow-up via nursing telephone calls at 24 hours and 7-10 days after discharge, minimizing cost and burden to the patient and office.

**Conclusions:** Initiation of a fast-track protocol for pediatric patients with non-complicated appendicitis significantly reduces total hospital and postoperative LOS. Other benefits include standardization of education, antibiotic use, and follow-up with decreased narcotic use and resource utilization. Creation of a designated physical unit for pre- and post-operative patients, staffed by nurses trained in ERAS, greatly facilitates these goals. Research into the fast track appendicitis protocol remains ongoing along with other common surgical diagnoses.

**PO14 A RARE INTRAMURAL EXTRAHEPATIC BILIARY HEMANGIOMA PRESENTING AS OBSTRUCTIVE JAUNDICE IN CHILDHOOD** Brett C Parker, MD<sup>1</sup>, Benjamin Tabak, MD<sup>2</sup>, John McGrath, MD<sup>2</sup>, John Butch, MD<sup>1</sup>, Anthony Savo, MD<sup>2</sup>; <sup>1</sup>University at Buffalo, <sup>2</sup>Women and Childrens Hospital of Buffalo

**Introduction:** Primary extrahepatic biliary hemangioma is an extremely rare finding. Hemangiomas are benign, relatively common tumors in infancy. They are typically found in the liver and are asymptomatic. Biliary obstruction is a less common complication, but has been reported on rare occasion from mass effect of tumors located in the porta hepatis or pancreas (2,3,4). We present an unusual case of intramural extrahepatic biliary hemangioma which presented with high-grade obstruction of the common bile duct in an otherwise healthy child.

**Case Report:** A 3-year-old Caucasian child was admitted to the pediatric service for worsening scleral icterus and dark colored urine. His laboratory evaluation was significant for leukocytosis, conjugated hyperbilirubinemia, transaminitis, and elevated gamma-glutamyl transferase. Magnetic resonance cholangiopancreatography demonstrated a severely stenotic common bile duct (CBD) and cystic duct, with dilatation to the level of the porta hepatis, along with anomalous drainage of a right posterior hepatic duct. No intra-abdominal mass was identified. An endoscopic retrograde cholangiopancreatography (ERCP) was performed, which confirmed long segment stenosis of the distal CBD, however brush biopsy of the CBD was unsuccessful due to difficulty crossing the stricture. After successful resolution of the patient's jaundice via a percutaneous transhepatic biliary drain (PTBD), he underwent elective laparoscopic cholecystectomy, excision of the CBD, and hepaticoduodenostomy. He was discharged home on postoperative day three, and returned two weeks later for removal of the PTBD. Pathology demonstrated a rare benign vascular neoplasm consistent with hemangioma involving the wall of entire common bile duct and gallbladder.

**Discussion:** A review of the literature revealed scarce reports of benign hemangiomas presenting with obstructive jaundice. In 1977, Tunell reported a juvenile hemangioendothelioma of the pancreas obstructing the common bile duct and duodenum(3). In 1990, Maksimak et. al. described the first patient with extrahepatic hemangioendothelioma of the biliary tree(6). In 1995, Hase et. al. published a case of benign hepatic hemangioma of the porta hepatis causing obstructive jaundice which spontaneously regressed after 20 months of percutaneous transhepatic drainage(2). In 2010, Terui et. al. reported the first kaposiform hemangioendothelioma involving the choledocus, treated with hepatopertoenterostomy(5). In 2013, Dr. Szavay et. al. described a juvenile hemangioma at the hepatic hilum, which similarly caused obstruction of the biliary tree down to the level of the CBD, which was successfully resected with hepaticojejunostomy(4).

We elected to perform a laparoscopic hepaticoduodenostomy, as opposed to hepaticojejunostomy, as we postulated that endoscopic surveillance and future biliary interventions would be easier via this reconstructive approach, which could have been necessary given the uncertainty of the diagnosis at the time of operation. Several unique factors prevented the diagnosis of benign biliary hemangioma prior to surgery in this case. Firstly, there was no solid tumor mass, which precluded a percutaneous or surgical biopsy. Secondly, the high-grade stenosis in the common bile duct prevented endoscopic brush biopsy. However, surgical resection provided a definitive and rapid treatment to the problem. Alternative therapies including observation, beta-blockers, radiation, and steroids may not have effectively alleviated the obstruction, and could have resulted in a prolonged treatment course, or additional complications.



# Poster Session Abstracts

## **P015 MODIFIED LAPAROSCOPIC BILIARY ENTERIC ANASTOMOSIS FOR CONGENITAL CHOLEDOCHAL CYST: CLINICAL REPORT OF 9 CASES** Lei Huang, MD, Bin Jiang, Bin Sun; Department of General Surgery, Children's Hospital of Nanjing Medical University

**Purpose:** To report our experience with a modified laparoscopic biliary–enteric anastomosis procedure for the surgical treatment of congenital choledochal cysts.

**Methods:** Between January 2016 and September 2017, 9 children (6 boys, 3 girls; ages, 31–118 months) with congenital choledochal cysts were treated with our modified laparoscopic surgical procedure in our hospital. All of these patients had type I cysts.

**Results:** The average operation duration was  $229.5 \pm 73.5$  min. The time until first flatus and resumption of oral diet were  $26.5 \pm 4.0$  h and  $5.5 \pm 0.5$  d, respectively. The mean postoperative hospital stay was  $11.5 \pm 2.5$  d. Postoperative complications occurred in three patients: postoperative bleeding (1 patient) and bile leakage (2 patients). follow-up to nowadays (2–22 months), one case of occasional abdominal pain was found. Contrast agent reflux was detected on upper gastrointestinal imaging in this children. All children had good nutrition.

**Conclusion:** The modified laparoscopic biliary–enteric anastomosis is a safe, simple, and new technique. However, longer follow-up and a larger sample size are necessary to prove its efficacy in the treatment of congenital choledochal cysts.

## **P016 INITIAL EXPERIENCE IN PIRS TECHNIQUE FOR INGUINAL HERNIA REPAIR IN CHILDREN** Eduardo Perez Etchepare, Mónica Tirado, Laura Velazquez, Gema Barrientos, Paolo Bragagnini, Chelsy Lasso, Mario Gómez; Hospital Universitario Nuestra Señora de Candelaria

**BACKGROUND:** Since percutaneous internal ring suturing (PIRS) technique was described for the treatment of inguinal hernias, it has gained popularity between minimally invasive pediatric surgeons during the few last years. We describe our initial experience in PIRS technique and evaluate the efficacy of percutaneous internal ring suturing for inguinal hernia repair in boys.

**MATERIALS AND METHODS:** Between February and October 2017, we performed percutaneous internal ring suturing in 27 boys (ages 21 days–14.5 years) with 37 inguinal hernias. All the procedures were performed under general anesthesia. Under laparoscopic-guided vision an 18-gauge epidural needle with a monofilament nonabsorbable thread (polidioxanona) inside the barrel of the needle was placed through the abdominal wall into the peritoneal cavity. By moving the injection needle, the thread passed under the peritoneum around the entrance into the hernia sac. The monofilament thread was used to pass an Ethibond 2/0 or 3/0 in reverse traction. The knot was tightened from outside and placed in the subcutaneous space. The contralateral open inguinal ring was checked it up and closed in the same way when the persistent peritoneo-vaginal duct was found.

**RESULTS:** The average operative time was 25 minutes for unilateral cases and 34 minutes for bilateral hernias. In the first 5 cases the medium operative time was 40 minutes and 55 minutes in unilateral and bilateral cases respectively. Follow-up ranged between 1–7 months. Cosmetic results are excellent with almost invisible scars. There were 2 cases of intraoperative complication: 1 incidental puncture of the iliac vein and 1 incidental puncture of epigastric vein. Both were treated with external compression, successfully. There was 1 case of hernia recurrence and was reoperated with percutaneous internal ring suturing. There were no hydroceles observed postoperatively.

**CONCLUSION:** The PIRS technique is feasible and effective minimally invasive procedure with excellent cosmetic results. Laparoscopic approach allows to ensure the presence or absence of contralateral pathology. According to our initial experience, the learning curve is short. In fact, we believe that this procedure is technically reproducible for young surgeons in laparoscopic training.

# Poster Session Abstracts

**P017 LAPAROSCOPIC RESECTION OF MESOBLASTIC NEPHROMA IN PREMATURE NEWBORN: FIRST CASES REPORTED IN COLOMBIA** Sergio Zavaleta, MD<sup>1</sup>, Ebenezer Cruz, MD<sup>2</sup>, Claudia Pinto, MD<sup>3</sup>; <sup>1</sup>Hospital Universitario De Santander, Colombia, <sup>2</sup>Hospital General Naval De Alta Especialidad, Mexico, <sup>3</sup>Clinica Materno Infantil San Luis, Bucaramanga Colombia

**INTRODUCTION:** Congenital Mesoblastic Nephroma (CMN) is a rare tumor, it counts for 3.5% of all pediatric renal neoplasms. It is associated with prematurity, polyhydramnios and neonatal hypertension. Primary radical nephroureterectomy is the treatment of choice and an excellent prognosis has been seen. In recent years the laparoscopic approach for selected cases of kidney tumors has shown potential benefits provided oncological principles are carefully followed. There are few cases reported in Latin America literature.

**OBJECTIVE:** To present the first two cases of preterm newborn with CMN treated by Minimal Invasive Surgery in Colombia.

## CASE PRESENTATION:

### Case 1.

Male preterm newborn of 30 weeks of gestation diagnosed at birth by palpable abdominal mass in the right flank, confirmed by nuclear magnetic resonance showing heterogeneous intrarenal tumor of 46x31x40mm. Surgical resolution was a right radical nephroureterectomy by laparoscopy at 26 days of life and 1.8kg of weight, after offset an episode of neonatal sepsis. Hematuria, hypertension and metabolic alterations were discarded in the complementary approach.

### Case 2.

Male preterm newborn of 34 weeks of gestation with prenatal diagnosis of right renal tumor confirmed at birth with ultrasound, identifying an intrarenal lesion of 37x33x31mm. At first week of life hypertension was diagnosed and treated with amlodipine, no other alteration in a complementary approach was found. Right radical nephroureterectomy was performed by laparoscopy, when hypertension was controlled, at day 10 of life with 2.4 kg of weight.

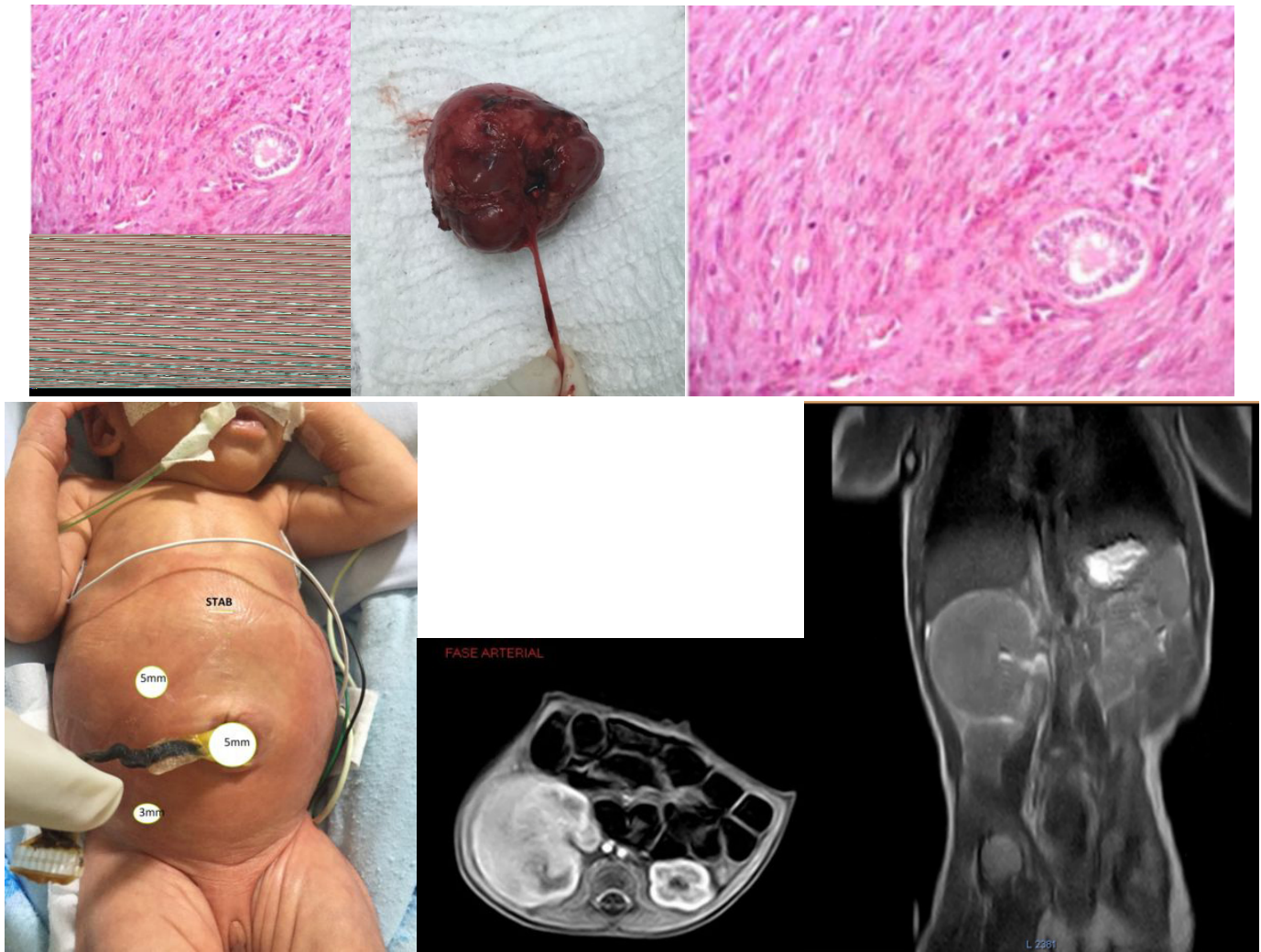
**SURGICAL TECHNIQUE:** After general anesthesia, orogastric and urinary tube placed, patients are positioned at 45° with the contralateral iliac crest near the edge of the surgical table. The surgeon, assistant, and the nurse in the left-side of the patient in front of the monitor located to the right of the surgical table. Three laparoscopic ports were placed; and 1 stab incision for liver retractor. Told's fascia was dissected to the hepatic angle with bipolar energy. After releasing right colon and moving it medially, retroperitoneum was exposed and we continued with a Kocher maneuver to mobilize the duodenum and visualize vena cava; after this maneuver renal hilum was exposed. We identify renal vein and artery, dissected and divided them with Ligasure 5mm bipolar energy. The adrenal gland was included in the tumor, dissection was completed and the distal ureter was ligated using extracorporeal suture with polyglactin 4.0. Continued the exploration of the retroperitoneum extracting 1 node in each case without identifying other lesions. The surgical specimen was removed in a bag through umbilical retractor.

**RESULTS:** Patients were extubated in the first 12 hours PO with favorable evolution, went home on the 10th and 6th postoperative days respectively. Histopathological studies confirmed Classical Mesoblastic Nephroma and paracaval ganglion without lesions. At follow-up at 14 and 18 months respectively there is no evidence of relapses.

**CONCLUSION:** Laparoscopic Nephroureterectomy is effective in achieving the same steps as in an open approach according to oncological principles. The approach in neonates can be considered by trained surgeons in selected cases.



# Poster Session Abstracts



**P018 MEXICAN TELEMENTORING IN PEDIATRIC LAPAROSCOPY** Ricardo Alba, PhD, Daniela Gonzalez, Student; Morelos Childrens Hospital

**Introduction:** telementoring or telemedicine (TM) is term for a computer or device with the technology that allows the exchange of medical information from one place to another via telecommunications. The aim of this paper is to explore the use of telementoring for surgical education in pediatric laparoscopy.

**Material and Methods:** A systematic review of telementoring in pediatric laparoscopic surgery, and a retrospective transverse review of surgeries performed with telementoring at our institution from February 2015 to February 2017 was performed, we reviewed in all the surgeries : type of communication, characteristics of surgery ,time and complications, technological and technical difficulties, devices used and characteristics of each surgery with well-established challenges and goals for each.

**Results:** ITU defines a standard for determining whether the computer can communicate properly and handle the data load sufficiently. Warns clear regulations for sound, video, video streams in parallel and data encryption. Patient safety, confidentiality and privacy were considered.

# Poster Session Abstracts

Five methods for transmitting data during videoconferencing are available today: Satellite communication, Internet Protocol (IP) based communication, Digital Network Integrated Services (ISDN), and mobile phones of 3rd and 4th generation (4G). 2 congenital diaphragmatic hernia, duodenal atresia 1, 1 choledochal cyst, 2 splenectomies, 2 appendectomies, 2 inguinal hernias, and 4 cholecystectomies: 14 surgeries with telementoring successfully completed in laparoscopy. In a period from February 2015 to February 2016. With times between 30 min and 240 min. In all surgeries we achieved proper communication, which produced no interruption of any kind.

**Conclusion:** Although it is a small number of cases, analysis and initial assessment of this technology of distance communication in the operating room suggests it may be extremely useful in increasing surgical experience in minimally invasive surgery in pediatrics.

## **P019 INANIMATE MODEL FOR TRAINING THORACOSCOPIC REPAIR OF ALL VARIETIES OF LEFT CONGENITAL DIAPHRAGMATIC HERNIA AND EDUCATIONAL STRATEGY.** Maximiliano Maricic, MD, Maria Marcela Bailez, MD; GARRAHAN CHILDREN'S Hospital

We present a new low-cost model designed for training skills and strategies for thoracoscopic repair of left congenital diaphragmatic defects. We will present guidelines for making this type of models, the educational strategy that we use in our advanced training models, the defects that can be trained, and the scope of the model, and combination with innovative ideas from authors from other countries used in our model.

**Materials and method:** The model consists in a plastic 3D printed left ribcage, extracted from a 3 month baby CT scan combined with simulated mediastinal structures, diaphragm, bowel, lung and spleen made of latex, silicone and polyester sponge respectively. Self-adhesive film is used as parietal pleura. A removable part (spare part) represents the last three ribs where the diaphragm is partially inserted, and a base as the upper abdomen is assembled to the left ribcage (ribs 1 to 9). Abdominal viscera are placed in this base. Cost of materials is u\$150.

The model is meant to simulate the most frequent diaphragmatic defects such as type A, B and C, with or without sac, but other rare defects also can be simulated. Live animal tissues as diaphragm or intestine also can be used, as already been published by other authors.

**Conclusions:** With this model we reinforce the concept of low cost, but with a high precision simulation, included within a standardized training program in minimally invasive neonatal surgery is a very useful tool. We believe that these models allow trying new technologies and surgical techniques in addition to training.

## **P021 PIGTAIL CATHETER DRAINAGE SAVES TIME IN THE TREATMENT OF CONGENITAL LOBAR EMPHYSEMA; PRESENTING A NOVEL APPROACH** Haluk B Güvenç, MD<sup>1</sup>, Nevin Hatipoglu, MD<sup>2</sup>; <sup>1</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Surgery, <sup>2</sup>Health Sciences University, Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Infectious Diseases

**Aim:** Congenital lobar emphysema (CLE) is a rare entity, where deficient development of cartilaginous tissue in the bronchus is said to create a ball and valve mechanism, which leads to progressive over-inflation of the affected lung by preventing the evacuation of air. Emergency surgical lobectomy is reported as the only treatment for CLE with severe respiratory distress. Here in we report a critically ill infant, initially treated by pigtail catheter insertion, avoiding an emergency surgical intervention.

**Methods and Material:** A 4 - month - old male infant presented to emergency care room with complaints of restlessness and dyspnea. His leukocyte count (19,130/mm<sup>3</sup>) and C-reactive protein (CRP) values were elevated (6.34 mg/dL). A 16 - Fr chest drain tube was inserted following a chest radiograph which resembled massive pneumothorax on the left. He was treated as presumptive sepsis and lower respiratory infection with antibiotherapy (vancomycin and cefotaxime) pending blood culture result. The child was transferred to intensive care unit and reconsulted for persistent image during control X -ray. Computerized tomography scan of thorax showed a well-defined, thin-walled giant solitary air-filled space (70x60x40 mm) in the upper lobe of the left lung with no evidence of rupture. The inflated lobe herniated into the right side of the chest and displaced the mediastinum. The patient was intubated since his clinical status gradually deteriorated (pH=7.16, BE=0.6 mmol/L, PCO<sub>2</sub>=68 mmHg, HCO<sub>3</sub>=23.4 mmol/L) with decreased breath

# Poster Session Abstracts

sounds on the left. In the operating theater, an 8 - Fr pigtail catheter was inserted under ultrasound guidance by pushing the trocar and catheter until reaching the cavity which was confirmed by intraoperative fluoroscopy. The procedure was accomplished under complete aseptic measures and proper general anesthesia, ready to convert an open thoracotomy. Patient's condition gradually recovered following successful tube drainage (pH=7.34, BE=2.7 mmol/L, PCO<sub>2</sub>=53.6 mmHg, HCO<sub>3</sub>=26.6 mmol/L). Subsequent chest X-ray showed decompression of the lobe and recovery from shifting. His blood and endotracheal cultures remained sterile; leukocyte and CRP levels returned to normal. Pigtail catheter showed continuous air leak and he eventually underwent an elective operation after completion of antibiotherapy for lower respiratory infection in the following week which revealed a left upper CLE.

**Conclusion:** Operative procedure is critical in infants with CLE, since even induction by anaesthetist may lead to progressive increase in amount of trapped gas further worsening the condition of the patient. Until appropriate timing for surgery during management of comorbid conditions, such as treating for infection, we advocate initial use of pigtail catheter drainage in infants with CLE enabling a rather safe and elective operative condition.

## **P022 MINIMALLY INVASIVE REPAIR FOR BOCHDALEK CONGENITAL DIAPHRAGMATIC HERNIA: LESSONS FROM 35 CASES** Mohmed I El sawaf, Prof, Mohamed A Arafa, MD; Tanta University Egypt

**Background:** Congenital diaphragmatic hernia has traditionally been repaired via laparotomy. More and more reports on thoracoscopic and laparoscopic repair are being published. Management of Congenital diaphragmatic hernia is a major challenge. Prognosis is depended on associated anomalies, the severity of pulmonary hypoplasia, pulmonary hypertension and iatrogenic lung injury associated with aggressive mechanical ventilation. The aim of the study was to evaluate the early outcome of minimally invasive surgery on neonatal and late presenters with Bochdalek congenital diaphragmatic hernia.

**Methods:** Between January 2014 to June 2017, 35 patients with posterolateral CDH were admitted of whom 27 (77%) cases were repaired thoracoscopically and 8 (23%) cases were repaired laparoscopically. Results In thoracoscopic group we succeeded to do primary repair in 24 cases and only 3 cases were converted to open laparotomy. The mean age was  $3.80 \pm 7.93$  months. Recurrence occurred in 3 cases; all are left sided in neonatal period. As regard mortality; 3 cases died, all are neonatal presenters with mild Pulmonary hypertension, one of them in the first day after operation due to circulatory failure and the other 2 cases on 20 days & 37 days postoperatively due to septicemia. In laparoscopic group, in 5 cases we successfully completed primary repair and 3 cases were converted to open laparotomy. The mean age was  $8.87 \pm 5.19$  months. There was no recurrence or mortality.

**Conclusion:** Thoracoscopic repair for Bochdalek CDH is feasible and safe. It could be indicated for selective newborn patients as well as late presenters. Laparoscopic repair of Bochdalek CDH seemed to be safe and feasible for late presenters of CDH patient but in neonatal presenters it is difficult and risky and should be avoided. Neonatal presenters of CDH with low ventilatory index less than 500 and no pulmonary hypertension are best candidates for thoracoscopic repair.

## **P023 ROLE OF LAPAROSCOPY IN PARA OVARIAN CYSTS IN CHILDREN** Malgorzata Grochot, Bartosz Bogusz, Marcin Maslanka, Gorecki Wojciech, PhD; Department of Pediatric Surgery, University Children's Hospital of Cracow, Jagiellonian University

**Background:** Paraovarian tumors constitute 10 % of pediatric adnexal pathology, but are rarely correctly diagnosed preoperatively. The possible first manifestation resulting from adnexal torsion leads to an urgent intervention. Intraoperative diagnosis, especially of a large mass or displaced adnexal structures, may be challenging. The negligible risk of malignancy in children allows for laparoscopic management in the majority of cases.

**Aim:** To present a large series of single center pediatric paraovarian tumors, examine their salient features and address the diagnostic and management considerations.

**Material and Method:** A retrospective case series of 34 girls who underwent surgery for paraovarian tumors between January 2000 and October 2017.

# Poster Session Abstracts

**Results:** The presenting symptoms were adnexal torsion (n=17, 50%), symptomatic adnexal mass without torsion (n=16) and giant abdominal cyst (n=1). All paraovarian tumors but one were correctly identified by meticulous intraoperative evaluation. Adnexal sparing surgery was performed in 33 patients and adnexectomy was undertaken in one.

**CONCLUSIONS:** Laparoscopy should be the first method of treatment in every case of adnexal mass in children. Correct identification of paraovarian cyst is the key to appropriate management and adnexal preservation during surgery. It hinges on a high index of suspicion and on meticulous inspection.

**P024 IDIOPATHIC OVARIAN TORSION CASE SERIES OF RARE PEDIATRIC PATHOLOGY** Bartosz Bogusz, MD, Malgorzata Grochot, MD, Piotr Soltysiak, PhD, Krzysztof Solecki, MD, Wojciech Górecki, Prof; Department of Pediatric Surgery, University Children's Hospital, Jagiellonian University Medical College, Kraków,

**Background:** Ovarian torsion is an uncommon cause of acute abdominal pain in children. The main risk present pathological adnexal masses. Only 9% of all episodes in the pediatric group concern ovaries without underlying pathology. Adnexal torsion requires prompt diagnosis and management, allowing to avoid further damage of the ovary and ovarian tube. The clinical presentation can be misleading and can mimic other pathologies. Abdominal ultrasound present a diagnostic modality helpful in establishing the diagnosis, but its sensitivity and selectivity is not as high in case of idiopathic torsion, as in case of pathological ovarian mass. Laparoscopic detorsion of the affected structure is the standard treatment preventing further adnexal damage.

**Aim:** Presentation of case series of patients with surgically confirmed idiopathic ovarian torsion.

**Material and method:** Retrospective analysis of medical history of patients with idiopathic ovarian torsion treated in the Department of Pediatric Surgery, of the University Children's Hospital of the Jagiellonian University Medical College in Kraków, from January 1, 2013 to October 1, 2017.

**Results:** Medical records of 10 patients (6 months to 17 years of age) with idiopathic ovarian torsion treated in our Department within the analysed period were identified. The only common symptoms on admission were abdominal or pelvic pain of acute onset and nausea. Ultrasonographic examination, performed in 7 cases and CT scan in 1 revealed unilateral ovarian enlargement and oedema. Seven patients were managed by laparoscopy with 1 conversion. One patient was treated by laparotomy. There were no negative surgical inspections. Oophoropexy was performed in 3 cases, while 4 children were treated only with detorsion of the adnexes. The levels of ovarian tumor markers (AFP, HCG and CA-125) were sampled before surgery and the results were normal. There was no observed recurrences.

**Conclusion:** In case of suspected adnexal torsion, prompt laparoscopic verification should be performed always, if the torsion cannot be definitely excluded. Detorsion is the treatment of choice regardless of the features of ovarian ischaemia. Oophoropexy doesn't seem to be mandatory in case of the first episode of torsion, if the contralateral ovary is preserved and normal.

**P025 MANAGEMENT OF OVARIAN MASS IN ACUTE ABDOMEN SURGERY: PRESERVING THE OVARIAN TISSUE** Alejandra Ríos Rubio, MD, Francisca Moreno, MD, Constanza Harding, MD, Miguel Guelfand, MD; Universidad de Chile

**INTRODUCTION:** Ovarian torsion is a surgical emergency that accounts for up to 2,7% of acute abdominal pain in the pediatric emergency department, mostly due to the presence of ovarian mass. First recommendations suggested to treat ovarian mass emergencies with oophorectomy despite the intraoperative aspect because of the risk of underlying malignancy, among other factors. Recently, a conservative management is preferred with post-surgical ultrasound control. Our aim is to evaluate the rate of benign pathology in ovarian mass emergency and it's long term follow-up.

**MATERIALS AND METHODS:** We conducted a retrospective study in which all patients with the diagnosis of acute abdomen secondary to ovarian pathology admitted to our hospital from January 2011 to December 2016 were included. Their charts were reviewed searching for average presentation age, symptoms, surgical approach, intraoperative ovarian description, biopsy result (if taken) and post-operative complications.

# Poster Session Abstracts

**RESULTS:** In 6 years, 28 girls underwent emergency surgery for ovarian pathology at an average age of 12 years (8-14 yrs). 14 laparoscopic, one of them converted because of size, 14 were laparotomy through pfannenstiel (6), Rockey Davis (2) and mid-line (2). Of the 28 patients, 21 had conservative management and 7 underwent ooforectomy and/or salpingectomy. Twenty-one patients had biopsy taken intra-operative, from which 6 were mature teratomas, 5 were follicular cysts, 5 were paraovarian cysts, 2 were corpus luteum cysts, 1 was a dermoid cyst, 1 was an ovarian cyst and 1 was necrotic salpinx. In a mean follow-up of 2,7 years (0,2-6 yrs), 3 patients had reappearance of cysts with new episodes of acute pain requiring surgery, one of them with anexectomy because of extension to uterine tube,

**CONCLUSIONS:** Most of ovarian pathologies that require emergency surgery are due to benign pathology with few latter complications, in our case none were malignant. We suggest a preservative management instead of traditionally oophorectomy as the procedure of choice to conserve reproductive and hormonal function in girls in ovarian acute abdomen surgery, and suspicion of underlying malignancy should not determine ovarian extirpation.

**P026 OVARIAN RECONSTITUTION FOLLOWING LAPAROSCOPIC DECAPSULATION OF CONGENITAL CYST** Mohannad Alghammas, MD, Jumanah Ajawi, MD, Osama Bawazeer, MD, Nadeem Kawaser, MD, Muayad Al Farsi, MD, Anies Mahomed; King Faisal Specialist Hospital & Research Center

**Background:** Laparoscopic management of congenital ovarian cysts is an established management strategy. These lesions present as either simple or complex cysts with no macroscopic or radiologically detectable underlying gonad. There is scant information on the final status of the gonad where conservative surgical options such as, laparoscopic decapsulation, are utilized.

**Aim:** To assess the recovery potential of gonads following laparoscopic decapsulation of congenital ovarian cysts

**Method:** Two term infants with antenatally detected abdominal cysts measuring 54 x 55 x 53mm and 45 x 33 x 43 were subjected to laparoscopic decapsulation following a period of observation (3 to 6 months) and exclusion of malignancy (alpha fetoprotein and B HCG).

Management involved initial camera guided percutaneous needle aspiration of the cysts followed by detorsion and laparoscopic decapsulation. Approximately 50% of the cysts wall were excised utilizing a combination of endoshears and hook diathermy (video). The thickened base of the cysts contiguous to the vascular pedical were left intact.

**Result:** Histology confirmed evidence of functional cysts. Post operative convalescence was smooth and serial ultrasound scans at 6 and 12 months post intervention confirmed resorption of residual cyst elements with complete restitution of both ovaries (images).

**Conclusion:** This paper provides the first objective evidence of ovarian salvage following conservative surgery. This approach and outcome make a firm case against ablative surgery and non-intervention as both carry significant risk of gonadal forfeiture.

Additionally, with this strategy, diagnosis and treatment are prompt and tissue for histology is invaluable for dispelling concerns over malignancy.

## Reference:

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# Poster Session Abstracts

**P027 PRIMARY FOWLER-STEPHENS LAPAROSCOPIC ORCHIDOPEXY: A SINGLE SURGEON EXPERIENCE** Paul Noh; Cincinnati Children's Hospital Medical Center

**Objective:** Laparoscopic orchidopexy has been performed with variable success. Intraoperative decision making includes choosing a primary procedure preserving the gonadal vessels versus performing a Fowler-Stephens orchidopexy. In an effort to simplify decision making and reduce operative interventions, a single stage Fowler-Stephens laparoscopic orchidopexy (FSLO) was routinely performed to manage high undescended testes. The aim of the study was to assess a single surgeon experience with this approach.

**Methods:** A prospective analysis was performed starting in March 2012 of primary single stage FSLO as the sole procedure for an intraabdominal testis. Exclusion criteria was a long looping vas deferens into the inguinal canal. Postoperative outcome for success was based on scrotal position without atrophy, assessed by physical examination.

**Results:** A total of 31 patients were identified, with 15 right, 18 left, and 2 bilateral FSLO (37 testes). Concomitant procedures were performed in 11 cases. Median age and weight at the time of surgery were 13 months (range 8 - 138) and 10 kg (range 6.2 to 44.4), respectively. Median laparoscopy video time was 30 minutes (range 17 - 58) for unilateral procedures. Median follow-up was 6 months (range 1 - 65), with 1 patient lost to follow-up. One atrophy was noted, with 35/36 testes in the scrotum without atrophy.

**Conclusions:** Single stage FSLO can be safely utilized as the primary approach for high undescended testis, with the potential for a higher success rate than laparoscopic orchidopexy preserving gonadal vessels.

**P028 TRANSUMBILICAL SINGLE INCISION TWO-PORT LAPAROSCOPIC VARICOCELECTOMY IN ADOLESCENTS** Xiaoyan Feng, MD, Long Li, MD, PhD, Chunsheng Hao, MD; Pediatric surgery department, Capital Institute Pediatric

**Background:** Varicocele is the most common cause of surgically correctable infertility in adolescents. Though the ideal surgical technique for adolescent varicocelectomy remains controversial, many institutions claimed the safety and efficacy of laparoscopic correction of varicocele. We present a modified laparoscopic technique for the treatment of clinically significant varicocele.

**Objective:** In this study we assess the feasibility and safety of transumbilical single site two-port laparoscopic varicocelectomy for adolescents.

**Methods:** Consecutive 16 pediatric patients (aged 8 to 17 years) presenting with clinically significant varicocele between Jan 2014 and Sep 2016 were considered for laparoscopic varicocelectomy. Laparoscopic varicocelectomy was performed with transumbilical single-incision placement of two ports. Two 2-0 silk sutures were used to ligate the spermatic vessels in a nonartery sparing technique.

**Results:** Sixteen clinically significant varicocele were identified in 16 patients, all of which were ligated with this technique. Mean operating time was 39 minutes (range, 20-60). Twelve hours post operation, the varicocele disappeared. All patients were discharged from surgery unit and returned to their regular physical activity within 2 to 3 days after surgery. Upon clinical follow up at 6 months to 3 years post-surgery, there was no evidence of varicocele recurrence, testis atrophy or persistent hydrocele formation, and no obvious surgical scars were observed.

**Conclusions:** Our single incision two-port laparoscopic varicocelectomy is feasible and effective in adolescents. This technique is comparable to previously described laparoscopic approaches, with even less operating time and better cosmetic effect. However, sufficient laparoscopic skills are required to master this technique.



# Poster Session Abstracts

**P029 ENDOSCOPIC TREATMENT OF UROTHELIAL TUMOURS IN CHILDHOOD CASE REPORTS AND REVIEW OF THE LITERATURE** Frank-Martin Haecker, MD<sup>1</sup>, Elisabeth Bruder, MD<sup>2</sup>; <sup>1</sup>Pediatric Surgery, University of Basel, <sup>2</sup>Institute of Medical Genetics and Pathology, University Hospital Basel

**Purpose:** Bladder lesions like urothelial carcinoma are rare in the first two decades of life and seldom require biopsy or cytology examination.

**Methods:** We describe clinical presentation and diagnostic procedures as well as endoscopic treatment and follow-up of two patients who presented with dysfunctional voiding symptoms. We performed a retrospective analysis of our database searching for keywords such as bladder neoplasia – bladder lesion – urothelial neoplasia - children. A review of the literature was performed to analyze recommendations concerning diagnostic staging, treatment and follow-up examinations as well as surveillance of urothelial tumours in the pediatric population.

**Results:** Both patients presented with an urothelial tumour and were treated successfully by endoscopic resection. Screening the pathology database of the Institute of Medical Genetics and Pathology of the University Hospital Basel between 1988 and 2014 yielded 284 samples involving the urinary bladder, 110 autopsies, 135 biopsies and 42 cytology specimens. Of these, most samples originated from malformations and inflammation. Only five were tumours: two were urothelial tumours and three were rhabdomyosarcomas. The majority of specimens comprised resections of diverticula or distal ureter.

Among the urothelial tumours, one was a papillary urothelial neoplasm of low malignant potential (PUNLMP). The tumour was investigated by FISH, where a 9p21 deletion was found. The second tumour like lesion was a fibroepithelial polyp arising from the bladder neck.

**Conclusions:** Bladder tumours in children are rare and mostly consist of urothelial and mesenchymal neoplasms. Rhabdomyosarcoma is the most common malignant bladder tumour in childhood. In urothelial neoplasms, similar to adult urothelial neoplasms, also in childhood, loss of 9p21 is implicated. General treatment protocols including recommendations for staging, tumour markers, and follow-up examinations are not yet available for this tumour entity in the pediatric population.

**Key words:** bladder neoplasia, bladder lesion, urothelial neoplasia, PUNLMP, children

**P030 POSTERIOR EXTRA PERITONEAL LAPAROSCOPIC ADRENALECTOMY FOR CHILDREN WITH ADRENAL TUMORS** Ahmed E Fares, PhD<sup>1</sup>, Gamal El Tagy<sup>2</sup>, Shref Kadah<sup>2</sup>, Ahmed Kadry, MD<sup>2</sup>, Hamed Sleim, MD<sup>3</sup>; <sup>1</sup>Fayoum University, <sup>2</sup>Cairo University, <sup>3</sup>Tanta university

**PURPOSE:** Retroperitoneal laparoscopy provides a direct access to the retroperitoneal cavity is an interesting approach to adrenal gland surgery. We report our initial experience with retroperitoneal laparoscopic adrenalectomy to determine its efficacy for children with adrenal tumor.

**MATERIALS AND METHODS:** Between July 2015 and March 2017, we have performed 7 adrenalectomies by the extra peritoneal laparoscopy.

in 3 girls and 4 boys with unilateral adrenal tumor less than 5cm who were 3 to 7 years old (mean age 5.6 years). Preoperative diagnosis was virilizing tumor in 3, feminizing tumor in 1, Cushing syndrome in 2, and masculinizing adrenal tumor in 1 patient.

The operations were performed with the patients were placed in prone position and 3 trocars were positioned. The retroperitoneal space was created bluntly by the index finger through a 10 mm skin incision, and the retroperitoneal space was insufflated with carbon dioxide at the pressure of 15 to 20 mmHg. Dissection of the adrenal gland and adrenal vein was performed by Ligasure. The completely freed adrenal gland was enclosed in a bag and extracted through the middle trocar and the wounds were closed.

**RESULTS:** We removed 6 right and 1 left adrenal glands successfully. Average tumor size was 34 mm. (range 24 to 52). Average hospital stay was 2.1 days (range 1 to 3). Blood loss was minimal. There was no intraoperative complication. Postoperative analgesic requirements were moderate. Conversion to open surgery was not necessary. The morbidity rate was low, with no mortality.

**CONCLUSIONS:** Retroperitoneal adrenalectomy is associated with excellent clinical results. It is a reliable, safe and effective technique. At our institution retroperitoneal laparoscopy is becoming the standard adrenal surgery approach for tumors less than 5 cm.

# Oral (Scientific Session Abstracts)

**V001 LAPAROSCOPIC-ASSISTED ANORECTAL PULL-THROUGH FOR HIGH IMPERFORATE ANUS IN A FEMALE** [Sophia Abdulhai, MD](#)<sup>1</sup>, Steve Rothenberg, MD<sup>2</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Rocky Mountain Hospital for Children

**INTRODUCTION:** This video describes the successful use of Laparoscopic-Assisted Anorectal Pull-through (LAAP) in a 3-month-old female, status post diverting colostomy on day of life 2, with a high imperforate anus seen on a distal stomagram.

**METHODS:** LAAP was performed with a 4-mm infraumbilical camera port and two 3-mm working ports in the right and left lower quadrants. The procedure was started by opening the peritoneal reflection, and dissecting out the distal rectal pouch using blunt dissection and a bipolar energy device. The dissection was continued distally directly on the rectum until the rectum was seen attaching to the lower half of the vagina, indicating a likely rectovaginal fistula that was not seen on her stomagram. A 5-mm stapler was used to separate the distal rectum from the vaginal directly on the vaginal wall, so to avoid creating a diverticulum. The middle of the sphincter complex was identified using a transcutaneous electrostimulator, and a 1 cm perineal incision was created over this. A Veress needle was placed through the middle of the sphincter complex into the abdomen under laparoscopic visualization, and dilated up to a 10-mm trocar. A clamp was placed through the 10-mm trocar to pull the rectum into the anus in the middle of the sphincter complex. The anocutaneous anastomosis was then created. The procedure was completed by placing hitch stitches between the rectum and the sacrum bilaterally, to prevent future rectal prolapse.

**RESULTS:** The patient tolerated the procedure well and was started on anal dilations at 1 month post-operatively and underwent a colostomy takedown at 6 weeks post-operatively.

**CONCLUSION:** LAAP can successfully be used in a female with a high imperforate anus. The advantages of LAAP are it allows for minimal perineal dissection, it preserves the distal rectum, and allows for accurate placement of the rectum in the middle of the sphincter complex.

**V002 THORACOSCOPIC RESECTION OF LARGE THYMIC CYST EXTENDING INTO THE LEFT NECK** [Sophia Abdulhai, MD](#), Scott Boulanger, MD, Avraham Schlager, MD; Akron Children's Hospital

**INTRODUCTION:** This video shows a total thoracoscopic resection of a large thymic cyst extending into the left neck in a 15 month old male.

**METHODS:** Our patient was found to have a mediastinal mass with right tracheal deviation on chest x-ray while undergoing workup for a cough. He underwent a CT chest that showed a large cystic mass, an echocardiogram that ruled out cardiac involvement, and an MRI that showed a large cystic mass in the right lobe of the thymus directly abutting the superior vena cava (SVC), left brachiocephalic vein (L BCV) and ascending aorta. It was also seen extending into the left neck splaying out the left internal jugular vein and left common carotid artery. He was taken for a right thoracoscopic mediastinal mass excision. He was placed in the supine position with a bump under his right side. The procedure was performed with a 5-mm camera port and three 3-mm stab incisions. The procedure was started by dissecting the cyst from the anterior chest wall using a combination of blunt dissection and electrocautery. The cyst was seen directly abutting the phrenic nerve, SVC, and L BCV laterally. The excision was carried out circumferentially staying directly on the cyst to avoid injury to surrounding structures. After freeing up the cyst distally, the cyst was then mobilized proximally and freed up from the left neck. The cyst was removed through one of the stab incisions and a right chest tube was placed at the end of the procedure.

**RESULTS:** The patient tolerated the procedure well. His chest tube was removed on postoperative day 2 and he was discharge home on postoperative day 4. The final pathology returned as a thymic cyst.

**CONCLUSION:** This video shows a successful thoracoscopic resection of a large thymic cyst extending into the left neck.

# Oral (Scientific Session Abstracts)

**V003 MANAGEMENT OF VARIATIONS IN CHOLEDOCHAL CYST ANATOMY DURING LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION IN CHILDREN** Ashwin Pimpalwar, MD<sup>1</sup>, Danielle Severns<sup>2</sup>; <sup>1</sup>Division of Pediatric Surgery, Department of Surgery, University of Missouri and Children's Hospital University of Missouri, Columbia, Missouri, <sup>2</sup>University of Missouri School of Medicine, Columbia, Missouri

**Background:** Choledochal cysts are congenital dilatations of the biliary system, either intra-hepatic, extra-hepatic, or both. They are sometimes associated with variations in biliary anatomy. The current standard in management of choledochal cysts is surgical resection of the cyst(s) with biliary-enteric anastomosis. This video shows standard laparoscopic choledochal cyst resection and the surgical management of variations in biliary anatomy seen during laparoscopic choledochal cyst resections.

**Patients and Methods:** In this video, we show laparoscopic resections of three patients' extra-hepatic choledochal cysts. Their ages are 6 months, 1 year and 3 years respectively. Under general anesthesia, 4 laparoscopic ports were placed. One camera port (5/10mm), 2 working ports (5mm) and one for liver retraction (5mm). Placement of the ports was almost similar to those for a laparoscopic cholecystectomy. One patient had standard choledochal cyst anatomy and underwent a laparoscopic choledochal cyst excision and hepaticoduodenostomy. The second patient had a trifurcation anomaly at the hilum. For this, we first approximated the three separate ducts together into a common sheath. A hepaticoduodenostomy was then completed by anastomosing the common sheath to the 1st part of the duodenum. The third patient had an accessory bile duct in the gallbladder fossa visualized during removal of the cyst, for which a Roux-En-Y hepaticojejunostomy of both the common hepatic duct and the accessory bile duct was completed.

**Conclusions:** Uncommon variations in anatomy can be seen in children with choledochal cysts. This video shows different technical options for laparoscopic management of these anatomical variations when discovered during choledochal cyst excision.

## References:

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**V004 LAPAROSCOPIC HAND-ASSISTED BILATERAL ADRENALECTOMY FOR CARNEY COMPLEX IN A CHILD** Richard E Overman, MD, Christa Grant, MD, Peter Ehrlich, MD, K. Elizabeth Speck, MD; University of Michigan

**Introduction:** Carney Complex is a rare cause of non-ACTH dependent hypercortisolism and obesity. It is an autosomal dominant syndrome characterized by Cushing Syndrome, cardiac myxomas, hyperpigmented skin lesions, and large cell calcifying Sertoli cell testicular tumors. Children often present with obesity due to hypercortisolism. The treatment of choice for Cushing Syndrome associated with Carney Complex is bilateral adrenalectomy. However, in obese patient there is significant morbidity associated with open surgery. This video demonstrates a technique for laparoscopic bilateral adrenalectomy in an 11-year-old male with Carney Complex who presented with Cushing syndrome.

**Operative Technique:** An 11 y.o. 105kg previously healthy male presented with a 61kg weight gain over the past three years. His work-up was significant for hypercortisolism in the setting of low ACTH. A testicular ultrasound demonstrated multiple small echogenic lesions bilaterally consistent with Carney Complex. Further imaging revealed no other active lesions.

The patient underwent a laparoscopic hand-assisted bilateral adrenalectomy. He was placed supine on a beanbag with an additional roll under the right flank to elevate him to 30 degrees. One 12mm port and four 5mm ports were utilized. Standard laparoscopic equipment was used and visualization was facilitated with liver retractors.

# Oral (Scientific Session Abstracts)

The volume of intra-abdominal fat made the operation challenging. The right adrenal gland was addressed first. After minimally mobilizing the hepatic flexure, Gerota's fascia was incised laterally exposing the approximately 5cm of circumferential renal fat. To assist with localization deep within the adipose tissue, we identified the right adrenal vein which guided us to the right adrenal gland. The adrenal vein was taken with a harmonic scalpel. The remainder of the adrenal gland was dissected free of its attachments and removed via an endocatch bag. The roll was removed from the right flank, laying him supine and the table rotated to facilitate exposure of the left adrenal gland without having to re-prepare.

To assist with exposure on the left side, we converted the left upper quadrant 5mm port to a 7cm hand GelPort. The left adrenal gland was extracted through the hand port, and the patient was closed in the standard fashion. Frozen section pathology confirmed intact adrenal glands.

**Results:** The immediate post-operative course was uncomplicated. He was weaned from stress dose steroids and transitioned to his home regimen of fludrocortisone. His post-operative course was complicated by sleep apnea and anorexia. He was discharged home on POD#11 with home CPAP. He was readmitted on POD#14 with relative hypotension, and required titration of his fludrocortisone dose, which was felt to be due to *Campylobacter* and *C. Difficile* diarrhea.

**Conclusions:** Laparoscopic bilateral adrenalectomy is a feasible approach to the treatment of Carney Complex, avoiding the morbidity of a large abdominal incision in obese patients.

**V005 VALIDATION OF THE FIRST PEDIATRIC LAPAROSCOPIC SIMULATOR OF LICH-GREGOIR URETERAL REIMPLANTATION TECHNIQUE (LAP SPUR)** Carolina Millan, MD, Manuel Lopez, MD, Jorge L Martinez, MD, Luzia Toselli, MD, Fernando Rabinovich, MD, Soledad Valverde, MD, Santiago Calello, MD, Horacio Bignon, Enrique Buela, MD, Gaston Bellia, MD, Maximiliano Maricic, MD, Marcelo Martinez Ferro, MD; Fundacion Hospitalaria Children's Hospital

**Introduction:** Inanimate models provide a safe environment by increasing technical performance and cognitive knowledge of a surgical procedure without compromising patient's safety.

**Objective:** The purpose of this study is 1) to evaluate the cost and 2) to present the initial validation process of the first Pediatric Laparoscopic Simulator of the Lich-Gregoir ureteral reimplantation technique (LAP SPUR)

**Materials and Methods:** LAP SPUR was built with reusable and disposable materials, assembled together into a simulation box (MT-BOX1®). 34 operators between urologists and surgeons participated. 35% of the 34 operators were experts in minimally invasive surgery, 20% had moderate experience and 45% were inexperienced. Second, 100% of the operators expressed that the main limitation when performing a laparoscopic ureteral reimplantation was lack of training.

**Procedure:** (1) Extravesical approach; (2) Detrusor division and mucosal exposure; (3) Ureteral reimplantation in the new tunnel and (4) Suture of the mucosa with 3 interrupted stitches.

**Validation:** The aspects analyzed were: (1) Level of education and experience of the operator in minimally invasive surgery; (2) Limitations when performing a laparoscopic ureteral reimplantation; (3) Aesthetics and degree of realism of its components; (4) Training capability; (5) Observations.

**Results:** Cost analysis resulted in 60 USD (50 USD per each simulation box MT-BOX1 and 10 USD for the artificial tissues).

The results of the survey were: regarding technique and materials used in the simulator, 99% found the device suitable for proper training although 30% suggested changing the texture of the ureters.

**Conclusion:** The LAPSPUR has a very low cost. 34 participants expressed that it has a high degree of realism, it is easy to manipulate as well as ergonomical in recreate a ureteral reimplantation. This simulator might be a first step in the training process for laparoscopic ureteral reimplantation facilitating its learning curve.

# Oral (Scientific Session Abstracts)

**V006 LAPAROSCOPIC LIGATION OF MIDDLE SACRAL ARTERY AND DISSECTION OF SACROCOCCYGEAL TERATOMA TO DECREASE INTRAOPERATIVE HEMORRHAGIC RISK** Gustavo Villalona, MD, FACS, FAAP, Armando Salim Munoz Abraham, MD, MBEE, Saurabh Saxena, MD, Hector Osei, MD, Rachele Damle, MD, MS, Clint Cappiello, MD; Saint Louis University

**Introduction:** Sacrococcygeal Teratoma is the most common teratoma presenting at birth. Life-threatening bleeding is a major complication during tumor excision in children. Here we demonstrate our technique for laparoscopic division of Middle Sacral Artery during dissection of Sacrococcygeal Teratoma in two pediatric patients, as a safe technique to minimize risk of hemorrhage.

**Methods:** Two female infants diagnosed Type IV and Type II Sacrococcygeal Teratomas underwent preoperative evaluation in the postnatal period. The first patient was a 18 months girl who presented with metastatic Type IV teratoma, resected after neoadjuvant therapy and the second patient was a 6 day old girl with prenatal diagnosis of cystic Type II teratoma. In both patients using laparoscopy, the presacral space was reached by opening the peritoneal reflection with blunt dissection and the Middle Sacral Artery was identified. Then it was carefully isolated and divided with vessel sealer. Then the pelvic components of the tumors were partially dissected using laparoscopy. The first patient tumor resection was completed using a posterior sagittal approach and the second patient required a standard Chevron incision.

**Results:** Both patients underwent successful laparoscopic ligation of the middle sacral artery and resection of the Sacrococcygeal Teratomas without complications.

**Conclusion:** Laparoscopic Middle Sacral Artery ligation before Sacrococcygeal Teratoma excision offers a safe approach that can reduce the risk of hemorrhage during surgery.

**V007 SUBPLEURAL PLACEMENT OF ELASTOMERIC PAIN CATHETERS IN PECTUS EXCAVATUM SURGERY** Amir Alhajjat, MD, Lisa McMahon, MD; Phoenix Children's Hospital

Pain control following surgical repair of pectus excavatum is challenging. It is one of the most painful elective procedures performed by pediatric surgeons. Non-narcotic analgesia is preferred due to the adverse side effects of narcotics. Elastomeric pain catheters have been part of our standard multimodal therapy, traditionally placed along the chest wall. Despite one center's report, we have not had abnormally increased infection rates from their use. Placing the catheters in a subpleural position locates the local analgesia where the intercostal nerves associated with where the bars are. This has significantly decreased the pain scores of our patients during the first few days of the most extreme pain following the procedure. This video demonstrates the placement of the catheters.

**V008 ROBOTIC REPAIR OF LATE PRESENTATION CONGENITAL DIAPHRAGMATIC HERNIAS: A CASE SERIES** Shelby D Flanagan<sup>1</sup>, Mohamed Arafah, MD<sup>2</sup>, Michael J Leinwand, MD<sup>3</sup>; <sup>1</sup>Western Michigan University, <sup>2</sup>Western Michigan University, Homer Stryker M.D. School of Medicine, <sup>3</sup>Bronson Children's Hospital

**Introduction:** Congenital diaphragmatic hernias (CDH) are typically diagnosed prenatally and repaired in the neonatal period. Repair can be done using open (laparotomy or thoracotomy) and minimally-invasive (laparoscopy or thoracoscopy) approaches. Common challenges in CDH management include pulmonary hypoplasia, persistent pulmonary hypertension of the newborn, and cardiac dysfunction. The robotic approach is problematic in neonates because the smaller working space is not ideal for robotic instrument articulation.

**Objective:** We aimed to show the feasibility of the robotic approach to CDH repair in patients presenting beyond the neonatal period.

**Methods:** We conducted a retrospective review of five CDH patients who underwent robotic repair by a single surgeon at our community-based teaching hospital over 3.4 years. Presenting symptoms varied and included emesis, tachypnea, and weight loss. Four of the patients (2 left-sided Bochdalek, 1 right-sided Bochdalek, and 1 Morgagni) underwent robotic-assisted thoracoscopic repair. One of the patients underwent robotic-assisted laparoscopic repair of a Morgagni hernia with concomitant Nissen revision. All were performed using an 8 mm camera port, two 5 mm robotic instrument ports, and one 5 mm accessory port. The defects were closed using interrupted polyester suture. None required patch repair. We reviewed patient age, weight, diaphragmatic defect length, operative time, postoperative length of stay, and complications.

# Oral (Scientific Session Abstracts)

**Results:** The mean age was 23.2 months (1.6 to 63.8 months). Mean weight was 11.3 kg (4.9 to 22.2 kg). Mean diaphragmatic defect length was 4.6 cm (3 to 6 cm). Excluding the patient who underwent Nissen revision, mean operative time was 144.5 minutes (99 to 213 minutes). Three patients were discharged home on the first postoperative day, and one patient on the second postoperative day. The youngest patient (1.6 months old) required an 18 day postoperative course for respiratory optimization. Mean duration of follow up was 71.4 days (22 to 242 days). No complications or recurrences were identified during this timeframe.

**Conclusion:** Robotic repair of CDH appears to be a safe and effective approach in patients presenting beyond the neonatal period.

**V009 PERCUTANEOUS EMBOLIZATION AND LAPAROSCOPIC LIGATION OF A CONGENITAL UMBILICAL ARTERIOVENOUS MALFORMATION** Phillip B Ham, MD, MS<sup>1</sup>, Spencer R Anderson, MD<sup>2</sup>, Lucas P Neff, MD<sup>3</sup>, Anne E Gill, MD<sup>4</sup>, C Matthew Hawkins, MD<sup>4</sup>, Amina M Bhatia, MD, MS<sup>3</sup>; <sup>1</sup>Medical College of Georgia at Augusta University, <sup>2</sup>Mercer University School of Medicine, <sup>3</sup>Division of Pediatric Surgery, Department of Surgery, Emory University School of Medicine, Children's Healthcare of Atlanta, <sup>4</sup>Division of Interventional Radiology, Department of Radiology, Emory University School of Medicine, Children's Healthcare of Atlanta

**Purpose:** There is one previously reported case of laparoscopic resection of a congenital umbilical arteriovenous malformation in the literature. We present the first reported case of combined percutaneous embolization and laparoscopic ligation of a congenital umbilical arteriovenous malformation (AVM).

**Case Presentation:** A newborn infant female fraternal twin presented with a congenital umbilical arteriovenous malformation (AVM). She had arterial contributions from both the bilateral inferior epigastric arteries as well as the umbilical arteries and venous outflow via the umbilical vein resulting in high-output cardiac failure.

**Results:** Embolization of the outflow to the AVM nidus and inferior epigastric arteries with intravascular coils was performed in interventional radiology on day of life nine. An ultrasound after embolization showed persistent flow in the umbilical arteries and vein with cessation of flow in the inferior epigastric arteries. Echocardiography showed no substantial improvement in right heart failure, however, so laparoscopic ligation of the umbilical arteries and vein was subsequently performed. Intra-operative ultrasound following ligation of the umbilical arteries and umbilical vein showed cessation of flow through the AVM and subsequent echocardiogram demonstrated resolution of high-output failure and pulmonary hypertension.

**Conclusion:** Combined percutaneous embolization and laparoscopic ligation appears to be a safe and effective approach for the treatment of congenital umbilical AVMs.

**V010 LAPAROSCOPIC CONVERSION OF PRIOR REVERSED GASTRIC TUBE FOR ESOPHAGEAL ATRESIA TO ROUX-EN-Y TO CORRECT GASTRIC OUTLET OBSTRUCTION** Andrew T Strong, MD<sup>1</sup>, Jeffrey L Ponsky, MD<sup>1</sup>, Matthew Kroh, MD, FACS<sup>2</sup>, John Rodriguez, MD<sup>1</sup>; <sup>1</sup>Cleveland Clinic, <sup>2</sup>Cleveland Clinic Abu Dhabi

This is a 37 year old female with a history of esophageal atresia, who underwent esophageal reconstruction with a reversed gastric tube routed in the substernal space with a cervical anastomosis as an infant. She developed symptoms of gastric outlet obstruction, including reflux, frequent emesis, dysphagia and recurrent aspiration pneumonia. Endoscopic evaluation revealed functional narrowing and twisting of the distal stomach and a non-malignant stricture at the gastric outlet. Prior attempts at endoscopic dilation of the distal gastric stricture had failed. She underwent a laparoscopic conversion to Roux-en-Y anatomy. At short term follow up, her symptoms completely resolved. The purpose of this video is to demonstrate an effective laparoscopic treatment for a late complication of a pediatric operation.

# Oral (Scientific Session Abstracts)

**S001 MASTERY LEARNING FOR PEDIATRIC SURGEONS: THE CORRELATION BETWEEN BASELINE ADVANCED SKILL METRICS AND SUMMATIVE PERFORMANCE** Katherine A Barsness, MD, MS<sup>1</sup>, Philipp Szavay, MD<sup>2</sup>, Holger Till, MD<sup>3</sup>, Maria Marcela Bailez, MD<sup>4</sup>; <sup>1</sup>Lurie Children's Hospital, <sup>2</sup>Children's Hospital Lucerne, <sup>3</sup>Vorstand der Univ.Klinik für Kinder- und Jugendchirurgie, <sup>4</sup>Garrahan Children's Hospital

**Background:** Mastery learning is an educational strategy in which educational excellence and uniform achievement is expected, while understanding that the time to achieve mastery is not uniform among all participants. The baseline skills assessment, a central feature of mastery learning standards, is well-described for simple procedures. However, a baseline assessment for complex, multi-step operations would be time-consuming, and may lead to frustration for learners early in their learning curve. We sought to evaluate participants' baseline skills for two complex tasks, each integral to the operations being taught in an advanced neonatal minimally invasive surgery (MIS) course, to determine if one or both skills correlated with participants' final achievements at course completion.

**Methods:** After IRB exempt determination, 27 participants attended a 9-hour combined didactic and hands-on simulation course, focused exclusively on thoracoscopic pulmonary lobectomy (tLobe) and tracheoesophageal fistula repair (tTEF). Participants completed a self-report survey of baseline experience and comfort levels with Lobe, TEF, and complex MIS skills. Baseline skills assessments across 6 domains were completed for intracorporeal suturing and vessel dissection skills for all participants. At the completion of the course, faculty assessed global and procedure-specific summative performance metrics for each participant. Finally, participants completed a post-course self-reported survey on their perceived improvements in Lobe, TEF and complex MIS skills. Descriptive statistics are reported as means (range, minimum - maximum possible scores). Correlation coefficients ( $r$ ) were calculated using Pearson bivariate linear regression analysis,  $P < 0.05$  significant.

**Results:** Of 27 participants, 8 had previously performed tLobe, with an average experience of 7 (range 3-15). Six of these participants were "somewhat comfortable" and 2 were "very comfortable" performing tLobe. Only 2 participants had previous experience performing tTEF, having performed 5 and 15 cases respectively. Both participants were "somewhat comfortable" performing tTEF. All other participants had no previous experience with tLobe or tTEF, and self-reported as "not comfortable" performing these procedures. The average score for the suturing assessment was 21 (range 6-34, min 6 - max 34). The average score for the vessel dissection assessment was 18 (range 6-28, min 6 - max 30). The average procedure-specific summative performance score for tLobe was 33 (range 9-45, min 9 - max 45). The average procedure-specific summative performance score for tTEF was 20 (range 9-28, min 9 - max 30). Baseline suturing skills were moderately correlated to summative performance metrics for tTEF ( $r = 0.51-0.54$ ), and more strongly correlated to summative performance metrics for tLobe ( $r = 0.62-0.72$ ). Vessel sealing skills were not correlated with summative performance metrics for either procedure ( $r < 0.44$ ). Interestingly, suturing skills were most strongly correlated with procedure-specific skills for tLobe, but much less so for procedure-specific tTEF skills.

**Conclusion:** Baseline performance metrics for intracorporeal suturing are moderate to strongly correlated with general and procedure-specific summative performance accomplishments for simulated tLobe and tTEF. Future directions of this novel mastery learning course for advanced neonatal MIS include the determination of minimum proficiency standards that all course participants accomplish to be defined as "accomplished in simulated tLobe and tTEF repair".

**S002 EVALUATION OF AN ADVANCED NEONATAL MINIMALLY INVASIVE SKILLS COURSE: ENHANCING EDUCATIONAL OPPORTUNITIES FOR PEDIATRIC SURGICAL TRAINEES** Lauren M Baumann, MD, Katherine A Barsness, MD; Ann & Robert H. Lurie Children's Hospital

**Purpose:** While adoption of minimally invasive surgical (MIS) techniques for neonatal conditions has increased, pediatric surgical fellows continue to have limited exposure to advanced neonatal repairs during training. To address this gap, an annual, advanced neonatal MIS skills course was developed for pediatric surgical trainees. The study aim is to describe baseline experience and self-reported proficiency levels for MIS skills amongst senior trainees and evaluate the impact of an intensive course on advanced neonatal MIS.

**Methods:** IRB-approved retrospective review of course evaluations for the 2017 advanced neonatal MIS course. Senior pediatric surgery fellows participated in the 2-day course, which included didactic lectures followed by skills simulation on real tissue models for duodenal atresia repair (DA), diaphragmatic hernia repair (DH), pulmonary lobectomy, and tracheoesophageal fistula repair (TEF), as well as rigid bronchoscopy model. Participants self-reported baseline experience and current proficiency levels (Likert scale: novice=1, proficient=3, expert=5) with advanced endoscopic skills and procedures. Skills were also self-rated using the ACGME milestone evaluations. Post-course survey was administered to assess perceived improvement across practiced procedures and skills. Descriptive analyses were performed and compared to evaluations of the previous 3 courses (2014-2016).

# Oral (Scientific Session Abstracts)

**Results:** Twenty-nine participants completed pre and post-course surveys. Overall baseline experience with select MIS procedures was low (mean case volume  $1.9 \pm 1.27$ ) compared to open procedures (mean case volume  $3.9 \pm 1.96$ ). Self-reported proficiency varied for MIS TEF (14%), lobectomy (41%), DA (31%), DH (52%), and Ladd procedure (59%). Despite limited experience, most participants reported a level 3 “adequate” performance or higher for TEF (59%), DA (76%), DH (86%), and Hirschprung’s pull-through (97%) on the milestones scale. The majority of participants reported baseline proficiency in individual MIS skills (55-90%), and also reported improvement on post-course survey in all skill categories (72-100%). Compared to previous years, there were no significant differences in baseline experience or proficiency levels for MIS TEF, DH, or DA. Experience for MIS lobectomy has significantly increased in the past 3 years, with an average  $4.1 \pm 4.3$  cases per participant in 2017 compared to  $2.1 \pm 1.9$  in 2015 ( $p=0.001$ ).

**Conclusion:** Pediatric surgical trainees continue to have limited experience with advanced neonatal MIS procedures, despite high comfort levels with individual technical skills. A 2-day, intensive simulation course in neonatal MIS resulted in self-perceived improvement for all skills and procedures addressed. These data highlight the need for continued simulation-based educational opportunities for advanced MIS to supplement the low number of clinical training opportunities. Objective skills evaluations using tools such as the Milestones framework should accompany ongoing training to assess educational progress and readiness for independent practice.

Table 1. Baseline experience and proficiency levels for MIS skills and procedures with perceived post-course improvement (n=29)

MIS Procedure	Baseline experience (mean number of cases)	Self-reported proficient (%)	Perceived improvement (%)	MIS Skill	Self-reported proficient (%)	Perceived improvement (%)
TEF	$0.1 \pm 1.2$	14%	93%	Intracorporeal suturing	93%	90%
DH	$2.3 \pm 2.1$	52%	90%	Port placement for MIS	83%	100%
DA	$1.0 \pm 1.6$	31%	100%	Patient position for MIS	86%	*
Lobectomy	$4.1 \pm 4.3$	41%	93%	Depth perception	93%	72%
Ladd procedure	$2.2 \pm 2.4$	59%	*	Bimanual dexterity	97%	79%
Choledochal cyst excision	$0.6 \pm 0.7$	31%	*	Safe tissue handling	97%	83%
Hirschprung’s pull-through	$2.8 \pm 2.4$	*	*	Describe pulmonary anatomy	28%	59%
				Identify/isolate distal TEF	55%	83%
				Identify/assemble rigid bronchoscopy instruments	55%	76%

\*Skill/procedure not addressed during course

## S003 OVARIAN TISSUE HEALTH AFTER LAPAROSCOPIC UNILATERAL OOPHORECTOMY: A PORCINE MODEL FOR ESTABLISHING OPTIMIZED FERTILITY PRESERVATION TECHNIQUES IN CHILDREN Kristine S Corkum, MD, Kelly A Even, Monica M Laronda, PhD, Erin E Rowell, MD; Ann & Robert H. Lurie Children’s Hospital of Chicago

**Introduction:** Ovarian tissue cryopreservation (OTC) is an experimental fertility preservation option for children at risk of premature ovarian insufficiency due to fertility-threatening treatments. Laparoscopy is the most commonly used approach for OTC, but to date, there has been no standard surgical technique used across different centers, nor understanding of how various techniques could affect the ovarian tissue, particularly the potential egg cells that reside in the cortical region under the ovarian capsule. The diverse techniques described include cortical tissue biopsies, partial and unilateral oophorectomy using a variety of dissection methods including sharp scissor, bipolar electrocautery, and advanced energy devices. This non-survival porcine model aimed to assess ovarian tissue health after laparoscopic oophorectomy for OTC using an ultrasonic energy device.

**Methods:** Three-month-old Yucatan mini-pigs were chosen as a model to simulate a prepubertal child due to size and reproductive development of the pig. Laparoscopic oophorectomy was performed using three-port laparoscopy. All adnexal tissue dissection was carried out with an ultrasonic energy device. The ovary was removed either adjacent to the capsule (“close-burn”) or 2.5 cm away from the ovarian hilum (“far-burn”). Controls were obtained by sharply removing the ovary via mini-laparotomy. After removal of the ovary, multiple 3-mm cortical biopsy punches were obtained. Each biopsy specimen underwent six days of culture in a follicle-stimulating hormone supplemented growth media. Media was sampled on day 2 (D2), day 4 (D4), and day 6 (D6) to test for secreted or consumed factors from tissue culture. Enzyme-linked immunosorbent assays for glucose, lactate, and estradiol were performed to assess tissue metabolism and hormone production.



# Oral (Scientific Session Abstracts)

**Results:** 8 mini-pigs underwent a total of 16 oophorectomies (5 controls, 6 “far-burn”, 5 “close-burn”). Glucose concentration varied significantly between the control, “far-burn”, and “close-burn” groups for D4 (62.3 vs 77.5 vs 53.0  $\mu\text{M}$ ,  $p < 0.001$ ) and D6 (43.9 vs 46.8 vs 40.6  $\mu\text{M}$ ,  $p = 0.001$ ), but not for D2 (81.5 vs 85.4 vs 78.5  $\mu\text{M}$ ,  $p = 0.482$ ). Lactate concentration was significantly higher from “far-burn” and “close-burn” specimens than controls on D4 (0.30 vs 0.39 vs 0.40  $\text{nmol}/\mu\text{L}$ ,  $p < 0.001$ ) and significantly higher from “far-burn” on D6 (0.29 vs 0.42 vs 0.31  $\text{nmol}/\mu\text{L}$ ,  $p = 0.017$ ). No difference existed between groups for D2 lactate concentration (0.30 vs 0.34 vs 0.37  $\text{nmol}/\mu\text{L}$ ,  $p = 0.007$ ). Estradiol concentration was significantly lower in both the “far-burn” and “close-burn” specimens than controls on D2 (945.9 vs 687.5 vs 492.4  $\text{pg}/\text{mL}$ ,  $p = 0.030$ ) and D4 (420.2 vs 219.1 vs 122.5  $\text{pg}/\text{mL}$ ,  $p = 0.003$ ), but not on D6 (32.3 vs 27.5 vs 23.1  $\text{pg}/\text{mL}$ ,  $p = 0.813$ ).

**Conclusion:** In this porcine model, significant differences in overall ovarian tissue health exist between surgical techniques for unilateral oophorectomy for ovarian cortical tissue harvest. Ovaries that were removed laparoscopically using an ultrasonic energy device had altered metabolic function (glucose and lactate) as well as significantly decreased estradiol production regardless of the “far-burn” or “close-burn” distances from the ovary. Ongoing studies include histological examination of ovarian follicle health. These findings may impact the surgical technique for ovarian tissue cryopreservation in children given the goal of preserving healthy, viable cortical tissue for possible re-implantation and restoration of fertility and hormone function.

**S004 ARE CARDIAC ANOMALIES AND PERSISTENT FETAL CIRCULATION A RISK FACTOR FOR CARDIOVASCULAR EVENTS DURING MINIMALLY INVASIVE SURGERY IN NEONATES? -PERSONAL EXPERIENCE AND REVIEW OF THE LITERATURE** Christine Burgmeier, Dr<sup>1</sup>, Felix Schier, Prof, Dr<sup>2</sup>; <sup>1</sup>Department of Surgery, Alb Fils Kliniken, Göppingen, <sup>2</sup>Department of Pediatric Surgery, University Center Mainz, Germany

**Introduction:** In the past decades, minimally invasive surgery (MIS) has been proven to be beneficial for the pediatric population and even neonates. Nevertheless, neonates are a very special group of patients and require extraordinary consideration. During the first month of life persistent fetal circulation and/or cardiac anomalies are very common. The aim of this study was to evaluate the risk for cardiovascular events during endoscopic surgery in neonates and to analyze the influence of persistent fetal circulation and/or cardiac anomalies in this exceptional period of life.

**Methods:** Retrospective, single institution study including all term and preterm neonates undergoing minimally invasive surgery. The charts were reviewed for intraoperative cardiovascular events, performed operative procedure and conversion rate. Special attention was paid to cardiac anomalies and persistent fetal circulation. Additionally, a review of the current literature concerning reported cardiovascular events during MIS in neonates was performed.

**Results:** Between January 2004 until December 2012 108 term and preterm neonates (62 male and 46 female) underwent either laparoscopic or thoracoscopic surgery at our institution. Altogether, 72 (66.7 %) of them were term and 36 (33.3 %) were preterm neonates. On average, the surgical procedure was performed on the 12. postnatal day and median weight at the time of surgery was 3.0 kg (range from 1.2 to 4.1 kg). Laparoscopic surgery was performed in 91 (84.3%) and thoracoscopy in 17 (15.7%) babies. None of these 108 term and preterm neonates developed a cardiovascular event during endoscopic surgery (0.0 %). Persistent fetal circulation and/or cardiac anomalies were evaluated in 50 of 108 (46.3 %) neonates undergoing endoscopic surgery within the first month of life. Conversion to open surgery was necessary in 21 neonates (19.4 %). In the additionally performed review of the literature four single case reports were identified. All four authors published major cardiovascular events during laparoscopic surgery in neonates. In all four patients gas embolism through a patent umbilical vein was assumed to be responsible for the cardiovascular event. One of these babies was known to have a small PDA and a PFO preoperatively. In the other three cases preoperative cardiac examination was not reported.

**Conclusions:** In our personal experience none of 108 term and preterm neonates undergoing endoscopic surgery within the first month of life developed a major cardiovascular event (0.0 %). Approximately half of the babies were known to have persistent fetal circulation and/or cardiac anomalies preoperatively. In the literature four case reports on gas embolism during laparoscopic surgery were published. In all of these babies injury of a persistent umbilical vein was assumed to be the entrainment of gas into the cardiovascular system. In our opinion, the main risk factor for major cardiovascular events during endoscopic surgery in neonates is vascular injury of a persistent umbilical vein. Persistent fetal circulation and/or cardiac anomalies seem to be less important for the development of major cardiovascular events during endoscopic surgery in neonates. In regard to safety of MIS in neonates further clinical studies are necessary in the future.

# Oral (Scientific Session Abstracts)

**S005 THE IMPACT OF SIMULATOR SIZE ON THE FORCES MEASURED IN THE PERFORMANCE OF A DEFINED INTRA-CORPOREAL SUTURING TASK: A PILOT STUDY** Aodhnait S Fahy, MD, PhD<sup>1</sup>, Luai Jamal, MD<sup>1</sup>, Bojan Gavrilovic, PhD<sup>2</sup>, Brian Carillo, PhD<sup>2</sup>, Justin T Gerstle, MD<sup>1</sup>, Ahmed Nasr, MD<sup>3</sup>, Georges Azzie, MD<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>University of Toronto, <sup>3</sup>Children's Hospital of Eastern Ontario

**Background:** One of the major differences between open and laparoscopic procedures is the working space. In pediatric minimal access surgery, the domain may be as large as that of an adult or as small as that of a neonate. While the implications of diminishing domain have been documented in terms of motion analysis, no data exist regarding the impact of a smaller working space on force. This pilot study was undertaken to quantify the impact of decreased operative domain within a simulator on the forces generated.

**Methods:** 105 participants at IPEG in 2016 performed a defined intra-corporeal suturing task in pediatric and adult simulators with force-sensing capabilities. Time to task completion, and assessment of total, maximum and mean forces in x, y and z axes were measured. Participants were classified as novices, intermediates and experts based on annual number of complex laparoscopic cases: novice (<10), intermediate (10-50), expert (>50). Time to task completion and forces were compared between pediatric and adult simulators using paired sample t-tests, with a p value of <0.05 judged significant.

**Results:** Ninety eight participants completed the task in both simulators. In the x axis ("side to side" movement), total, maximum and mean forces were all higher in the adult simulator regardless of level of expertise. In the y axis ("in and out" movement) and z axis ("up and down" movement), total and mean forces were higher in the adult simulator regardless of level of expertise. Maximum force did not vary significantly in the y axis ("in and out" movement) regardless of level of expertise or simulator size. Differences in maximum force between the adult and pediatric simulators in the z axis ("up and down" movement) did vary significantly for novices and intermediates, but not for experts. Time to task completion varied significantly for experts between adult and pediatric simulators, but not for intermediates or novices.

**Conclusion:** Total and mean forces generated in the "side to side", "up and down" and "in and out" components of this defined intra-corporeal suturing task are significantly higher in the simulator of larger domain, regardless of level of expertise. Maximum force generated in the "side to side" component is higher for experts in the larger simulator, but not for intermediates and novices. The potential clinical and educational implications of this variation in force secondary to working space volume remain to be established. Further analysis will help determine the reasons for the increased force parameters in the simulator of larger domain, and may help establish a role for the analysis of force in the formative assessment of laparoscopic skills.

**S006 ANALYSIS OF FORCE IN SIMULATORS OF SMALLER DOMAIN ALLOW GREATER DISCRIMINATION BETWEEN PARTICIPANTS OF VARYING EXPERTISE: IMPLICATIONS FOR EDUCATION.** Aodhnait S Fahy, MD, PhD<sup>1</sup>, Luai Jamal, MD<sup>1</sup>, Bojan Gavrilovic, PhD<sup>2</sup>, Brian Carillo, PhD<sup>2</sup>, Justin T Gerstle, MD<sup>1</sup>, Ahmed Nasr, MD<sup>3</sup>, Georges Azzie<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>University of Toronto, <sup>3</sup>Children's Hospital of Eastern Ontario

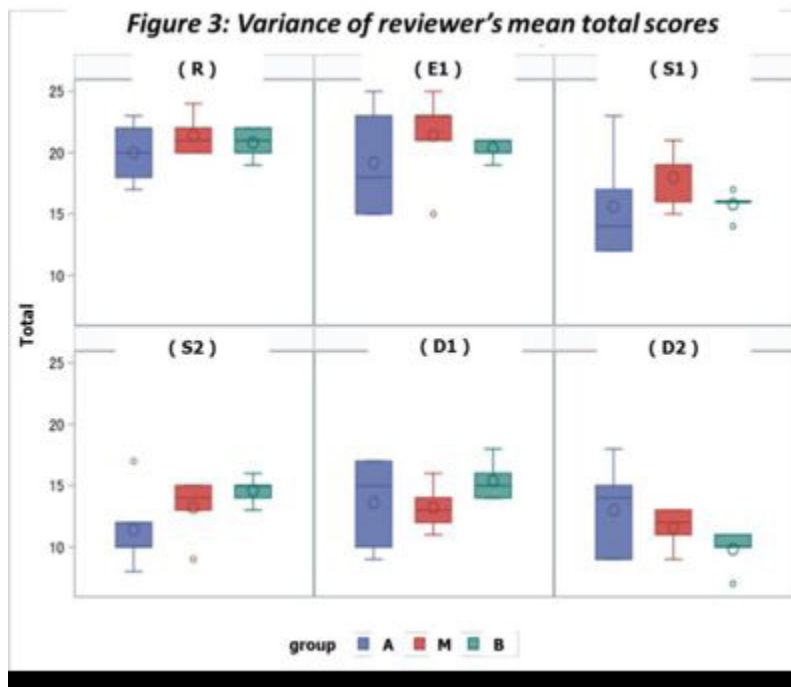
**Background:** New training platforms are targeting the analysis of force in laparoscopic simulators. We hypothesized that the decreased domain of a pediatric rather than adult simulator may accentuate differences in forces generated between novice, intermediate and expert participants.

**Methods:** 105 participants performed a defined intra-corporeal suturing task in pediatric and adult simulators with force-sensing capabilities. Outcomes included assessment of time to task completion and assessment of force in x, y and z axes. Participants were stratified into novice, intermediate and expert groups based on expert video analysis. Differences between forces in each axis and time to task completion were compared across levels of expertise. Data were analyzed with ANOVA.  $p < 0.05$  was judged significant

**Results:** Ninety eight participants completed the task within both the pediatric and adult simulator. Time to task completion allowed discrimination between expert, intermediate and novice participants in both the pediatric and adult simulator. In the smaller, pediatric simulator assessment of total, maximum and mean forces generated "side to side" (x axis) and "in and out" (y axis) in the performance of the defined intra-corporeal suturing task allowed discrimination between novices, intermediates and experts. Forces generated "up and down" (z axis) in the pediatric simulator did not allow discrimination between participants of varying level of expertise. In the larger, adult simulator, forces in the "side to side" x or "in and out" y axis failed to discriminate between expertise levels and only total and maximum forces generated "up and down" (z axis) allowed discrimination between novices, intermediates and experts.

# Oral (Scientific Session Abstracts)

**Conclusion:** In the performance of this defined task, a decrease in the working space seems to accentuate differences in total forces generated by participants of varying levels of expertise. This interesting finding may have implications in terms of applying force analysis for training and assessment to simulators of smaller rather than larger domain.



**S007 SHOULD WE REFINE THE TRADITIONAL METHODOLOGY OF DEFINING LAPAROSCOPIC EXPERTISE?** Aodhnait S Fahy, MD, PhD<sup>1</sup>, Luai Jamal, MD<sup>1</sup>, Bojan Gavrilovic, PhD<sup>2</sup>, Brian Carillo<sup>2</sup>, Justin T Gerstle, MD<sup>1</sup>, Ahmed Nasr, MD<sup>3</sup>, Georges Azzie<sup>1</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>University of Toronto, <sup>3</sup>Children's Hospital of Eastern Ontario

**Purpose:** The customary stratification of laparoscopic expertise in simulation studies is to assign participants to novice, intermediate or expert groups on the basis of case numbers. Our group has been studying traditional summative and novel formative assessment of technical skills on simulators, and has questioned the validity of assigning psychomotor expertise on the basis of case numbers, especially in light of emerging formative assessment tools including force analysis. We hypothesized that video analysis might improve discrimination of psychomotor expertise in laparoscopic simulation studies.

**Methods:** 105 participants performed a defined intra-corporeal suturing task in pediatric simulators with force-sensing capabilities. Outcomes included traditional summative assessment of precision and time to task completion, and novel formative assessment of total force in x, y and z axes. Participants were stratified into novice, intermediate and expert groups via three classification schemes: 1) annual number of complex laparoscopic cases (novice (<10), intermediate (10-50), expert (>50)), 2) self-declared level of expertise, and 3) average rating by three experts of each participant's video. Precision, time to task completion, and forces were compared across the classification schemes for assigning expertise using one-way ANOVAs.  $p < 0.05$  was judged significant.

**Results:** Evaluation of expertise based on case numbers or self-reported level of expertise allowed discrimination between novice, intermediate and expert groups for time to task completion. Evaluation of expertise based on video analysis allowed discrimination between novice, intermediate and expert groups for time to task completion as well as for total forces in X, Y and Z axes.

**Conclusion:** Video analysis may refine the ability to discriminate the psychomotor level of expertise of participants in the performance of a defined intra-corporeal suturing task within a simulator. The implications may be important, particularly as new formative assessment methods such as force analysis are incorporated in laparoscopic simulators.

# Oral (Scientific Session Abstracts)

**S008 A SYSTEMATIC REVIEW OF SIMULATION-BASED TRAINING IN PEDIATRIC SURGERY** Shinichiro Yokoyama<sup>1</sup>, Yo Kurasima<sup>1</sup>, Kenichi Mizunuma<sup>1</sup>, Yusuke Watanabe<sup>1</sup>, Tomoko Mizota<sup>1</sup>, Saseem Poudel<sup>2</sup>, Toshiaki Shichinohe<sup>1</sup>, Satoshi Hirano<sup>1</sup>; <sup>1</sup>Department of Gastroenterological surgery II, Hokkaido University Graduate School of Medicine, <sup>2</sup>Department of Surgery, Steel Memorial Muroran Hospital

**Background:** Acquiring the technical skills of pediatric surgery has longer learning curve than that of general surgery because of its less case volume and technical complexity. Simulation-based training (SBT) has been used in various surgical fields for the efficient and safe surgical training without harming the patient. SBT in the field of pediatric surgery has also been expanding and various simulators are emerging with the development of medical engineering technology in recent years. The purpose of this systematic review is to summarize and clarify the role of the simulator as assessment tools and training tools in the field of pediatric surgery.

**Methods:** This review adhered to PRISMA (the Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards. A search was performed using the database of PubMed, Cochrane Library and Web of Science from January 2000 until July 2017. Inclusion criteria were simulation-based training for resident, fellow and faculty using trainer box, Virtual-Reality simulator, physical simulator and animal models. No language limits were applied. Exclusion criteria included simulation-based training for medical student, pharmacology, analgesia.

**Results:** In total, 5858 unique citations were retrieved based on our research question, and 69 articles met inclusion criteria. There were 45 papers on the development of the simulator, and 21 of them were used as assessment tools. They differentiated between experts and trainees by using mainly assessment scale (52%) and/ or checklist (24%). Simulators as training tools of SBT were described in 24 papers and they were used for the training of alimentary tract, fetal therapy, trauma, airway foreign body, extracorporeal membrane oxygenation cannulation and endoscopic surgical skills. Low fidelity models were used for the basic training of endoscopic surgery, the others were high fidelity modes. The way of evaluating the training efficiency was survey (30%), checklist (20%) and original assessment tool (17%). There were only four simulators using the apparently validated before training.

**Conclusions:** There are few simulators for the training of pediatric surgery which have definite goals with a proper assessment. It is necessary to accumulate evidence on SBT in the field of pediatric surgery, and the future study should demonstrate the educational impact of the simulator as an assessment tool or a training tool for pediatric surgery.

**S009 TRANSMEMBRANE G PROTEIN-COUPLED RECEPTOR (TGR5) MAY WORK IN OPPOSITION TO THE EFFECTS OF NUCLEAR FARNESOID X RECEPTOR (FXR) IN THE SMALL INTESTINE** Michael Mallicote, MD, Oswaldo Escobar, BS, Avafia Dossa, MD, Christopher Gayer, MD, PhD; Children's Hospital Los Angeles

**Objective:** Activation of the dedicated bile acid receptors transmembrane G protein-coupled receptor (TGR5) and the nuclear farnesoid X receptor (FXR) induces differential effects on the intestinal epithelium. We hypothesize that TGR5 acts in opposition to FXR in the small intestines.

**Methods:** We treated IEC-6 cells with the TGR5 specific agonist oleanolic acid (OA, 0.01-10  $\mu$ M). Proliferation was measured with EdU and crystal violet staining and TGR5 levels were reduced with siRNA knockdown. In vivo, we used a mouse model of lipopolysaccharide (LPS) induced barrier dysfunction where mice are injected with LPS or saline via intra-peritoneal route to induce intestinal injury and gavage-fed FITC-dextran with or without OA 100mg/kg. Serum FITC levels and mRNA expression by RT-PCR were determined to assess barrier function.

**Results:** Proliferation increased by 25% at OA 1 $\mu$ M in IEC-6 cells, similar to taurocholic acid (TCA) treatment alone. TGR5 siRNA knockdown blocked TCA-induced proliferation. FXR inhibits proliferation, as we have previously shown. OA did not appear to protect the intestinal barrier in wild-type (WT) mice, but did decrease barrier breakdown in FXR knock-out (FXR-KO) mice. In WT and FXR KO mice, TGR5 mRNA expression was upregulated in mice treated with OA. LPS increased FXR mRNA expression in WT but not in FXR-KO.

**Conclusions:** OA stimulates intestinal cell proliferation and it protects the intestine most effectively in the absence of FXR. These data suggest that TGR5 and FXR work in opposition to one another and this activity may uncover novel therapeutic targets for regulating the intestinal epithelium during injury.

# Oral (Scientific Session Abstracts)

**SO10 CAN REVIEW OF INTRAOPERATIVE VIDEO RECORDINGS IMPROVE SURGICAL TECHNIQUE? A PILOT STUDY USING LAPAROSCOPIC PERCUTANEOUS EXTRAPERITONEAL CLOSURE IN CHILDREN WITH INGUINAL HERNIA.** Go Miyano, MD<sup>1</sup>, Katsuhiko Tabata, MD<sup>1</sup>, Katherine A Barsness, MD<sup>2</sup>, Toshiaki Takahashi, MD<sup>3</sup>, Nana Nakazawa-Tanaka, MD<sup>4</sup>, Junichi Kusafuka, MD<sup>5</sup>, Koji Fukumoto, MD<sup>3</sup>, Eiji Miyazaki, MD<sup>5</sup>, Geoffrey J Lane, MD<sup>1</sup>, Tadaharu Okazaki, MD<sup>6</sup>, Masahiko Urao, MD<sup>4</sup>, Naoto Urushihara, MD<sup>3</sup>, Atsuyuki Yamataka, MD<sup>1</sup>; <sup>1</sup>Juntendo University School of Medicine, <sup>2</sup>Ann and Robert H. Lurie Children's Hospital of Chicago, <sup>3</sup>Shizuoka Children's Hospital, <sup>4</sup>Juntendo Nerima Hospital, <sup>5</sup>Seirei Hamamatsu General Hospital, <sup>6</sup>Juntendo Urayasu Hospital

**Aim:** We organized a panel of surgeons with different levels of experience to review intraoperative video recordings (IVR) of laparoscopic percutaneous extraperitoneal closure (LPEC) for inguinal hernia in children blindly to determine if there were skill-related factors that might affect outcome.

**Methods:** One of the co-authors (GM) performed 183 LPEC between April 2013 and March 2016 and classified each according to perceived operator stress at the time of surgery as: difficult (D; n=8), straightforward (S; n=96), or easy (E; n=79). There was one recurrence (R; 4-year-old male; group E). A panel of 15 board certified pediatric surgeons not involved with the LPEC surgery performed by GM was created comprised of accomplished (group A; >400 LPEC cases; n=5), mid-level (group M; 50-150 cases; n=5), and beginner (group B; <10 cases; n=5) reviewers. Case R's IVR and 5 other randomly chosen IVR from male patients (1 from E (E1) and 2 each from D (D1, D2) and S (S1, S2)) were copied onto a single disc and sent to each reviewer for blind scoring according to a standardized protocol (Fig 1). Each reviewer was also asked to rank each IVR according to their perceived risk for recurrence with the IVR most likely to result in recurrence given a rank of 6 and the IVR least likely to result in recurrence given a rank of 1. The variance of each reviewer's mean total score for each of the 6 IVR was also evaluated for each reviewer then compared between reviewer groups (A, M, and B).

**Results:** Reviewer scores for each assessment criterion and mean risk for recurrence ranks for each IVR are shown in figure 2. Mean rankings for Case R's IVR were 1, 2, 2 by groups A, M, and B, respectively; in other words, case R's IVR was assessed as being a case that would be least likely or unlikely to recur by all reviewer groups. Differences in "skill of suturing" and "bleeding" scored by group A, and "plane of dissection" and "peritoneal injury" scored by group M were statistically significant for ranking. There was no correlation between criteria and ranking in group B. Figure 3 shows the variance of each reviewer group's mean total score for each of the 6 IVR. For D1 and D2, differences in variance were statistically significant between groups A and M and between groups A and B. For R, E1, S1, and S2, variance was greater in group A than in group M and in group M than in group B.

**Conclusion:** Recurrence would appear to have a multifactorial etiology not due solely to the skill of the operating surgeon. While IVR review provides valuable insight into the surgical skill of the operator for the operator's own benefit, the opinions of more experienced reviewers varied with little consistency. As surgery is a field where experience is highly regarded, our finding is controversial and questions the validity of conventional surgical education.

Figure 1: LPEC video evaluation scoring protocol

Score	Skill of suturing	Plane of dissection	Vas/Vessel dissection	Bleeding	Peritoneal injury
5	confidently steady	completely accurate	very easy	none	none
4	unconfidently steady	accurate	easy	minimal	minimal
3	standard	occasionally inaccurate	standard	minor	minor
2	un-steady	inaccurate	difficult	moderate	moderate
1	dangerously un-steady	wrong	very difficult	severe	severe

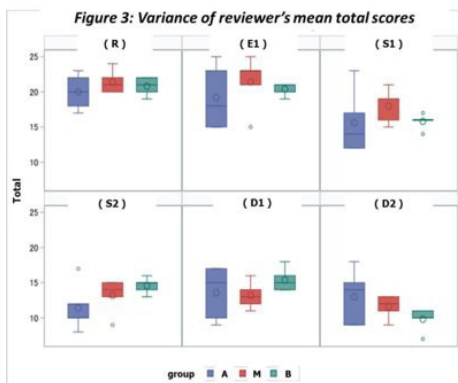


Figure 2: Mean LPEC video evaluation scores

Reviewer	Recurrence	Case video	Skill of suturing	Plane of dissection	Vas/Vessel dissection	Bleeding	Peritoneal injury
<b>group A: Accomplished surgeons (&gt;400 LPEC cases; n=5)</b>							
1	1	R (Recurrence Case)	1.0	4.0	4.0	1.0	4.0
2	2	E1	3.4	4.0	4.0	3.8	4.2
3	2.5	S1	3.0	4.0	2.8	3.2	3.8
4	3.5	D1	1.8	3.0	2.8	2.4	3.8
5	3.8	S2	1.2	3.2	1.8	2.2	3.8
6	3.6	D2	3.2	3.8	3.4	2.2	3.4
<b>group M: Mid-level surgeons (50-150 LPEC cases; n=5)</b>							
1	1.5	E1	3.8	4.2	4.4	4.0	4.6
2	2.5	R (Recurrence Case)	4.2	4.4	4.0	3.8	4.0
3	2.8	S1	3.8	4.0	2.2	3.8	4.4
4	3.8	D2	1.8	3.2	2.4	2.4	3.8
5	4.8	D1	2.2	3.2	1.8	3.8	3.2
6	3.8	D2	3.0	2.8	1.4	2.8	2.8
<b>group B: Beginner surgeons (&lt;10 LPEC cases; n=5)</b>							
1	1	E1	4.0	4.0	4.0	4.0	4.0
2	2.0	R (Recurrence Case)	4.8	3.8	4.8	4.2	3.4
3	2.2	S1	3.8	4.2	2.8	3.4	3.8
4	3.8	D1	3.2	3.0	3.0	2.4	3.8
5	4.8	D2	1.8	3.4	2.2	3.2	4.8
6	4.4	D2	3.2	2.8	2.2	1.8	1.8

1: lowest (left), 6: highest (right)

■: Average of reviewer mean scores for each video

□: Criterion with statistical significance for recurrence

# Oral (Scientific Session Abstracts)

**SO11 LAPAROSCOPY CAN ASSIST SURGICAL DECISION-MAKING IN NECROTIZING ENTEROCOLITIS.** Kristine Bach Korsholm Knudsen, MD<sup>1</sup>, Joergen Mogens Thorup, Professor<sup>1</sup>, Thomas Thymann, Master, PhD<sup>2</sup>, Rune Strandby, MD<sup>1</sup>, Nikolaj Nerup, MD<sup>1</sup>, Michael Achiam, MD, PhD<sup>1</sup>, Per Torp Sangild, Professor<sup>2</sup>, Torsten Lauritsen<sup>1</sup>, Inge Boetker Rasmussen Ifaoui, MD, PhD<sup>1</sup>; <sup>1</sup>Rigshospitalet, University Hospital of Copenhagen, <sup>2</sup>University of Copenhagen

**Aim of the study:** Necrotizing enterocolitis (NEC) is a devastating intestinal disease. Despite advancements in neonatal care, mortality remains high (30-50 %) and controversies still persist with regards to the most appropriate management of neonates with NEC. The decision to perform surgery is often difficult to make, especially in early stages of NEC, in absence of pneumoperitoneum and/or peritonitis. We aimed to examine if laparoscopy is feasible for early diagnosis of NEC.

**Methods:** Preterm caesarean-delivered piglets (n= 42), were fed with parenteral nutrition and increasing amounts of infant formula to induce NEC. On day three to five, we performed a laparoscopy in general anesthesia. By open technique, the camera port was placed one centimeter caudal to sternum; Veress canula was placed in the left side of the abdomen to maintain pneumoperitoneum at a pressure of 6 mmHg. We examined the bowel with a non-touch technique by moving the pig from supine position to the left and right side. Macroscopic NEC lesions were identified and graded according to a macroscopic scoring system (1-6 for increasing NEC-severity until necrosis). At last, a laparotomy was performed to rule out organ injury and missed NEC lesions.

**Main Results:** The mean birthweight of the piglets was 904 ±206 g. We found NEC lesions (score 3-6) in 16 out of 42 piglets (38%). A positive predictive value at 100 % was found for laparoscopy as a diagnostic marker of NEC in both colon and the small intestine. Five piglets had a higher score found at laparotomy in the small intestine, resulting in a sensitivity of 50 %. Additionally the sensitivity was 92 % in colon. The specificity was 100 % in both colon and the small intestine. All piglets were respiratory and circulatory stable during surgery.

**Conclusions:** We found that laparoscopy performed in preterm piglets was a feasible technique with a high positive predictive value and specificity to identify NEC-lesions. The sensitivity to identify NEC-lesions in the small intestine was low (50 %), and would probably be increased by using an instrument to examine the bowel systematically, but entails a risk of iatrogenic lesions. Laparoscopy could be an important and safe diagnostic tool even in early stages of NEC.

**SO12 PERSONAL LEARNING STYLE MAY AFFECT THE ABILITY TO LEARN LAPAROSCOPIC SURGERY: A PRELIMINARY STUDY** Giuseppe Retrosi, MD, MEd<sup>1</sup>, Melanie Morris, MD, MSc<sup>1</sup>, Jonathan McGavock, PhD<sup>2</sup>; <sup>1</sup>Department of Surgery, Division of Pediatric Surgery, Health Sciences Centre - Children's Hospital of Winnipeg, University of Manitoba, Winnipeg, Manitoba, Canada, <sup>2</sup>Department of Pediatrics, University of Manitoba, Winnipeg, Manitoba, Canada

**Purpose:** Learners acquire laparoscopic skills at different speeds and levels. A learning style is the way in which learners attempt to efficiently and effectively perceive, process, store, and recall information. Our aim is to assess if subjects' learning style may affect the ability to learn laparoscopy.

**Methods:** Nineteen medical students performed 10 repetitions of the object transfer task on a validated pediatric laparoscopic simulator (Research Ethics Board Approval: HS20361). Participants' learning style was established using the Fleming VARK learning style inventory (<http://www.vark-learn.com/english/index.asp>). VARK is a validated learning styles model that identifies 4 different learning styles (V: visual, A: aural, R: reading/writing, K: kinesthetic). Motion analysis software was used to assess participants' performance. The main outcomes were laparoscopic proficiency treated as a binary outcome based on (1) task completion time (<107 seconds) and (2) total instrument distance (<2.03 meters)\*. To determine if participants' laparoscopic proficiency was associated with learning style we used Chi-square tests for categorical variables and t-tests for continuous variables.

**Results:** All 19 participants completed the inventory (results summarized in Table 1) and 37% (7 students) were classified as kinesthetic and/or visual style learners, while 63% (12 students) were considered multimodal or reading style learners. Participants classified as visual/kinesthetic were ~4 years older than participants classified as multimodal or reading style learners. No gender differences were observed between the groups. 85% (6 students) of participants with a kinesthetic and/or visual learning style reached the proficiency level for the task completion time while only 17% (2 students) of participants with multimodal or reading learning style were able to perform the task in <107 seconds ( $\chi^2=8.7$ ;  $p=0.003$ ). Regarding total instrument distance, 85% (6 students) of participants classified as

# Oral (Scientific Session Abstracts)

kinesthetic and/or visual learners and 67% (8 students) of participants classified as multimodal or reading learners performed the task in <2.03 meters ( $p=0.36$ ).

**Conclusion:** This is the first study to investigate the correlation between trainees' learning style and their ability to acquire laparoscopic skills. This pilot study suggests that trainees' learning style may affect their ability to acquire laparoscopic skill proficiency. Larger studies are needed to confirm these preliminary observations.

**\*Reference:** Retrosi G et al. *Motion Analysis-Based Skills Training and Assessment in Pediatric Laparoscopy: Construct, Concurrent, and Content Validity for the eoSim Simulator.* J Laparoendosc Adv Surg Tech A. 2015

**Table 1:** Learning style and likelihood of being proficient

Variable	Kinesthetic/Visual (n=7)	Multimodal/Reading (n=12)	p
Time < 107 seconds	6 (85%)	2 (17%)	<b>0.003</b>
Length < 2.03 meters	6 (85%)	8 (67%)	0.36
Male	3 (43%)	3 (25%)	0.42
Age (years)	28 ± 4	24 ± 2	<b>0.05</b>

## **S013 LAPAROSCOPIC VERSUS OPEN APPENDECTOMY IN PAEDIATRIC PATIENTS WITH COMPLICATED APPENDICITIS: A META-ANALYSIS** Zhi Xuan Low<sup>1</sup>, Jun Liang Teh<sup>2</sup>, Wee Boon Tan<sup>2</sup>, Sharon Zhiling Koh<sup>2</sup>, Jun Jie Ng<sup>2</sup>; <sup>1</sup>National University of Singapore, <sup>2</sup>National University Hospital

**Background:** Acute appendicitis is a common surgical condition in the paediatric population. For patients with uncomplicated appendicitis, laparoscopic appendectomy (LA) is the treatment of choice as compared to open appendectomy (OA) due to benefits such as lower surgical site infection rates (SSI) and faster recovery times. However, in patients with complicated appendicitis (CA), as defined by gangrenous or perforated appendicitis, or appendicitis associated with an appendicular abscess, the decision to perform OA or LA still remains unclear.

**Aims:** Multiple studies have reported differing results in outcomes such as SSI and intraabdominal abscess (IAA) when comparing LA to OA in CA. Hence, we performed a meta-analysis using literature published in the last 20 years that compared the outcomes of LA and OA in paediatric patients who have CA. The primary outcomes of this meta-analysis are to examine the rates of postoperative SSI and IAA, as well as operating time (OT) and length of stay (LOS). The secondary outcomes are the rates of postoperative ileus and/or intestinal obstruction (IO), time to oral intake (TTOI), rate of readmission, and need for surgical or percutaneous intervention.

**Methods:** The PRISMA guidelines were adhered to. An electronic database search in the period of 1997 to 2017 was performed using the Cochrane, Medline, PubMed, Scopus, Ovid, Embase and Web of Knowledge databases. We included papers which studied paediatric patients with CA and compared the postoperative outcomes of LA and OA. Data analysis and generation of Forest plots were performed using RevMan 5.3 from the Cochrane Collaboration. Methodological and risk of bias assessment of the included studies were performed.

**Results:** Five randomized-control trials (278 LA vs 345 OA) and 32 case-control trials (3628 LA vs 4522 OA) were included in the analysis. Compared to OA, LA is shown to have a significantly shorter LOS (WMD = -1.40, 95% CI: -1.51 – -1.28,  $P < 0.00001$ ) and a lower rate of SSI (OR = 0.39, 95% CI: 0.32 – 0.47,  $P < 0.00001$ ). However, there were no difference in the OT (WMD = 1.40, 95% CI: -0.15 – 2.95,  $P = 0.08$ ) and rates of IAA (OR = 0.88, 95% CI: 0.73 – 1.07,  $P = 0.19$ ) between OA and LA. LA was also shown to have significantly lower readmis-

# Oral (Scientific Session Abstracts)

sion rates (OR = 0.60, 95% CI: 0.47 – 0.76, P < 0.00001), lower rates of postoperative ileus and/or IO (OR = 0.49, 95% CI: 0.35 – 0.67, P < 0.0001), lower rates of reoperation (OR = 0.44, 95% CI: 0.27 – 0.71, P = 0.0007), and a shorter TTOI (WMD = -0.82, 95% CI: -1.03 – -0.62, P < 0.00001).

**Conclusion:** In paediatric patients with CA, LA confers benefits such as a shorter LOS, lower rate of SSI and other various improved outcomes. It was previously thought that OA allows for better peritoneal lavage leading to reduced rates of IAA. However, our meta-analysis has shown that the rates of IAA in LA were comparable to that of OA. Based on our study, LA should be the procedure of choice in paediatric patients presenting with CA.

**S014 CONGENITAL PARAESOPHAGEAL HERNIA: CONTEMPORARY RESULTS AND OUTCOMES OF LAPAROSCOPIC APPROACH TO REPAIR IN INFANTS AND CHILDREN** Mikael Petrosyan, MD, Adil A Shah, MD, A. Alfred Chahine, MD, Philip C Guzzetta, MD, Anthony D Sandler, Timothy D Kane, MD; Children's National Medical Center

**Background:** Congenital paraesophageal hernia (CPEH) is a rare diaphragmatic anomaly for which repair has primarily been described by laparotomy, although, more recent case series describe a laparoscopic repair. In reports with over five patients, the predominant approach has been with laparotomy. The purpose of our study was to review our recent institutional experience and results with exclusively laparoscopic repair of CPEH in infants and children.

**Methods:** An IRB approved retrospective review of all patients with CPEH who underwent laparoscopic treatment at a tertiary children's hospital from 2010-2017 were evaluated. We included only those patients with primary CPEH or CPEH with prior repair (s) with recurrence presenting for operation. Data including demographics, diagnostic studies, operative details, complications, outcomes, and follow up were analyzed. Age at diagnosis was one day to 25 years of age (mean 2.5 years).

**Results:** A total 27 patients underwent 29 operations to treat CPEH. All operations were completed laparoscopically with no conversions to open. There were 7 Type II, 14 Type III, and 6 Type IV CPEH patients. Sixteen patients were under one year of age (59%). Weight at time of repair was 1.2 to 44 kg (average 10.4 kg). Nineteen patients (70%) were less than 10 kg and 8 were over 10 kg. Operative times ranged from 61-390 minutes (average 122 minutes). Three patients underwent initial CPEH repair (s) (open and laparoscopic) at other institutions before the laparoscopic revision was performed at our hospital (11%). Crural repair was performed in all patients, fundoplication in 25 (93%), and gastrostomy in 9. Complications included two patients with recurrent Hiatal hernias, which were re-done laparoscopically (2/27 or 7.4% recurrence) and 1 capnothorax requiring pigtail drainage post operatively. There were no deaths and no requirement for esophageal dilations or esophageal lengthening. Concomitant gastrostomy was placed in 12 patients (44%) and one patient required laparoscopic gastrostomy 6 weeks post initial repair for failure to thrive. Follow-up ranged from 3 months to 7 years (mean 35 months).

**Conclusion:** Congenital paraesophageal hernia in infants and children are uncommon. Based on our experience, the laparoscopic approach to repair is feasible, even for neonates, with excellent results, acceptably low recurrence rate, and should be considered the standard of care.

**S015 NATIONAL TRENDS IN PEDIATRIC AND ADOLESCENT WEIGHT LOSS SURGERY IN THE UNITED STATES** Cornelia Griggs, MD, Numa Perez, MD, Robert Goldstone, MD, David Chang, PhD, MBA, MPH, Cassandra Kelleher, MD, Janey Pratt, MD; Massachusetts General Hospital

**Purpose:** The surgical treatment of adolescent obesity is evolving rapidly. Our objective was to examine recent national trends in bariatric operations among obese children and adolescents.

**Methods:** The Kids' Inpatient Database (KID) and the National Inpatient Sample (NIS) database were used to identify pediatric patients (<21 years old) undergoing bariatric surgery from 2005-2014. Patients were identified using ICD-9-CM procedure codes for bariatric operations with a confirmatory diagnosis code for obesity. National population estimates were calculated using weights provided by the Healthcare Cost and Utilization Project (HCUP), and statistics were obtained using a chi-square analysis for type of procedure, patient characteristics, and in-hospital complications.



# Oral (Scientific Session Abstracts)

**Results:** An estimated 14,178 ± 690 bariatric operations were performed from 2005 to 2014 among patients age 20 years old and younger. Patients were predominantly white (59%, p<0.001) and female (78%, p<0.001), with a mean age of 18.6 ± 0.1 years old. Operation type varied significantly throughout the study period. Specifically, vertical sleeve gastrectomy (VSG) increased from 1% of all bariatric procedures to 70% (p<0.001), while laparoscopic Roux-en-Y gastric bypass (LRYGB) decreased from 54% to 28% (p<0.001). Adjustable gastric band (AGB) peaked in 2009 to account for 28% of all procedures, and rapidly decreased to 0.3% of all procedures by 2014 (p<0.001). The mean length of stay (LOS) was 2 ± 0.04 days. Postoperative in-hospital complications decreased from 8.8% of patients in 2005 to 2% of patients in 2014 (p<0.001). There was one in-hospital postoperative death, which occurred in 2006.

**Conclusion:** Utilization of bariatric surgery for treatment of pediatric obesity has remained stable over the past decade, with a significant shift in type of procedure that shows increasing frequency of VSG and decreasing frequency of LRYGB and AGB. This shift mirrors operative trends in the adult population.

Types of Adolescent Bariatric Surgical Procedures Performed 2005-2014, Ages < 21 yo

Procedure, n(%)	2009 (KID)	2010 (NIS)	2011 (NIS)	2012 (KID)	2013 (NIS)	2014 (NIS)
LRYGB	809 (54.4)	792 (61.9)	652 (49.6)	640 (41.4)	575 (34.5)	485 (27.9)
ORYGB	92 (6.2)	50 (3.9)	35 (2.7)	36 (2.4)	30 (1.8)	15 (0.9)
AGB	418 (28.1)	226 (17.7)	243 (18.5)	80 (5.2)	20 (1.2)	<11 (0.3)
VSG	132 (8.9)	211 (16.5)	341 (26.0)	779 (50.4)	1030 (61.9)	1225 (70.4)
VBG	23 (1.5)	22 (1.7)	18 (1.4)	13 (0.8)	15 (0.9)	<11 (0.3)
Total	1474	1300	1289	1549	1670	1735

All p values are <0.001. Years 2005-2008 omitted for brevity, but p values calculated including these years

**SO16 TRENDS IN HOSPITAL LENGTH OF STAY AND 30-DAY MORBIDITY IN PEDIATRIC PATIENTS UNDERGOING LAPAROSCOPIC ILEO-CECAL RESECTION, 2012-2016** Sarah B Cairo, MD, MPH, Kristen A Calabro, MD, MBS, Carroll M Harmon, MD, PhD, Kaveh Vali, MD, David H Rothstein, MD, MPH; John R. Oishei Children's Hospital

**Purpose:** To examine post-operative length of stay, hospital readmission frequency and 30-day complications in pediatric patients undergoing laparoscopic ileocecal resection in a contemporary cohort.

**Methods:** Patients less than 19 years of age who underwent a laparoscopic ileocecal resection were identified from the American College of Surgeons National Surgery Quality Improvement Project, Pediatric (NSQIP-P) 2012-2016 participant user files. Mean post-operative lengths of stay, hospital readmission frequencies and wound-specific and composite overall complications were calculated and compared by year of operation using ANOVA or chi-squared analysis, as appropriate.

**Results:** A total of 348 patients were identified (range, 46-96 per year). A majority of patients were admitted the day of operation (range, 55.2%-69.8% with a non-statistically significant frequency rise). Post-operative lengths of stay ranged from 5.4 ± 2.9 days to 7.3 ± 9.1 days, but the differences were not statistically significant (p=0.24). Even when examining only those patients admitted on the day of operation, post-operative lengths of stay remained relatively long, ranging from 5.0 ± 3.0 days to 5.7 ± 4.0 days (p=0.89). Rates of hospital readmission within 30 days of operation rose from 6.9% in 2012 to 15.5% in 2016, but this trend similarly did not reach statistical significance (p=0.41). Wound complication rates (including superficial, deep and deep organ space infections, as well as wound dehiscence) ranged from 0.0% to 8.6%, but did not vary in a statistically significant manner. Non-wound complication rates were vanishingly small.

**Conclusions:** Post-operative length of stay in pediatric patients undergoing laparoscopic ileocecal resection in a select group of patients cared for in hospitals participating in NSQIP-P has not decreased in the past 5 years despite emerging evidence of the safety and relevance of enhanced recovery after surgery programs. Surgeons must remain vigilant to avoid unnecessary hospital readmissions and maintain low wound infection rates.

# Oral (Scientific Session Abstracts)

**S017 POSTOPERATIVE ADHESIVE SMALL BOWEL OBSTRUCTION FOLLOWING LAPAROSCOPIC OR OPEN FUNDOPLICATION FOR GAS-TROESOPHAGEAL REFLUX IN CHILDREN** Michimasa Fujiogi, MD<sup>1</sup>, Nobuaki Michihata, MD, MPH<sup>2</sup>, Hideo Yasunaga<sup>2</sup>, Jun Fujishiro, MD, PhD<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Graduate School of Medicine, The University of Tokyo, <sup>2</sup>Department of Clinical Epidemiology and Health Economics, School of Public Health, The University of Tokyo

**Background:** Fundoplication is a common abdominal procedure for children with gastroesophageal reflux. Postoperative adhesive small bowel obstruction is one of the most serious adverse events which deteriorate quality of life for children. However, data have been lacking on whether laparoscopic fundoplication (LF) is superior to open fundoplication (OF) in terms of reducing postoperative adhesive small bowel obstruction.

**Objective:** The aim of this study was to compare postoperative adhesive intestinal obstruction and other postoperative complications (including laceration, pneumonia, urinary tract infection), duration of anesthesia, postoperative length of stay, interval from surgery to intake and total hospitalization costs between the LF and the OF.

**Methods:** Using the Diagnosis Procedure Combination database, a national inpatient database in Japan, we retrospectively identified patients aged 7 days old -18 years old who underwent LF or OF from July 2010 to March 2016. Propensity score adjustment was used to compare the outcomes between the groups.

**Results:** We identified 1,279 eligible patients who underwent LF (n=1,047) or OF (n=232). The median age at surgery were 4.9 years in the LF group and 3.4 years in the OF group (P = 0.002). The median weight at surgery were 12.5 kg and 10.5 kg, respectively (P < 0.001). There was no significant difference in the median interval from surgery to intake (2 days vs 3 days, P = 0.16) between the groups. The LF group had significantly longer duration of anesthesia (316 minutes vs 251 minutes, P < 0.001), higher total costs (13,782 USD vs 11,899 USD, P < 0.001) and shorter postoperative length of stay (13 days vs 16 days, P < 0.001) than the OF group. In the propensity score-adjusted generalized estimating equations, there was no significant difference in the proportion of postoperative complications between the LF and OF groups (9.7% vs 12.1%; odds ratio, 1.22, 95% confidence interval, 0.59-2.51; p = 0.54). In the propensity score-adjusted Cox regression analysis, postoperative adhesive small bowel obstruction was significantly less likely to occur in the LF group than in the OF group (2.0% vs 4.7 %; hazard ratio, 0.36; 95% confidence interval, 0.14-0.95; p = 0.04).

**Conclusion:** In this retrospective nationwide study, LF was significantly associated with reduction in postoperative adhesive small bowel obstruction compared with OF.

**S018 ENDOLOOP VERSUS ENDOSTAPLER: WHAT IS THE BEST OPTION FOR APPENDICEAL STUMP CLOSURE IN CHILDREN WITH COMPLICATED APPENDICITIS? RESULTS OF A MULTICENTRIC INTERNATIONAL SURVEY.** Maria Escolino<sup>1</sup>, Francois Becmeur<sup>2</sup>, Giovanni Severino<sup>1</sup>, Amulya Saxena<sup>3</sup>, Francesco Turrà<sup>1</sup>, Mariapina Cerulo<sup>1</sup>, Holger Till<sup>4</sup>, George W Holcomb 3rd<sup>5</sup>, Ciro Esposito<sup>1</sup>; <sup>1</sup>Federico II University of Naples, Italy, <sup>2</sup>Hopitaux Universitaires de Strasbourg, France, <sup>3</sup>Chelsea Children Hospital, London, UK, <sup>4</sup>Medical University of Graz, Austria, <sup>5</sup>Mercy Children's Hospital, Kansas City, Missouri, USA

**Background:** The most appropriate method for appendiceal stump closure during laparoscopic appendectomy (LA) is still debated because of limited and conflicting evidence. We aimed to compare endoloop (EL) vs endostapler (ES) for stump closure during LA for complicated appendicitis in children.

**Methods:** We retrospectively reviewed the records of 708 patients who underwent LA for complicated appendicitis in 5 international centers of Pediatric Surgery over a 5-years period. There were 463 boys and 245 girls with an average age of 9.8 years (range 6.9-11.8) and an average weight of 45.7 Kgs (range 26-60). The appendix was perforated with localized peritonitis in 470 cases while a diffuse peritonitis was found in 238 patients. EL was used in 374 cases (G1) whereas ES was adopted in 334 cases (G2). All patients received the same antibiotic therapy protocol (cephalosporine + metronidazole) in the postoperative period.

**Results:** No intra-operative complication was recorded but 5 conversions to open surgery were reported in G1 (1.3%) and 4 in G2 (1.1%) (p=0.55). There was no significant difference between the 2 groups in regard to: average operative time (G1:56 minutes; G2:62.3 minutes; p=0.20), average analgesic requirement (G1:48 hours; G2:56 hours; p=0.55), average time of resumption of oral diet (G1:53 hours; G2:58 hours; p=0.55), average resumption of gastrointestinal transit (G1:3.8 days; G2:4.3 days; p=0.7), average length of hospital

# Oral (Scientific Session Abstracts)

stay (G1:6.5 days; G2:7 days;  $p=0.41$ ), average duration of antibiotic therapy (G1:6.5 days; G2:7 days;  $p=0.41$ ). Incidence of intra-abdominal abscess (G1:  $n=47$  or 12.5%; G2:  $n=32$  or 9.5%) and small bowel obstruction (SBO) (G1:  $n=8$  or 2.1%; G2:  $n=2$  or 0.5%) were significantly higher in G1 compared to G2 ( $p=0.0001$ ). Re-operations and readmission rate was significantly higher in G1 ( $n=14$  or 3.7%) compared to G2 ( $n=2$  or 0.5%) ( $p=0.0001$ ). The average cost of supplies for LA was significantly higher in G2 (€ 915.60) compared to G1 (€ 578.36) ( $p=0.0001$ ).

**Conclusions:** Our study is the first in the pediatric population to demonstrate that the method used for appendiceal stump closure may influence the outcome of LA in complicated appendicitis. Although ES is more expensive compared to EL, we believe, on the basis of our results, that appendix stump closure should be performed using ES rather than EL in selected complicated appendicitis since its use was associated with a lower incidence of postoperative intra-abdominal abscess and SBO and lower re-operations rate.

**S019 LAPAROSCOPIC NISSEN FUNDOPLICATION: AN EXCELLENT TREATMENT OF GERD-RELATED RESPIRATORY SYMPTOMS IN CHILDREN. RESULTS OF A MULTICENTRIC STUDY.** Ciro Esposito<sup>1</sup>, Maria Escolino<sup>1</sup>, Amulya Saxena<sup>2</sup>, Francesco Turrà<sup>1</sup>, Mariapina Cerulo<sup>1</sup>, Sabine Irtan<sup>3</sup>, Giovanni Severino<sup>1</sup>, Holger Till<sup>4</sup>; <sup>1</sup>Federico II University of Naples, Italy, <sup>2</sup>Chelsea Children Hospital, London, UK, <sup>3</sup>Hopital Trousseau, Paris, France, <sup>4</sup>Medical University of Graz, Austria

**Background:** Respiratory manifestations of gastro-esophageal reflux disease (GERD), particularly chronic cough, are being recognized with increased frequency also in children. This survey aimed to investigate the efficacy of laparoscopic Nissen fundoplication for treatment of GERD-related respiratory symptoms not responsive to medical therapy in neurological normal children.

**Methods:** We collected data of children with GERD-related respiratory complaints not responsive to medical therapy underwent laparoscopic Nissen fundoplication in 4 European centers of Pediatric Surgery over a 10-years period. We excluded children with neurological impairment or any other disease that can lead to aspiration. Pre-operative workup included chest X-ray and pH-impedanzimetry in all patients. Bronchoscopy with bronchoalveolar lavage (BAL) and positive lipid-laden alveolar macrophage (LLAM) scoring were performed in only 1 center.

**Results:** A total of 220 laparoscopic Nissen procedures were performed in all centers in the period 2005-2015. Twenty-four (12 boys and 12 girls, average age 9.5 years) out of the 220 patients (10.9%) presented with chronic cough and other respiratory manifestations including asthma, reactive airway disease and recurrent pneumonia. Pathologies associated were esophagitis in 4 patients and a Barrett's esophagus in 2 children. Average operative time was 65 minutes. As for postoperative complications, 2 tight wraps requiring endoscopic dilatation (IIIb Clavien) and 2 relapses of GERD for slipped Nissen requiring re-operation (IIIb Clavien) were recorded. Average follow-up length was 7 years. At clinical controls, respiratory symptoms disappeared with a significant improvement of quality of life scoring in 22/24 patients (91.6%).

**Conclusion:** Our results confirm that GERD should be investigated as one of the possible etiologic factors in any child with chronic cough or other persistent respiratory complaints. In patients with symptoms not responsive to medical GERD therapy, laparoscopic Nissen fundoplication is the treatment of choice with a very high success rate (>90% in our series), a very low morbidity and a significant improvement in quality of life of patients and their families.

**S020 SAFETY AND EFFICACY OF ENDOSCOPIC SLEEVE GASTROPLASTY IN CHILDREN AND ADOLESCENTS** Aayed R Alqahtani, MD, FRCSC, FACS, Mohamed O Elahmedi, MBBS; Obesity Chair, King Saud University

**Background:** Endoscopic sleeve gastropasty (Endosleeve) is a new technique where sutured full-thickness endoluminal plications are used along the greater curvature to reduce gastric volume. Early adult case series show promising results. Nevertheless, there is no evidence on the safety and efficacy of this endobariatric technique in children and adolescents.

**Methods:** All patients who opted to undergo Endosleeve were enrolled into our prospective outcomes study database. We queried the database for outcome data pertinent to patients aged up to 21 years. This included weight loss, co-morbidity and safety.

# Oral (Scientific Session Abstracts)

**Results:** Since the inauguration of the study in December 2016, 28 children and adolescents underwent Endosleeve. The mean age (range) and body mass index was  $17.1 \pm 2.6$  (11 to 21) years and  $33.5 \pm 5.6$  kg/m<sup>2</sup>, respectively, and 25 patients (89%) were females. Mean % excess weight loss (weight change) at one (n=20), three (n=16), and six months (n=12) was  $43.9 \pm 32.2\%$  ( $-6.9 \pm 1.2$ kg),  $52.7 \pm 45.4\%$  ( $-8.4 \pm 2.4$  kg), and  $54.0 \pm 27.6\%$  ( $-9.9 \pm 4.6$  kg), respectively.

Seventeen (60.7%) patients had co-morbidities. Six (21.4%) of those had dyslipidemia, five had both prediabetes and dyslipidemia (17.9%), four had hypertension (14.3%), one had diabetes (3.5%), and one had prediabetes (3.5%). All these conditions were in remission at the last follow-up visit.

Postoperative morbidity included occasional, nonspecific mild abdominal pain (n=2; 7.1%), and nonspecific fever in day 1 postoperative (n=1; 3.5%). There were no readmissions, reoperations, mortality, or prolonged hospitalization. Postoperative hospital stay was one day for all patients except the case with the fever, who was managed conservatively and discharged two days after the procedure.

**Conclusions:** This early case series demonstrates that endoscopic sleeve gastropasty is safe and effective in children and adolescents. Further long-term, large-series studies are needed to evaluate the sustainability of weight loss and resolution of comorbidities.

**S021 COMPARISON OF PERI-OPERATIVE VARIABLES AND PATIENT OUTCOMES BETWEEN USE OF POLYETHYLENE CLIPS VERSUS STAPLERS FOR SIPES (SINGLE INCISION PEDIATRIC ENDOSURGERY) APPENDECTOMY** Lena Perger, MD<sup>1</sup>, Camille Graham, MD<sup>1</sup>, Luka Komidar, PhD<sup>2</sup>; <sup>1</sup>McLane's Children's Hospital, <sup>2</sup>University of Ljubljana, Slovenia

**INTRODUCTION:** Appendectomy is the most common pediatric surgical procedure in our hospital, and because of large volume, even a small change in procedure can have a large impact. In order to decrease the cost and environmental impact of Single Incision Pediatric EndoSurgery (SIPES) appendectomies, we have switched from using linear cutting endoscopic staplers to polyethylene clips placed with non-disposable laparoscopic appliers. This resulted in \$286 - \$333 savings per case and reduced waste by a factor of 54 (previously presented data). After three years of using the clips, the aim of this study is to compare the peri-operative variables and outcomes in patients where clips were used, to historical controls where staplers were used.

**METHODS:** Retrospective chart review of SIPES appendectomies was performed for a study group of patients operated on after the switch to clips in 2013, and compared to historical control group of patients who had appendectomies before the clips were introduced. Demographic data was collected along with operative and clinical variables. T-test, Mann-Whitney test, and chi squared test were used to analyze the data as appropriate.

**RESULTS:** 150 patients were included in each group. There were no statistically significant differences between the groups for any of the measured variables. For the whole sample, mean age was 10.5 years, weight 45 kg, operative time 49 minutes, estimated blood loss (EBL) 5 ml, length of stay (LOS) 1.6 days, percentage of complicated appendicitis 23%, and incidence of major post-operative complications requiring interventions 7.6% (mostly intra-abdominal abscesses requiring percutaneous drainage, large majority of which occurred in complicated appendicitis). There were no intra- or post-operative complications related to use of clips. Most procedures were performed by 4th year general surgery residents (53%), followed by 2nd year residents (40%), and interns (6.5%). After switching to clips, staplers were still used in 18% of appendectomies (in 8% the base of appendix was too large, gangrenous or perforated and could not be clipped, 10% happened in the first year since the switch for no apparent reason that could be gleaned from the operative report).

**CONCLUSIONS:** Use of polyethylene clips for appendectomy is safe, effective and comparable to stapling in operative time, EBL, LOS and peri-operative complications. Large majority of appendectomies can be performed using clips. Based on our data, appendiceal base is not amenable to clipping in 8% of patients. This study supports use of clips over staplers to decrease cost and environmental impact of SIPES appendectomy.

# Oral (Scientific Session Abstracts)

**SO22 A RANDOMIZED TRIAL TO COMPARE THE CONVENTIONAL THREE-PORT LAPAROSCOPIC APPENDECTOMY PROCEDURE TO SINGLE INCISION AND ONE PUNCTURE PROCEDURE THAT WAS SAFE AND FEASIBLE, EVEN FOR SURGEONS IN TRAINING** Motoi Mukai, MD, PhD, Tomoe Moriguchi, MD, Seiro Machigashira, MD, Koshiro Sugita, MD, Keisuke Yano, MD, Masato Kawano, MD, Shun Onishi, MD, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, MD, Takafumi Kawano, MD, PhD, Kazuhiko Nakame, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

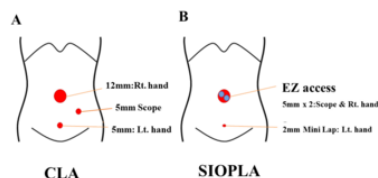
**Background and Aim:** Single incision laparoscopic surgery has emerged; however the procedures might be complicated for trainees. We compared the clinical outcomes of conventional three-port laparoscopic appendectomy (CLA) and single incision and one puncture laparoscopic appendectomy (SIOPLA) by attending pediatric surgeons (APs) and surgeons in training (SITs).

**Patients and Methods:** The CLA procedure: A 12 mm trocar was placed at the umbilicus using the open access procedure. A 5-mm trocar was placed at the left lower abdominal quadrant, and another 5-mm port was placed at the supra pubic region as working ports (Fig.1A). The SIOPLA procedure: A 15 mm skin incision was made at the umbilicus and laparotomy was performed, then a Lap-Protector® (size, XS; Hakko Co., LTD., Tokyo, Japan) was inserted into the umbilical wound and an EZ Access port® (Hakko, Tokyo, Japan) was attached. Two 5mm trocars were inserted through the EZ access port. One trocar was used for a 5-mm telescope and the other trocar was used for a working port. Then one 2-mm grasper (Mini Lap, Teleflex, Tokyo, Japan) was inserted at the supra pubic region as a working port (Fig.1B) using puncture method. Appendectomy was performed using the same procedure as CLA. We reviewed the clinical outcomes of 72 randomized laparoscopic appendectomies that were consecutively performed by SITs and APs over a 2-year period. The cases were categorized according to the pathology as catarrhal and phlegmonous (C+P) or gangrenous (G) and according to type of surgeon. Finally, 7 CLA (C+P), 5 SIOPLA (C+P), 3 CLA (G), and 13 SIOPLA (G) procedures were performed by SITs, and 8 CLA (C+P), 6 SIOPLA (C+P), 16 CLA (G), and 14 SIOPLA (G) procedures were performed by APs. The operative time, blood loss, analgesic use, complications and hospital stay were analyzed.

**Results:** Table 1 shows the characteristics of the CLA and SIOPLA groups divided according to pathological findings. There were no significant differences in the characteristics of the patients with the same pathological diagnosis. Table 2 compares the outcomes when the same surgical procedure was performed by APs or SITs in patients with the same pathological diagnosis. When the pathological diagnosis of the resected appendix was the same, the time taken by SITs to perform CLA was significantly longer in comparison to APs ([C+P; APs vs. CITs,  $p = 0.01$ ], [G; APs vs. CITs,  $p = 0.02$ ], respectively) (Table 2). Furthermore, the time taken by SITs to perform SIOPLA operations in patients with C+P appendicitis was significantly longer ( $p = 0.02$ ). However, in the case of SIOPLA for gangrenous appendicitis, the operation time of the SITs and APs did not differ to a statistically significant extent ( $p = 0.07$ ). There were no significant differences in any of the evaluation points between CLA and SIOPLA.

**Conclusion:** The operation time in SIOPLA performed by SITs was significantly longer in comparison to SIOPLA performed by APs; however, the postoperative outcomes were satisfactory. SIOPLA has effective manipulation angle same as CLA and was safe and feasible for young surgeons to perform.

**Figure 1** Port layout for CLA and SIOPLA



**Table 1** Comparison of patients' characteristics between CLA with SIOPLA divided by pathological diagnosis

Carrier as surgeon	APs						SITs					
	C+P		p	G		p	C+P		p	G		p
Pathology	CLA	SIOPLA		CLA	SIOPLA		CLA	SIOPLA		CLA	SIOPLA	
Surgical procedure												
Number	8	6		16	14		7	5		3	13	
Age (Y)	8.0 ± 0.8	8.1 ± 0.4	0.87	7.6 ± 0.8	8.8 ± 0.7	0.29	10.0 ± 0.9	8.8 ± 1.9	0.55	10.3 ± 0.8	8.2 ± 0.8	0.27
Sex (Male:Female)	5/3	3/3	0.67	10/6	6/8	0.42	7/0	3/2	0.52	0/3	8/5	0.06

**Table 2** Comparison of operative outcome between APs with SITs divided by pathological diagnosis

	CLA (n = 34)				SIOPLA (n = 38)							
	(C+P)		p	(G)		(C+P)		p	(G)			
	APs	SITs		APs	SITs	APs	SITs		APs	SITs		
Operation time (min)	43.8 ± 25.9	110.4 ± 29.2	0.01	87.8 ± 30.3	104.0 ± 31.2	0.02	10.3 ± 12.0	95.3 ± 28.2	0.02	96.7 ± 27.1	118.9 ± 23.3	0.07
Blood loss (ml)	13.1 ± 20.4	7.1 ± 18.9	0.85	11.8 ± 6.3	8.0 ± 8.0	NA	8.0 ± 8.0	8.0 ± 8.0	0.68	17.2 ± 31.7	18.8 ± 20.8	0.88
Need for analgesics	2.00 ± 1.92	2.0 ± 1.92	1	1.98 ± 0.97	1.86 ± 1.52	0.94	1.86 ± 1.70	1.20 ± 1.27	0.79	2.85 ± 2.71	6.30 ± 7.91	0.11
Post Op. Complications	0	0	0.8	0	0	NA	0	0	NA	0	0	0.84
Hospitalization days	4.3 ± 2.6	4.8 ± 0.8	0.12	11.9 ± 9.0	16.7 ± 17.7	0.34	4.7 ± 1.8	6.4 ± 2.2	0.42	11.7 ± 8.0	14.0 ± 8.1	0.84

Contra of Post Op. complications:

\* Abscess

\*\* abscess+ileus+acute renal failure

# Oral (Scientific Session Abstracts)

**S023 RETROSPECTIVE ANALYSIS OF LAPAROSCOPIC LADD'S PROCEDURE THROUGH SINGLE UMBILICAL APPROACH** Yingzi Li, MD, Jinshi Huang, MD, Yongwei Chen; Capital Medical University

**Purpose:** There are controversial opinions about treating intestinal malrotation through laparoscopic procedure. We summarize our experiences in order to offer an opinion.

**Method:** Summarize clinical data of laparoscopic Ladd's procedure through single umbilical approach to repair intestinal malrotation for last three years retrospectively.

**Result:** There are total 88 cases performed this procedure from Jan 2014 to Dec 2016. Operating-time is 27min-103min. 6 of them turned to open surgery. 3 cases need re-operation, and 2 of these 3 were recurrent volvulus, 1 was perforation of duodenum.

**Conclusion:** Laparoscopic Ladd's procedure through single umbilical approach is an effective method to treat intestinal malrotation.

**S024 TRANS-UMBILICAL LAPAROENDOSCOPIC SINGLE SITE SURGERY FOR INGUINAL HERNIA AND HYDROCELE IN CHILDREN** Tran N Son, PhD, Hoang V Bao, MD, Tran V Quyet, MD, Nguyen T Hong Van, MD; Saint Paul Hospital

**Objectives:** To present our technique of trans-umbilical laparo-endoscopic single site surgery (TULESS) and its outcome for inguinal hernia /hydrocele in children.

**Methods:** Medical records of all children undergoing TULESS for inguinal hernia or hydrocele at our center between June 2016 and August 2017 were reviewed. For TULESS, one 5.5mm port for camera and one 3.5mm port for grasper were placed at a single 10mm umbilical incision. A 17G spinal needle and a small wire-lasso were used. With assistance of the grasper, the pathologic processus vaginalis was closed extraperitoneally at internal ring by the needle placed percutaneously with a suture, threaded intraperitoneally through the wire-lasso. Contralateral persistent processus vaginalis (CPPV) was treated in the same procedure. Scrotal puncture for fluid evacuation was performed for most cases of hydrocele.

**Results:** 614 patients, 81.4% boys and 18.6% - girls were enrolled. 469 patients had inguinal hernia (median age 32 months, ranged 1 month to 15 years), among them 19 had incarcerated hernia. 145 patients had hydrocele (median age 34 months, ranged 24 months to 9 years). 95.9% of patients had unilateral disease and 4.1% - bilateral. In 589 patients with unilateral disease, CPPV was detected intraoperatively in 45.5%. Median operative time was 22 minutes for unilateral and 28 minutes for bilateral procedures. There was no intraoperative complication. No additional port was needed even for the cases with incarcerated hernia. At follow up 2-16 months, recurrence occurred in 1.3% and 0% of patients with inguinal hernia and hydrocele, respectively. Stitch inflammatory reaction or granuloma was noted in 1.3% of all patients. There was no case of postoperative hydrocele, testicular atrophy, or iatrogenic cryptorchism. Postoperative cosmesis was excellent as all patients were virtually scarless.

**Conclusions:** TULESS for inguinal hernia and hydrocele in children is feasible, safe, with ability of management of CPPV and with excellent postoperative cosmesis. This technique can be applied successfully also for incarcerated hernia. TULESS can be a good alternative technique in treatment of inguinal hernia and hydrocele in children.

**S025 EARLY CLINICAL OUTCOME OF STAGED LAPAROSCOPIC TRACTION ORCHIDOPEXY FOR ABDOMINAL TESTES** Mohamed A Abouheba, MD; University of Alexandria

**Aim:** To assess the short-term clinical outcome of the novel Shehata technique of laparoscopic traction-lengthening for abdominal testes in a single center over a 12 months period (January - December 2014). An ethical approval of the study & appropriate consents were obtained for all patients before inclusion in our study.

**Methods:** A total of 47 consecutive boys presented with impalpable testes in the ipsilateral hemi scrota, 3 of them were bilateral summing up to a total of 50 units of abdominal testes to a single center over 12 months (January - December 2014). Those underwent a preoperative U/S Doppler scan for the ipsilateral & contralateral testes. Then proceeded to a 1st stage laparoscopic exploration for

# Oral (Scientific Session Abstracts)

the testes in which the cranial testicular artery & the caudal vas deferens were traced to their meeting point to locate the abdominal testes that were either found (peeping at the internal inguinal ring or more cranially) or otherwise vanishing (intra abdominally blind-ending vas & vessels or extra abdominally passing through the internal inguinal ring). All 50 testes failed to stay at the contralateral IIR when brought there mandating a preliminary lengthening of the testicular vessels by lateral dissection, traction & fixation to a point 1-2 cm superolateral to the contralateral anterior superior iliac spine (ASIS), essentially a mobile traction point. After 12 weeks, all underwent a 2nd stage laparoscopic-assisted ipsilateral subdartos orchidopexy for the testes under traction. Occasional slippage of the testis-under-traction mandated an otherwise 2nd stage re-traction & a 3rd stage orchidopexy. All underwent U/S Doppler scan 3 & 6 months after orchidopexy.

**Results:** The 47 cryptorchid boys presented at a mean age of 3 years 2 months (range: 6 months - 8 years). Out of the 50 impalpable testes, 9 were non-visualized on preoperative U/S Doppler scan & another 16 were vanishing on laparoscopic exploration: 5 abdominally (in-utero vascular accident) & 11 scrotally (perinatal torsion). The remaining 25 testes were fixed loosely near the contralateral ASIS in the 1st stage laparoscopic exploration. Out of which, 3 had slipped traction at the 2nd stage. The 12 weeks traction interval went uneventfully and a pre-definitive U/S Doppler scan confirmed viability of all testes under traction. All 25 elongated testes were mobilized & fixed in the ipsilateral hemi scrota inside a created subdartos pouch (of de Netto). All 25 fixed testes were confirmed viable on U/S Doppler scan 3 & 6 months after orchidopexy.

**Conclusion:** The novel Shehata technique of staged laparoscopic traction-lengthening for abdominal testes is safe, easy and convenient as evidenced by our limited early experience. Neither internal herniation complicated the traction period nor testicular atrophy (by undue tension) complicated the traction or follow-up periods. We advocate this technique as an alternative to the de facto Fowler-Stephens staged orchidopexy that entails risky division of the testicular vessels.

**S026 SIMULTANEOUS ROBOT-ASSISTED LAPAROSCOPIC BOWEL AND BLADDER RECONSTRUCTION** Devin R Halleran, MD, Richard J Wood, MD, Alejandra Vilanova-Sanchez, MD, Rebecca M Rentea, MD, Christopher Brown, MD, Molly Fuchs, MD, Venkata R Jayanthi, MD, Christina Ching, MD, Marc A Levitt, MD, Daniel DaJusta, MD; Nationwide Children's Hospital

**Introduction:** Patients with neurogenic bladder frequently have coexisting bowel dysfunction and a simultaneous urologic and colorectal reconstruction is possible. We present our experience with combined reconstructive procedures using robot-assisted laparoscopy and demonstrate the utility of a minimally invasive approach that considers both the bowel and bladder management of these patients.

**Methods:** We retrospectively reviewed all patients who underwent combined bowel and urologic reconstruction at our institution since we started a multidisciplinary robotic program. Operative videos and surgical technique were reviewed and operative results analyzed.

**Results:** Seven patients were identified in our cohort. The mean age at the time of the patient's reconstruction was 6.4 years (median 5.4, range 3.8-10.1). Six patients had myelomeningocele and 1 had caudal regression. Malone appendicostomies were placed in all 7 patients. A split appendix technique was used as a conduit in 4 patients, in situ appendix in 2, and neoappendicostomy in 1. Five patients had a Mitrofanoff conduit created. Five patients required bladder neck repair and 3 underwent bladder augmentation. 1 patient had a sigmoid colovesicostomy for urinary diversion. There were no intraoperative or perioperative complications. The average operating time was 473 minutes (range 313-580). The average length of stay was 5.2 days (median 5, range 4-7). All patients remain clean and dry on their current catheterizing and flush regimens.

**Conclusion:** Patients with neurogenic bladder often have coexisting bowel dysfunction requiring reconstruction of both organ systems in order to achieve social urinary and bowel continence. Prior to committing to any intervention, the surgeon should consider both the urologic and gastrointestinal needs of the patient, and whenever possible, perform the needed procedures simultaneously. We describe a number of combined operations aimed at bowel and bladder management that can be performed safely using robot-assisted laparoscopy and have excellent initial results.

# Oral (Scientific Session Abstracts)

**S027 LAPAROSCOPIC CLOSURE OF A CONTRALATERAL PATENT PROCESSUS VAGINALIS TO PREVENT METACHRONOUS INGUINAL HERNIAS OVERTREATMENT OR USEFUL PREVENTION? A META-ANALYSIS** Christina Oetzmann von Sochaczewski, MD, Oliver J Muensterer, MD; Department of Pediatric Surgery, Universitätsmedizin Mainz, Mainz, Germany

**Background:** The value of prophylactic closure of a contralateral patent processus vaginalis during laparoscopic inguinal hernia repair is vehemently debated. The most compelling reason to perform this intervention would be to spare the patient from presenting from a subsequent metachronous inguinal hernia. We aimed to aid in the decision-making by performing a systematic review and meta-analysis with the primary outcome of an absolute risk difference for metachronous inguinal hernias between laparoscopic and conventional open hernia repair.

**Methods:** We searched Medline, the Web of Science and Scopus at the 6th of September 2017; reference lists and CrossRef were snowballed for additional records. Eligibility criteria were age <18 years, preoperative diagnosis of unilateral hernia, laparoscopic evaluation, a second group treated by unilateral open repair, and publication since January 2012. Studies using hernioscopy (transinguinal laparoscopy) were excluded. The search strategy identified 634 records including 324 duplicates. We screened 100 records published since 2012, and assessed 49 full-texts. All included studies were retrospective and none provided a definition of an open contralateral patent processus vaginalis. We employed the Random-Effects model 'Restricted Maximum Likelihood' using OpenMetaAnalyst-software.

**Results:** We included nine reports in our quantitative synthesis (Figure). Publication bias was absent based on Egger's regression ( $t=0.22$ ;  $P=0.834$ ). The included studies were highly heterogeneous ( $I^2=88\%$ ;  $P<0.001$ ). Laparoscopy was used in 6,282 patients while 5,764 had an open inguinal hernia repair. The studies included 2,691 prophylactic laparoscopic closures of a contralateral patent processus vaginalis. A metachronous hernia occurred in 10 laparoscopically treated patients, whose contralateral patent processus vaginalis was routinely closed. In contrast, 286 metachronous inguinal hernias became manifest in patients treated by the open approach. We calculated an absolute risk difference of 5.7% (95% confidence interval: 3.6–7.7%;  $P<0.001$ ).

**Conclusions:** Prophylactic closure of a contralateral patent processus vaginalis during laparoscopic inguinal hernia repair reduces the number of metachronous inguinal hernias. However, approximately 18 prophylactic laparoscopic closures of a contralateral patent processus vaginalis are necessary to prevent one metachronous inguinal hernia. With this in mind, pediatric surgeons must carefully balance potential complications with the hypothetical benefits of the procedure when counseling patients and caregivers. Overall, the methodological quality of the available included studies is poor, which makes it difficult to derive strong recommendations from the present source data.



Figure. Forest plot of the included studies for the risk difference achieved by prophylactic laparoscopic closure of a contralateral patent processus vaginalis compared to conventional open repair. MIH = metachronous inguinal hernia. LCPPV = cohort with laparoscopically diagnosed and prophylactically closed contralateral patent processus vaginalis. OR = open repair.



# Oral (Scientific Session Abstracts)

**S028 APPROACH TO THE MANAGEMENT OF PEDIATRIC OVARIAN MASSES IN THE 21ST CENTURY: SYSTEMATIC REVIEW AND META-ANALYSIS** Saqib H Qazi, FACS<sup>1</sup>, Sarah M Jeelani<sup>1</sup>, Jai K Das<sup>1</sup>, Amulya K Saxena<sup>2</sup>; <sup>1</sup>Aga Khan University, <sup>2</sup>Chelsea Children's Hospital Chelsea and Westminster Healthcare NHS Fdn Trust

**Purpose:** Minimally invasive techniques are increasingly being adopted for ovarian pathologies in adults. However its implementation as standard management and efficacy of ovarian masses has not been analyzed in the pediatric population.

**Methods:** Databases of PubMed, Cochrane Library and Google Scholar were systematically searched to extrapolate data. Comparison studies on laparoscopic vs. open management of pediatric ovarian masses were collected and a meta-analysis was performed. Studies pertaining to current trends on types of pediatric ovarian lesions and experiences of institutions' with laparoscopic management were also included in this analysis.

**Results:** A total of 49 studies met the inclusion criteria: 15 epidemiological studies on types of ovarian lesions, 27 outlining experiences with laparoscopy for ovarian masses and 7 comparing both modalities, out of which five included outcomes as per the inclusion criteria. Non-neoplastic lesions ranged from n= 78-84 (36.5-73.7%), with cystic lesions being the most prevalent. Neoplastic lesions accounted for n= 30-136 (26.3-63.5%) of the cases. An overall malignancy rate of n= 4-23(3.5-10.8%) was determined. Germ cell tumors were the most common neoplastic lesions. Studies on laparoscopic management strongly advocated its use for benign ovarian lesion due to multiple advantages, however caution was advised for malignancy to prevent upstaging. Meta-analysis demonstrated that laparoscopic procedures when compared to open procedures are significant with regards to shorter operating time (MD= -33.24 min, 95% CI = -34.29 to -32.19, p<0.0001), less intra-op bleeding (MD= -61.46, 95% CI= -62.69 to -60.24, p<0.0001), and reduced length of hospital stay (MD= -2.78 days, 95% CI= -2.82 to -2.74, p<0.0001). Complication rates however remain similar in both the approaches.

**Conclusion:** Ovarian masses present a large variation in incidences of non-neoplastic and neoplastic lesions. This analysis demonstrated that the laparoscopic approach to ovarian masses has significant advantages in shorter operating times, less intraoperative bleeds and reduced length of hospital stay. Careful case selection is necessary for selection of laparoscopic procedures to prevent upstaging due to accidental spillage, as malignant lesions can constitute up to 10% of the cases.

**Keywords:** ovarian mass, laparoscopy, surgical outcomes, epidemiology, children, adolescents

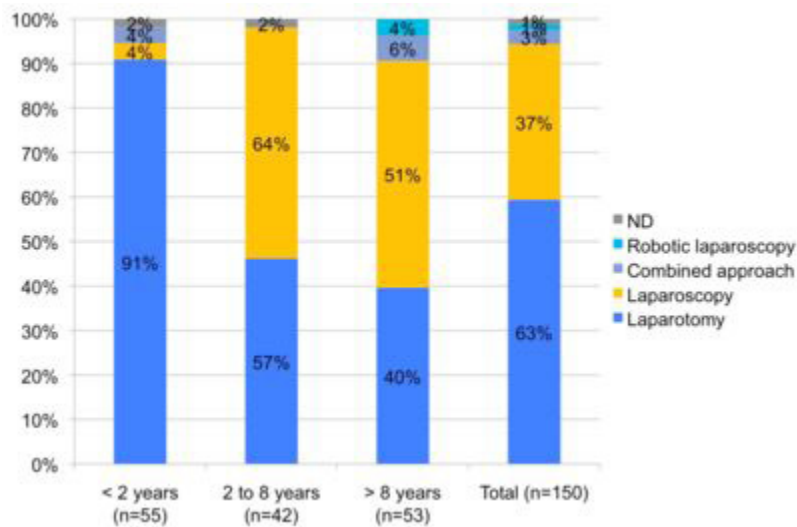
**S029 RISK FACTORS FOR COMPLICATIONS AFTER OPEN AND LAPAROSCOPIC EXCISIONS OF THE URACHUS IN CHILDREN** Aurelien Scalabre, MD<sup>1</sup>, Elodie Delorme<sup>1</sup>, Olivier Abbo, MD, PhD<sup>2</sup>, Quentin Ballouhey, MD<sup>3</sup>, Nicolas Berte, MD<sup>4</sup>, Marie-Berenice Popelin<sup>5</sup>, Sabine Irtan, MD, PhD<sup>5</sup>, Aurelien Binet, MD, PhD<sup>6</sup>, Ciro Esposito, MD, PhD<sup>7</sup>, Pierre-Yves Rabattu, MD<sup>8</sup>, François Varlet, MD, PhD<sup>9</sup>; <sup>1</sup>CHU de Saint Etienne, <sup>2</sup>CHU de Toulouse, <sup>3</sup>CHU de Limoges, <sup>4</sup>CHU de Nancy, <sup>5</sup>Assistance Publique Hôpitaux de Paris, <sup>6</sup>CHU de Tours, <sup>7</sup>Napoly University, <sup>8</sup>CHU de Grenoble

The aims of this multicentric study were to compare the outcomes of laparoscopic and open urachal excisions in children and to identify the risk factors for complications.

**Materials and methods:** This is a retrospective study including all consecutive children who underwent excision of the urachus between 2006 and 2016 across 8 centers. Patients were divided in groups according to the surgical technique (laparoscopy, laparotomy, combined or robotic) and age at time of surgery (less than 2 years, 2 to 8 years, and more than 8 years old). Preoperative, operative, and postoperative data were collected to compare outcomes among groups and to identify the risk factors for complications.

**Results:** 150 children (78 females and 72 males) were included. The mean age was 3.8 years (0 - 17) at diagnosis and 4.2 years (1 day – 18 years) at surgery. Urachal anomalies were 60 urachal cysts (40%), 54 urachal abscesses (36%), 20 urachal fistulas (13%), 10 urachal sinuses (7%), 4 fibrous urachal remnants (3%) and 2 urachal diverticula (1%). 97 children (65%) were operated on by laparotomy, 46 by laparoscopy (31%), 5 by laparoscopy combined with laparotomy (3%) and 2 by robotic laparoscopy (1%).

# Oral (Scientific Session Abstracts)



**Figure 1:** Surgical technique according to age group

Children operated on by laparoscopy were significantly older (8.8 years +/- 4.3) than children operated on by laparotomy (3.9 years +/- 4.7) ( $p=0.0001$ ). (Figure) The mean operative time in the laparoscopy group was 113 min +/- 70 whereas it was 61 min +/- 33 in the laparotomy group. The difference was significant ( $p=0.001$ ). Postoperative hospital stay was 2.9 days +/- 1.8 in the laparoscopy group and 3.5 days +/- 2.5 days in the laparotomy group. The difference was not significant.

The mean operative time was 50 min +/- 29 in patients less than 2 years and 93 min +/- 56 in older children. The difference was significant ( $p=0.0001$ ).

Twelve (8%) postoperative complications were reported after a mean follow-up of 2.2 months (1 – 99): 5 wounds infections in the laparotomy group and 2 wounds infections, 2 urinary infections, 1 orchiepididymitis, 1 dysuria and 1 bladder fistula in the laparoscopy group. The complications rates in the laparotomy group and in the laparoscopy group were not significantly different.

Age at time of surgery was significantly associated with postoperative complications: 2,4% (1/41) in children less than 2 years, 3,6% (2/53) between 2 and 8 years, and 17% (9/44) in older children. ( $p=0.02$ ). The operative time was a prognosis factor for complications ( $p=0.045$ ).

Type of urachal anomaly, gender, surgical technique, preoperative urachal abscesses, partial bladder dome resection, postoperative drainage and antibiotherapy were not identified as risk factors for complications.

**Conclusion:** Age at time of surgery and operative time are risk factors for complications after excision of the urachus in children. Laparoscopy is usually chosen in children older than 2 years old, with a longer operative time but a complications rate comparable to laparotomy.

## **S030 INCIDENCE OF PEDIATRIC METACHRONOUS CONTRALATERAL INGUINAL HERNIA AND THE RELATIONSHIP WITH CONTRALATERAL PATENT PROCESSUS VAGINALIS** Yang Wu, Miao Yuan, MD; West China hospital, China

**Background:** The management of contralateral patent processus vaginalis (CPPV) in children with unilateral inguinal hernia is still controversial. The objective of this current study was to verify the relationship between the suspicious factors as the type of CPPV, gender and the age of pediatric patients with the incidence of metachronous contralateral inguinal hernia (MCIH).

**Methods:** Children with unilateral inguinal hernia from three medical centers underwent either open or laparoscopic repair. Clinical information, including demographics, morphological characteristics of CPPV, follow-up examinations and outcome, was obtained.

# Oral (Scientific Session Abstracts)

**Results:** Of 2942 patents (92.2 %) who received open repair with successful follow-up, 185 (6.29 %) developed into MCIHs (125 (10.9%) on the right side and 60 (3.3%),  $p=0.006$ ) on the left), including of 156 cases (7.07 %) younger than 3-years-old and 29 cases (3.94 %) older than 3-years-old. Patients who were younger than 3-years-old with primary left inguinal hernias easily develop into MCIHs and the difference is statistically significant. Of 5370 patents (96.0 %) who received laparoscopic repair with successful follow-up, the morphology of ipsilateral patent processus vaginalis were cavernous type in 5318(99%) children and 52(1%) cases were fissure type. CPPVs were identified in 2233 (41.5%) cases (1256 (35.01%) on the left side and 977 (54.80%) on the right,  $p<0.001$ ), 1503 cases were cavernous type (1276 cases younger than 3-years-old and 227 cases older than 3-years-old) and 730 cases were fissure type (422 cases younger than 3-years-old and 308 cases older than 3-years-old). In children younger than 3-years-old, the probability of occurrence of cavernous type and CPPV was greater than that of children older than 3-years-old.

**Conclusion:** Not all CPPVs progress into an MIH, 15 CPPVs would need to be repaired to prevent one MIH. If patient with initial left-sided inguinal hernia is younger than 3 years old, when the morphology of CPPV is cavernous type by laparoscopic exploration, the CPPV may be repaired simultaneously.

## **S032 COMPLICATIONS OF COMPLETE LAPAROSCOPIC CYST EXCISION AND ROUX-EN-Y HEPATICOJEJUNOSTOMY FOR CHOLEDOCHAL CYST** Pham D Hien, PhD<sup>1</sup>, Nguyen T Liem, Prof<sup>2</sup>, Vu M Hoan<sup>1</sup>, Tran X Nam<sup>1</sup>; <sup>1</sup>National Children's Hospital, <sup>2</sup>Vinmec International Hospital

**Objective:** describe and manage of complications of complete laparoscopic cyst excision and Roux-en-Y hepaticojejunostomy for choledochal cyst from December 2007 to May 2017.

**Methods:** medical records of all patients undergoing complete laparoscopic cyst excision and Roux-en-Y hepaticojejunostomy of Choledochal cyst in our center. All the patients were treated by other methods will be excluded. The informations: intra-operative and post-operative complications and longterm outcomes were analysed.

**Results:** From December 2007 to May 2017, 481 patients were operated. There were 110 boys and 371 girls. Ages ranged from 1 month to 16 years old. 265 patients (55,1%) were type I and 216 patients were type IV (Todani). There were no post-operative death and no conversion. No blood transfusion was required. Postoperative anastomosis leakage occurred in 10 cases (2 %) and 2 cases needed to be re-operated. Follow up from 3 months to 115 months was obtained in 408/481 patients (84,8%). Of these patients, there were 4 cholangitis occurred (1%), and no cholelithiasis nor anastomosis stenosis. There was no gastritis nor duodenal ulcer. However the rate of simple pain in the lower right costal area is 4,4%.

**Conclusion:** The rate of complications of laparoscopic complete cyst excision and hepaticojejunostomy for treatment of choledochal cyst is low, not severe and can be detected and managed effectively.

**Keywords:** Laparoscopic surgery, choledochal cyst, children.

## **S033 LAPAROSCOPIC KASAI PORTOENTEROSTOMY HAS A FAVORABLE ADVANTAGE OVER OPEN KASAI PORTOENTEROSTOMY IN SUBSEQUENT LIVER TRANSPLANTATION** Chiyoe Shirota, MD, Hiroo Uchida, MD, Yasuyuki Ogura, Hideya Kamei, MD, Yujiro Tanaka, MD, Takahisa Tainaka, Wataru Sumida, MD, Kazuki Yokota, MD, Kazuo Oshima, Ryo Shiotsuki, MD, Kosuke Chiba, Akinari Hinoki, MD; Nagoya University Graduate School of Medicine

**Background:** Liver transplantation (LTx) for biliary atresia (BA) has dramatically improved survival rates and is often used as a final radical operation. Kasai portoenterostomy (PE), however, is still regarded as the standard initial therapy for BA. The standard therapeutic strategy is to perform PE first, followed by living donor LTx in which a jaundice-free status cannot be achieved with PE. However, the success rate of Kasai PE alone to resolve BA has not improved in the past 20 years, which leaves 35–60% of patients requiring subsequent LTx after PE. Moreover, 80% of these patients undergo LTx within 2 years of age. Since the interval between the last PE to subsequent LTx is relatively short, it is important to evaluate the impact of the PE on LTx. Laparoscopic surgery is generally considered to provide faster recovery and less adhesion; furthermore, we actively perform laparoscopic Kasai PE (Lap-PE) for BA. Thus, we evaluated the impacts of Lap-PE on subsequent LTx.

# Oral (Scientific Session Abstracts)

**Patients and Methods:** We obtained approval from our institutional ethics board for a retrospective review of the medical records of patients diagnosed with BA at our institution (approval number: 2015-0094) as well as for the progressive study of laparoscopic Kasai portoenterostomy (approval number: 2014-0400).

We evaluated the perioperative data of patients who received LTx after PE within 2 years of age between 2006 and 2017, which included the following: duration between start of surgery and completion of hepatectomy, blood loss, total duration of surgery, complication during the surgery, duration of intensive care unit (ICU) stay, and duration of post-LTx hospital stay. Statistical analysis was performed using Wilcoxon's test with  $P < 0.05$  being assumed to indicate statistical significance.

**Results:** During the study period, there were 37 cases that received LTx within 2 years of age. Among them, 29 patients underwent LTx after Open-Kasai Portoenterostomy (Open-PE) and 8 patients, after Lap-PE. Lap-PE cases exhibited less adhesions and had a significantly shorter surgical duration up to completion of the recipient's hepatectomy (median: 145 min; range: 117-231 min) than Open-PE cases (median: 232 min; range: 141-334 min). There were no significant differences in blood loss, duration of ICU stay, or duration of post-LTx hospital stay between Lap-PE and Open-PE cases. There were 2 cases of intraoperative complications in each group. One case was IVC injury in the Open-PE group and one case was IMA injury in the Lap-PE group.

On the other hand, PE was conducted in 78 cases at our institution during the same period, including 45 Open-PE and 29 Lap-PE cases. Subsequent LTx within 2 years of age was required in 15/45 (33%) Open-PE and in 8/29 (28%) Lap-PE cases.

**Conclusion:** There was no significant difference in the short-term jaundice-free rate between Lap-PE and Open-PE in our institution. In addition, Lap-PE cases had a significantly shorter surgical duration up to completion of recipient's hepatectomy during LTx than Open-PE cases did. This study demonstrated that Laparoscopic Kasai portoenterostomy has a favorable advantage over open Kasai portoenterostomy in subsequent liver transplantation due to reduced adhesion.

**S034 PROGNOSTIC CLASSIFICATION USING INDOCYANINE GREEN FLUORESCENCE CHOLANGIOGRAPHY IN KASAI PORTOENTEROSTOMY FOR BILIARY ATRESIA** Chiyoe Shirota, Hiroo Uchida, Yujiro Tanaka, Takahisa Tainaka, Wataru Sumida, Kazuki Yokota, Kazuo Oshima, Ryo Shiotsuki, Kosuke Chiba, Akinari Hinoki; Nagoya University Graduate School of Medicine

**Introduction:** Navigation using indocyanine green (ICG) fluorescence imaging has recently been broadly applied for various surgeries, including fluorescent cholangiography in adult patients. We performed prognostic classification using ICG fluorescence cholangiography in Kasai portoenterostomy (PE) for biliary atresia (BA), and compared jaundice-free status to prognostic prediction using ICG.

**Subjects and Methods:** This study was approved by our institutional ethics board. We retrospectively evaluated the surgical outcomes of patients who received ICG fluorescence cholangiography during PE surgery for BA (including revision PE after initial PE) at our hospital from 2014 to 2017. Fluorescent cholangiography with 0.05 mg/kg of ICG, administered intravenously at the beginning of surgery, was performed using near-infrared fluorescence laparoscopy. Eight pediatric surgeons with laparoscopic PE experience independently reviewed fluorescent cholangiography video recordings, and classified the fluorescence strength at the hepatic portal lesion into one of three grades: grade 0, no fluorescence; grade 1, low fluorescence; and grade 2, high fluorescence. Total fluorescence strength score was obtained from the classification grades of all eight surgeons (range, 0-16). Postoperative jaundice-free status was determined when total serum bilirubin level was  $<1.2$  mg/dL. The potential difference in total fluorescence strength between those who achieved and did not achieve jaundice-free status was analyzed. Statistical analysis was performed using Wilcoxon's test, with  $P < 0.05$  as statistically significant. Additionally, we attempted to measure the fluorescence intensity at the hepatic portal lesion with a fluorescence analyzer.

**Results:** During the study period, fluorescent cholangiography was applied in 12 surgeries (nine cases with initial PE, and three cases with revision PE). Median total score of fluorescence strength was 7.5. Jaundice-free status was achieved in four cases after the initial PE and in three cases after the revision PE. Among these, four cases demonstrated markedly high fluorescence strength (score  $\geq 10$ ), while the remaining three cases had relatively low strength (scores were 4, 5, and 8). In contrast, five cases that failed to achieve jaundice-free status had lower fluorescence strength (scores ranged from 4-8). Fluorescence strength score was significantly higher in jaundice-free cases compared to failed cases ( $P=0.0461$ ). No fluorescence was observed for any condition in two patients who did not have decreased serum bilirubin after surgery. Additionally, accurate fluorescence measurement was difficult with a fluorescence

# Oral (Scientific Session Abstracts)

analyzer due to strong liver artifacts.

**Discussion:** Fluorescence strength was significantly higher in those who achieved postoperative jaundice-free status compared to failed cases. Although the current results are preliminary, ICG fluorescence strength might be a predictor for postoperative jaundice-free status. Further, in order to accurately measure fluorescence strength using an analyzer, it is necessary to adjust for presence artifacts.

## **S035 PRIMARY LAPAROSCOPIC ENDORECTAL PULL-THROUGH PROCEDURE WITH OR WITHOUT A POSTOPERATIVE RECTAL TUBE FOR HIRSCHSPRUNG DISEASE: A MULTICENTER STUDY**

Li Yang<sup>1</sup>, Xi Zhang<sup>1</sup>, Shao-tao Tang<sup>1</sup>, Long Li<sup>2</sup>, Suo-lin Li<sup>3</sup>, Shui-xue Li<sup>4</sup>, Xiao-ye Wang<sup>5</sup>; <sup>1</sup>Department of Pediatric Surgery, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China, <sup>2</sup>Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing, People's Republic of China, <sup>3</sup>Department of Pediatric Surgery, The Second Hospital of Hebei Medical University, Shijiazhuang, Hebei, China, <sup>4</sup>Department of Pediatric Surgery, People's Hospital of Xinjiang Uygur Autonomous Region, Urumqi, Xinjiang, China, <sup>5</sup>Department of Pediatric Surgery, Tianjin Children's Hospital, Tianjin, China

**BACKGROUND/PURPOSE:** Hirschsprung-associated enterocolitis (HAEC) can be occurred both preoperatively and postoperatively. HAEC is reported to occur in 16% of patients preoperatively and in 18% postoperatively. The etiology of HAEC includes intestinal mechanical obstruction, abnormal microbiota, epithelial barrier dysfunction and impaired mucosal immunity, etc. but the main mechanism is not fully understood. Moreover, intestinal obstruction has been considered as a closely related factor, it may causes abdominal distention, fecal stasis, disturbance of intestinal microbiota and epithelial barrier dysfunction. Postoperative rectal tube can effectively assist the passage gas by anus and avoid abdominal distention. We conducted a large multicenter series study to determine the effect of preserving postoperative rectal tube on postoperative HAEC after primary laparoscopic endorectal pull-through procedure.

**METHODS:** Between August 2014 and January 2017, a total of 380 consecutive patients with recto-sigmoid segment HD were randomly divided into the following two groups: group A (neonate 48, infant 124, preschool children 18 [n=190]), and group B (neonate 49, infant 123, preschool children 21 [n=193]). All of them were underwent primary laparoscopic pull-through procedure described by the Georgeson technique, with the same postoperative treatment protocols, except for group A with a rectal tube after surgery for 5 days, while group B without it. The follow-up period was at least for 6 months and the mean time was 2 years. Demographics, operative data, postoperative complications, and clinical outcomes were compared between these two groups.

**RESULTS:** There were no statistically significant differences in patient demographics between the two groups. Outcomes within 1 month after surgery indicated a lower incidence of abdominal distention (4% vs 15%,  $P<0.05$ ) and postoperative HAEC (1.2% vs 6.8%,  $P<0.05$ ) in group A compared to group B. There were no significant differences in the defecation frequency and other complications. Beyond 1 month after surgery, there were no significant differences in the incidence of postoperative HAEC (12% vs 13.1%,  $P=0.54$ ), incomplete continence (5.3% vs 5.8%,  $P=0.82$ ) and constipation (14.2% vs 15.1%,  $P=0.78$ ) between these two groups.

**CONCLUSIONS:** Primary laparoscopic endorectal pull-through procedure with a postoperative rectal tube can reduce the early-stage postoperative incidence of abdominal distension and HAEC, is beneficial to postoperative management.

## **S036 LAPAROSCOPIC TECHNIQUES IN THE MANAGEMENT OF ANORECTAL MALFORMATIONS: A PROPENSITY SCORE-MATCHED OUTCOME STUDY USING A LARGE INPATIENT DATABASE.** Jun Tashiro, MD, MPH, Juan E Sola, MD, Chad M Thorson, MD, MSPH, Samir Pandya, MD, Eduardo A Perez, MD; University of Miami Miller School of Medicine

**BACKGROUND:** Posterior sagittal anorectoplasty (PSARP) has been the standard for management of patients with anorectal malformations (ARM). In recent years, there has been an increase in the use of laparoscopic techniques in the management of these children. We aim to analyze the outcomes of laparoscopic pull-through (LPT) procedures using a large inpatient database.

**METHODS:** The Kids' Inpatient Database (KID) was analyzed for ARM (ICD-9-751.2) patients between 1997 and 2012. Perineal fistulas were excluded from the dataset. Propensity score (PS)-matched analyses were performed using 36 variables to determine the effects

# Oral (Scientific Session Abstracts)

of laparoscopic vs. open approach on resource utilization. Cases were weighted to provide national estimates.

**RESULTS:** Overall, 17,285 cases were extracted, of which 4,827 patients underwent surgical repair. After careful analysis, 178 patients under the age of 2 were identified as having undergone a LPT. Eighty-eight percent of the patients were male. Most were of Caucasian (n=71; 45%), followed by Hispanic (n=41; 26%) descent. Most cases were performed in 2009 and 2012 (n=149; 83%). Most patients were covered by Medicaid (88; 50%), followed by private insurance (80; 45%). The mean length of stay was 10 days. The majority of cases were performed in a free-standing children's hospital (n=57; 56%).

When comparing LPT to traditional open PSARP using PS-matched analyses, we found that the laparoscopic approach had significantly shorter length of stay (Median: 4 [Interquartile range: 3]) compared to open (6 [17]) days, p=0.001. Other comparisons including rates of reoperation, wound infection, wound dehiscence, and mortality were unchanged between the laparoscopic and open approaches. In comparing total charges, the difference between the laparoscopic approach (45551 [45634]) compared to open (34436 [27585]) USD did not reach statistical significance, p=0.06.

**CONCLUSIONS:** A minimally invasive approach to a complex procedure requires significant time and resources for adoption as a standard. The PSARP procedure is an important example, as increased availability of a laparoscopic alternative and therefore, access to the procedure for patients will greatly affect resource utilization and recovery for the patient. As demonstrated, the length of stay is significantly lower for the LPT procedure in comparison to the traditional approach. Future research will clarify boundaries to introducing the laparoscopic approach as a potential standard technique in the next decade.

**S037 LAPAROSCOPIC REVISION OF PORTOENTEROSTOMY FOR BILIARY ATRESIA HAS A LIMITED BUT POSITIVE EFFECT IN PREVENTING PROGRESSIVE LIVER FAILURE AFTER INITIAL PORTOENTEROSTOMY** Hiroo Uchida, MD, Yujiro Tanaka, MD, Chiyoe Shirota, MD, Takahisa Tainaka, MD, Wataru Sumida, MD, Kazuki Yokota, Ryo Shiotsuki, MD, Kazuo Oshima, MD, Kosuke Chiba, MD, Akinari Hinoki, MD, Naruhiko Murase, MD; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

**Background:** The successful replacement of open portoenterostomy (Open-PE) with laparoscopic portoenterostomy (Lap-PE) for biliary atresia (BA) is currently controversial. Several studies have suggested that Lap-PE requires a longer operative time, requires an extensive learning curve for pediatric surgeons, and is a poor treatment for BA. Nevertheless, Lap-PE offers the obvious advantages of excellent visibility and reduced pain and scarring. Other studies have shown that Lap-PE is feasible and offers an outcome comparable to that of Open-PE, along with faster recovery and lower rate of complications. The excellent visibility of the porta hepatis during laparoscopy would allow a precise and reproducible portoenterostomy procedure.

In cases of unsuccessful PE, whether revision of PE restores adequate biliary drainage is unclear. We reported that open revision of PE (Open-revision) has a limited but positive effect in preventing progressive liver failure after initial PE. Here, we aggressively performed laparoscopic revision of PE (Lap-revision). This study aimed to compare the outcome of Open-revision with that of Lap-revision.

**Patients and Methods:** We retrospectively reviewed the medical records of patients with BA at our institution. Between January 1996 and January 2013, 76 patients underwent Open-PE. Further, from December 2013 to April 2017, 26 patients underwent Lap-PE. The main indications for Lap-revision included abrupt bile flow cessation and recurrent cholangitis. In this study, Open-PE was conducted via laparotomy if PE was performed via laparotomy. Conversely, Lap-revision was performed if patients underwent Lap-PE. Open-revision and Lap-revision clinical data were compared.

**Results:** The bilirubin concentration was transiently normalized after initial Open-PE and Lap-PE in 67.1% (51/76) and 65.4% (17/26), respectively. Open-revision was performed in 22 (28.9%) of the 76 patients and Lap-revision was in 10 (38.5%) of the 26 patients. The median duration of revision was 235 min (range 170–400) in Open-revision and 275 min (range 208–343) in Lap-revision; blood loss was 70 mL (range 15–1071) in Open-revision and 75 mL (range 7–713) in Lap-revision. There were no significant differences between the operative data of the two groups. After Open-revision, the bilirubin level was normalized in 10 patients (45.5%), and seven patients (31.8%) were jaundice-free survival with native liver. A total of 48 (63.2%) of the 76 Open-PE patients, including those who underwent

# Oral (Scientific Session Abstracts)

Open-revision, were jaundice-free survival with native liver. In the laparoscopic revision, one of 10 patients was converted to open surgery due to bleeding. The bilirubin level was normalized by laparoscopic revision in nine patients (90%), and five of the 10 patients (50%) were jaundice-free survival with native live at the 6-month follow-up. Eighteen (69.2%) of the 26 Lap-PE patients, including those who underwent Lap-revision, survived jaundice-free with native liver. During laparoscopic revision, little adhesion was found around the porta hepatis in all patients.

**Conclusion:** The outcome of Lap-revision is comparable to that of Open-revision. Lap-revision is a feasible method that has a limited but positive effect in preventing progressive liver failure after initial PE.

**S038 THIRTY-DAY OUTCOMES OF LAPAROSCOPIC VERSUS OPEN TOTAL PROCTOCOLECTOMY WITH ILEOANAL ANASTOMOSIS IN CHILDREN: A NSQIP PEDIATRIC ANALYSIS** Jeremy D Kauffman, MD, Paul D Danielson, MD, Nicole M Chandler, MD; Johns Hopkins All Children's Hospital

**Background:** Studies comparing laparoscopic and open total proctocolectomy with ileoanal anastomosis in children consist primarily of single-institution retrospective studies with small sample sizes involving only patients with ulcerative colitis (UC). Such studies have demonstrated similar complication rates and either equivalent or decreased length of stay (LOS) in the laparoscopic as compared to open group. The purpose of this study is to evaluate thirty-day outcomes of laparoscopic versus open total proctocolectomy with ileoanal anastomosis performed for any indication in children by utilizing the National Surgical Quality Improvement Project Pediatric (NSQIP-P) database.

**Methods:** Subjects were identified by CPT code in the NSQIP-P database from 2012–2015. Those who underwent laparoscopic or open total proctocolectomy with ileoanal anastomosis with or without creation of ileal reservoir were included. Demographics, preoperative comorbidities, and thirty-day outcomes were compared for open and laparoscopic groups. Categorical variables were evaluated using chi-square or Fisher's exact test. Continuous variables were assessed using an independent samples *t*-test or Kruskal-Wallis test. Multivariate analysis was performed. *P* values less than 0.05 were considered significant.

**Results:** A total of 244 subjects were included. The majority were female (53%), white (80%), and underwent a laparoscopic procedure (63%). Median age was 14.2 years (IQR=10.8–16.1). Median weight was 48.3 kg (IQR=31.7–62.1). Demographic characteristics were similar between groups. The most common indications for the procedure were benign neoplasm of the colon (39%), UC (39%), Hirschsprung disease (7.4%), and benign lesion of the rectum and anal canal (2.5%). Preoperatively, the open surgery group had significantly higher rates of ventilator dependence and supplemental nutritional support (Table 1). The laparoscopic group had a significantly lower mean postoperative LOS (6 days, IQR=5–9 vs 8 days, IQR=6–10; *P*<0.01). Neither preoperative ventilator dependence nor need for nutritional support was associated with increased postoperative LOS. The open group had higher rates of postoperative superficial surgical site infection (SSI) independent of nutritional or ventilator status (OR=4.9, 95% CI: 1.2–19.6, *P*=0.02). There was no difference in rates of thirty-day readmission or reoperation (Table 2). On subgroup analysis, among children with an indication for surgery other than UC (*n*=145), postoperative LOS and rates of superficial SSI were decreased in the laparoscopic group, while mean operative time was 46 minutes longer (95% CI: 23–92, *P*=0.04). Among children with a diagnosis of UC (*n*=94), there was no significant difference in outcomes between laparoscopic and open groups.

**Conclusions:** Among children in the NSQIP-P database who underwent total proctocolectomy with ileoanal anastomosis, the laparoscopic approach resulted in shorter postoperative LOS and decreased risk of superficial SSI when compared to the open approach. This is the largest pediatric risk-adjusted study of laparoscopic versus open total proctocolectomy with ileoanal anastomosis for children with UC that demonstrates similar outcomes between surgical techniques. In addition, our findings suggest that the laparoscopic approach may be superior to the open approach for children undergoing this procedure for indications other than ulcerative colitis.

Table 1.

# Oral (Scientific Session Abstracts)

Preoperative characteristics	Open (n=90)	Laparoscopic (n=154)	P-value
Steroid therapy	11 (12.2%)	26 (16.9%)	0.327
Ventilator dependence	3 (3.3%)	0 (0%)	0.049
Nutritional support	11 (12.2%)	7 (4.6%)	0.040
Sepsis within 48 hours			0.201
SIRS	1 (1.1%)	3 (2.0%)	1.000
Sepsis	0 (0%)	0 (0%)	n/a
Septic Shock	2 (2.2%)	0 (0%)	0.135
Hematologic disorder	13 (14.4%)	18 (11.7%)	0.533
Bleeding disorder	1 (1.4%)	5 (3.9%)	0.420
Neuromuscular disorder	2 (2.2%)	1 (0.7%)	0.557
Cardiac risk factors			0.255
Minor	0 (0%)	2 (1.3%)	0.532
Major	4 (4.4%)	2 (1.3%)	0.197

Table 2.

30-Day Outcomes	Open (n=90)	Laparoscopic (n=154)	P-value
Median operative time (min)	275 (IQR=203 - 399)	318 (IQR=233 - 403)	0.097
Median post-op LOS (days)	8 (IQR=6 - 10)	6 (IQR=5 - 9)	0.005
Mortality	0 (0%)	0 (0%)	n/a
Blood transfusion	6 (6.7%)	6 (3.9%)	0.367
Pneumonia	1 (1.1%)	0 (0%)	0.369
Sepsis	1 (1.1%)	6 (3.9%)	0.266
Urinary tract infection	3 (3.3%)	1 (0.7%)	0.143
Surgical site infection (SSI)	12 (13.3%)	12 (7.8%)	0.161
Superficial SSI	8 (8.9%)	3 (2.0%)	0.021
Deep SSI	2 (2.2%)	1 (0.7%)	0.557
Organ space SSI	2 (2.2%)	9 (5.2%)	0.332
Wound dehiscence	0 (0%)	2 (1.3%)	0.532
Reoperation	12 (13.3%)	25 (16.2%)	0.542
Readmission	16 (17.8%)	32 (20.8%)	0.569

**S039 RESULT OF PEDIATRIC LAPAROSCOPIC LIVER RESECTION: A REPORT OF 15 CASES** Ya Gao, PhD, MD, Hui Yu, MD, Baijun Zheng, Wei Gong, Xinkui Guo, Jiwen Cheng, Huaijie Wang, Weikang Pan; Department of Pediatric Surgery, The Second Affiliated Hospital, Xi'an Jiaotong University

**Background** Growing reports suggest that laparoscopic liver resection (LLR) in adult has undergone worldwide dissemination. However, little is known about the LLR for the resection of liver masses in the field of pediatric surgery. The aim of this study is to assess the clinical application of LLR for liver masses in children.

**Methods** Medical records of consecutive patients (pts) who underwent LLR at this single institution from November 2005 to April 2017 were retrospectively reviewed for patient characteristics, perioperative results and follow-up data. The extent of hepatic tumor was determined at diagnosis and after chemotherapy using the SIOPEL PRE/POST-TEXT system. Preoperative chemotherapy for diagnosed hepatoblastoma (HB) was 2-4 courses of platinum-based chemotherapy (or TACE). Detailed surgical plan was established by 3D CT reconstruction of the liver and preoperative multidisciplinary team consultation.

**Results** Fifteen children (9 boys) with an average age of 18.4 months (range, 1.5-74 months) were included. There were 4 benign lesions (hemangioendothelioma 2, hepatic cyst 1, and 1 with chronic granuloma with abscess formation) and 11 cases of HB. Thirteen pts had a solitary tumor with an average diameter of lesion was 7.2cm (range, 3.8-16.0cm). Complete LLR was performed in 14, except one converted to laparotomy as massive bleeding. Type of resection was non-anatomic resection in 5, Left Lateral Sectionectomy 3, Left Hepatectomy 3, Extended Left Hepatectomy 2, and Right Hepatectomy 2. The median operation time was 225 minutes (range, 100-390 min). The median intraoperative blood loss was 60 ml (range, 10-200ml) and 6 pts required RBC transfusion. There were no perioperative deaths. The average edge was 1.0 cm (range, 0.3-2.0 cm) (R0). Four of 15 pts had postoperative complications, 3 of bile leakage



# Oral (Scientific Session Abstracts)

(spontaneous healing in 2 and portoenterostomy in 1 as an ineffective peritoneal and ERCP drainage. An average 2.9 year (range, 0.6-15.0 ys) follow-up showed that 4 pts of benign lesions were normally growth and development without recurrence, 1 patient of HB recurred within 1 year after the operation and finally died, and the disease-free survival rate was 83.33% (5/6).

**Conclusions** This study demonstrates that pediatric LLR is safe and feasible in experienced center for selective cases. Long-term effect needs to be observed.

**S040 THE OUTCOMES OF LAPAROSCOPY-ASSISTED OPERATIONS FOR RECTOSIGMOID HIRSCHSPRUNG S DISEASE IN JAPAN: COMPARISON TO NON-LAPAROSCOPY-ASSISTED OPERATIONS** Satoshi Obata, MD<sup>1</sup>, Ryota Souzaki, MD, PhD<sup>1</sup>, Satoshi Ieiri, MD, PhD<sup>2</sup>, Takashi Akiyama, MD, PhD<sup>2</sup>, Naoto Urushihara, MD, PhD<sup>2</sup>, Hisayoshi Kawahara, MD, PhD<sup>2</sup>, Masayuki Kubota, MD, PhD<sup>2</sup>, Miyuki Kono, MD, PhD<sup>2</sup>, Yuji Nirasawa, MD, PhD<sup>2</sup>, Shohei Honda, MD, PhD<sup>2</sup>, Masaki Nio, MD, PhD<sup>2</sup>, Makoto Hashizume, MD, PhD, FACS<sup>3</sup>, Tomoaki Taguchi, MD, PhD, FACS<sup>3</sup>; <sup>1</sup>Department of Pediatric Surgery, Kyushu University, <sup>2</sup>The Japanese Study Group for Hirschsprung's disease, <sup>3</sup>Department of Advanced Medicine and Innovative Technology, Kyushu University Hospital

**Background and aims:** The introduction of laparoscope to the radical operations for Hirschsprung's disease (HD) has been reported to result in satisfactory cosmetic outcomes and less postoperative complications. We previously reported that laparoscopy-assisted procedures have increased up to about 50% in recent period in Japan (Taguchi T, et al, *Pediatr Surg Int* 2017). This study aimed to survey the outcomes of laparoscopy-assisted operations for HD in Japan, comparing to non-laparoscopy-assisted procedures.

**Methods:** Patient data was extracted from results of a nationwide survey of HD which we conducted collecting the data of total 933 HD patients from 2008 to 2012 in Japan, and we extracted the HD patients extending from rectum to sigmoid colon (lower rectum type: aganglionosis restricted to the lower rectum (under peritoneal reflection), and sigmoid colon type: aganglionosis extending to the sigmoid colon), comparing laparoscopy-assisted operations (LA) to non-laparoscopy-assisted operations (non-LA). As the results, the total number of the extracted HD patients was 672, including 326 with LA (48.5%) and 346 with non-LA. Statistical analysis was performed using *Chi-squared* test and  $p < 0.05$  was statistically significant.

**Results:** In LA, Soave's procedure including transanal endorectal pull-through and prolapsing method were most common (82.3%), following that, Duhamel's and its modified procedures (10.7%), and Swenson's procedure (6.7%), trending the same in non-LA (Soave: 78.9%, Duhamel: 15.3%, Swenson: 6.7%). Regarding overall postoperative complications, there were 30 of 326 patients (9.2%) in LA, comparing to 34 of 346 patients in non-LA (9.8%) ( $p=0.78$ ). Surgery-related postoperative complications were postoperative bleeding (LA vs non-LA=0.3% vs 1.7% ( $p=0.06$ ), postoperative ileus (0.9% vs 1.4% ( $p=0.53$ ), and anal stricture (GI: 4.0% vs 2.9% ( $p=0.43$ )). Re-do operations performed in 7 patients in LA (2.1%), comparing to 11 patients in non-LA (3.2%) ( $p=0.41$ ). Only 2 patients (0.6%) died of Surgery-unrelated causes (unexpected deaths) in LA, compared to 3 patients (0.9%) in non-LA dying of cardiac failure with congenital heart disease.

**Conclusions:** Soave's procedure was the most common laparoscopy-assisted procedure for rectosigmoid HD in Japan. Although aganglionic segment was short like lower rectum and sigmoid type HD which didn't need to make splenic flexure free or perform mesenteric vascular manipulation, LA was introduced to almost a half of the radical procedures, resulting satisfactory surgical outcomes, especially decreasing postoperative bleeding.

**S041 LAPAROSCOPICALLY ASSISTED ANORECTOPLASTY FOR INTERMEDIATE TYPE OF IMPERFORATE ANUS: COMPARISON OF SURGICAL OUTCOMES WITH THE SACROPERINEAL APPROACH** Tetsuya Ishimaru, MD, PhD<sup>1</sup>, Hiroshi Kawashima, MD<sup>1</sup>, Takahisa Tainaka, MD, PhD<sup>1</sup>, Keisuke Suzuki, MD<sup>1</sup>, Shohei Takami, MD<sup>1</sup>, Tomo Kakihara<sup>1</sup>, Reiko Katoh, MD<sup>1</sup>, Tomohiro Aoyama, MD<sup>1</sup>, Hiroo Uchida, MD, PhD<sup>2</sup>, Tadashi Iwanaka, MD, PhD<sup>1</sup>; <sup>1</sup>Saitama Children's Medical Center, <sup>2</sup>Nagoya University

**Aim:** Application of the laparoscopic approach to treat the intermediate type of imperforate anus is controversial because manipulation in the deep and small pelvic cavity is technically demanding and evidence that fecal continence after laparoscopic repair is superior to that after the conventional approach is lacking. The aim of this study was to compare surgical outcomes of patients with the intermediate type of imperforate anus who underwent laparoscopically assisted anorectoplasty (L group) or sacroperineal ano-

# Oral (Scientific Session Abstracts)

rectoplasty (S group).

**Methods:** Medical records of patients with the intermediate type of imperforate anus at a single institution between April 1983 and April 2017 were retrospectively reviewed. Laparoscopically assisted anorectoplasty (LAARP) was introduced as the standard procedure in 2000. As for fecal continence, the clinical assessment score for fecal continence developed by the Japanese Study Group of Anorectal Anomalies was used. The scoring system is composed of 4 items, i.e. the urge to defecate, constipation, incontinence, and soiling, and has a maximum score of 8, with higher scores indicating better fecal continence.

**Results:** Twelve cases (recto-bulbar urethral fistula, 7; anal agenesis without fistula, 4; recto-vaginal fistula, 1) were included in the L group and fourteen cases (recto-bulbar urethral fistula, 11; anal agenesis without fistula, 3) were included in the S group. The median (range) age and body weight at the time of surgery of the L group and S group were 6mo (4 – 17mo) vs 6.5mo (2 – 18mo), and 6750g (5400 – 10200g) vs 7023g (6229 – 10100g), respectively. There were no significant differences in both parameters. The median (range) procedure time in the L group and S group was 230min (173 – 316min) vs 184min (80 – 255min), showing a statistically significant difference ( $p < 0.01$ ). The total score for fecal continence 3, 5, and 7 years after the surgery were 4, 5, and 4 points in the L group and 4, 5, and 6 points in the S group, respectively, showing no significant differences between the two groups. Mucosal prolapse occurred in 50% of the L group and 29% of the S group ( $p = 0.42$ ). Failed rectoanal anastomosis and anal stenosis were not identified in either group.

**Conclusions:** Postoperative fecal continence and the incidence of complications after LAARP were comparable with those after sacroperineal anorectoplasty in patients with the intermediate type of imperforate anus.

## **S042 COMBINED-LAPAROSCOPIC-ENDOSCOPIC-PROCEDURES: ITS VALUE TO REMOVE THE STONE IN COMMON CHANNEL OF CHOLEDOCHAL CYST IN CHILDREN** Jiangbin Liu, Zhibao Lv, professor; Shanghai Children's Hospital

**Objective:** Combined-laparoscopic-endoscopic-procedures (CLEP) is a technical advance in minimally invasive approaches, here we review our experience of CLEP on the removal of stone in common channel of choledochal cyst(CC) in children.

**Methods:** We compared a series of recent 34 cases of CC treated by CLEP from September 2015 to May 2017(group 1) with 66 cases of CC patients only treated by tradition laparoscopy between November 2012 and August 2015 (group 2), focusing on the procedure of laparoscopic excision of CC combined with a fine pediatric ureteroscopy (Storz, F7) on the removal of stone in common channel of CC. The following data such as common-channel-stone-formation, intra- and postoperative complications were analyzed.

**Results:** In group 1, CLEP identified common-channel-stone-formation in 5 patients (15%) and all the stone were removed completely and successfully by the intraoperative fine pediatric ureteroscopy without intraoperative perforation of bile duct. In group 2, 9 patients were diagnosed as stone in common channel by MRCP and intraoperative cholangiography, 33%(3/9) of children were converted to open surgery and intraoperative bile duct irrigation was underwent in 6 cases. 2 patients in group 2 received postoperative ERCP(2 and 5 months after laparoscopic procedure, respectively) in adult hospital for recurrent pancreatitis. All the children followed up till now and the incidence of postoperative pancreatitis was 0% in group 1 and 4.5% (3/66) in group 2.

**Conclusions:** CLEP, combining the advantages of both laparoscopy and endoscopy, is a technical advance in minimally invasive approaches and is a safe and feasible approach on the removal of stone in common channel of CC in children.

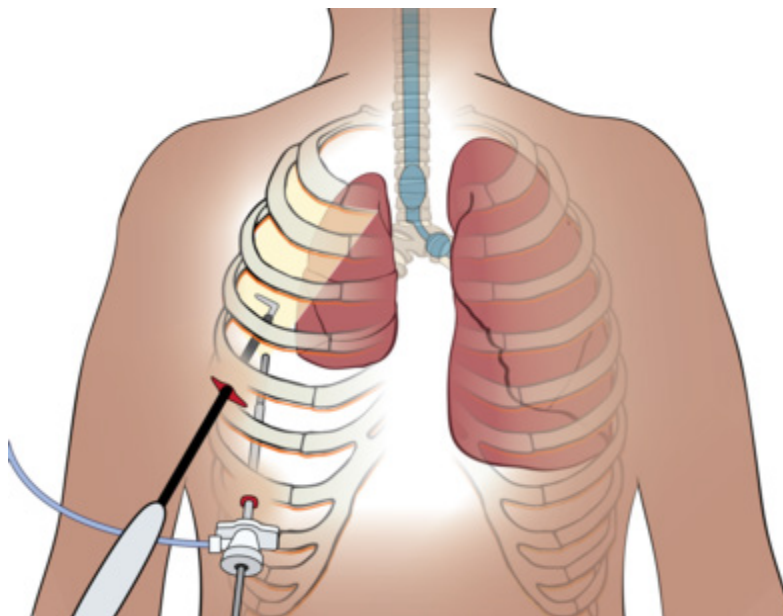
## **S043 A NOVEL TECHNIQUE FOR THORACOSCOPIC INTERCOSTAL NERVE CRYOABLATION DURING THE NUSS PROCEDURE** Veeshal H Patel, MD, MBA<sup>1</sup>, Claire E Graves, MD<sup>2</sup>, Benjamin E Padilla, MD<sup>1</sup>; <sup>1</sup>University of California, San Francisco, <sup>2</sup>Columbia University

**Background:** The Nuss procedure is the preferred surgical method for pectus excavatum repair. However, it causes significant postoperative pain leading to high opiate requirements, considerable activity restrictions, and loss of productivity. In response, our practice includes thoracoscopic posterolateral intercostal nerve cryoablation immediately preceding the Nuss procedure. Cryoablation is a technique whereby nerve axons are frozen using a CryoICE cryoprobe (AtriCure; Mason, Ohio). We report the technical feasibility and considerations when performing cryoablation.

# Oral (Scientific Session Abstracts)

## Technique:

- The patient is positioned supine and arms are adducted.
- The patient undergoes general anesthesia and intubation with a dual-lumen endotracheal tube.
- Bilateral lateral transverse incisions for the Nuss bar insertion are made at the anterior axillary line. Right lung ventilation is stopped and a 5mm port is placed through the incision and into the chest cavity. A 5mm thoracoscope is inserted and a second 5mm port is placed in the midclavicular line as low in the chest as possible (typically the 7th intercostal space).
- The thoracoscope is moved to the midclavicular port, providing excellent visualization of the posterior and lateral course of the intercostal nerves.
- 2cm of the cryoprobe is deployed from the insulating sheath and bent to 90°.
- The 7mm diameter cryoprobe does not fit through a 5mm port. The first port is removed, the port tract enlarged slightly, and the probe inserted directly without a port.
- We perform cryoablation on five intercostal nerves, encompassing the level of the incision and two levels above and below (generally T3-T7). **Caution: ablation of T1/T2 can result in Horner's syndrome and ablation below T8 can cause weakness of the abdominal wall.**
- The cryoprobe is applied directly on the intercostal nerves as proximal as possible, targeting the visible nerve through the membranous portion of the intercostal muscles lateral to the transversus thoracis muscle.
- The cryoprobe cools to -60°C for 2 minutes, and then thaws within seconds and dissociates from the pleural lining. **Caution: incomplete freezing may cause neuropathic pain**
- The right lung is ventilated, evacuating the pneumothorax through the port. After right lung recruitment, a similar procedure is performed on the left side.



**Discussion:** Cryoablation of the intercostal nerves during the Nuss procedure provides excellent postoperative pain control, reduced opioid use, and shorter hospitalizations. The described procedure is accomplished utilizing the standard incisions for the Nuss procedure and a single 5mm incision on each side, resulting in an average 40-minute increase in operating room time. In comparison to CO<sub>2</sub> insufflation, single lung ventilation provides better exposure of the posterior-lateral aspect of the chest, decreases the likelihood

# Oral (Scientific Session Abstracts)

of freezing injury to the lung, and speeds up the cryoanalgesia portion of the operation.

**Conclusion:** Due to the significantly improved recovery of patients, cryoablation of the intercostal nerves is changing surgeons' practice patterns. With a dual-lumen endotracheal tube and one additional 5mm port site bilaterally, we demonstrate a safe and effective method for cryoablation during the Nuss procedure without the need for extensive dissection.

**S044 RECURRENT TRACHEOESOPHAGEAL FISTULA AND TRACHEAL DIVERTICULUM; TRACHEOSCOPIC ABLATION WITH TCA** Rocio Soledad Gutiérrez, MD<sup>1</sup>, Manuel Lopez, MD, PhD, HDR<sup>2</sup>, Eduardo Leopold, MD<sup>3</sup>, Patricio Varela, MD, PhD<sup>3</sup>; <sup>1</sup>Department of Pediatric Surgery, University Hospital Dr. Pedro de Elizalde. Buenos Aires, Argentina, <sup>2</sup>Department of Pediatric Surgery, University Hospital Vall d'Hebron, Barcelona, España, <sup>3</sup>Department of Pediatric Surgery, University Hospital Calvo Mackenna. Santiago, Chile

**Objective:** Recurrent tracheoesophageal fistula (RTEF), bronchial-esophageal fistula (BEF), trachea-colonic fistula (TCF) and tracheal diverticulum (TD) are a serious complication after repair of esophageal atresia and tracheoesophageal fistula (EA/TEF). The treatment of any of those complications involved an open surgery with a high morbidity and mortality. Many endoscopy techniques have been developed since the past decades: thoracoscopic or bronchoscopic approach for the treatment of those fistulas; nevertheless, optimal treatment is not still determined because of few numbers of patients, short term follow-up, and different procedures.

Our objective is to report our experience in the treatment of this fistulas and TD by tracheoscopic ablation with the use of 50% trichloroacetic acid (TCA) as an effective, safe and minimally invasive technique.

**Materials and methods:** From 2009 to 2017, twenty-four patients with RTEF, BEF, TCF and TD were selected for endoscopic management in two centers. Eighteen patients had RTEF after primary repair of EA/TEF by thoracotomy approach, and five patients had other type of fistulas. In all cases the diagnosis was confirmed by esophagram, bronchoscopy, and clinical evaluation. Under general anesthesia, a rigid pediatric bronchoscope with a 0° rod lens telescope and tele-monitoring was used to localize the fistula. Cotton soaked with 50% TCA was applied on the fistula during 30 s, and the procedure was repeated 3 times. The endoscopic treatment was performed monthly until fistula closure was achieved.

**Results:** Fistula was closed in twenty-three patients, including the TD. One patient with RTEF has still the fistula open after 2 TCA and we lost the follow-up. The mean number of procedure in each patient was 1.7. Closure of fistula was confirmed by esophagram, bronchoscopy, and clinical evaluation. There were a bacterial pneumonia and bronchospasm as postoperative complications. Median follow-up was 57 months. Twenty-two of these fistulas and the TD remain completely obliterated, and all of these patients are asymptomatic.

**Conclusion:** Tracheoscopic ablation of recurrent fistula and TD with TCA is an effective, safe, simple and minimally invasive technique with few complications and avoids the morbidity of open surgery.

**S045 THORACOSCOPIC CARDIAC SYMPATHETIC DENERVATION: ADJUNCT THERAPY FOR SECONDARY PREVENTION OF LIFE-THREATENING VENTRICULAR ARRHYTHMIAS IN CHILDREN** Erin M Garvey, MD, Andrew L Papez, MD, J. Craig Egan, MD, David M Notrica, MD, Mark Molitor, MD, Mitchell I Cohen, MD, Kathleen van Leeuwen, MD; Phoenix Children's Hospital

**Background:** Cardiac sympathetic denervation (CSD) is regarded as a therapeutic option in patients at risk for life-threatening ventricular arrhythmias triggered by catecholamine surges. Previously described cohorts have included populations in which CSD was performed for both primary and secondary prevention of life-threatening arrhythmias. We report the efficacy of CSD as adjunct therapy in children with medically refractory life-threatening arrhythmias.

**Methods:** A retrospective chart review of patients undergoing thoracoscopic CSD at a single institution between January 2008 and July 2017 was performed. Data including patient demographics, indications, procedural detail and complications, length of stay and effectiveness of the intervention were reviewed.

# Oral (Scientific Session Abstracts)

**Results:** A total of 10 thoracoscopic CSD procedures were performed in 8 patients. Four patients had long QT syndrome (LQTS), 3 patients had catecholaminergic polymorphic ventricular tachycardia (CPVT), and 1 patient had short QT syndrome. Mean age at time of surgery was 8.2 years (8 days to 19 years), mean weight was 32.6kg (2.7 – 57 kg), and 50% were female. All patients initially underwent left CSD, with 2 subsequently requiring right CSD. All patients were on maximized medical therapy prior to CSD (mean number of anti-arrhythmic medications 1.5) and had at least 2 (2 - >40) previously documented episodes of resuscitated ventricular arrhythmia. Six patients had undergone implantable cardioverter-defibrillator (ICD) placement with a mean of 11.9 appropriate discharges (1 - 40) prior to CSD.

Mean procedure duration was 52 minutes and 3 ports were required. In all cases, 75% of the lower portion of the stellate ganglion was resected. There were no intraoperative complications, no conversions to open, and no intraoperative arrhythmias. Median length of postoperative stay was 1 day (1 - 19 days). One patient experienced transient mild ptosis and one patient had a small pneumothorax that did not require chest tube placement. Another patient continues to have anisocoria, mild ptosis and intermittent Harlequin syndrome 4 years post-procedure.

Four of six ICD patients experienced dramatic improvement following CSD (total 48 ICD discharges pre-CSD; 3 post-CSD). Two patients non-compliant with medical therapy had no significant improvement (24 ICD discharges pre-CSD; 23 post-CSD) and subsequently underwent right CSD, again with no improvement (23 discharges pre-right CSD; 28 post-CSD). Both patients without an ICD underwent elective pacemaker placement at the time of CSD to facilitate maximum beta-blocker therapy. An 8 day-old female with LQTS and intractable torsades de pointes experienced no further arrhythmias following CSD; she was managed with atrial pacing and propranolol alone until undergoing elective upgrade to an ICD at 4 years of age. An 8 year-old male remains atrially-paced with no ICD 4 years post-CSD.

**Conclusions:** Thoracoscopic cardiac sympathetic denervation can be safely performed in the neonate and pediatric populations. When utilized in concert with medication therapy, CSD is an effective adjunct in reducing ICD discharges and arrhythmia burden.

**S046 METICULOUS TREATMENT OF THORACOSCOPIC LOBECTOMY IN INFANTS AND CHILDREN** [Chang Xu](#); Department of pediatric surgery, West China Hospital of Sichuan University

**Background/Purpose:** In infants and children, air leak, bleeding and bronchopleural fistula are still the most common complications of thoracoscopic lobectomy. Reasonable treatments on vessels, fissures and bronchi may be the key to avoid such complications. In this study, we reviewed the cases that accepted thoracoscopic lobectomy, and tried to summarize the experience in the meticulous treatment during thoracoscopic lobectomy.

**Methods:** The cases that accepted thoracoscopic lobectomy in our hospital from October 2013 to March 2017 were reviewed retrospectively. During the procedure, three valved endoscopic ports were used for those procedures. Vessels, fissures and bronchi of the lobe that lesions located in were dissected respectively. The conscious was focused on the variation of vessel's quantity and position. After dissecting carefully, the vessels were sealed by Hemo-lock or Ligasure according to its size. In the condition that the vessels were difficult to dissect, a drawn wire was applied to facilitate this procedure. The fissure tissues were cut apart by monopolar hook electrocautery in the incomplete fissure cases. Once the important structures were disclosed, the residual thick fissure tissues were sealed by the Ligasure. The bronchi were dissected to its segmental level. It could be ligated with non-absorbable sutures in infants or sealed with Endo-GIA in large patients. A chest tube drainage was left after the procedure.

**Results:** Total 142 cases were included in this study, 76 were boys and 66 were girls. The ages ranged from 4 months to 13 years (mean, 2.3 years). There were 28 upper lobes, 98 lower lobes, 2 middle lobes and 14 extralobar pulmonary sequestrations. Variations of the vessels were most common in left upper lobe, the quantity of its vessels ranged from 2-7. There were 8 cases that the inferior lingular artery deriving from the left basal trunk or its branch, 9 patients encountered double arteries to right middle lobe, 8 patients had double superior arteries and 2 intralobar pulmonary sequestration cases had 3 arteries deriving from chest aorta. The inferior lingular artery injury was occurred in 1 case for its variation, and 1 case conversed to open operation owing to the injury and bleeding

# Oral (Scientific Session Abstracts)

of left inferior pulmonary vein. The other 141 cases were completed endoscopically. The operative times ranged from 50 minutes to 120 minutes (average, 50 minutes). The chest tubes were removed within 24 hours postoperatively. The hospital stay ranged from 2 to 3 days. The patients had mild postoperative pain, and air leak, bleeding, bronchopleural fistula or other postoperative complications were not occurred in all cases. During the following, the remaining lung compensated well, and no recurrence or other complications occurred in all cases.

**Conclusions:** Meticulous treatments on the vessels, fissures and branchi are the keys of thoracoscopic lobectomy. It can be effective to avoid the intraoperative and postoperative complications, and improve the success rate of this procedure.

**S047 OUTCOMES USING CRYOABLATION FOR POST-OPERATIVE PAIN CONTROL IN CHILDREN FOLLOWING MINIMALLY INVASIVE PECTUS EXCAVATUM REPAIR** Joseph Sujka, MD, Leo A Benedict, MD, Jason D Fraser, MD, Pablo Aguayo, MD, Daniel L Millspaugh, MD, Shawn D St. Peter, MD; Children's Mercy Hospital

**Purpose:** Pain is the factor that determines the post-operative course for patients undergoing pectus bar placement. Cryoablation of the intercostal nerves has been suggested to mitigate this pain. We have instituted a protocol for using intercostal cryoablation and here we report our early results compared to our immediately previous cohort.

**Methods:** A retrospective study was conducted on patients undergoing minimally invasive repair for pectus excavatum between January 1, 2017 and August 21, 2017. Demographic data, anthropometrics, operative times, type and duration of patient analgesia, and post-operative length of stay were collected. Descriptive statistics were performed with all means reported  $\pm$  standard deviation and medians reported with interquartile ranges. Comparisons between groups were analyzed on STATA using T-tests and Mann-Whitney U with a significance of  $< .05$ .

**Results:** 28 patients were treated for pectus excavatum during the study period with 8 (28%) undergoing cryoablation. The mean number of rib spaces ablated was  $5 \pm .53$  with no reported intraoperative complications. Mean operative time was 20 minutes longer in the cryoablation group ( $p 0.07$ ). The days to only oral pain medication was over 1 day less in the cryoablation group, ( $1.25 \pm .25$  vs  $2.55 \pm .16$ ,  $p 0.00$ -list). Length of stay was over 2 days shorter with cryoablation ( $1.5 \pm .75$  vs  $3.9 \pm 1.25$ ,  $p 0.00$ ). There were no reported complications from cryoablation or bar placement during the study period. In follow up the median days to discontinuation of oral narcotics was a week less in the cryoablation group ( $8.5$  (IQR 1, 13) vs  $14.5$  (IQR 10.5-25),  $p 0.04$ ).

**Conclusions:** Cryoablation after pectus bar placement dramatically decreases narcotic usage and post-operative length of stay.

**S048 THORACOSCOPIC POSTERIOR TRACHEOPEXY DURING PRIMARY ESOPHAGEAL ATRESIA REPAIR. INTRODUCTION OF A NEW APPROACH TO PREVENT TRACHEOMALACIA COMPLICATIONS.** Stefaan H Tjtgat, MD, PhD, Maud Y van Herwaarden, MD, PhD, David C van der Zee, Prof, MD; Wilhelmina Children's Hospital University Medical Center Utrecht

**Background:** Esophageal atresia (EA) is usually accompanied by some form of tracheomalacia. During the early phases in life, excessive dynamic collapse of the trachea can cause a wide spectrum of symptoms ranging from mild complaints to acute life threatening events (ALTE's). Therapeutic strategies for severe tracheomalacia include aortopexy to lift the anterior weakened cartilaginous rings or posterior tracheopexy of the floppy membranous tracheal intrusion. In this study, we describe a new approach in which the posterior tracheopexy is performed directly during the primary thoracoscopic correction of EA.

**Methods:** In 2017, all consecutive EA patients (9) underwent a rigid tracheo-bronchoscopic (RTB) evaluation during induction of anesthesia prior to the thoracoscopic EA repair. Tracheomalacia was diagnosed in four patients. During the subsequent thoracoscopic procedure the posterior membranous trachea was fixed to the longitudinal vertebral ligament with non-resorbable sutures. The esophageal ends were then mobilized towards the right hemithorax and anastomosed.

**Results:** On preoperative RTB, two patients had a severe (70-95%) mid tracheal collapse and two patients had a mild (30-40%) mid tracheal collapse. Thoracoscopic posterior tracheopexy with two sutures was possible in all four patients, prior to the formation of the esophageal anastomosis. Median time per suture was six minutes (range 4-12 minutes). All operative procedures were uneventful. A median follow up of 6 months (range 4 to 9 months) revealed that all patients showed further recovery without any tracheomalacia symptoms or ALTE's.

# Oral (Scientific Session Abstracts)

**Conclusion:** This is the first report that introduces a new approach to thoracoscopic posterior tracheopexy during primary EA repair. We believe that this technique can prevent the potentially deleterious sequelae of mild to severe tracheomalacia that may complicate the lives of EA patients. Also, a second, sometimes complex surgical procedure can be prevented as the posterior tracheopexy is performed during the primary thoracoscopic EA correction.

**S049 THORACOSCOPIC VERSUS OPEN RESECTION IN CHILDREN WITH ASYMPTOMATIC LUNG MALFORMATIONS: A REPORT FROM A MULTI-INSTITUTIONAL RESEARCH COLLABORATIVE** Shaun M Kunisaki<sup>1</sup>, Shawn D St. Peter<sup>2</sup>, Jacqueline M Saito<sup>3</sup>, Mary E Fallat<sup>4</sup>, Kevin N Johnson<sup>1</sup>, Rodrigo A Mon<sup>1</sup>, Ronald B Hirschl<sup>1</sup>, On Behalf of the Midwest Pediatric Surgery Consortium<sup>5</sup>; <sup>1</sup>C.S. Mott Children's Hospital, University of Michigan, <sup>2</sup>Children's Mercy Kansas City, <sup>3</sup>St. Louis Children's Hospital, <sup>4</sup>Norton Children's Hospital, Louisville, <sup>5</sup>Midwest Pediatric Surgery Consortium

**Purpose:** Over the last decade, minimally invasive techniques have been adopted worldwide for the surgical management of congenital lung malformations (CLM). Nevertheless, the learning curve required to safely perform thoracoscopic resection remains a concern, and debate continues amongst pediatric surgeons as to whether thoracoscopy is associated with improved clinical outcomes. The purpose of this study was to evaluate outcomes of children undergoing elective resection of an asymptomatic CLM within a large multicenter research collaborative.

**Methods:** After central reliance IRB approval, a retrospective cohort study was conducted on all lung resections performed in asymptomatic CLM patients between 2009 and 2015 at eleven participating children's hospitals (mean bed number: 297) in the United States. Demographic, perioperative, and outcomes data, including operative time, hospital length of stay (LOS), and post-operative complications, were collected and analyzed by the two-sample t-test, Wilcoxon rank-sum test, Pearson chi-square, or hierarchical multivariate regression, as appropriate ( $p < 0.05$ ).

**Results:** Among 311 resections, a thoracoscopic approach was initiated in 180 (57.9%). The remaining cases ( $n=131$ , 42.1%) underwent resection by thoracotomy without thoracoscopy. There were no deaths. Thirty (16.7%) of the thoracoscopic cases were converted to thoracotomy. Conversion rates decreased over time, and hemorrhage was an uncommon reason for conversion (6.7%, 2/30). There was a three-fold increase in the number of thoracoscopic resections per year during the study period. However, substantial variability among institutions was evident with regards to percentage of total cases successfully completed by thoracoscopy [min: 0/51 cases (0%); max: 14/14 cases (100%)]. Lung resection by thoracoscopy took slightly longer than by thoracotomy (178 vs. 170 min, respectively), but this did not meet statistical significance ( $p=0.42$ ). The median LOS in both groups was 3 days, and complications rates were slightly lower in thoracoscopy compared to thoracotomy (11.6% vs. 15.4%, respectively;  $p=0.36$ ). The only variables in univariate analysis that were significantly different between the two groups were the presence of preoperative co-morbidities, which was increased in the thoracotomy group (13.0% vs. 9.0%, respectively;  $p=0.04$ ), and performance of a lobectomy (79.4% vs. 68.0%, respectively;  $p=0.03$ ). After adjusting for potential confounders in multivariate regression analyses, operative approach had no impact on operative time, LOS, and post-operative complication rates. Patients who underwent conversion to thoracotomy had similar complication rates to those those who underwent successful thoracoscopic resection and those initially approached by thoracotomy.

**Conclusions:** Data from this multi-institutional study suggest that thoracoscopic resection of CLMs is being increasingly employed at major children's hospitals. Moreover, thoracoscopy can be safely performed, is associated with a declining rate of conversion to thoracotomy, and has equivalent post-operative outcomes to thoracotomy in multivariate analyses. Given the safety as well as potential for superior cosmesis, reduced post-operative pain, and decreased long-term musculoskeletal morbidity, thoracoscopic resection is at least equal, if not superior, to thoracotomy for the surgical management of most asymptomatic CLMs.

**S050 MINIMALLY INVASIVE SURGICAL APPROACH FOR POSTERIOR TRACHEOPEXY TO TREAT SEVERE TRACHEOMALACIA: LESSONS LEARNED FROM INITIAL CASE SERIES** A Kamran, MD, T E Hamilton, MD, B Zendejas, MD, R W Jennings, MD, C J Smithers, MD; Boston Children's Hospital

**Background:** Posterior tracheopexy directly addresses membranous tracheal intrusion in severe tracheomalacia. We have previously reported our experience of posterior tracheopexy via open approach in a large series of patients. This study aimed to review some

# Oral (Scientific Session Abstracts)

lessons learned with our initial series of thoracoscopic posterior tracheopexy.

**Description:** A retrospective study included six patients with symptomatic tracheomalacia who underwent video-assisted (n=4) or robot-assisted (n=2) thoracoscopic posterior tracheopexy.

In the operating room, after semi-prone lateral decubitus positioning and using a bronchial blocker for single-lung ventilation, ports were inserted in standard locations for tracheoesophageal surgery. We divided the azygos vein between ligatures, resecting a segment to use as autologous pledget material. The esophagus was dissected so that it could be pushed either left or right in the posterior mediastinum. The anterior spinal ligament was exposed, pushing fatty tissue including the thoracic duct toward the left chest. Posterior tracheobronchopexy was performed by placing pledgeted horizontal mattress sutures through the longitudinal midline portion of the posterior tracheal/bronchial membrane and suturing them to the anterior longitudinal spinal ligament. Flexible bronchoscopic visualization was used continuously to confirm that sutures were not placed intraluminally and that the airways were optimally opened without distortion. Finally, the pleura was closed, and the esophagus was rotated either left or right of the trachea depending on its more natural position and the level of required posterior tracheobronchopexy to improve long-term durability for scarring for the tracheopexy.

Patients ranged in age from 8 months to 12 years, only the youngest had prior history of operation for type C esophageal atresia repair. All had symptomatic tracheomalacia; one patient with tracheostomy/ventilator dependence also had severe distal bronchomalacia including segmental levels. All patients had improved respiratory symptoms following the operation, except for patient with pre-existing ventilator dependence. Operative times ranged 4.5 – 10 hours. Patients were hospitalized 3-7 days, with 1-2 days for ICU observation (excluding patient with tracheostomy who remains hospitalized). Two complications were noted: one patient with BMI of 35 developed a left thigh pressure sore that resolved without intervention, and the 8 month old with prior right thoracotomy required open conversion.

**Discussion:** The thoracoscopic approach for posterior tracheopexy, while challenging, can be applied in children with severe tracheomalacia. As we are gaining experience, more complicated procedures and re-operative cases will be possible. Minor degrees of imprecision can lead to distorted airway shape that must be prevented or corrected during the procedure. The simultaneous use of flexible bronchoscopy is mandatory to confirm precision by providing luminal visualization during suture placement. Thoracoscopic surgery with robotic assistance can eliminate some technical limitations of the video-assisted approach by providing an easier platform for very complicated suturing angles. Each operation has to be customized for the individual patient's airway anatomy, including decisions about the desired anatomic relationships of the trachea to the esophagus and/or major vasculature in cases of aberrant arteries or descending aorta impingement on the left mainstem bronchus.

**S051 ECHOCARDIOGRAPHIC PREDICTORS OF MORTALITY IN CDH PATIENTS WITH PULMONARY HYPERTENSION** [Sophia Abdulhai, MD<sup>1</sup>](#), [Ian C Glenn, MD<sup>1</sup>](#), [Dave Gothard, MS<sup>2</sup>](#), [Pamela Lally, MD<sup>3</sup>](#), [Avraham Schlager, MD<sup>1</sup>](#); <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Biostats Inc, <sup>3</sup>The University of Texas McGovern Medical School, Department of Pediatric Surgery, and Children's Memorial Hermann Hospital

**INTRODUCTION:** Pulmonary hypertension (pHTN) is a known risk factor for mortality in patients with congenital diaphragmatic hernia (CDH); however, it is, as of yet, unclear how the severity of pHTN and other echocardiographic findings affect mortality in these patients. The purpose of this study is to evaluate how initial echocardiogram findings, including relative severity of pHTN, change mortality outcomes in CDH patients.

**METHODS:** We performed a retrospective study utilizing the CDH study group database of all patients who had a preoperative echocardiogram from 2007-2016. Any patient with significant congenital cardiac defects was excluded.

The following echocardiogram findings were then analyzed as possible risk factors for mortality: severity of pulmonary HTN (pHTN), presence and direction of a patent ductus arteriosus (PDA) shunt, presence of a patent foramen ovale (PFO), and tricuspid regurgitation.

Statistical analysis was performed using Pearson chi-square test with post-hoc Bonferroni adjusted z tests, univariate risk analysis and multivariate logistic regression.

**RESULTS:** We had a total of 3040 patients from 2007 to 2016. Severity of pHTN, PDA, ductal shunt, and tricuspid regurgitation were



# Oral (Scientific Session Abstracts)

significantly associated with mortality (all  $p < 0.001$ ). There was no association between mortality and the presence of a PFO ( $p = 0.830$ ). A univariate odds ratio of death was then calculated for the above significant risk factors and they are listed in Table 1.

The significant risk factors for mortality identified in the univariate analysis were then taken in concert with each other and pHTN greater than systemic BP, right to left shunt and tricuspid regurgitation were found to increase the odds of death in a multivariate logistic regression (all with  $p < 0.05$ ).

**Table:** Univariate odds ratio of death based on the above listed echocardiogram findings (all with  $p < 0.05$ ). \* Depicts the statistically significant factors that affected mortality in the multivariate analysis. BP-Blood pressure.

Variable	Odds Ratio
Elevated 2/3 Systemic BP or more	4.18
Severity of pHTN	
Elevated 2/3 to Systemic BP	1.04
*Elevated greater than Systemic BP	2.96
Open Ductus	2.92
Ductal Shunt (compared to no shunt)	
Left to Right	0.89
Bidirectional	2.29
*Right to left	7.73
*Tricuspid Regurgitation	1.69

**CONCLUSION:** Severity of pHTN and the presence of a PDA, ductal shunt, and tricuspid regurgitation on initial echocardiogram significantly increase the risk of mortality in CDH patients.

**S052 NO MORTALITY BENEFIT IN DELAYED CONGENITAL DIAPHRAGMATIC HERNIA REPAIR IN PATIENTS WITH SUPRASYSTEMIC PULMONARY HYPERTENSION** Sophia Abdulhai<sup>1</sup>, Ian C Glenn, MD<sup>1</sup>, Dave Gothard, MS<sup>2</sup>, Pamela Lally, MD<sup>3</sup>, Avraham Schlager, MD<sup>1</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Biostats Inc, <sup>3</sup>The University of Texas McGovern Medical School, Department of Pediatric Surgery, and Children's Memorial Hermann Hospital

**INTRODUCTION:** Timing of surgical repair in CDH patients with pulmonary hypertension (pHTN) remains an area of controversy. It is common practice to defer surgical repair in CDH patients with suprasystemic pHTN (ss pHTN) until improvement or resolution of echocardiogram findings. We theorize that delaying surgical treatment until improvement of ss pHTN may not alter outcomes. The goal of this study is to compare the mortality of CDH patients with ss pHTN based on timing of surgical repair.

**METHODS:** We performed a retrospective review using the CDH study group database of all patients who had a pre-operative echocardiogram demonstrating ss pHTN between 2007 to 2016. Patients with complex cardiac defects were excluded. We compared early and overall mortality between the following surgical repair groups:

- *Group 1:* Initial echo demonstrating ss pHTN and surgery within 3 days (without a repeat echo)
- *Group 2:* Initial echo demonstrating ss pHTN and surgery more than 3 days following initial echo (with no determinate repeat ECHO)
- *Group 3:* Initial echo with ss pHTN with repeat ECHO demonstrating decreased improvement of pHTN prior to surgery

# Oral (Scientific Session Abstracts)

- *Group 4:* Initial echo with ss PHTN with a second preoperative echo that showed persistent ss pHTN who still underwent surgery.

Statistical analysis was performed using Fischer's exact and Pearson chi-square tests.

**RESULTS:** There were a total of 739 patients with ss pHTN from 2007 to 2016. The distribution of the patients in groups 1-4 were 186, 444, 84 and 25, respectively (see table).

There was no statistically significant difference in overall mortality between Groups 1-4 ( $p=0.222$ ). There was also no significant difference in overall post-operative mortality between those repaired within 3 days of initial ECHO (Group 1) and those repaired after 3 days (Groups 2-4) ( $p=0.621$ ).

**Table:** Distribution and percent mortality per surgical repair group. There was no statistically significant difference in mortality between the groups ( $p=0.222$ ).

Timing of Repair	Total (n)	Died (n)	% Mortality
Group 1	186	39	21.0%
Group 2	444	103	23.2%
Group 3	84	11	13.1%
Group 4	25	6	24.0%

**CONCLUSION:** Delayed surgical repair in CDH patient with suprasystemic pulmonary hypertension is not associated with decreased mortality.

**V011 SUCCESSFUL THORACOSCOPIC TREATMENT FOR KLUTH IV2 ESOPHAGEAL ATRESIA COMBINED WITH TRACHEAL BRONCHUS: A CASE REPORT OF RARE VARIANT ESOPHAGEAL ATRESIA** Masakazu Murakami, MD, Keisuke Yano, MD, Seiro Machigashira, MD, Yuto Nonaka, MD, Motoi Mukai, MD, PhD, Takafumi Kawano, MD, PhD, Shun Onishi, MD, Masato Kawano, Koji Yamada, MD, Waka Yamada, MD, PhD, Ryuta Masuya, Kazuhiko Nakame, MD, PhD, Tatsuru Kaji, MD, PhD, Satoshi Ieiri, MD, PhD, FACS; Department of Pediatric Surgery, Kagoshima University

**Background:** In 1976, Kluth published an atlas comprising all forms of esophageal atresias (EA) observed to date. Ninety-six variants were described. We herein report a rare variant case in which thoracoscopic repair was successfully performed to treat a Kluth IV<sub>2</sub> EA combined with tracheal bronchus.

**Patient and Methods:** The patient was born at G40w0d with an Apgar score of 9/9. After stating oral intake, the patient showed vomiting and respiratory distress. Coil-up sign and abdominal gas were recognized, and EA (Gross type C) was suspected. The patient was then transferred to our hospital by helicopter, and thoracoscopic repair for EA was planned.

**The Operative Findings and Procedure:** Under general anesthesia, the patient was placed in the supine position. Initially, broncho-fiber was performed to confirm trachea-esophageal fistula (TEF). TEF was recognized about 8 mm proximal to the carina at the right postero-lateral side. The patient's position was then changed to the left three-quarter prone position. A camera port was inserted at the fifth intercostal space (ICS) of the posterior axillary line using optical methods. Two working ports were inserted at the third (operator's right hand) and seventh ICS (operator's left hand) of the anterior axillary line. A 45° 5-mm scope was used to obtain a wide view. The parietal pleura was opened using bipolar scissors (Robi; Karl Storz, Tuttingen, Germany). The azygos vein was coagulated and

# Oral (Scientific Session Abstracts)

divided using a vessel sealing system (LigaSure™; Medtronic, Minneapolis, MN, USA). Careful dissection of the distal esophagus was performed to detect the TEF, but the esophagus was not interrupted and showed a normal outer appearance. TEF was also not recognized at the dorsal side of the trachea. A stomach tube was inserted orally to confirm the endoluminal interruption of the esophagus. However, the tube could not be passed and stopped at the upper esophagus. Membranous stenosis was therefore suspected. To confirm the TEF, broncho-fiber was performed again. A fistula-like structure 8 mm proximal to the carina was identified as a “tracheal bronchus”. To confirm and repair the endoluminal stenosis, two traction sutures were placed at both the proximal and distal sides of the stenosis. The upper esophagus was opened at the right side via a longitudinal incision. A membrane structure was recognized in the endoluminal space of the incised esophagus. The membrane was resected using bipolar scissors, and a 6.5-Fr trans-anastomotic feeding tube was passaged to the distal esophagus. The longitudinal esophageal incision was transversely closed by interrupted 6-0 monofilament absorbable sutures (PDS; Ethicon, Cincinnati, OH, USA) to prevent stenosis. The tip of the Blake drain was placed at the closed site of the esophagus through the trocar wound at the seventh ICS of the anterior axillary line.

**Conclusion:** There were no intraoperative or postoperative complications. The postoperative course was uneventful, and contract enema showed no leakage or stenosis. In the present case, the definitive diagnosis of Kluth IV<sub>2</sub> EA was obtained based on the intraoperative findings. The thoracoscopic approach was found to be useful even for the diagnosis and treatment of rare variant EA.

**V012 MINIMALINVASIVE DUODENODUODENOSTOMY USING A MINIATURE STAPLER** Oliver J Muensterer, MD, PhD; University Medicine Mainz

**Background:** Laparoscopic duodenoduodenostomy is technically challenging, mostly due to suturing of the back wall of the anastomosis. Recently, miniature staplers below 6mm diameter have been introduced, which may facilitate this procedure.

**Purpose:** To describe our experience with minimalinvasive duodenoduodenostomy using a miniature stapler.

**Technique:** The optic trocar is introduced into the navel. Two 3mm working trocars are placed in the right lower quadrant and the left upper quadrant. Dissection is performed to mobilize the distal part of the duodenum and approximate both proximal and distal portions in parallel. A simple 3-0 polyglactin suture is used to approximate both parts, leaving the suture long and armed with the needle. Using endosurgical scissors, openings are created in the proximal and distal portion of the duodenum. The left upper trocar is then removed and the stapler is introduced percutaneously through that site. It is opened intraabdominally and slid into completely into the parallel duodenal parts, closed, and then fired. Thereby, a wide side-to-side anastomosis is created. The suture is used to close the defect using a running technique.

**Results:** So far, 5 patients have been treated using the described method. Median operative time was 84 minutes, there were no intraoperative complications, no leaks, and no postoperative stenoses. Full feeds were tolerated by all patients after 5 to 10 days.

**Conclusion:** The miniature stapler has made duodenoduodenostomy simpler. It can be performed reliably by trainees. We believe that this method has the potential to become the standard of care to treat duodenal stenosis and atresia.

**V013 ENDOSCOPIC-ASSISTED PERCUTANEOUS ANO-RECTO-PLASTY (EPARP)** Oliver J Muensterer, MD, PhD, Stephan Rohleder, MD, Ahmad Alswed, MD, Jan Gödeke, MD; Pediatric Surgery, University Medicine Mainz, Germany

**Background:** Imperforate anus without a fistula is rare and comprises only about 5% of all anorectal malformations. It usually is associated with down syndrome and patients initially have an upfront colostomy placed. Several alternative techniques for repair have been described, including the PSARP and laparoscopic-assisted anorectoplasty. Since we usually place a divided colostomy, we have devised an endoscopic-assisted percutaneous approach we coined the dPARP.

**Technique:** The patient is placed supine with the fluoroscopy unit in place to provide cross-table lateral radiographic guidance. The blind end of the colon is identified endoscopically with the typical star-shaped scar. The center of the muscle complex is identified from the outside using an electronic stimulator. Under radiographic guidance, with gas insufflated into the colon to distend it and provide contrast, a needle is advanced percutaneously through the muscle complex into the colon. A guidewire is placed through the

# Oral (Scientific Session Abstracts)

needle, and a 12mm balloon dilator is placed over the guidewire. The skin is incised in a cross-shaped pattern, and the tract is dilated. The balloon dilator is then removed. Through the tract, two sharp hooks are introduced to pull the mucosa out. It is secured with stay sutures and then a colcutaneous anastomosis is created circularly using interrupted braided resorbable sutures.

**Patient:** The patient in the video is a 6 month old girl with down syndrome with a distance from the colonic pouch to the skin of 2 cm on ultrasound. Operative time was 55 minutes, the patient was discharged 2 days after the procedure. On follow up, she had an almost normal looking inverted anus and was stooling spontaneously without further therapy.

**Conclusions:** We have performed ePARP in a total of 3 patients with good results. ePARP is a minimal-invasive option to correct ano-rectal malformations without a fistula.

**VO14 THORACOSCOPIC DIVISION OF A VASCULAR RING** Sophia Abdulhai, MD<sup>1</sup>, Steven Rothenberg, MD<sup>2</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Rocky Mountain Hospital for Children

**INTRODUCTION:** This video will discuss a successful thoracoscopic division of a vascular ring in a patient with a right-sided aortic arch.

**METHODS:** Our patient is a 12-year-old male who presented with a several month history of worsening dysphagia. He underwent a CT chest and echocardiogram that showed a right-sided aortic arch with an aberrant subclavian artery off a diverticulum of Kommerrell and a ligamentum arteriosum, creating a vascular ring. We were unable to tell from the CT scan if the ligamentum arteriosum still had a patent vessel, so we treated it as though it were patent during our operative resection. Because of his symptoms, he was taken to the operating room for a thoracoscopic division of this vascular ring. Prior to starting the procedure, proximal and distal pulse oximeters and blood pressure cuffs were placed on the upper and lower extremities. The procedure was performed with single lung ventilation through a right mainstem intubation. He was positioned with his left side up to 40 degrees, and the procedure was performed using three ports: a 4-mm camera port just posterior to the tip of the scapula, and 3-mm and 5-mm working ports anterior and posterior to the camera port. The procedure was started by opening up the pleura overlying the approximate location of the ligamentum arteriosum using a 3-mm bipolar vessel sealer. The ligamentum arteriosum was dissected out using blunt dissection and the bipolar energy device, being on the constant lookout for the vagus and the recurrent laryngeal nerves. After dissecting out the ligamentum arteriosum circumferentially, a test clamp was performed to ensure that there was no difference between the proximal and distal pulse oximeters and blood pressures, and there was not. The ligamentum arteriosum was then divided using a 5-mm stapler. After division of the ligamentum arteriosum, the surrounding fibrous tissue was resected to ensure relief of the anatomic obstruction of the trachea and esophagus.

**RESULTS:** The patient tolerated the procedure well and was discharged home on postoperative day 1. He had complete resolution of his dysphagia on his two-week follow-up.

**CONCLUSION:** Thoracoscopy is a safe and successful approach to performing a vascular ring division.

**VO15 THORACOSCOPIC AORTOPEXY FOR SEVERE TRACHEOMALACIA** Jason D Fraser, MD, Jason R Axt, MD; Children's Mercy Hospital

**Purpose:** Aortopexy is a well-established technique for the treatment of severe tracheomalacia that occurs most commonly in the setting of children with esophageal atresia and tracheoesophageal fistula. There is a lack of video evidence of the thoracoscopic technique. We therefore present a thoracoscopic aortopexy for severe tracheomalacia.

**Methods:** The patient is an 8 month old male who was born with a type A esophageal atresia. He also had a single kidney and cleft lip and palate. A laparoscopic gastrostomy was placed on day of life 1 followed by a thoracoscopic converted to open repair of the esophageal atresia after he was allowed to grow. This was complicated by a small contained leak and prolonged oxygen dependence. He was never able to be weaned off oxygen and did suffer from a respiratory code event at 8 months of life leading to another intubation. A repeat bronchoscopy at that time showed almost complete airway collapse with significant distal secretions. Therefore, aortopexy was indicated. A left thoracoscopic approach was selected due to his previous right-sided operations. A 5mm port was placed at the anterior axillary line at the nipple level and two 3mm ports were placed just anterior to the 5mm port on each

# Oral (Scientific Session Abstracts)

side. The left lobe of the thymus was removed bluntly giving good visualization of the pericardium and aortic arch. A 3-0 braided polyethylene suture was then passed through the sternum. The first suture was placed through the adventitia of the distal aortic arch. This suture was then fed back through the sternum with some effort. The second suture was brought into through the sternum and was paced through the proximal aortic adventitia. Then an 18g needle with a loop of monofilament suture placed in a loop was passed through the sternum. The loop was placed into the chest and used to lasso the other suture, which was then brought back out of the chest. The third suture was passed through the sternum and was passed through the pericardium at its junction with the aorta. The 18g needle was again used to lasso this suture. Tying the three sutures brought the mediastinal structures into direct apposition with the sternum. Immediate bronchoscopy showed significant distal secretions with some residual airway collapse. A repeat bronchoscopy a week later after he was weaned from all oxygen showed the airway was completely open without any residual collapse.

**Results:** The patient tolerated the procedure well was weaned from the ventilator after one day and was off all oxygen support after a few days. He was discharged home and continues to be free of respiratory issues in follow-up.

**Conclusions:** The thoracoscopic approach for aortopexy is safe, well tolerated and affords the surgeon excellent visualization.

**V016 LAPAROSCOPIC RIGHT NEPHROPEXY FOR NEPHROPTOSIS** Adil Shah, MD, Mikael Petrosyan, MD, Philip Guzzetta, MD, Timothy Kane, MD; Children's National Medical Center

**Background:** Nephroptosis is a rare condition resulting in floating kidney and renal ptosis, where kidney descends more than two vertebral bodies during a position change from supine to upright. We present a case of 18-year-old female who presented with abdominal pains that occurred with upright posture along with "cramping." CT which was obtained did not show any pathology. The US was also normal however the right kidney was easily mobilized to the midline especially when the patient moved to the left lateral decubitus position. She had 5-10 episodes of pains per day for three straight weeks after she was asked to keep a daily diary. The decision was made to undergo nephropexy.

**RESULTS:** The patient underwent laparoscopic right nephropexy using, the hepatic flexure of the colon was mobilized; Gerota's fascia was opened and kidney completely mobilized. A total of 4 x 2-0 Vicryl sutures were placed to pex the kidney. Two from the psoas muscle to the inferior/superior poles; and 2 sutures to the transversalis fascia laterally to the kidney. Gerota's fascia was closed with a running 3-0 Vicryl.

**CONCLUSION:** Nephropexy is indicated in a very small percentage of nephroptosis cases. It is reserved only for symptomatic patients with flank pain (often >1 year in duration) in whom studies confirm renal descent upon transition from a supine to an erect position.

**V017 THORACOSCOPIC RESECTION OF CONGENITAL ESOPHAGEAL STRICTURE** Jeremy G Fisher, MD, Dominic Papandria, MD, Christopher M Carter, MD, Karen A Diefenbach, MD; Nationwide Children's Hospital

**Objective:** Demonstration of thoracoscopic approach to resection of congenital esophageal stricture.

**Methods:** The patient chart and archival intraoperative video were reviewed for an 18 month old male who presented with episodic vomiting and aspiration and was subsequently found to have a distal esophageal stricture. The patient underwent thoracoscopic resection and sutured primary anastomosis over a trans-anastomotic sump tube.

**Results:** The strictured esophagus was completely resected with pathology concordant with a congenital esophageal stricture. Post-operative recovery was remarkable for mild anastomotic stenosis on esophagography and fluoroscopically-guided dilation is planned.

**Conclusions:** Based on review of this case, thoracoscopic resection of congenital esophageal stricture is feasible and safe in this age group.

# Oral (Scientific Session Abstracts)

**V018 LAPAROSCOPIC MEDIAN ARCUATE LIGAMENT RELEASE** Eveline H Shue, MD, Nam X Nguyen, MD; Children's Hospital of Los Angeles, Miller Children's Hospital of Long Beach

**Purpose:** Median arcuate ligament syndrome is a rare disease that is a diagnosis of exclusion. It most commonly affects middle-aged women. This video describes a laparoscopic median arcuate ligament release in an adolescent patient.

**Methods:** The patient was placed in a supine, split leg position. We used five 5mm ports to perform the operation. The camera was placed in the supraumbilical port. A liver retractor was placed in the right lateral subcostal port, and we used two working ports in the mid-clavicular line on the right and left side.

**Results:** We successfully performed a laparoscopic median arcuate ligament release by initially coming through the gastrohepatic ligament. We then mobilized the esophagus to expose both the right and left crura as it came together into the median arcuate ligament. We carefully used a hook electrocautery and a sealing device to expose the anterior surface of the aorta by coming from proximal to distal. We identified the celiac trunk and dissected distally along it until we identified the branches coming off of the celiac trunk. The esophageal hiatus was then re-approximated to prevent herniation. The patient had significant symptomatic improvement postoperatively.

**Conclusions:** Laparoscopic median arcuate ligament release can be safely performed in the pediatric population

**V019 RIGHT THORACOSCOPIC REPAIR OF AN H-TYPE TRACHEOESOPHAGEAL FISTULA** Sophia Abdulhai, MD<sup>1</sup>, Steven Rothenberg, MD<sup>2</sup>; <sup>1</sup>Akron Children's Hospital, <sup>2</sup>Rocky Mountain Hospital for Children

**INTRODUCTION:** Although H-Type tracheoesophageal fistulas (TEF) are routinely repaired using a neck incision, thoracoscopic repair is a feasible, and potentially advantageous, alternative to the management of this anomaly. This video demonstrates successful treatment of an H-type TEF using a right thoracoscopic approach.

**METHODS:** Our patient is a 3-month-old female with severe combined immunodeficiency and suspected CHARGE syndrome, who presented with difficulty swallowing and likely aspiration. She underwent a swallow study that was positive for aspiration as well as reflux. A bronchoscopy was then performed that showed an H-type TEF in the lower neck. She was taken to the operating room for a right thoracoscopic repair of her H-type TEF. The patient was placed in the left lateral decubitus position and the procedure was performed using three ports: a camera port behind the tip of the scapula at approximately the 4th intercostal space, a working port directly below the camera port, and a working port anterior to the camera port at the mid-axillary line. Upon entering the chest, we first identify the trachea, and then dissect in the tracheoesophageal groove using a combination of blunt dissection and a bipolar energy device. After careful dissection, the TEF was identified, and it was then dissected out circumferentially using blunt dissection. The fistula was then divided using two 5-mm staplers. After complete transection was achieved, a pleural flap was placed between the staples lines of the trachea and esophagus to help prevent a recurrent fistula. The parietal pleura was then closed over the trachea and esophagus.

**RESULTS:** The patient tolerated the procedure well. She underwent a swallow study on postoperative day 2, which was negative for a leak and she was started on feeds.

**CONCLUSIONS:** Thoracoscopy is a successful alternative approach to repairing an H-type tracheoesophageal fistula. Advantages are that it allows for direct and magnified visualization between the esophagus and the trachea, it also allows you to see the vagus nerve clearly and avoid injury to the recurrent laryngeal nerve, and it avoids a neck incision.

**V020 ELONGATION OF BOTH ENDS BY STRETCHING TECHNIQUE FOR TREATMENT OF PURE ESOPHAGEAL ATRESIA BY THORASCOPIC SURGERY** Jun Wang, MD, PhD, Suna Sun, Wenji Wu, Weihua Pan; Xinhua Hospital affiliated Shanghai Jiaotong University School of Medicine

This is a patient with long gap esophageal atresia (Gross type A). We use preoperative stretching technique to prolong the proximal and distal esophageal segments by bougie to achieve primary anastomosis

# Oral (Scientific Session Abstracts)

After entering the thoracic cavity, identify the proximal esophageal pouch and gently mobilize the proximal pouch. It is important to be careful with this dissection to not injure the membranous trachea which is lying adjacent to the proximal esophagus. Then it's mobilization of the distal esophageal pouch. But we can see the two segments are still widely separated, the anastomosis is hard to achieve because of the long gap, so we performed Livaditis for both proximal and distal segments. It is important to be careful when performing myotomies to avoid esophageal perforation. Resect the top tissue, two segments are ready for anastomosis. First to suture the posterior row using 5-0 polydioxanone (PDS), we suggest the sutures tied by ligature tool. Once the posterior row is sutured, a 8 French tube is then inserted through the infant's nares, across the esophageal anastomosis, and into the stomach. The anterior portion of the anastomosis is then completed in an interrupted fashion. After completing the anastomosis, check everything is right, then a small silastic drain is inserted through one of the incisions and positioned near the anastomosis. Then close the incisions

This is esophagram at 1 month's and 6 months' post-operative days which demonstrating no anastomotic leak nor stenosis.

**S053 USE OF VENOVENOUS EXTRACORPOREAL MEMBRANE OXYGENATION PREFERENTIALLY IN INFANTS WITH CONGENITAL DIAPHRAGMATIC HERNIA** Heather L Short, MD<sup>1</sup>, Matthew S Clifton, MD<sup>1</sup>, Sarah Keene, MD<sup>2</sup>, Adarsh Patel, BS<sup>1</sup>, Curtis Travers<sup>3</sup>, Avraham Schlager<sup>4</sup>; <sup>1</sup>Emory University School of Medicine, Department of Surgery, Atlanta, GA, <sup>2</sup>Emory University School of Medicine, Department of Neonatology, Atlanta, GA, <sup>3</sup>Emory University School of Medicine, Department of Pediatrics, Atlanta, GA, <sup>4</sup>Akron Children's Hospital, Department of Pediatric Surgery, Akron, OH

**PURPOSE:** Traditionally, venoarterial (VA), rather than venovenous (VV), extracorporeal membrane oxygenation (ECMO) has been considered necessary in the management of refractory respiratory failure in infants with congenital diaphragmatic hernias (CDH). This stems from the belief that the complex physiology inherent to CDH patients requires VA support, and the use of VV ECMO will inevitably result in an unacceptably high conversion rate in this patient population. Our purpose was to test this assumption by evaluating the conversion rate of patients managed primarily with VV ECMO and compare outcomes with those managed initially with VA ECMO.

**METHODS:** We performed a retrospective review of all CDH patients requiring ECMO cannulation for treatment of respiratory failure between January 2000 and July 2015 at a single institution where VV ECMO was the preferred initial ECMO modality. Primary outcomes included rate of conversion from VV to VA ECMO and comparative mortality.

**RESULTS:** Sixty-five CDH patients required ECMO support between 2000-2015. Fifty-nine patients (90.8%) underwent initial VV ECMO cannulation, while 6 patients (9.2%) underwent initial VA ECMO cannulation. Four (6.8%) VV patients required conversion to VA ECMO. Indications for conversion included 2 patients with worsening right ventricular function, 1 patient with inadequate flows, and 1 patient with acute desaturations concerning for pulmonary embolus. Mortality among the VV patients was 23.6% (n=13) compared to 33.3% (n=2) in the VA patients (p=0.579). There were no mortality events in the conversion group. There was no significant difference in the number of days spent on ECMO between the 3 groups (VV:6 days, IQR 5, 12; VA:7.5 days, IQR 6, 12; VV to VA:10.5, IQR 6.5, 15; p=0.411).

**CONCLUSIONS:** VV ECMO is both a safe and effective method for management of refractory respiratory failure in CDH patients. When performed at an experienced VV center, it is associated with an extremely low conversion rate.

**S054 EFFECT AND SIGNIFICANCE OF RA ON VEGF AND ET EXPRESSION IN THE LUNGS OF THE NITROFEN-INDUCED CONGENITAL DIAPHRAGMATIC HERNIA RAT MODELS** Lishuang Ma, Bin Sun, Jingna Liu, Cuizhu Feng, Yue Zhang, Ying Wang, Yanxia Zhang, Yandong Wei, Chao Liu; Capital Institute of Pediatrics, Peking University Teaching Hospital

**Objective** To research the expression and significance of VEGF and ET in fetal rat lung with congenital diaphragmatic hernia (CDH) and evaluate the effect of intervention by Retinoic Acid in fetal lung development of rat with CDH.

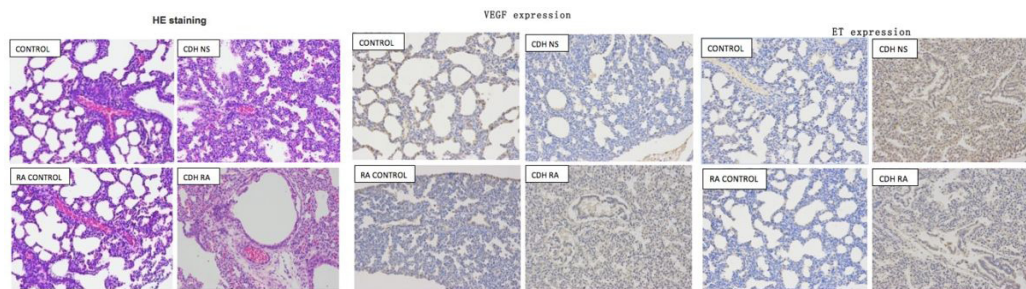
**Materials and Methods** 20 adult feminine Sprague-Dawley rats were divided into 4 groups (5 rats in each group): 1. Normal Control (NC); 2. Retinoic Acid Control (RC); 3. CDH Normal Saline (CDH NS); 4. CDH Retinoic Acid (CDH RA). Each pregnant rat in group 1 and 2 was intragastric administration with 1ml olive oil on day 9.5 of gestation. Others were administered 100mg Nitrofen dissolved in 1ml olive oil. From day 18.5 of pregnancy, NS 1ml/d was administered by intraperitoneal injection to each rat in group 1 and 2, and RA (dissolved in olive oil 1 ml) in group 3 and 4 for three days. Then the fetuses were delivered by cesarean section and executed by decoloration on day 21.5 of gestation. Body weight and lung tissue weight of each fetus were recorded. Lung histologic evaluate PAA (proportional alveolar area), MTBD (mean terminal bronchi density), MWT (proportional medial wall thickness) and RAC (axial acinar count).

# Oral (Scientific Session Abstracts)

VEGF and ET immunohistochemistry staining evaluations were performed with image analysis. The expression of VEGF and ET in the fetal lung tissue were analyzed with orientation and quantitation. Experimental datas were performed with statistical analysis.

**Results** The ratio of the fetuses with CDH in the group 3 and 4 was 48.8% and 36.7%. CDH fetuses in CDH RA group were significantly less than the CDH NS group ( $P < 0.05$ ). There was no CDH fetus in group 1 and 2. Lw/Bw of CDH groups were all significantly lower than Control groups ( $P < 0.05$ ). But in Control groups, the difference of Lw/Bw between group 1 and 2 had no significant difference ( $P > 0.05$ ). In CDH groups, the difference of Lw/Bw between group 3 and 4 had no statistical significance ( $P > 0.05$ ). Light microscope observation manifested the pulmonary arterioles and bronchioles wall of Normal Control group were thin while the pulmonary arterioles and bronchioles wall of CDH NS group were thick. The pulmonary arterioles and bronchioles wall of CDH RA group were between the preceding two groups. The NC group and RC group had the same result. Image analysis and statistical analysis showed that the difference of PAA, MTBD, MWT and RAC in all experimental groups had significance ( $P < 0.05$ ). The VEGF expression was positive on the endothelial cell. And the difference of VEGF expression intensity on the sections had statistical significance ( $P < 0.05$ ). The ET expression was positive on the endothelium cell and smooth muscle of pulmonary arterioles, epithelium mucosae and smooth muscle of bronchioles and alveolar epithelium.

**Conclusions** Nitrofen can make VEGF and ET express down-regulation in the fetal rat lungs. Retinoic Acid can improve the development of pulmonary in congenital diaphragmatic hernia rat models. And it can make VEGF express up-regulation and ET down-regulation in the fetal rat lungs. But the relationship between CDH and VEGF and ET is still not clear. It remains a long way to declare the mechanism of the role of VEGF and ET in CDH.



**S055 DOES THORACOSCOPIC CONGENITAL DIAPHRAGMATIC HERNIA REPAIR CAUSE A SIGNIFICANT INTRA-OPERATIVE ACIDOSIS WHEN COMPARED TO AN OPEN ABDOMINAL APPROACH?** Maricarmen Olivos<sup>1</sup>, Christine Lam<sup>2</sup>, Alex Scarlet<sup>1</sup>, Muhammad Choudhry<sup>1</sup>, William Sherwood<sup>1</sup>, Amulya Saxena<sup>1</sup>, Diane De Caluwe<sup>1</sup>, Munther Haddad<sup>1</sup>, Simon Clarke<sup>1</sup>; <sup>1</sup>Chelsea and Westminster Hospital, <sup>2</sup>Imperial College of London

**AIMS:** Thoracoscopic repair of CDH is reported as producing a significant intra-operative acidosis secondary to the pneumocarbina. We aimed to compare the outcomes as well as any intra-operative acidosis between the MIS technique and the abdominal open approach.

**METHODS:** Data was collected retrospectively on patients undergoing either an MIS or open CDH repair over a 13-year period. Blood gases were identified during the operation on all patients. Operative time, complications and recurrence rates was also collected.

**RESULTS:** 85 patients were identified over the 13-year period. 23 cases were excluded; 3 were Morgagni hernias, 6 had missing notes and 14 patients died prior to their operation. Of the 62 patients analysed, 22 patients underwent an MIS repair and 40 underwent an open repair. Neonates in the open group had a significantly lower birth weight (1.69kg vs. 3.08kg,  $p < 0.05$ ). There were no differences between the two groups' patch requirement ( $p = 0.052$ ), pre-operative ventilation ( $p = 0.5$ ), pre-operative ionotropes ( $p = 0.92$ ) or operative time ( $p = 0.07$ ). The intraoperative pH values were similar between the two groups. There were 2 recurrences in each group and no mortalities.

**CONCLUSIONS:** Thoracoscopic CDH repair appears to have similar outcomes to that of an open procedure though in this series birth weights were not matched. There were no significant differences in intra-operative pH or recurrence rates between the two procedures. Further multicentre prospective studies would be needed to establish the long-term outcome of this technique and whether



# Oral (Scientific Session Abstracts)

low birth weight is a risk factor for hypercarbia.

**S056 UTILIZATION TRENDS IN MINIMALLY INVASIVE PEDIATRIC ABDOMINAL SURGERY - EVIDENCE FROM U.S. TRAINING PROGRAMS** Dominic Papandria, Jeremy G Fisher, MD, Andrew B Nordin, MD, Karen A Diefenbach, MD; Nationwide Children's Hospital

**Objective:** Patterns of practice in the field of pediatric surgery increasingly reflect broad adoption of Minimally Invasive Surgery (MIS) techniques. This study attempts to quantify penetrance of MIS in Accreditation Council for Graduate Medical Education (ACGME) pediatric surgery training programs over a twelve-year period.

**Methods:** We collected public reports from the ACGME (2004-2016) listing all surgical cases logged by pediatric surgery trainees completing an accredited U.S. program. We selected operations with discrete reporting of MIS and open approaches and mean case numbers reported were analyzed for each available year. From these, we narrowed the procedures to those with 60% or greater use of laparoscopy as reflected by mean case totals in 2016 and excluded years with incomplete reporting. Procedures included were antireflux procedures, gastrostomy/jejunostomy, appendectomy, splenectomy (for the years 2005-2016); cholecystectomy (2009-2016); pyloromyotomy, and adrenal procedures (2010-2016). Historic and contemporary training cohorts were defined (for years 2005-2011 and 2012-2016 respectively) and proportions of MIS versus open cases were compared for each procedure.

**Results:** A total of 423 (annual median 35) trainees were represented in the reports examined. For all surgical approaches, mean numbers of cases per trainee varied between 1.2 (adrenal procedures) and 85.4 (appendectomy) with a total of 426 combined MIS and open cases per trainee. Trends toward increasing use of MIS approach were noted in all but two of the included procedures. Cholecystectomy was consistently performed > 88% laparoscopically for each year included. There were statistically significant increases ( $P < 0.05$ ) noted for antireflux procedures, gastrostomy/jejunostomy, and appendectomy (Table 1). In 2016, MIS utilization was highest for appendectomy (95.9%), cholecystectomy (94.5%) and pyloromyotomy (83.1%).

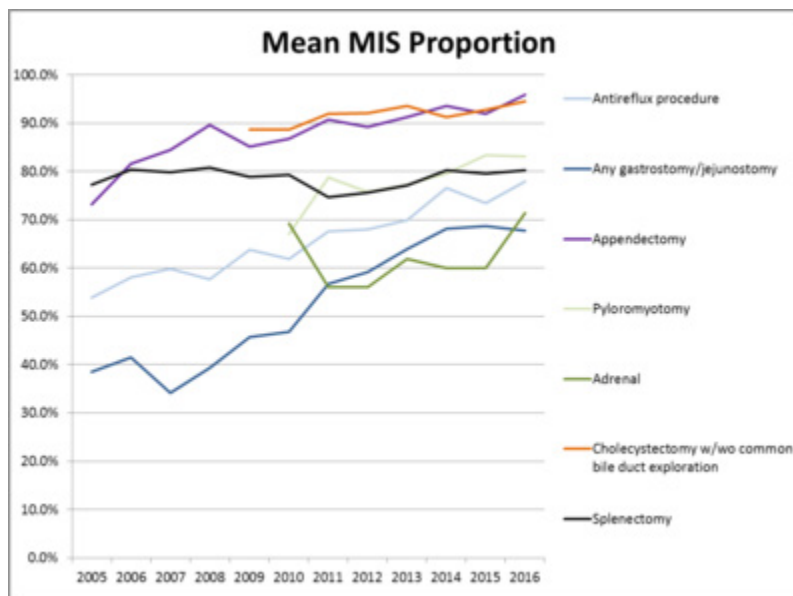
**Conclusions:** MIS approaches are increasingly utilized by U.S. training programs in pediatric surgery, with typical trainees completing relatively few cases examined in the current study via open approach. Despite limitations in our statistical analysis due to incomplete data from earlier reporting years, the trends observed illustrate broad adoption of MIS, in some cases to the near exclusion of open surgery. Consensus statements, informed by evidence and guided by leaders in the field, should advocate for universal adoption of these techniques where they confer a clear benefit to patients.

**Table 1:** Surgical approach reported by graduating pediatric surgical trainees, grouped by era

Procedure (% MIS)	2005-2011	2012-2015	p
Antireflux procedure	60.4	73.0	<b>0.0045</b>
Gastrostomy/jejunostomy	45.8	65.8	<b>0.0045</b>
Appendectomy	85.2	92.5	<b>0.0118</b>
Pyloromyotomy	51.5	79.7	0.2453
Adrenal	60.5	61.7	0.8437
Cholecystectomy	89.7	92.8	0.0526
Splenectomy	78.8	78.5	0.8075

# Oral (Scientific Session Abstracts)

**Figure 1:** Surgical approach reported by graduating pediatric surgical trainees, grouped by procedure



**S057 BLEEDING AT REMOVAL OF NUSS BAR: RARE BUT SOMETIMES SIGNIFICANT** Nina S Cohen, MD<sup>1</sup>, Robert J Obermeyer, MD<sup>2</sup>, Robert E Kelly Jr, MD<sup>2</sup>, M Ann Kuhn, MD<sup>2</sup>, Frazier W Frantz, MD<sup>2</sup>, Margaret M McGuire, MD<sup>2</sup>; <sup>1</sup>Eastern Virginia Medical School, <sup>2</sup>Children's Hospital of the King's Daughters

**Background:** Intraoperative or postoperative hemorrhage following Nuss bar removal is an uncommon but feared complication that can be life threatening if not controlled rapidly. This study aims to identify the incidence of large volume hemorrhage, sources of hemorrhage, successful management strategies, and provide patient care recommendations.

**Methods:** An IRB approved (#15-11-WC-0214) single institution, retrospective chart review was performed covering 15 years (8/2000 – 8/2015) for patients who underwent removal of metal sternal support Nuss bar operations. Patient characteristics, estimated blood loss (EBL), source of hemorrhage, management, and outcome were identified.

**Results:** There were 1628 Nuss bar removal procedures during this review period, with 103 cases that had greater than 25 mL EBL. Of these, 15 patients (0.92%) had greater than 50 mL EBL, 7 (0.43%) had greater than 150 mL EBL, and only 2 (0.12%) had more than 2000 mL EBL. The sources of bleeding included lateral soft tissue, lateral ectopic calcium, intercostal vessels, and ectopic calcium in the medial tract. Bleeding was controlled in the vast majority of patients with pressure and electrocautery. Only 2 patients (0.12%) required transfusion, with EBL of 2000 mL and 3000 mL. In one of these cases, the source was identified by thoracoscopy to be an intercostal vessel, which was controlled with bipolar cautery. The second patient required a right limited thoracotomy and assistance from a cardiothoracic surgeon, during which hemostasis was achieved with electrocautery of a large vein bleeding from the calcified substernal tract. None of the patients suffered cardiac injuries or required cardiopulmonary bypass. There was no associated mortality.

**Conclusion:** In our experience, large volume hemorrhage after Nuss bar removal is a rare event, but may require blood transfusion, thoracoscopic or open exploration, or assistance from a cardiothoracic surgeon. Pectus bar removal should be performed in centers capable of these interventions. Patients should have blood sent to the blood bank for type and screening before operation. After operation, a chest x-ray and a period of postoperative observation are indicated to detect occult hemorrhage.

**S058 BASELINE ASSESSMENT METRICS (BAM) OF INTRACORPOREAL SUTURING AND LAPAROSCOPIC VESSEL SEALING IN PEDIAT-**

# Oral (Scientific Session Abstracts)

**RIC MIS. EXPERIENCE IN ONE CENTER.** H Yang, MD, G Falcioni, J Chichizola, M Maricic, M Bailez; Garrahan Children's Hospital

Starting in 2013 as simulation-based educators, we have developed 3 levels of hands-on pediatric MIS courses with progressive complexity. It is mandatory to attend level 1 (L1) and 2 (L2) before level 3 (L3-neonatal). A skill assessment model and evaluation form (based on GOALS) of intracorporeal suturing designed by Katherine Barsness MD emerged in IPEG Courses in 2016. We reproduced it and also designed an assessment model for vessel sealing.

**Objective:** Describe our initial experience with BAM for intracorporeal suturing in small cavity and safe vessel sealing using bipolar technology.

**Materials and Methods:** Trainees were asked to perform as pre-course skill assessment 2 square knots at a silicone tube in a 250ml training box with 3mm instruments and a 10 cm 5-0 thread (S-trainees); in the second day of L2 training they were asked to conduct dissection, coagulation and section of the vessels using a bipolar sealing device in a dissected ex vivo porcine kidney (V-trainees).

Every performance was video-recorded. The blinded task scoring was registered by 3 trained faculties in the scoring form considering depth perception, bimanual dexterity, efficiency, tissue handling, flow of operation, knowledge of specific procedure, timing, vessel tearing and leakage. 86% was scored by one same evaluator. We compared scoring baseline in diverse groups.

We categorized S-trainees in: novels with no course attended (Group N); L1 course done (Group L1): (A) post course immediate evaluation, (B) delayed evaluation; L1 and L2 courses done (Group L2); other course attended (Group O).

All V-trainees had attended our L1 training.

## Results:

S-Trainees	n	Depth perception	Bimanual Dexterity	Efficiency	Tissue Handling	Flow of Operation	Knowledge of Specific Procedure	Mean Time (seconds)
Group N	18	1.67	1.81	1.57	1.97	1.31	2.05	89% task not completed
Group L1A	14	2.95	3	2.35	3.15	2.7	3.5	923 (662-1511)
Group L1B	46	2.92	3.04	2.66	3.15	2.78	3.40	878 (418-1774)
Group L2	22	2.72	2.59	2.95	3	2.95	3	655 (379-1120)
Group O	12	2.36	2.85	2.35	2.86	2.42	2.78	998 (389-1774)
V-Trainees	19	3.63	3.09	2.84	2.63	2.84	2.94	Leakage after sealing 21%

**Discussion:** Although there was improvement between Groups N and L1 (20%,  $p=0.4$ ), the scoring average kept almost unvarying and stayed stable in time after L1. Moving along the levels, the timing has optimized. Only 63% V-trainees accomplished the exercise perceiving difficulties in tissue handling and technical usage of bipolar sealer. We aim to compare our scoring with faculties of other institutions to seek for validity of the assessment method and formulate standardized simulation training curricula that facilitates the acquisition of proficiency.

**S059 THE DEVELOPMENT OF AN IDEALIZED TROCAR LAYOUT DECISION SYSTEM FOR LAPAROSCOPIC SURGERY FOR NEUROLOGICALLY IMPAIRED CHILDREN BASED ON INTRA- AND EXTRA-ABDOMINAL WORKING SPACE CALCULATIONS MADE USING A THREE-DIMENSIONAL SCANNER** Koji Yamada, MD<sup>1</sup>, Keisuke Yano, MD<sup>1</sup>, Masato Kawano, MD<sup>1</sup>, Shun Onishi, MD<sup>1</sup>, Waka Yamada, MD, PhD<sup>1</sup>, Ryuta Masuya, MD<sup>1</sup>, Takafumi Kawano, MD, PhD<sup>1</sup>, Seiro Machigashira, MD<sup>1</sup>, Kazuhiko Nakame, MD, PhD<sup>1</sup>, Motoi Mukai, MD, PhD<sup>1</sup>, Tatsuru Kaji, MD, PhD<sup>1</sup>, Munenori Uemura, PhD<sup>2</sup>, Satoshi Ieiri, MD, PhD, FACS<sup>1</sup>; <sup>1</sup>Department of Pediatric Surgery, Kagoshima University, <sup>2</sup>Kyushu University

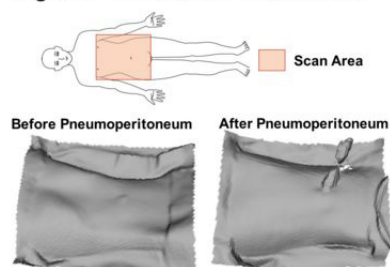
# Oral (Scientific Session Abstracts)

**Background and Aim:** Neurologically impaired children and adolescents need anti-reflux surgery due to gastro-esophageal reflux disease. However, when performing laparoscopic surgery, it is very difficult to determine the appropriate body position and idealized trocar layout in cases of severe deformity. The motion of both the forceps and scope are sometimes restricted during operative procedures, not only inside the abdominal cavity but also outside the body wall. In this study, we attempted to calculate the working volume of both the abdominal cavity and the extra-abdominal wall based on pneumoperitoneum body surface three-dimensional (3D) scanning data obtained before and after surgery. The aim of this study was to develop an idealized trocar layout decision system for laparoscopic surgery for neurologically impaired children based on intra- and extra-abdominal working space calculations obtained using a 3D scanner.

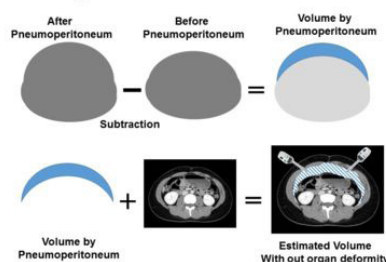
**Methods:** Before the operation, patients were scanned by computed tomography (CT) or magnetic resonance imaging (MRI) to determine the position of their organs. In the operating room, we scanned the body surface with a 3D scanner before and after the induction of pneumoperitoneum, as shown in Figure 1. The working volume of the abdominal cavity was obtained by subtracting the volume data obtained before from that obtained after pneumoperitoneum, as shown in Figure 2. In addition, we obtained data on the organ-flattening effect of pneumoperitoneum, as shown in Figure 3. These data were obtained in an open-MRI operating room. On combining the extended volume obtained using a 3D scanner and the organ-flattened MRI data, the real working volume of the abdominal cavity was calculated. By determining the working port layout virtually, the distance between the abdominal wall and target site (i.e. the crura of the esophagus) could be automatically calculated, and the risk of extra-abdominal collision of forceps and deformed legs could be predicted.

**Results and conclusion:** The simulated virtual data resembled the actual condition of the abdominal cavity under pneumoperitoneum. We successfully determined the preoperative laparoscopic trocar layout for neurologically impaired children using a 3D scanner. The 3D scanner is a non-invasive tool and useful for obtaining the body surface configuration as well as simulating the ideal trocar layout.

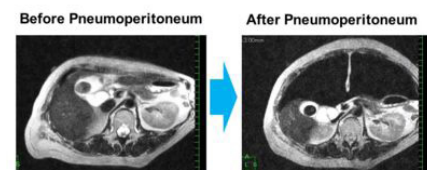
**Figure 1 3D Scanner Volume Data**



**Figure 2 Volume Calculation**



**Figure 3 Organ-flattening effect of pneumoperitoneum**



**S060 FETOSCOPIC TWO LAYERS CLOSURE OF OPEN NEURAL TUBE DEFECTS** Carlos Gine, MD, PhD, Silvia Arevalo, MD, PhD, Nerea Maiz, MD, PD, Carlota Rodó, MD, Jose A Molino, MD, Susana Manrique, MD, Elena Carreras, MD, Manuel Lopez, MD, PhD; Hospital Universitari Vall d'Hebron

**Introduction:** Fetoscopic treatment of neural tube defects is controversial regarding the technique used to close the malformation. Several groups advocate for the use of patches or the direct closure in one layer. We present our technique of fetoscopic Two Layers closure aiming to mimic the open fetal surgical technique.

**Methods:** With the exteriorized uterus and three 10Fr ports, the placode is dissected from the surrounding tissue and de-tethered as usual. The skin is undermined by blunt dissection and the defect is sutured in two layers (myofascial and the skin) by a running 4/0 resorbable barbed suture.

**Results:** From February to September 2017 five patients were operated by this technique, three myelomeningocele and two myelocele. The mean gestational age at procedure was 25,3 weeks. The surgery was successful in all cases without intraoperative complications. Total surgical time was 169 min and fetoscopic time 98 minutes. Hospital stay was 6,8 days. At the moment of submitting this

# Oral (Scientific Session Abstracts)

abstract three patients were born and two are still ongoing. One patient was delivered vaginally and the other two by C-section. The defect was watertight closed with good quality tissue in all of them and no surgical revision was needed. Hindbrain herniation was reversed in all cases and one patient required ventricle-peritoneal shunting at 1,7 months.

**Conclusion:** Fetoscopic Two Layer closure of NTD may improve the quality of the tissue over the defect diminishing the need of surgical revision, preserving its well-documented beneficial effects over the neural tissue and hindbrain herniation, although these are only preliminary and incomplete results. Incidence of dermal inclusion cysts and tethered cord needs to be evaluated over time with longer follow up.

**S062 LAPAROSCOPY AT THE TIME OF FIRST VENTRICULOPERITONEAL SHUNT REVISION RESULTS IN FEWER SUBSEQUENT PERITONEAL SHUNT REVISIONS A RETROSPECTIVE COHORT STUDY OF 148 PEDIATRIC PATIENTS.** Aodhnait S Fahy, MD, PhD<sup>1</sup>, Stephanie Tung, MD<sup>2</sup>, Maria Lamberti-Pasculli, RN<sup>2</sup>, James Drake, MD<sup>2</sup>, Abhaya Kulkarni, MD, PhD<sup>2</sup>, Justin T Gerstle, MD<sup>2</sup>; <sup>1</sup>Hospital for Sick Children, Toronto, <sup>2</sup>Hospital for Sick Children

**Background:** Ventriculoperitoneal (VP) shunts are the mainstay of treatment of hydrocephalus but are associated with a frequent need for revisions. Open mini-laparotomy is the traditional operative approach for peritoneal catheter revision. While pediatric case series of laparoscopic shunt revisions have demonstrated the safety and feasibility of a laparoscopic approach, there has been no direct comparison of laparoscopic versus open VP shunt revision outcomes in the pediatric population. We hypothesized that laparoscopy at the time of first peritoneal shunt revision may reduce the need for subsequent peritoneal shunt revisions.

**Methods:** A prospectively maintained, externally validated database of pediatric patients who underwent VP shunt insertion or revision between 2008 and 2016 was reviewed for patients who underwent a first peritoneal shunt revision. Outcomes including subsequent peritoneal or ventricular shunt revisions, shunt infections, and operative time were compared between open and laparoscopic groups. Statistics are reported as Student's t-test or Chi-squared analysis with  $p < 0.05$  judged significant.

**Results:** 148 patients underwent a first revision of the peritoneal portion of a VP shunt – 40 laparoscopically and 108 open (Table 1). There was no significant difference in age or gender at the time of surgery. Operative time and length of stay after shunt revision did not vary between laparoscopic and open revisions. There was no difference in shunt infections between laparoscopic (7%) versus open (9%) revisions,  $p = 0.51$ . There was no significant difference between need for additional overall (ventricular or peritoneal) shunt revisions in the laparoscopic group (20%) versus the open group (34%),  $p = 0.07$ . However, there were significantly fewer subsequent peritoneal revisions in the laparoscopic group (3%) versus the open group (15%),  $p = 0.04$ .

**Conclusion:** This first cohort analysis of laparoscopic versus open VP shunt revision in pediatric patients suggests that laparoscopic peritoneal VP shunt revision may reduce the rate of subsequent peritoneal revisions without increasing the shunt infection rate or operative time in pediatric patients. This advocates for consideration of laparoscopic peritoneal VP shunt revision in the pediatric setting.

	Laparoscopic (n=40)	Open (n=108)	
Age Mean (y+SD)	11.4 +/- 5.7	9.5 +/- 5.5	$p = 0.07$
Gender	M:F = 60%:40%	M:F = 60%:40%	$p = 0.56$
Patients requiring subsequent revisions (ventricular or peritoneal)	8 (20%)	37 (34%)	$p = 0.07$

# Oral (Scientific Session Abstracts)

Patients requiring subsequent peritoneal revisions (*some patients had more than one revision)	1 (3%)	16 (15%)	p=0.04
Peritoneal and ventricular	1 (3%)	10 (9%)	p=0.15
Peritoneal and valve	0 (0%)	4 (4%)	p=0.28
Peritoneal only	1 (3%)	5 (5%)	p=0.48
Shunt infections	3 (7%)	10 (9%)	p=0.51
Mean operative time (mins +/-SD)	72 +/- 27	79 +/- 31	p=0.24
Mean stay after shunt placement (days +/- SD)	6.6 +/- 15	5.6 +/- 14	p=0.73

## **S063 PAIN MANAGEMENT IN PECTUS EXCAVATUM SURGERY: A COMPARISON OF SUBCUTANEOUS CATHETERS VS. EPIDURALS IN A PEDIATRIC POPULATION** Shefali Thaker, MPH, Elise McKenna, MD, PhD, Christine Rader, MD, Meghna V Misra, MD, MS; Connecticut Children's Medical Center

**INTRODUCTION:** Pectus excavatum is a common congenital chest wall anomaly. Achieving optimal pain control is a major consideration in managing adolescent patients who undergo surgical correction of this condition. In the last 5 years, our center has started to use bilateral subcutaneous infusion catheters (On-Q pump) to help assist in pain management for our pectus excavatum patients. Prior to our adoption of these catheters, epidurals were routinely placed to manage pain in this population. The purpose of this study is to demonstrate the feasibility of using On-Q pumps for adolescent patients undergoing repair of pectus excavatum. Furthermore, we will compare the experience of patients who used the On-Q pumps to those who used epidurals in terms of length of stay, pain scores, and complications.

**METHODS:** IRB approval was obtained to conduct a retrospective chart review on patients who had undergone minimally invasive repair of pectus excavatum (MIRPE) or modified Nuss procedure. The time of interest spanned from January 2010 to August 2016. Patients were divided into two groups based on the pain control treatment they were administered – epidural and On-Q. Patients in both populations used adjunct intravenous narcotics, non-steroidal medications, and acetaminophen for pain control. Data was obtained from electronic medical records and paper charts. Primary outcomes were length of stay, pain scores, and complications.

**RESULTS:** Of the 124 patients included in this study, 40% used an epidural for pain management (n=50), and 60% had the On-Q Pump (n=74) for pain control. Male patients comprised 86% of this study. The average age of patients who underwent surgical correction was 15.6 years, and the average Haller Index was 4.3. Average length of stay among all patients was 5.2 days. An independent sample t-test was conducted to compare the length of stays between the two groups. The On-Q pump population had a significant decrease in postoperative length of stay (M=4.86, SD=.85) compared to patients who had an epidural (M= 5.60, SD=.97); p = <0.001. An independent sample t-test compared the average pain score over hospital days between the two pain management techniques. There was a significant difference observed in pain scores for patients on the epidural (M=2.91, SD=1.13) and On-Q pump (M=3.81, SD=1.19; p=<0.001). There was n=1 wound infection reported in each group, which was not statistically different between the two groups.

**CONCLUSIONS:** The use of bilateral subcutaneous infusion catheters is a safe and effective method for pain control in patients undergoing surgical correction of pectus excavatum. These pumps are associated with a shorter postoperative length of stay and do not increase the incidence of complications in this patient population.

## **S064 TECHNIQUES OF STERNAL ELEVATION TO IMPROVE SAFETY DURING THE NUSS PROCEDURE** Frank-Martin Haecker, MD; Pediatric Surgery, University of Basel

**Objective:** to evaluate the routine use of sternal elevation techniques (SET) for elevating the sternum during minimally invasive repair of Pectus excavatum (MIRPE, the Nuss procedure).

# Oral (Scientific Session Abstracts)

**Method:** we performed a review of the literature with focus on different techniques of sternal elevation during MIRPE. Reported effects and side effects were evaluated and compared with our own experience concerning the routine use of the vacuum bell for sternal elevation during MIRPE during the last 12 years.

**Results:** SET is more often used in adult patients than in adolescents. SET improves visualization and safety of the procedure. Advancement of the Pectus introducer, retrosternal dissection and placement of the pectus bar is easier. The risk of cardiac and/or pericardial lesion is reduced significantly.

Different types of retractors with or without an additional clamp, a crane combined with a wire and/or customized hooks are reported to be used for SET. However, more technical equipment (crane), and in some SETs additional incisions are necessary. In contrast, no additional incision is necessary for the vacuum bell. The routine intraoperative use of the vacuum bell was safe and effective in 131 patients as it facilitates the retrosternal dissection and the insertion of the pectus bar like other SETs. Besides a temporary mild hematoma, no relevant side effect was observed.

**Conclusion:** an increasing number of authors/studies report on the routine use of SET during MIRPE to improve safety of the procedure. If available, we recommend the routine intraoperative use of the vacuum bell during MIRPE.

## **S065 POSTOPERATIVE ENLARGEMENT AND PROGNOSTIC EFFECTS OF PORTAL VENOUS BYPASS GRAFTS IN CHILDREN** [Jinshan Zhang](#), Long Li; Capital Institute of Pediatrics

**Objective:** The patency of bypass vein after Rex shunt is an important indicator for prognosis. However, there was no report about the changes of caliber of bypass vein after Rex shunt. The aim of this study is to identify the postoperative changes of bypass vein and assess its effectiveness for prognosis.

**Methods:** Between October 2008 to October 2016, 114 children were diagnosed as extra-hepatic portal venous obstruction in our center. The portal cavernoma-portal bypass with interposition of grafted portal vessels were performed on 29 children, the gastro-portal shunt were performed on 54 children and other 29 children underwent other Rex shunts. At the follow-up, the patency and diameter of bypass vein were assessed with ultrasound and CT. The intra- and post-operative diameter of bypass vein was compared to identify the postoperative changes of bypass vein. The prognosis was compared between children with and without an enlarged bypass vein.

**Results:** The caliber of bypass vein was enlarged in 50% children (40/80) at postoperative 6 months. The post-operative incidences of re-bleeding and esophageal varices in children with an enlarged bypass vein were significantly lower than those without ( $P < 0.05$ ). The postoperative reduced level of splenic size in children with an enlarged bypass vein were significantly higher than those without ( $P < 0.05$ ). The postoperative increased level in platelet count in children with an enlarged bypass vein were significantly higher than those without ( $P = 0.006$ ). There was no significant difference in the flow velocity of bypass vein between children with and without an enlarged bypass vein ( $P = 0.133$ ). The portal pressure was significant reduced after surgery in children with an enlarged bypass vein than children without an enlarged bypass vein ( $P = 0.017$ ).

**Conclusions:** The caliber of bypass vein increases in 50% children after Rex shunt using a grafted portal vessel, which is a positive prognostic indicator.

## **S066 ENGAGING SOCIAL MEDIA MEDICAL JOURNAL POSTS, SUCH AS INFOGRAPHICS AND VIDEO REVIEWS, LEAD TO LESS ARTICLE VIEWS** [Sophia Abdulhai, MD](#), [Abdulraouf Lamoshi, MBCh, MPH, ABPS, MS, CTS](#), [Todd A Ponsky, MD](#); Akron Children's Hospital

**INTRODUCTION:** As more medical professionals are using social media, academic journals are now adopting social media to promote recently published articles. The Journal of Pediatric Surgery (JPS) Facebook page promotes new articles by posting links to them accompanied by the title alone, infographic (slide with a brief synopsis of the study using images), and/or video review (2-minute videos discussing the article design and conclusion). Infographics and video reviews are not intended to serve as an analysis of these articles, but give a brief summary with the goal to promote interest in reading the article. This study will evaluate if this is true by comparing the number of post views and article link clicks of the different types of JPS group posts.

# Oral (Scientific Session Abstracts)

**METHODS:** Posts to the JPS Facebook page about a JPS article from July 2016-August 2017 were divided into three types: video review, infographic, and article title. Number of people reached (number of newsfeeds the post showed up on), posts clicks, post engagements (reactions, comments, shares), and article link clicks were compared using descriptive statistics.

**RESULTS:** 198 posts were analyzed: 23 video reviews, 18 infographics, and 157 article titles.

Video reviews resulted in more people reached, post clicks, and post engagements (average 6394, 688, 202, respectively) compared to infographics (2993, 253, 80, respectively), and article title posts (1320, 94, 31, respectively). Despite less engagement and views of article title posts, they resulted in more average article link clicks (75), compared to video reviews (29) and infographics (26) (see Table).

**Table:** Average user analytics per type of JPS Facebook Post

METRICS	VIDEO	INFOGRAPHICS	TITLE
Total Posts	23	18	157
Article Link Clicks	29	26	75
Post Clicks	688	253	94
People reached	6394	2993	1320
Post Engagements	202	80	32
Comments	17	5.3	1.2
Reactions	154	61	26
Shares	31	13	5

**CONCLUSIONS:** While video review and infographics resulted in more user interest and engagement, they resulted in less article link clicks. This raises concern that social media followers are using these posts as substitutes for reading the article. Academic journal social media groups should take this into account when creating these multimedia posts.

**S067 PEDIATRIC ENDOSCOPIC PILONIDAL SINUS TREATMENT (PEPSIT), A REVOLUTIONARY TECHNIQUE TO ADOPT IN CHILDREN WITH PILONIDAL SINUS FISTULAS: A COMPARATIVE STUDY WITH CLASSIC OPEN REPAIR.** *Ciro Esposito, Maria Escolino, Serena Izzo, Francesco Turrà, Mariapina Cerulo, Giovanni Severino, Alessandro Settimi, Giuseppe Cortese; Federico II University of Naples, Italy*

**Background:** Although many techniques for surgical treatment of pilonidal sinus have been described until now, there is no consensus about the gold standard treatment option for this pathology. This study aimed to report our preliminary experience with pediatric endoscopic pilonidal sinus treatment (PEPSiT) and to compare it with the classic open excision technique.

**Methods:** We retrospectively reviewed the reports of 30 patients underwent repair of non-infected pilonidal sinus disease in our institution over a 18-months period. In Group 1 (G1) we included 15 patients, 6 girls and 9 boys with an average age of 16 years (range 13-18), underwent PEPSiT. Four of these cases were redo-procedures, for recurrence of disease after open excision repair. In Group 2 (G2) we included 15 patients, 8 boys and 7 girls with an average age of 15.1 years (range 12.5-17), operated using the classic open excision technique. Surgical outcomes of sinus healing, recurrence of disease, postoperative pain, hospital stay, analgesic requirements and patient satisfaction levels were evaluated and a comparison analysis between the 2 groups was performed.

**Results:** In PEPSiT group (G1) all procedures were performed under subarachnoid spinal anesthesia and a fistuloscope, an endoscopic forceps and a monopolar electrode were always adopted to remove the hairs and to heal the fistula. In OPEN group (G2) a wide excision of the fistula tract until the bone and a primary closure of the wound were performed. The average length of surgery was significantly shorter in G1 compared to G2 (28.5 min vs 42 min,  $p=0.001$ ). The average pain score evaluated using VAS pain scale during the first 48 postoperative hours was significantly better in G1 compared to G2 (3.2 vs 6.8,  $p=0.001$ ). The average analgesic requirement was significantly shorter in G1 compared to G2 (22 hours vs 88 hours,  $p=0.001$ ) and so was also the average hospital stay length (28 hours vs



# Oral (Scientific Session Abstracts)

76 hours,  $p=0.001$ ). No postoperative complication occurred in G1 whereas a bleeding requiring operative hemostasis was recorded in one G2 patient (6.6%) (IIIb Clavien-Dindo). Two recurrences of pilonidal disease were reported in G2 (13.3%). The average healing time was significantly shorter in G1 compared to G2 (30 days vs 92 days,  $p=0.001$ ) and the average time to full daily activities was significantly shorter in G1 patients compared to G2 ones (2.5 days vs 15.4 days,  $p=0.001$ ).

**Conclusion:** Our results confirmed that PEPSiT is associated with a significantly shorter, painless and better outcome compared to open technique. On the basis of our preliminary experience, we believe that PEPSiT is a promising technique for surgical treatment of pilonidal sinus in children. It is technically easy and quick to perform, with a short and painless hospital stay, without recurrences in our series. It allows to operated patients an early return to full daily activities without restrictions as happened for the classic open repair.

**S068 3D VS. 2D LAPAROSCOPY IN THE HANDS OF NOVICES** Sabine Zundel, Marie Heyne-Pietschmann, Philipp Szavay; Luzerner Kantonsspital

**Introduction:** Since the first introduction of laparoscopy, visualization has progressively improved with better quality cameras and high-definitions screens. Nevertheless, until recently it remained two-dimensional which necessitated a steep learning curve. 3D cameras and screens are now available but not adequately assessed. To be able to evaluate whether the investment in this new visualization is worthwhile, the 3D vision needs to provide explicit benefits. To evaluate and quantify the expected advantages, we compared the performance of beginning laparoscopists with 2D versus 3D in a box trainer.

**Methods:** Five laparoscopic tasks were performed twice by the participants. After pilot-testing, the sample size was calculated to be 24. All participants were medical students and novices to laparoscopic surgery. Each of the five tasks were adapted from the Fundamentals of Laparoscopic Surgery to better suit novices. Time until completion or progress until the end of the set time limit, errors and precision were assessed. The participants were randomized into two groups and started either with 3D or 2D visualization. Alternatingly the next task was started with the other camera (for an alternating cross-over design).

**Results:** The 3D tasks were performed considerably quicker no matter if the 3D task was performed first or second (medians: task 1: 34 vs 34.5 sec; task 2: 217.5 vs. 116 sec; task 3: 185.5 vs. 98 sec; task 4: 258 vs. 153.5 sec. task 5: 174.5 vs. 106 sec). Additionally they were performed more precisely and with fewer mistakes. In addition, there is a trend that repetition leads to improvement, both in time until completion and number of errors made. The data is illustrated in Figure 1 and 2.

**Conclusion:** Simulated 3D laparoscopy was far superior to simulated 2D laparoscopy among novice surgeons. 3D laparoscopy proved to be much easier with regard to time to completion and precision. While we predict that this difference is less pronounced for more experience 2D laparoscopic surgeons, we believe the application of this technology will help flatten the learning curve for beginning laparoscopists. The fact that we did not see a steep learning curve when the task was performed for the second time is most likely due to too few repetitions to see the betterment.

# Oral (Scientific Session Abstracts)

Figure 1: Median time scores comparing 2D and 3D visualization

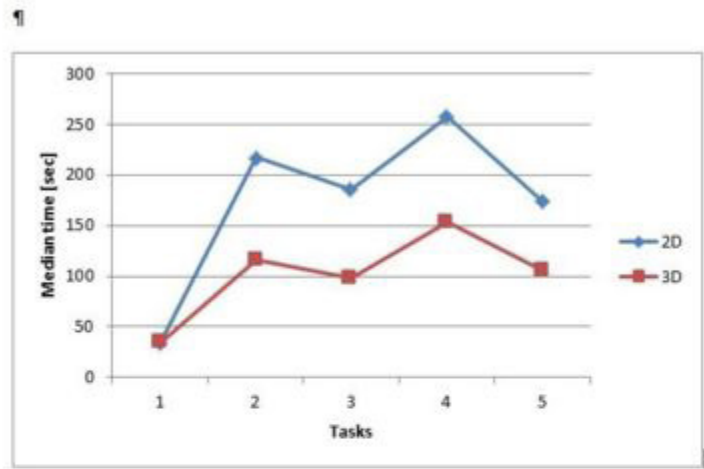
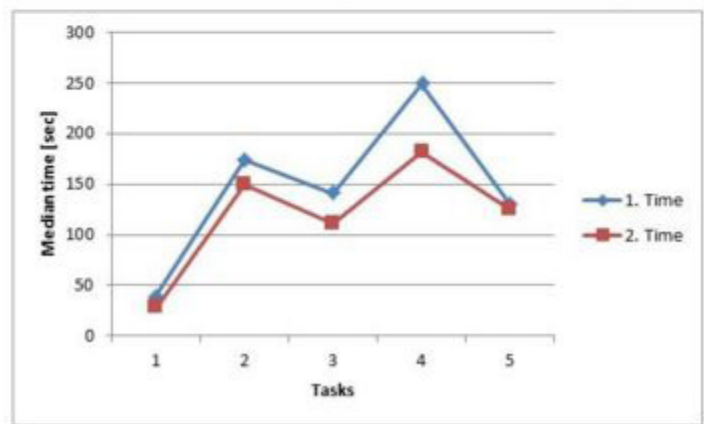


Figure 2: Median time scores comparing first and second performance



**S069 LEARNING CURVE OF LAPAROSCOPIC KASAI PORTOENTEROSTOMY FOR BILIARY ATRESIA WITH 100 CASES** Zhicheng Xu; West China Hospital of Medicine, Sichuan University

**Objectives:** The aim of this study is to promote the application of laparoscopic Kasai portoenterostomy (LKPE) for biliary atresia (BA).

**Methods:** A series of 100 consecutive cases of BA underwent LKPE between Jan 2009 and Jan 2013. The first 50 patients were assigned to Group A, and the remaining 50 patients were assigned to Group B. All data of patients were reviewed and analyzed retrospectively. The operative time, clearance of jaundice (CJ), survival with native liver (SNL) and other demographic data were compared between the Group A and Group B respectively.

**Results:** All the patients of Group A and Group B were non-syndromic BA. The median age, weight, time of oral feeding after operation between Group A and Group B was not significant different. The sex ratio and number of type III BA was not statistically significant either. Twenty percent conversion from LKPE to open Kasai portoenterostomy (OKPE) in Group A was statistically higher than 2% in Group B ( $p < 0.01$ ). Seventy-eight percent of postoperative cholangitis in Group A was significant higher than 54.0% in Group B ( $p < 0.01$ ). Cumulative sum(CUSUM)analysis showed a significant reduction in operative time (ORT) after 50 cases (from 316 min to 239 min;  $p < 0.01$ ). Fifty-two percent of CJ in Group A was significant lower than 72.0% in Group B ( $p < 0.05$ ). One-year, 3-year, 5-year SNL was 56.0%, 40.0%, 26.0% in Group A, 76.0%, 58.0%, 42.0% in Group B. The Kaplan–Meier method analysis showed that SNL of Group A was significant worse than that of Group B ( $p < 0.05$ ).

# Oral (Scientific Session Abstracts)

**Conclusions:** In this experience, the outcomes of LKPE were optimized after 50 cases.

**Keywords:** Pediatric, Biliary atresia, Portoenterostomy, Laparoscopy, Learning curve

**S070 SILS SPLENECTOMY** Ali Elsayed, Specialist, Yazeed Owivi, Specialist, Ameen Alsaggaf, PHD, Alaa Ghallab, PHD, Mohammed Fayez, Specialist, Enaam Raboe, PHD; KFAFH

**Introduction:** Minimally invasive techniques have revolutionised surgical treatment. Few centers worldwide have advanced SILS for pediatric age group. Few studies comparing SILS splenectomy versus conventional laparoscopy in children.

**Aims:** To determine the feasibility, safety, and expediency of SILS splenectomy in pediatric patients. To highlight the difficulties in this technique and discuss our strategies to address these issues and compare it with other published series.

**Material & Methods:** Retrospective study of all patients operated with SILS splenectomy from April 2011 to August 2017. Thirty-four patient had been operated. Age ranged from 2.5 year to 14.8 years. Thirty patients with sickle cell disease, two with thalassemia one spherocytosis and one Fanconi's anemia. One type of port was used in all cases. Articulating and straight regular instruments were used in the procedures. One extra port in the left flank was used for splenic retraction.

**Results:** Forty nine patients underwent SILS splenectomy. Six cholecystectomies were done simultaneously, 2 conversion due to bleeding. There is no wound infection, no post operative bleeding and PICU admission. Mean operative time for splenectomy +/- cholecystectomy was 190 minutes, ranging from 103minutes to 270 minutes depended on the operator's skill, severity of adhesions and size of the spleen. It is comparable with conventional technique.

**Conclusion:** SILS splenectomy is safe, feasible and more cosmetic with almost invisible scar. More than one procedure could be done at the same time. The confusion of crossing image will be adapted after the first 10-15 min. Operative time is comparable with conventional technique. Learning curve improving with experience and hands-on MIS workshops.

**Keyword:** SILS Splenectomy, Single Port, laparoscopy, Splenectomy

**S071 CT-GUIDED LOCALISATION FOR THORACOSCOPIC RESECTION OF SMALL LUNG NODULES IN CHILDREN** S T Seitz, M Besendoerfer; Department of Paediatric Surgery, University Hospital Erlangen

**PURPOSE:** Thoracoscopic wedge-resection has by now become the standard mode of therapy in treatment of paediatric pulmonary nodules. However intraoperative localisation of small lesions still presents a problem. The purpose of this study is to evaluate the efficacy of preoperative CT-guided wire marking in preventing open thoracotomy.

**METHODS:** We analyzed the data of patients treated at our hospital from 2012 to 2017 who received thoracoscopic resection of lung nodules. All nodules were preoperatively localised with CT-guided hook wire placement. The wire was loosely attached to the thorax by a sterile dressing. Characteristics of interest were stability of the wire marking, complete resection and prevention of open thoracotomy.

**RESULTS:** 8 cases of wire marked lesions in 6 patients (median age at intervention=16 years, m=5, f=1) with diagnosed malignant disease and small lung nodules (median size 9mm) received thoracoscopic resection of the lung nodules. 2 patients had bilateral, 2 left-sided and 2 right-sided lung lesions, with preference of the lower lobes (n=5). Wire placement did not lead to pneumothorax, there was no hook slippage and complete resection was successful in all cases. In 7 cases wedge resection was possible, one case needed atypical resection. In 2 cases a mini-thoracotomy at the port insertion site had to be performed to extract the tissue. There was no conversion to thoracotomy. Malignancy was found in all specimens and recurrence of the malignant disease was seen in 5 patients. In one patient post-operative, haemorrhagic anaemia necessitated transfusion.

**CONCLUSIONS:** Preoperative wire-localisation of small lung nodules is a safe and effective tool to enable thoracoscopic resection in children and to avoid unnecessary open thoracotomies in diagnostic or therapeutic interventions.