

IPEG's 25th Annual Congress *for* Endosurgery *in* Children



Held in conjunction with JSPS, AAPS, and WOFAPS

May 24–28, 2016

Fukuoka, Japan

HELD AT THE HILTON FUKUOKA SEA HAWK



FINAL PROGRAM **2016**





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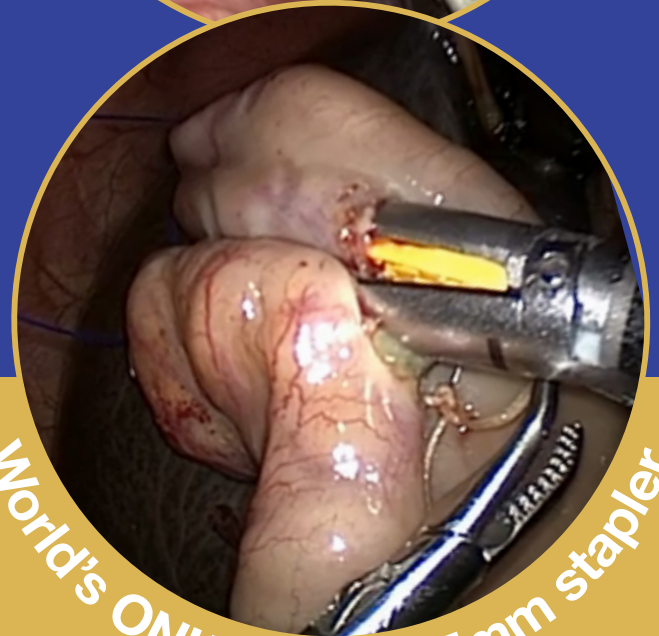
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IPEG's 25th Annual Congress for Endosurgery in Children

May 24–28, 2016
Fukuoka, Japan

THE HILTON FUKUOKA SEA HAWK
810–8650, Fukuoka-shi, 2–2–3 Jigyohama,
Chuo-ku, Japan
T: +81-92-844 8111 ■ F: +81-92-844 7887

International Pediatric Endosurgery Group (IPEG)

11300 W. Olympic Blvd, Suite 600
Los Angeles, CA 90064
T: +1 310.437.0553 ■ F: +1 310.437.0585
E: info@bscmanage.com
www.bscmanage.com

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

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

TABLE OF CONTENTS

General Information	4
Meeting Hours	4
Accreditation	5
2016 Program Chairs	5
2016 CME Chair	7
Award Winners	9
2016 Meeting Leaders	10
2016 Meeting Faculty	11
Schedule-at-a-Glance	12
Floor Plan	13
Innovations Corner	14
Complete Schedule	19
CME Worksheet	37
Commercial Bias Reporting Form	38
New Membership	40
LTRF Donors	42
Highlights Corner	44
Poster Abstracts	45
Oral Abstracts	115
Video Abstracts	193

Welcome Message



Dear Colleagues,

On behalf of our IPEG family, I have the privilege to welcome you all to the 25th Congress of the International Pediatric Endosurgery Group (IPEG) in Fukuoka, Japan in May of 2016.

This will be a special Congress for IPEG. We have paired up with the Pacific Association of Pediatric Surgeons and the Japanese Society of Pediatric Surgeons to hold a combined meeting that will add to our always-exciting IPEG sessions a fantastic opportunity to interact and learn from the members of those two surgical societies. I want to thank Dr. Tomoaki Taguchi and the local leadership team for welcoming us to Japan.

IPEG is a truly international society founded by pioneers who believed that minimally invasive surgery in children was possible. It was not easy, but with passion, commitment and never ending enthusiasm they indeed made it possible. IPEG's 25th anniversary is a testimony of how pediatric surgeons from all over the world can work together and push in the same direction to share knowledge, teach, learn, and ultimately improve the surgical care of all children.

As the first female IPEG president I want to encourage all female surgeons to become active IPEG members, join our committees, bring ideas, share your experiences and work with us. IPEG is an amazingly friendly society where everyone is welcome.

For IPEG's 25th meeting our Program Chairs Dr. Pablo Laje, Dr. Atsuyuki Yamataka, and our local Chairs Dr. Tadashi Iwanaka, and Dr. Tomoaki Taguchi have put together a phenomenal program that includes innovative hands-on simulation courses, interactive discussions with experts, combined panels and debates with IPEG, JSPS and AAPS members, a special lecture on the field of advanced surgical technology given by Dr. Steven Schwartzberg, a web-based live conference from IRCAD given by Dr. Luc Soler, many exciting scientific sessions and a fabulous social event with surprises and a lot of fun.

I would also like to thank Jacqueline Narváez, IPEG Executive Director, and the team at BSC Management Inc., without whom, this would not be possible.

We hope to see you all in Fukuoka!

Sincerely yours,
Marcela Bailez
IPEG President



General Information

Who Should Attend?

The 25th 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.

2016 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.

Registration Hours

Tuesday, May 24, 2016	8:00 am – 5:00 pm
Wednesday, May 25, 2016	6:30 am – 6:00 pm
Thursday, May 26, 2016	6:30 am – 6:00 pm
Friday, May 27, 2016	7:00 am – 5:00 pm
Saturday, May 28, 2016	8:00 am – 11:00 am

Poster Setup

Wednesday, May 25, 2016	Rigel Room 4:00 pm – 8:00 pm
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Poster Viewing

Thursday, May 26, 2016	Rigel Room 9:00 am – 4:00 pm
Friday, May 27, 2016	9:00 am – 4:00 pm

Speaker Prep Room Times

Wednesday, May 25, 2016	Nire Room 12:00 pm – 6:00 pm
Thursday, May 26, 2016	6:30 am – 6:00 pm
Friday, May 27, 2016	6:30 am – 5:00 pm
Saturday, May 28, 2016	7:00 am – 11:00 am

Why IPEG?

Now is an excellent time to become an IPEG member.

IPEG Member Benefits

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

- **Network** – A network of over 750 pediatric Surgeons Worldwide, and opportunities to meet and discuss pediatric minimally invasive surgery with leaders and innovators in the field
- **Journal** – Subscription to the *Journal of Laparoendoscopic & Advanced Surgical Techniques* (a \$1200 value is yours for FREE with your paid IPEG membership.)
- **Access to State-of-the-Art Hands On Courses**
 - Advance Neonate
 - Innovations
 - Basic Skills acquisition with world renowned faculty
 - Research
- **Continuing Education**
 - Innovation Opportunities
- **Registration Discounts** – Significant discounts on registration fees for the Annual Congress for Endosurgery in Children. (Note: registering for the IPEG Scientific Session, as a member, will save you the equivalent of one year's dues)
- **Affordable Dues** – Affordable dues for surgeons and surgeons-in-training in any country.
- **Awards** – As an IPEG member you can enter to win Awards such as:
 - IPEG Research Grant
 - IRCAD Award
 - Basic Science Award

For more information on awards and to see the 2015 winners please go to page 9.

To become an IPEG member visit us online at: www.ipeg.org/member/memberapplication.

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 **24 AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Date	Total Credits
Wednesday, May 25, 2016	4
Thursday, May 26, 2016	8.5
Friday, May 27, 2016	8.5
Saturday, May 28, 2016	3

2016 Program Chairs

PROGRAM CHAIR: Pablo Laje, MD

PROGRAM CO-CHAIR: Simon Clarke, MD

PROGRAM CO-CHAIR: Atsuyuki Yamataka, MD, PhD

LOCAL PROGRAM CHAIR: Tadashi Iwanaka, MD, PhD

LOCAL PROGRAM CHAIR: Tomoaki Taguchi, MD, PhD, FACS

Pablo Laje, MD

Program Chair



Dr. Pablo Laje is Assistant Professor of Surgery at the University of Pennsylvania and Attending Surgeon at the Children's Hospital of Philadelphia (CHOP), USA. He attended Medical School at the University of Buenos Aires. He did his Pediatric Surgery training at the "JP Garrahan" National Pediatric Hospital in Buenos Aires. He did several years of basic and clinical research at the Children's Hospital of Philadelphia in the areas of fetal surgery and minimally invasive surgery. He was appointed CHOP faculty in 2011.

Dr. Laje has a particular interest in pediatric minimally invasive surgery and has conducted numerous basic science research projects to study the physiological implications of minimally invasive surgery on healthy and diseased organs. He is a former winner of the Best Basic Science Abstract Award at IPEG and former recipient of the IPEG's Research Grant for his work on minimally invasive surgery in biliary atresia.

He has more than 35 publications on PubMed and has written multiple book chapters in the pediatric surgery literature. He has been an active IPEG member for over 12 years.

Simon Clarke, MD

Program Co-Chair



Simon Clarke has served as Clinical Director at the Chelsea children's Hospital, London for children's surgical services for the past 3 years as well as honorary senior lecturer at Imperial College London. He has been at the institution as a consultant since 2005 having worked previously at Great Ormond street as well as an Associate Professor in the minimal access training unit at the Chinese University of Hong Kong. Simon received his medical degree and completed his surgical training in Oxford and London.

Simon has served on the educational committee at IPEG for over 7 years and now leads the evidence based guidelines group. Simon has an interest in simulation, model development, education and more recently robotics. Simon is currently chairman of the Education Committee for British association of Paediatric Surgeons and also serves as simulation lead for the UK national training committee. Simon established and serves as course director for the UK's first national facilitating simulation course for Paediatric Surgeons as well as being course director for an advanced minimal access training course. Simon has helped establish one of only two robotic surgical programs for children in the UK and regularly lectures in UK and Europe on this as well as simulation and minimal access surgery. Simon has published over 60 peer reviewed articles, abstracts and book chapters and has been awarded 8 clinical Excellence awards during his consultancy.

2016 Program Chairs

Atsuyuki Yamataka, MD, PhD

Program Co-Chair



Yama is the Professor/Head of the Pediatric Surgery Department, and the Director of the Perinatal Medical Support Centre at Juntendo University School of Medicine, Tokyo, Japan. He is also the Visiting Co-Professor of the Department of Gastrointestinal and Pediatric Surgery at Tokyo Medical University, Tokyo, Japan. He graduated from Juntendo and continued his pediatric surgery training there and also at Alder Hey Hospital, (Liverpool, England), Great Ormond Street Hospital (London, England), Princess Alexandra Hospital (Queensland, Australia)/Royal Brisbane Children's Hospital (Brisbane, Australia) and Wellington Hospital (Wellington, New Zealand).

His clinical interests include Minimally Invasive Surgery, Hepatobiliary Surgery, Anorectal Malformation and Hirschsprung's Disease.

He is on the Editorial Board as an Editorial Consultant for Journal of Pediatric Surgery and Pediatric Surgery International, as well as being the Pediatrics Asian Editor for Journal of Laparoendoscopic Advanced Surgical Techniques (JLAST) and JLAST Videoscopy. He is also an Associate Editor for Frontiers in Pediatric Surgery.

He has served as the President of the International Pediatric Endosurgery Group in 2007, and the Publication Committee Chairman of the Pacific Association of Pediatric Surgeons from 2007-2009. He is currently serving as: the President of the Asian Association of Pediatric Surgeons, the President-Elect, and member of the Board of Directors of the Pacific Association of Pediatric Surgeons, the Publication Committee Chairman of the Japanese Society of Pediatric Surgeons (international session), the Publication Committee Chairman of the Asian Association of Pediatric Surgeons Pediatric Surgeons as well as holding numerous and other positions in various Japanese and International Pediatric Surgery Associations.

Presently, he has published over 300 peer-reviewed articles in various high-quality journals.

"Operate on sick children as if they were my own child." – Dr. Yamataka

Tadashi Iwanaka, MD, PhD

Local Program Chair



Tadashi Iwanaka, MD, PhD has just moved from The University of Tokyo Hospital to The Saitama Children's Medical Center, Saitama, Japan, as a director. He graduated from Faculty of Medicine, The University of Tokyo in 1978, and he was surgeon-in-chief, Saitama Children's Medical Center, Saitama, Japan from 1997 to 2006. His research and clinical interests are neonatal anomalies, surgical oncology, and pediatric minimally invasive surgery. He was Congress Chairman of the 50th Annual Meeting of Japanese Society of Pediatric Surgeons (2013) and the President of IPEG 2013. His hobbies are walking, cooking, and eating good foods with his friends and family. Also he is very happy to spend his holidays with his granddaughter.

Tomoaki Taguchi, MD, PhD, FACS

Local Program Chair



Tomoaki Taguchi, MD, PhD, FACS is Professor and Chairman, Department of Pediatric Surgery, Graduate School of Medical Sciences, Kyushu University. He graduated from Faculty of Medicine, Kyushu University in 1979, and he spent one year as Post-doctoral fellow in McGill University in 1987-88. He became Professor in 2006.

His research and clinical interests are neonatal surgery, surgical oncology, organ transplantation, tissue engineering, and minimally invasive surgery.

He was President of Japanese Society of Pediatric Surgeons from 2011 to 2013. He was Congress Chairman of Japanese Society of Pediatric Hematology/Oncology in 2013. He is now Congress Chairman of Japanese Society of Perinatal and Neonatal Medicine in 2015. He is going to be Congress Chairman of Japanese Society of Pediatric Surgeons and Asian Association of Pediatric Surgeons in 2016.

His hobbies are walking in mountains and playing tactical games. His dream is changing Japanese Capital from Tokyo to Kyushu.

2016 CME Chairs

Celeste Hollands, MD

CME Chair

University of South Alabama in Mobile, AL, USA



Dr. Hollands is currently Adjunct Associate Professor of Surgery at the University of South Alabama and a Pediatric Surgeon at The University of South Alabama Children's and Women's Hospital in Mobile, Alabama. Dr. Hollands completed medical school at the University of South Alabama and completed her surgical residency at The Graduate Hospital of the University of Pennsylvania. She completed a Pediatric Trauma fellowship at The Children's Hospital of Philadelphia and a Pediatric Surgery Fellowship at Miami Children's Hospital. She served on the surgical faculty as Assistant Professor of Surgery and Pediatrics at Louisiana State University Health Sciences Center in Shreveport, Louisiana where her research focused on developing pediatric robotic surgical procedures. She served on the faculty of the University at Buffalo, Women's and Children's Hospital of Buffalo as Associate Professor of Surgery and Pediatrics where she was Director of the Miniature Access Surgery Center and Director of Trauma. Dr. Hollands was Associate

Professor of Surgery and Pediatrics at the University of South Alabama where she served as Chief of Pediatric Surgery and Director of Surgical Simulation. Dr. Hollands has published on topics that include: minimally invasive and robotic surgery, pediatric trauma, simulation, and faculty development. She serves as Chair of the American College of Surgeons Committee on Medical Student Education, as Community Editor for the American College of Surgeons Women in Surgery Committee, as a member of the American College of Surgeons and Association for Surgical Education Medical Student Core Curriculum Steering Committee, as Vice President of the Association of Women Surgeons and is active in committee service in the International Pediatric Endosurgery Group, Society of American Gastrointestinal and Endoscopic Surgeons, Association for Surgical Education, and is a member of the American Pediatric Surgical Association, and the American Academy of Pediatrics Section on Surgery. She serves on the editorial board of The American Journal of Surgery and The Journal of Laparoendoscopic and Advanced Surgical Techniques and is an ad hoc reviewer for several other journals. Her interests include advanced minimally invasive surgery and robotics, technical skills acquisition, surgical simulation and education.

Samir Pandya, MD

CME Co-Chair

New York Medical College



Dr. Samir Pandya was awarded his Bachelor's of Science with honors in Biomedical Engineering at the University of Miami. He subsequently pursued medicine to be on the front lines of patient care and medical device development. He completed his medical training at the Medical College of Virginia and then General Surgery residency at the Westchester Medical Center Campus of New York Medical College in Valhalla, NY. He went on to train in Pediatric General and Thoracic Surgery at Children's Healthcare of Atlanta at Emory University in Atlanta. Upon completion of his fellowship training in 2011 he joined the faculty at New York Medical College as Assistant Professor in the Department of Surgery and Pediatrics.

He has a very strong interest in minimally invasive pediatric surgery with expertise in minilaparoscopy and single-incision procedures. He is currently the Surgical Director for Newborn Surgery, Pediatric and Neonatal Extracorporeal Life Support programs at the Maria Fareri Children's Hospital. 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.

Academically he enjoys working with medical students, residents and fellows. He has received numerous teaching awards during his career. He currently also serves as the Associate Program Director of the General Surgery Residency at New York Medical College. 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

Emory University, Children's Healthcare of Atlanta, GA



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 Assistant Professor of Surgery and Pediatrics 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 serves on the editorial board 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.

Award Winners

Best Science Award

The Best Science Award winner is awarded a complimentary registration to IPEG's 26th Annual Congress and IPEG 3 year membership, total value of over \$1,000. It is based on a blind review and the winner will be selected by the IPEG Program Committee. The IPEG Executive Committee is committed to education and feels that this is a very concrete way to express that commitment.

IRCAD Award

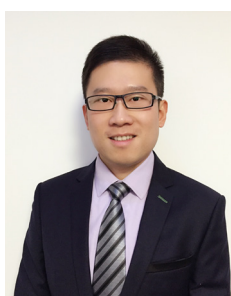
As a result of a generous grant provided by Karl Storz Endoscopy, the best resident abstract presenters will be selected by the IPEG Publications Committee to receive the 2016 IRCAD Award. The Award recipients will travel to Strasbourg, France to participate in a course in pediatric minimally invasive 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. The deadline to submit your application is prior to the annual meeting each year.

IPEG 2015 BEST BASIC SCIENCE WINNER

Jie Zhu, MD



Dr. Jie Zhu is an attending doctor at the department of pediatric surgery of Children's Hospital of Soochow University in Soochow, China. He was selected as a visiting scholar in Juntendo University for 3 months last year in Tokyo, Japan. He recently received the 2015 IPEG Best Basic Science Award for his research project in Soochow. His research focuses on the impact of laparoscopy and laparotomy surgery on NLR signal pathway in children with appendicitis.

This study aims to discuss the effects of stress response caused by different kinds of surgery on NOD-like receptor (NLR) mediated innate immune response by comparing the changes in NOD1 and NOD2 signals in children with appendicitis preoperatively and postoperatively.

This research found that transient systemic inflammation can be caused by appendectomy, but it was less severe by laparoscopy than by laparotomy; laparotomy may cause the decreased expression levels of CD14, MD-2 and TLR4 on monocytes, but the stress response was relieved to a certain extent in LA group, and open appendectomy can inhibit the activation of TLR4 signaling pathway in monocytes upon LPS stimulation, which may result in the insufficient amount of TNF- α and IL-6 during postoperative infection, while laparoscopy surgery can reduce the side effect to some extent.

Dr. Zhu's instructor Professor Jian Wang and his team are devoted to the research of inflammatory response and the resultant stress response during laparoscopic surgery. The Department of Pediatric Surgery in Children's Hospital of Soochow University is a center of excellence for neonatal and pediatric general surgery, specifically focusing on laparoscopic surgery. The Department of Pediatric Surgery has extensive experience in pediatric surgery disease such as congenital anorectal malformations, congenital biliary dilatation, Hirschsprung's disease and so on, focusing on laparoscopic minimally invasive surgery of children.

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Fukuoka Convention & Visitor's Bureau

Gold Level

Karl Storz Endoscopy

Bronze Level

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Additional Support: Applied Medical

Award Winners

IPEG 2015 COOLEST TRICKS WINNER

Marcelo Martinez-Ferro, MD



Marcelo Martinez-Ferro was born in Buenos Aires, Argentina. He graduated from the Buenos Aires University School of Medicine in 1983, completing his residency in pediatric surgery at the Ricardo Gutierrez Children's Hospital. Later, at Garrahan National Children's Hospital, where he stayed for 15 years, he focused in drastically improving survival of newborn surgical patients, whose mortality rate was historically very high in Argentina.

In 1992, the completion of a fellowship at the Fetal Treatment Center of the UCSF, confirmed his passion and interest in fetal treatment and video surgery. Upon his return to Argentina, Dr. Ferro became a pioneer in pediatric minimal access surgery

(laparoscopy, thoracoscopy) developing techniques, tools and multidisciplinary teams to perform pediatric surgeries never done before in the country. In the early 90's, Dr. Ferro and his team performed the first pediatric minimal access surgery procedure in Argentina and in 2001, together with the CEMIC Surgical and Obstetrical Team, the first fetal surgery of myelomeningocele in South-America.

Many of the novel minimal access surgical techniques and procedures used today resulted from Dr. Ferro's innovative approaches, especially in the treatment of esophageal atresia, hepatobiliary disorders, neonatal thoracoscopic and laparoscopic procedures, and chest wall deformities. One of his most significant contributions was the invention, together with Dr. Fraile, of the FMF Dynamic Compressor System, an adaptable brace used to correct chest wall deformities, which is currently used worldwide with excellent results.

Author of the Latin American best seller "Neonatologia Quirurgica" (Surgical Neonatology) text-book, more than 20 other book chapters and close to 150 publications, he remains a highly-requested lecturer and guest speaker for numerous surgical and medical societies and is a former IPEG (International Pediatric Endosurgery Group) President.

As current professor of surgery and pediatrics, Chief Division of Pediatric Surgery, at Fundación Hospitalaria Children's Hospital in Buenos Aires, he keeps a busy academic life and intense medical practice, fostering research, team-work, academic excellence and career development of his staff. Always restless and in search of new trends and challenges, he is currently investigating potential clinical applications of 3D printing in pediatric surgery.

As the first author of prize winning "Coolest Tricks" abstract in 2015, Dr. Martinez - Ferro deeply wishes to acknowledge the hard work of all the authors involved, some of which appear in this photograph.

IPEG 2015 RESEARCH WINNER

Sybille Waldron, MD



My medical studies at Hamburg University were completed in 2011 where I focused on neurosurgical research. I started my first job in general surgery shortly after, however throughout my studies I developed a strong interest for pediatric medicine, specifically surgery. I successfully applied for my current position in Mainz University Hospital in 2013 where I have started to develop my research interests as well as fulfilling my position as a pediatric surgeon. My recent research projects have focused on treatment technique comparisons in gastro-intestinal and burn procedures respectively. My future projects, with the help of the 2015 IPEG research grant, will focus specifically in procedure development utilizing a multiphoton microscopy to investigate its potential use in oncology diagnostics.

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2016 Meeting Leaders

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Tadashi Iwanaka, MD, PhD (2013)
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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)
Takeshi Miyano, MD (1997) – *Retired*
Steven Rubin, MD (1996) – *Retired*
Gunter-Heinrich Willital, MD (1995)

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Marcelo Martinez-Ferro, MD – Buenos Aires, Argentina

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Luc Soler, PhD – Strasbourg, France

Philipp O. Szavay, MD – Lucerne, Switzerland

Tomoaki Taguchi, MD, PhD, FACS – Fukuoka, Japan

Holger Till, MD – Graz, Austria

Hiroo Uchida, MD – Nagoya, Japan

Reza Vahdad, MD – Cologne, Germany

David C. Van der Zee, MD, PhD – Utrecht, The Netherlands

Kenneth K. Wong, MD – Hong Kong, China

Richard John Wood, MD – Columbus, OH, USA

Mark Wulkan, MD – Atlanta, GA, USA

Atsuyuki Yamataka, MD – Tokyo, Japan

C.K. Yeung, MD – Hong Kong, China

Schedule-at-a-Glance



PRE-MEETING COURSE

Tuesday, May 24

2:00 pm – 6:00 pm **HANDS-ON LAB: High Fidelity Neonatal Course for the Advanced Learner** [NON CME](#)

Wednesday, May 25

8:00 am – 11:30 am **HANDS-ON LAB: Innovations in Simulation Based Education for Pediatric Surgeons** [NON CME](#)

3:00 pm – 7:00 pm **INTERACTIVE POSTGRADUATE SESSION: “The Experts Want to Talk to You”**

7:00 pm – 8:30 pm **Welcome Reception** [NON CME](#)

IPEG’S 25th ANNUAL CONGRESS

Thursday, May 26

7:30 am – 8:20 am **SCIENTIFIC SESSION: Video I – Coolest Tricks and Extraordinary Procedures**

8:20 am – 8:25 am **IPEG Welcome Address** [NON CME](#)

8:25 am – 8:30 am **Local Welcome Address** [NON CME](#)

8:30 am – 9:30 am **SCIENTIFIC SESSION: Gastrointestinal**

9:30 am – 10:05 am **PRESIDENTIAL ADDRESS & LECTURE “Children are Citizens of the World; They Deserve the Best MIS Wherever they are”**

10:05 am – 10:30 am **Break**

10:30 am – 12:00 pm **JOINT EXPERT PANEL: Minimally Invasive Surgery Kasai Revisited**

12:00 pm – 12:30 pm **Lunch**

12:30 pm – 1:30 pm **FUTURE INNOVATORS 1**

1:30 pm – 2:30 pm **SCIENTIFIC SESSION: Robotics and Single Site Surgery**

2:30 pm – 3:15 pm **SCIENTIFIC SESSION: Basic Science and Simulation**

3:15 pm – 3:30 pm **Break**

3:30 pm – 5:00 pm **EXPERT PANEL: Minimally Invasive Surgery in Anorectal Malformations**

5:00 pm – 5:30 pm **KEYNOTE LECTURE: “We Can All Be Innovators”**

5:30 pm – 6:30 pm **INNOVATIONS SESSION** [NON CME](#)

Friday, May 27

7:30 am – 8:30 am **SCIENTIFIC VIDEO SESSION II**

8:30 am – 9:30 am **SCIENTIFIC SESSION: Colorectal & Hepatobiliary Minimally Invasive Surgery**

9:30 am – 10:00 am **Break**

10:00 am – 11:30 am **SCIENTIFIC SESSION: Thoracic Minimally Invasive Surgery**

11:30 am – 12:30 pm **FUTURE INNOVATORS 2**

12:30 pm – 1:00 pm **Lunch**

1:00 pm – 1:30 pm **KARL STORZ LECTURE: “Virtual and Augmented Reality in MIS”**

1:30 pm – 3:00 pm **EXPERT PANEL: Education in Minimally Invasive Surgery
“Your Pediatric Surgery Fellow is Counting on You”**

3:00 pm – 4:00 pm **SCIENTIFIC SESSION: Urology Minimally Invasive Surgery**

4:00 pm – 5:00 pm **SCIENTIFIC SESSION: Colorectal & Hepatobiliary Minimally Invasive Surgery II**

8:00 pm – Midnight **Friday Night Main Event** [NON CME](#)

Saturday, May 28

8:00 am – 9:30 am **SCIENTIFIC SESSION: Miscellaneous**

9:30 am – 10:25 am **General Assembly** [NON CME](#)

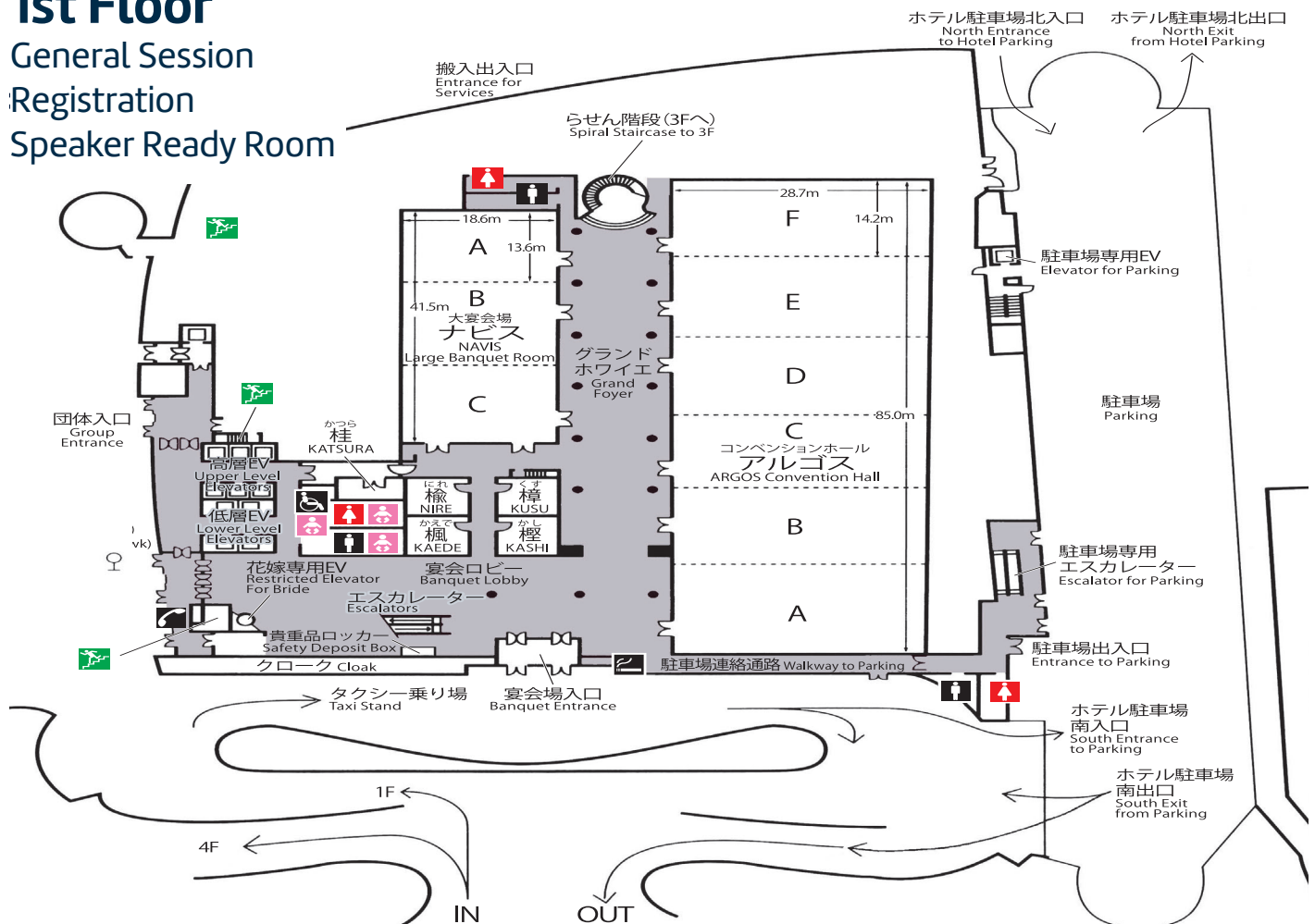
10:25 am – 10:35 am **IPEG Awards** [NON CME](#)

10:35 am – 11:05 am **EVIDENCE BASED SURGERY: MIS Inguinal Hernia Repair**

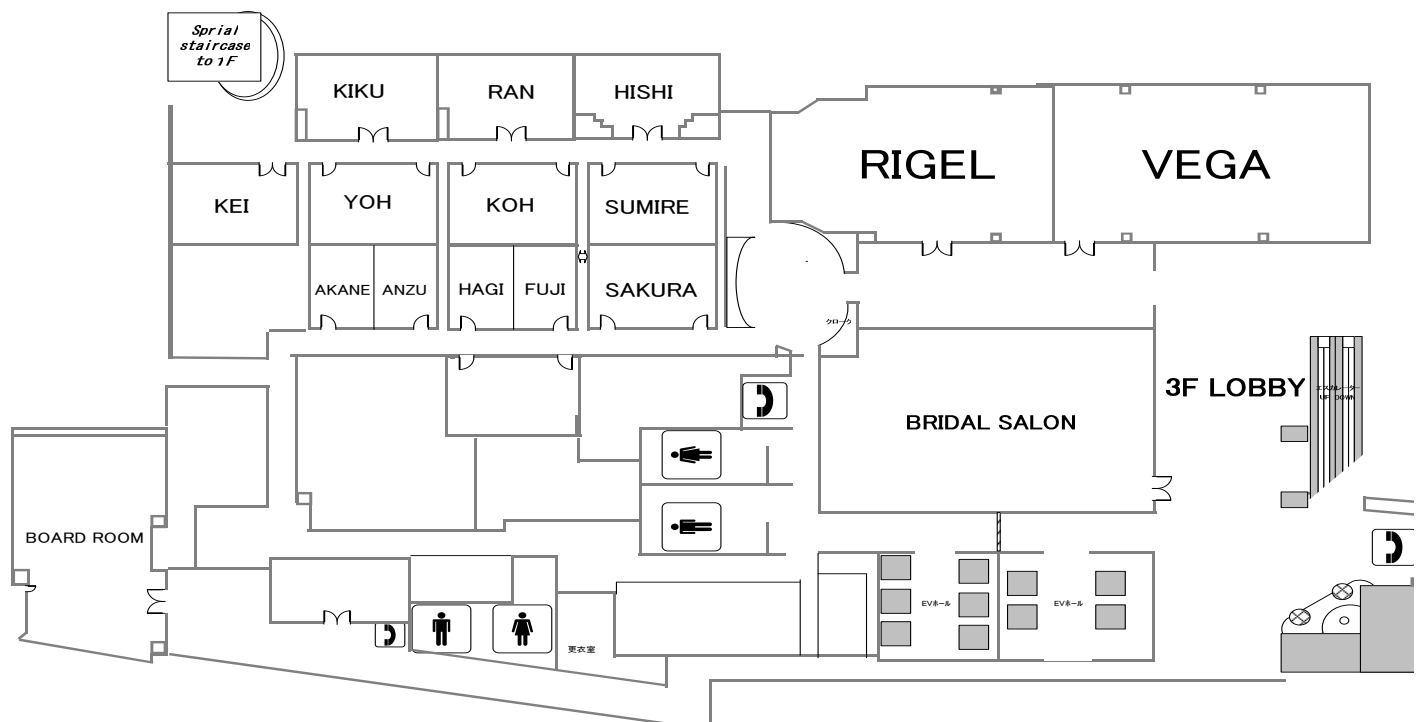
11:05 am – 12:05 pm **VIDEO SESSION WITH EXPERT PANEL DISCUSSION: “My Worst Nightmare” – The Management of Unexpected Complications and Strategies for Future Avoidance**

12:05 pm **Closing Remarks**

Speaker Ready Room



Poster Room

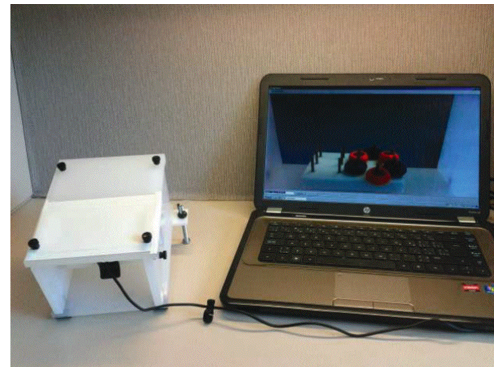


Innovations Corner

PEDIATRIC LAPAROSCOPIC SURGERY (PLS) SIMULATOR

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.



Further development using motion tracking of instruments within the PLS simulator may allow real time analysis of movement, and further improve the educational benefit.

INANIMATE NEONATAL MODELS

For Training Esophageal Atresia / Tracheoesophageal Fistula Repair (EA/TEF), Duodenal Atresia (DA) and Hepatico yeyunostomy (HY)

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.

Further development using motion tracking of instruments within the PLS simulator may allow real time analysis of movement, and further improve the educational benefit.

Models Features:

- Anatomically validated
- Low cost
- Reproducible
- Portable
- In constant development and improvement

Background:

Advanced Neonatal Course. Garrahan Children Hospital. Buenos Aires, Argentina. October 2014

IPEG's 23rd Annual Congress for Endosurgery in Children. Edinburgh, Scotland. June 2014.

IPEG's 22nd Annual Congress for Endosurgery in Children. Beijing, China. June 2013.

IRCAD/BRAZIL Course ADVANCED COURSE IN PEDIATRIC SURGERY "LAPAROSCOPY IN NEONATES" December 2013



Esophageal Atresia / TEF Repair Model



Duodenal Atresia Model

Innovations Corner

BASIC AND SUTURING INANIMATE MODELS

We have developed models for basic training, precision, coordination.

Appropriate to the endoscopic suturing and instrumental dimensions used in Pediatric Surgery. Provides volume of work area between 150 – 450 ml.

These models are used in training within the curriculum of medical residents, as well as in basic and advanced suturing training courses.

Background:

Basic and Advanced Courses. Garrahan Children Hospital. Buenos Aires, Argentina.

May, Jun, Jul, Aug, Sep, Oct, Nov. 2013 and 2014



Basic & Intermediate Models

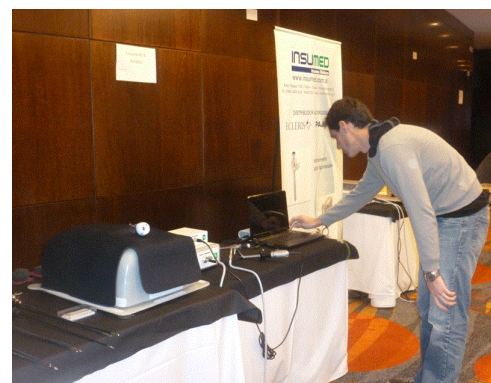
Developed to train coordination and suture

MAGNET ASSIST LAP TRAINER

Magnet-Assisted laparoscopy is a novel surgical technique that requires additional training. In order to train surgeons with this technique, we have designed a model that simulates the outer and inner environment during magnet-assisted laparoscopy. With the aid of a local pediatric orthopedist, we built the core of the trainer with propylene (45 cm long x 28 cm wide x 18 cm thick). At the outer surface, we covered the center portion of the trainer with a 4-mm thick neoprene fabric (40 cm vertical axis x 50 cm wide) attached with Velcro. This system creates a hinge mechanism that allows for practical removal of surgical tools and simulated organs. So far, we have custommade several organs with foam rubber including liver-gallbladder (cystic duct and artery), uterus and most recently colon and appendix.

During manufacture, we have taken into account several key factors:

1. To develop a trainer with optimal ergonomics.
2. To use simulated organs with similar appearance and consistency as the human tissue.
3. To use low cost of materials.
4. The model should require straightforward transportation.
5. The trainer should have smooth surfaces that enable optimal sliding of the magnetic instruments in the outer surface as well in the inside.



SAVE THE DATE

**IPEG Postgraduate Course at BAPS
July 19–20, 2016
Amsterdam, The Netherlands**

Director : Simon Clarke



Faculty: Maria Marcela Bailez (IPEG President), David Van der Zee (IPEG President-Elect), Kathy Barsness (Chicago), Prof Holger Till (Graz), Philipp Szavay (Luzern), Munther Haddad (London), Matthias Oomen (Amsterdam), Sean Marven (Sheffield), Naved Alizai (Leeds)

This course is aimed at those with an interest in Paediatric minimally invasive surgery who wish to gain more knowledge and experience of working in the confines of a neonatal abdomen or chest.

For more information and to register for this course go to:

<http://congress.baps.org.uk/schedule/19-july-2016/ipeg-postgraduate-training-course/>

Innovations Corner

TRAINING MODEL FOR THORACOSCOPIC ESOPHAGEAL ATRESIA ANASTOMOSIS

Over time, training and development of technical skills have been performed in the operating room. Clinical training using simulated environments may improve the efficiency and safety of videosurgery. We developed a training model in thoracoscopic surgery for esophageal atresia .

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

1. Video surgery equipment and 3mm instruments.
2. The designed doll simulate a term newborn. A longitudinal slot of 10 cm long and 2cm wide, through which a plaque is introduced.
3. Rabbit tissue or synthetic material are used. We proceed to place the videosurgery unit just like a real procedure. Placing the optic, visualizes the first image of esophagus and trachea. Afterwards, performing a meticulous dissection the separation of the tracheoesophageal partition is done, a suture 5/0 is placed around the esophagus, simulating fistula ligation. Than the end to end anastomosis can be performed.

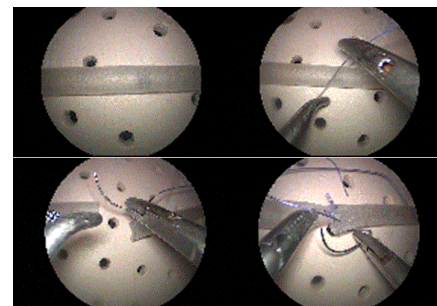
Since the beginning of laparoscopy, the use of simulators have proven a great potential for training and acquiring skills , shortening the learning curve and the early use in real procedures. This model reproduces the environment of an EA has been used by pediatric surgeons in the unit, allowing them to acquire skills that could then be applied during surgery.

Background:

Utrecht (WKZ) Hands on course Surgery in Children & Neonates "Esophageal Atresia Model-suturing esophagus Montpellier model" University Medical Center May, 2010
IPEG's 19th Annual Congress for Endosurgery in Children Hawai, USA June 2010
IPEG's 21st Annual Congress for Endosurgery in Children San Diego, USA March 2012
IPEG's 22nd Annual Congress for Endosurgery in Children Beijing, China June 2013
IPEG's 23rd Annual Congress for Endosurgery in Children Edinburgh, Scotland June 2014



Esophageal Atresia Model using Rabbit esophagus



Esophageal Atresia Model using soft synthetic tissue

SAVE THE DATE

Pediatric Surgery, "Federico II" University of Naples
Naples, Italy

2016 COURSES

MASTERCLASS

Abdominal Wall and Inguinal Hernia Surgery
July 6th, 2016

ADVANCED COURSE

Laparoscopic Neonatal Surgery
July 7-8, 2016

2017 COURSES

ADVANCED COURSE

Videosurgery in Pediatric Urology
June 8-9, 2017

ADVANCED COURSE

Laparoscopic Neonatal Surgery
June 22-23, 2017

Registration Includes: Access to scientific sessions, lunches and coffee breaks on all days of the meeting, course materials (congress bag, scientific program), and certificate of attendance

For further information please contact pedsurg.esposito@unina.it

Innovations Corner

PEDIATRIC URETERAL REIMPLANTATION LAP TRAINER

Simulation model for the training in pediatric laparoscopic ureteral reimplantation

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 surgeons.

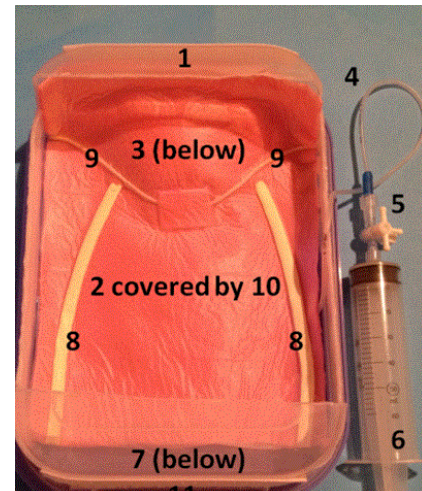
We have designed the first Laparoscopic Simulator for Pediatric Ureteral Reimplantation (LAP SPUR) using the Lich-Gregoire technique. LAP SPUR was tested by 3 highly trained pediatric urologists, using 3-mm, 20-cm short instruments. Low cost reusable materials (RM) and Disposable Materials (DM) "off the shelf" were employed to manufacture LAP SPUR.

- RM: A rectangular plastic bowl (25 x 17 cm)¹ and a neoprene cloth (26 x 36 cm)².
- DM: A water balloon³, a K-30 plastic nasogastric tube⁴, a 3-way valve⁵, a 60 ml syringe⁶, a rectangle of foam (17 x 23 x 0.4 cm)⁷, 2 long white balloons (28 x 0.5 cm)⁸, 2 threads of fine white lace⁹, a IOBANTM drape¹⁰ and 1 m of Velcro strap¹¹.

In all cases the simulator provided:

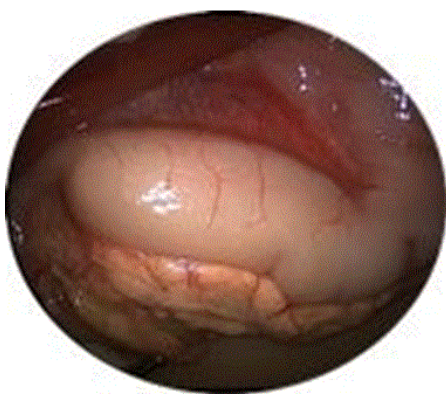
1. Usefulness, ease and ergonomics to perform the laparoscopic procedure
2. Similarity to the real anatomic structures involved in terms of appearance and consistency
3. Low cost of the materials: \$ 10.92 (RM: \$ 8.03 and DM: \$ 2.89) in total
4. Low weight (200 grams) for straightforward transportation

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



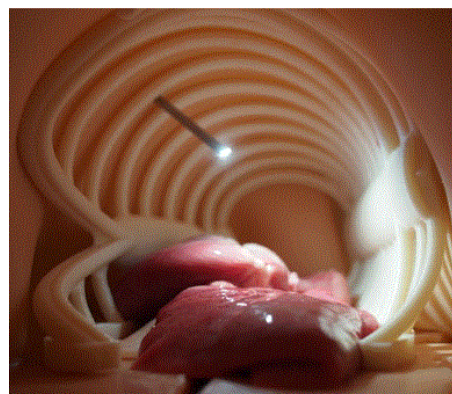
HYBRID SIMULATION MODEL FOR LAPAROSCOPIC DUODENAL ATRESIA REPAIR

The model is a hybrid of a 3D printed structural surround completed with abdominal tissue blocks that are consistent with Type III duodenal atresia. The model is sized to represent a 3.4 Kg infant. This real-tissue model is realistic and relevant to pediatric surgical learners' needs for achieving and maintaining skills for laparoscopic approaches to duodenal pathology in newborn infants.



HYBRID SIMULATION MODEL FOR THORACOSCOPIC LOBECTOMY

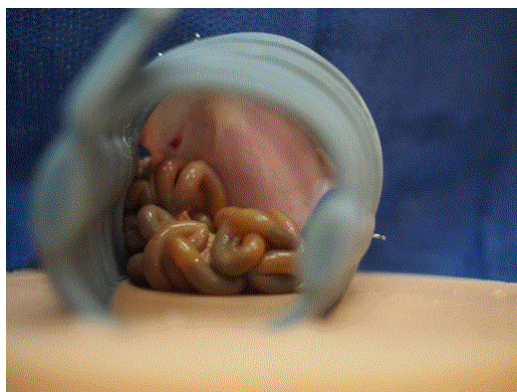
The model is a hybrid of a 3D printed structural surround completed with real thoracic tissue blocks that are anatomically correct for pulmonary lobectomy. The model is sized to represent a 3-month old infant. This real-tissue model is highly realistic and relevant to pediatric surgical learners' needs for achieving and maintaining skills for thoracoscopic lobectomy for congenital anomalies.



Innovations Corner

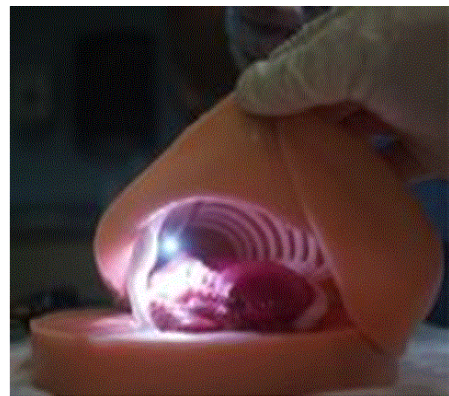
HYBRID SIMULATION MODEL FOR THORACOSCOPIC REPAIR OF CONGENITAL DIAPHRAGMATIC HERNIA

The model is a hybrid of a 3D printed structural surround completed with real diaphragm and intestinal tissues, replicating a left-sided Bokdalek diaphragmatic hernia. The model is sized to represent a 3.4 Kg infant. This real-tissue model is highly realistic and relevant to pediatric surgical learners' needs for achieving and maintaining skills for thoracoscopic primary and patch repair of a variety of different sized diaphragmatic hernias.



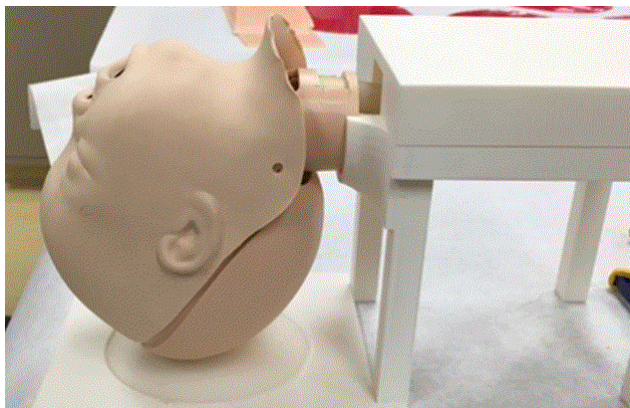
HYBRID SIMULATION MODEL FOR THORACOSCOPIC ESOPHAGEAL ATRESIA + TRACHEOESOPHAGEAL FISTULA REPAIR

The model is a hybrid of a 3D printed structural surround completed with real thoracic tissue blocks, replicating all variants of esophageal atresia and/or tracheoesophageal fistulae. The model is sized to represent a 3.4 Kg infant. This real-tissue model is highly realistic and relevant to pediatric surgical learners' needs for achieving and maintaining skills for thoracoscopic esophageal atresia repair.



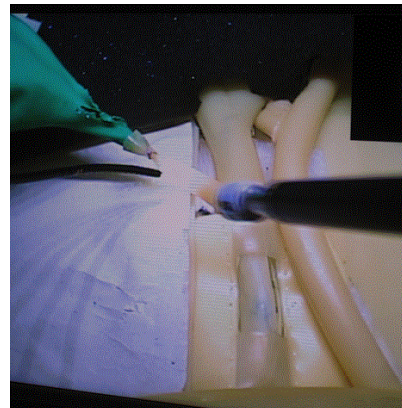
RIGID BRONCHOSCOPY MODEL FOR AIRWAY FOREIGN BODY RETRIEVAL

The model is created by attaching a 3D printed, anatomically correct tracheobronchial tree to an infant intubation simulator, and is used to simulate rigid bronchoscopy + retrieval of a variety of aspirated foreign bodies. The airway replicates an 18-month old infant airway, and the model is designed for use with rigid bronchoscopy equipment and various retrieval baskets and instruments. The model has been evaluated and is



LAPAROSCOPIC COMMON BILE DUCT EXPLORATION SIMULATION MODEL

The simulator is a fully synthetic model of a 3D printed biliary system that is housed within a standard laparoscopy trainer. The model includes picture-in-picture from a flexible video choledochoscope, along with real-time fluoroscopic images controlled by a standard foot pedal. Participants are expected to retrieve one or more 6-mm multifaceted beads from the common bile duct. The simulator has been evaluated and is realistic and relevant



Complete Schedule

PRE-MEETING COURSE

Tuesday, May 24

2:00 pm – 6:00 pm

HANDS-ON LAB: High Fidelity Neonatal Course for the Advanced Learner NON CME

CHAIR: Philipp O. Szavay, MD

CO-CHAIRS: Satoshi Ieiri, MD & Kathy Barsness, MD

DESCRIPTION: This course is designed for advanced MIS pediatric surgeons who are about to begin, or have already begun, to introduce laparoscopic duodenal atresia repair, thoracoscopic diaphragmatic hernia repair (with and without a patch), thoracoscopic TEF repair, and/or thoracoscopic lobectomy. All participants must provide a Departmental Chief's letter documenting expertise in basic MIS procedures, to be eligible to attend this course. Performance metrics will be assessed at the completion of the course.

OBJECTIVES

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

- Choose appropriate instruments for neonatal laparoscopy and thoracoscopy.
- Demonstrate improved instrument handling and knot tying skills within the confines of a newborn chest or abdomen.
- Demonstrate and describe port placement for common neonatal procedures.

FACULTY: Philipp Szavay, MD; Katherine Barsness, MD; Matthew Clifton, MD; Samir Pandya, MD; Charles Leys, MD; Jose Prince, MD; Drew Rideout; Satoshi Ieiri, MD; Joel Cazares, MD; Karen Diefenbach, MD; David J. Juang, MD; Stefan Scholz, MD; Dafydd Davies, MD; Bradley J. Segura, MD

IPEG gratefully acknowledges support of this course from Fukuoka Conventions & Visitor's Bureau, Halyard Health, Karl Storz Endoscopy, and Stryker



SAVE THE DATE

**IPEG endorsed Central and Eastern European Meeting on
Neonatal and Paediatric MIS**

October 12-15, 2016

Dept. of Paediatric and Adolescent Surgery
Medical University of Graz, Austria



Trainer and Lecturer

Maria Marcela Bailez (Argentina), Steve Rothenberg (USA), Sameh Shehata (Egypt), Katherine Barsness (USA), David Van der Zee (The Netherlands), D. Patkowski (Poland), Karen Diefenbach (USA), J. Schleef (Italy), Holger Till (Austria)

PART 1: "HANDS-ON" COURSE OCTOBER 12-13, 2016

1.5 day training course using IPEG's most sophisticated high fidelity simulation models for esophageal atresia (EA), congenital diaphragmatic hernia (CDH), duodenal atresia (DD), lobectomy, hepatico-jejunostomy, pyloroplasty.

Fee: € 280 (25 participants, registration required)

PART 2 : INTERNATIONAL SYMPOSIUM OCTOBER 14-15, 2016

IPEG leaders from all over the world will entertain you for 2 days with designated lectures on neonatal, thoracic, abdominal, urogenital topics. Moreover, YOU are encouraged to bring your own tricky cases to be discussed interactively.

Fee: € 250 (200 participants, registration required)

Please register through our homepage pediatric-surgery.at!
We are looking forward to welcoming you in Graz!

Complete Schedule

Wednesday, May 25

8:00 am – 11:30 am

HANDS-ON LAB: Innovations in Simulation Based Education for Pediatric Surgeons NON CME

CHAIR: Philipp O. Szavay, MD

CO-CHAIRS: Karen Diefenbach, MD & Maximiliano Maricic, MD

DESCRIPTION: To practice MIS skills and learn new ones in established simulators for a variety of standardized pediatric surgical procedures. Simulation-based instruction will include advanced surgical techniques for TEF, duodenal atresia, diaphragmatic hernia, hepaticojejunostomy, pyloromyotomy, single incision surgical techniques, gastrostomy, technical skills models, and many more innovative models. Participants of all levels of MIS skill are encouraged to attend the course.

OBJECTIVES

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

- Choose appropriate instruments for neonatal laparoscopy and thoracoscopy.
- Demonstrate improved instrument handling and knot tying skills within the confines of a newborn chest or abdomen.
- Demonstrate and describe port placement for common neonatal procedures.

FACULTY

- TEF: Paula Flores, MD; Hossein Allal, MD & Holger Till, MD
- CDH: Peter Esslinger, MD & Charles Leys, MD
- Duodenal atresia: Katherine Barsness, MD & Mathijs Oomen, MD
- Cholecystectomy: Martin L. Metzelder, MD
- Hepaticojejunostomy: Maria Marcela Bailez, MD & Matthew Clifton, MD
- PLS: Georges Azzie, MD & Justin Gerstle, MD
- Magnet model: Carolina Millan, MD
- Ureteral Reimplantation: Marcelo Martinez, MD
- Gastric Banding: Samir Pandya, MD
- Single Site: Todd Ponsky, MD, Go Miyano, MD & Oliver J. Muensterer, MD
- Neonatal Simulator: Milissa McKee, MD
- Intestinal Simulator: Jose Prince, MD
- Gastrostomy Model: Tobias Luithle, MD & Reza Vahdadi, MD
- Robot: John Meehan, MD & Timothy Kane, MD
- Hernia Models: Simon Carke, MD & Atul Sabharwal, MD
- Rigid Bronchoscopy: Drew Rideout, MD
- LCBDE: Katherine Barsness, MD & Bradley J. Segura, MD
- Esophageal Atresia: Philipp Szavay, MD

IPEG gratefully acknowledges support of this course from Fukuoka Conventions & Visitor's Bureau, Halyard Health, Karl Storz Endoscopy, and Stryker

IPEG gratefully acknowledges in-kind support of the above courses from Halyard Health, JustRight Surgical, Karl Storz Endoscopy, Stryker, and Teleflex

IPEG would like to recognize our local hands-on course coordinators

Tetsuya Ishimaru, MD, PhD – *The University of Tokyo*

Takahiro Jimbo, MD – *Kyushu University*

Hiroki Nakaruma, MD, PhD – *Juntendo University*

Satoshi Obata, MD – *Kyushu University*

Ryota Souzaki, MD – *Kyushu University*

Shinya Takazawa, MD – *The University of Tokyo*

THANK YOU!

Complete Schedule

THIS SESSION WILL BE HELD IN ROOM NAVIS 1/3

3:00 pm – 7:00 pm

INTERACTIVE POSTGRADUATE SESSION: “The Experts Want to Talk to You”

CHAIR: Atsuyuki Yamataka, MD

CO-CHAIRS: Pablo Laje, MD & Kenneth Wong, MD

DESCRIPTION: Participating experts will describe their work and experience and also difficulties and problems in relation to routine surgery and complicated cases. Topics covered will probably deal mainly with general pediatric surgery and pediatric urology. We would expect the audience for this session to be experienced enough to gain from talking directly with an expert about correct technique or how to deal with problems

OBJECTIVES

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

- Achieve confidence to apply skills learned from the experts in advanced MIS procedures.
- Gain expert advice on how to perform advanced MIS procedures.
- Improve knowledge on clinical care of patients requiring advanced MIS procedures.

3:00 pm Lung Lobectomies – Steven Rothenberg, MD

3:30 pm Achalasia – Carroll Harmon, MD

4:00 pm Laparoscopic Inguinal Hernia – Todd Ponsky, MD

4:30 pm PUJ & VUR – CK Yeung, MD

5:00 pm Choledochal Cyst – Atsuyuki Yamataka, MD & Long Li, MD

5:30 pm Esophageal Atresia – Mark Wulkan, MD

6:00 pm Pectus Deformities – Marcelo Martinez Ferro, MD

IPEG gratefully acknowledges support of this course by Fukuoka Conventions & Visitor's Bureau, Karl Storz Endoscopy, and Stryker

7:00 pm – 8:30 pm

Welcome Reception NON CME

HELD in the EXHIBIT HALL/FOYER on the 1ST FLOOR of the HILTON FUKUOKA SEA HAWK

IPEG provides Course Endorsement!

If interested please contact the IPEG Office : admin@ipeg.org

Apply at : www.ipeg.org/course-endorsement-institutional-application/

3rd Annual Pediatric Colorectal, Motility and Pelvic Reconstruction Conference

November 9-12, 2016 | Nationwide Children's Hospital | Columbus, Ohio

Led by Program Directors, Drs. Marc Levitt, Karen Diefenbach, Richard Wood, Rama Jayanthi, and Carlo Di Lorenzo, the conference will feature hands-on labs, audience interaction, panel discussions on controversial topics, an outcomes session, abstract presentations by attendees, and special fellow teaching sessions. The symposium again features an amazing line-up of visiting faculty, including pediatric surgeons Drs. Jeff Avansino, Megan Durham, Jack Langer, Donald Shaul and Elizabeth Speck, and urologists Drs. Paul Austin, Mark Cain and Joao Pippi-Salle.

Visit NationwideChildrens.org/2016-colorectal-conference



Complete Schedule

IPEG'S 25th ANNUAL CONGRESS

Thursday, May 26

ALL SESSIONS ON THIS DAY WILL BE HELD IN ROOM NAVIS 3/3

7:30 am – 8:20 am

SCIENTIFIC SESSION: Video I – Coolest Tricks and Extraordinary Procedures

MODERATORS: Paula Flores, MD & Charles M. Leys, MD

V001: A MODIFICATION OF THE HEINEKE–MIKULICZ CONCEPT APPLIED TO CONGENITAL ANAL STENOSIS – Taiwo A Lawal, MD, Carlos Reck, MD, [Richard J Wood](#), Victoria A Lane, MBChB, Alessandra Gasior, MD, Karen Diefenbach, MD, Marc A Levitt, MD; Nationwide Children's Hospital, Columbus, Ohio, USA

V002: PERORAL ENDOSCOPIC MYOTOMY FOR PEDIATRIC ACHALASIA: POEM TECHNIQUE Mikael Petrosyan, MD, [Timothy D Kane, MD](#); Children's National Medical Center

V003: LAPAROSCOPIC RIGHT HEPATECTOMY FOR HEPATOBLASTOMA IN A 25 MONTH GIRL [Ya Gao, MD](#), Qiang Huang, MD, Wei Gong, MS, Weikong Pan, MD, Peng Li, MD, Baijun Zheng, MS, Xuanlin Wu, MS, Yitao Duan, BS; The Second Affiliated Hospital of Xi'an Jiaotong University School of Medicine

V004: INNOVATIVE TECHNIQUES SOLVE RESECTIVE COMPLICATIONS IN PECTUS EXCAVATUM [C Millán, MD](#), G Bellía, MD, M Floria, MD, C Fraire, MD, F Rabinovich, MD, H Bignón, MD, L Toselli, MD, S Valverde, MD, C Abdenur, MD, M Martinez Ferro, MD; Fundación Hospitalaria, Private Children Hospital, Buenos Aires, Argentina

V005: LEFT THORACOSCOPIC TWO-STAGE REPAIR OF TRACHEOESOPHAGEAL FISTULA WITH A RIGHT AORTIC ARCH AND A VASCULAR RING [Kazuo Oshima, MD](#), Hiroo Uchida, MD, PhD, Takahisa Tainaka, MD, PhD, Akihide Tanano, MD, PhD, Chiyo Shirota, MD, Kazuki Yokoi, MD, Naruhiko Murase, MD, Ryo Shiotsuki, MD, Kosuke Chiba, MD, Akinari Hinoki, MD, PhD; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

V006: THORACOSCOPIC RESECTION OF AN ECTOPIC MEDIASTINAL PARATHYROID ADENOMA UTILIZING A GAMMA PROBE AND INTRAOPERATIVE PTH MONITORING IN A CHILD [Taizo Furukawa, MD](#), Shigehisa Fumino, Kohei Sakai, Mayumi Higashi, Shigeyoshi Aoi, Tatsuro Tajiri; Kyoto prefectural university of Medicine

V007: THORACOSCOPIC REPAIR OF A RARE ESOPHAGEAL ATRESIA AND TRACHEOESOPHAGEAL FISTULA VARIANT (KLUTH SUBTYPE V5) [Samir Pandya, MD](#), Shirley Hu, BS, Whitney McBride, MD; New York Medical College

V008: THORACOSCOPIC LEFT LOWER LOBECTOMY FOR TREATMENT OF INTRAPULMONARY SEQUESTRATION WITH ASSOCIATED CONGENITAL PULMONARY AIRWAY MALFORMATION (CPAM) AND BRONCHOGENIC CYST: SAFE EARLY INTERVENTION [Stephen P Oh, MD¹](#), Daniel M Relles, MD², Gudrun Aspelund, MD², Iskander Bagautdinov¹, Steven S Rothenberg, MD³; ¹Weill Cornell Medicine, ²Morgan Stanley Children's Hospital, Columbia University Medical Center, ³Rocky Mountain Children's Hospital at Presbyterian/St. Luke's Medical Center

8:20 am – 8:25 am

IPEG Welcome Address [NON CME](#)

Maria Marcela Bailez, MD, 2016 President

8:25 am – 8:30 am

Local Welcome Address [NON CME](#)

Tomoaki Taguchi, MD, PhD, FACS, Local Organizing Chair

8:30 am – 9:30 am

SCIENTIFIC SESSION: Gastrointestinal

MODERATORS: Matthew Clifton, MD & Matthijs W. N. Oomen, MD

S001: LAPAROSCOPY IS SAFE IN INFANTS AND NEONATES WITH CONGENITAL CARDIAC DISEASE: A NATIONAL STUDY OF 3,684 PATIENTS [Jina Kim, MD](#), Zhifei Sun, MD, Brian R Englum, MD, Alexander C Allori, MD, Obinna O Adibe, MD, Henry E Rice, MD, Elisabeth T Tracy, MD; Duke University Medical Center

S002: HOW TO REDUCE THE RISK OF DYSPHAGIA AND RECURRENCE: LESSONS LEARNED FROM A SERIES OF MORE THAN 1500 LAPAROSCOPIC TOUPET IN CHILDREN [Philippe Montupet, MD¹](#), Reva Matta²; ¹Bicetre University Hospital, ²University of Beyrouth

S003: ENDOSCOPIC DEVITALIZATION OF GASTRIC MUCOSA AS AN ALTERNATIVE BARIATRIC PROCEDURE: EXPERIMENTAL EVIDENCE OF EFFICACY. [Andreas Oberbach, MD, PhD, DrPH, MPH¹](#), Holger Till, MD, PhD², Nadine Schliching, PhD³, Marko Heinrich⁴, Stefanie Lehmann, PhD⁴, Yvonne Kullnick, MSc⁴, Anthony N. Kalloo, MD, PhD¹, Vivek Kumbhari, MD¹; ¹Department of Medicine and Division of Gastroenterology and Hepatology. The Johns Hopkins Medical Institutions, Baltimore, ²Department of Paediatric and Adolescent Surgery, Medical University of Graz, Austria, Department of Pediatric Surgery. University of Leipzig. Leipzig. Germany, ⁴University of Leipzig, Fraunhofer-Institute for Cell Therapy and Immunology IZI, experimental surgery research group

Complete Schedule

S004: SURGICAL MANAGEMENT OF MEDIAN ARCUATE LIGAMENT SYNDROME– A SINGLE CENTER EXPERIENCE Mikael Petrosyan, MD, Philip Guzzetta, MD, Andrea Badillo, MD, Anthony D Sandler, MD, Timothy D Kane, MD; Children's National Medical Center

S005: OUTCOMES OF LAPAROSCOPIC VERSUS OPEN GASTROSTOMY TUBE PLACEMENT IN CHILDREN: A REVIEW OF THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM PEDIATRIC (NSQIP-P) DATABASE Kristine Corkum, MD¹, Colin Gause, MD², Timothy Lautz, MD², Catherine Hunter, MD², Julia Grabowski, MD²; ¹Northwestern University, ²Ann & Robert H. Lurie Children's Hospital of Chicago

S006: THE CLINICAL ENTITY OF 'CHRONIC APPENDICITIS' – DOES IT EXIST AS A CAUSE FOR RECURRENT ABDOMINAL PAIN (RAP)? Ketan Parikh, Dr; Jaslok Hospital

S007: LAPAROSCOPIC HELLER'S MYOTOMY FOR ACHALASIA CARDIA: EXPERIENCE WITH YOUNGER PATIENTS Adam Hancox, MRCS, Giampiero Soccoroso, FRCS, Singh Mike, FRCS, Tony Lander, Dakshesh Parikh, FRCS; Birmingham Children's Hospital

S008: TUBULARIZED GASTRIC CONDUIT IS MORE DESIRABLE IN PEDIATRIC PATIENTS TREATED WITH MINIMALLY INVASIVE ESOPHAGECTOMY AND GASTRIC PULL-UP Shannon L Castle, MD, Manuel B Torres, MD, Dean M Anselmo, MD, Nam X Nguyen; Children's Hospital Los Angeles

S009: USE OF 5-MM LAPAROSCOPIC STAPLER TO PERFORM OPEN SMALL BOWEL ANASTOMOSIS IN NEONATAL ANIMAL MODEL Ian C Glenn, Nicholas E Bruns, Todd A Ponsky; Akron Children's Hospital, Akron, Ohio, USA

S010: LAPAROSCOPIC VERSUS OPEN SURGERY IN MANAGEMENT OF CONGENITAL DUODENAL OBSTRUCTION IN NEONATES: A SINGLE CENTER EXPERIENCE WITH 112 CASES Tran N Son, MD, PhD, Hoang H Kien, MD; National Hospital of Pediatrics, Hanoi, Vietnam

9:30 am – 10:05 am

PRESIDENTIAL ADDRESS & LECTURE: Children Are Citizens of the World; They Deserve the Best MIS Wherever They Are.

Maria Marcela Bailez, MD, 2016 President

INTRODUCTION: Steven Rothenberg, MD

DESCRIPTION: The IPEG president will discuss how international societies can influence and expand the access to advanced MIS to children around the world. This session is appropriate for all pediatric surgeons.

OBJECTIVES

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

- Recognize the worldwide need for support for pediatric MIS.
- Identify areas of the world where mentors are needed.
- Articulate the barriers to developing standards for advanced pediatric MIS worldwide.



Dr. Bailez is the Head of the Surgical Department of Garrahan's Children's Hospital (University of Buenos Aires Argentina). She also serves as an Assistant Professor in the division of Pediatric Surgery at the same hospital starting in 1988.

She is the Director of the Pediatric Minimally Invasive Surgery (MIS) Training Courses organized by the School of Medicine of the Northeast National University in Argentina and Associate Director of the Pediatric Courses in IRCAD Brazil. She has started an MIS simulation center in her department and is the director of the basic, advanced and neonatal courses done every month.

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

Dr. Bailez is the current president of IPEG International Pediatric Endosurgery Group and was the program chair of 2010 IPEG meeting in Hawaii and co chair in 2011 Prague. She was the vice-president of the International Society of Intersex (ISHID). She serves on the editorial board of 3 major surgical journals and is the author of 210 abstracts/publications and 9 book chapters. She has made more than 200 presentations, conferences and live surgery demonstrations around the world on pediatric surgical topics and was the winner of the Websurg Award in 2007.

Dr. Bailez lives in Buenos Aires with her husband Fernando and has 3 children: Manuel 31 years old who is a tourist administrator and a professional golf manager, Clara, 27 years old is a neurosurgical resident and Victoria, 16 years old who is in high school and studies dancing and acting. They all share a passion for nature specially climbing mountains and skiing.

Complete Schedule

10:05 am – 10:30 am **Break**

10:30 am – 12:00 pm **JOINT EXPERT PANEL: Minimally Invasive Surgery Kasai Revisited**

CHAIR: Atsuyuki Yamataka, MD

CO-CHAIRS: Tomoaki Taguchi (AAPS) & Pablo Laje, MD (IPEG)

DESCRIPTION: Innovative techniques developed by Professor Kasai for his original portoenterostomy in the late 1950s have been readopted for laparoscopic use. His original portoenterostomy was generally successful but was modified extensively and when first attempted laparoscopically was abandoned because of technical complexity and poor outcomes in 2007. This session will interest pediatric surgeons and hepatobiliary surgeons.

OBJECTIVES

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

- Distinguish differences between the original open Kasai, extended Kasai, and laparoscopic Kasai.
- Identify the keypoints for an effective laparoscopic Kasai.
- Understand the results data for jaundice clearance and survival with the native liver.

10:30 am Open Kasai and re-do Kasai – Masaki Nio, MD

10:52 am Lap Kasai – going back to open – Kenneth Wong, MD

11:07 am Lap Kasai – staying laparoscopic – Atsuyuki Yamataka, MD

11:22 am Lap Re-do Kasai – Hiroo Uchida, MD

12:00 pm – 12:30 pm **Lunch** Sponsored by Ethicon Japan

HELD IN ROOM ARGOS

12:30 pm – 1:30 pm **Future Innovators 1**

MODERATORS: Oliver J. Muensterer, MD & Atul J. Sabharwal, MD

S011: LAPAROSCOPIC AND OPEN OPERATIONS IN THE TREATMENT OF CONGENITAL DUODENAL OBSTRUCTION: A COMPARATIVE STUDY Victor Rachkov, MD¹, Alexander Razumovsky, Prof¹, Olga Mokrushina, MD¹, Vasilij Shumihin, MD²; ¹The Pirogov Russian National Research Medical University, ²Filatov Children's Hospital

S013: TERMINAL ILEAL ADHESIONS– AN ENTITY NEEDING TO BE RECOGNISED AND TREATED IN RECURRENT ABDOMINAL PAIN (RAP) Ketan Parikh, Dr; Jaslok Hospital

S014: CHILDREN WITH ACHALASIA TREATED WITH LAPAROSCOPIC HELLER'S MYOTOMY: HOW DO THEY RATE QUALITY OF LIFE YEARS FOLLOWING THE PROCEDURE? Amar A Alnaqi, MBBCh, MD, FRCS, Michael H Livingston, MD, Bethany Easterbrook, Henrietta Blinder, Michael J Walton, MD, FRCS; McMaster University

S015: COMPARISON OF LAPAROSCOPIC TOUPET AND LAPAROSCOPIC NISSEN FUNDOPLICATIONS IN NEUROLOGICALLY NORMAL CHILDREN. Go Miyano, MD¹, Masaya Yamoto, MD², Hiromu Miyake, MD², Keiichi Morita², Mariko Koyama², Manabu Okawada¹, Takashi Doi¹, Hiroyuki Koga¹, Geoffrey J Lane¹, Koji Fukumoto², Atsuyuki Yamataka¹, Naoto Urushihara²; ¹Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine, ²Department of Pediatric Surgery, Shizuoka Children's Hospital

S016: EFFECT OF ELEVATED INTRA-ABDOMINAL PRESSURE (IAP) ON TLR4 SIGNALING IN INTESTINAL MUCOSA AND INTESTINAL BACTERIAL TRANSLOCATION IN A RAT Igor Sukhotnik, MD¹, Adam Strier, MD¹, Arnold G Coran, MD², Isaac Srugo, MD³, Tatiana Dorfman, MD¹, Yulia Pollak, MSc¹, Drora Berkowitz, MD³, Dragan Kravarusic, MD⁴; ¹The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Dept Pediatric Surgery, Bnai Zion Medical Center, ²University of Michigan, Section of Pediatric Surgery, Mott Children's Hospital, Ann Arbor, MI, ³The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Dept Pediatrics, Bnai Zion Medical Center, ⁴The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Laboratory of Intestinal Adaptation and Recovery

S017: BARIATRIC SURGERY IN ISRAELI ADOLESCENT'S – FACING THE "FASHION" Dragan Kravarusic, Emmanuelle Seguer-Lypszyc, Simona Tyroler, Naftali Freud; Schneider Children's Medical Center

S018: THE IMPACT OF SCOLIOSIS ON LAPAROSCOPIC NISSEN FUNDOPLICATION Tetsuya Ishimaru, PhD¹, Masahiko Sugiyama, MD¹, Mari Arai, PhD¹, Kaori Satoh, MD¹, Chizue Uotani, PhD¹, Masataka Takahashi, MD¹, Shohei Takami, MD¹, Tsubasa Goshima, MD¹, Jun Fujishiro, PhD¹, Tadashi Iwanaka, PhD²; ¹Dept. of Pediatric Surgery, The University of Tokyo Hospital, ²Saitama Children's Medical Center

Complete Schedule

S019: A COMPARISON OF LAPAROSCOPIC REDO FUNDOPLICATIONS AFTER FAILED TOUPET AND NISSEN

FUNDOPLICATIONS IN CHILDREN Go Miyano, MD¹, Masaya Yamoto, MD², Hiromu Miyake, MD², Keiichi Morita, MD², Mariko Koyama, MD², Manabu Okawada, MD¹, Takashi Doi, MD¹, Hiroyuki Koga, MD¹, Geoffrey J Lane, MD¹, Koji Fukumoto, MD², Atsuyuki Yamataka, MD¹, Naoto Urushihara, MD²; ¹Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine, ²Department of Pediatric Surgery, Shizuoka Children's Hospital

S020: OUTCOMES AFTER OPEN AND LAPAROSCOPIC LADD PROCEDURE IN NEONATES, CHILDREN, AND SCHOOL AGE/ ADOLESCENTS Colin D Gause, MD¹, Grace Hsiung, MD¹, Maria G Sacco-Casamassima, MD², Brian P Blackwood, MD¹, Kristine Corkum, MD¹, Irene Helenowski, PhD³, Fizan Abdullah, MD, PhD¹, Timothy B Lautz, MD¹, Catherine J Hunter, MD¹, Julia Grabowski, MD¹; ¹Department of Surgery, Division of Pediatric Surgery, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, ²Department of Surgery, Division of Pediatric Surgery, Johns Hopkins Hospital, Baltimore, MD, ³Department of Preventive Medicine, Feinberg School of Medicine, Northwestern University, Chicago, IL

S021: ARE SKILLS TRANSFERT FROM ROBOTIC ASSISTED LAPAROSCOPIC SURGERY TO CONVENTIONAL LAPAROSCOPIC SURGERY STRAIGHTFORWARD ? Pauline Clermidi, MD¹, Quentin Ballouhey, MD², Xavier Orsoni², Evan Appourchaud¹, Jerome Cros, MD¹, Bernard Longis, MD¹, Fanny Nauche¹, Laurent Fourcade, MD, PhD¹; ¹Department of pediatric surgery, Limoges University Hospital, ²Department of pediatric surgery

S022: SKILLS COMPARISON IN PEDIATRIC RESIDENTS USING A TWO-DIMENSIONAL VERSUS A THREE-DIMENSIONAL HIGH-DEFINITION CAMERA IN A PEDIATRIC LAPAROSCOPIC SIMULATOR Riccardo Guanà, MD, Luisa Ferrero, Riccardo Lemini, Jurgen Schleeff, Regina Margherita Children's Hospital

S023: LAPAROSCOPIC STEREOSCOPIC AUGMENTED REALITY: TOWARDS A CLINICALLY VIABLE ELECTROMAGNETIC TRACKING SOLUTION Xinyang Liu, Sukryool Kang, William Plishker, George Zaki, Mikael Petrosyan, MD, Raj Shekhar, Timothy D Kane, MD; Children's National Medical Center

S024: MAGNAMOSIS VI: SENSING METHODS FOR SAFE DELIVERY OF MAGNETIC ANASTOMOTIC RINGS Claire E Graves, MD¹, Anupama Arun, PhD¹, Dillon A Kwiat, BS¹, Brandon T Gaston, BS¹, Richard Fechter, BS¹, Luzia Toselli, MD², Michael R Harrison, MD¹; ¹University of California, San Francisco, ²Fundación Hospitalaria, Private Children Hospital

S025: POSSIBILITIES OF ENDOSURGERY IN DIAGNOSIS OF TUMOR DISEASES OF OF THORACIC AND ABDOMINAL LOCALIZATION AT CHILDREN D.v. Rybakova, P.a. Kerimov, A.p. Kazancev, M.a. Rybansky, A.v. Khizhnikov; Federal State Budgetary Institution «N.N. Blokhin Russian Cancer Research Center» under the Russian Academy of Medical Sciences

S026: MODIFIED TECHNIQUES OF LAPAROSCOPIC ASSISTED ANORECTOPLASTY FOR ANORECTAL MALFORMATIONS: PERSONAL EXPERIENCE WITH 150 CASES Liem Nt, Phd, Professor; Vinmec International Hospital

S027: THE SINGLE SURGEON'S LEARNING CURVE EXPERIENCE IN LAPAROSCOPIC TRANSHIATAL ESOPHAGECTOMY AND GASTRIC PULL-UP (TEGPUL) Alejandra M Parilli Perera, MD¹, Wilfredo García, MD¹, Angel A López Gil, MD¹, Eleonora Sánchez, MD¹, Michele Frias, CNS¹, María F Alessio, CNS², Carol Rodríguez, MD³, Diana López, MD³; ¹Hospital de Clínicas Caracas, ²Fundación LaparoKids, ³Policlínica La Arboleda

S028: OPERATIVE OUTCOMES FOR APPENDICITIS IN CHILDREN < 5 YEARS OLD: NOT SUCH A DIFFERENT DISEASE Simone M Langness, MD¹, Katherine Davenport, MD², Jonathan Halbach, DO³, Erin Ward, MD¹, Karen Kling, MD², Stephen Bickler, MD², Timothy Fairbanks, MD², Julia Grabowski, MD⁴; ¹UCSD, ²Rady Children's Hospital, ³Naval Medical Center San Diego, ⁴Lurie Children's Hospital

S029: LAPROSCOPIC PYLOROMYOTOMY IN INFANTS: A RETROSPECTIVE ANALYSIS AT SINGLE CENTER EXPERIENCE Xinghai Yang, MD, Haitao Chen, MD, Song Lin, MD; Hubei women and children's Hospital

S030: LAPAROSCOPIC DUODENODUODENOSTOMY WITH PARALLEL ANASTOMOSIS FOR DUODENAL ATRESIA Minjung Kim, Chaeyoun Oh, Sanghoon Lee, Suk-Koo Lee, Jeong-Meen Seo; Samsung Medical Center

1:30 am – 2:30 pm

SCIENTIFIC SESSION: Robotics and Single Site Surgery

MODERATORS: John J. Meehan, MD & Saleem Islam, MD

V009: ROBOTIC HYSTERECTOMY AND MINIMALLY INVASIVE PSARP FOR CLOACA Erik R Barthel, MD, PhD, Paul J Kokorowski, MD, Kasper S Wang, MD, FACS, FAAP; Children's Hospital Los Angeles

S031: TRANSUMBILICAL LAPAROENDOSCOPIC SINGLE SITE SURGERY FOR CHILDHOOD CHOLEDOCHAL CYST: RESULTS AND LESSONS FROM 202 CASES Tran N Son, MD, PhD¹, Dinh A Duc, MD¹, Pham T Hung, MD¹, Tran D Phuong, MD¹, Nguyen T Liem, MD, PhD²; ¹National Hospital of Pediatrics, Hanoi, Vietnam, ²Vinmec International Hospital

Complete Schedule

S032: THE BURNIA: LAPAROSCOPIC SUTURELESS INGUINAL HERNIA REPAIR IN GIRLS Jorge Godoy, MD¹, Maria C Puentes, MD², E Leopold, MD³, M Ortega, MD⁴, Nathan M Novotny, MD⁵; ¹Clinica Las Condes, Santiago, Chile, ²Hospital San Juan de Dios, Santiago, Chile, ³Hospital Calvo Mackenna, Santiago, Chile, ⁴Hospital La Florida, Santiago, Chile, ⁵Beaumont Children's Hospital, Royal Oak, MI, USA

S033: A SIMPLE UMBILICAL NEGATIVE PRESSURE DRESSING LOWERS THE RATE OF SURGICAL SITE INFECTIONS AFTER TRANSUMBILICAL, EXTRACORPOREAL APPENDECTOMY FOR ACUTE APPENDICITIS Federico G Seifarth, MD¹, Neilendu Kundu, MD², Alfredo D Guerron, MD³, Mary M Garland, MD⁴, Michaela W Gaffley, MD⁴, Sarah Worley⁵, Colin G Knight, MD⁶; ¹Cleveland Clinic Children's Hospital, ²Cleveland Clinic, Dermatology and Plastic Surgery Institute, ³Duke University, Department of Surgery, ⁴Wake Forest University, Department of Surgery, ⁵Cleveland Clinic, Quantitative Health Sciences, ⁶Nicklaus Children's Hospital, Department of Pediatric Surgery

S034: COMPARISON OF SINGLE-PORT HYBRID CHOLECYSTECTOMY VERSUS TRADITIONAL FOUR-PORT LAPAROSCOPIC CHOLECYSTECTOMY IN THE PEDIATRIC POPULATION Maitham A Moslim, MD¹, Michael H Liu, MD¹, Dimaris Ayala-Bocanegra, BA², Sarah Worley¹, Federico G Seifarth, MD²; ¹Cleveland Clinic Foundation, ²Cleveland Clinic Children's Hospital

S035: OPERATIVE AND IMMEDIATE POST-OPERATIVE DIFFERENCES BETWEEN MULTI-PORT AND SINGLE-INCISION LAPAROSCOPIC TOTAL SPLENECTOMY IN PEDIATRIC HEMATOLOGY PATIENTS Aaron D Seims, MD, Lisa VanHouwelingen, MD, Jessica Mead, Amos Loh, MD, John A Sandoval, MD, Andrew M Davidoff, MD, Winfred C Wang, MD, Israel Fernandez-Pineda, MD; St Jude Children's Research Hospital

S036: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL OF SINGLE PORT AND 3-PORT LAPAROSCOPIC APPENDECTOMY IN CHILDREN. Andrzej Golebiewski, PhD, Stefan Anzelewicz, MD, Agnieszka Wiejek, Dominika Lubacka, Piotr Czauderna; MEDICAL UNIVERSITY OF GDANSK

S037: SCARLESS ILEAL POUCH ANAL ANASTOMOSIS UTILIZING AN UMBILICAL STOMA Donald Potter, MD¹, Stephanie Polites, MD¹, Matthew Alexander, MD², Christopher Moir, MD¹; ¹Mayo Clinic, ²University of Iowa

S038: SINGLE-PORT LAPAROSCOPIC ASSISTED TRANSROTAL APPROACH ORCHIDOPEXY COMBINED WITH PERCUTANEOUS EXTRA-PERITONEAL INNER RING LIGATION USING HOOKED NEEDLE FOR CRYPTORCHIDISM WITH PALPABLE TESTIS Suolin Li, MD, Yazhen Ma, MD, Xinning Wang; The Second Hospital of Hebei Medical University

2:30 pm – 3:15 pm

SCIENTIFIC SESSION: Basic Science and Simulation

MODERATORS: Karen A. Diefenbach, MD & Timothy Kane, MD

S039: ENDOSCOPIC INTERVENTION OF GASTRIC MUCOSA: A NEW TARGET TO TREAT OBESITY AND RELATED COMORBIDITIES Andreas Oberbach, MD, PhD, DrPH, MPH¹, Vivek Kumbhari, MD², Nadine Schlichting, PhD³, Stefanie Lehmann, PhD⁴, Yvonne Kullnick, MSc¹, Marco Heinrich, PhD¹, Anthony N. Kalloo, MD, PhD², Holger Till, MD, PhD⁵; ¹University of Leipzig, Fraunhofer-Institute for Cell Therapy and Immunology IZI, experimental surgery research group, ²Department of Medicine and Division of Gastroenterology and Hepatology. The Johns Hopkins Medical Institutions, Baltimore, MD, ³Department of Pediatric Surgery. University of Leipzig. Leipzig. Germany, ⁴Integrated Research and Treatment Center (IFB) Adiposity Diseases. University of Leipzig. Leipzig. Germany, ⁵Department of Paediatric and Adolescent Surgery, Medical University of Graz, Austria

S040: LAPAROSCOPIC PERCUTANEOUS EXTRAPERITONEAL CLOSURE FOR INGUINAL HERNIAS IN CHILDREN Xinghai Yang, MD, Hongqiong Geng, MD, Shigang Cheng, MD; Hubei women and children's hospital

S041: PEDIATRIC THORACOSCOPIC SURGICAL SIMULATION USING A PEDIATRIC CHEST MODEL AND MOTION SENSORS CAN BETTER IDENTIFY SKILLED SURGEONS THAN A CONVENTIONAL BOX TRAINER Shinya Takazawa, MD¹, Tetsuya Ishimaru, MD, PhD¹, Kanako Harada, PhD², Kyoichi Deie, MD¹, Jun Fujishiro, MD, PhD¹, Naohiko Sugita, PhD², Mamoru Mitsuishi, DrEng², Tadashi Iwanaka, MD, PhD³; ¹Department of Pediatric Surgery, The University of Tokyo Hospital, ²School of Engineering, The University of Tokyo, ³Saitama Children's Medical Center

S042: DOES A 3D IMAGE IMPROVE LAPAROSCOPIC MOTOR SKILLS? Semiu E Folaranmi, MRCS, MB, BS, BSc¹, Roland W Partridge², Mark A Hughes, PhD, MRCS, MBChB, BSc², Paul Brennan², Iain A Hennessey, FRCS, MMIS, MBChB¹; ¹Alder Hey Children's Hospital, ²The University of Edinburgh

Complete Schedule

S043: PRELIMINARY EVALUATION OF A NOVEL PEDIATRIC RIGID BRONCHOSCOPY SIMULATION MODEL FOR AIRWAY FOREIGN BODY RETRIEVAL

Grace E Hsiung, MD¹, Ben Schwab, MD¹, Ellen K O'Brien, BS², Colin D Gause, MD¹, Ferdynand Hebal, MD³, Deborah M Rooney, MD⁴, Katherine A Barsness, MD, MS³; ¹Department of Surgery, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ²Department of Medical Education, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ³Division of Pediatric Surgery, Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois, ⁴Department of Learning Health Sciences, University of Michigan Medical School, Ann Arbor, Michigan

S044: ADVANCES IN PEDIATRIC SURGICAL EDUCATION: A CRITICAL APPRAISAL OF TWO CONSECUTIVE MINIMALLY INVASIVE PEDIATRIC SURGERY TRAINING COURSES

Colin D Gause, MD¹, Grace Hsiung, MD¹, Ben Schwab, MD¹, Matthew Clifton, MD², Katherine A Barsness, MD, MS¹; ¹Department of Surgery, Division of Pediatric Surgery, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, ²Department of Surgery, Division of Pediatric Surgery, Emory University, Children's Hospital of Atlanta, Atlanta, GA

S045: PRELIMINARY EVALUATION OF A LAPAROSCOPIC COMMON BILE DUCT SIMULATOR FOR PEDIATRIC SURGICAL EDUCATION

Ben Schwab, MD¹, Deborah M Rooney², Eric S Hungness, MD¹, Katherine A Barsness, MD, MS³; ¹Department of Surgery, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ²Department Of Learning Health Sciences, University of Michigan Medical School, Ann Arbor, Michigan, ³Department of Surgery, Division of Pediatric Surgery, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois

S046: THE EFFICACY OF A NEW LAPAROSCOPIC HEPATICOENTEROSTOMY TRAINING SIMULATOR FOR OBJECTIVE SURGICAL SKILL EVALUATION

Takahiro Jimbo¹, Satoshi Ieiri², Satoshi Obata¹, Ryota Souzaki¹, Munenori Uemura³, Noriyuki Matsuoka⁴, Tamotsu Katayama⁴, Kouji Masumoto⁵, Makoto Hashizume³, Tomoaki Taguchi¹; ¹Department of Pediatric Surgery, Faculty of Medical Sciences, Kyushu University, ²Department of Pediatric Surgery, Field of Developmental Medicine, Kagoshima University, ³Department of Advanced Medicine and Innovative Technology, Kyushu University Hospital, ⁴Kyoto Kagaku, Co. Ltd, ⁵Department of Pediatric Surgery, Faculty of Medicine, University of Tsukuba

S047: VIDEO GAMING, PLAYING MUSIC, SURGICAL EXPERIENCE, AND THE IMPACT ON ROBOTIC SIMULATOR PERFORMANCE

Julia Scholsching, MD, Dennis Muensterer, Oliver Muensterer, MD, PhD; Department of Pediatric Surgery, University Medicine Mainz, Mainz, Germany

3:15 pm – 3:30 pm

Break

3:30 pm – 5:00 pm

EXPERT PANEL: Minimally Invasive Surgery in Anorectal Malformations

CHAIR: Maria Marcela Bailez, MD

CO-CHAIR: Giovanna Riccipetoni, MD

DESCRIPTION: The use of MIS in ARM was first reported in 2000. Since that initial report, several authors have published on its feasibility with very few studies addressing long term results. Classic colorectal surgeons have criticized these reports and controversy has developed regarding accurate classification of anomalies and appropriate comparison of functional results as well as reports of new complications related to the approach such as posterior urethral diverticula.

This session is designed to present evidence and stimulate discussion on: the role of MIS in the treatment of ARM, achieving consensus regarding preoperative evaluation and ARM classification, tricks to prevent complications, and its use in complex ARM like cloacas or unusual anomalies on the ARM spectrum. Pediatric surgeons who manage patients with ARM should attend.

OBJECTIVES

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

- List uses of MIS for surgical management of ARM.
- Define strategies to minimize complications of MIS in management of ARM.
- List preoperative studies that may be useful in planning MIS operations for ARM.

3:30 pm Preoperative imaging evaluation to prepare for surgery –Dynamic 3D imaging in Anorectal Malformations – 3D printing in Anorectal Malformations – *Richard Wood, MD*

3:50 pm Why is MIS treatment of ARM criticized? The particular role of MIS in females with ARM/cloacas; unusual spectrums and vaginal fistulas – *Maria Marcela Bailez, MD*

4:05 pm MIS technical details to prevent complications – *Atsuyuki Yamataka, MD*

4:20 pm Modified Laparoscopic Approaches in Management of Anorectal Malformations – *Thanh Liem Nguyen, MD*

4:30 pm Experience in training MIS and open correction of ARM with a unique visualization system – *Philip K. Frykman, MD*

4:50 pm Q&A – All

Complete Schedule

5:00 pm – 5:30 pm

KEYNOTE LECTURE: “We Can All Be Innovators”

SPEAKER: Steven Schwartzberg, MD

INTRODUCTION: Maria Marcela Bailez, MD, 2016 President

DESCRIPTION: Dr. Schwartzberg will discuss concepts that will allow attendees to see the world as an opportunity to innovate and educate attendees on the ways they can seek to become innovators in their daily lives.

OBJECTIVES

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

- Identify opportunities to recognize problems that can be acted on and improved.
- Develop tools that will facilitate innovation.
- Create opportunities for collaborative innovation.



Steven D. Schwartzberg, MD FACS is the Professor and Chairman of the Department of Surgery at the University at Buffalo. Formally he was the Chief of Surgery of the Cambridge Heath Alliance and Professor of Surgery at Harvard Medical School. He is a graduate of the Johns Hopkins University, Baylor College of Medicine, and Baylor General Surgery Residency as well as fellowships in Infectious Diseases and Pediatric Trauma. He is the Multimedia Editor for *Surgical Endoscopy* and is on the editorial boards of several other surgical journals. Dr. Schwartzberg is the recipient of several awards for patient care and a Computerworld Laureate award for introducing surgical video editing into post graduate education. He holds 2 patents and has written more than 120 articles, 12 books chapters and is currently editing 2 books. His funded research interests are in Minimally Invasive Surgery (MIS) with a particular focus on the value proposition of current and emerging surgical technology which includes training/simulation, surgical infection and outcomes. Recent publications include examining the intersection of cost and quality which examines the role of surgery in the emerging era of payment reform, Dr. Schwartzberg is a past president of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) and currently serves as a Governor to the American College of Surgeons. He is interested in forging alliances between groups of physician, surgeons, and nurses across many disciplines as well as industry to work cooperatively and transparently to build new educational programs and responsibly introduce new technologies. The roles of developed and developing countries working together to promote surgical safety, education and training remains a challenge he hopes to impact through the combined use of imagination, diplomacy and technology.

5:30 pm – 6:30 pm

Innovations Session [NON CME]

MODERATORS: Steven Rothenberg, MD & Katherine Barsness, MD

ET002: MAGNETIC COMPRESSION ANASTOMOSIS IN A PURE ESOPHAGEAL ATRESIA PORCINE MODEL Nicholas E Bruns,

MD¹, Domenic R Craner, BA¹, Ian C Glenn, MD¹, Steve J Schomisch, PhD², Michael R Harrison, MD³, Todd A Ponsky, MD¹;

¹Akron Children's Hospital, ²University Hospitals Case Medical Center, ³University of California, San Francisco

ET003: DESIGN AND CONSTRUCTION OF A PERCUTANEOUS ESOPHAGEAL INTRATHORACIC TRACTION DEVICE FOR ESOPHAGIC LENGTHENING Cristobal Abello Munarriz, MD, Msc; North Clinic ORGANIZATION

ET004: THE ROTALOCK: A NEW SLEEVELESS TROCAR FOR NEONATAL AND INFANT LAPAROSCOPY Hock Lim Tan, MD; Prince Court Medical Centre

ET005: A NOVEL KNOT-TYING TECHNIQUE HELPS MANIPULATING THORACOSCOPIC REPAIR OF NEONATAL CONGENITAL DIAPHRAGMATIC HERNIA SAFELY AND EFFICIENTLY Qiuming He, MD, Zhe Wang, MD, Le Li, MD, Yunpu Tan, Jiakang Yu, MD, Wei Zhong; Guangzhou Women and Children's Medical Center, Guangzhou Medical University, Guangzhou, Guangdong, China

ET006: USE OF A NEW 3D IMAGING TECHNOLOGY IN THE EVALUATION OF PECTUS DEFORMITIES Kevin N Johnson, MD, James Geiger, MD; University of Michigan

ET007: APPLICATION OF WIRELESS ELECTRICAL NON-FIBEROPTIC ENDOSCOPE: POTENTIAL BENEFIT AND LIMITATION IN ENDOSCOPIC SURGERY Chin-Hung Wei, MD¹, Chih-Hao Chen¹, Ho Chang²; ¹Mackay Memorial Hospital, ²Graduate Institute of Mechanical and Electrical Engineering, National Taipei University of Technology

Complete Schedule

ET008: MOTION ANALYSIS OF THE DECONSTRUCTED SEGMENTS OF AN INTRA-CORPOREAL SUTURING TASK: IMPLICATIONS ON EDUCATION AND ASSESSMENT USING A NOVEL TECHNOLOGY

Monica A Farcas, MD, FRCSC¹, Maeve O'Neill Trudeau, MD, MPH², Ahmed Nasr, MD, FRCSC³, J. Ted Gerstle, MD, FRCSC⁴, Brian Carrillo, PhD⁵, Georges Azzie, MD, FRCSC⁴; ¹Division of Urology, University of Toronto, Toronto, ON, Canada, ²Division of General Surgery, University of Toronto, Toronto, ON, Canada, ³Division of Pediatric Surgery, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada, ⁴Division of Pediatric Surgery, The Hospital for Sick Children, Toronto, ON, Canada, ⁵Center for Image Guided Innovation and Therapeutic Intervention, The Hospital for Sick Children, Toronto, ON, Canada

ET009: 3D PRINTING MODEL FOR PRE-OPERATIVE ASSESSMENT OF CYSTIC BILIARY ATRESIA

Joel Cazares, MD¹, Atsuyuki Yamataka, MD, PhD, FAAP, Hon², Javier López-Morales, Jr, MD³, Héctor R Siller, PhD⁴, Obedt Figueroa-Cavazos, MSc⁴; ¹Department of Pediatric Surgery, Hospital Regional de Alta Especialidad Materno Infantil, ²Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine, ³Department of Neonatology, Hospital Zambrano Hellion, ⁴School of Engineering and Sciences, Tecnológico de Monterrey

Friday, May 27

ALL SESSIONS ON THIS DAY WILL BE HELD IN ROOM NAVIS 3/3

7:30 am – 8:30 am

SCIENTIFIC VIDEO SESSION II

MODERATORS: Carolina Millan, MD & Dan Ostlie, MD

V010: PERCUTANEOUS ENDOSCOPIC PLACEMENT OF GASTROJEJUNAL FEEDING TUBE: A NOVEL MODIFIED SELDINGER TECHNIQUE Maitham A Moslim, MD¹, Arathi Mohan², Federico G Seifarth, MD³; ¹Cleveland Clinic Foundation, ²Case Western Reserve University, ³Cleveland Clinic Children's Hospital

V011: USEFULNESS OF THE ENSEAL® TISSUE SEALER DURING PULMONARY RESECTION IN A NEONATE WITH CONGENITAL PULMONARY AIRWAY MALFORMATION (CPAM) Atsuyuki Yamataka, Hiroshi Murakami, Junya Ishii, Manabu Okawada, Geoffrey Lane, Hiroyuki Koga; Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine, Tokyo, Japan

V012: THORACOSCOPIC SEGMENTAL RUL RESECTION Anne C Kim, MD, MPH; Rainbow Babies and Children's Hospital

V013: LOOK BEFORE YOU CUT: ANOMALOUS ARTERIAL SUPPLY TO A PULMONARY SEQUESTRATION Victoria K Pepper, MD, Karen A Diefenbach, MD; Nationwide Children's Hospital

V014: THORACOSCOPIC DRAINAGE OF LARGE POSTERIOR MEDIASTINAL ABSCESS AND RETRIEVAL OF INGESTED FOREIGN BODY AFTER ESOPHAGEAL PERFORATION Keith A Kuenzler, MD¹, Jason C Fisher, MD¹, Dare V Ajibade, MD², Luciana D Roman, APN²; ¹NYU Langone Medical Center and Hackensack University Medical Center, ²Hackensack University Medical Center

V015: MAGNAMOSIS: FIRST-IN-HUMAN PROCEDURE Claire E Graves, MD, Ryan Hsi, MD, Selma Masic, MD, Jill Imamura-Ching, RN, Marshall Stoller, MD, Michael R Harrison, MD, FACS; University of California, San Francisco

V016: LOW COST SIMULATION MODEL FOR TRAINING MIS REPAIR OF DUODENAL ATRESIA (DA) COMBINED WITH TELEMENTORING TECHNOLOGY. INITIAL ASSESMENT Maria M Bailez, MD, Maximiliano Maricic, MD, Juan J Aguilar, MD, Paula Flores, MD, Paula Losada, Roberto Debbag, MD, Pablo Schiavo, Technician; Garrahan Children's Hospital Buenos Aires

V017: TOTAL ABDOMINAL LAPAROSCOPIC COLLIS-NISSEN FUNDOPLICATION FOR THE TREATMENT OF ACQUIRED SHORT ESOPHAGUS IN CHILDREN Carlos Garcia-Hernández, MD, Lourdes Carvajal Figueroa, MD, Sergio Landa Juárez, MD, Edmur Salinas-Hernández, MD; Universidad Nacional Autónoma de México

V018: THORACOSCOPIC KIMURA, AN EXTREME TECHNIQUE. TECHNICAL DETAILS AND LESSONS LEARNED C Millán, MD, H Bignón, MD, F Rabinovich, MD, G Bellía, MD, L Toselli, MD, S Valverde, MD, C Abdenur, MD, M Martinez Ferro, MD; Fundación Hospitalaria, Private Children Hospital, Buenos Aires, Argentina

V019: LAPAROSCOPIC RESECTION OF A PRENATALLY DIAGNOSED INTESTINAL DUPLICATION WITH INTRACORPOREAL STAPLED ANASTOMOSIS Sarah Lai, MD, Steven Rothenberg, MD; Rocky Mountain Hospital for Children

8:30 am – 9:30 am

SCIENTIFIC SESSION: Colorectal & Hepatobiliary Minimally Invasive Surgery

MODERATORS: Go Miyano, MD & Munther J. Haddad, MD

S048: SINGLE-PORT LAPAROSCOPY COMBINED TRANSPERINEAL SIGMOID VAGINOPLASTY FOR MRKH SYNDROME Suolin Li, MD, Chi Sun, MD, Xiaofeng Yang, MD; The Second Hospital of Hebei Medical University

S049: THREE LAPAROSCOPIC MANAGEMENT OF HIRSCHSPRUNG'S DISEASE: AN ASSESSMENT OF CLINICAL OUTCOMES AND ERGONOMIC ANALYSIS Shao-tao Tang, Tajammool H Aubdoollah, Xi Zhang, Li Yang, Shuai Li, Guoqing Cao; Department of pediatric surgery, Union Hospital, Tongji Medical University, HuaZhong College of Science and Technology

Complete Schedule

S050: LAPAROSCOPY-ASSISTED DUHAMEL-Z SUTURE FOR TOTAL COLONIC AGANGLIONOSIS; OUTCOME ASSESSED BY FECAL CONTINENCE EVALUATION Go Miyano, MD, Hiroki Nakamura, MD, Shogo Seo, MD, Ryo Sueyoshi, MD, Manabu Okawada, MD, Takashi Doi, MD, Hiroyuki Koga, Geoffrey J Lane, Tadaharu Okazaki, MD, Atsuyuki Yamataka, MD; Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine

S051: LAPAROSCOPIC VERSUS OPEN KASAI PORTOENTEROSTOMY: OUR EXPERIENCE. Alexander Razumovsky, Prof¹, Victor Rachkov, MD¹, Nadezhda Kulikova², Abdumanap Alhasov, MD¹, Nikita Stepanenko, PhD², Zoricto Mitupov, MD¹, Natalia Uskova, PhD¹; ¹The Pirogov Russian National Research Medical University, ²Filatov Children's Hospital, Moscow

S053: CAN LAPAROSCOPIC INTRAOPERATIVE CHOLANGIOGRAPHY BE A GOLDEN CRITERIA FOR DIAGNOSING BILIARY ATRESIA WITH PATENT DISTAL EXTRAHEPATIC BILE DUCTS? Pu Yu, [Long Li](#); Capital Institute of Pediatrics

S055: LAPAROSCOPIC MANAGEMENT OF CONGENITAL ANOMALIES AND ACQUIRED LESIONS OF THE PANCREAS IN CHILDREN Yuri Sokolov, MD, Dmitri Donskoy, MD, Mihail Shuvalov, MD, Dmitri Pykhteev, MD, Manvel Akopyan, MD, Alexsey Vilesov, MD, Aleksandr Zykin, MD; Sent Vladimir Children Hospital

S056: DOES THE LEVEL OF TRANSECTION OF THE BILIARY REMNANT AFFECT OUTCOME AFTER PORTOENTEROSTOMY FOR BILIARY ATRESIA? Hiroki Nakamura, Hiroyuki Koga, Go Miyano, Manabu Okawada, Takashi Doi, Takashi Doi, Geoffrey J Lane, Atsuyuki Yamataka; Juntendo university school of medicine Department of Pediatric General & Urogenital Surgery

S057: REOPERATIVE AFTER LAPAROSCOPIC CYST EXCISION WITH CHOLEDOCHAL CYST Zhigang Gao, MD, Qixing Xiong, MD, Qiang Shu, Pro; Pediatric Endoscopy Center

9:30 am – 10:00 am **Break**

10:00 am – 11:30 am **SCIENTIFIC SESSION: Thoracic Minimally Invasive Surgery**
MODERATORS: Pablo Laje, MD & Thanh Liem Nguyen, MD

S058: APPROACH TO RECURRENT CONGENITAL DIAPHRAGMATIC HERNIA: RESULTS OF AN INTERNATIONAL SURVEY Nicholas E Bruns, MD¹, Kelly E Arps, BS², Ian C Glenn, MD¹, Neil L McNinch, MS, RN¹, Todd A Ponsky, MD¹, Avraham Schlager, MD¹; ¹Akron Children's Hospital, ²Emory University School of Medicine

S059: ESTABLISHING EQUIPOISE: NATIONAL SURVEY OF THE TREATMENT OF PEDIATRIC PARA-PNEUMONIC EFFUSION AND EMPYEMA Morgan K Richards, MD, MPH, FACS¹, Jarod McAteer, MD, MPH¹, Lucas Hoffman, MD², Matthew Kronman, MD², Dennis Shaw, MD², Adam B Goldin, MD, MPH²; ¹University of Washington, Department of Surgery, ²Seattle Children's Hospital

S060: REGENERATIVE SURGERY IN THE TREATMENT OF COSMETIC DEFECTS FOLLOWING NUSS PROCEDURE Flavio Facchini, Marco Ghionzoli, Alessandra Martin, Sara Tanini, Roberto Lo Piccolo, [Antonio Messineo](#); Meyer Childrens' Hospital – University of Florence

S061: SCOLIOSIS AND PECTUS EXCAVATUM IN ADOLESCENTS: DOES THE NUSS PROCEDURE AFFECT THE SCOLIOTIC CURVATURE? Marco Ghionzoli¹, Alessandra Martin¹, Martina Bongini¹, Ubaldo Bongini¹, Gastone Ciuti², Laura Grisotto¹, Vito Monaco², Arianna Menciassi², Claudio De Filippi¹, [Antonio Messineo](#)¹; ¹Meyer Childrens' Hospital – University of Florence, ²The Biorobotic Institute – Scuola Superiore Sant'Anna – Pisa

S062: IS FETAL THERAPY A CONTRAINDICATION FOR THORACOSCOPY IN CONGENITAL PULMONARY MALFORMATIONS? EXPERIENCE FROM A SINGLE CENTRE. Sara Costanzo, MD, [Claudio Vella, MD](#), Claudia Filisetti, MD, Giovanni Di Iorio, MD, Cristina Ciulli, Giovanna Riccipetoni, MD; Pediatric Surgery Department "V. Buzzi" Children's Hospital Milan Italy

S063: THORACOSCOPIC RESECTIONS OF MULTI-LOBAR. BILATERAL CONGENITAL PULMONARY LUNG MALFORMATIONS AND THOSE COMBINED WITH FOREGUT DUPLICATIONS AND SUPRA AND INFA-DIAPHRAGMATIC LESIONS M Short, Dr, M Singh, Dr, D Parikh, Dr; Birmingham Childrens Hospital

S064: MINIMALLY INVASIVE REPAIR OF CDH RECURRENCE: FACING THE FACTS Kelly Arps, BS¹, [Avraham Schlager, MD](#)², Ragavan Siddharthan, MD³, Mark L Wulkan, MD¹, Matthew S Clifton, MD¹; ¹Emory University / Children's Healthcare of Atlanta, ²Akron Children's Hospital, ³Oregon Health and Sciences University

S065: SURGICAL INTERVENTION FOR SPONTANEOUS PNEUMOTHORAX IN PAEDIATRIC POPULATION: WHEN AND WHY? Fanny Yeung, Dr, Patrick Ho Yu Chung, Dr, Kenneth Kak Yuen Wong, Dr, Esther Ling Yin Hung, Dr, Chi Sum Yuen, Dr, Paul Kwong Hang Tam, Professor; Queen Mary Hospital

Complete Schedule

S066: TUBE THORACOSTOMY AT THE TIME OF CDH REPAIR: RE-ASSESSING THE RISKS AND BENEFITS Avraham Schlager, MD¹, Kelly Arps, BS², Ragavan Siddharthan, MD³, Matthew S Clifton, MD²; ¹Akron Children's Hospital, ²Emory University / Children's Healthcare of Atlanta, ³Oregon Health and Sciences University

S067: A MULTI INSTITUTIONAL REVIEW OF TOTAL THORACOSCOPIC APPROACH FOR NEONATAL CONGENITAL DIAPHRAGMATIC HERNIA (CDH) REPAIR Katrina L Weaver, MD¹, Go Miyano, MD², Martin Lacher, MD³, Manabu Okawada, MD², Joanne Baerg, MD⁴, Lena Perger, MD⁵, George W Holcomb III, MD, MBA¹, Shawn D St. Peter, MD¹; ¹Children's Mercy Hospital, ²Juntendo University Hospital, ³Children's of Alabama, ⁴Loma Linda University Children's Hospital, ⁵Baylor Scott & White Health

V020: SCARLESS RIB STITCH FOR LAPAROSCOPIC MORGAGNI HERNIA REPAIR Nicholas E Bruns, MD¹, Priya A Rajdev, MD², Aaron P Garrison, MD¹, Todd A Ponsky, MD¹, Avraham Schlager, MD¹; ¹Akron Children's Hospital, ²Emory University School of Medicine

S068: SUPERIOR MEDIASTINUM FOREGUT DUPLICATIONS: BEWARE OF A COMMON WALL WITH THE TRACHEO-BRONCHIAL TREE Rajay Rampersad, Dr, Michael Singh, Mr, Dakshesh Parikh, Mr; Birmingham Childrens Hospital

V021: THORACOSCOPIC ASSISTED VENTRICULO-ATRIAL SHUNT PLACEMENT Samir Pandya, MD, Erwin Rusli, MD, Jennifer Ronecker, MD, Michael Tobias; New York Medical College

S069: THOROSCOPIC GRETEX PATCH REPAIR FOR CONGENITAL DIAPHRAGMATIC HERNIA : A TECHNICAL CHALLENGE? M Short, Dr. N Coleman, D Parikh, Dr. I Jester; Birmingham Childrens Hospital

11:30 am – 12:30 pm **Future Innovators 2**
MODERATORS: Jorge Godoy Lenz, MD & Joel Cazares, MD

S070: UNIDIRECTIONAL BARBED SUTURES CAN BE USED SAFELY IN PEDIATRIC GASTRO-INTESTINAL SURGERY. Ravindra K Vegunta, MD, FRCSEd, FACS, FAAP, Erin M Kloos, MD, Kristina L Morgan, PAC; Cardon Children's Medical Center

S071: LAPAROSCOPIC SURGERY FOR DUODENAL ATRESIA & STENOSIS Joel Cazares, MD; Department of Pediatric Surgery, Hospital Regional de Alta Especialidad Materno Infantil

S072: SINGLE-PORT ROBOTIC CHOLECYSTECTOMY IN PEDIATRIC PATIENTS: SINGLE INSTITUTION EXPERIENCE Armando Rosales, MD¹, Federico Seifarth, MD², Fuad Alkhoury, MD³; ¹Cleveland Clinic Florida, ²Cleveland Clinic Foundation, ³Nicklaus Children's Hospital

S073: APPLICATION OF ENDOSCOPY COMBINED WITH LAPAROSCOPY IN THE TREATMENT OF BILE DUCT CALCULI IN CHILDREN Shuguang Jin, Bo Xiang, Chuncheng Wu, Lin Zhong, Fuyu Li; West China Hospital

S074: SINGLE SITE LAPROSCOPIC TREATMENT FOR HEPATIC DUCK OBSTRUCTIONS CAUSED BY COMPRESSION OF ABERRANT RIGHT HEPATIC ARTERIES WITH CHOLEDOCHAL CYSTS Jian Wang, PhD, MD, Jie Zhu, MD; Children's hospital of Soochow University

S075: LAPAROSCOPIC MANAGEMENT FOR CHOLEDOCHAL CYST ASSOCIATED WITH ACCESSORY HEPATIC DUCT Zhe Wen, MD, Qifeng Liang, Jiankun Liang, MD; Guangzhou Women and Children's Medical Center

S076: LONG-TERM RESULTS OF LAPAROSCOPIC HEPATICOJEJUNOSTOMY IN CHILDREN WITH CHOLEDOCHAL CYSTS Mei Diao, MD, PhD, Long Li, MD, PhD, Zhen Chen, B, Med; Department of Pediatric Surgery, Capital Institute of Pediatrics

S077: FEASIBILITY OF A NEW THORACOSCOPIC TRAINING SIMULATOR FOR ESOPHAGEAL ATRESIA WITH AN ENDOSCOPIC SURGICAL SKILL VALIDATION SYSTEM S Obata, MD¹, S Ieiri, MD, PhD², T Jimbo, MD¹, R Souzaki, MD, PhD¹, M Uemura, PhD⁴, N Matsuoka³, T Katayama³, M Hashizume, MD, PhD, FACS⁴, T Taguchi, MD, PhD, FACS¹; ¹Department of Pediatric Surgery, Kyushu University, ²Department of Pediatric Surgery, Field of Developmental Medicine, Kagoshima University, Graduate School of Medical and Dental Sciences, ⁴Department of Advanced Medicine and Innovative Technology, Kyushu University Hospital, ³Kyoto Kagaku Co., Ltd.

S078: OUTCOMES OF SINGLE PORT LAPAROSCOPIC APPENDECTOMY VERSUS CONVENTIONAL THREE PORT LAPAROSCOPIC APPENDECTOMY FOR THE COMPLICATED APPENDICITIS IN CHILDREN: A PROSPECTIVE RANDOMIZED TRIAL Soo Min Ahn, MD, Tae Ah Kim, MD, Won Me Kang, RN; Hallym Univ Sacred Heart Hospital

S079: TRANSPERITONEAL LAPAROSCOPIC HEMINEPHRECTOMY IN DUPLEX KIDNEYS IN INFANTS AND CHILDREN Delphine Demede, MD¹, Stephane Thiry, MD², Pierre-Yves Rabattu³, Jacques Birraux, MD⁴, Isabelle Vidal, MD⁴, Pierre DE Mouriquand, MD¹, Pierre-Yves Mure, MD, PHD¹; ¹HFME hospital, ²Clinique universitaire St Luc, Belgique, ³Hôpital Couple-Enfant, Grenoble, ⁴Hôpital des enfants, Genève

Complete Schedule

S080: MICRO-ENDOSCOPIC ASSISTED TREATMENT OF BENIGN BONE LESIONS IN CHILDREN [Martin Schwind, MD¹](#), Sven-Oliver Dietz, MD², Stephan Rohleder, MD², Oliver Muensterer, MD, PhD²; ¹University Medicine Mainz, Department of Pediatric Surgery, Mainz, Germany, ²University Medicine Mainz, Department of Orthopaedics and Traumatology, Mainz, Germany

V022: LAPAROSCOPIC REPAIR OF TRAUMATIC DIAPHRAGMATIC AND VENTRAL HERNIAS Erol M Knott, DO, PhD, Katrina L Weaver, MD, [David Juang, MD](#), Sohail R Shah, MD, Richard J Hendrickson, MD; Children's Mercy

V023: LAPAROSCOPIC APPROACH FOR PREDUODENAL PORTAL VEIN AND COMMON BILE DUCT IN ASSOCIATION WITH INTESTINAL MALROTATION [Juan I Bortagaray, MD](#), Gayathri Panabokke, MBBS, Peter Ferguson, MBBS, FRACS, Chris Kimber, MBBS, FRACS, FRCS, FAICD; Monash Children's

V024: LAPAROSCOPIC IMPLANTATION OF DIAPHRAGMATIC PACING SYSTEM Daniel Solomon, MD, [Saleem Islam, MD](#), MPH; University of Florida

V025: TRANSRECTAL ENDOSCOPIC RESECTION OF A PRESACRAL MASS IN A TEENAGE GIRL Ben Tabak, MD, Carrol M Harmon, MD, PhD, [David H Rothstein, MD, MS](#); Department of Pediatric Surgery, Women & Children's Hospital of Buffalo and Department of Surgery, University at Buffalo, State University of New York

V026: LAPAROSCOPIC RECTOPEXY FOR A FULL THICKNESS RECTAL PROLAPSE IN AN EX-EXTREME PREMATURITY INFANT [Juan Bortagaray, MD](#), Tom Clarnette, MBBS, MD, FRACS, Paeds, Ram M Nataraja, MBBS, BScHons, FRCSEd, PaedsSurg; Monash Children's Hospital

V027: NEW TECHNIQUE TO IDENTIFY THE EXACT LOCATION OF THE FISTULA IN PATIENTS WITH ANORECTAL MALFORMATIONS [Cristobal A Adolfo Abello Munariz, md, Msh](#); OCGN NORTH CLINC ORGANIZATION

V028: LAPAROSCOPIC CHOLECISTECTOMY AND CHOLEDOCHOSCOPY IN A 7 KG INFANT Angelica Osorio, MD¹, Ana-raquel Silva, MD¹, Humberto Cristino, MD¹, [Jorge Correia-pinto, MD, PhD²](#); ¹Hospital de Braga, ²Life and Health Sciences Research Institute (ICVS) ICVS/3B's - PT Government Associate Laboratory School of Health Sciences, University of Minho

V029: SILS MODIFIED RETROGRADE LAPAROSCOPIC CHOLECYSTECTOMY [Kevin Johnson, MD](#), James Geiger, MD; University of Michigan

12:30 pm - 1:00 pm

Lunch

1:00 pm - 1:30 pm

KARL STORZ LECTURE: "Virtual and Augmented Reality in MIS"

SPEAKER: Luc Soler, PhD

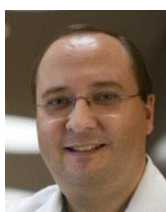
INTRODUCTION: Maria Marcela Bailez, MD, 2016 President

DESCRIPTION: The keynote lecture on augmented reality and computer assisted surgery is designed to present the current and future state of this field to all pediatric surgeons interested in MIS.

OBJECTIVES

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

- Identify components of the new hybrid operating room.
- Recognize challenges related to preoperative patient simulation.
- Articulate current limitations of robotic surgery.



Luc Soler was born on October the 6th, 1969. In 1994, he was valedictorian for the magister at the Higher Education Computer Science School of the Paris University. He obtained his PhD degree in computer sciences in 1998. Since 1999, he is research project manager in computer sciences and robotics at the Research Institute against Digestive Cancer (IRCAD, Strasbourg). In October 2000, he joined the surgical team of Professor Marescaux as invited professor at the Medical Faculty of Strasbourg.

His main areas of interest are medical image processing, 3D modelling, virtual and augmented reality, surgical robotics and abdominal anatomy. His works have been nationally and internationally awarded: Computer World Smithsonian Award (1999), First World Summit Award in Health (2003), Health Award from "le monde Informatique" (2006), MICCAI Award (2008), MICCAI Best Biomedical Visualization Award (2009), Numeric'Alsace (2014), Alsace innovation (2014).

Complete Schedule

1:30 pm – 3:00 pm

EXPERT PANEL: Education in Minimally Invasive Surgery “Your Pediatric Surgery Fellow is counting on you”

CHAIR: Celeste Hollands, MD

CO-CHAIR: Georges Azzie, MD

DESCRIPTION: This session is designed for all pediatric surgeons. The training pathways for pediatric surgeons around the world, including training in minimally invasive surgery will be compared and contrasted. Formal certification in minimally invasive surgery will be discussed including how to standardize this process.

OBJECTIVES

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

- Describe different training pathways for pediatric surgeons around the world.
- Describe several types of MIS certification.
- Describe how evidence and needs assessments can be used to develop rigorous education programs.

1:30 pm Ped Surgery Training in South America – *Maria Marcela Bailez, MD*

1:45 pm Ped Surgery Training in Asia/Australia – *Satoshi Ieiri, MD*

2:00 pm Ped Surgery Training in North America and Europe – *Oliver Muensterer, MD*

2:15 pm Pediatric FLS and Other Forms of Certification – *Georges Azzie, MD*

2:30 pm Applying CME and Evidence Based Principles to Training – *Celeste Hollands, MD*

2:45 pm Q&A – *Panel Discussion*

3:00 pm – 4:00 pm

SCIENTIFIC SESSION: Urology Minimally Invasive Surgery

MODERATORS: CK Yeung, MD & Lisandro Piaggio, MD

S082: CLINICAL DECISIONS OF LAPAROSCOPICALLY-DISCOVERED CONTRALATERAL OPEN INTERNAL RINGS DURING LAPAROSCOPIC REPAIR OF PEDIATRIC UNILATERAL INGUINAL HERNIAS Yang Wu, MD, Bo Xiang, Department of Pediatric Surgery, West China Hospital, Sichuan University

S083: EVALUATION ON THE EFFICACY AND SAFETY OF FLEXIBLE URETEROSCOPY FOR UPPER URINARY TRACT CALCULI IN CHILDREN Yao-wang Zhao, MS, Li Liu, Lei Tu, Chuang-ye Li; Hunan children's hospital

S084: LAPAROSCOPIC PARTIAL NEPHRECTOMY IN DUPLEX KIDNEYS IN INFANTS AND CHILDREN: A SINGLE CENTRE EXPERIENCE OF 53 CASES Tobias Luithle, MD, Verena Ellerkamp, MD, Florian Obermayr, MD, Joerg Fuchs, MD; Department of Pediatric Surgery and Pediatric Urology, University Children's Hospital, Tuebingen, Germany

S085: ROBOTIC-ASSISTED PARTIAL NEPHRECTOMY IN DUPLICATED COLLECTING SYSTEMS FOR SMALL CHILDREN Quentin Ballouhey, MD¹, Pauline Clermidi, MD¹, Karim Braik, MD², Thierry Villemagne, MD³, Hubert Lardy, MD, PhD³, Laurent Fourcade, MD, PhD¹; ¹Department of pediatric surgery; Limoges University Hospital, ²Department of pediatric surgery; Tours university hospital, ³Department of pediatric surgery ; Tours University hospital

S086: MID-TERM OUTCOMES OF ABDOMINAL TESTIS FOLLOWING LAPAROSCOPIC SURGERY Kensuke Ohashi, MD¹, Minoru Tada, MD¹, Daigo Funakoshi, MD¹, Hiroshi Kawashima, MD², Yujiro Tanaka, MD², Hiroo Uchida, MD³, Tadashi Iwanaka, MD²; ¹Saitama Children's Medical Center, Urology, ²Saitama Children's Medical Center, Pediatric Surgery, ³Nagoya University Graduate School of Medicine, Department of Pediatric Surgery

S087: LAPAROSCOPIC RESECTION AND END-TO-END URETEROURETEROSTOMY FOR MIDURETERAL OBSTRUCTION IN CHILDREN Liangsheng Lu, MD, Yunli Bi, Xiang Wang, Shuangshui Ruan; Division of Pediatric Urology, Children's Hospital of Fudan University

S088: PNEUMOVESICAL URETERIC REIMPLANTATION USING T-FASTENER: A NOVEL TECHNIQUE Ct Lau, Lawrence Lan, Kenneth Wong, Paul Tam; Department of Surgery, Queen Mary Hospital, The University of Hong Kong

S089: MININVASIVE TREATMENT OF CONGENITAL MEGAURETER: THE ROLE OF ENDOSCOPIC DILATATION Federica Marinoni, MD, Claudio Vella, MD, Sara Costanzo, MD, Claudia Filisetti, MD, Giovanni Di Iorio, MD, Giorgio Selvaggio, MD, Giovanna Riccipetoni, MD; Pediatric Surgery Department, “V.Buzzi” Children's Hospital ICP, Milan – Italy

Complete Schedule

4:00 pm – 5:00 pm

SCIENTIFIC SESSION: Colorectal & Hepatobiliary Minimally Invasive Surgery II

MODERATORS: Melissa A. McKee, MD & Holger Till, MD

S090: PAEDIATRIC LAPAROSCOPIC CHOLECYSTECTOMY IN SCOTLAND: A NATIONAL REVIEW OF INCIDENCE AND OUTCOMES (1998–2015) P Sekaran, Mr¹, Ar Ross, Mr², A Rooney, Miss¹, G Duthie, Miss³, M Clarke, Miss³, Fd Munro, Mr², Aj Sabharwal, Mr¹; ¹RHSC Glasgow, ²RHSC Edinburgh, ³RHSC Aberdeen

S091: LAPAROSCOPIC PARTIAL SPLENECTOMY IN CHILDREN AND ADOLESCENTS: A 20-YEAR EXPERIENCE Edward Esteves, PhD, Calebe P Souza, MD, Juliana V Gomes, MD; University of Goias and Cancer Hospital of Goias

S093: LAPAROSCOPY IN THE MANAGEMENT OF COMPLEX CLOACA MALFORMATIONS Bhargava Mullapudi, MD, Lesley Breech, MD, Jason S Frischer, MD, Beth A Rymeski, MD, Belinda His Dickie, MD; Cincinnati Children's Hospital and Medical Center

S094: CHANGING FACE OF PEDIATRIC CHOLECYSTECTOMY: EXPERIENCE IN THE CURRENT ERA Jonathan Halbach, DO¹, Erin Ward, MD¹, Simone Langness, MD¹, Katherine Davenport, MD¹, Stephen Bickler, MD¹, Karen Kling, MD¹, Timothy Fairbanks, MD¹, Julia Grabowski, MD²; ¹Rady Children's Hospital, San Diego, CA, ²Lurie Children's Hospital, Chicago, IL

S095: NATIONAL OUTCOMES AFTER ADOLESCENT LAPAROSCOPIC CHOLECYSTECTOMY COMPARING ADULT WITH PEDIATRIC SURGEONS Grace E Hsiung, MD¹, Timothy B Lautz, MD², Catherine J Hunter, MD², Fizan Abdullah, MD, PhD², Julia Grabowski, MD²; ¹Department of Surgery, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ²Division of Pediatric Surgery, Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois

S096: TWO-INCISION LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN Sarah Lai, MD, Steven S Rothenberg, MD, Kay Sandra, MD, Kristen Shipman, MD, Bethany J Slater, MD, FACS; Rocky Mountain Hospital for Children

S097: SURGICAL COMPLICATIONS OF LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION AND ROUX-EN-Y HEPATICOJEJUNOSTOMY FOR CHILDREN EVALUATED BY CLAVIEN-DINDO GRADING SYSTEM : A 10-YEAR SINGLE CENTER EXPERIENCE Fan Lyu, Yeming Wu, Prof, Jun Wang, Prof; Shanghai Jiaotong University School of Medicine affiliated Xinhua Hospital

S098: COMPARATIVE ANALYSIS OF MODIFIED LAPAROSCOPIC DUHAMEL AND LAPAROTOMIC DUHAMEL PULL-THROUGH: CLINICAL OUTCOME AND BOWEL FUNCTION AFTER SURGICAL TREATMENT FOR HIRSCHSPRUNG'S DISEASE Masaya Yamoto, Naoto Urushihara; Department of Pediatric Surgery, Shizuoka Children's Hospital

S099: THE SHORT-TERM OUTCOME OF LAPAROSCOPIC KASAI PORTOENTERSTOMY FOR BILIARY ATRESIA WITH 60 CASES Zhicheng Xu, Yin Zhou, Yibo Li, Yi Ji; West China Hospital of Medicine, Sichuan University

8:00 pm – Midnight

Friday Night Main Event & Dance Off! NON CME

Held in the Argos Room on the 1ST FLOOR of the HILTON FUKUOKA SEA HAWK

SAVE THE DATE

IPEG's Middle East Chapter Activities and Course Endorsements

September 24–26, 2016 ADVANCED LAPAROSCOPY COURSE IN PEDIATRIC SURGERY 2 day course Max. of 18 Participants

For candidates with basic experience in Laparoscopic Surgery (performed more than 30 procedures)

King Fahad Armed Forces Hospital, Jeddah, KSA | www.kfafh.org | Contact: Dr. Enaam Raboie – enaamraboie@yahoo.fr

November 27–29, 2016 ADVANCED LAPAROSCOPY IN PEDIATRIC SURGERY 2 day course Max. of 18 Participants

This course will consist of Interactive Lectures, Panel Discussion, Debates, Free Papers, Hands On Training and Live Surgery Transmissions

For candidates with basic experience in laparoscopic surgery (performed more than 30 procedures)

Learning Resource Center- Cairo, Egypt | www.lrc.edu.eg | Contact: Prof. Hesham Elsaket – helsaket@gmail.com

February 9–11, 2017 BASIC LAPAROSCOPY IN PEDIATRIC SURGERY 3 day course Max. of 18 Participants

For candidates with no or minimal experience in Laparoscopic Surgery (assisted in no more than 10 procedures)

Learning Resource Center- Cairo, Egypt | www.lrc.edu.eg | Contact: Prof. Hesham Elsaket – helsaket@gmail.com

Complete Schedule

Saturday, May 28

ALL SESSIONS ON THIS DAY WILL BE HELD IN ROOM NAVIS 3/3

8:00 am – 9:30am

SCIENTIFIC SESSION: Miscellaneous

MODERATORS: Aayed R. Al-Qahtani, MD & Martin L. Metzelder, MD

S100: INITIAL SINGLE INSTITUTION EXPERIENCE USING A 5-MM ENDOSTAPLER Andrew P Rogers, MD, Tiffany J Zens, MD, Hau D Le, MD, Jonathan E Kohler, MD, MA, Peter F Nichol, MD, PhD, Charles M Leys, MD, MSCI; University of Wisconsin School of Medicine and Public Health

S101: SURGEON NECK PAIN IS REDUCED WITH USE OF VIDEO TELESCOPIC OPERATING MONITOR (VITOM®) COMPARED WITH SURGICAL LOUPES Philip K Frykman, MD, PhD, MBA¹, Andrew L Freedman, MD¹, Timothy D Kane, MD², Zhi Cheng, MD¹, Mikael Petrosyan, MD², Kenneth Catchpole, PhD¹; ¹Cedars-Sinai Medical Center, ²Children's National Medical Center

S102: RETROPERITONEOSCOPIC ADRENALECTOMY FOR SOLID ADRENAL TUMOR IN CHILDREN: A SINGLE SURGEON EXPERIENCE WITH 23 CASES Tran N Son, MD, PhD, Tran A Quynh, MD; National Hospital of Pediatrics

S103: A STUDY OF OPERATING TEAM USAGE OF VITOM® IN PEDIATRIC SURGERY AND UROLOGY: APPLICATION OF THE TECHNOLOGY ACCEPTANCE MODEL Philip K Frykman, MD, PhD, MBA¹, Andrew L Freedman, MD¹, Timothy D Kane, MD², Zhi Cheng, MD¹, Mikael Petrosyan, MD², Kenneth Catchpole, PhD¹; ¹Cedars-Sinai Medical Center, ²Children's National Medical Center

S104: TOWARD SAFER LAPAROSCOPIC INGUINAL HERNIA REPAIR: DEVELOPMENT OF NEW DEVICE AND EVALUATION OF THE EFFECTIVENESS Takaki Emrua¹, Noboru Oyachi¹, Takeyuki Suzuki¹, Hiroshi Ohta²; ¹Yamanashi Prefectural Central Hospital, ²Yamagata Prefectural Central Hospital

S105: MINIMALLY INVASIVE SURGERY FOR THE TREATMENT OF NEUROBLASTOMA WITHOUT IMAGE-DEFINED RISK FACTORS IN LOW-TO-HIGH-RISK PATIENTS Chiyoe Shiota, MD, Hiroo Uchida, MD, PhD, Akihide Tanano, MD, PhD, Akinari Hinoki, MD, PhD, Takahisa Tainaka, MD, PhD, Kzuki Yokota, MD, Oshima Kazuo, MD, Naruhiko Murase, MD, Ryo Shiotsuki, MD, Kousuke Chiba, MD; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

S106: 3D LAPAROSCOPY IN NEONATES AND INFANTS Yury Kozlov¹, Konstantin Kovalkov², Vladimir Novozhilov³, Polina Baradieva⁴; ¹Irkutsk Municipal Pediatric Clinical Hospital, ²Kemerovo Clinical Pediatric Hospital, ³Irkutsk State Medical University, ⁴Irkutsk State Medical Academy of Continuing Education

S107: SUBCUTANEOUS ENDOSCOPICALLY ASSISTED LIGATION (SEAL) USING MINIPOINT FOR REPAIR OF INGUINAL HERNIAS IN GIRLS Akinari Hinoki¹, Hiroo Uchida¹, Rie Ikeda², Akihide Tanano¹, Takahisa Tainaka¹, Chiyoe Shiota¹, Naruhiko Murase¹, Kazuki Yokota¹, Kazuo Oshima¹, Ryo Shiotsuki¹, Shigeki Takahashi²; ¹Department of Pediatric Surgery Nagoya University Graduate School of Medicine, ²Department of Pediatric Surgery Fukaya Red Cross Hospital

S108: ENDOSCOPIC SACROCOCCYGEAL PILONIDAL SINUS TREATMENT IN PEDIATRICS João Moreira-Pinto, MD, Angélica Osório, MD, Sara Fernandes, MD, Jorge Correia-Pinto, MD; ¹Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga; ²ICVS/3B's-PT Government Associate Laboratory, Braga/Guimarães, Portugal; ³Pediatric Surgery Department, Hospital de Braga, Braga, Portugal.

S109: ASSESSING THE ADEQUACY OF ABSORBABLE BRAIDED SUTURE FOR LAPAROSCOPIC HIGH LIGATION IN RABBITS Nicholas E Bruns, MD¹, Domenic R Craner, BA¹, Ian C Glenn, MD¹, Neil L McNinch, MS, RN¹, Steve J Schomisch, PhD², Todd A Ponsky, MD¹; ¹Akron Children's Hospital, ²University Hospitals Case Medical Center

S110: LAPAROSCOPIC GROSS TOTAL RESECTION (LGTR) IN NEUROBLASTOMA Paula Flores, MD, Martin Cadario, MD, Yvonne Lenz, MD; Garrahan Hospital

S111: SURVEY ON ROBOT-ASSISTED SURGICAL TECHNIQUES UTILIZATION IN AMERICAN PEDIATRIC SURGERY FELLOWSHIPS Ilan I Maizlin, MD¹, Robert T Russell, MD, MPH¹, Michelle C Shroyer, MPH¹, David C Yu, MD², Colin A Martin, MD¹, Mike K Chen, MD¹; ¹Children's Hospital of Alabama, Department of Pediatric Surgery, University of Alabama at Birmingham, ²Department of Pediatric Surgery, Louisiana State University

S112: CLINICAL OUTCOME OF LAPAROSCOPIC SURGERY FOR NEUROBLASTOMA IN CHILDREN: A SINGLE-INSTITUTION EXPERIENCE Ryota Souzaki, MD¹, Satoshi Obata, MD¹, Takahiro Jimbo, MD¹, Yoshiaki Kinoshita, MD¹, Makoto Hashizume, MD², Tomoaki Taguchi, MD²; ¹Department of Pediatric Surgery, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan, ²Department of Advance Medicine and Innovative Technology, Kyushu University Hospital, Fukuoka, Japan

S113: DIAGNOSTIC AND CURATIVE MINIMALLY INVASIVE SURGERY FOR PEDIATRIC ABDOMINAL TUMOR. Chaeyoun Oh, MD, Jung-Kee Yoon, MD, Ji-Won Han, MD, Hyun-Young Kim, MD, PhD, Sung-Eun Jung, MD, PhD; Department of Surgery, Seoul National University College of Medicine, Seoul, Korea

S114: LEARNING CURVES IN PAEDIATRIC MINIMALLY INVASIVE SURGERY: A SYSTEMATIC REVIEW OF THE LITERATURE AND A FRAMEWORK FOR REPORTING Alexander L Macdonald, Munther Haddad, Simon A Clarke; Chelsea and Westminster NHS Foundation Trust

Complete Schedule

9:30 am – 10:25 am	General Assembly NON CME COMMITTEE UPDATES: • CME • Program • Development • Research • Education • Information Technology • JLAST Pediatric Editorial Board • Membership • Latin American Chapter • Middle East Chapter • President – Presentation of IPEG's 2017 President
10:25 am – 10:35 am	IPEG Awards NON CME • Coolest Tricks • Basic Science/Innovation • Research
10:35 am – 11:05 am	EVIDENCE BASED SURGERY: MIS Inguinal Hernia Repair CHAIR: Simon Clarke, MD PRESENTERS: Dafydd Davies, MD & Drew Rideout, MD DESCRIPTION: This session aims to present the evidence that has accumulated over the past decade regarding minimal access surgery for paediatric inguinal hernia. Several controversies exist surrounding this topic such as: variation in technique outcomes such as recurrence. These controversies will be discussed and levels of evidence presented. This session is relevant for all levels of clinicians carrying out surgery for inguinal hernia in children OBJECTIVES At the conclusion of this session, participants will be able to: • Identify levels of evidence for MIS Inguinal hernia repair in children. • Articulate the current best evidence based practice for MIS inguinal hernia repair. • Describe the evidence on risks, benefits and alternatives on MIS inguinal hernia repair as relates to informed consent.
11:05 am – 12:05 pm	VIDEO SESSION WITH EXPERT PANEL DISCUSSION: “My Worst Nightmare” – The Management of Unexpected Complications and Strategies for Future Avoidance CHAIRS: Tadashi Iwanaka, MD, PhD & David Van der Zee, MD DESCRIPTION: This session consists of video presentations of complications encountered in advanced MIS and a discussion of how the presenters managed them. Experienced MIS surgeons from different institutions around the world are asked to discuss their experiences and approach to these complications. This session is appropriate for pediatric surgeons who perform MIS OBJECTIVES At the conclusion of this session, participants will be able to: • Plan strategies to manage complications encountered during advanced pediatric MIS. • Recognize situations where complications may occur in advanced pediatric MIS. • Employ techniques to manage complications encountered during advanced pediatric MIS.

SOCIAL PROGRAMS

Welcome Reception

EXHIBIT HALL 1ST FLOOR ■ Wednesday, May 25, 2016 ■ 7:00 pm – 8:30 pm

Friday Night Main Event & Dance Off

ARGOS ROOM 1ST FLOOR ■ Friday, May 27, 2016 ■ 8:00 pm – Midnight

Complete Schedule

TRANSECTION OF THE COMMON HEPATIC DUCT DURING LAPAROSCOPIC CHOLESYSTECTOMY Takashi Sasaki¹, Ryuta Saka¹, Takaharu Oue¹, and Hiroomi Okuyama²; ¹Department of Pediatric Surgery, Hyogo College of Medicine, Hyogo, ²Department of Pediatric Surgery, Osaka University Graduate School of Medicine, Osaka, Japan

SERIOUS COMPLICATION: PUNCTURE OF THE SUPERIOR VENA CAVA DURING VIDEO-ASSISTED THORACOSCOPIC MEDIASTINAL TUMOR NEEDLE BIOPSY Michimasa Fujigoi¹, Yujiro Tanaka¹, Hiroshi Kawashima¹, Tetsuya Ishimaru², Keisuke Suzuki¹, Kyohei Miyakawa¹, Hizuru Amano¹, Kaori Morita¹, and Tadashi Iwanaka¹; ¹Department of Pediatric Surgery, Saitama Children's Medical Center, ²Department of Pediatric Surgery, The University of Tokyo Hospital

OPTICAL TROCAR INSERTION AND THE NIGHTMARE Atsuyuki Yamataka, Go Miyano, Hiroyuki Koga, Manabu Okawada, Takashi Doi, Ryo Sueyoshi, Hiroki Nakamura, Shogo Seo, Hiroshi Murakami; Department of Pediatric Surgery, Juntendo University School of Medicine, Tokyo, Japan

DISLODGE MENT OF THE VASCULAR CLIP DURING THORACOSCOPIC PULMONARY LEFT UPPER LOBE SEGMENTECTOMY Atsuyuki Yamataka, Hiroyuki Koga, Manabu Okawada, Go Miyano, Takashi Doi, Ryo Sueyoshi, Hiroshi Murakami; Department of Pediatric Surgery Juntendo University School of Medicine, Tokyo, Japan

DISCONNECTION OF THE ESOPHAGUS IN RECURRENT TRACHEOESOPHAGEAL FISTULA IS TROUBLE David C. van der Zee; Department of Pediatric Surgery, University Medical Center Utrecht, The Netherlands

PERFORATION OF THE PROXIMAL POUCH IN ESOPHAGEAL ATRESIA David C. van der Zee Dept. Pediatric Surgery, University Medical Center Utrecht, The Netherlands

12:05 pm

Closing Remarks

SPEAKER: Maria Marcela Bailez, MD

CME Worksheet

TIME	ACTIVITY	Credits Available	Hours Attended
TUESDAY, MAY 24, 2016			
2:00 pm – 6:00 pm	HANDS-ON LAB: High Fidelity Neonatal Course for the Advanced Learner NON CME	0	
Total credits available for Tuesday		0	
WEDNESDAY, MAY 25, 2016			
8:00 am – 11:30 am	HANDS-ON LAB: Innovations in Simulation Based Education for Pediatric Surgeons NON CME	0	
3:00 pm – 7:00 pm	INTERACTIVE POSTGRADUATE SESSION: “The Experts Want to Talk to You”	4	
7:00 pm – 8:30 pm	Welcome Reception NON CME	0	
Total credits available for Wednesday		4	
THURSDAY, MAY 26, 2016			
7:30 am – 8:20 am	SCIENTIFIC SESSION: Video I – Coolest Tricks and Extraordinary Procedures	.75	
8:20 am – 8:25 am	IPEG Welcome Address NON CME	0	
8:25 am – 8:30 am	Local Welcome Address NON CME	0	
8:30 am – 9:30 am	SCIENTIFIC SESSION: Gastrointestinal	1	
9:30 am – 10:05 am	PRESIDENTIAL ADDRESS & LECTURE: Children are Citizens of the World. They Deserve the Best MIS wherever they are.	.5	
10:30 am – 12:00 pm	JOINT EXPERT PANEL: Minimally Invasive Surgery Kasai Revisited	1.5	
12:30 pm – 1:30 pm	FUTURE INNOVATORS 1	1	
1:30 pm – 2:30 pm	SCIENTIFIC SESSION: Robotics and Single Site Surgery	1	
2:30 pm – 3:15 pm	SCIENTIFIC SESSION: Basic Science and Simulation	.75	
3:30 pm – 5:00 pm	EXPERT PANEL: Minimally Invasive Surgery in Anorectal Malformations	1.5	
5:00 pm – 5:30 pm	KEYNOTE LECTURE: “We Can All Be Innovators”	.5	
5:30 pm – 6:30 pm	Innovations Session NON CME	0	
Total credits available for Thursday		8.5	
FRIDAY, MAY 27 2016			
7:30 am – 8:30 am	SCIENTIFIC VIDEO SESSION II	1	
8:30 am – 9:30 am	SCIENTIFIC SESSION: Colorectal & Hepatobiliary Minimally Invasive Surgery	1	
10:00 am – 11:30 am	SCIENTIFIC SESSION: Thoracic Minimally Invasive Surgery	1.5	
11:30 am – 12:30 pm	FUTURE INNOVATORS 2	1	
1:00 pm – 1:30 pm	KARL STORZ LECTURE: “Virtual and Augmented Reality in MIS”	.5	
1:30 pm – 3:00 pm	EXPERT PANEL: Education in Minimally Invasive Surgery “Your Pediatric Surgery Fellow is counting on you”	1.5	
3:00 pm – 4:00 pm	SCIENTIFIC SESSION: Urology Minimally Invasive Surgery	1	
4:00 pm – 5:00 pm	SCIENTIFIC SESSION: Colorectal & Hepatobiliary Minimally Invasive Surgery II	1	
Total credits available for Friday		8.5	
SATURDAY, MAY 28, 2016			
8:00 am – 9:30am	SCIENTIFIC SESSION: Miscellaneous	1.5	
9:30 am – 10:15 am	General Assembly NON CME	0	
10:15 am – 10:35 am	IPEG Awards NON CME	0	
10:35 am – 11:05 am	EVIDENCE BASED SURGERY: MIS Inguinal Hernia Repair	.5	
11:05 am – 12:05 pm	VIDEO SESSION WITH EXPERT PANEL DISCUSSION: “My Worst Nightmare” – The Management of Unexpected Complications and Strategies for Future Avoidance	1	
Total credits available for Saturday		3	
TOTAL POSSIBLE CREDITS		24	

To receive a **CME Certificate** for this meeting:

- Please visit www.ipeg.org/cme
- CME Contact: Nicole Von Husen/IPEG-CME Department
11300 W. Olympic Blvd. Suite 600, Los Angeles, CA, 90064
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*An additional charge of US\$25.00 will be assessed for requests received after **Monday, July 4, 2016**.*

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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.

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

Commercial Bias about: (check all that apply)

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

Please return this form to Nicole Von Husen at nicolevh@ipeg.org or fax to +1 310.437.0585.

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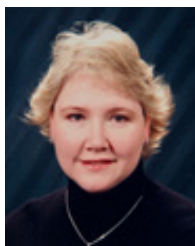
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APRIL 2015–MAY 2016

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

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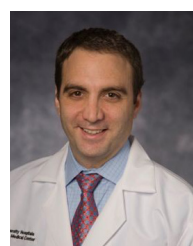
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Highlights Corner

A GREAT FALL FOR IPEG: MUSINGS OF A PAST PRESIDENT

The last few months of 2015 were an exciting time and a period of record breaking expansion for IPEG. Under the strong leadership, drive, and determination of our current president Dr. Maria Marcela Bailez, IPEG is expanding its influence and reach around the globe as never before. Understanding that IPEG must reach out to pediatric surgeons all over the world to provide education and support, and that most pediatric surgeons cannot travel to our annual congress every year, IPEG is ramping up its effort to engage membership and bring needed resources to all corners of the globe.

In October, Dr. Bailez held a South American MIS Symposium and Hands On Course sponsored and endorsed by IPEG, in Buenos Aires which attracted over 200 pediatric surgeons. There were extensive hands on workshops (aided by Dr. Katherine Barsness and Holger Till), a great 2 day didactic meeting (with Dr. David van der Zee, Holger Till, Katherine Barsness, Steven Rothenberg, and Satoshi Ieiri), and this resulted in over 80 new members joining. There were also extensive discussions with the Mexican Society of Pediatric Surgeons, with plans set for a strong IPEG presence at the 2017 meeting in Cabo San Lucas. It also set the ground work for the opening of the Latin American chapter of IPEG.

In November the Egyptian Pediatric Surgical Association, lead by Dr. Sameh Shehata, celebrated their 30th Congress in Luxor and IPEG had a strong presence. Dr. Bailez and Rothenberg participated in the historic congress and then held a surgical workshop in Cairo. History was also made with the inauguration of the Middle East Chapter of IPEG, a project brought to life by Dr. Aayed Al Qahtani. I attended the initial board meeting and the excitement was palpable. Dr. Munther Hadad, a longtime IPEG leader, was named the first honorary president of the chapter. Many new members joined during and after the congress with extensive plans on how to integrate the new chapter over the coming year.

Shortly after, in London, BAPES (The British Association of Paediatric Endoscopic Surgeons) held their 15th Scientific Meeting and Hands on Workshop, with IPEG endorsement. Under the direction of Mr. Ashish Desai, Organising Chairman and Mr. Niyi Ade-Ajayi, Course Director, a great course was put on and many IPEG/BAPES members were intimately involved. I was able to address the annual BAPES congress, as well as speak to the combined meeting of BAPES/BAPS/ APA on "MIS in Neonates, How Small Can We Go". A great deal of excitement was generated for the combined IPEG/BAPS/ BAPES congress to be held in London in 2017. Dr. Philippe Montupet, the President of ESPES, also attended and plans were laid for future collaboration between the 2 groups in the coming years.

At this meeting I was exposed esSurgical, a company making laparoscopic simulators for surgical residents. The roots of this company go back to the IPEG 2010 Coolest Tricks Awarded to Roland Partridge, one of the founders of the company, who created his own "home trainer" using a camcorder and laptop computer. This shows that our support of junior surgeons and innovation are impacting surgery all over the globe.

This is a great time for IPEG with many irons in the fire and unprecedented growth. I have not seen this much energy and expansion since 2000 when IPEG adopted a new constitution and expanded from 80 to over 250 members. All IPEG members should be energized and take part in our renewed global presence where there are huge opportunities for pediatric MIS surgeons all over the world.

Thanks to all who have worked so hard over the last year to bring these events to fruition!

– Steven Rothenberg, MD (Past President 2000)



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Poster Abstracts

P001 SEVERITY SCALE FOR GASTROESOPHAGEAL REFLUX IN CHILDREN AND ADOLESCENTS: A NOVEL TOOL FOR THE SURGICAL TREATMENT OF PEDIATRIC GERD Edward Esteves, PhD¹, Paulo Cesar S Costa, PhD¹, Claudia M Salgado, PhD²; ¹University of Goias, ²University of Pittsburgh

Background: There is no scale or classification for the severity of pediatric gastroesophageal reflux (GER) or a predictor for optimal medical or surgical management. Objective: To develop a novel GER severity scale and validate it in a previously treated population.

Methods: Analytical cross-sectional cohort study of neurologically normal children with GER, admitted from May/1995 to May/2008. The charts data from 399 patients (409 treatments) fed a data bank of GER factors, each receiving proportional values, whose sum in each patient resulted in individual reflux scores. Statistical analysis selected 10 factors to compose the Pediatric Gastroesophageal Reflux Scale (PEGERS) with a score range of 1-32. The children had undergone 3 types of previous treatment (C = clinical for mild reflux, Partial fundoplication -PFP- for estimated moderate GER disease [GERD], and Total fundoplication -TFP- for severe GERD). For validation of PEGERS, long-term outcomes were compared according to 3 severity grades and the 3 types of treatment.

Results: 409 scores formed 3 severity groups: low severity reflux (LS, scores ≤ 12 , n=66), moderate (MS, 13-18, n=141) and high (HS, ≥ 19 , n=202). Cases previously treated coincidentally within the expected severity PEGERS group (i-PEGERS, n=339, 86.3%) were compared to the others, treated outside the expected PEGERS group (o-PEGERS, 54 events, 13.7%). The i-PEGERS events had more favorable rates than o-PEGERS ($p < 0.001$) concerning cure / improvement of GERD (97.9% vs 83.3%), postoperative complications (3.11% vs 29.2%), recurrences (2.36% vs 12.9%), and better quality of life (QOL, 92.63% vs 74.1%).

Conclusions: A pediatric GER scale could be developed, predicting optimal tailored treatments (medical, partial or total fundoplication) with better rates for cure, recurrences, complications and QOL than using non-tailored management.

P002 EFFECT OF LAPAROSCOPIC AND OPEN APPENDECTOMY ON SERUM LEVELS OF CYTOKINES IN CHILDREN WITH PERFORATED APPENDICES, PERITONITIS, AND SEPSIS Duan XuFei, Zhou Shiqiong; The Children's Hospital of Wuhan
Purpose: To examine the effect of laparoscopic (LA) and open appendectomy (OA) on serum levels of inflammatory factors IL-6 and TNF- α and anti-inflammatory factor, IL-10, in children with perforated appendices and sepsis.

Methods: Two groups of subjects were enrolled in this study, 36 children who received LA and 31 children who received OA. Serum levels of IL-6, TNF- α and IL-10 in each group were measured by double-antibody sandwich ELISA and compared at different time points before and after surgery using ??? test.

Results: There was no significant difference between LA group and OA group in preoperative serum levels of IL-6, TNF- α and IL-10 ($P > 0.05$). However, serum levels of IL-6 and TNF- α in the LA group were significantly lower than the OA group on postoperative postoperatedays 1, 3 and 7 (all $P < 0.05$). The serum level of IL-10 in the LA group was initially higher than the OA group, on postoperative days 1 and 3 ($P < 0.05$), but became significantly lower than the OA group on postoperative day 7 ($P > 0.05$). In addition, in the LA group, postoperative serum levels of IL-6 and TNF- α declined more rapidly than the OA group postoperative, and IL-10 level increased more rapidly and persisted longer than the OA group.

Conclusion: LA alleviates inflammatory response and enhances anti-inflammatory reaction by reducing serum levels of IL-6 and TNF- α , and increasing IL-10 in children with perforated appendices, peritonitis, and sepsis. Moreover, LA.

P003 RESTORATIVE PROCTOCOLECTOMY WITH J-POUCH ANASTOMOSIS BY LAPAROSCOPIC SINGLE-SITE SWENSON PROCEDURE FOR TOTAL COLONIC AGANGLIONOSIS. Kazuki Yokota, Hiroo Uchida, Takahisa Tainaka, Yasuyuki Ono, Akihide Tanano, Chiyo Shirota, Naruhiko Murase, Satoshi Makita, Ryo Shiotsuki, Akinari Hinoki, Kazuo Oshima; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

Poster Abstracts

INTRODUCTION: Total colonic aganglionosis (TCA) is a rare and severe form of Hirschsprung disease (HD) and various surgical techniques have been described for this, however, there is no consensus as to superior techniques. We present our new operative technique in TCA. We describe the four cases treated by restorative proctocolectomy with J-pouch anastomosis by laparoscopic single-site Swenson procedure for TCA.

CASE PRESENTATION: Patient 1 underwent ileostomy at age of 14 days. At 5 months of age, radical surgery was performed. Patient 2 was diagnosed as having esophageal atresia type A at birth and accordingly underwent gastrostomy the following day. One week later, his ileum perforated and he underwent ileostomy. Then he was diagnosed with TCA. At 3 years of age, he underwent radical surgery. Patient 3 was diagnosed with congenital central hypoventilation syndrome at the age of 6 days. And then he diagnosed with TCA, ileostomy was performed at age of 18 days. At the age of 2 years, he underwent radical surgery. Patient 4 had a family history with HD. At age of 14 days, she was diagnosed with TCA and transanal decompressive tube was inserted. At 3 months of age, radical surgery was performed.

SURGICAL PROCEDURE: Under general anesthesia, the patient is in the lithotomy position. In the case of 1,2 and 3, a spindle-shaped incision is made around the ileostomy site, and in the case of 4, an umbilical Benz incision is made, after which the aganglionic bowel of the distal ileum and total colon with the mesentery and associated vessels are mobilized and removed through this incision. Dissection is then extended to the peritoneal reflection of the rectum. A J-pouch, in which the ileum is fold back on itself for a length of 8cm, is then easily constructed with exteriorization from the incision. Then, the laparoscopic procedure is commenced. A multi-channel access port device with an wound retractor, in which three 5-mm trocars are set up, is inserted through the incision. The rectum below the peritoneal reflection is dissected circumferentially all the way up to the level of the internal anal sphincter, this dissection being performed meticulously along the precise lines of the wall of the rectum. That the level of dissection has reached the internal anal sphincter is confirmed by digital examination. Next, a transanal procedure in which the rectum is resected obliquely upward in the full-thickness manner along the anorectal line is performed and the aganglionic bowel removed, leaving an extremely small muscular cuff. Last, a J-pouch ileoanal anastomosis is constructed by transanal pull-through.

RESULT: There were no major surgical complications, although all four evidenced frequent defecation, liquid stools, and perianal excoriation in the early postoperative period. These symptoms subsided with medications such as anti-flatulents and codeine, thereafter all four patients were defecating about two to five times per a day after a couple of postoperative months.

CONCLUSION: This procedure improves quality of life by preserving rectovesical function and decreasing the frequency of bowel movements and is safe, feasible, and cosmetically acceptable.

P004 INDICATIONS AND DIAGNOSTIC YIELD OF PAEDIATRIC COLONOSCOPY Mithila Sivasubramaniam, Dr, Udaya Samarakkody; Waikato Hospital

Introduction: Colonoscopy is a well established diagnostic and therapeutic procedure in children. The aim of this study was to evaluate the indications, safety and diagnostic yield of paediatric colonoscopies at a single tertiary centre in New Zealand.

Method: A retrospective study was performed at Waikato Hospital including all paediatric patients under the age of 16 who had a colonoscopy performed by either adult or paediatric services over a 15 year period from 2000 to 2015. Clinical information was obtained through patient notes and data on age gender, indications, pre procedural investigations, colonoscopy findings, complications and final diagnosis were collected and analysed.

Results: In the 15 year period a total of 264 patients were identified who had a total of 291 colonoscopies or sigmoidoscopies. The most common indications were rectal bleeding (46.5%), suspicion of inflammatory bowel disease (46.0%) and cancer surveillance (3.2%) for initial colonoscopies or sigmoidoscopies. The most common diagnoses found were inflammatory bowel disease (9.4 % chron's disease, 10.0% ulcerative colitis and 2.8 % unspecified inflammatory bowel disease), non-specific colitis or inflammation (10.0%) and juvenile polyp (5.7%). No diagnosis was found in 46.7% of patients. There were no procedure related complications in the study population.

Poster Abstracts

Conclusion: Paediatric colonoscopy is a safe and effective procedure. The most common indications are bleeding from the lower gastrointestinal tract and suspicion of inflammatory bowel disease. The overall diagnostic yield was 53.3%

P006 FOLLOW-UP OUTCOMES OF LAPAROSCOPIC ASSISTED ANORECTAL PULL THROUGH FOR ANORECTAL MALFORMATIONS OF HIGH TYPE Tran A Quynh¹, Nguyen T Liem², Pham D Hien¹, Bui D Hau¹; ¹National Hospital of Pediatrics, ²Vinmec International Hospital

AIM: Described surgical technique and follow-up outcomes of laparoscopic assisted anorectal pull through for anorectal malformations of high type.

MATERIALS AND METHODS: All patients with anorectal malformations of high type underwent laparoscopic surgery by the same surgeons from January 2009 to July 2014 including 50 boys and 11 girls. The age of patients varied from 3 - 9 months (mean 3.6 ± 1.0 months). The operation was carried out using three trocars. CO2 pressure was maintained from 8-10 mmHg.

RESULTS: Laparoscopic assisted rectal pull-through was performed in 61 patients. Of these 61 patients, 18 were found to have bladder fistula, 21 had a rectoprostate fistula and 11 had a cloaca and 11 without fistula. Operative time ranged from 45 - 120 minutes (mean 78.7 ± 22.9 minutes). One patient had vaginal perforation during operation. 3 patients had mild infection anastomotic.

The mean hospital stay was 4.8 ± 2.9 days (range, 3 – 17 days). Follow-up from 12 to 77 months (mean 45.6 ± 16.0 months) was obtained in 52 patients.

Thirty four patients had stool from 1 to 2 times per day, fifteen patients had stool 3 - 4 times per day, 2 patients had stool more 5 times per day and 1 patient had 1 stool every 3 days. No mortality or complications postoperation but 15 patients had rectal prolapse. No urethral diverticulum or urethral fistula have seen on voiding cystography in male patients after operation

CONCLUSION: Laparoscopic assisted rectal pull-through is feasible, safe and effective for anorectal malformations of high type.

P007 LAPAROSCOPIC APPENDICECTOMY AND CAECOPEXY FOR MOBILE CAECUM SYNDROME MANIFESTING AS CHRONIC RIGHT ILIAC FOSSA PAIN Caroline Pardy, MBBS, BSc, MRCS¹, Anies Mahomed, MB, BCh, FCS, SA, FRCS, Glas, FRCS, Pae²; ¹Royal Alexandra Children's Hospital, Brighton, ²King Faisal Specialist Hospital and Research Center

Introduction: Interruption of intestinal rotation and fixation during any point in the development of the midgut results in malrotation. Retroperitoneal fixation of the duodeno-jejunal flexure and the caecum normally occurs after 11 weeks.

'Mobile caecum syndrome' refers to failure of the right colonic mesentery to fuse with the lateral peritoneum. The terminal ileum, caecum and ascending colon lack retroperitoneal attachment, enabling the caecum to rotate on itself resulting in intermittent obstruction. Although identified in 11.2% at autopsy¹, this syndrome rarely manifests pathologically. Patients most commonly present with chronic right iliac fossa (CRIF) pain^{2,3}, but can also present with intussusception (Waugh's syndrome)⁴, and rarely caecal volvulus⁵.

We present 5 cases of mobile caecum syndrome, identified at the time of laparoscopy and appendicectomy for the management of CRIF pain.

Methods: Prospective data collection over an 11-year period (2003-2014), for a single surgeon's series of laparoscopy and appendicectomy performed for the management of CRIF pain.

Results: 40 children with a median age of 13 years (5-19 years) underwent laparoscopic appendicectomy for CRIF

Poster Abstracts

pain. The median duration of pain was 6 months (1-36 months). 5 of the 40 patients (12.5%) were identified at laparoscopy to have mobile caecum syndrome. One of these patients had complained of an intermittent tender mass in the right lower abdomen, and at laparoscopy was found to have an enlarged, thickened, hypermobile caecum. All 5 children underwent concurrent laparoscopic appendicectomy and caecopexy. A standard technique was employed for caecopexy using 3 interrupted 2/0 Ethibond sutures passed between the taenia coli and the right anterolateral abdominal wall.

2 of the 5 patients had macroscopic features of appendicitis confirmed histologically. Of the 3 remaining patients with a macroscopically normal appearing appendix, 2 had normal histology, and histological changes were identified in 1. All patients reported resolution of symptoms prior to surgical discharge, with a median follow-up of 2 months (1-15 months).

Discussion: Mobile caecum syndrome is likely to be an under-recognised phenomenon responsible for CRIF pain. It is difficult however, to ascertain whether this condition or underlying appendiceal pathology is the source of CRIF pain. The advent of laparoscopy enables a minimally invasive means of both diagnosing and treating this condition, preventing more serious complications such as intussusception and caecal volvulus. Until a clear aetiology for CRIF pain can be established in these patients, a concomitant appendicectomy is advised.

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P008 THE MANAGEMENT OF THE URETHRAL FISTULA IN MALE CHILDREN WITH HIGH OR INTERMEDIATE ARM THROUGH LAPAROSCOPIC-ASSISTED ANORECTOPLASTY Chen Wang, Long Li, Mei Diao; Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing 100020, P. R. China

Object: This study aims to evaluate the safety and efficacy of the new approach for urethral fistula in male children with high or intermediate ARM through laparoscopic assisted anorectoplasty.

Methods: Children with ARMs and rectourethral or rectovesical fistula who underwent LAARP or SILAARP between May 2005 and September 2015 were reviewed. In our approach, the rectal blind pouch was pulled up to the abdominal cavity for identification and dissection of the fistula. The distal blinded rectal pouch was dissected along submucosal layer from 0.5 cm proximal to the urethra. The mucosa of the fistula was peeled off at the junction of the fistula and urethra. The mucosa of the fistula was completely transected at the insertion on the posterior urethra to prevent postoperative urethral diverticulum. The muscular cuff was closed with Hemolock clip or suturing. In those patients who had narrow and long fistula length (> 0.5 cm) which were located in relatively shallow pelvis, the stump of fistula was closed by Hemolock clip. In those patients who had wide and short fistula length (≤ 0.5 cm) or the fistula located in deeper pelvis (no adequate space allowing 5 mm Hemolock to work), the stump of fistula was closed by 5/0 PDS horizontal running suture. In suture fistula closure, the telescope was rotated 180 degrees to assess the transected fistula and facilitate fistula closure to avoid postoperative recurrent fistula. The distal rectum was ligated before pull-through to minimize faecal contamination in the pelvic cavity.

Results: All patients successfully underwent LAARP or SILAARP without conversions. Average operative time was 1.94 hours. All patients were followed up. The median follow-up period was 5.1 years. No injuries of urethral or vas deferens occurred in operations. No recurrent fistula or urethral diverticulum LAARP or SILAARP was encountered.

Poster Abstracts

Conclusions: The approach which completely transect the mucosa of the fistula at the junction of the fistula and urethra and close the 0.5cm remnant muscular cuff with Hemolock clip or suturing is safe, feasible and effective for the urethral fistula in male children with high or intermediate ARM.

P009 SURGICAL MANAGEMENT OF FUNCTIONAL CONSTIPATION: PRELIMINARY REPORT OF A NEW APPROACH USING A LAPAROSCOPIC SIGMOID RESECTION COMBINED WITH MALONE APPENDICOSTOMY Alessandra C Gasior, DO¹, Giulia Brisighelli, MD², Karen Diefenbach, MD¹, Victoria Lane, MD¹, Richard Wood, MD¹, Carlos Reck, MD¹, Marc A Levitt, MD¹; ¹Nationwide Children's Hospital, ²Fondazione IRCCS Ca'Granda-Ospedale Maggiore Policlinico Milano, Italy

INTRODUCTION: Functional constipation is a common problem in children. It usually can be managed with laxatives but a small subset of patients develop intolerable cramps and need to be temporarily treated with enemas. The senior author has previously reported (1) open sigmoid resection as a surgical option, but this did not sufficiently reduce the laxative need, then (2) a transanal approach (with resection of rectosigmoid), but this led to a high rate of soiling due to extensive stretching of the anal canal and loss of the rectal reservoir. The understanding of these procedures results has led us to use a laparoscopic sigmoid +/- left colonic resection with a Malone appendicostomy for these patients, to decrease the laxative requirements, temporarily treat with antegrade flushes, and to reduce post-operative soiling.

METHODS: A single-institution retrospective review (3/2014-9/2015) included patients who failed our laxative protocol, and therefore were considered surgical candidates. Patients with ARM, HD, spina bifida, tethered cord, Trisomy 21, cerebral palsy, mitochondrial disease, prior colon resection at other facilities, or those that did not participate in our laxative program were excluded. Demographics, duration of symptoms, prior treatments, post-operative complications, and postoperative bowel regimens were evaluated.

RESULTS: 6 patients (3 male; median age of 12.5 years) presented with soiling related to constipation and intolerance to laxatives. Four patients failed pre-operative cecostomy (done prior to referral to us). An average of 4.7 medication treatments were previously tried. 4 patients had required in-patient disimpactions. Duration of symptoms was 7.5 years (median). The median senna dose was 30 mg (range 15-150 mg), and all patients had intolerable symptoms or failed to empty their colon, which we considered a failed laxative trial. All had contrast enemas that demonstrated a dilated and/or redundant sigmoid colon, and colonic manometry was abnormal in 4. All patients underwent laparoscopic sigmoid and left colon resection (2), or only sigmoid resection (4). Two patients had post-operative colitis treated with oral antibiotics. The median follow-up was 52 days (range 8-304 days). 5 patients are on antegrade enemas with plans to convert to laxatives at 6 months, 1 is taking laxatives alone at a 33% lower dosage. Five of 6 are completely clean, 1 soils occasionally and their daily flush is being adjusted.

CONCLUSION: Only a minority of patients with functional constipation are medically unmanageable. This preliminary report shows that laparoscopic colon resection combined with antegrade flushes is an effective surgical technique to treat that group. A laparoscopic approach, guided by contrast enema and colonic manometry, allows for a defined resection of the abnormal segment of colon with the advantages of minimally invasive surgery including allowing for an extensive rectal resection (an improvement over open sigmoid resection) and avoidance of overstretching of the anal canal and removal of the rectal reservoir (an improvement over the transanal approach). Having antegrade access is useful to manage soiling and avoiding cramping in the early post-operative period. Long-term, most patients likely can avoid antegrade flushes and be on no or a dramatically reduced laxative dose.

P010 SINGLE-INCISION LAPAROSCOPIC-ASSISTED ANORECTOPLASTY FOR CHILDREN WITH ANORECTAL MALFORMATIONS Tran A Quynh¹, Nguyen T Liem², Pham D Hien¹, Bui D Hau¹; ¹National Hospital of Pediatrics, ²Vinmec International Hospital

Aim: To describe technical details and early outcomes of single-incision laparoscopic-assisted anorectoplasty (SI-LAARP) for children with anorectal malformations (ARMs)

Patients and Methods: Children with ARMs who underwent SI-LAARP June 2014 to June 2015 were reviewed.

Poster Abstracts

The patients were placed in a Trendelenburg position. An incision around umbilicum was made and 3 ports were inserted. Laparoscopic rectal dissection was performed from peritoneal reflection, the fistula was closed with Hemo-lock clip or suturing. The SILAARP was carried out in rectovesical fistula and high cloaca. The combined SILAARP and modified posterior sagittal approach preserving the external sphincter was performed in other types of anorectal malformations.

Results: 30 consecutive patients were operated from June 2014 to June 2015 included 25 boys and 5 girls. Patient's age ranged from 2 to 4 months (Mean: 3.3 months). The median operating time was 107 minutes (from 75 - 135 minutes), Mean postoperative hospital stay was 4.6 days (range: 3 – 9 days). Follow-up from 4 - 16 months (mean: 7.7 months) was obtained in 30 children. Twenty patients had stool from 1 to 3 times per day, nine patients had stool more than 4 times per day and 1 patient had 1 stool every 3 days. No mortality or complications intraoperation and postoperation but 3 patients had rectal prolapse.

Conclusion: Single-incision laparoscopic-assisted anorectoplasty is safe, feasible and effective for ARMs

P011 EXPERIENCE WITH LAPAROSCOPIC-ASSISTED ANORECTAL PULL-THROUGH IN 55 MALES WITH ANORECTAL MALFORMATION AND RECTOURETHRAL OR RECTOVESICAL FISTULAE: POSTOPERATIVE COMPLICATIONS AND FUNCTIONAL RESULTS: LONG TERM FOLLOW-UP Minjung Kim¹, Sumin Jung², Sanghoon Lee¹, Suk-Koo Lee¹, Jeong-Meen Seo¹; ¹Samsung Medical Center, ²Bundang Cha hospital

Background: LAARP (laparoscopic-assisted anorectal pull-through) has become an established operation for anorectal malformation (ARM) with rectourethral or rectovesical fistula. We adopted the LAARP technique in 2003. This report details the clinical outcomes of LAARP and our experience with 55 male patients who had ARM with rectourethral or rectovesical fistula.

Purpose: The aim of this study was to review post-LAARP operation complications and midterm functional results.

Patients and Methods: From December 2003 to 2015 March, 55 LAARPs were performed in male ARM patients with rectourethral or rectovesical fistula at Samsung Medical Center, Seoul, Korea. We retrospectively analyzed the clinical outcomes (patients' ages, types of fistula, associated anomalies, followup duration, hospital stay, feeding start day, operation time, postoperative complications, readmission and reoperation) from medical records.

Result: The mean age was 2.7 ± 1.4 months and the mean duration of follow-up was 29.4 ± 20.0 months. The most common type of anorectal malformation was rectoprostatic urethral fistula (n=30), followed by rectobulbar fistula (n=3), and rectovesical fistula (n=5). Immediate postoperative complications occurred in only three patients, including a urinary tract infection in a vesicoureteral reflux patient, lung complications. 11 patients maintained a rectal tube for a month and intermittent insertion was required for several months due to high anal sphincter tone. Rectal prolapse developed in 29 patients (52%) after a median duration of 8 months (range: 1–48 months) The average median time from diagnosis of rectal prolapse to prolapse excision was 4 months. Anal stricture occurred in two patient and anoplasty was performed. Urethral diverticulum occurred in one patient with a rectobulbar fistula.

Conclusion: LAARP was a safe procedure. Shorter dissection of rectum in the intra-abdominal space may be helpful in preventing rectal mucosal prolapse. Intermittent rectal tube insertion may be useful for the patient with high rectal tone in the immediate postoperative period.

P012 SILS ILEOCECTOMY FOR CROHN'S DISEASE Kevin Johnson, MD, James Geiger, MD; University of Michigan

Background: The use of laparoscopic techniques for surgery involving inflammatory bowel disease has become increasingly common. Presented here is a technique for a single incision ileocectomy in a adolescent with Crohn's disease.

Methods/Results: Presented here is a technique for a single incision ileocectomy, which has improved cosmesis compared to traditional techniques. Additionally, by only using a periumbilical incision, reoperations are simpler, which is a significant consideration in patients with Crohn's disease.

Poster Abstracts

Conclusion: A single incision approach to ileocectomy is an effective approach for patients with inflammatory bowel disease, with improved cosmesis and simpler reoperations compared to traditional approaches.

P013 RELIABILITY OF LAPAROSCOPIC IDENTIFICATION OF THE LEVEL OF AGANGLIONOSIS IN HIRSCHSPRUNG'S DISEASE Rafik Shalaby, MD, Rafik Shalaby, MD, Maged Ismail; Al-Azhar University

Background: It is crucial to exactly identify the level of transition to the normal ganglionic colon in instances of Hirschsprung's disease (HD). Open leveling biopsies carry many of the complications as that of the definitive repair. Frozen section biopsies interpretation is not available in each center. The correlation between the laparoscopic leveling of the transitional zone (TZ) and the histopathological level of aganglionosis has not been well studied. The aim of this study was to assess whether the laparoscopic leveling of TZ could be a reliable method for the diagnosis of the actual level of HD.

Patients and methods: The study included 150 children with diagnosed HD. All patients were subjected to laparoscopy for identification of TZ and any colonic dilatation. Laparoscopic seromuscular suture was applied as a marker about 3 cm proximal the level of TZ. In cases of non-identification of any TZ, laparoscopic seromuscular biopsies were taken from rectosigmoid, sigmoid, descending colon, splenic flexure and transverse colon.

Results: The study included 98 males and 52 females with HD. Their mean age was 2.4 ± 12 years old (range= 3 months to 6 years). All operations were completed laparoscopically without conversion. The mean operative time was 54.4 ± 12 minutes (range= from 45 to 70 minutes). Laparoscopic leveling of the TZ and dilated zone coincided with the images of preoperative barium enema in 125 cases. While in 25 cases without definitive TZ in preoperative barium enema, laparoscopic visualization of TZ was identified. Laparoscopic identification of the level of the TZ zone coincided with the histopathological results of the resected colonic specimens in all cases. No intraoperative complications were reported.

Conclusion: Laparoscopic identification of TZ in HD is a feasible and a safe procedure. It is a reliable method for diagnosing the expected level of aganglionosis in HD. .

P014 USE OF LAPAROSCOPY IN PEDIATRIC NON-HYPERTROPHIC PYLORIC OBSTRUCTION Xu Li, Kaoping Guan, Long Li; Capital Institute of Pediatrics, Beijing

Objective: To study the use of laparoscopy in pediatric non-hypertrophic pyloric obstruction.

Methods: We included 7 patients with non-hypertrophic pyloric obstruction, who underwent laparoscopic pyloroplasty from January 2009 to March 2014. Among which, 2 cases of prepyloric diaphragm, 2 cases of pyloric duplication, 1 case of pyloric scar, pyloric atresia and pyloric obstruction followed by gastric chemical injury gastrointestinal tract radiography, abdominal ultrasound, CT or electronic gastroscopy. And we preceded the laparoscopic operation after correcting the electrolytes disorder.

Results: We operated all the patients laparoscopically with no major complications. 2 of the underwent laparoscopic diaphragm resection and pyloroplasty, 2 of them with laparoscopic pyloric cyst dissection, while another 3 with longitudinal contraction pyloroplasty. All of them stopped the gastrointestinal decompression on the post operation day 3 to 4, and left the hospital on day 5 to 7. None of them present with anastomosis stenosis or leakage. We follow up to 4 months – 4 years, all the patients have good prognosis with well development.

Conclusions: Laparoscopic pyloroplasty is a reliable and safe method to treat pediatric non-hypertrophic pyloric obstruction with different etiologies. Compare to open procedure, laparoscopic operation is much more convenient and easier for surgeons, while with less complications and quicker recovery patients.

P015 SIMULTANEOUS OPERATIONS DURING ACUTE SURGICAL PATHOLOGY Elena Y Dyakonova, Alexey A Gusev, Dmitriy A Morozov, Alexandr S Bekin; Scientific Center of Children Health

Current problems in the modern endoscopic surgery is the presence or absence of indications to perform simultane-

Poster Abstracts

ous operations for acute appendicitis. With the extensive development of laparoscopic procedures performed in the department of emergency surgery clinic for children with "acute abdomen" will more accurately diagnose the organs of the abdominal cavity. Often, when performing laparoscopy, in addition to inflammatory changes in the appendix, was identified comorbidities pelvic and abdominal organs such as the fallopian tubes gidatidy, parovarian cyst, ovarian fibroma, Meckel's diverticulum, inguinal hernia. In the absence of expressed purulent process in the abdominal cavity were performed simultaneous operations with the removal of the fallopian tubes gidatid, husking and removal parovarian cyst, removal of fibroids ovarian, resection of Meckel's diverticulum, extended closure of the internal inguinal rings. The presence of purulent peritonitis, is a contraindication to perform such operations.

The aim is to define further surgical approach in identifying comorbidities in children operated concerning appendicitis, without peritonitis.

Materials and methods:

Analyzed the the medical history of 105 patients in the period of 2013 and 2015 had been carried out by diagnostic laparoscopy and identified destructively form of appendicitis with concomitant diseases. Children age from 4 to 17 years.

All children underwent laparoscopic appendectomy about catarrhal or phlegmonous modified forms of appendicitis.

In 33 children (31.4%) during surgery revealed enhanced internal inguinal ring (inguinal hernia) with further suturing.

In 37 children (35.2%) during laparoscopy revealed gidatidy fallopian tubes that have been deleted.

In 10 children (9.5%) intraoperative identified parovarian cyst.

In 11 children with the revision of the small intestine was detected Meckel's diverticulum, with its subsequent resection.

In one case (0.95%) revealed a torsion suspension fatty colon and removed.

In 2 children (1.9%) for the audit of the pelvic organs revealed fibroma, followed by removal of the ovary.

There is a combination of comorbidity one child (0.95%) and inguinal hernia parovarian cyst. 9 children (8.6%) revealed gidatidy fallopian tubes and parovarian cyst. In one child (0.95%), and Meckel's diverticulum diagnosed gidatidy fallopian tube.

Postoperative period in children after simultaneous operations proceeded without complications, no different from the postoperative period in children after laparoscopic appendectomy. All children conducted therapy (infusion, antibiotic, analgesic) does not exceed the volume and timing of the course in children with isolated pathology of the appendix.

Results: Detection of comorbidity of the abdomen and pelvic organs during laparoscopic appendectomy, raises the question before the operating surgeon on the need to perform simultaneous operations. The combination of destructive forms of appendicitis without peritonitis, with gynecological diseases and disorders of the abdominal cavity - is not protivopakazaniem to perform simultaneous operations. If any purulent peritonitis, conducting simultaneous operations is not possible.

Conclusions: In the surgical treatment of patients with combined surgical and gynecological diseases can eliminate all the identified pathology within the same anesthesiological support, relieves repeated operations and associated postoperative surgical and anesthetic complications and emotional stress; eliminates in the early postoperative period in not corrected acute accompanying disease, improves the quality of life in patients

Poster Abstracts

P017 SCARLESS APPENDECTOMY IN CHILDREN Bethany J Slater, MD, FACS, Steven S Rothenberg, MD; Rocky Mountain Hospital for Children

Purpose: Laparoscopic appendectomy is one of the most common operations performed by pediatric surgeons. Single site appendectomy has been gaining popularity due to the proposed increased cosmesis. However, single site surgery has certain disadvantages. The purpose of this study was to review the results of a scarless laparoscopic appendectomy technique.

Methods: After IRB approval, a retrospective review of all patients who underwent scarless appendectomy for appendicitis at a single institution between January and September 2015 was performed. Details examined included patient demographics, classification of appendicitis, operative time, complications, and length of hospital stay. For all cases, a 4 mm and 5 mm trocar were placed through an infraumbilical ring incision and a 3 mm trocar placed in the suprapubic region. After mobilizing the appendix, the mesoappendix was divided with electrocautery. The appendix was then divided with a 5-mm stapler and removed in a specimen bag through the 5 mm port.

Results: 32 patients underwent appendectomy using this technique during the study period. All patients were seen in follow-up at two weeks. The average age was 9.7 years (range from 5 to 16 years) and the average weight was 40 kg (range from 15.7 to 73.3 kg). 14 were female and 18 were male. The classifications of appendicitis consisted of 18 simple, 4 suppurative, 3 gangrenous, and 7 perforated appendicitis. The average operative time was 29 minutes (range from 6 to 53 min) and the average length of stay was 1.9 days (range from 1 to 6 days). There were no complications and all cases were able to be completed with this technique including perforated appendicitis and obese patients. All patients reported satisfaction with their post-operative cosmetic outcome to date. (Figure 1)

Conclusion: Disadvantages of single site surgery include need for a large umbilical incision with increased pain and potential for incisional hernias as well as an inability to triangulate instruments making retraction and dissection difficult. This technique using an additional 3 mm suprapubic port allows for a smaller umbilical incision similar to that of a traditional 3 port appendectomy using a 10 or 12 mm trocar at the umbilicus. The additional 3 mm port allows for easier retraction while maintaining an essentially nonexistent scar. In addition, it is feasible in larger and obese children. This procedure is simpler and faster than a true single site appendectomy for most surgeons. Thus, this technique allows the main scar to be hidden at the umbilicus creating an essentially scarless cosmetic result while still allowing increased maneuverability of the instruments.

P018 ELECTRICAL STIMULATION THERAPY OF THE LOWER ESOPHAGEAL SPHINCTER IN TREATING GASTROESOPHAGEAL REFLUX DISEASE IN PEDIATRIC POPULATION, WORLD'S FIRST REPORTED CASE Rodrigo Hipolito Cifuentes, PHD¹, Rene Carmona Barba, PHD¹, Cristian Zalles Vidal, PHD², Antonio Vega Valdes, MD³, Placido Espinosa Rosas, PHD⁴; ¹STARMEDICA HOSPITAL INFANTIL PRIVADO, ²HOSPITAL INFANTIL DE MEXICO FEDERICO GOMEZ, ³HOSPITAL ANGELES PEDREGAL, ⁴CENTRO MEDICO NACIONAL 20 DE NOVIEMBRE ISSSTE

BACKGROUND: Electrical stimulation therapy (EST) of the Lower Esophageal Sphincter (LES) is a new treatment for Gastroesophageal reflux disease (GERD) that was always used in adult patients, in this work we describe the first case of EST in a child with GERD, the EST improves the pressure of the LES without interfering with its relaxation.

AIM: To describe the first case in pediatric population with the use of ENDOSTIM

METHODS: Case: Female, 12 years old with GERD, with chronic pain, semi choking episodes, heartburn, regurgitation who don't response to proton pump inhibitors with abnormal esophageal pH demeester score of 63.2, hiatal hernia less than 3 cm and esophagitis los angeles grade C evaluated by endoscopy and biopsies reporting chronic esophagitis, manometry with pressure at rest 10.1 mmHg (normal up 14), complete relaxation, the mother refused performing Nissen fundoplication, the case was evaluated and approved by the Bioethics Committee of the hospital. Two Bipolar stitch electrodes were placed in the LES using laparoscopy and a dispositive was placed in a subcutaneous pocket, electrical stimulation was delivered at 20 Hz, 215 ns, 3-8 mA, in 30 minutes session, with recess of 90 minutes, with-

Poster Abstracts

out chance of this parameters, the patient was evaluated using GERD daily symptom and medication use, endoscopy, esophageal ph and high resolution manometry.

RESULTS: 1 female patient, on chronic acid-suppressive therapy who underwent successful laparoscopic implantation of the LES stimulation system, surgery time 1 hour, trans surgical endoscopy with absence of perforation, closure of pillars, measured by GERD daily symptom diaries the patient symptoms improved soon, 2 weeks after the surgery the patient reported better symptom control without the intake of PPI, and the absence of heartburn and regurgitation. 1 month follow-up with esophageal ph shows decrease of De meester score to 20.2, and 3 months esophageal ph shows decrease to 3.9 (**Normal Demeester score less than 14**) manometry with primary peristalsis in 80% of swallowing, complete relaxation, pressure at rest EEI 16.9 mmHg, endoscopy with biopsies reported esophagitis los angeles grade A, without affection of the quality of life, follow up 6 and 12 months after surgery describes absence of any symptom.

DISCUSSION: This is the first pediatric case of long-term electrical stimulation as a treatment for GERD, the results show that electrical stimulation of the LES can improve symptoms of GERD, reduce esophageal acid exposure by augmenting esophageal sphincter pressures and reduce the need for PPI medication without Gastro esophageal side effects typically seen with other antireflux procedures that involve mechanical alteration of the gastroesophageal junction, formal randomized clinical trials are needed this will test the true rate of operative complication and side effects. and the studies could assess whether the device is restricted to patients with no hernia or is suitable for use after crural repair to know the real benefit and safety of this study.

P019 PROSPECTIVE STUDY OF THE USE OF PREOPERATIVE UPPER GASTROINTESTINAL SERIES FOR ROUTINE GASTROSTOMY PLACEMENT Morgan K Richards, MD, MPH¹, Jeffrey Foti, MD², Janie Hallstrand, MD², Jonathan Swanson, MD², Adam B Goldin, MD, MPH, FACS²; ¹University of Washington, ²Seattle Children's Hospital

Introduction: The utility of an upper gastrointestinal series (UGI) as a prerequisite to evaluate for malrotation before routine gastrostomy or gastrojejunostomy (GT/GJ) placement is controversial. Current literature consists of retrospective reviews where 12-42% of patients did not receive a preoperative UGI exam prior to GT/GJ placement. The purpose of our study was to prospectively evaluate the value of an UGI in the workup of patients requiring GT/GJ devices.

Methods: We performed a prospective study examining children from birth to 20 years of age receiving a primary GT/GJ from June 1, 2013 – July 7, 2015. All patients who received a routine GT/GJ device obtained an UGI preoperatively as part of a standardized pathway. For this study, we excluded patients with known malrotation (gastroschisis, omphalocele, congenital diaphragmatic hernia) or prior intra-abdominal operations. Results of the UGI were compared to operative findings. Univariate analyses included Chi2 and t-tests for categorical and continuous variables, respectively ($p < 0.05$). Charge data were used to estimate the cost of the exam.

Results: Of the 264 children that received a routine GT/GJ and met inclusion criteria, 261 (98.9%) had a preoperative UGI. There were 133 (50.4%) female patients and the median age was one year (range: 7.4 days-20 years). Thirteen (4.9%) children had trisomy 18 or 21, and 3 (1.1%) had heterotaxy. For those patients with a preoperative UGI, 253 (96.9%) had a normal study. Of the 8 (3.1%) patients with an UGI suggestive of malrotation, 4 (1.5%) had malrotation confirmed intra-operatively and underwent a Ladd's procedure and GT placement. No patient received a Ladd's procedure without GT after routine workup for a GT demonstrated malrotation on the screening UGI exam. Patients with heterotaxy, but not trisomy, were more likely to have malrotation both on UGI ($p = 0.002$, $p = 0.5$, respectively) and at operation ($p < 0.001$, $p = 0.6$, respectively). Median cost of an UGI was \$794 (range: \$794-1,989).

Conclusion: Among children who undergo routine GT/GJ placement, malrotation is rare. This study demonstrates a lower incidence of malrotation than has been previously reported in similar cohorts because nearly all children received the preoperative imaging study. Previous studies have demonstrated a low incidence of malrotation, but given the retrospective designs and high degree of missing data, justification for changing practice was limited. Formal cost effectiveness evaluation is necessary to evaluate the appropriate use of the test. Careful patient selection may be required to improve the use of UGI as a screening tool for malrotation, which may result in significant cost savings and reduction in radiation administration.

Poster Abstracts

P020 FIRST ESTABLISHED PEDIATRIC ADOLESCENT CENTER OF EXCELLENCE (PACE) IN METABOLIC AND BARIATRIC SURGERY: GUIDELINES, PROCEDURES, PITFALLS AND SOLUTIONS Andrew M Wassef, BA, BS¹, Michael J Donnaire, MD², Ragui W Sadek, MD, FACS²; ¹Rutgers Robert Wood Johnson Medical School, ²Robert Wood Johnson University Hospital

Background: Adolescent obesity, a seemingly nonexistent occurrence to children of the 1960's, has developed into one of the most chronic diseases plaguing children today. Comorbidities commonly associated with adult morbid obesity, such as type II diabetes mellitus, hypertension, and dyslipidemia, are now diseases associated with a much younger subset of morbidly obese patients (15-21 YOA). With the astronomical quadrupled growth of adolescent obesity in just 30 years time, consideration for more invasive treatments such as surgical management of adolescent obesity, has been tested, tried, and found wanting. We present the case of the first established Adolescent Bariatric Center of Excellence in the United States. The following review discusses the epidemiology of adolescent obesity, markers for operative therapy, optimal surgical procedures for adolescent weight loss, multidisciplinary management for this unique patient population, and surprising outcomes of our program.

Methods: The following study consists of forty-one (n=41) adolescent bariatric patients (Male=26, Female=15) with ages ranging from 15-21 years of age who received sleeve gastrectomy. All patients received weight check and blood workup and general examination pre-operatively and post operatively at 1 week, 1 month, 3 month, 6 months and 1 year. All patients were enrolled in the Adolescent Bariatric Center of Excellence at Bristol Meyer Squibb Children's Hospital and subject to all requirements including nutrition, exercise, and support group regimens. Patients were accessed for excess weight loss, resolution of comorbidities, complications, vitamin deficiencies, and general quality of life.

Results:

	Male	Female
Excess Weight Loss	83%	80%
Resolution of T2DM	100%	95%
Resolution of Hyperlipidimia	100%	None
Resolution of Joint Pain	100%	100%
Complication Rate	0%	0%
Vitamin Deficiency	0%	0%
Quality of Life Increase After Surgery (1-10 before/1-10 after)-100	60.5%	58.5%

Conclusions: Surgery for obesity in adolescents has particular risks and benefits that must be accounted for when considering an invasive approach due to their unique physiological, psychological and emotional needs. As such, reasonable guidelines are necessary to ensure successful/safe weight loss in adolescent patients.

P021 ADVANCED TISSUE MANAGEMENT IN LAPAROSCOPY: TECHNIQUES OF PEXY Sonja Kern, Julia Syed, Roman T. Carbon, Prof, Dr, med; Department of Pediatric Surgery, University Hospital Erlangen-Nuremberg

Background: Procedures of pexy show a high impact as a mechanical procedure. Anatomical structures, parenchymatous or hollow organs can change their position due to a pathological process regarding perfusion and function. Following surgical procedures changing of position and condition of structures may occur, demanding fixation, orientation or drapery. Tissue management enables dedication to mechanic (suture, stapler), high frequency (sealing, coagulation), piezoelectric (sealing, coagulation) and biological (fibrin gluing, patch) techniques.

Methods: To preserve organs or rather to keep up their function, there is a wide field of indications and techniques for pexy:

Hollow organs: gastrointestinal tract with kinking (problems of passage because of malposition [angle of HIS]), embryologic remnants [ligaments of LADD], adhesive bands, mal-/nonfixation, sigma elongatum), intussusception (evoked by diverticulum of MECKEL, mesenteric lymphadenitis, hypermobility) or prolapse (anal/rectal prolapse). Regarding a long running compression or distortion of hollow viscus, a memory effect is due to the tissue that necessitates an

Poster Abstracts

external draping, e.g. in combination with luminal splinting. A combination of intracorporeal sutures with sealing (liquid, fleece-bound), draping or reinforcement of the intestinal wall is feasible. A significant status of intestinal prolapse requires combination with paraluminal sclerotherapy, intestinal resection and sacropexy by means of gluing and/or reinforcement with patch [polyglactin-/collagen-mesh] materials. Kinking of uterus (hematometrokolpos by non-/mal-fixation) can be regulated by tightening the ligaments and ligamental reinforcement by biological membranes.

Parenchymatous organs: liver, spleen and ovary can suffer from torsion and wandering, resulting in disturbance of perfusion because of malfixation, associated mass with rotation equivalent, megaly or reposition after omphalocele. Anchoring by sutures to the abdominal wall can be completed with large-area fibrin sealing by laparoscopic spraying, drop-sealing or fleece-bound sealing (TachoSIL, Takeda). Abdominal catheters, e.g. in peritoneal dialysis or ventricular shunts, can be affected and choked on tissue with consecutive occlusion, kinking or compression. Guiding the flexible hose by measures of pexy in a convenient track ensures untroubled function after conditions of dysfunction.

Results: In pediatric laparoscopy (age 0 – 20 yrs, 1400 g - 176 kg) we performed the following interventions/techniques: Gastropexy by suturing in gastroesophageal reflux/fundoplication, duodenopexy in duodenal obstruction (atresia, valves, LADD's ligaments) and jejuno-, ileo- and ileoascendopexy in volvulus and intussusception by suturing and means of fibrin sealing, to connect intestinal loops. In prolapse of colon, sigma/rectum, a combination of intracorporeal sutures to the abdominal wall, the sacral bone, sealing and/or patch reinforcement to the sacrum had been administered. Conditions of torsion or wandering (liver, spleen, ovary) were removed and stabilized by sutures in combination of patch reinforcement ("hammock"-technique) and sealing application. Dislocation and recurrent malfunction of peritoneal catheter systems (Tenckhoff, VP) could be managed by fleece bound sealing to the abdominal wall by performing a track.

Summary: Minimally invasive laparoscopic pexy is feasible and provides regulation of malposition and dysfunction of anatomical structures and organs. Tissue management includes intracorporeal suture techniques, sealing with fibrin glue application and reinforcement by biological patch materials. Organs can be preserved by maintaining perfusion and function of organs.

P022 TREATMENT OF PEDIATRIC EMBEDDED HERNIA WITH AN OMPHALOIDEAN SINGLE SITE LAPAROSCOPIC SURGERY. Haijin Huang², Wei Peng¹, Qian Liu, PHDMD², Haijin Liu, MD²; ¹Gannan Medical University, ²First Affiliated Hospital of Gannan Medical University

Objective: To investigate the feasibility of laparoscopic surgery for the treatment of pediatric embedded hernia with an omphaloidean single site.

Method: A comparative analysis of the advantages and disadvantages of the old surgical treatment of open surgical treatment pediatric embedded hernia and the new surgical treatment for the treatment of embedded pediatric hernia with an omphaloidean single site laparoscopic operation. At the same time, retrospective analysis of the patients who have been treated with an omphaloidean single site laparoscopic surgery for pediatric embedded hernia during the period from January 2014 to 2015 June, We have 18 cases, 2 cases with bilateral inguinal hernia. All were male, the age was 11.4 ± 2.8 months, and the average time of incarceration was 17h. Operation mode is put a stamp card in the umbilical ministry, building pneumoperitoneum, the umbilical edge row 0.5cm incision, placed a operating forceps, Using Kirschner wire for high ligation of the hernia sac.

Result: The old and new operation both have advantages and disadvantages, but the new method is more in line with the needs of patients. And its laparoscopic operation time was 30 ± 17min, the amount of bleeding during operation was 0—10ml. Among them, 2 cases of hernia automatic returning after anesthesia, 14 cases had successful manipulative reduction in laparoscopic assistance. In 2 cases, a small incision was made with 1.5cm, and the contents of the hernia were rapidly reduced after the opening of the narrow loop. After the success of reduction, there were no obvious abnormalities in the intestinal peristalsis, A 0.2cm incision was made at the surface of the hernia sac, and the high ligation of the hernia sac was performed with a self-made sled needle with No. 0 Musi line. All of the children had no intestinal necrosis. 7 cases of occult hernia were found during the operation (Figure 1). After 6 hours into the liquid,

Poster Abstracts

the average hospitalization days is 3.8d. 6 months—1 year follow-up, no recurrence of hernia and intestinal obstruction. The development of testis and the contralateral testis were equal to the contralateral side.

Conclusion: By transumbilical single site laparoscopic technique can be used for treatment of children with incarcerated hernia, but for preoperative evaluation and the surgeon is more stringent. Laparoscopic surgery for children with embedded hernia can be a comprehensive exploration of intestinal hernia content, such as the contents of the intestinal tract, cord and testis, and so on, especially the time of embedding is long. Operation time is shorter, less bleeding, intestinal wall to reduce exposure, avoid serious intestinal edema, decrease postoperative intestinal adhesion, at the same time we can found and treat the occult hernia, and with no destroy of the inguinal canal structure and low recurrence rate. It can also avoid the effects of damage and scar of vas deferens and the spermatic vessels of vas deferens and spermatic vascular function separation sac. In addition, the umbilical single site operation can further reduce abdominal injury, postoperative patients recover quickly.

P023 POSTOPERATIVE ANALGESIA FOLLOWING PAEDIATRIC LAPAROSCOPIC FUNDOPLICATION H Takahashi, BMBS, A Benjafield, BSc, MBBS, R Desai, RNChild, BNurseHons, U Dickson, MBChB, FRCA, M Singh, MBBS, FRCSEdPaedSurg; Birmingham Children's Hospital

Background: There is little evidence in literature regarding the use of patient-controlled (PCA) or nurse-controlled analgesia (NCA) specifically after laparoscopic fundoplication, although they are generally considered safe and effective methods of postoperative analgesia in paediatric surgery. The aim of the study was to evaluate PCA and NCA as forms of postoperative analgesia in children undergoing laparoscopic fundoplication.

Methods: The retrospective study was carried out in a single paediatric centre with six surgeons performing the procedure. Postoperative management of 30 children undergoing laparoscopic fundoplication was reviewed. Those converted to open procedure or transferred to intensive care postoperatively were excluded. Where patients were started on PCA or NCA, the initial prescription consisted of morphine sulphate, 1mg/kg diluted in 50ml saline, at a 0.2-0.5ml/hr background infusion depending on age. The observer-based modified FLACC (Face, Legs, Activity, Cry, Consolability) scoring system was performed by nursing staff. Pain scores of four or above out of 10 were considered inadequate pain control in accordance with the hospital pain team policy and prompted administration of analgesia. Data was collected prospectively by pain team and ward nurses as part of routine postoperative documentation, including pain score, rate of morphine infusion, number of boluses given, action taken for high pain scores, sedation scores and presence of nausea and/or vomiting. All mean values are represented as mean $\pm$ standard deviation.

Results: Patient age ranged from 16 months to 7 years, and weight from 7.76 to 36.6kg. 23 patients had neurological impairment. All patients received regular paracetamol, 19 received an NSAID, and 25 received PCA/NCA. On average PCA/NCA was stopped after 31.52 $\pm$ 15.01 hours postoperatively. Three of the 25 patients on PCA/NCA had pain scores of ≥ 4 at some point during the first 24 hours postoperatively. Two of these patients received additional analgesia with good effect, and one required additional pain team involvement and the use of supplementary ketamine with good analgesic effect. Of the five patients who were not started on PCA/NCA postoperatively, two required enteral opioids due to their pain scores exceeding four. 18 patients had their feed started within 12 hours of surgery. There was no significant difference between the mean pain scores when feed was started at ≤ 12 hours (0.27 $\pm$ 0.59) and >12 hours (0.32 $\pm$ 0.71, $P=0.61$). Seven out of 25 patients on PCA/NCA had nausea, and two patients had itching. All patients with side effects experienced good relief following anti-emetics and anti-histamines. None of the patients had respiratory depression. One patient without PCA/NCA had persistent nausea despite anti-emetics.

Conclusions: Patient or nurse controlled analgesia is an effective form of postoperative analgesia in paediatric patients undergoing laparoscopic fundoplication. Most patients who had significant pain responded well to additional analgesia, including boluses from the PCA/NCA and enteral analgesia. The pain score acts as a trigger for nursing staff to administer additional analgesia. It also encourages appropriate escalation to the pain team. None of the patients on PCA/NCA suffered from significant side effects, and minor side effects were treated adequately.

Poster Abstracts

P024 USE OF 5MM STAPLER FOR INTRACORPOREAL ANASTOMOSIS IN INFANTS < 5KG Bethany J Slater, MD, FACS, Steven S Rothenberg, MD; Rocky Mountain Hospital for Children

Introduction: There are a number of disease processes that require resection and anastomosis in pediatric surgery. Laparoscopic-assisted procedures have been described for intestinal anastomoses in infants and neonates. This study reports our experience with laparoscopic intracorporeal anastomosis using a 5mm stapler.

Methods: 3 patients under 5 kg underwent laparoscopic intracorporeal anastomosis with a 5-mm stapler (JustRight surgical) at a single institution. All operations were performed with 3 ports (a 4mm port of the camera, 3 mm port for the left hand instrument, and 5 mm port for insertion of a 5mm stapler). A transabdominal stay stitch was utilized to line up the two ends of the bowel and provide retraction and exposure. An intracorporeal side to side, functional end to end anastomosis was fashioned using a 5 mm stapler for the anastomosis and a running suture to close the enterotomies. The 5-mm stapler fires 4 staggered rows of 2.0 mm staples and then cuts between them.

Results: The average age was 2.2 months (range 1 to 2.5 months) and the average weight was 3.5kg (range 2.6 to 5 kg). There was one female and two male patients. The average operating time was 107 minutes (range 55 to 160 minutes). The diagnoses included post necrotizing enterocolitis stricture, intestinal duplication cyst, and small bowel atresia with perforation requiring stoma creation. All procedures were successfully completed laparoscopically.

Conclusion: The laparoscopic intracorporeal anastomosis using a 5 mm stapler is a safe and effective technique in infants less than 5 kg. The benefits of this approach includes enhanced visualization, improved cosmesis, and possible decreased adhesions. In addition, this technique may reduce the operative time as compared to performing a hand-sewn anastomosis. Finally, when bowel is resected with this technique, there is minimal intra-abdominal contamination given that the two bowel ends are stapled.

P025 THE EXPERIENCE OF THORACOSCOPIC ESOPHAGECTOMY FOR CONGENITAL TRACHEOBRONCHIAL CARTILAGE REMNANTS OF ESOPHAGUS IN CHILDREN Xu Li, Shu Li Liu, Kaopin Guan, Long Li; Capital Institute of Pediatrics

Objective: The aim of this study was to explore the clinical manifestation and diagnostic characteristics of congenital tracheobronchial cartilage remnants of esophagus, and further evaluate the therapeutic efficacy of thoracoscopic esophagectomy on this disease.

Methods: Total 12 patients (M 6, F 6; ranging from 1. 1 to 7 year old) were diagnosed as congenital tracheobronchial cartilage remnants of esophagus between March 2008 and May 2015. Two patients appeared dysphagia in postoperative one month, and CT and endoscopy were carried out before surgery, and then followed by thoracoscopic resection of esophageal stricture and esophageal anastomosis without conversion to open surgery.

Results: All patients presented recurrent vomiting without gastric juice and bile, especially with complementary feeding. Patients started to appear typical clinical symptoms in 6 months after birth and generally affect healthy development. Upper gastrointestinal contrast showed a typical "pendulum sign" features, thin line change between the esophagus and cardia, distinctive dilation of proximal esophagus. Esophagoscopy examinations showed a sudden expansion of esophageal stenosis and annular bulge can be seen and no passing through the stenosis segment. The stenosis segment was excised and interrupted full-thickness esophageal anastomosis with 5-0 PDS. 5 days after operation, esophageal imaging showed 2 patients appeared little contrast leak, but good recovered without operation. One patient appeared esophageal fistula who underwent reoperation and recovered. 8 patients appeared lower esophageal stricture and symptoms were reduced after esophageal balloon dilatation.

Conclusions: Surgery is the safe reliable way to treat this disease. Thoracoscopic resection of esophageal stricture has some advantages involving less bleeding, quick recovery and minimally invasive injury to chest wall, as well less chances of postoperative pneumonia.

Poster Abstracts

P026 LAPAROSCOPIC RESECTION OF RETROPERITONEAL TUMORS IN CHILDREN Jinshan Zhang, Long Li; Capital institute of pediatrics

Purpose: Laparoscopic surgery is widely practiced in pediatric surgery. However, its application in resection of retroperitoneal tumors in children is limited. In this article, we describe laparoscopic resection for children with retroperitoneal tumors.

Methods: Nine children with retroperitoneal tumor underwent laparoscopic resection between August 2009 and June 2015. Five of nine children were boys, and four were girls. The ages ranged from 2 to 47 months.

Results: The tumors were resected successfully in all patients. The time required for surgery ranged 90 to 230 min (mean: 134 min), and blood loss was from 10 to 100ml (mean: 40ml). The diameter of tumors was 3-12.6cm. The hospital stay period after the operation was 3 to 6 days. The postoperative histologic diagnosis was neuroblastoma in five patients, cystic lymphangioma in two patients, cystic granuloma in one patient, and teratoma in one patient. The patients with malignant tumor underwent chemotherapy in medical oncology. All of patients were followed up from 4 to 46 months. During the following-up, there was no tumor recurrence.

Conclusions: Laparoscopic resection for children with retroperitoneal tumors is safe and effective.

KEY WORDS: laparoscope; retroperitoneal tumor; neuroblastoma; children

P027 TRIPLE ENDOLOOP TECHNIQUE FOR APPENDICULAR STUMP CLOSURE- ARE WE JUSTIFIED IN USING MORE EXPENSIVE OPTIONS? Ketan Parikh, Dr; Jaslok Hospital

Laparoscopic appendectomy is one of the commonest laparoscopic procedures performed in children.

There are various methods of handling the appendicular stump to prevent its blow-out and the resultant complications. These include endoloop application, application of stapler, division with harmonic scalpel, application of clips etc.

In order to provide the benefits of MAS to the maximum number of children, it is important that the cost of MAS procedures do not escalate unnecessarily. We have been using the triple endoloop application for the past 17 years with a zero-complication rate for the appendicular stump. The endoloops are possibly the cheapest option and are as effective as other more expensive options. We either use the ready-made endoloops provided by ethicon or prepare the endoloops using a long length of suture material (chromic catgut).

Materials, methods: We have been performing laparoscopic appendectomy in children since the past 17 years. During the early years, we learnt to close the appendicular stump with endoloops made from chromic catgut. The 1st endoloop is placed within 3 mm of the cecal wall, the 2nd loop within 5 mm of the first and the 3rd loop is placed about 10 mm away. Over the years, we are aware that a multitude of different methods for closure of the appendicular stump have been described but we have not yet changed significantly since we have not yet encountered any complication due to the use of endoloops.

We either use the ready-made loop marketed by Ethicon or prepare the endo-loop from a long piece of chromic catgut (no.1). The principle of either is the same so we have not analysed our data separately for either.

Total number of lap appendectomies done: 749

Acute appendicitis: 325

Interval appendectomy/ Appendectomy in a case of RAP: 424

Poster Abstracts

Results: The appendicular stump was closed by the triple endoloop technique in all but 7 cases of lap appendectomy irrespective of the fact whether it was an acute appendicitis or interval (subacute/ chronic) appendicitis.

In 7 cases, where the stump of the appendix was completely sloughed out, we took a purse-string suture of 2-0 vicryl on the caecal opening. In either case, these 7 cases could not have been handled a good by either of the other modalities of handling the stump including a stapling of the base of the caecum in view of the severe inflammation of the caecum.

We did not have a single case of stump blow-out or leak in these 749 cases.

The average time for placing 3 ready-prepared endoloops was less than 3 minutes.

We feel that the triple endoloop closure of the appendicular stump is an easy, quick and reliable method of appendicular stump closure applicable in almost every type of case and offers the significant advantage of drastically reducing the cost of the procedure.

P028 LAPAROSCOPIC SURGERY OF ESOPHAGEAL HIATUS HERNIA IN NEONATES Zhang Yanxia, BS; Capital institute of pediatric

Introduction: Laparoscopic surgery of esophageal hiatus hernia is widespread used in adults and children, it can provide excellent patients' satisfaction and symptom resolution, and reduce the hospitalization stay. But this procedure is rarely performed on neonates due to the technical difficulty and uncertainly safety and feasibility. However conservative treatment does not work in some cases, especially in type II and III, and patients suffer from gastroesophageal reflux disease which results in poor nourishment and life quality.

Objective: To study the feasibility, safety and effect of laparoscopic surgery of esophageal hiatus hernia in neonates.

Methods: A Retrospective study included 10 neonatal patients who were suffered from esophageal hiatus hernia and underwent laparoscopic surgery in our department from April 2007 to June 2015. Ten neonates aged from 22 hours to 21 days, the average age was 8.1, six male and four females. 3 patients were diagnosed as congenital diaphragmatic hernia antenatally and were transferred to our department immediately after birth. The other seven patients presented symptoms as vomiting frequently, five of them combined with pneumonia, and one of them suffered from malnutrition and anemia. The diagnosis was made based on the upper gastrointestinal contrast. Six cases were type II, and four cases were type III.

Results: Laparoscopic hiatal hernia repair and fundoplication was performed in 9 cases, including 7 cases Nissen fundoplication and 2 cases of Toupet fundoplication, only laparoscopic hiatal hernia repair was performed in one case. The operative time ranged from 80 to 220 minutes. The blood loss during the surgery was minimal, about 1 to 5 mL. No conversion to open surgery. The postoperative hospitalization time was 5 to 14 days. After follow-up of 1 months to 7 seven years, 8 patients developed well with no recurrence, esophageal stenosis and symptomatic recurrence. The patients without fundoplication vomited after the surgery, but healed by position-feeding, and got weight well after 2 months follow-up. The recurrence of esophageal hiatus hernia was confirmed in one patient who were re-operated via an open approach.

Conclusions: Laparoscopic surgery for esophageal hiatus hernia on neonates is technically feasible and safe, but also challenging because of the limited abdominal space and fragile tissues. The surgeons who perform this procedure must be well trained and skillful, so that the postoperative complications can be significantly decreased.

P029 PEUTZ-JEGHERS SYNDROME IN CHILDREN. ENDOSCOPIC CONTROL AND TREATMENT TACTICS. Dmitriy A Morozov, PhD, MD, Professor, Maksim M Lokhmatov, MD, Alexey A Gusev, PhD, Elena Y Dyakonova, PhD, Valentin V Sytkov; Scientific Center of Children Health

Poster Abstracts

BACKGROUND AND AIMS: The Peutz-Jeghers syndrome is a hereditary gastrointestinal tract disease featuring a combination of multiple gastrointestinal polyps along with skin and mucous membranes melanin hyperpigmentation, which is common found around the vermilion border and natural orifices. The disease is genetically determined with an autosomal dominant mutation of STK11 gene. The Peutz-Jeghers syndrome is a rare disease with an incidence rate 1: 250000 cases per year, regardless of race or gender. The goal of the study was to identify appropriate methods for evaluation and treatment of children with Peutz-Jeghers syndrome.

MATERIALS AND METHODS: Routine blood tests, esophagogastroduodenoscopy, colonoscopy, capsule enteroscopy, balloon enteroscopy.

RESULTS: From 2013 to 2015, 7 children with Peutz-Jeghers syndrome were examined and treated in endoscopic department. Based on a history, clinical presentation and staged endoscopic examination results, diagnosis was confirmed in 4 boys and 3 girls, aged from 10 to 16 years.

Endoscopic examination data analysis was performed: in two patients polyps were located predominantly in the duodenum and jejunum with maximum size no more than 2-3 mm, which required further control in 6 months. In 4 cases (2 boys and 2 girls) size of polyps ranged from 4 to 15 mm in diameter and an electroexcision was performed (both in esophagogastroduodenoscopy and colonoscopy). In one case, a boy of 14 years, large polyp (greater than 15 mm) was visualized during capsule enteroscopy at a level of 10-th segment (1 segment = 10 cm) and along antegrade balloon enteroscopy was performed an electroexcision.

Polyp appeared to be hamartomatous on histological examination. All patients with Peutz-Jeghers syndrome, which were examined and treated in endoscopic department, had signs of anemia, hemoglobin levels prior to polyp electroexcision was 90-100 g/l; in a week after procedure there was an increase in hemoglobin levels up to 110 g/l.

CONCLUSION: The Peutz-Jeghers syndrome is a rare disease of gastrointestinal tract. Due to common asymptomatic course of the disease, which may be complicated by intussusception and bleeding, for early diagnosis must be performed a comprehensive examination and, if necessary, endoscopic treatment: balloon enteroscopy with polyp electroexcision, that will significantly improve a general patient condition and increase hemoglobin level up to normal reference range.

P032 LAPAROSCOPIC HELLER MYOTOMY FOR ESOPHAGEAL ACHALASIA IN CHILDREN? A REPORT FROM SHANGHAI

Yeming Wu, MD, Jun Wang, MD, WeiHua Pan, MD; Xinhua Hospital

Objective: It is presented a single center experience of laparoscopic Heller myotomy for achalasia in children from Shanghai of China.

Methods: Summarized the laparoscopic Heller myotomy for achalasia in children during past eight years in Shanghai Xinhua hospital affiliated to Shanghai Jiaotong University Medical School.

Results: A total of 16 cases of preoperative diagnosis of esophagus achalasia were operated by minimally invasive surgery in Xinhua hospital from Oct. 2008 to Dec. 2014. The age of patients is 10 months to 13 years old. 14 cases were successful completed Heller myotomy by laparoscopic procedure and fundoplication, 2 case (12.5%) were transferred to open surgery because of complications of the ectopic tracheal cartilage ring in lower esophagus and the giant duodenal in another one.

One esophageal perforation occurred in 14 cases during operation and was repaired by laparoscopic procedure. It was good recovery after operation. Postoperative patients were followed up for 1 to 6 years. There were no postoperative esophageal leaks. 2 cases need pneumatic dilations two times for postoperative dysphagia. There were mild gastro-esophageal reflux in 2 cases.

Conclusion: Laparoscopic Heller myotomy are effective and should be a first choose for esophageal achalasia in children.

Poster Abstracts

P033 COMBINED LAPAROSCOPIC AND THORACOSCOPIC EXCISION OF ESOPHAGO-GASTRIC LEIOMYOMA IN A CHILD.

Annie Hsiao, BA, Ashwin Pimpalwar, MD, FRCSPed, surg; Division of Pediatric surgery, Michael E DeBakey Department of surgery, Baylor college of Medicine and Texas Children's Hospital, Houston, Texas, USA.

An 11 year old girl presented with history of dysphagia for solids. She had no other symptoms. Esophagoscopy and contrast swallow revealed a lower esophageal mass. CT scan of the abdomen revealed an esophago-gastric mass most likely leiomyoma. She underwent a combined laparoscopic and thoracoscopic excision of esophago-gastric leiomyoma.

Technique: **Laparoscopic** excision was done using 4 ports similar to a fundoplication. One camera port, 2 working ports and one for liver retraction. Esophagoscopy was done continuously during the entire procedure.

Esophageal myotomy was done using a hook diathermy, the leiomyoma was excised under the visualization of laparoscope and esophagoscope and then the esophagomyotomy was closed with intracorporeal sutures.

A 270 Deg posterior partial Toupet wrap was used to cover the suture line.

Thoracoscopy was done using 3 ports. One camera and 2 working ports. Esophageal myotomy was done using a hook diathermy, the leiomyoma was excised under the visualization of laparoscope and esophagoscope and then the esophagomyotomy was closed with intracorporeal sutures.

A contrast swallow 24hrs after the procedure showed no evidence of leakage. She was discharged home on the 4th postop day on full oral diet.

Follow up: At 4 year follow up she was asymptomatic and was swallowing liquids and solids without difficulty.

Conclusion : Combined laparoscopic and thoracoscopic excision of esophago-gastric leiomyoma is feasible and safe procedure in children. Constant visualization with the esophagoscope during the procedure helps prevent esophageal mucosal injuries.

P034 MANAGEMENT OF DUODENAL STENOSIS WITH DELAYED DIAGNOSIS Victoria K Pepper, MD, Karen A Diefenbach, MD; Nationwide Childrens Hospital

Introduction: While duodenal obstruction is typically encountered during the neonatal period, patients with partial obstruction (stenosis or web) may present later in life with feeding intolerance, emesis, or recurrent pancreatitis. Patients with developmental delay may be particularly subject to a delay in diagnosis. We present the case of a 12-year-old male with Trisomy 21 who presented with a 3-month history of non-bilious emesis who was diagnosed with congenital duodenal obstruction using an upper gastrointestinal study and CT scan.

Methods/Results: Due to significant impaction of food in the stomach and proximal duodenum noted on imaging studies, the patient initially underwent upper endoscopy. Using this therapy, the stomach and duodenum was cleared of debris and the diagnosis of duodenal web was confirmed. The patient then underwent laparoscopic excision of the web and transverse closure of the enterotomy. While significant chronic inflammation and adhesions were observed, the procedure was safely completed with minimal contamination. The patient was nasally decompressed until post-operative day (POD) 13 and was discharged home on POD 16.

Conclusion: Delayed diagnosis of duodenal obstruction is rare, but is more likely to be encountered in patients with some form of developmental delay. In these cases, food impaction, stasis, and bacterial overgrowth can complicate the surgical correction. Upper endoscopy can be a useful tool in managing this problem, aiding in evacuation of the stomach and duodenum and completion of a laparoscopic approach.

Poster Abstracts

P035 PRIMARY LAPAROSCOPIC GASTROJEJUNOSTOMY BUTTON PLACEMENT : A NOVEL TECHNIQUE Alessandra C Gasior, DO, MS, Karen Diefenbach, MD; Nationwide Children's Hospital, Columbus Ohio

INTRODUCTION: Gastrojejunostomy (GJ) feeding tubes are often useful to allow enteral feeds when it is unsafe for a child to be fed via gastric feeds. These patients frequently have significant comorbidities in which gastric decompression is also desirable. A primary GJ tube allows for post-pyloric feeding, gastric decompression, and avoidance of a second procedure to either thread a tube through a primary gastrostomy tube or replace the original tube with a GJ tube as a delayed procedure. In addition, placement of a button when possible has the advantage of a low profile system. In our preliminary series, we report a novel technique for placing primary GJ tubes.

METHODS: We performed a single –institution, retrospective review from January 2015-October 2015. We included all patients who underwent a primary gastrojejunostomy placement at our institution. Each procedure was performed in the following manner: The potential gastrostomy site is marked prior to insufflation. A camera port is placed through the base of the umbilicus. A stab incision is made in the left lower quadrant, below the level of the umbilicus. A 4 mm assist port is placed where the gastrostomy will be placed. Three sutures are placed in the anterior wall of the stomach in a triangular fashion. The ends of these are brought up through the fascia. Using Seldinger technique, a wire is passed through a needle into the gastric lumen and the tract is dilated to 20 French. A 20 FR dilator and sheath is placed over the wire and visualized laparoscopically to go through the pylorus. The guidewire is removed and a hydrophilic guidewire is then passed through the dilator into the jejunum under fluoroscopy. The GJ tube is then passed over this wire, through the sheath into the small bowel. Final position is confirmed with fluoroscopy. We evaluated age, weight, comorbidities, indications for jejunal feeds, upper gastrointestinal study prior to operation, size of gastrojejunostomy tube, operative time and operative complications.

RESULTS: Four patients with a median age of 8.1 months (range 3.1-10.1) and median weight of 7.8 kg (range 3.6-9.2) had primary GJ buttons placed. All patients had significant comorbidities including neurologic, cardiac, and respiratory. All patients had UGI studies prior to the operation and were on goal jejunal feeds via a nasojejunal tube pre-operatively. Median operative time was 90 min (range 68-111). All patients reached goal feeds via jejunostomy postoperatively. No 30-day complications were seen. One patient had to have the gastrojejunostomy replaced by interventional radiology 3 months post-operatively due to a broken balloon. One patient died 4 months after his procedure due to his underlying cardiac condition. No perforations occurred and no tubes required repositioning.

CONCLUSION: Primary GJ tubes can be performed by the surgeon under a single anesthetic and save the patient with significant risk due to comorbidities prolonged or multiple anesthetic times. This is a novel surgical technique for primary gastrojejunostomy tube placement. Although the patients in this series all received a GJ button, the technique is applicable to standard GJ tube placement as well.

P036 SPLEEN PRESERVING LAPAROSCOPIC DISTAL PANCREATECTOMY FOR INSULINOMA Anna Poupalou, PHD, Gregory Rodesch, Corina Zamfir, Henri Steyaert; Queen Fabiola Children's Hospital

Introduction: Insulinomas are rare insulin-secreting pediatric neoplasms that arise from pancreatic beta cells. 10% occur in the setting of multiple endocrine neoplasia-type 1 (MEN-1). This is the case of a 13-year-old girl who presented with neuroglycopenic symptoms for 6 months. She was transferred to our center for evaluation and definitive management. Hyperinsulinemic hypoglycemia was found. An MRI was performed and found a 3cm lesion of the tail of the pancreas. The clinical and radiological workup also demonstrated a prolactinoma and adenomas of two parathyroid glands (MEN1 syndrome).

Operative Techniques / Methods: Laparoscopic distal pancreatectomy with preservation of the spleen was scheduled. The patient was installed in a supine position, with the surgeon between the legs. Surgery was carried out using a four-trocar technique.

The first step was the division of the gastrocolic ligament using the LigaSure™ vessel-sealing device in order to enter the lesser sac. The stomach was retracted cephalad together with the left lobe of the liver, which allows for a better

Poster Abstracts

exposure of the pancreatic tail. We started dissection in the inferior border of the pancreas. The peritoneum on the lower pancreatic margin was incised to get access to the retroperitoneal area. Retropancreatic attachments were dissected with the LigaSure™ device. With dissection advanced, the pancreas could be lifted up. The insulinoma became visible on the posterior margin of the pancreas and was well delimited with intraoperative palpation.

Turning down the pancreas helps finding the vessels in the superior border. Next step was the identification and dissection of the splenic vein. In this case, the tail of the pancreas was embodying the splenic vein. Approaching small pancreatic vessels originating in the splenic vein is better performed with a small hook monopolar electrocautery. We continued freeing towards the body of the pancreas. The peritoneum around the proximal splenic artery is also incised with the hook.

Once the splenic vessels were retracted and the dissection was completed the umbilical 5-mm port was converted to a 12-mm port. The EndoGIA™ linear stapler was introduced and transection of the pancreas was performed using two 30mm cartridges. The end of the proximal pancreas was over sewn with four 4-0 Vicryl sutures to prevent pancreatic leak. The specimen was placed in a retrieval bag and extracted through the ombilical port. A drain was placed in the pancreatic bed. Patient recovered well after surgery and was discharged home in a good condition.

Conclusion: Laparoscopic distal pancreatectomy with preservation of the spleen appears to be a feasible, effective and safe procedure in case of pediatric insulinoma. Laparoscopy gives an excellent view of small vessels.

P037 LAPAROSCOPIC SPLENIC ARTERY LIGATION IN THE TREATMENT OF HYPERSPLENISM AFTER REX SHUNT IN CHILDREN Jinshan Zhang, Long Li; Capital Institute of Pediatrics

Purpose: To investigate the effectiveness and feasibility of laparoscopic splenic artery ligation in the treatment of hypersplenism after Rex shunt in children.

Methods: From Aug 2014 to Dec 2014, three children with hypersplenism after Rex shunt were treated in our hospital. The ultrasound and computed tomography (CT) showed splenomegaly and the patency of bypass vein in three children underwent Rex shunt. There was no upper gastrointestinal bleeding and esophageal variceal in all children. Laparoscopic splenic artery ligation was performed in all patients. All patients were followed-up for 6-10months (mean: 8.5 months).

Results: The laparoscopic splenic artery ligation was successfully performed in all patients. During operation, the angiography of portal system showed the patency of bypass vein in all patients. The median operative time was 126 minutes (range: 120-150 min). No patients underwent transfusion, and the length of hospital stay varied from 4 to 11 days (median: 6.6 days). Postoperatively, the complete blood count was within normal range. The size of spleen decreased. The partial splenic infarction and the reduction of splenic blood were found in all patients. After surgery, three children suffered from fever (>38.5?), the duration of fever was 2-5 days.

Conclusions: The laparoscopic splenic artery ligation is an effective treatment of hypersplenism in children undergoing Rex shunt.

P038 ENDOSCOPIC MUCOSECTOMY FOR DUODENAL CORISTOMA Cristobal A Adolfo Abello Munarriz, MD, Ped, Surg; NORTH CLINIC ORGANIZATION

Nowadays, the mucosectomy is a standard procedure used to treat tumors and polyps of the gastrointestinal tract in adults. We applied this procedure to treat a 12 year old female child with chronic abdominal pain, a large duodenal secal and irregular polyps. The endosonography showed the pathology was limited to the mucosa of the lateral wall of the second duodenal portion. Through the use of the endoscopy, sclerotherapy needle, polypectomy snare and endoclips, we effectively removed all polyps without perforation. The previous biopsy suggested an adenoma duodenal. The final diagnosis was an ectopic gastric mucosa. We will present a video of the mucosectomy we performed to treat our 12 year old patient. The video illustrates the procedure, the results and follow-up observations. There was no recurrence of the pathology for 6 months following the procedure. Even though mucosectomies are used mainly for

Poster Abstracts

the treatment of adult patients, our results show that this procedure is a viable approach to treat this pathology in children effectively, and avoid surgery.

P039 SINGLE SITE LAPAROSCOPIC RECTAL PULL-THROUGH WITH SUSPENSION SUTURES FOR HIRSCHSPRUNG DISEASE. Liem NguyenThanh, MD¹, Quynh TranANH, MD²; ¹Vinmec internal hospital, ²National hospital of Pediatric

Aim: to present our technique and primary results of single site laparoscopic rectal pull-through with suspension sutures using conventional instruments for Hirschsprung disease.

Methods: An incision was carried out around the upper border of the umbilicus. A 5mm troca was inserted in the middle for a scope, 5mm troca was inserted in the right and a 3 mm troca was inserted in the left for instruments. A suspension suture was performed to secure the sigmoid colon to the abdominal wall. Dissection around the rectum was carried out and then another suspension suture was performed to suspend the rectovesical or rectovaginal peritoneal fold to the abdominal wall. The dissection around the rectum was continued around 1cm below the peritoneal fold. The operation was completed by transanal approach.

Results: From September 2012 to July 2013, 36 children with Hirschsprung disease underwent the operations. The median age was 2.7 months (range: 14days-17months). Mean operative time was 94.7 minutes. There were no intra-operative or postoperative complications. No conversion to open surgery was required. Mean postoperative stay was 4.1 days. All patients can pass stool spontaneously.

Conclusion: Single site laparoscopic rectal pull-through with suspension sutures using conventional instruments is feasible and safe for Hirschsprung disease.

P040 LAPAROSCOPIC-ASSISTED RESECTION OF A LARGE OMENTAL LYMPHATIC MALFORMATION IN A TWO-YEAR-OLD MALE Barbara E Coons, MD¹, Daniel M Relles, MD², Vincent P Duron, MD²; ¹Columbia University Medical Center, ²Department of Pediatric Surgery, Children's Hospital of New York, Columbia University Medical Center

Introduction: A two-year-old male with a new diagnosis of a large multi-septated abdominal cyst undergoes laparoscopic-assisted resection of this large mass

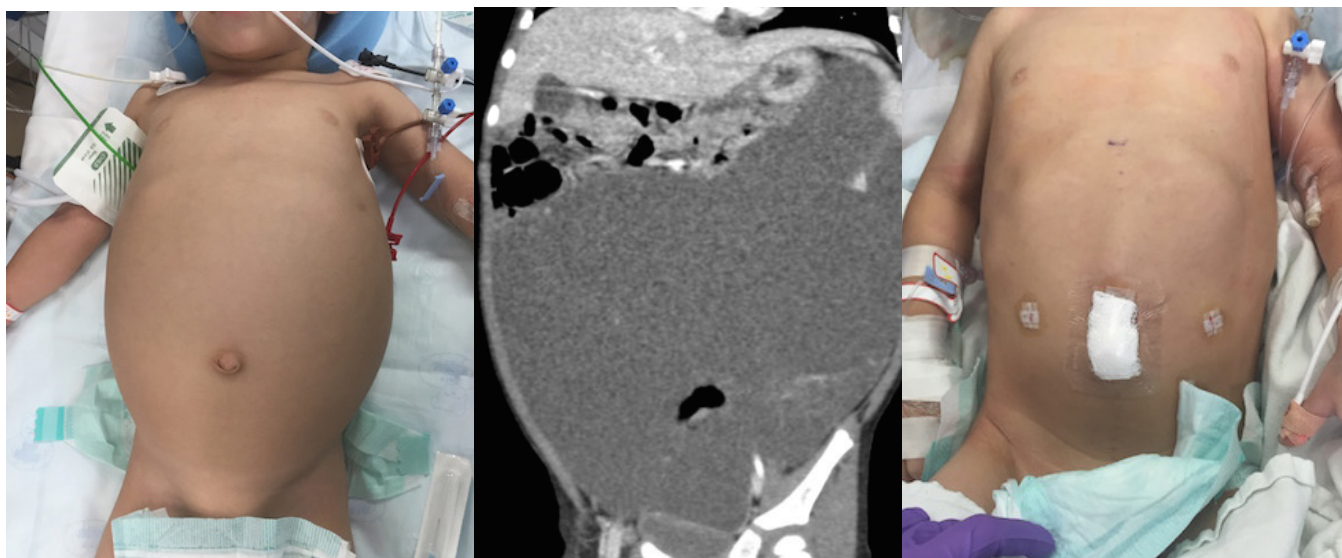
Case Description: The patient, a two-year-old male with a past medical history of reactive airway disease, presented on multiple occasions over the course of one month to the Pediatric Emergency Room with abdominal pain, distension, diarrhea, and temperatures above 38C. Originally, he was diagnosed with enteritis, and sent home twice. On his third visit, he was noted to be dehydrated and physical exam revealed a distended abdomen. An abdominal X-Ray showed a paucity of gas, concerning for possible intestinal obstruction. Laboratory results revealed WBC 22.6k, platelets 438, bicarbonate 18, and ESR 46. An abdominal ultrasound showed a large, septated, fluid-filled structure, extending from the upper abdomen to the pelvis. A subsequent CT Scan showed the cystic mass measured 20x24cm, and had displaced the loops of small bowel to the periphery with large bowel pushed medially and posteriorly by the mass. AFP, beta hCG, and LDH were all within normal limits. Given these findings, it was theorized that the patient had an abdominal lymphatic malformation of the omentum. The patient was started on antibiotics pre-operatively for 48 hours, out of concern that the cysts may be infected, thus causing the fevers.

In the operating room, a 5mm laparoscope was introduced through the umbilicus into the peritoneal cavity. The large cystic mass was seen occupying the entire abdominal cavity. Two more 5mm ports were placed on the right and left sides of the abdomen. Using these ports to insert a laparoscopic needle and a bowel grasper, the multiple septations of the mass were drained one-by-one, until the cystic mass was decompressed. Once the mass was decompressed enough, it was found that it could be easily mobilized from the pelvis. At this time, the umbilical incision was lengthened superiorly and inferiorly, and the cystic mass was partially delivered via the umbilical port site incision. The mass was further decompressed – a total of 2.5 liters of cloudy serous fluid was drained. The mass was found to be originating entirely from the omentum, and the cyst was excised from the surrounding omentum with the LigaSure.

Pathology revealed that the cyst was likely a lymphatic malformation originating from the omentum. On microscopic examination, there were numerous, variably sized and often collapsed channels lined by a single layer of flat cells. Present within the septal walls were variable sized lymphoid aggregates and a large reactive lymph node. Staining was

Poster Abstracts

positive for CD34, CD31, and D2-40 and negative for CK and CK7. Calretinin and WT-1 demonstrated the presence of some mesothelial cells along the outer surface of the mass, supporting the diagnosis of lymphatic malformation. We present this case as a novel technique for the excision of a large multi-septated abdominal lymphatic malformation.



P042 LAPAROSCOPIC VERSUS OPEN EXCISION OF CHOLEDOCHAL CYST IN NEONATES Ju Yeon Lee¹, Jung Hyun Choi¹, So Hyun Nam², Jung Man Namgoong¹, Dae Yeon Kim¹; ¹Department of Pediatric Surgery, Asan Medical Center, University of Ulsan College of Medicine, ²Department of Pediatric Surgery, Dong-A University of Ulsan College of Medicine

Laparoscopic excision of choledochal cyst (LEC) can be performed preferably in pediatrics and adults. However, laparoscopic surgery is not performed well in neonates so that the safety and feasibility of neonatal LEC remain unknown. The purpose of this study is to evaluate the surgical outcomes of LEC in neonates. This is a retrospective study of 28 neonates who underwent excision of choledochal cyst between November 2001 to March 2015. 19 neonates underwent open excision of choledochal cyst (OEC) and 9 neonates underwent LEC. The perioperative and surgical outcomes that were reviewed included age, operative time, postoperative hospital stay, time to diet, and surgical complications. The median age of the OEC and LEC groups were 15 days (range, 2-30) and 13 days (range, 6-26) and the median body weight at the time of operation were 3.5kg (range, 2.64-4.22) and 3.2kg (range, 2.73-3.80), respectively. The median operative time was 160 minutes (range, 126-336) in OEC and 220 minutes (range, 153-280) in LEC groups and there was no significant difference between OEC and LEC groups ($P=0.26$). Intraoperative bleeding was minimal in both groups. The postoperative hospital stay, time to start diet, and time to return to full feeding had no significant differences in both groups. There were no intraoperative complication in both groups and no conversion in the LEC group. After discharge, 4 of 19 (21%) OEC patients experienced readmission due to cholangitis and ileus, there were none in the LEC group. But statistically there was no significant difference. This study revealed that LEC had no difference in prognosis compared to OEC. LEC provided an excellent cosmetic result. So we think LEC can be performed selectively in neonates. This is a small series, therefore future studies will have to include a larger number of patients and evaluate long-term follow-up.

P043 LAPAROSCOPY IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE LIVER TUMOR IN CHILDREN Polad Kerimov, MD; Russian Cancer Research Center named NN Blokhin

The Clinic of Pediatric Oncology Cancer Research Center from 2008 to 2015 were examined and treated 120 with various tumor liver disease. 26 patients laparoscopy was used for diagnostic purposes in 12 patients, radical resection of liver performed in 14 cases. 18 patients were male and 8 female patients.

Of the 12 patients, 8 were male and 4 female. Blood loss was from 0-20 mL in 11 patients, in one case, was 1200 ml in confirming the progression of hepatoblastoma due coagulopathy, which in turn hindered the implementation of hemostasis. The duration of operation from 20 to 30 minutes in 11 cases was 120 minutes in 1 case. Conversion was one

Poster Abstracts

case of the child with the right adrenal neuroblastoma giant with liver disease. There was no possibility of installing additional ports. Being in the intensive care unit for all children was one day. Immediate and long-term postoperative complications were found.

In our clinic performed 14 endosurgical anatomical liver resections. In 10 patients with hepatoblastoma, 3 nodular hyperplasia and one with liver metastasis neuroblastomas. 10 patients were males and 4 females. Hemihepatectomy made 6 patients, 5 patients were diagnosed with hepatoblastoma, and 1 child nodular hyperplasia. Mean operative time was 90 minutes, the average blood loss was 70 - 120ml. Converse has been noted. Being in the intensive care unit was the third day. Antibiotic therapy for 5 days. Immediate and long-term postoperative complications were found. S 2-3 segmentectomy performed in 4 patients, 3 had been hepatoblastoma, 1 nodular hyperplasia. Mean operative time was 60 minutes, the average blood loss was 0 - 50ml. Converse has been noted. Being in the intensive care unit was 2nd day. Antibiotic therapy for 3 days. Immediate and long-term postoperative complications were found. S 5-6 segmentectomy performed 1 patient with hepatoblastoma. Mean operative time was 60 minutes, the average blood loss was 0 - 50ml. Converse has been noted. Being in the intensive care unit was 2nd day. Antibiotic therapy for 3 days. Immediate and long-term postoperative complications were found. S 6-7 segmentectomy performed 1 patient with hepatoblastoma. Mean operative time was 60 minutes, the average blood loss was 0 - 50ml. Converse has been noted. Being in the intensive care unit was 2nd day. Antibiotic therapy for 3 days. Immediate and long-term postoperative complications were found. Segmentectomy S 3 is performed in 2 patients with 1 metastasis of neuroblastoma in S3 and liver with nodular hyperplasia 1. Mean operative time was 40 minutes, the average blood loss was 20 mL. Converse has been noted. Being in the intensive care unit was 1 day. Antibiotic therapy for 3 days. Immediate and long-term postoperative complications were found. Among the 10 patients with malignant pathologies of liver disease progression were observed for the entire period of observation. Median follow-up was 60 months. In conclusion, we should say that endosurgical method of liver resections, absolutely justified in the surgical treatment of tumors, as well as non-neoplastic lesions in the bulk

P044 LAPAROSCOPIC KASAI OPERATION FOR BILIARY ATRESIA - SINGLE SURGEON'S INITIAL EXPERIENCE Chia-Man Chou, PhD, Sheng-Yang Huang, MD, Hou-Chuan Chen, MD; Taichung Veterans General Hospital, Taiwan

Purpose: Minimal invasive surgery for all kinds of surgical disease had been practiced for years. Laparoscopic Kasai operation is one of the most challenging procedures. This study presented the initial experience of our institute in the recent 2 years.

Materials and Methods: From Feb. 2012 to Aug. 2015, patients with biliary atresia operated at our institute were included. General data, operative data and surgical outcomes were collected.

Results: There are totally 6 patients (5 female and 1 male). Mean operative age was 30.8 month-old, and mean operative body weight was 3.51 kg. All patients received laparoscopic hepatic hilar dissection and portoenterostomy with extracorporeal Y-anastomosis. Mean operative time was 299 minutes (mean CO2 inflation time 197 minutes). Mean blood loss was 17 ml, and no conversion to open surgery was noted. Mean follow-up duration was 11.8 months, and 5 of them achieved jaundice-free in one month after the operation.

Conclusion: For neonates or infants with biliary atresia, laparoscopic Kasai operation provides magnification of hepatic hilum with better vision of small bile ducts, precise control of bleeders and less damage of micro-bile ducts. Longer operative time may be overcome by increasing more surgical experiences.

P045 THE TREATMENT OF THERAPEUTIC ERCP FOR PANCREATIC DISEASES IN CHILDREN Zhou Jun, MD¹, Liu Dalin¹, Chen Fanglin¹, Jiang Bin¹, Zou Xiaoping², Yao Yuling²; ¹Nanjing Children's Hospital, Nanjing Medical University, ²Nanjing Drum Tower Hospital

Objective To explore therapeutic value of Endoscopic retrograde cholangiopancreatography (ERCP) for pancreatic diseases in children, the clinical data of all cases of our group in recent years were analyzed retrospectively.

Poster Abstracts

Methods 13 children (age range from 10 months to 13.3 years) patients received therapeutic ERCP from 2007 to 2014. Primary diagnosis was made by B-Ultrasound, CT or MRI, and confirmed with ERCP. According to individual conditions, the suitable therapeutic approaches were selected, such as EST(Endoscopic Sphincterotomy),EPS(Endoscopic Pancreatic Sphincterotomy),EPBD(Endoscopic Papillary Balloon Dilation),ERBD(Endoscopic Retrograde Biliary Drainage),ERPD(Endoscopic Retrograde Pancreatic Drainage),ENPD(Endoscopic Naso-pancreatic Drainage). The leukocyte count and the activities of blood amylase were monitored on 3h, 12h and 24h post-ERCP.

Results Among 13 cases, 3 of Acute Biliary Pancreatitis, 2 of Pancreatic Divisum, 2 of Pancreatic Injury, 2 of Pancreatic Pseudocyst, 2 of Chronic Pancreatitis and 2 of Pancreatic duct stone had been successfully diagnosed and received appropriate ERCP therapy respectively. No severe complications occurred, such as massive gastrointestinal hemorrhage, digestive tract perforation, severe biliary infection and death. Post-ERCP pancreatitis was not noted. Hyperamylasemia occurred in case 3 and case 12, who were cured through conservation treatment and recovered out of hospital. After a follow-up period of 14 to 77 months, clinical symptom alleviated and weight gained in all cases. Up to now, abnormal dietary and altered bowel habits were not found. Liver function and serum amylase did not show abnormal on regular reexamination. The physiological and intellectual developments were normal in all cases.

Conclusions Therapeutic ERCP is minimally invasive, reliable, safe and effective in the treatment for some benign pancreatic diseases in children. But surgical operation is still necessary to thoroughly clear basic pathological change of Congenital Biliary Dilatation.

P046 LAPAROSCOPIC HEPATICO-DUODENOSTOMY FOR AN ATYPICAL CHOLEDOCHAL CYST Mustafa Kucukaydin, MD, Necip Fazil Aras, MD, Ayse Betul Ozturk, MD, Mahmut Guzel, MD; Erciyes University Medical School Department of Pediatric Surgery

Aim: To present a case with atypical choledochal cyst that performed hepatico-duodenostomy with laparoscopic approach in this video.

Case: A 20 month-old female presented with complaints of intermittent crampy upper abdominal pain and vomiting for a month. There was no past history of fever and jaundice. Physical examination did not reveal any significant abnormality. Laboratory investigations including liver function tests were within normal limits. Ultrasound examination showed a cystic hepatic lesion. Then the patient underwent magnetic resonance cholangiopancreatography (MRCP) which revealed that there was a cystic dilatation in choledochus and a cystic dilatation of left hepatic duct (Todani, Type 4B ?). There was no associated anomalous pancreatobiliary junction.

Three 5 mm port were used and retraction of liver was achieved by suturing the ligamentum falciforme hepatis to the abdominal wall. Then gall bladder, cystic choledochus and cystic left hepatic duct were excised and distal end of choledochus was ligated with 4/0 vicryl suture and divided. After that, left and right hepatic duct were separately anastomosed to the duodenum with interrupted 5/0 vicryl sutures. A suction drain was inserted to the peritoneal cavity.

Result: The operation time was about 180 minutes. Feeding was started in 3rd postoperative day. Early postoperative period was uneventful. The patient was discharged from the ward at 5th postoperative day.

Conclusion: The first choice operation for choledochal cyst is hepatico-jejunostomy Roux-Y. Hepatico-duodenostomy is an other alternative technique for treatment of choledochal cyst and number of related papers is increasing with minimally invasive ages.

P048 THE ROLE OF LAPAROSCOPY IN THE DIAGNOSIS AND TREATMENT OF BLUNT ABDOMINAL TRAUMA IN CHILDREN Anna Shapkina; Pacific State Medical University

Trauma is the leading cause of death in the younger age. The evaluation and treatment of abdominal injuries are critical components in the treatment of severely injured trauma patients. Missed injuries are a frequent cause of preventable trauma deaths. Many factors, including the mechanism, the body region involved, the patient's hemodynamic and neurological status, associated injuries, and hospital resources influence the diagnostic approach and the

Poster Abstracts

outcome of blunt trauma. The assessment of a patient with abdominal trauma can be complicated by many factors. Preventable laparotomy in patients with abdominal trauma who present with hemoperitoneum but stable hemodynamic may be avoided by use of laparoscopy. Laparoscopic techniques are being used with greater frequency for the diagnosis and management of traumatic injuries. When performed in carefully selected hemodynamically stable patients, laparoscopy is safe and technically feasible.

Aim: The following study was undertaken to find out the role of emergency laparoscopy as a diagnostic and potentially therapeutic modality in children with blunt abdominal trauma admitted to the hospital which has no opportunity to do computed tomography urgently.

Methods: This is a retrospective review of prospectively collected data of injured hemodynamically stable patients who underwent minimally invasive surgery for blunt abdominal trauma in a Children's Hospital from 1979 to 2014. Data was collected from operative records and medical records. Variables obtained included patient demographics, mechanism of injury, location of injury, operative procedures and findings, blood loss, complications, postoperative outcomes.

Results: Of the 492 children under 15 years of age with blunt abdominal trauma, 35 (7.1%) underwent laparoscopic exploration. Laparoscopy was useful in avoiding open laparotomies in 32 of patients when no significant injury was found, leading to a significant difference in negative exploration rates compared to open procedures. On the basis of laparoscopic findings, 3 of patients underwent conversion to exploratory laparotomy; all of them required repair of significant injuries. Therapeutic laparoscopy was performed in 5 patients (coagulation of organs laceration). Outcomes were improved when laparoscopy was utilized.

Conclusion: Trauma laparoscopy is a safe and effective method for evaluation of the hemodynamically stable patient with suspected abdominal visceral injury and can reduce the number of negative laparotomies and discharge care requirements. Laparoscopy was also helpful in diagnosing some injuries that were not seen on ultrasound. Criteria for the selective use of laparoscopy in trauma need to be better defined. What's more, now surgeons undergo more training in minimally invasive surgery with significantly more laparoscopic experience, and laparoscopy can be a very useful diagnostic, as well as a therapeutic modality.

P049 COMPARISON OF SINGLE PORT PERCUTANEOUS EXTRAPERITONEAL REPAIR AND THREE PORT MINILAPAROSCOPIC REPAIR FOR PEDIATRIC INGUINAL HERNIA. Mevlit Korkmaz, Assoc, Prof, MD¹, Haluk B Güvenç, Prof, Dr, MD²; ¹Fatih University, School of Medicine, Dept. of Pediatric Surgery, ²Dr. Sadi Konuk Education and Research Hospital, Dept. of Pediatric Surgery

Aim: Laparoscopy has been widely used in surgical practice in pediatric age and many techniques for laparoscopic hernia repair have been described till now. In this study, we compared two laparoscopic techniques performed by two surgeons; each surgeon practicing only one of the two techniques.

Materials and methods: A retrospective analysis was performed on the surgical charts, enrolling 71 patients with uncomplicated inguinal hernia who underwent laparoscopic repair. Patients were divided into two groups according to the type of surgery: (group A, 24 patients aged 2mo – 8 y) laparoscopic percutaneous internal ring suturing technique and, (group B, 47 patients aged 35 days – 12 y) three port mini-laparoscopic hernia repair technique. The hernia sac was ligated at the level of internal ring, using non-absorbable 4/0 – 3/0 suture material. Any unexpected contralateral opening was repaired in the same fashion for both groups. Follow-up period was 4mo - 2 years and 9mo - 8 years respectively. Operative time and complications of the surgeons were analyzed.

Results: The analysis showed a shorter operative time for the percutaneous technique for both unilateral and bilateral hernia repair. There were no recurrences in group A, while two recurrences occurred in group B during the learning curve period. A contralateral opening accompanied the presenting unilateral hernia in 3 cases for group A and 16 for group B. One patient had to be converted open resulting from epigastric vessel injury, and postop hydrocele formation was seen in another in group A. No intraoperative complications were seen in group B.

Poster Abstracts

Conclusion: The overall experience shows that laparoscopic repair is a reliable approach regardless of the chosen technique. Percutaneous repair seems to be a less invasive method with shorter operative time but it is not free of complications according to this series.

P050 MINIMALLY-INVASIVE SURGERY FOR TUMOR BIOPSY IN CHILDREN Jun Fujishiro, MD, PhD¹, Tetsuya Ishimaru, MD, PhD¹, Masahiko Sugiyama, MD¹, Mari Arai, MD, PhD¹, Kaori Sato, MD¹, Chizue Uotani, MD, PhD¹, Masataka Takahashi, MD¹, Shohei Takami, MD¹, Tadashi Iwanaka, MD, PhD²; ¹The University of Tokyo, ²Saitama Children's Medical Center

Introduction: The role of minimally-invasive surgery (MIS) for biopsy of thoracic/mediastinal and abdominal/retroperitoneal lesion suspicious of malignancy is unclear. In this study, we clarified the characteristics of MIS for tumor biopsy in children by reviewing our institutional experiences.

Method: All pediatric patients who underwent incisional biopsy by open or MIS technique for tumor-suspicious lesion in the thorax/mediastinum and abdominal cavity/retroperitoneum from January 2006, to August 2015, were included in the study. Pre-, intra- and post-operative clinical data were retrospectively collected by chart review. Numerical data were expressed as the median. Statistical analysis was performed by the Chi square test or the Mann-Whitney's U test. P value less than 0.05 was considered as significant.

Result: Twenty patients (male: 10, female: 10) were included in the study. The median (range) age of the patients was 18.2 (4.5-88.8) months. The final diagnosis of these patients was neuroblastoma in 8, hepatoblastoma in 6, and other lesions in 6, respectively. Ten patients underwent open biopsy and 10 underwent MIS biopsies, respectively.

In comparison with open biopsy group, MIS biopsy group were significantly younger (11.3 vs 31.7 months, $p=0.0065$) and had the diagnosis of neuroblastoma more frequently (7 patients in the MIS group and 1 patient in the open group, $p=0.005$). While there was a tendency that operation time was longer in the MIS group (110.5 vs 85.5 min, $p=0.089$), the amount of bleeding was significantly fewer in the MIS group (0 vs 56 ml, $p=0.005$). There was a tendency that postoperative oral intake was started early (24 vs 38.5 hrs, $p=0.057$) and postoperative peak white blood cell counts (WBC) and C-reactive protein (CRP) were lower (10100 vs 13700/mm³, $p=0.31$, and 2.6 vs 4.9 mg/dL, $p=0.19$) in the MIS group. The timing of postoperative chemotherapy was similar in both groups (6.0 days in the open group and 5.0 days in the MIS group, $p=0.24$).

No open conversion and no postoperative surgical complication were experienced in the MIS group. Sufficient tissue samples for diagnosis were obtained in all patients with MIS biopsy. Two of 10 patients in the MIS group finally avoided open surgery for tumor resection during their clinical course.

Conclusion: In this study, we demonstrated that MIS biopsy was a safe and reliable procedure. While operation time tended to be longer, less bleeding, early oral intake and lower peak WBC and CRP values suggested MIS biopsy was less invasive for pediatric patients with lesions suspicious of malignancy. MIS biopsy led to avoidance of open surgery in some patients, such as those who finally did not need tumor resection in the clinical course or who underwent tumor resection with MIS after chemotherapy. It is other possible advantages of MIS biopsy that biopsy site can be chosen easily with whole inspection and that the incision of open laparotomy or thoracotomy can be made freely for subsequent tumor resection after MIS biopsy. In conclusion, MIS tumor biopsy would be a good option for pediatric patients requiring tumor biopsy, especially with hypo-vascular lesion such as neuroblastomas.

P051 ENDOSURGERY IN PEDIATRIC ONCOLOGY PATIENTS: 4-YEAR EXPERIENCE. Natalia Uskova, MD¹, Sergey Talypov, MD¹, Evgeny Andreev¹, Raisa Oganessian¹, Nikolay Merkulov¹, Natalia Ivanova¹, Victor Rachkov, MD, PhD², Maxim Sukhov, MD, PhD³, Nikolay Grachev, MD¹; ¹Federal Scientific and Clinical Center for Pediatric Hematology, Oncology and Immunology named after Dmitry Rogachev, Moscow, Russia, ²European Medical Center, Moscow, Russia; Russian National Research Medical University named after N.I. Pirogov, Moscow, Russia, ³Federal Scientific and Clinical Center for Pediatric Hematology, Oncology and Immunology named after Dmitry Rogachev, Moscow, Russia; Russian Children's Clinical Hospital, Moscow, Russia

Poster Abstracts

Minimally invasive approach (MIA) is possible for many pediatric surgical diseases. It has a numerous advantages over open surgery such as decreased need for narcotic analgesics, quicker recovery, shorter hospitalization and good cosmetic results. The applications of MIA are steadily expanding. The authors describe their 4-year experience with laparoscopic and thoracoscopic procedures for pediatric oncology patients. The aim of this study was to determine the role of MIA in diagnostics and treatment of children with oncological pathology.

METHODS: Between January 2012 and September 2015, 3729 children with oncological diseases were operated on at our clinic. In 219 patients, MIA was used to perform surgery. The mean age of the patients at the time of a surgery was 63.5 months.

Laparoscopic approach was used in 144 patients: 59 total resections of abdominal and retroperitoneal masses (41%), 32 biopsies of lymphatic nodes and abdominal masses (22.2%), and 53 other surgical procedures such as appendectomy, cholecystectomy, gastrostomy, etc. (36.8%).

75 patients were treated with thoracoscopy: 37 total resections of thoracic masses (49.3%), 34 biopsies of mediastinal and lung masses (45.3%), and 4 other procedures (5.3%).

RESULTS: The mean operative time for biopsy procedures was 52 minutes, for tumor resection – 127 minutes. There were 24 (11%) conversions to open surgery: total resection of tumors – 15, biopsy – 4, other surgical procedures – 5. There were 6 (2.7%) intraoperative complications: total resection of tumors – 0, during biopsy – 3 (rupture of the capsule of a tumor in one case, bleeding from a tumor in two cases); during other operations – 3 (damage of intestinal wall during reduction of a intussusception in two cases, ovary ischemia during ovariopexy in one case). There were 5 (2.3%) postoperative complications – all after total resection of neuroblastoma (Horner syndrome in 4 cases, ischemia of the upper pole of a kidney in one case). There were no deaths as a result of surgery. The morphological verification of a diagnosis was made by the primary biopsy in 95.5% cases. In three cases we had to perform a second biopsy.

CONCLUSION: Our experience with laparoscopy and thoracoscopy in the management of intrathoracic and intraabdominal masses in children shows that MIA procedures are safe, feasible and effective in the treatment of pediatric patients with oncological diseases.

P052 ESTABLISHING A PEDIATRIC ROBOTIC SURGERY PROGRAM IN CANADA Andreana Bütter, Dr, Neil Merritt, Dr, Sumit Dave, Dr; Children's Hospital / London Health Sciences Center

Purpose: Despite the introduction of robotic surgery in 2000, few pediatric surgeons have embraced this technology. We discuss our experience with establishing the first Canadian pediatric robotic surgery program.

Methods: After simulator training, live animal surgery and observation of robotically assisted cases at an outside institution, we performed our first pediatric da Vinci surgery in July 2013. A dedicated robotic coordinator and a select group of operating room nurses were also trained with the da Vinci system. A prospective database was established.

Results: 41 children have undergone robotically assisted surgery for the following 42 procedures: (a) pyeloplasty (17), (b) ureteral re-implantations (12), (c) uretero-uretostomy (1), (d) cholecystectomies (10), (d) interval appendectomy (1) and (d) distal pancreatectomy (1). The average age was 9.7yrs(range 1.6-17.9) and 66% of patients were female. Average operative time was 174 min(range 47–301). Length of stay was 3 days(range 0–20). All procedures were completed without conversion to open or laparoscopy. There were no technical failures. Two post re-implantation patients had small bladder leaks treated conservatively. Despite the lack of haptic feedback, we have noted that the markedly enhanced three dimensional visualization and instrument dexterity offer significant advantages for complex pediatric surgery. This platform may also enable trainees to perform more advanced minimally invasive pediatric surgery.

Conclusions: We have successfully established the first pediatric robotic surgery program in Canada. Our da Vinci system is shared with our adult colleagues, which enables more frequent use as well as some cost sharing. A dedicated group of operative nurses and surgeons are required.

Poster Abstracts

P053 FACILITATING PEDIATRIC VIDEOSURGERY WITH TRANSPARIETAL THREADS, STYLETS AND STITCHES Edward Esteves, PhD; University of Goias

Background: Many surgeons use more than 3 instruments or ports to perform laparoscopic or thoracoscopic procedures, in order to obtain good exposure of the organs. Usually a third and inexperienced assistant is required, and unseen visceral damages are expected. Each port site forms a scar, carries its risk for complications and many scars lead to unpleasant cosmetic appearance. Besides, disposable trocars are not cheap, are large for babies, resulting in large scars, which will grow up with the child. The aim of the authors is to present many tricks and hints to avoid unnecessary or dangerous extra instruments and ports, making videosurgery really minimally invasive.

Patients & Methods: Since 1996, in over 3200 patients, many techniques for application of transparietal staying sutures or sliding knots to retract or pull the liver, spleen, stomach, bowel, tumors, cysts, bladder, rectum, gallbladder, ovaries, lungs, diaphragm, ureters and omentum allowed the use of no more than 3 orifices in most operations. Sliding knots required just one or two ports. Gravity principles have been applied to retract down the omentum, bowel, stomach, and lungs. Fine metallic stylets could be used instead of larger instruments for retraction, introduced through 1-mm stab wounds. Endorectal or gastric tubes could mobilize the organ onto different directions to facilitate some procedures.

Results: All the described techniques proved to be very useful, reduced the number of ports or orifices to a maximum of 2 or 3 ports, have showed to be safer than using a third assistant in some types of operations and confirmed the expected goal of a MIS. Many cases that could otherwise be converted to open surgery had more chance to be accomplished laparoscopically due to a wide exposure. Each type of operation required specific tricks resulting in elegant and fast operations.

Conclusions: The surgeons should apply the different technical maneuvers described herein, to expose and keep the viscera in steady positions, to use the minimum of trocars or extra hands and to make the operations safer, cheaper, faster and easier.

P054 MINIMALLY INVASIVE SURGERY BIOPSIES IN PEDIATRIC ONCOLOGY AND HEMATOLOGY. Natalia Ivanova¹, Victor Rachkov, PhD², Denis Kachanov, MD¹, Sergey Talypov, MD¹, Natalia Uskova, MD¹, Nikolay Merkulov¹, Raisa Oganessian¹, Evgeniy Andreev¹; ¹Federal State Research Centre of Pediatric Oncology and Hematology, ²European Medical Center

Minimally invasive surgery (MIS) is an accepted surgical technique for the treatment of a variety of benign diseases. But the use of MIS in pediatric cancer is a matter of debate. Diagnostic MIS to obtain biopsy specimens for pathology has been accepted as a technique in pediatric surgical oncology. The diagnostic role of MIS was evaluated in our study in children with malignancies.

An interdisciplinary panel approved the indication for minimally invasive or conventional biopsy. Diagnostic accuracy, complications, conversion rate and time before specific treatment after MIS biopsy was estimated.

A retrospective analysis was performed involving all patients who underwent the procedure of laparoscopic and thoracoscopic biopsy in our clinic from February, 2013, to December, 2015. MIS techniques for biopsy of neoplasms were used in 72 procedures: 32 laparoscopies (12 - lymphoma, 4 – for neuroblastoma, other lesions - 16) and 40 thoracoscopies (17 - diffuse lung disease, 12 - lymphoma, 3 – neuroblastoma, 8 - other lesions).

Sample size was more than 2 cm³ – 50 cases, less than 2 cm³ – 22 cases. More quantity of tissue did not provide growth of diagnostic accuracy.

Average intraoperative hemorrhage was 29 ml, ranged from minimal about 5 ml to maximal 1000 ml (when the bleeding occurred because of the rupture of ovarian tumor capsule).

The duration of the procedure ranged from 20 minutes to 2.5 hours (average time 92 minutes).

The average time before specific treatment or outpatient treatment was 6 days.

Poster Abstracts

The conversion rate was 5.5% (1 laparoscopic procedure due to the bleeding because of the rupture of ovarian tumor capsule, 1 thoracoscopic due to severe adhesions of pleural cavity, 2 thoracoscopic due to inability to localize substrate for biopsy).

Intraoperative complications occurred in 4 (5,5%) patients: in 2 cases - lesion of colonic wall by the coagulating, in 2 – continuing bleeding.

Postoperative complications had place in 6 children (8.3%): the perforation of colonic wall in 2 children required open operations, in 1 case the postoperative wound did not heal over for a long time because of soldering of omentum at the edge of wound, in 3 patients with previous lung disease respiratory insufficiency required prolonged AVL.

The diagnostic accuracy of MIS biopsies was 94.5%.

Thereby MIS techniques in pediatric oncology and hematology are enough safe and reliable as a diagnostic tool. Using of MIS for biopsy can reduce the time before specific treatment. MIS techniques can be the method of choice for biopsy in view of interdisciplinary evaluation of possible risk for each patient.

P055 MINIMALLY INVASIVE VIDEO ASSISTED TOTAL THYROIDECTOMY FOR FOLLICULAR NEOPLASM, INITIAL EXPERIENCE Joel Cazares, MD¹, Jorge Osorio-de Dios, MD¹, Jorge Cantú-Reyes, MD¹, Leonor Hinojosa-Amaya, MD², Héctor F Sánchez-Maldonado, MD³; ¹Department of Pediatric Surgery, Hospital Regional de Alta Especialidad Materno Infantil, ²Department of Endocrinology, Hospital Regional de Alta Especialidad Materno Infantil, ³Department of General Surgery, Hospital Regional de Alta Especialidad Materno Infantil

BACKGROUND: Thyroid nodules occur less frequently in children and adolescents, approximately 7 per 1000 children. These thyroid nodules are more often malignant than in adults, in the range of 15-20%.

Both benign and malignant disorders can accuse thyroid nodules. Therefore, the clinical importance of newly diagnosed thyroid nodules is primarily the exclusion of malignant thyroid lesions.

Most patients with thyroid nodules are asymptomatic and nodules are often discovered incidentally. A careful physical examination of the thyroid gland and cervical lymph nodes is mandatory, ultrasound (US) is the most sensitive test available to detect thyroid lesions, measure their dimensions, identify their structure and evaluate diffuse changes in the thyroid gland. The US criteria for FNA (fine-needle aspiration) biopsy are marked hypoechogenicity, microcalcifications, irregular margins and intranodular vascular images. FNA biopsy is currently the best triage test for the preoperative evaluation of thyroid nodules. Thyroidectomy has been the procedure of choice, however, minimally invasive video-assisted thyroidectomy (MIVAT) although considered a challenging procedure; studies in the adult population have documented its safety and efficacy. Its use in pediatric patients is underreported, we present a case report.

CASE REPORT: A 14-year-old girl with an asymptomatic thyroid mass preceding for 4 months was referred from primary healthcare hospital. US demonstrated a thyroid nodule of 2x2cm and corroborated by computed tomography (CT Scan). Thyroid function test (TFT) was within normal limits. FNA revealed follicular neoplasm (Class 4 Bethesda) carrying 15-30% risk of malignancy. Hence, patient underwent a total thyroidectomy by MIVAT approach. The 5mm, 30° laparoscope provided excellent visualization of key structures, such as the superior pole vessels, middle thyroid vein, and inferior pole vessels. Superior laryngeal nerve, recurrent laryngeal nerve, and parathyroid glands were identified. Operative time was 150 minutes, no drainage was needed. Postoperative course was uneventful and currently patient is under levothyroxin treatment.

CONCLUSION: MIVAT approach is safe and effective in the treatment of thyroid nodules in children as well as provides excellent cosmetic results and a better postoperative course, reducing postoperative pain and discomfort. Inclusion criteria for MIVAT technique are: thyroid estimated volume less than 30 mL, thyroid nodule less than 35 mm, absence of enlarged lymph nodes, absence of biochemical signs of thyroiditis and previous thyroid surgery. To our knowledge, this is the first case reported in Latin-America.

Poster Abstracts

P056 USING SUCTION FOR SUTURE RETRIEVAL IN LAPAROSCOPIC EXTRA-PERITONEAL INGUINAL HERNIA REPAIR: A NOVEL TECHNIQUE Cheng-ji Zhao, MD¹, Wen-zhen Yuan, MD¹, Xue-qiang Sun, MD¹, Kenneth Wong²; ¹First Hospital of Lanzhou University, ²The University of Hong Kong

Background: Laparoscopic repair of inguinal hernia in children are now practiced widely. This article described the novel application of negative pressure suction to assist in suture retrieval during laparoscopic extra-peritoneal repair.

Method & Results: The operation is performed very to the usual extra-peritoneal technique, with a long 3/0 suture was passed into a 12G needle, leaving 5-6 cm inside. The prepared needle was then inserted percutaneously at the internal ring until reaching the peritoneum. After passing round the vas deferens extraperitoneally along the internal ring, the needle was pushed into the peritoneal cavity. The suture was then pulled out from the needle using grasper and left in the peritoneal cavity. The needle was then withdrawn back to the level of the internal ring and passed extraperitoneally along the other side of the internal ring, and finally going through the previous puncture site. The suture was inserted back through the needle with the help of grasper. Suction was applied on the needle with 20ml syringe to retrieve the suture. Knot was subsequently tied extraperitoneally to close the internal ring.

Conclusion: Negative pressure suction retrieval of suture using 20ml syringe is safe and simple, easy to master, and does not require special instrument.

P057 PRELIMINARY STUDY OF PEDIATRIC ENDOSCOPIC SURGICAL SKILL ASSESSMENT USING A NEONATAL ESOPHAGEAL ATRESIA/TRACHEOESOPHAGEAL FISTULA SIMULATOR Kyoichi Deie, MD¹, Tetsuya Ishimaru, MD, PhD¹, Shinya Takazawa, MD¹, Kanako Harada, PhD², Hideyuki Sato², Takashi Yamashita², Naohiko Sugita, PhD², Mamoru Mitsuishi, Dr, Eng², Jun Fujishiro, MD, PhD¹, Tadashi Iwanaka, MD, PhD¹; ¹Department of Pediatric Surgery, The University of Tokyo Hospital, ²Department of Mechanical Engineering, The University of Tokyo

BACKGROUND: Highly advanced surgical skills are required in neonatal endoscopic surgery. In particular, thoracoscopic esophageal atresia/tracheoesophageal fistula (EA/TEF) repair is technically difficult because of the remarkable difficulties associated with the small working space and fragility of tissues. Therefore, we developed a neonatal EA/TEF simulator using a rapid-prototyped neonatal chest model to assess surgical skills for thoracoscopic EA/TEF repair. The aim of this study was to show the construct validity of the EA/TEF simulator by video-based endoscopic suturing skill assessment.

METHODS: A rapid-prototyped neonatal chest model was developed using a set of computed tomography data. An artificial esophagus model with mechanical properties similar to those of the actual neonatal esophagus was placed in this model. Thirty-three pediatric surgeons performed an endoscopic intracorporeal suturing and a knot-tying task using the model. They were asked about their experience in thoracoscopic EA/TEF repair and their qualification status by the pediatric Endoscopic Surgical Skill Qualification (ESSQ) system of the Japan Society for Endoscopic Surgery. Each task was video-recorded, and the task completion time and number of manipulations were evaluated. Additionally, two blinded pediatric surgeons assessed the videos using two evaluation methods (the 29-point checklist method and the error assessment sheet method). A statistical analysis was performed using the Wilcoxon rank-sum test. A p-value <0.05 was deemed statistically significant.

RESULTS: Two participants without experience in thoracoscopic EA/TEF repair (one was ESSQ qualified and the other was not) failed to complete the task because the esophagus model was torn when excessive force was applied. In comparison of the thoracoscopic TEF repair experience, the experienced surgeons (ES, ≥5 EA/TEF procedures, n = 4) were significantly superior to the inexperienced surgeons (IS, <5 experiences in the procedure, n = 27) in all four metrics (Table 1). In comparison of surgeons according to ESSQ qualification status, only the result of the 29-point checklist differed significantly between the qualified (n = 12) and non-qualified (n = 19) surgeons. The qualified ES (n=4) were significantly superior to the qualified IS (n = 8) in three metrics; namely, the 29-point checklist, number of manipulations, and task completion time (Table 2).

CONCLUSION: Surgeons with thoracoscopic TEF repair experience showed better endoscopic surgical skills using the

Poster Abstracts

neonatal EA/TEF simulator than those without such experience. This observation was valid in the comparison among ESSQ-qualified surgeons. The construct validity of the simulator was demonstrated, and the simulator would be useful especially for skilled surgeons to practice thoracoscopic EA/TEF procedures.

Table 1. Comparison of suturing performance between the experienced surgeons (ES) and the inexperienced surgeons (IS)

	ES (4)	IS (27)	P value
Checklist	24.1 ± 0.85	20.5 ± 3.71	0.018
Error score	8.12 ± 1.97	12.2 ± 4.56	0.009
No. manipulations	17.3 ± 3.60	32.0 ± 10.0	0.003
Completion time (sec)	228 ± 28.0	367 ± 131	0.025

Table 2. Comparison of suturing performance between experienced surgeons (ES) and inexperienced surgeons (IS) among 12 qualified surgeons

	ES in qualified (4)	IS in qualified (8)	P value
Checklist	24.1 ± 0.85	21.8 ± 2.76	0.029
Error score	8.12 ± 1.97	12.5 ± 5.20	0.060
No. manipulations	17.3 ± 3.60	31.6 ± 12.7	0.027
Completion time (sec)	228 ± 28.0	363 ± 145	0.041

P058 THE EDUCATIONAL IMPORTANCE OF DEFINING SURGICAL EXPERTISE Giuseppe Retrosi¹, Brian Carrillo², Justin T Gerstle¹, Georges Azzie¹; ¹Division of General and Thoracic Surgery, Hospital for Sick Children, Toronto - Canada, ²Hospital for Sick Children, Toronto - Canada

INTRODUCTION: The concept of surgical expertise is widely embraced, yet poorly defined. Historically, an expert in surgery has been defined as an “experienced surgeon with consistently better outcomes than non-experts”. More recently, the literature has accepted that the level of expertise be arbitrarily ascribed on the basis of the number of cases performed. Some studies have however reported that less experienced surgeons outperform experts, at least in so far as technical skills are concerned.

According to the theory of “zone of proximal development” (ZPD), one of the ways a trainee progresses in problem solving is through collaboration with experts. If one believes that the role of experts in providing assistance during the surgical training is crucial, the definition of such expertise is then paramount. The aim of our study is to reflect on the validity of case numbers alone in ascribing the level of psychomotor expertise, and to discuss the potential role for the establishment of parameters to better define who is a “surgical expert”, and the implications thereof.

METHODS: Experts, as defined by the number of cases performed per year, were assessed in the performance of a modified, more difficult, intracorporeal suturing task on the Pediatric Laparoscopic Surgery (PLS) simulator at the 2013 IPEG meeting. Data were analysed using educational theories (constructivism: ability to generate meaning and knowledge from the interaction between ideas and experiences, zone of proximal development (ZPD): the capacity of a learner to progress under the supervision of an expert, and “adaptive expertise” vs “routine expertise”) to help understand the different levels of performance between experts.

RESULTS: We enrolled 39 experts on the basis of the number of cases performed (>50 cases per year). Ten of 39 surgeons were not able to successfully complete the task. While this may have been based on the sheer difficulty of the task, it does bring in to question the very definition of expertise used in this study. In isolation, the number of cases performed by a participant did not allow to predict who would be able to complete a more complex technical task.

Poster Abstracts

CONCLUSION: The definition of surgical expertise is complex. The widely accepted metric for psychomotor expertise, which is based solely on the number of cases performed, has limitations. Issues such as natural technical aptitude, quality of surgical training, and the ability to develop “adaptive expertise” rather than “routine expertise” should perhaps be considered as criteria necessary to define a technical expert. Further study is necessary if we hope to better define surgical expertise, and better understand the implications of the level of expertise of the trainers on the learning of trainees.

P059 THE USE OF LAPAROSCOPIC SIMULATOR (LAPSIM) AS A TOOL IN TRAINING IN MINIMALLY INVASIVE SURGERY (MIS) Maria Paula Losada Rey, MD, Maximiliano Maricic, MD, Maria Marcela Bailez, MD; Cesim - Surgical Simulation Center, Children’s Hospital Garrahan.

Objective: To evaluate the skills that can be developed using a virtual laparoscopic simulator and its utility in the practice of minimally invasive surgery (MIS)

Method: In January 2015 a customized course was designed with 11 different LapSim exercises that was attached to the curriculum of basic courses at the Surgical Simulation Center of Garrahan Hospital. A prospective study including 42 doctors who attended the course between February and October 2015 was evaluated. The course consisted of 11 exercises and 4.5hs as the maximum time to complete it. Seventeen of them (40%) make it up to 100%. Three students (0.7%) completed more than 75%, eight students (19%) completed between 50 and 75% of the exercises and thirteen (30%) completed between 25 and 50% of the course.

A survey of analytical type was developed and used to evaluate the previous experience in MIS, the experience during the execution of the exercises, the difficulty and the percentage by which each exercise was approved, the number of times required to pass each, and total time used to pass the course.

Results: In reference to previous experience in MIS 22 of them (52%) performed less than 1 laparoscopic surgery per week, 19 (45%) between 1 and 3; and only 1 (0.2%) more than 3. The level considered having in endoscopic surgery was high in 4 cases (0.95%), medium in 10 (23.8%) and low in 28 participants (66%).

In total each student required to perform 85 repetitions approximately between 11 exercises to pass the course, being fewer for those who partially completed the same.

The maximum time to complete the course was 4.5hs, the average time spent per student was 2.79hs

The average approval rate of progress, was 69.6%

Conclusions: This study allows us to observe that with an estimated maximum of 4.5 hours while having different exercises performed with an average of 85 repetitions to approved them LapSim enables us to acquire the minimum skills such as avoiding stretching of tissues, prevent unnecessary movement through measuring the length of the angular course, acquire the behavior of having both instruments remain in the field at all times, prevent tissue damage, among others.

Such skills we think are minimal tools needed to acquire to think about the possibility of a video endoscopic surgery. The LapSim provides us with the basic course of these skills but does not offer the necessary strategy to perform a specific surgery only punctual movements that allow surgery to develop efficiently, optimizing motion and making sure not to damage structures.

P060 SINGLE PORT LAPAROSCOPIC APPROACH TO INCARCERATED INGUINAL HERNIA IN CHILDREN Jun Zhang; Capital Institution of Pediatrics

Objective The purpose of this study was to explore the value of single port laparoscopic approach to incarcerated inguinal hernia in children.

Methods After umbilical incision, one trocar was inserted to establish the pneumoperitoneum. AZ- laparoscope was

Poster Abstracts

inserted at the umbilicus with a no-damage clamp. By the no damage clamp to inspect the hernia contents types and incarcerated degree. Combined external manual pressure and no damage clamp the incarcerated inguinal hernia can be pulled, then observed the condition of incarcerated organs. If there was no injury ,the high ligation of hernial sac was given. Intraoperative explored the hidden contralateral hernia simultaneously.

Results March 2013 to September 2014, 48 cases w successfully underwent single-hole laparoscopic surgery. Preoperative diagnosis of incarcerated hernia on the right side in 32 cases, 16 cases on the left. Intraoperative exploration 10 cases of recessive contralateral hernia were detected. Incarcerated hernia contents included 36 cases of bowel, 8 cases of ovarian, 4 cases of omentum. All incarcerated content were successfully reset by Manual reduction assistance, then observed 5 minutes, 48 cases incarcerated organ blood flow were good. Unilateral hernia operation time were 10 ~ 18 minutes, mean 15 minutes, while bilateral hernia were 16 ~ 30 minutes, average 24 minutes. Children ate after anesthesia awake, all could endure pain and discharge the mean postoperative 12 hours. There were no postoperative wound infection, scrotal edema and hematoma .The follow-up time was 3 to 9 months, no recurrence and other complications.

Conclusions Single port laparoscopy for incarcerated inguinal hernia in children without broken the anatomy of the inguinal canal and high ligation of hernial sac. Laparoscopy allowed for simultaneous reduction under direct visual control. Recessive contralateral hernia could be detected. It is safe and effective, minimally invasive, is a worth promoting new technology.

P061 NEW INANIMATE LOW-COST LAPAROSCOPIC TRAINING MODEL FOR CHOLECYSTECTOMY , APPENDECTOMY AND GYNECOLOGICAL PATHOLOGY. Maria Paula Losada Rey, MD, Maximiliano Maricic, MD, Maria Marcela Bailez, MD; CeSim Surgical Simulation Center, Garrahan Children's Hospital. Buenos Aires, Argentina.

We present a new inanimate low-cost training model for multi or single port laparoscopy. It can be used to simulate,cholecystectomy, appendectomy and gynecological pathology.

The anterior surface resembling the abdominal wall was made with silicone, foam rubber and synthetic leather. Simulated intrabdominal content made of latex, silicone and fabrics was partially covered by an adhesive film as anatomical fixations , filled with fluid and covered with vaseline to improve the visual and tactile sensation.

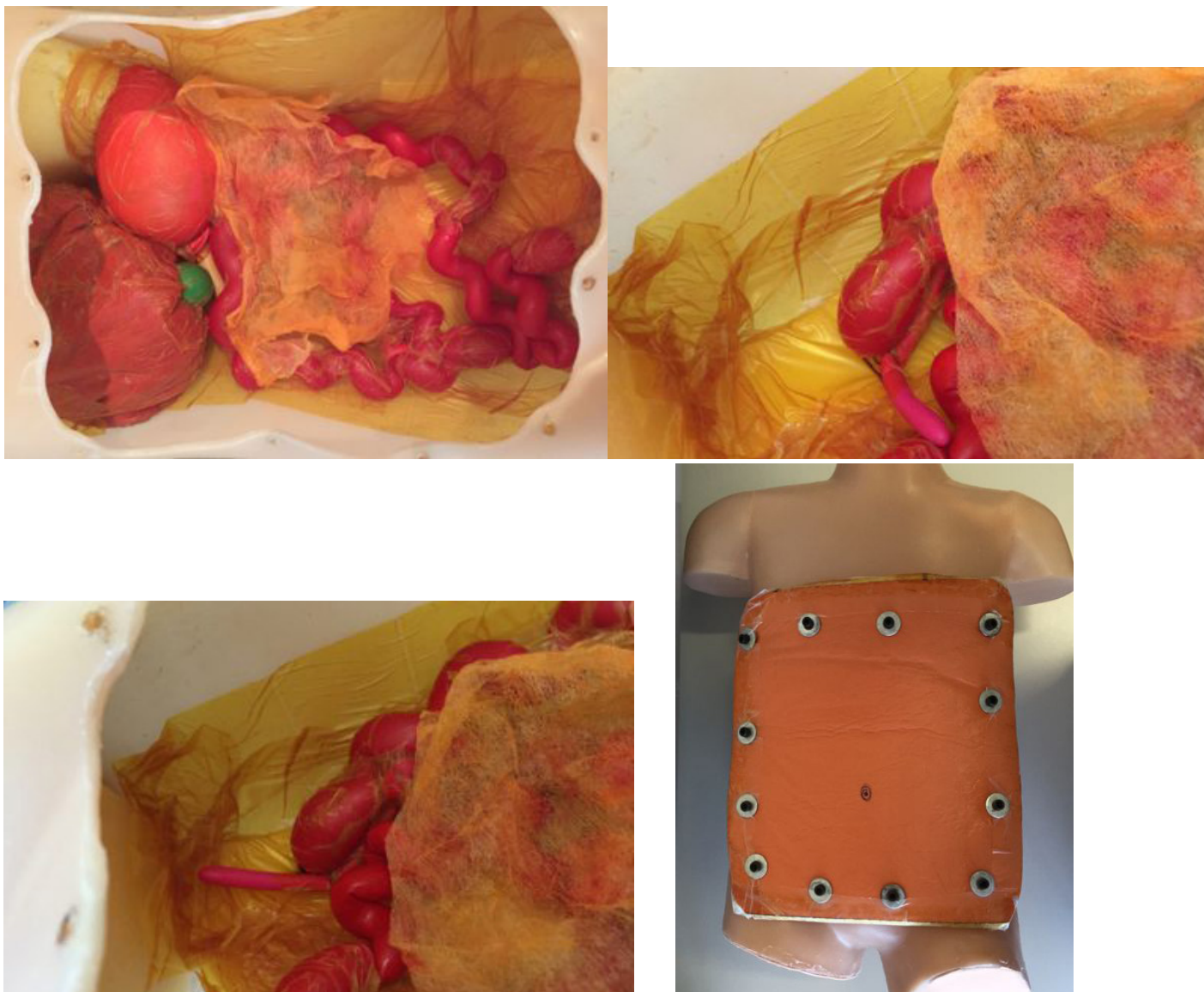
Practice include: optimizing the use of the 30 degrees lens, placing and fixation of ports, making stab incisions and resecting the appendix, gallbladder and an ovarian cyst. Resections can be achieved using intra and extra corporeal sutures , staplers and clips. Currently, the model does not support the use of electrocautery.

It allows the trainees to go through all the steps of a real procedure, starting with the placement of trocars. The abdominal wall has blood vessels that may be injured.

We created it as a tool to train trocar insertion and use of the lens but we extended its features for training use of both hands,teamwork and specific procedures.



Poster Abstracts



P062 EXPERIENCE OF USING THREE-DIMENSIONAL IMAGING SYSTEMS DURING PEDIATRIC LAPAROSCOPIC AND THORACOSCOPIC SURGERY Manabu Okawada, MD, Hiroyuki Koga, MD, Takashi Doi, MD, Go Miyano, MD, Geoffrey J Lane, MD, Atsuyuki Yamataka, MD; Juntendo University School of Medicine, Tokyo, Japan

Aim: Recently a number of manufacturers have developed three-dimensional (3-D) image systems that significantly improve visualization and enhance the ability of a surgeon to perform delicate endoscopic dissection and suturing. These 3-D image systems may also assist in the education of surgeons-in-training, as they can have a better understanding of anatomic relations during endoscopic surgery. Here we report our experience of using a 3-D image system during advanced pediatric laparoscopy and thoracoscopy and present our assessment of its effectiveness.

Method: Our series comprises 6 subjects. Indications for laparoscopic/thoracoscopic surgery were choledochal cyst (CC; n=2), male imperforate anus with recto-prostatic/bulbar fistula (IA; n=3), and congenital pulmonary airway malformation (CPAM; n=1). Surgery was performed using either a rigid (IMAGE1 SPIESTM 3-D in full high-vision, 0°, 30°/10mm, Karl Storz, Germany) or tip-flexible (ENDOEYE FLEX 3D, 10mm, Olympus, US) 3-D image system. Effectiveness was evaluated by 4 board certified pediatric surgeons with specialist training in endoscopic surgical skills according to a simple grading system with respect to conventional 2-D instruments: poorer, effective, better, much better, or very good. Evaluations were made intraoperatively when a particular surgeon was the operating surgeon.

Poster Abstracts

Results: Mean age at surgery was 36.7 months (range: 8-127). Mean weight at surgery was 13.1kg (range: 8.4-29.7). Both 3-D systems were evaluated as being very good during suturing by all 4 surgeons. All graded both systems as being good for dissection, but for closer inspection for example during distal dissection during CC excision, the flexible system was graded as being poorer and was actually replaced by a conventional 2-D system because of halation due to reflected scope light. For dissection of the rectobulbar fistula in male IA, the flexible system was graded as being effective. Gradings were worse for thoracoscopic procedures compared with laparoscopic procedures because access to the thorax was limited by the size of the intercostal spaces. However, suturing was faster and accuracy was improved with 3-D systems compared with 2-D systems. In addition, with 3-D systems, the scopist does not need to be as technically adept as is required with 2-D systems because of the superior depth perception and perspective provided by 3-D imaging systems.

Conclusions: We believe 3-D video imaging systems can greatly facilitate the efficiency of endoscopic reconstructive procedures, especially suturing, and conversion from 3-D to 2-D is convenient. Although 3-D imaging systems cost more than conventional 2-D systems, the enhanced depth perception of 3-D endoscopes enhances performance and accuracy and could prove to be cost effective for minor minimally invasive surgical procedures.

P066 EFFICIENT TECHNIQUE FOR SINGLE PORT LAPAROSCOPIC INGUINAL HERNIA REPAIR IN CHILDREN Rafik Shalaby, MD; Al-Azhar University

Background: The desire to reduce incision related morbidity and pain while achieving improve cosmetic results has recently led to the introduction of single incision pediatric endosurgery [SIPES]. Over the last few years, SIPES is increasingly used for a variety of procedures; single incision laparoscopic hernia repair [SILHR] is perhaps its common applications. Intracorporeal suturing and knot tying during SIPES remain one of the most challenging tasks. The aim of this study is to present a novel technique to avoid excessive purposeless movements during SILHR in children.

Patients and Methods: One-hundred and fifty patients with 170 hernial defects were subjected to SILHR during the period from June 2009 to October 2011. Extraperitoneal saline was injected around internal inguinal ring [IIR] in males. The opened IIR was closed by percutaneous insertion of purse string suture using Reverdin Needle (RN) with intracorporeal suture tie. The main outcome measurements were; feasibility of the technique, tightness of the suture tie, operative time, postoperative hydrocele formation, recurrence rate, and cosmetic results.

Results: One-hundred and fifty patients with 170 hernial defects were subjected to SILHR during the period from June 2009 to October 2011. Ages ranged between 6 months and 7 years (mean 2 ± 24.2 years). They were 101 males and 49 females. Eighty-four patients presented with right sided inguinal hernia, 46 patients with left sided hernia, and 20 patients with bilateral hernia. The mean operative time was 12.4 ± 1.7 minutes for unilateral cases and 18.6 ± 1.7 minutes for the bilateral cases. On follow-up, there was only 1 case of recurrence and 3 cases of hydrocele and the scar is nearly invisible.

Conclusion: The preliminary results of this study showed that our technique is very promising to achieve secure closure of IIR and reduced operative time with excellent cosmetic results.

P067 ROLE OF SINGLE-SITE UMBILICAL LAPAROSCOPY IN THE TREATMENT FOR INGUINAL INCARCERATED HERNIA IN CHILDREN. Li GuiBin; the 5th central hospital of TianJin

Objective To evaluate clinical effect of single-site umbilical laparoscopy in the treatment for inguinal incarcerated hernia in children.

Methods Retrospective reviews were conducted for the clinical data of the 105 children of inguinal incarcerated hernia during January 2010 to August 2014. According to different operative approach, single-site laparoscopic surgery group (SLS, n=56) and open surgery group (OS, n=49) were assigned and compared. The follow-up period was 6-36 month.

Poster Abstracts

Results Operation underwent successfully in both groups .The average operative duration had significant difference , which was (33.73 ± 4.41) min for OS versus (25.13 ± 4.82) min for 48 cases in SLS($p<0.01$) ; the operative duration of other 8 cases in SLS was (32.25 ± 2.18) min, because of discovery occult inguinal hernia and treating bilateral hernia. The average operative blood loss was (3.18 ± 2.90) ml for OS versus (1.73 ± 0.88) ml for SLS($p<0.01$).The hospitalization duration was (4.22 ± 1.16) d for OS versus (3.50 ± 0.97) d for SLS($p<0.01$). The postoperative complication were 24.5% for OS and 8.9% for SLS.

Conclusion Single-site umbilical laparoscopy is safe and efficacious for inguinal incarcerated hernia in children .It offers many advantages such as mini-invasiveness , quick recovery ,fewer complication and discovery of occult inguinal hernia.

P068 UTILIZATION OF SINGLE INCISION LAPAROSCOPIC SURGERY APPROACH IN TREATMENT OF PEDIATRIC INTUSSUSCEPTION Ilan I Maizlin, MD, Jerry S Chen, MD, Mike K Chen, MD, Colin A Martin, MD, Scott A Anderson, MD, Vincent E Mortellaro, MD, David A Rogers, MD, MHPE, Robert T Russell, MD, MPH, Elizabeth A Beierle, MD; Children's Hospital of Alabama, Department of Pediatric Surgery, University of Alabama at Birmingham

Introduction: The purpose of our study is to evaluate the feasibility and effectiveness of single-incision laparoscopic (SILS) approach in treatment of idiopathic intussusception, defining its role in care of children requiring operative intervention. Intussusception is one of the most common causes for intestinal obstruction in infancy, but no investigation has been undertaken to examine the employment of SILS in this pediatric problem.

Methods: Following IRB approval, retrospective chart review was performed for all patients less than 18 years old who underwent operative management of intussusception between 2009 and 2015. Patient demographics and operative details were recorded. Descriptive statistics were performed for continuous variables, with linear t-tests with Bonferroni correction for statistical analysis.

Results: Seventeen children were treated via SILS approach. Median age was 11 months (range 2-168). Major presenting complaints were vomiting (84%), abdominal pain (78%) and distention (38%). During surgery, 12 ileocolic, 3 ileo-ileal and 2 colocolic intussusceptions were identified. Eleven (65%) of 17 were successfully reduced using SILS. The 6 children (35%) who could not be completely reduced via SILS, underwent conversion to open procedure via 2cm extension of the single umbilical incision for extracorporealization of bowel. Five (83%) required bowel resection and one (17%) had completion of reduction. Partial SILS reduction of intussuscepted bowel was possible in all cases prior to conversion to laparotomy, allowing for smaller incision and less extensive bowel resection. There were no instances of bowel perforation or spillage. Table 1 provides further intraoperative and post-operative comparison of SILS, SILS converted to open and purely open procedures. No difference was noted between SILS and open conversion patients in median operative time ($p=0.35$), days to initiation of diet ($p=0.65$) or length of post-operative hospitalization ($p=0.37$). During same period, 7 patients underwent open reduction, with similar median operative time ($p=0.48$), but significantly longer time to initiation of diet ($p=0.04$) and post-operative hospitalization ($p=0.03$). With mean out-patient follow-up period of 32 days (± 11 days), no significant post-operative complications were observed in any of the children.

Conclusions: Single-incision laparoscopic reduction of intussusception was successful in majority of patients. Children who failed SILS reduction were managed by small extension of the umbilical port incision and majority of them required bowel resection. Considering comparable operating time but improved post-operative recovery periods, SILS appears to be a useful technique in management of pediatric intussusception.

Poster Abstracts

Table 1: Operative details of SILS, SILS converted to open and open procedures

	SILS (Range)	SILS to Open (Range)	p- value	Open (Range)	p- value
Number of Patients	11	6		7	
Median Operative Time (minutes)	28 (21-54)	49 (32-85)	0.35	43 (23-65)	0.48
Mean Time to Initiation of Diet (days)	1 (1-5)	1.5 (1-4)	0.65	3 (1-6)	0.04
Mean Post-Operative Hospitalization (days)	2 (1-6)	3 (1-5)	0.37	6 (5-9)	0.03

P069 TWO-STAGE SINGLE-INCISION LAPAROSCOPIC TOTAL PROCTOCOLECTOMY WITH ILEAL POUCH-ANAL ANASTOMOSIS: OUR INITIAL EXPERIENCES. Makoto Suzuki, MD, PhD¹, Yasuyuki Unhide, MD¹, Kenjiro Ogushi, MD¹, Sayaka Otake, MD¹, Hiroyuki Kuwano, MD, PhD, FACS²; ¹Division of Pediatric Surgery, Integrative Center of General Surgery, Gunma University Hospital, ²Department of General Surgical Science, Gunma University Graduate School of Medicine

Background/Purpose: Restorative total proctocolectomy with ileal pouch-anal anastomosis (TPC-IPAA) is the treatment of choice in children with ulcerative colitis (UC) uncontrolled with medical therapy. Laparoscopic surgery has been shown to offer several advantages over the open approach in this setting. And also, Laparo-endoscopic single-site surgery (LESS) is gaining popularity. The purpose of this study is to show our initial experiences of two-stage LESS TPC-IPAA and to present some considerations about this technique.

MATERIALS AND METHODS: We retrospectively reviewed the patients with medically refractory UC who underwent two-stage LESS TPC-IPAA for UC at our institution between June 2014 and September 2015. All patients were on aggressive medical therapy with corticosteroids or immunosuppressors and were selected for this approach on the basis of their body habitus and the absence of relevant comorbidities. The first-stage consisted of LESS TPC-IPAA with a diverting ileostomy. The TPC was performed through a single access device to the abdominal cavity, placed at the ileostomy site marked preoperatively and a J-pouch ileal reservoir created outside the stoma incision. Ileostomy was closed in the second stage after the three months.

RESULTS: Three patients were identified who had undergone LESS TPC-IPAA. Ages ranged from 10, 15, and 16 years old, respectively. The mean operating time was 536 minutes (range, 382 to 640), mean blood loss was 269.3mL (range, 155 to 428), and incision length was 3 cm. No intraoperative complications or conversions to conventional laparoscopy or open surgery occurred. In all cases the postoperative course was uneventful. The patients could tolerate a solid diet on postoperative day 4 ± 2. Satisfactory functional results were achieved in all, there was no significant perineal excoriation and quality of life was excellent.

CONCLUSIONS: In our experience, despite instruments and camera being in-line, working angles are not compromised, and visualization is adequate, a LESS approach to total abdominal colectomy for refractory ulcerative colitis has been shown to be safe and feasible.

P071 A COMPARATIVE STUDY OF TRANSUMBILICAL SINGLE INCISION LAPAROSCOPIC AND CONVENTIONAL TRI-PORT LAPAROSCOPIC IN DUODENAL ANASTOMOSIS Jinshi Huang, MD¹, Yue Zhang², Kuai Chen¹, Junfeng Tao¹; ¹Jiangxi provincial Children's Hospital, ²Capital Institute of Pediatrics

Objective: Explore the umbilical single parts of the safety and feasibility of laparoscopic technique duodenostomy.

Methods: The clinical data of 51 patients who underwent laparoscopic from Feb. 2013 to Mar. 2015 were retrospectively analyzed. 22(team A) patients were designated to the single incision laparoscopic and 29(team B) to conventional triport laparoscopic. The data of intraoperative and postoperative were compared.

Poster Abstracts

Results: Group A longitudinal cutting transverse suture average operation time was (84.67±19.70) min, slitting and transverse suture group B average operation time was [(77.10± 28.63) min, P>0.05]; Group A diamond anastomosis average operation time was (124.15±30.92) min, diamond anastomosis group B average operation time [(115.70±19.21) min, P>0.05]; The average postoperative eating time in group A (5.15±0.99) d, group B [(4.84±0.92) d, P>0.05]; group A the postoperative hospital stay was (11.80±2.76) d, group B[(11.13±2.58) d, P>0.05]; postoperative complications of two groups of near term complications were no significant difference (P>0.05).

Conclusions: Single incision laparoscopic treat neonates with duodenal obstruction is feasible,safe,simple,cosmetic,and with a lower cost.

P072 TREATMENT OF PEDIATRIC CICATRICAL ESOPHAGEAL STENOSIS BY LAPAROSCOPIC GASTROSTOMY JOINT BALLOON DILATATION USING FORLEY'S CATHETER Weili Xu, Suolin Li, Lin Liu, Yanbin Fang, Chi Sun, Wenbo Wang; Department of Pediatric Surgery of Hebei Medical University

Objective: To explore the feasibility and curative effect of laparoscopic gastrostomy joint balloon dilatation by Forley's Catheter for pediatric cicatricial esophageal stenosis.

Methods: From July 2006 to February 2014, 11 children with cicatricial esophageal stenosis were admitted in the Department of Pediatric Surgery in the Second Hospital of Hebei Medical University, 8 males and 3 females, aged 39.27 +/- 29.32 months. All patients were performed laparoscopic gastrostomy under general anesthesia and combined with balloon dilatation using the simple Forley's Catheter since the 7th day after operation.. All patients were reviewed by contrast esophagography at 1 month, 3 months, 6 months, 1 year and 2 years postoperatively and the diameters variation of the stenosis segments were measured and compared.

Results: All of 11 cases were performed laparoscopic gastrostomy peacefully, the operative time was 24.01 +/- 5.02 minutes, the intraoperative blood loss was 15.91 +/- 4.37 milliliters and the postoperative hospital stay was 8.18 +/- 0.98 days. Balloon dilatation of esophageal stenosis were performed smoothly since the 7th day operatively. After 1 month of dilatation treatment, 4 cases can take a small amount of solid food. 9 cases can take normal diet after 3 months of dilatation. Almost all children can take normal diet at 6 months. The variation of esophageal diameters of the stenosis segments increased obviously between the first and the third month postoperatively, comparing to the other periods (F = 13.407, P = 0.000 < 0.01). Complications including fistula dermatitis or eczema (n=8), stoma prolapse (n=1) and esophageal mucosa hemorrhage after dilatation (n=2) were observed. No stoma retraction, esophagus perforation, thread or catheter rupture and peritonitis were found.

Conclusions: Laparoscopic gastrostomy joint balloon dilatation by Forley's Catheter can cure cicatricial esophageal stenosis effectively, Less trauma, less bleeding and faster recovery were observed, routine equipments and simplified operative procedurewere required.

Table 1. Diameter variation of stenosis segment after esophageal dilatation treatment

Item	Preoperation to postoperative 1 month	Postoperative 1 month to 3 months	Postoperative 3 months to 6 months	Postoperative 6 months to 12 months
Diameter variation of stenosis segment in different period	3.36±1.12(mm)	7.82±2.71(mm)	4.18±2.14(mm)	3.36±1.29(mm)



Poster Abstracts

Figur 1. Esophageal barium meal radiography in various periods preoperatively and postoperatively

A diameter of stenosis segment is 2mm preoperatively

B diameter of stenosis segment is 6mm after procedure and dilatation treatment for 3 month

C diameter of stenosis segment is 8mm after procedure and dilatation treatment for 6 month

D diameter of stenosis segment is 12mm after procedure and dilatation treatment for 1 year

P073 MINIMAL INVASIVE SPLENECTOMY, A JOURNEY FROM TRADITIONAL LAPAROSCOPY TO SILS. INITIAL CASE SERIES REVIEW Mohamed Shoukry¹, Shamshad Syed², Munther Haddad¹; ¹Chelsea and Westminster hospital and St. Mary's Hospital, Imperial College, ²St. Mary's Hospital, Imperial College

Aim of study: Currently, minimal invasive splenectomy (MIS) is carried out in most paediatric surgery centres. Our institute is practising single incision laparoscopic splenectomy (SILS) and Hybrid port Laparoscopic Splenectomy (HPLS) replacing traditional multiple ports splenectomy. HPLS technique adopts use of SILS and additional 5mm port to facilitate additional laparoscopic procedures. This article is a review of early experience with laparoscopic splenectomy in paediatric-age group.

Method: Retrospective case note review of all MIS performed between September-2010 and August-2015, which was carried out consistently by same surgical team in 2 different tertiary centres. Patients' demographic details, operative time, hospital stay and complications were collected and analysed.

Results: Twenty three patients (12 girls) with age range 5-13 years. All patients have benign haematological disorders. ASA grade was 2-3. Estimated spleen weight by USS was 500 grams. Fifteen SILS procedures and 8 HPLS have been carried out electively. Other surgical procedures were done simultaneously including: 5 cholecystectomies, 4 liver biopsies and 1 appendectomy. None of MIS procedures were converted to multi-port however. Conversion to open happened once to retrieve huge spleen (1350 grams). Mean operative time was 174 minutes (range 75–300 minutes). Postoperatively, all patients received patient control analgesia (PCA). Average hospital stay was 6 days (range 4-7 days). All patients continue to have haematological and surgical follow-up. No mortality and no significant morbidity have been reported.

Conclusions: Recently, SILS has gained popularity in paediatric-age group. SILS proves to be safe and feasible. There is no significant difference in outcome but SILS has superior cosmetic impact compared to multi-port.

P074 THE GUIDANCE OF 256-SLICE HELICAL CT ANGIOGRAPHY FOR SINGLE INCISION LAPAROSCOPIC SPLENECTOMY IN CHILDREN Suolin Li, MD, Meng Li, Weili Xu; The Second Hospital of Hebei Medical University

Objective: To explore the role of the guidance of 256-slice helical CT angiography (CTA) for single incision laparoscopic splenectomy (SILS).

Methods: Between May 2011 and April 2015, 34 children with various hematologic and autoimmune disorders underwent SILS. The anatomic type of splenic pedicle, the adjacent relationship of splenic vessel to the pancreas, and presence of accessory spleen were detected by CTA before operation. The individualized strategy was drawn up accordingly. The above-mentioned parameters were recorded again by telerecording in SILS and compared with those by 256-slice helical CT angiography (McNemar's Test was applied).

Results: The consistency between the indexes by CTA and those by operation was high, including the two anatomic types of splenic pedicle ($\chi^2=1.0$, Kappa=0.75, $P>0.05$), the adjacent relationship between splenic vessel and the pancreas ($\chi^2=0.33$, Kappa=0.81, $P>0.05$) and accessory spleen detection ($\chi^2=0.33$, Kappa=0.74, $P>0.05$). All 34 SILSs were accomplished successfully.

Poster Abstracts

Conclusions: CTA before operation is applicable, to identify the anatomic type of splenic artery, the adjacent relationship between spleen vascular path and the pancreas, and accessory spleen, thereby it could provide accurate and reproducible information for SILS.

P075 A COMPARATIVE STUDY OF SINGLE-INCISION LAPAROSCOPY AND CONVENTIONAL LAPAROSCOPY FOR ACUTE CHILDREN APPENDICITIS Jun Zhang; Capital Institute of Pediatrics

Objective: To describe the technique and evaluate the outcome of single incision laparoscopic approach for acute appendicitis in children.

Methods: 114 Children with acute appendicitis who underwent single-incision laparoscopic surgery or conventional laparoscopic surgery between March 2013 and March 2015 were reviewed. Mean age at operation were similar in 2 groups (single-incision laparoscopic surgery vs conventional laparoscopic surgery: 64.7+10.1 months vs 68.5+13.5 months). The mean follow-up period was 13.7 months (range, 3 to 24 months). 31 acute simple appendicitis, 63 suppurative appendicitis and 20 gangrenous appendicitis were included.

Results: All cases underwent single-incision laparoscopic surgery or conventional laparoscopic surgery successfully. Mean operation time was decreased in single-incision laparoscopic surgery group ($p < 0.05$). There was no significant difference between the 2 groups in intraoperative blood loss, postoperative complication and postoperative stay.

Conclusions: Single incision laparoscopic approach for hernia of acute appendicitis is a safe and effective, minimally invasive new technology.

P076 SINGLE-INCISION LAPAROSCOPIC APPROACH FOR HERNIA OF LINEA ALBA IN CHILDREN. Jun Zhang; Department of Pediatric Surgery, Capital Institute of Pediatrics, Beijing 100020, P. R. China

Objective: To describe the technique and evaluate the outcome of single incision laparoscopic approach for hernia of linea alba in children.

Methods: A 2 cm vertical umbilical incision was made and stretched horizontally. An extra-long 5-mm 30° laparoscope (26046BA, Karl Storz GmbH & Co. KG, Tuttlingen, Germany) was inserted through the 5 mm middle port. A 3 mm lateral ports was made for instruments. The patient was placed in Trendelenburg position. CO₂ pressure was maintained between 8 and 12 mmHg. The bladder was emptied using a urinary catheter,

The extraperitoneal fat was cleaned after the hernial sac was resected. The coloboma of linea alba was repaired by approximating the tissue on each side. The peritoneum was reconstructed with continuous suture.

Results: From May 2014 to May 2015, 6 cases underwent single-incision laparoscopic surgery. Mean operation time was 32.5 minutes (range, 30 ~ 45 minutes). Oral intake was resumed in anesthesia recovery period. All could endure pain and discharge on the postoperative 12 hours. There were no postoperative wound infection. The follow-up period was 1 to 12 months, no recurrence and other complications.

Conclusions: Single incision laparoscopic approach for hernia of linea alba is a safe and effective, minimally invasive new technology. The hernia of linea alba could be repaired with a cosmetic outcome.

P077 SINGLE-INCISION LAPAROSCOPIC 90% PANCREATECTOMY FOR THE TREATMENT OF PERSISTENT HYPERINSULINEMIC HYPOGLYCEMIA OF INFANCY Jinshan Zhang, Long Li; Capital Institute of Pediatrics

Objective: The authors describe the use of Single-incision laparoscopic 90% pancreatectomy for persistent hyperinsulinemic hypoglycemia of infancy (PHHI) and report the outcomes in this article.

Methods: Between July 2011 and February 2015, the single incision laparoscopic 90% pancreatectomy was performed in three children with PHHI. All patients underwent 18F-DOPA PET/CT before surgery, which showed diffuse physio-

Poster Abstracts

logic 18F-DOPA activity in entire pancreas. All patients were followed-up. The levels of blood sugar and insulin were recorded postoperatively.

Results: The time required for surgery was 120 to 230 min, and blood loss was minimal without necessity for blood transfusion. The hospital stay period after the operation was 6 days. The duration of postoperative abdominal drainage was 4 to 5 days. The level of fasting blood glucose after surgery was higher than that before surgery (4.38-8.9mmol/L vs. 0.54-1.8mmol/L). The level of fasting insulin after surgery was lower than that before surgery (2.4-5.5uU/ml vs. 14-33.3uU/ml). The duration of following-up was 4 to 46 months. During following-up, the levels of blood glucose and insulin were normal in three patients undergoing 90% pancreatectomy. There was no the recurrence of hypoglycemia after reoperation in this patient.

Conclusions: Single incision laparoscopic 90% pancreatectomy for children with PHH is safe and effective.

P078 A MODIFIED LAPAROSCOPIC PIRS TECHNIQUE FOR REPAIR INGUINAL HERNIA AND HYDROCELE IN CHILDREN

Péter Etlinger, MD, Angélica Osório, MD, Nuno Carvalho, MD, Student, Jorge Correia-Pinto; Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga; ICVS/3B⁺ PT; Government Associate Laboratory, Braga/Guimarães, Portugal; Department of Pediatric Surgery, Hospital de Braga, Braga, Portugal

Background: Various laparoscopic techniques have been suggested for closure of patent *processus vaginalis* in children either with inguinal hernia or communicating hydrocele. The percutaneous inguinal ring suture (PIRS) presented by Patkowsky *et al* (2006) is one of these techniques that has as advantages to leave no visible scar avoiding metachronous hernia, but it is associated with a recurrence rate higher than open herniotomy. With the objective of reducing the recurrence rate, we modified the PIRS technique. We present our technique in a video, step-by-step and the major complications that we had as well as the results of our series.

Methods: In the last two years and a half, we used this modified PIRS technique in 312 patients [284 inguinal hernias (242 males | 42 females) and 28 hydroceles] with a median age of 3.1 yo (range 0.1-15.2 yo). Briefly, the technique included a 3 mm dissection grasper introduced through a stab-incision in the *linea alba* just above a 5 mm trocar (30° optics) introduced through the umbilicus in a SILS-like approach. With the help of the 3 mm grasper and an Abbocath 16G, we manage to i. safely pass the Prolene® loop and Ethibond® 2-0 thread extraperitoneally, between the peritoneum and the testicular vessels and the vas deferens; ii. Exit the peritoneum only once, leaving no peritoneal gaps; iii. Cauterize the peritoneum in the external superior quadrant of the internal inguinal ring.

Results: Median operative time for unilateral and bilateral repair was 31 and 54 minutes, respectively. Among complications, we had 4 (1.3%) intraoperative events (femoral vessels puncture), and 3 (1%) patients developed, a few weeks after the procedure, inguinal granuloma related with the inguinal Ethibond® thread. Moreover, we had two (0.6%) ipsilateral hernia recurrences (repaired with re-laparoscopy), whereas none case of testicular atrophy, residual hydrocele or metachronous hernia had been noticed up to now.

Conclusion: Our modified PIRS technique is safe and reliable for inguinal hernia or communicating hydrocele repair with excellent cosmetics, minimal complications and a low recurrence rate.

P079 SILS RECTOPEXY Vincent E Mortellaro, MD, Mike K Chen, MD; Children's Hospital of Alabama

This is a video of a SILS rectopexy in a 2yo female who had rectal prolapse that did not respond to bowel management. The technique uses a 3 port Olympus SILS port as well as standard instruments, and sutures.

P081 THORACOSCOPIC DELAYED PRIMARY ANASTOMOSIS WITH ESOPHAGEAL INTERNAL TRACTION FOR CONGENITAL ESOPHAGEAL ATRESIA

Takahisa Tainaka, PhD¹, Hiroo Uchida¹, Hizuru Amano², Akihide Tanano¹, Chiyoe Shirota¹, Akinari Hinoki¹, Kazuki Yokota¹, Naruhiko Murase¹, Kazuo Oshima¹, Ryo Shiotsuki¹, Kosuke Chiba¹, Hiroshi Kawashima², Yujiro Tanaka²; ¹Nagoya University, ²Saitama Children's Medical Center

Poster Abstracts

Background: The management of newborns with long-gap esophageal atresia remains a challenge for pediatric surgeons. It has been determined that esophagoesophageal anastomosis is the optimal esophageal reconstruction procedure for most pediatric patients with the condition. Recently, various esophageal traction techniques have been described. In 2013, we reported a two-stage thoracoscopic repair procedure for long-gap esophageal atresia involving the use of simple internal traction. We subsequently used a two-stage thoracoscopic delayed primary anastomosis procedure to treat four pediatric patients with long-gap esophageal atresia. In this study, we evaluate the reasonability and feasibility of the procedure.

Patients and Methods: We retrospectively analyzed the clinical data of patients that were free from serious cardiac anomalies and were treated with two-stage thoracoscopic delayed anastomosis at two institutions between January 2010 and September 2015. The surgical complications and outcomes of these cases were evaluated. The two-stage operation was used to treat long-gap esophageal atresia and cases of esophageal atresia involving a vascular ring. The two-stage thoracoscopic delayed primary anastomosis procedure was performed as follows: In the first operation, a thoracoscopic procedure was carried out using three ports. The proximal esophagus was extensively dissected towards the cervical section, and the distal esophagus was gently mobilized down to the diaphragm. Both ends of the esophagus were subjected to traction using sutures, which were tied to costal bones and approximated to each other. Gastrostomy was performed at the same time. In the second operation, which was carried out 6–24 days after the first operation, delayed primary esophagoesophageal anastomosis was performed in combination with adhesiolysis. The study protocol was approved by each institutional ethics committee.

Results: Thoracoscopic esophageal traction was performed for long-gap esophageal atresia in 3 patients and for a vascular ring in 1 patient. In the latter patient, it was found that a proximal esophageal pouch had been surrounded by the vascular ring; therefore, we decided to perform the abovementioned two-stage repair procedure. The median operation times of the first and second operations were 253 min and 241 minutes, respectively. In addition, the first and second operations resulted in median blood loss of 3 ml and 13 ml, respectively. The postoperative complications experienced by the patients included gastroesophageal reflux in 3 cases and minor anastomotic leakage, anastomotic stricture, tension pneumothorax, chylothorax, and hiatal hernia in 1 case each. All of the patients survived to discharge and are doing well (median follow-up period: 310 days).

Conclusion: The two-stage thoracoscopic repair of esophageal atresia is reasonable and feasible for long-gap esophageal atresia and can also be applied to unexpected cases of esophageal atresia associated with other conditions.

P082 CONGENITAL DIAPHRAGMATIC HERNIA CORRECTION THROUGH MINIMALLY INVASIVE SURGERY, AN UNEXPLORED APPROACH IN A REFERRAL PEDIATRIC HOSPITAL OF THE BUENOS AIRES AUTONOMOUS CITY Hsien Chen Yang, MD, Claudia Cannizzaro, MD, Maria Bailez, MD, Aixa Reusmann, MD, Mariano Boglione, MD, Martin Rubio, MD, Patricia Nemer, Gastón Senyk, MD, Diana Fariña, MD; Garrahan Childrens Hospital

Introduction: “Dr. JP Garrahan” Pediatric Hospital (GPH) has pioneered the Fetal Diagnosis and Treatment Program (FDTP) to optimize the care of patients with congenital anomalies (CA) starting from the prenatal stage. Since 2012, selected fetuses with major CA have been born in the institution.

Objective: To analyze the surgical approach and the minimally invasive surgery (MIS) selection criteria for CDH in the GPH.

Material and Methods: descriptive chart study of newborns with diagnosis of CDH of the GPH’s FDTP during a period of 3 years.

Results: in the selected period, the FDTP has followed up 479 patients in which 46 (9.6% fetuses) had prenatal diagnosis of CDH. 36 fetuses with CDH were admitted to GPH neonatal therapy, and 30 (83, 3%) were candidates for surgery (study population n = 30). Only 3 (10%) operations have been boarded by MIS. Other 3 (10%) patients had right-sided HDC. The postoperative mortality was 3.33% (1/30). Following the anatomical classification, 3.33% were type A; 26.66% type B; 60% type C; and 10% type D. Patients who were operated by MIS shared certain conditions for this surgical approach: none has required extracorporeal membrane oxygenation (ECMO), pulmonary pressure was

Poster Abstracts

2/3 less than systemic, ventricular function was adequate, the oxygenation index was below 5 without requirement of epinephrine or inhaled nitric oxide when entering the surgical room. However, there were 6 other surgical candidates that accomplished those demands and the chosen the approach was by laparotomy.

Conclusion / Discussion: The MIS for CDH was not the major approach probably by the lack of guidelines for patient selection. We propose to conduct a survey to centers with expertise in pediatric MIS on their selection criteria to agree on CDH MIS patient selection criteria.

P083 COMPARING THE OUTCOMES OF THORACOSCOPIC VERSUS OPEN REPAIR OF CONGENITAL ESOPHAGEAL ATRESIA AT MEDIUM TERM FOLLOW UP Patrick Ho Yu Chung, Kenneth Kak Yuen Wong, Paul Kwong Hang Tam; The University of Hong Kong

Background and objective: Thoracoscopic repair of congenital esophageal atresia has been advocated in recent years. While early outcomes appear satisfactory, outcomes at medium term follow up period remain under-reported. The objective of this study is to compare the outcomes of thoracoscopic surgery (T) vs open surgery (O) at 3 years after repair of type C esophageal atresia. Three year was chosen because this is the usual timing when feeding with solid food should have been fully established

Methods and materials: Retrospective study with a study period from 2005 to 2012 was carried out. Demographic data from the two groups were reported. Outcomes measured were tolerance to oral feeding and growth parameters at 3 years after operation. In addition, number of endoscopic dilatation per annum, Patient Scar Assessment Questionnaire (PSAQ) score and the presence of chest wall deformity at the latest follow up were also studied.

Result: A total of 19 patients were identified with 7 being operated thoracoscopically. All malformations were type C. The median body weights at operation were 3.5 kg (T) vs 2.8 kg (O), $p=0.08$ and the median follow up periods were 3.9 years (T) vs 5.3 years (O), $p=0.32$. Regarding the feeding practice at three years after operation, 85.7% of patients in the thoracoscopic group were able to tolerate age-appropriated diet while 83.3% of patients in the open group did ($p=0.68$). 28.6% (T) and 33.3% (O) of patients complained of vomiting at least once a week ($p=0.57$). Concerning growth parameter, the median body weight percentiles at 3 years were 36.5% (T) vs 46.3% (O), $p=0.42$ and the median body height percentiles were 35.5% (T) vs 40.5% (O), $p=0.50$. At the latest follow up, 57.1% (T) and 33.3% (O) of patients had received endoscopic dilatation of esophagus for more than once ($p=0.06$) and the numbers of dilatation per annum were 3.6(T) vs 1.5 (O), $p=0.08$. The median PSAQ scores were 32.8 (T) and 46.7 (O), $p=0.03$. None of the patients in the thoracoscopic group complained of chest wall deformity while 2 patients in the open group did.

Conclusion: Outcomes of thoracoscopic repair of congenital esophageal atresia in terms of feeding tolerance and growth at medium follow up period appeared satisfactory and were comparable to that of open surgery. At a slightly longer follow up period, patients operated with open surgery tend to have inferior cosmetic outcomes but fewer requirements for endoscopic dilatation of esophageal stricture. Further studies with larger sample size and longer follow up period are recommended to study the long term outcomes of these two operative approaches.

P084 THORACOSCOPIC LIGATION OF CHYLOUS FISTULA BY A NOVEL IMAGING TECHNIQUE OF INTRAOPERATIVE INDOCYANINE-GREEN FLUORESCENT LYMPHOGRAPHY AFTER THORACOSCOPIC REPAIR OF TRACHEOESOPHAGEAL FISTULA Ryo Shiotsuki¹, Hiroo Uchida¹, Akihito Tanano¹, Takahisa Tainaka¹, Chiyoe Shirota¹, Akinari Hinoki¹, Kazuki Yokota¹, Naruhiko Murase¹, Kazuo Oshima¹, Kousuke Chiba¹, Yoshiaki Satoh², Masahiro Hayakawa²; ¹Department of Pediatric Surgery, Nagoya University Graduate School of Medicine, ²Division of Neonatology, Center for Maternal-Neonatal Care, Nagoya University Hospital

Introduction: A series of successful thoracoscopic repairs of esophageal atresia (EA) and tracheo- esophageal fistula (TEF) have been reported over the past decade. Chylothorax, which is a rare but serious complication, might occur when thoracic duct or lymphatic vessels are injured during surgery. Indocyanine-green (ICG) fluorescence-guided approaches are useful in lymphography, micro-arteriography, and tumor visualization under near infrared (NIR) excitation and emitted light at a wavelength of 760 nm, bringing highly sensitive detection. Sentinel lymph node navi-

Poster Abstracts

gation with ICG fluorescence is widely used for breast cancer and melanoma. Recently, NIR-excited ICG imaging has spread to endoscopic surgery, including intraoperative biliary fluorography in laparoscopic cholecystectomy. However, fluorescent lymphography of chylothorax has been poorly reported, especially in neonates and infantile conditions.

Here, we report successful thoracoscopic repair of chylothorax with NIR-excited ICG imaging guidance after TEF repair.

Operative procedure: The thoracoscopic procedures were performed using three ports: an optical 10-mm port, placed in the 6th intercostal posterior axillary line with a 30-degree rigid thoracoscope for ICG detection; and two 3-mm operative ports, one placed in the 3rd intercostal mid-axillary line, and the other placed in the 6th intercostal back region. An artificial pneumothorax of 4-6mmHg with carbon dioxide achieved an adequate surgical view. Preoperative ICG injection (0.25 mg) at inguinal site was performed at 1 hour before surgery. During surgery, thoracic duct and chylous leakage were visualized by ICG detection with a thoracoscopic NIR camera.

Case 1: A girl with TEF type C was born at gestational age 37 weeks at 2670 g. Under intubation due to labored breathing, thoracoscopic repair of TEF was performed. Chylous leakage occurred at postoperative day (POD) 2. Conservative therapy was performed, but chylous leakage could not be decreased. We performed thoracoscopic reoperation against chylothorax at POD 20. Thin lymphatic vessels were detected by fluorescent signal on NIR image; as some chylous leakage points were observed near the thoracic duct region, these points were sutured to stop and avoid chylous leakage (operation time 3:15). After ligation, chylous leakage was rarely observed. Postoperative drain leakage was greatly reduced. Enteral feeding was slowly increased. Drain was removed at POD 26 of reoperation with no recurrent pleural effusion.

Case 2: A boy with fetal growth retardation was born at 37 weeks of gestation at 1700 g. After a definitive diagnosis of TEF type C, thoracoscopic repair of TEF was performed at 2 days old. Postoperative chylothorax occurred at POD 4 with 200-400 ml per day and refractory to conservative therapy. We performed thoracoscopic reoperation against chylothorax at POD 14. Thoracoscopic fluorescence revealed chylous leakage near the ablation site of the azygous vein at first operation, and the leak points were sutured (operation time 2:07). Postoperative leakage was decreased and complete remission was obtained at POD 11.

Conclusion: NIR-excited ICG imaging provides powerful guidance for surgical intervention against chylothorax. Moreover, this procedure can be widely applied to other lymphatic leakage diseases for assessment and surgical approaches for visualizing lymphatic flow or leakage.

P085 EARLY EXPERIENCE WITH PEDIATRIC THORACOSCOPIC LOBECTOMY / SEGMENTECTOMY IN ISRAEL Dragan Kravarusic¹, Steve Rothenberg², Naftali Freud¹; ¹Schneider Children's Medical Center of Israel, Tel Aviv, Israel, ²The Rocky Mountain Hospital For Children, Denver, CO, USA

Objective: In our community open surgery for symptomatic congenital lung malformations is a common practice. For asymptomatic CPAM's discovered on routine pre / postnatal imaging, management is controversial. This report evaluates the safety and efficacy of recently introduced thoracoscopic lung resections for pediatric patients.

Methods: In last 3 years twenty four selected patients underwent thoracoscopic lobectomy / segmentectomy. Patients ages ranged from 8 months to 7 years. Preoperative diagnosis included congenital cystic adenomatoid malformation (n = 14), pulmonary sequestration (n = 7), bronchogenic cyst (n = 2) and complex bronchiectasis (n = 1). Fourteen patients were symptomatic with previous lung infections and eleven others were asymptomatic. Single lung ventilation was desired but not accomplished in 8 patients. Three ports 3-5 mm were used with controlled pressure pneumothorax. A ligasure sealing device was the mode for tissue dissection / vessel ligation and bronchi were closed either by stapling device or by interrupted sutures.

Results: All the procedures were completed thoracoscopically. Operating times ranged from 70 - 160 min (remarkable longer in patients with previous infections). We performed nineteen lobectomies and five segmental lung resections with no intraoperative complications. Chest tubes were left for one day in all but two cases of extralobar sequestration. Hospital stay ranged from 1 to 3 days and only two patients required overnight ICU admission post operatively.

Poster Abstracts

Conclusions: Supervised mentorship in the process of translation from open to thoracoscopic approach for congenital lung malformations changed our paradigm of practice. Thoracoscopic lobectomy / segmentectomy in selected patients is feasible and safe technique. There is a clear difference in dissection complexity in patients with previous infectious complications. Decreased postoperative pain, shorter hospital stay and better cosmetic results are definite advantages.

P086 MANAGEMENT OF SPONTANEOUS PNEUMOTHORAX IN CHILDREN Lisa M Soler, Shawn D Larson, MD, Janice A Taylor, MD, Saleem Islam, MD, MPH; University of Florida

Purpose: The management of primary spontaneous pneumothorax (PSP) in children is controversial, with some studies suggesting a recurrence rate of 50% over a 4-year period, and advocating no surgery for the first occurrence, while others suggest more operative intervention. The purpose of this study was to understand the optimal management of a first episode of spontaneous pneumothorax based on our experience.

Methods: A retrospective cohort at a single center over 12 years (2002-2014) was studied. Cases of PSP in the 5-19 year age group were selected and other pneumothoraces excluded. Data regarding pre, hospital, and post hospital course was collected and analyzed, with recurrent PSP the primary outcome variable.

Results: 81 cases met the inclusion criteria for PSP. There was an overall recurrence rate of 44.4%, with 89% of these occurring within 12 months of the initial event. Recurrent PSP cases were older and taller, but were similar to the non recurrent ones in use of chest tubes, and in the proportion of initial CXR being either a moderate or large size pneumothorax. The use of CT scans did not differ between the recurrent or non recurrent groups, and additionally 5/6 CT scans which were interpreted as 'normal' had a recurrence. Thoracoscopic surgery resulted in a significantly lower rate of recurrent PSP (Table). Patients who did not undergo surgery had a 50% recurrence rate with 90% within 12 months of the initial PSP.

Conclusions: Initial thoracoscopic management of a spontaneous pneumothorax was associated with a significantly reduced rate of recurrence. CT scans were not helpful in selection of patients for procedure in our experience. We have altered our approach to the management of PSP based on these data.

	Recurrent (n=36)	Non Recurrent (n=45)	p value
Age (years)	17.7	16.6	0.05*
Height (m)	1.77	1.69	0.02*
BMI	18.7	19.2	0.5
Sx duration (days)	7.4	7.9	0.9
Chest tube used (%)	38.9	46.7	0.5
Moderate/Large size Ptx(%)	38.9	46.7	0.5
CT scan (%)	31	40	0.4
Thoracoscopy (%)	5.6	24.4	0.03*

P087 THE EXPERIENCE OF DIAGNOSIS AND TREATMENT AND THE ANALYSIS OF POSTOPERATIVE COMPLICATIONS ABOUT THE THORACOSCOPIC REPAIR OF 15 TYPE ? ESOPHAGEAL ATRESIA NEONATES Lishuang Ma; Capital Institute of Pediatrics, Beijing, People's Republic of China

Objective: In order to study the feasibility and safety of thoracoscopic repair of this treatment, and analyze its postoperative complications, a retrospective review of neonates and infants underwent thoracoscopic repair of type ? esophageal atresia (EA) in our institutes was performed.

Methods: From January 2010 to April 2015, 15 neonates underwent thoracoscopic repair of EA. There were 9 males

Poster Abstracts

and 6 females(all with type ?), aged from 1 to 22 days,and the lowest weight was 1700g. 6 cases were doubted as EA in prenatal diagnosis,anddiagnosed by the upper gastrointestinal contrast examination.The rest 9 cases were diagnosed by the upper gastrointestinal contrast examination as EA after the failure of the passage of a stomach tube.

Results: 14 cases underwent repair of EA via thoracoscopy only once time, and 1 case by stages.4 after birth diagnosed neonates had a complication of pneumonia,all given anti-inflammatory treatment and well-healed before operation. The operation time ranged from 100~390 minutes.There was minimal amount of bleeding.The average duration of hospital stay amounted to 22 days(range:13~65 days).All patients with no case occurring of horacocyllosis,4 pneumonia,1 gastroesophageal reflux,2 stomal leak and 3 esophageal stenosis recovered quickly after treatment during follow-up periods of 2 months to 2 years(the median time was 1 year and 3 months).

Conclusions: The thoracoscopic repair of type ? EA is a safe and feasible approach.This approach has the advantages of reduced trauma,improvedcosmesis and fast recovery after operation.The advanced skills may benefit to the good prognosis.Compared with the open operation,there is no much difference of the postoperative complications.

P088 APPLICATION OF LOOP SUTURE HOLDING TRICK DURING TRANSABDOMINAL WALL CLOSURE OF MORGAGNI HERNIA REPAIR. AN EASIER AND QUICK APPROACH Ergun Ergun, Gulnur Gollu, Ufuk Ates, Nil Yasam Tastekin, Huseyin Dindar, Aydin Yagmurlu, Meltem Kologlu, Murat Cakmak; Ankara University Faculty of Medicine, Department of Pediatric Surgery, Ankara. TURKEY

Various laparoscopic techniques to repair Morgagni hernia have been described in the literature which are primary closure with intracorporeal suturing, using a prosthetic mesh and transabdominal wall closure by subcutaneous knot placement. During transabdominal wall closure sometimes taking out the needle exactly from the same point of insertion could be difficult. Therefore we applied the loop suture removal technique , previously used in PIRS (Percutaneous internal ring suturing) repair of inguinal hernias. In this video presentation, we aimed to show the technical details of this trick which makes Morgagni hernia repair faster and easier.

After taking down falciform ligament 20-gauge injection needle with nonabsorbable 2-0 prolene suture inside the barrel of the needle is introduced into the peritoneal cavity through the abdominal wall and posterior rim of the diaphragma .The suture pushed through the barrel of the needle makes a loop. The needle is pulled out, leaving the loop inside the abdomen. From outside, one of the ends of the suture is introduced again into the barrel of the needle and the needle passes through the same skin puncture point and posterior rim of diaphragma. The end of the suture goes through into the loop and the needle is withdrawn. Next, the loop is pulled out of the abdomen with the end of suture caught by the loop. Then the knot is tied subcutaneously.

Three patients of different ages (1, 6, and 14 years old boys) with Morgagni hernia were operated in our department with this approach. Mean operating time was 30 minutes. This technique reduces the anesthesia time, gives a more comfortable area for surgeon and makes easier to suture the defect.

Laparoscopic Morgagni hernia repair with using percutaneous extracorporeal sutures and loop suture holding technique is a feasible, simple, safe and quick approach in children.

P089 THORACOSCOPIC DIVISION OF VASCULAR RINGS IN INFANTS AND CHILDREN Alexander Razumovskiy, Victor Rachkov, Khassan Bataev, Nikita Stepanenko; Filatov Children Hospital

Introduction: Congenital anomalies of the aortic arch such as a double aortic arch and a right-sided aortic arch can result in a severe respiratory failure, which requires emergency surgery. Modern equipment and accumulated experience make it possible to perform thoracoscopic surgery for this type of pathology.

Materials & Methods: A total of 14 children (age from 6 months to 17 years, weight from 7 to 64 kg) who underwent thoracoscopic division of vascular rings from 2008 to 2014 in Filatov Pediatric Clinical Hospital ?13 were included in the study. The timing of surgery depended on the clinical picture and the severity of the respiratory failure. There

Poster Abstracts

were two types of vascular rings: double aortic arch - 8 children (57%), right-sided aortic arch with Botallo's duct - 6 children (43%).

Results: Mean operating time was 57 minutes. The average length of stay was 11 days. There was no intraoperative complications. In early postoperative period there was bleeding in one child due to failure of clipping the the distal segment of the aortic arch which required thoracotomy. Postoperative chylothorax was observed in one child, which was treated conservatively.

Conclusion: The latest advances in surgical methods allowed to make thoracoscopic division of vascular rings in infants and children the method of choice with detailed intraoperative visualisation of the anatomy of the defect and secure mobilization of large vessels. Thoracoscopic surgery for congenital anomalies of the aortic arch is feasible to improve the postoperative outcomes and reduce the time of hospitalization.

P090 RESERVE THE AZYOS VEIN MAY BE AN EFFECTIVE WAY TO PREVENT THE RECURRENCE OF TRACHEOESOPHAGEAL FISTULA DURING THE LAPAROSCOPIC ESOPHAGEAL ATRESIA CORRECTION Kuiran Dong, PhD, Chun Shen, PhD, Zai Song, PhD, Gongbao Liu, MD, Rui Dong, PhD; Children's Hospital of Fudan University

Purpose: In this video we perform to reserve the azygos vein during the laparoscopic esophageal repair operation and insert it between the esophagus and trachea to prevent the recurrence of the tracheoesophageal fistula.

Method: During the operation, we first open the pleura on both sides of the azygos vein and separate the esophagus and azygos vein. The fistula was found above the vein. The fistula trachea junction was identified. With a 5-0 PDS suture, the fistula was sutured and tied at the fistula trachea junction. This ligature was done by two times. Then the end of proximal esophagus was found, and isolated. The fistula was cut off at the distal part of the ligation. The distal esophagus was dragged out from behind azygos vein and received further separation. A suture was made by 5-0 Vicryl between the front wall of the fistula stump and the upside adventitia of the azygos and pleura. The esophageal anastomosis was done in front of the vein. We use the continuous suture skill and the 5-0 Vicryl to do the anastomosis. First is the posterior wall, then pass through a gastric tube, then the front wall. The operation was done and the azygos vein was inset between the fistula stump and the esophageal anastomosis.

Result: We began to use this surgical skill at March 2004. So before that time, 4 of 29 cases of esophageal atresia was found recurrence of fistula at the one month after the first operation. After that time 11 cases of esophageal atresia were done with this skill and no fistula recurrence were found after at least three month follow up.

Conclusion: Reserve the azygos vein during the laparoscopic esophageal atresia repair is feasible. Insert the azygos vein between the fistula stump of trachea and the esophageal anastomosis may be an helpful way to prevent the recurrence of tracheoesophageal fistula.

P091 THORACOSCOPIC PERICARDIECTOMY Angelo Loochkartt, Jhonny Sierra Marín; Hospital Pablo Tobón Uribe

Thoracoscopic pericardial resection has proved safe and effective. It allows a wider pericardial resection than that usually permitted by the subxiphoid route, and should lessen the pain and the number of pulmonary complications, compared with open thoracotomy. An additional advantage is that it allows the visualization and management of simultaneous pleural and pulmonary abnormalities.

We report the use of thoracoscopic pericardiectomy to treat 8 year old female patient with massive pericardial effusion caused by uremic pericarditis. Although intensive hemodialysis was performed, the patient could not remain on hemodialysis because of severe hypotension during the procedure. Echocardiography revealed massive pericardial effusion and severe hypokinesis of the left ventricular wall. Pericardiocentesis was performed first, without success, followed by thoracoscopic pericardiectomy under general anesthesia. One month after the pericardiectomy, episodes of hypotension during hemodialysis improved, and dyspnea diminished. Echocardiography showed no pericardial effusion and improvement of left ventricular wall motion. Pericarditis is a fatal complication in patients with end-stage renal failure and patients on maintenance hemodialysis.

Poster Abstracts

This case proves the utility Pericardiectomy thoracoscopy in the treatment of constrictive pericarditis with less morbidity and equal outcome.

P092 IS THE TECHNIQUE OF LAPAROSCOPIC VAGINAL RECONSTRUCTION USING AN ISOLATED SEGMENT OF THE SIGMOID COLON SAFE? Michał Wolnicki, PhD, Barbara Glazar, PhD, Ireneusz Honkisz, PhD, Wiesław Urbanowicz, Prof; Department of Pediatric Urology Jagiellonian University in Cracow

Introduction: There are many conservative and surgical methods for reconstructing the vagina. According to some authors as the first to be applied conservative methods. However, these techniques may encounter difficulties, mainly psychological. In young girls should be preferentially used technique laparoscopic vaginal reconstruction with the use of an isolated segment of the sigmoid colon. Opponents of this method criticize it for long time of the operation and the risks associated with interference in the gastrointestinal tract.

Objective: Evaluation of early and late complications in patients after laparoscopic vaginal reconstruction.

Material and methods: In the years 2002 - 2014 were operated 24 girls with vaginal agenesis. 22 in course of MRKH syndrome and 2 with the total androgen insensitivity syndrome.

Evaluation of the early results included operative time, length of hospital stay, start of oral watering and feeding, duration of supply of painkillers and healing of surgical wounds. In no case was required conversion to open surgery nor blood transfusion and blood products. After surgery, with time averaged 419 minutes, was used intravenous supply of antibiotics for an average of 5 days. Watering was started on average at 3 postoperative day and feeding at 5 day. Mean length of stay was 14 days. Splinting of neovagina were removed at 10 day. One patient at 6 postoperative day was established as a result of fecal fistula anastomosis of the colon to a location of the lower left laparoscopic port. In the treatment of complication we applied using a rectal drainage, exclusion of patients from oral intake, TPN for 14 days and antibiotics with a broad spectrum of action. After this period, there was a spontaneous closure of the fistula.

The follow-up was assessed the width of the introitus and the depth of the neovagina and degree of satisfaction survey made patients after surgery based on a questionnaire.

One patient was found with vaginal entrance stenosis, which required a further operation to its extension at 12 months after the original procedure. The length of the neovaginas ranged between 8 and 14 cm. In all patients the healing of surgical wounds was effected by first intention of leaving small scarring in the area of the front abdominal wall. In a longtime observation period in patient after conservative treatment of fistula, there were no complications from the gastrointestinal tract as well as newly formed vagina. The survey found that 20 patients entered into stable partnerships. All of them have taken intercourse. All are satisfied with the conduct of co-existence as well as their partners, without discomfort while having sex. All of these patients were of the opinion that the use of surgical treatment raised their self-esteem as women and allowed for the rapid adoption of intercourse. The remaining 4 patients have not taken intercourse due to failure to maintain relationships with partners.

Conclusion: Low number of complications in our series is giving the impression that the laparoscopic vaginal reconstruction using an isolated segment of the sigmoid colon is safe and recommended in the pediatric patient population.

P093 TRANSPERITONEAL LAPAROSCOPIC PYELOPLASTY: A SAFE AND FEASIBLE TECHNIQUE FOR PEDIATRIC SURGEONS AND PEDIATRIC UROLOGISTS Takayuki Masuko, MD¹, Minoru Tada, MD², Kensuke Ohashi, MD², Daigo Funakoshi, MD²; ¹Jichi Medical University Saitama Medical Center, ²Saitama Children's Medical Center

PURPOSE: Although transperitoneal laparoscopic pyeloplasty (LP) is feasible and safe for the treatment of ureteropelvic junction obstruction, it is not yet popular in Japan. We aimed to determine whether transperitoneal LP is safe and feasible for use by pediatric surgeons and pediatric urologists.

METHODS: Records of 26 infants who underwent LP from 2011 to 2014, with at least 6 months of follow up, were ret-

Poster Abstracts

respectively reviewed. Eight surgeons were divided into 3 sets of 2 groups each: (1) experts certified or not certified in laparoscopic surgery, (2) pediatric surgeons or pediatric urologists, and (3) those with or without experiences of open pyeloplasty. The perioperative complications and the results of pre- and postoperative imaging studies (ultrasonography [US] and diuretic renography [DR]) were noted. The parameters were compared using Fisher's exact test.

RESULTS: In all the children, transperitoneal LP was successfully performed using the dismembered Anderson–Hynes method without any open conversions. No complications were observed, and a second intervention was not required. LP was successful in relieving the obstruction in 21 of 24 (87.5%) patients, as observed using follow-up US, and in 15 of 19 (78.9%) patients, as observed using follow-up DR. No significant difference in the success rate was observed between the 2 groups in each of the 3 sets, according to the certification status of the surgeons, whether the surgeon was a pediatric surgeon or pediatric urologist, and whether the surgeon had experience of open pyeloplasty ($p = 1.00$, 1.00 , and 1.00 respectively).

DISCUSSION: This retrospective series showed that introduction of transperitoneal LP in children is safe and feasible. The success rate was 70–96%, and the complication rate was 0–24% for open pyeloplasty. These results are comparable to the results of previous studies. Transperitoneal LP should be introduced in all the facilities in Japan.

P094 COMPARISON OF SINGLE-PORT AND MULTI-PORT LAPAROSCOPIC METHODS OF NEPHRECTOMY IN YOUNG INFANTS Yury Kozlov¹, Vladimir Novozhilov², Konstantin Kovalkov³, Andrey Rasputin¹, Polina Baradieva⁴; ¹Pediatric Hospital Irkutsk, ²Irkutsk State Medical University, ³Kemerovo Clinical Pediatric Hospital, ⁴Irkutsk State Medical Academy of Continuing Education

Background: The aim of this study was to evaluate the effect of single-incision laparoscopic nephrectomy (SIL-N) for treatment of non-functioning kidneys in neonates and infants.

Materials and methods: Between January 2013 and May 2015 we have performed 12 nephrectomies for non-functioning kidneys with use of single-incision laparoscopy (Group I) and 12 operations by means of multi-port laparoscopic surgery (Group II). For implementation a SIL-N in 3 month old infants a new technological platform was developed taking into account anatomical and physiological features of the infant body like selection of beneficial access, equipment and practical skills. The analysis of demographic data, intra- and postoperative parameters, immediate and late effects of the procedures, was performed at the final stage of the study.

Results: There were no differences in the pre- and postoperative parameters between the two groups. The compared groups were similar in terms of demographics parameters (diagnosis, age, gender and weight). The mean operative time in Group I was 48,3 min. In contrast, the mean duration of the operation in the Group II was 43,3 min ($p=.378$). Length of postoperative hospital stay was identical in patients of both groups (3 days vs 2,92 days; $p=.779$). The postoperative course and follow up was uneventful in the all patients. We did not register any complications of the procedure such as hematoma of the bed of the removed kidney or wound infection in the early postoperative period. Follow-up (from 1 month to 1 year) of patients showed no negative effects of nephrectomy that was performed by using a single-incision technique.

Conclusion: The results of this study confirm that a SIL-N can be used for treatment of non-functioning kidneys in young infants with good outcomes.

P095 THE ROL OF MIS IN GONADAL TREATMENT IN DSD PATIENTS .VARIABILITY AND INCIDENCE OF GERM CELL TUMORS(GCT) EXPERIENCE IN A SINGLE CENTER Maria M Bailez, MD, Grecia Colmenares, MD, Jorge Mier, Mariana Constanzo, MD, Alicia Belgoroski; Garrahan Childrens Hospital

Introduction : Gonadal histology is required in selected DSD patients with abnormal gonadal development The existence of a Y chromosome is associated with a higher risk developing germ cell tumors.

Aim Analyze the spectrum of gonads, document its variability with the aid of MIS armamentarium and assess the incidence of germ cell tumors.

Poster Abstracts

Method: A prospective and observational study of DSD patients who underwent gonadal surgery. Age, sex assigned, karyotype, molecular analysis, surgical findings and pathology of the gonads were analyzed. Patients were divided into 3 groups: chromosomal dysgenesis (G1); 46XX gonadal dysgenesis; (G2) and 46XY gonadal dysgenesis (G3). More than half of the gonads were intrabdominal and were treated laparoscopically. All streak gonads were removed, avoiding previous biopsy with 25 to 50% chances to develop a germ cell neoplasm and the possibility of an in situ tumor at the time of surgery. We always waited for the result of biopsy before removing any other gonad than a classical streak. We prefer a laparoscopic approach in most of inguinal palpable gonads as it enables not only visualization of Mullerian structures but also allows for treatment of a patent peritoneal sac, when removing the gonads, with better cosmetic results.

Results: In total 94 patients with a mean age of 56.42 months (2-216) were analyzed. Forty eight patients (19 with a Turner syndrome) with a mean age of 105 months (2-216) were included in G1. The karyotype was 45X0/46XY in 87.5% of them. Male sex was assigned in 19, with a mean of 7.26 EMS (1-10). Histological analysis of 89 gonads was completed identifying 52 streak gonads, 32 dysgenetic testes and 5 ovotestes. Six GCT were found in 4 patients. Fifteen patients with a mean age of 27.6 months (2-180) were included in G2. Male gender was assigned to 6 with a mean EMS of 6.82 (range, 4-8.5). Twenty nine gonads were analyzed: 10 ovotestes, 15 dysgenetic testes and 4 ovaries. Bilateral gonadoblastoma was found in a 6 month patient with bilateral ovotestes. Mean age of the 31 patients in G3 was 69.71 months (5-192). Five of them had an SF-1 NR5A mutation, 6 a WT1; 6 a complete and 3 a partial androgen insensitivity syndrome. A new mutation in the SRY (p.MET64VAL) gene was identified in 2 sisters. Male gender was assigned in 10 with a mean EMS of 4.52 (range, 1-10). Fifty nine gonads were analyzed, identifying 41 dysgenetic testes, 10 streak gonads and 8 testes. Eight GCT were found in 5 patients (16%) (7 in streak gonads and 1 in a dysgenetic testis).

Conclusion: DSD patients with gonadal dysgenesis have a wide variability. The incidence of gonadoblastoma is not negligible in patients 46XY, and even feasible in 46XX. The incidence of GCT was 8,3; 6,6 and 16 % in G1 2 and 3 respectively. Early histological analysis and monitoring of these patients is mandatory. To our knowledge this is the first report of bilateral gonadoblastoma in ovotestes at a very early age.

P097 VISCERAL SLIDE REVISITED - A CASE OF OMPHALOCELE CLOSURE IN A CHILD WITH BECKWITH-WIEDEMANN SYNDROME AND BILATERAL IMPALPABLE TESTES. CAN AND SHOULD LAPAROSCOPIC ORCHIDOPEXY BE ATTEMPTED? Michael Ee, FRACS, Paed; Royal Hobart Hospital

Background: A 4 year-old boy with Beckwith-Wiedemann syndrome presented at birth with omphalocele and bilateral impalpable testes. Following successful closure of the omphalocele, the testes emerged briefly rendering them palpable.

Ultrasound showed left testis to be within the inguinal canal and the right deep to the internal ring.

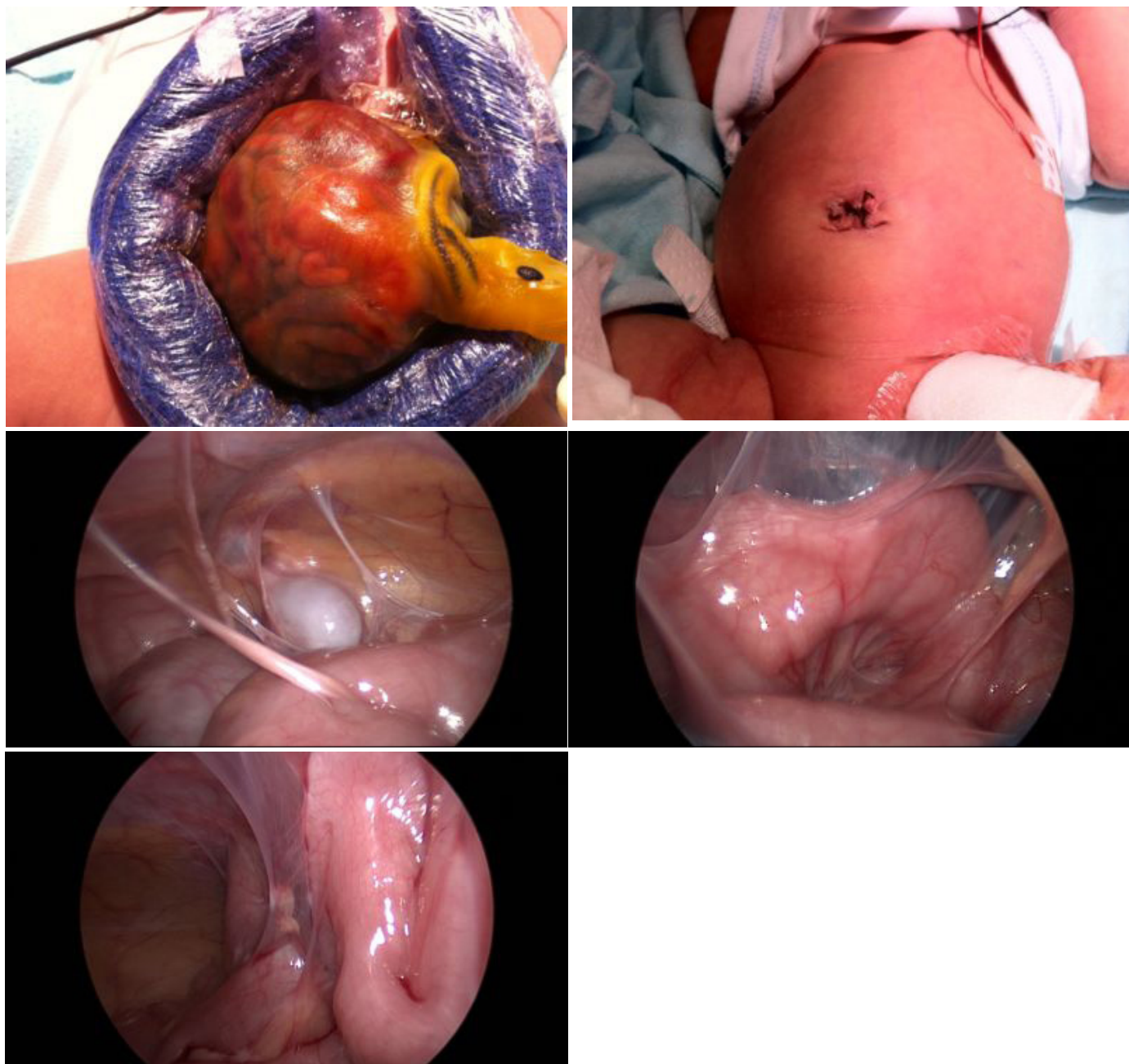
On-table ultrasound was performed to demonstrate visceral slide to allow laparoscopic orchidopexy to be performed safely on the right testis.

Methods: Sonographic assessment of the abdominal wall was performed under general anaesthesia. Readily available portable ultrasound was initially performed by the operating surgeon and subsequently validated by a consultant radiologist using standard departmental ultrasound machine transported to the OR. Once visceral slide was confidently demonstrated, an open Hasson technique port insertion for pneumoperitoneum was achieved. All other subsequent ports were inserted under direct vision following successful adhesiolysis. Staged orchidopexy was completed over a 9-month period.

Results: The abdominal defect was considerable at birth (photo 1). Although closure was achieved with satisfactory aesthetic appearance (photo 2), the extent of the transverse abdominal muscle closure was significant. Laparoscopic view of the right internal ring demonstrated why the intra-abdominal testis cannot descend further (photo 3) and confirmed reduced visceral slide corresponded to the area of visceroparietal adhesions (photo 4 and 5). A video clip of the visceral slide at the time of surgery is available.

Poster Abstracts

Conclusions: Although the use of ultrasound for detection of abdominal wall adhesions has been described since the 1990s, it has not been widely popularised in pediatric minimally invasive surgery in Australia as far as the author is aware of. With more widespread use of portable ultrasound in OR, a trained operator can readily use it to both demonstrate area of normal and reduced visceral slide to allow safe introduction of the first port in high risk children with visceroparietal adhesions.



P098 COMBINED APPROACH: LAPAROSCOPY AND FLEXIBLE URETEROSCOPY FOR THE TREATMENT OF RENAL STONES SECONDARY TO PUJO IN CHILDREN. Maria Grazia Scuderi, MD¹, Mario Falsaperla, MD², Damiana Olenik, MD¹, Vincenzo Di Benedetto, PR¹; ¹DEPARTMENT OF PEDIATRIC SURGERY AND NICU POLICLINICO-VITTORIO EMANUELE HOSPITAL UNIVERSITY OF CATANIA, ²UROLOGY DEPARTMENT POLICLINICO-VITTORIO EMANUELE HOSPITAL UNIVERSITY OF CATANIA

Purpose: renal stones are rare in children and generally associated with metabolic disorders or urinary malformations. Current standard treatment modalities include extracorporeal shock wave lithotripsy, ureteroscopy and percutaneous antegrade removal.

Poster Abstracts

The choice of treatment is related to age of children stone characteristics and position.

We describe a single centre experience with laparoscopic pyeloplasty combined with flexible ureteroscopic renal stone extraction in pediatric age.

Materials and methods: Between January 2013 to October 2015, in our department 5 patients (2 female and 3 male) with renal stones secondary to PUJO were treated. The mean age was 12,6 ys (range 10-15ys).

Every child presented more than 1 stone for kidney diagnosed by US, UROMR and renal scintigraphy.

After failure of medical treatment for renal lithiasis, all patients underwent laparoscopic pyeloplasty combined with laparoscopic extraction of stones using a flexible cystoscopy and Dormia® catheter inserted through a five mm abdominal trocars.

Results: all patients were treated with success. All stones were extracted at the end of procedure. The mean size of renal stones was 6,86 mm (range 2-20 mm). 15 stones were removed from 5 patients and a dismembered laparoscopic pyeloplasty was performed in all cases. The mean operative time was 123 min (range 140-110 min). No conversion in open surgery and intraoperative complications occurred. An ureteral stent was left in place for 4 weeks and removed cystoscopically. The mean follow-up is 18 months (range 6-34 months) with no recurrence.

Discussion: laparoscopic ureterolithotomy with renal stone extraction using a stone basket under flexible ureteroscopy can be considered one of treatment modalities for children with multiple renal stones with a low rate of recurrence and complications.

P099 TO STENT OR NOT TO STENT AFTER URINARY LITHIASIS ENDOSCOPICALLY TREATED IN CHILDREN? Sebastian Ionescu¹, Simion Tirlea¹, Mihai Mocanu¹, Elena Licsandru¹, Monica Ivanov¹, Veronica Marcu², George Isac¹; ¹Marie S. Curie Emergency Children Hospital Department of Pediatric Surgery,²Marie S. Curie Emergency Children Hospital Department of Radiology and Medical Imaging

Purpose: The aim of this study is to evaluate the need for endoscopic placement of “double J” stent, the efficiency and outcomes in pediatric patients with urinary lithiasis..

Materials and methods: We studied retrospectively 42 hospitalized patients with urinary lithiasis endoscopically treated, from 2004 until present, in “M. S. Curie” Children Hospital, Bucharest. We performed ballistic lithotripsy in 15 patients, laser lithotripsy in 11 patients and endoscopic extraction of stones in 16 patients.

Results: The endoscopic approach was used in 3 cases with renal calculi, 1 case with reno-ureteral lithiasis, 28 cases with ureteral calculi and 10 cases with bladder calculi. The success rate using the endoscopic approach in urinary lithiasis was 83.33%. Children were aged between 4-17 years. In case of ureteral bilateral localization we realized two step lithotripsy, the second after 2 weeks period. The size of the calculi measured by ultrasound ranged between 0.5-3.5 cm in diameter. We used “double J” stent in 12 cases. with reno-ureteral lithiasis. The “double J” stent was removed after 18-21 days, as an outpatient procedure. In all patients a bladder catheter was placed for 1- 2 days. We registered a hospitalization period of 3-4 days. Prophylactic antibiotherapy was administrated until “double J” stent was removed. For ureteral localizations, the mean operating time was 45 minutes and varied from 75 minutes for the first cases to 25 minutes for the last ones. There were not significant incidents or accidents, during or after the procedure. Complications of “double J” stent was encountered in 5 cases (2 cases – urinary tract infection, 1 case – stent migration, 2 cases – misposition with replacement). The patients were followed by ultrasound at 1 and 4 weeks postoperatively with no evidence of remaining calculi.

Conclusions: The endoscopic approach of urinary lithiasis in children should be the first option in treatment and “double J” stent should be used only for cases in which laser lithotripsy could not split the stones into small enough fragments. This technique is a safe, effective method of treatment of urinary tract lithiasis without X ray exposure. Placing a “double J” stent is not compulsory and in the same time no additional anesthesia is required for the stent extraction.

Poster Abstracts

P100 LAPAROSCOPY FOR PRESERVING OVARIAN TISSUE IN PEDIATRIC ONCOLOGY Julia Syed¹, Martin Chada², Roman T. Carbon, Prof, Dr, med¹, Sonja Kern¹; ¹Department of Pediatric Surgery, University Hospital Erlangen-Nuremberg, ²Department of Pediatric Oncology, University Hospital Erlangen-Nuremberg

Background: As chemotherapy is gonadotoxic, it is our duty to offer the possibility of cryopreservation of ovarian tissue to young women and even to prepubertal girls with cancer disease. This strategy is included in a couple of tumor protocols but we are motivated to spread into some more entities to use the advantage of preserving fertility in the girls' future life. We report our 5 year experience extracting ovarian tissue laparoscopically, focusing on our surgical technique.

Patients and Methods: Cryopreservation was administered laparoscopically in 28 female patients from the age of 8 years on from 2010 to 2015. All patients had diagnosis of malign tumor disease and were about to get chemotherapy. To preserve their fertility, cryopreservation was indicated in all cases, irrespectively of kind of tumor's entity or chemotherapeutic treatment: 11 Hodgkin's lymphoma (39,3%), 4 Non-Hodgkin's lymphoma (14,3%), 7 acute leukemia (25%), 4 sarcoma (14,3%) and 2 cerebral neoplasm (7,1%). Implantation of the therapeutic venous access (port system, Hickman catheter) was planned as a simultaneous procedure to reduce anesthesia. Laparoscopic preparation was performed by three 5 mm ports (umbilicus, inguinal) with tangential resection of 2/3 of the ovarian cortex of a singular ovary at the opposite side of mesovarian edge by scissors. No high frequency, piezoelectric or stapling devices were used to avoid thermic side effects and consecutive waste and lesions of the preserved tissue. Ideally no bleeding occurs with strictly correct depth of dissection. To treat or prevent bleeding and/or adhesions the fingertip-like ovarian lesion was completely covered by fleece-bound sealing with fibrinogen/thrombin coated collagen (TachoSIL, Takeda). In every case peritoneal drainage was placed into the small pelvis via the inguinal access. Postoperative bleeding occurred in 2 cases of aplastic patients but could be stopped by applying coagulation products. No conversion has been required.

Discussion: Cryopreservation is a minimally invasive and innovative option to preserve fertility, since there have been women inseminated successfully after reimplanting preserved follicles. It should be offered to all patients getting chemotherapy by default. It is reasonable to manage the laparoscopic procedure as a simultaneous intervention to other procedures needed in oncologic strategy, e.g. implantation of venous catheters. There is a significant risk of postoperative bleeding in the context of coagulation disorders in oncologic patients, especially in aplasia. This can be managed by fleece-bound sealing which even shows significant reduction of adhesions.

P101 THE ROLE OF LAPAROSCOPY IN PECULIAR UROLOGICAL CASES Claudio Vella, MD, Giorgio Selvaggio, MD, Giovanni Di Iorio, MD, Sara Costanzo, MD, Claudia Filisetti, MD, Federica Marinoni, MD, Giovanna Riccipetioni, MD; Pediatric Surgery Department "V.Buzzi" Children's Hospital Milan Italy

Background and aim: Laparoscopic technique represents the gold standard procedure in several pediatric pathologies, most of them are worldwide accepted in term of feasibility and safety. Aim of our presentation is to report three peculiar urological cases successfully treated laparoscopically avoiding more invasive practice as a demonstration of the versatility of this technique.

Materials and Methods: We describe 3 patients affected by hydroureteronephrosis from peculiar etiologies.

Case 1: male 7 years old, treated at 16 month of age for right obstructive megaureter with an Hendren procedure with resolution of the dilatation at clinical and US follow-up. At the age of 7 y an ultrasound and subsequent MRI revealed an unexpected ureteral dilatation. The patient underwent to a laparoscopic lysis of ureteral adhesions with kinking resolution of the proximal tract of the ureter.

Case 2: male 8 years old with prenatal diagnosis of right hydroureteronephrosis; the child underwent to clinic-diagnostic follow-up including ultrasound and renal scan. The first diagnostic hypotesis was congenital obstructive megaureter, he was scheduled for cystoscopy, ascending pielography and pneumatic VUJ dilatation. During the procedure no ureteral papilla stenosis was detected, the ascending pielography revealed a stenosis of the proximal ureter suggestive for a vascular compression. The MRI revealed a retrocaval right ureter.

Poster Abstracts

The patient underwent to a laparoscopic treatment, ureteral isolation and caval debridement, resection and complete endoabdominal ureter - ureteral anastomosis.

Case 3: female, 12 yrs old, presenting with acute abdominal pain, US diagnosis of severe left hydroureteronephrosis. MAG3 renal scan revealed a medium ureteral obstruction, MR-urography excluded extrinsic compression. Ureteroscopy allowed to confirm an intrinsic stenosis, that was subsequently treated through laparoscopic approach, consisting of ureteral isolation and video-assisted resection and anastomosis (small 2-cm incision in left iliac fossa).

Results: All the procedures were completed laparoscopically. The mean operative time was 180 minutes.

The procedures carried out in Case 1 and Case 3 were easily performed in an average time of 90 minutes ; in both cases the laparoscopic approach lead us to resolve the obstruction with good visualization of the ureteral peristalsis and urine passage (one lysis of adhesion and one isolation of ureteral intramural fibrosis)

The laparoscopic uretero-ureteral anastomosis (Case 2) was performed after caval debridement and ureter isolation and resection.

The post operative course was uneventful in all cases , all the patients required low doses of analgesic and the cosmetic results were optimal.

Conclusions: In our center all the minimally invasive techniques are currently applied for the treatment of most of the pathologies. In these particular cases the laparoscopic approach was essential for a complete diagnostic confirmation as well as an elegant solution of three different non conventional causes of ureteral obstructions

P102 PNEUMOVESICAL URETERIC REIMPLANTATION IN PAEDIATRIC PATIENTS: AN INTERMEDIATE TERM RESULT Ct Lau, Lawrence Lan, Kenneth Wong, Paul Tam; Department of Surgery, Queen Mary Hospital, The University of Hong Kong

Introduction: Pneumovesical ureteric reimplantation has gained increasing popularity for the treatment of vesico-ureteric reflux and vesicoureteric junction obstruction in paediatric patients. In this study we reviewed our experience at an intermediate term basis.

Methods: A retrospective review of all patients with pneumovesical ureteric reimplantation performed in a tertiary referral centre between 2005 and 2015 was carried out. Patients' demographics, operative measures and post-operative outcomes were recorded.

Results: 31 patients were identified during the study period. 23 patients had vesicoureteric reflux and 8 patients had vesicoureteric junction obstruction. A total of 43 ureteric reimplantation procedures were carried out. The mean age at operation was 6.1 years old. The mean operative time was 221 minutes. On average the length of hospital stay was 7.42 days. 4 patients required conversion to open approach. 4 patients had low grade residual vesicoureteric reflux after the operation and all were treated conservatively. There was no major complication or mortality.

Conclusion: Pneumovesical ureteric reimplantation is safe and effective for paediatric patients. Intermediate term result confirmed its reliability and low recurrence rate. It should be advocated as the approach of choice for major centres.

P103 LAPAROSCOPIC BILATERAL ADRENALECTOMY FOR PRIMARY PIGMENTED NODULAR ADRENOCORTICAL DISEASE (PPNAD) - A DEMANDING PROCEDURE BUT EASED DUE TO EXCELLENT VISIBILITY Wilfried Krois, MD¹, Anja Weinhandl, MD¹, Adalbert Raimann, MD², Gabriele Haeusler, Prof, MD², Martin L Metzelder, Prof, MD¹; ¹Clinical Department of Pediatric Surgery, ²Department of Pediatrics

Introduction: Primary pigmented nodular adrenocortical disease (PPNAD) as the micronodular form of adrenal hy-

Poster Abstracts

perplasia is a very rare cause for ACTH (adrenocorticotrope hormone)-independent Cushing's-syndrome in children. Patients with PPNAD have an autonomous production of cortisol which leads to obesity and arrest of growth. Typical symptoms of hypercortisolism usually develop later in lifetime. Due to the autonomous function of the adrenal glands, the only cure by now is the surgical bilateral adrenalectomy.

Casereport: To report the case of a 3 years old boy who was admitted to our department with clinically and biochemically established ACTH-independent Cushing's-syndrome. The patient's history reported a 7-month-episode of rapid weight increase, decreasing growth velocity, arterial hypertonia and typical Cushingoid phenotype. Cortisol levels were increased to 27.2 pg/ml and ACTH-levels depressed below 1 pg/ml. MR-imaging confirmed bilateral nodular adrenal hypertrophy and genetic testing excluded the PPNAD as part of a concomitant Carney-complex. The patient underwent simultaneous bilateral laparoscopic adrenalectomy using a 4 trocar-technique in close interdisciplinary contact to our department of paediatric metabolic disorders and paediatric anaesthesiologists. Addison crisis was prevented by accurate pre-, intra- and postoperative hormone replacement strategy. The patient received the first intravenous glucocorticoid supplementation intraoperative after ligation of the supplying vessels of the first gland. Continuous intravenous hydrocortisone-therapy (60mg/m²/day) was started after resection of the second adrenal gland. No intraoperative complications were encountered and the postoperative course was uneventful. Additional mineralocorticoid replacement (0,05 mg fludrocortisone/day) was administered orally from the sixth postoperative day and glucocorticoid replacement was switched to oral administration one week postoperatively. Accompanying antihypertensive therapy was continued. Within this therapy the patient showed no signs of further hypercortisolism. Histopathology revealed adrenal hyperplasia with small, pigmented bilateral cortical nodules and therefore confirms the diagnosis of a PPNAD. The patient was discharged at the 10th postoperative day.

Discussion: Laparoscopic adrenalectomy is even in the paediatric population the Gold Standard for most adrenal diseases. In contrast to macronodular forms of ACTH-independent macronodular hyperplasia or other adrenal diseases in adults with huge tumors the PPNAD in small children come along with a very tiny operating field and small adrenal glands embedded in fatty tissue which are not easy to differentiate due to the associated adipositas.

Conclusion: Magnification in minimal invasive-surgery procedures seems to be advantageous to discriminate adrenal gland tissue from fatty tissue in small children with PPNAD, however close cooperation of different disciplines is mandatory for good results in children with this very rare disease.

P104 LAPAROSCOPIC MANAGEMENT OF RETROCAVAL URETER: CASE REPORT Edward Esteves, PhD, Hugo Leonardo F Gomes, MD; University of Goias

Background: A rare etiology for the right-sided hydronephrosis is the ureteral stenosis due to compression by the vena cava, when the child has a retrocaval ureter (RCU). The authors report on the operative management with minimally invasive technique by laparoscopy, probably the first case reported in South America.

Case Report: A 7-year old boy had two episodes of urinary tract infection and right lumbar pain along the last year. He had had the prenatal diagnosis of grade I hydronephrosis that had been treated conservatively and eventually ignored for years. Now the doppler-ultrasound images showed grade III-IV right-sided uretero-hydronephrosis by a RCU, interrupted at its medium segment. Preoperative MAG3-cintigraphy confirmed a mechanic obstruction, DMSA showed renal function of 31% vs 69% at the left normal side, and the CT scan confirmed the anatomy of the disease. Surgical treatment was performed through a transperitoneal laparoscopy using 3 ports: umbilical 10-mm scope, two 5-mm ports (left upper quadrant and right-sided lumbar region). The exact spot to place the latter port was chosen by the intrabdominal direct view of the ureteral stenosis, so that the trocar would be introduced just at this place. With the help of 30-degree lateral left inclination of the child, the right colon was retracted, the inferior vena cava was dissected and the proximal dilated and the distal ureter were freed, keeping the medial vascularization. The stenotic ureter was cut apart, the two ends were transferred to the anterior aspect of the vena cava and exteriorized through the lumbar port site. The extracorporeal diagonal end-to-end anastomosis was performed (running 5-0 PDS), a 4F double-J catheter (DJC) was easily introduced, the ureter was returned to behind the mesocolon. The port sites were closed without drainage. Operative time was 1 hour, hospital staying of 1 day. Recovery was uneventful. Hydro-

Poster Abstracts

nephrosis gradually reduced and the DJC was removed after 2 months. After 2 years of follow-up the boy has been asymptomatic.

Conclusion: The transperitoneal laparoscopic approach is feasible and safe for the repair of RCU, facilitated by the safer extracorporeal hand-sewn anastomosis, with all advantages of MIS.

P105 DISORDERS OF SEX DEVELOPMENT - LAPAROSCOPY MANAGEMENT IN PATIENTS WITH DIFFERENT TYPE OF DSD DISORDERS. Michał Wolnicki, PhD, Janusz Sulislawski, MD, Barbara Dobrowolska -Glazar, PhD, Ireneneusz Honkisz, MD; Uniwersytecki Szpital Dzieciacy Cracow

Objective: Disorders of sex development (DSD) are rare condition. It is important to understand types of sexual disorders and carefully consider functional and malignant risks. Laparoscopy is helpful in diagnosis, planning therapeutic strategies and managing patients with various conditions.

Patients and methods: In our Clinic we performed 17 laparoscopies between 2002 and 2015 in patients with DSD disorders. Four patients with a 46 XY karyotype have bilateral cryptorchidism and Persistent Mullerian Duct Syndrome /PMDS/. In all of these patients Mullerian Duct Remnant /MDR/ were removed out. In 13 patients with DSD problems were performed diagnostic laparoscopy. Among them, 5 were diagnostic laparoscopy including gonadal biopsy, and 8 were therapeutic laparoscopy with gonadal resection. Surgical procedures and complications were evaluated.

Results: Seventeen patients with DSD were divided into two groups: for therapeutic laparoscopy and diagnostic. The first group is patients with therapeutic laparoscopy. Gonadectomies were performed in 8 patients (bilateral in 2). 4 patients were diagnosed as PMDS and in two of them laparoscopy excision of MDR and bilateral orchidopexy were performed during the same procedure. The indication for a laparoscopic excision of MDR is only when the symptoms are present as a: infection, dysuria or menstruation.

The second group was patients only for diagnostic laparoscopy. Laparoscopic gonadal biopsy was performed in 5 patients. Inspection was performed on 3 patients with 46XY DSD, 1 with gonadal regression syndrome and 1 with mixed gonadal dysgenesis (MGD). In the 1 patient with ovotesticular DSD, the gonadal pathology was diagnosed as bilateral ovotestis. There were no severe perioperative complications. Laparoscopy gonadal biopsies and excision of MDR is technically feasible, and provides favorable outcomes in cases of a single operation with orchidopexy.

Conclusions: Laparoscopy is the best technique to make diagnosis and final treatment of DSD problems. Laparoscopy having the advantages of being a minimally invasive approach, with good cosmetic result and also an important factor for children and parents involved in complex psychological and social relationships.

P106 OVARIAN TERATOMA ASSOCIATED WITH ANTI-NMDA (N-METHYL D-ASPARTATE) RECEPTOR ENCEPHALITIS. L. Nellihela, Mr, D Drake, Mr, N Bouhadiba, Mr; Evelina London Children's Hospital, Guy's and St Thomas' NHS Foundation Trust, UK.

Aim: Anti-N-methyl D-aspartate receptor (NMDAR) encephalitis is para-neoplastic, immune-mediated encephalopathy described recently. It is frequently associated with an underlying ovarian teratoma. We present the first case in U.K with of an ovarian teratoma in a 7 year old child who presented with acute encephalitis due to anti-NMDA receptor antibodies. Following successful laparoscopic excision, the encephalitis regression and improvement of the cognitive faculties were noticeable.

Method: Previously fit and healthy girl presented with acute onset of cognitive disturbances. She was suspected for infective encephalopathy. She had negative cultures growth. Electroencephalography reported diffuse background slowing with suspected encephalopathy. Extensive autoimmune screen was sent and Anti-NMDA receptor antibodies was positive. Brain MRI was unremarkable. Whole body MRI (looking for occult malignancy) found right adnexal lesion consistent with ovarian teratoma.

Poster Abstracts

Laparoscopy proceeds with 10mm and two 5mm ports. There was no salvageable healthy ovarian tissues left on MRI and on examination. Left ovary was normal and there were no other lesions. Right ovary was excised using harmonic scalpel. Specimen retrieved using endobag without leak or spillage. (The video film is presented)

Results: There were no post-operative complications. Patient continues to have neurological care and was recovering progressively the cognitive faculties. The pathology confirmed the diagnosis of mature cystic ovarian teratoma with neural tissues, no immature component.

Conclusion: Auto immune encephalitis due to ovarian teratoma are extremely rare in children, this is the first reported case in U.K. Laparoscopy to excise these lesions provides a safe access, better assessment of the lesion, the other ovary and intra-abdominal organs.

P107 LAPAROSCOPIC SURGERY FOR ZINNER SYNDROME IN A 6-MONTH-OLD INFANT Masahito Sato, MD, PhD¹, Masashi Oae, MD², Kumiko Suzuki, MD¹, Hiroaki Hayashi, MD¹; ¹Department of Pediatric Surgery, Kitano Hospital, ²Department of Urology, Kitano Hospital

Background: Zinner syndrome is a rarely diagnosed disease characterized by seminal vesicle cysts, and renal agenesis and an ectopic ureter on the ipsilateral side. We present the first pediatric case of Zinner syndrome in which the patient was treated with laparoscopic surgery.

Case: A 6-month-old infant was referred to our hospital under a diagnosis of repeated urinary tract infection. On admission, his left scrotum was reddish and slightly swollen. A diagnosis of left-sided epididymitis was made by ultrasonography. Magnetic resonance imaging revealed a left-sided seminal vesicle cyst, but no kidney was seen on the left side. Cystourethrography also detected the ectopic insertion of the left ureter into the left seminal vesicle and the seminal vesicle cyst. A renal scan revealed a functionless left kidney and a normal right kidney showing compensatory hypertrophy.

During surgery, the patient was placed in the supine position. A Foley catheter was introduced into the bladder under direct vision using cystoscopy. A 12-mm trocar for the camera was inserted via a curved intraumbilical incision. Carbon dioxide pneumoperitoneum of 10 mmHg was established, and a 30-degree rigid scope was inserted. Then, a 5-mm trocar was inserted via a mid-clavicular incision in the patient's right flank, and two 3-mm trocars were then placed in his left flank and lower abdomen. A whitish tortuous mass was found in the left retroperitoneum, and it was found to be in communication with the seminal vesicle. The retroperitoneum was explored on the left side of the sigmoid colon. Dissection was performed from the cranial side to the caudal direction using electrocautery and laparoscopic coagulation shears. The left vas deferens was separated from the cyst and preserved. The proximal side of the cyst was clipped under direct vision using intraoperative cystoscopy. The total operation time was 143 minutes, and the patient's postoperative course was uneventful. The patient was discharged on the third postoperative day.

Conclusion: The diagnosis of a seminal vesicle cyst and ipsilateral renal agenesis is suggestive of Zinner syndrome, a very rare condition. In such cases, the presence of a symptomatic condition, such as repeated epididymitis, is considered to be an indication for laparoscopic surgery, even in infants, in order to avoid late complications, such as perineal pain, painful ejaculation, lower urinary tract symptoms, dysuria, or infertility.

P108 TRANSPERITONEAL FLEXIBLE PYELOSCOPY Robert A Coleman, Mr; Birmingham Children's Hospital

Calyceal stones can be difficult to treat at laparoscopic pyeloplasty. Unsuccessful treatment can necessitate additional procedures to achieve stone clearance following pyeloplasty. We describe transperitoneal pyeloscopy using a flexible cystoscope as an adjunct to laparoscopic pyeloplasty. This technique can be employed for the investigation of collecting system anatomical anomalies, for the identification and treatment of renal stones, and the clearance of collecting system debris.

A retrograde JJ stent is inserted cystoscopically and the patient is repositioned in a lateral position. Laparoscopy ports

Poster Abstracts

are inserted at the umbilicus, with two 5mm working ports on the affected side. The pelviureteric junction (PUJ) is dissected and a pelvic “stay suture” inserted. The PUJ is disconnected, providing access to the collecting system.

A 16FG flexible cystoscope is introduced via the subcostal laparoscopy port and inserted into the renal pelvis with the help of a laparoscopic grasper. The renal pelvis is explored as with flexible ureteropyeloscopy. Stone fragments can be grasped using a stone basket and removed via the 5mm port. The pyeloplasty can then be continued as standard.

In our experience this is a simple technique which provides excellent endoscopic evaluation of the pelvicalyceal system without significantly prolonging laparoscopic pyeloplasty.

P109 LAPAROSCOPIC LEFT RETROPERITONEAL LYMPH NODE DISSECTION Daniel Solomon, Saleem Islam, MD, MPH; University of Florida

This video describes a laparoscopic left retroperitoneal lymph node dissection in an 18yo male with paratesticular rhabdomyosarcoma. A three port technique is utilized to dissect a lymph node packet from the insertion of the gonadal vein through the inguinal canal inferiorly to the renal vessels superiorly. Port placement and margins of dissection are discussed.

P110 TRANSPERITONEAL LAPAROSCOPIC URETEROPLASTY Robert A Coleman, Mr, Anna Harris, Miss; Birmingham Children's Hospital

Congenital midureteral stenosis is an uncommon anomaly with an incidence of approximately 1 in 4000 children. We present a case of laparoscopic correction of midureteric stenosis.

A 5 year old girl presented after ultrasound imaging for enuresis workup, with a background history of a febrile UTI at 18 months of age. Ultrasound scan (USS) demonstrated right hydronephrosis and upper ureteric dilatation. Further investigation with MAG3 isotope renography demonstrated poor drainage and reduced function on the right which contributed only 21% to overall renal function. MAG3 was seen to accumulate in the right collecting system and upper ureter. Further evaluation with cystoscopy demonstrated normal urethra, bladder and ureteral orifices. Retrograde pyelogram demonstrated a normal distal ureter and midureteral stenosis with a dilated upper ureter and pelvicalyceal system.

Surgical correction was achieved by transperitoneal laparoscopic dismembered ureteroplasty. The patient was positioned in a left lateral position with umbilical open 5mm cannulation and 2 further 5mm working ports. The caecum and ascending colon were mobilised medially and the ureter dissected. The periureteric arterial plexus was preserved as much as possible to ensure adequate blood supply. The stenotic segment was excised and the ureter spatulated. A continuous anastomosis was achieved over a 4.7FG double J ureteric stent. Bladder drainage was established with a foley catheter. Recovery was uneventful and the patient was discharged home on post operative day 2.

The ureteric stent was removed at 7weeks following ureteroplasty. At 6 month follow up the patient remained pain free and had significant improvement in upper tract dilatation on repeat ultrasound scan. We advocate management of congenital mid ureteral stenosis by primary laparoscopic dismembered ureteroplasty, ensuring careful preservation of the periureteric vascular plexus.

P113 LAPAROSCOPIC ASSISTED TRANSUMBILICAL EXCISION OF GIANT CYSTIC OVARIAN TUMOR IN A CHILD: A CASE REPORT Narito Takada, MD, Kotaro Eriguchi, MD, Kentaro Watanabe, MD, Tetsuo Katayama, MD; Hyogo Prefectural Amagasaki General Medical Center

Cystic ovarian tumors are not uncommon in children. This tumor may be cystic (simple with a solitary fluid collection) or complex (cystic with solid components or septations). The majority of cystic ovarian tumors in children are benign, the most common being simple cysts, serous cystadenomas, mucinous cystadenomas and mature teratomas. It is reported that the incidence of ovarian malignancy is 2.6/100,000 per year in childhood.

The surgical treatment has become more conservative and less invasive; hence, a laparoscopic approach in the pres-

Poster Abstracts

ence of a benign tumor has become a standard strategy. However, large cystic ovarian tumors in the pediatric population require a thoughtful consideration to the preservation of the ovary when possible and the risk of malignancy.

We herein report a case of a 12-year-old girl referred to our department for an abdominal mass. On examination, the abdomen was distended by a large intraabdominal mass. An abdominal computed tomography scan showed a complex cyst measuring approximately 31 cm x 22 cm x 15 cm arising from the right ovary. She was treated with the laparoscopic assisted surgery. The tumor was removed en bloc through the umbilicus. We used an umbilical zigzag skin incision technique reported in adult laparoscopic surgery. The wound of the umbilical region was nearly scarless in this case. This method has advantages of lower invasiveness and better cosmetic appearance, and may be able to accomplish radical excision of ovarian tumors and preservation.

The literature was reviewed and the diagnosis, treatment options, and controversies in the management are discussed, highlighting the laparoscopic assisted surgery for cystic ovarian tumors.

P115 OUTCOMES OF ROBOTIC ASSISTED LAPAROSCOPIC SURGERY IN PEDIATRIC UROLOGY: AN EARLY EXPERIENCE IN CHINA Hua Xie; Shanghai Childrens Hospital

INTRODUCTION AND OBJECTIVES: Although robotic assisted laparoscopic surgeries have been widely used in adult urology in China, the outcomes in pediatric urology have not been evaluated yet. We here provide a pioneer experience of robotic assisted surgery in pediatric urology in China.

METHODS: We started robotic assisted surgery in pediatric urology from October 2013. A retrospective study including 23 patients was performed.

RESULTS: There are 23 patients in this study (18 boys and 5 girls). The mean age was 7.26 years (ranged 4-13 years). 13 patients with pelvic-ureteral junction obstruction underwent pyeloplasty (Anderson-Hynes). 3 patients with vesicoureteral junction obstruction and 2 patient with bilateral vesicoureteral reflux underwent extravesical ureteral reimplantation (Lich-Gregoir). 3 patient with adrenal adenoma underwent adrenalectomy. 1 patient with Wilms tumor underwent nephrectomy. 1 patient with duplicate kidney underwent upper nephrectomy. There was no conversion to open procedure and no intraoperative complication. The mean operative time was 167 minutes (range 100- 250 minutes). The mean blood loss was 21 ml (range 10-100ml). Patients were followed up 11 months (range 1-25 months). Efficacies were satisfied and no complication was observed.

CONCLUSIONS: From our early experience, robotic assisted laparoscopic technology is feasible and safe in pediatric urological surgery. It is particularly useful in reconstructive operations that required precise intracorporeal suturing, such as ureteral reimplantation and pyeloplasty. A previous experience in laparoscopic surgery could help surgeons shorten the learning curve for this technique.

P116 USE OF THE 5-MM STAPLER FOR LIGATION OF HIGH IMPERFORATE ANUS FISTULA Bethany J Slater, MD, Steven S Rothenberg, MD; Rocky Mountain hospital for Children

Objective: Laparoscopic anorectoplasty (LARRP) for the treatment of select anorectal malformations has gained popularity due to the enhanced visualization of the fistula and the ability to place the rectum within the sphincter complex while minimizing division of the muscles and the perineal incision. However, given the technical challenges and reported complications of ligation, a number of techniques have been described including using clips, suture ligation, endo-loops, or division without closure. We aimed to evaluate fistula closure and division using a 5-mm stapler (JustRight Surgical, Boulder, CO).

Methods: A retrospective chart review was performed on patients who underwent LARRP for imperforate anus between March 2015 and January 2016.

Results: 3 patients underwent LARRP with division of the fistula using the 5-mm stapler. The average age was 2.7 months and average weight was 4.1 kg. The location of the fistula was recto-prostatic in two cases and recto-bladder neck in one case. There were no complications.

Poster Abstracts

Conclusion: Division of a fistula at or above the level of the prostate can safely and effectively be performed with the 5-mm stapler. The stapler allows for division flush with the urethra or bladder, is ergonomic, and minimizes spillage of rectal contents.

P118 LAPAROSCOPIC DUHAMEL TECHNIQUE COMBINED WITH EXTRA-ANAL TRANSECTION OF THE RECTUM FOR HIRSCHSPRUNG'S DISEASE Xi Zhang, MD, Li Yang, Shao-tao Tang; Department of Pediatric Surgery, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology

Objective: Laparoscopic-assisted Duhamel procedures had been accepted as the common procedures for the treatment various types of Hirschsprung's disease (HD). In various reported laparoscopic-assisted Duhamel procedures, they were difficult and complex to apply to infants. Here, we reported the innovative laparoscopic Duhamel technique combined with extra-anal transection of the rectum through the incision in the posterior rectum for the surgical management of HD with subtotal or total colectomy.

Methods: Laparoscopic modified Duhamel procedure was performed using three 5-mm trocars and one 3 mm trocar. For the patients with colostomy, we used this abdominal opening to place one of the 5 mm trocar as operating port. The transverse, ascending colon, ileum, descending and sigmoid were mobilized. For patients with subtotal colectomy, the ascending branch of the arteriae colica dextra was preserved. Intrapelvic dissection was continued on the back wall of the rectum until the level just above the dentate line was reached.

A Lone Star retractor was used to expose the anus. A full-thickness hemicircumferential incision was made using cautery in the back wall of the anal canal 1 cm above the dentate line. Retrorectal dissection was performed using Kelly forceps, which was extended upward where a retrorectal tunnel was created. Once the retrorectal tunnel created, a Kelly forceps was introduced the pelvic cavity. Under vision, the mobilized colon or ileum was grasped and pulled down through the presacral space. The colon or lieum was extra-anally divided perpendicular to the anus using linear cutting stapler in order to obtain a short 4-5 cm rectal stump.

The colorectal or Ileocolic end-to-side anastomosis was completed. The side-to-side colorectal or Ileocolic stapled anastomosis was completed by using linear cutting stapler; one jaw of the stapler was passed into the lumen of the native blind rectum stump and the other one into the lumen of the normal colon or lieum. Usually, one cartridge (60mm in length) was triggered under laparoscopic view to maximize the septum resection, leaving an insignificant less than 0.5 cm septum remnant.

26 patients with long-segment HD requiring subtotal colectomy and 9 patients with total colonic aganglionosis requiring total colectomy went modified laparoscopic Duhamel procedure described in this report.

Results: No conversion to open surgery was necessary. Mean operating time was 178 min. No intraoperative complications and anastomotic leak was observed. Mean follow-up period was 48 months. The mean timespan to obtain an acceptable defecation frequency (1-4 times /day), 4.1 months for subtotal colectomy and 6.8 months for total colectomy. The 6 patients had readmission for enterocolitis, they were all treated conservatively. 2 patients experienced episodes of constipation during the follow-up period. Of the 24 patients over 4 years old, all achieved normal defecation without incontinence.

Conclusions: Laparoscopic Duhamel technique combined with extra-anal transection of the rectum for HD with subtotal or total colectomy appears feasible, safe and easy to perform with good results. Using the Endo-GIA Stapler extra-anally is simple and more beneficial, reduces trauma to the abdominal wall.

P120 DEVELOPMENT OF A NEW NEEDLE KIT FOR LAPAROSCOPIC REPAIR OF PEDIATRIC INDIRECT INGUINAL HERNIAS. Masao Endo, MD, PhD¹, Leonardo R Igarashi²; ¹Saitama City Hospital, ²COSMIC M.E. INC.

Poster Abstracts

Objective: Percutaneous extraperitoneal ligation of patent processus vaginalis (PPV) is the simplest and easiest way to repair pediatric indirect inguinal hernia among the various laparoscopic techniques. We developed a unique technique to achieve completely extraperitoneal ligation of PPV without any skip areas, sparing the spermatic cord and vessels (Surg Endosc, 2009), and the technique has been applied to more than 2,000 children with minimum recurrence rates (0.08%).

A key of this technique is to lead a suture around the internal inguinal ring (IIR) percutaneously under the safe and precise control. The development of equipment for sending and retrieving the suture as the easily usable and commercially available products is necessary so that this technique spreads widely. The purpose of this paper is to introduce our most recently devised equipment named EndoneedleNeo that can be provided as a marketing product.

Technology: This newly developed needle kit consists of a 70-mm, 16-G metal needle with a sharp cutting edge (puncture needle), a 18-G dull-tipped needle to send a 2-0 twisted suture through the barrel of the puncture needle (suture sender), and a 22-G needle that catches the suture end using its loop and retrieve the suture (suture retriever). These three needles can be put together into an assembly with plastic grips and acts as a 3-stage rocket by pushing each grip forward sequentially.

In actual procedures, the puncture needle passes through the skin along the lower half of the IIR through the extraperitoneal layer, crossing over the testicular vessels and cord, and projects into the abdominal cavity at the opposite side. The suture sender, which has the suture in its lumen, carries the suture through the barrel of the puncture needle, and delivers one end of the suture to a grasper. After removing of the puncture needle and the suture sender, the suture is placed in the extraperitoneal space along the lower half of the IIR.

Then, the puncture needle again passes along the upper half of the IIR and projects into the abdominal cavity through the outlet of the previously placed suture. The suture retriever, which appears from the tip of the puncture needle, catches the intra-abdominal end of the suture using its loop. After removal of the all needles, the suture encircles the IIR with both ends of the suture outside the body. The IIR is closed by tying the both ends of the suture.

Preliminary results: The clinical application of this needle kit is planned in near future. The procedures will be facilitated more satisfactorily with the EndoneedleNeo than previously devised tools in terms of precise control and saving the operation time. During the procedures the combined grips serve to not only fix the needles in place, but also can be used as a handling grip.

Conclusions: Using this 3 stage-rocket style needle kit, surgeon can perform all of the procedures with a single tool in hand, and can facilitate the operation smoothly. This kit can reduce the strain for both the surgeon and the affected patients during herniorrhaphy.

P121 ESTABLISHING A MULTIMODULAR INFORMATION TECHNOLOGY (IT) SOLUTION FOR PEDIATRIC SURGERY UNITS WITH MODEST RESOURCES Mahmoud Elfiky, MD; Cairo University

Objective: Every Pediatric Surgery unit needs an IT solution for saving patient medical records, researching & communicating with the World and its staff, which costs from thousands to millions of dollars. Our goal was to minimize the cost to the least for units with modest resources.

Description of the technology and method of its use or application: Cloud computing was used with a shared private secure server. The initial needed modules were for creating emails, setting up a welcoming website, integrating social media platforms & setting up other cloud modules. The first module was an electronic medical records software. The other was a clinical research data collection tool. Both modules were synchronized for specific research projects. More modules were added later to archive all surgery photos, sharing presentations & for online tutorials.

Results: The IT solution was created & implemented for our University Faculty of Medicine, the local Pediatric Surgery Association & was proposed for IPEG. The cost for the total setup was \$100 annually with no running costs. Several research projects results have been published using the technology in other surgery meetings. Results have helped in auditing and improving our department surgery services.

Poster Abstracts

Conclusion: Implementing a total IT solution for a modern Pediatric Surgery unit can be created using this low cost solution.

P122 MINI-INVASIVE SURGERY FOR HIRSCHSPRUNG'S DISEASE IN CHILDREN Vasyl Prytula, MD¹, Mykhailo Silchenko², Oleg Godik¹, Syed Faizullah Hussaini¹, Oleg Kurtash¹, Andriy Kuzyk¹; ¹O.O.Bogomolets National Medical University, Kyiv, Ukraine, ²National Childrens Specialized Hospital Ohmatdyt, Kyiv, Ukraine

Introduction. Mini-invasive technique is the most modern approach for correction of Hirschsprung's disease (HD).

The aim - study the efficiency of mini-invasive surgery for HD.

Materials and methods. Since October 2011 till January 2016, we treated 130 children. 69 - with Transanal Endorectal Pull-Through (TEPT) and 61 - with laparoscopic-assisted TEPT.

Seventeen (13.08%) patients aged below 1 year, 60 (46.15%) 1 to 3 years - , 29 (22.31%) 4 to 5 years - and 24 (12.38%) above 6 years. Rectal form of aganglionosis was diagnosed in 93 (71.54%), recto-sigmoid - in 35 (26.92%) and subtotal in 2 (1.54%).

For diagnosis we used medical history, blood and urine tests, ECG, ultrasonography of internal organs, barium enema, anomanometry, histological and determination of the activity of anticholinesterase).

Results and discussion. After the diagnosis of HD patients were prepared for surgery, for laparoscopic-assisted TEPT two teams of surgeons worked parallelly - team for laparoscopic surgery (1 surgeon and 1 assistant) and team for transanal rectal dissection and endorectal pull-through (1 surgeon and 2 assistants). By this method children aged above 3 years were operated.

Patient was placed in litotomic position on operation table. Three ports of 5.5 mm were installed: 1st - below the umbilicus for 30° optics, 2nd and 3rd - in upper left and lower right quadrants. Laparoscopically after revision of the distal colon area of resection was determined. Then colon was mobilized, from transitional fold of peritoneum to the determined level of resection by ligation of mesentery vessels and separating it from flanks. Then next step was transanal demucosation of rectum till the folds of peritoneum forming sero-muscular pouch, similar to Soave. Mobilized colon was pulled through the sero-muscular pouch to the determined level of resection and coloanal anastomosis was imposed by absorbable nodal sutures. Intestinal intubation tube was inserted through the line of anastomosis. Repneumoperitoneum was performed to visualize and revise the pulled-through intestine. After that, pneumoperitoneum was eliminated, ports were removed. Places of the ports were sewn.

Duration of operation – laparoscopic-assisted TEPT was 150-175 minutes, hospitalization time - 7-14 days, the length of the colon removed - 20-60 cm. Time of observation in the postoperative period - from 1 month to 3 years.

In three (2.30%) children non consistency of coloanal anastomosis due to the hyper activity of the patient in the early postoperative period, this was corrected by open staged treatment. In 15 (11.54%) patients we had soiling in 11 (8.46%) stenosis of coloanal anastomosis which was treated conservatively. All children in the postoperative period underwent rehabilitation treatment with good functional results.

Conclusions. Laparoscopic-assisted TEPT is one of the promising surgical procedures, which requires high qualification pediatric surgeons and full technical support. Modern methods of identification of agangliar and secondary changed areas of non-functioning colon segment give more possibilities to determine the length of colon resection which greatly affects on the achievement of good functional results after operation. Laparoscopic assistance creates better conditions of transanal dissection of the colon and makes the operation easier and faster.

P123 SINGLE-PORT LAPAROSCOPIC ASSISTED TRANSCROTAL APPROACH ORCHIDOPEXY (LATAO) COMBINED WITH PERCUTANEOUS EXTRA-PERITONEAL INNER RING LIGATION USING HOOKED NEEDLE FOR PALPABLE CRYPTORCHIDISM WITH INDIRECT INGUINAL HERNIA Yazhen Ma, MD¹, Suolin Li, MD¹, Xuelai Liu, PhD², Jianhui Cai, PhD³, Wenbo Wang, MD¹, Lin Liu, MD¹, Xinning Wang, MD¹; ¹Department of Pediatric Surgery, The Second Hospital of Hebei Medical University, ²Department of Pediatric Surgery, The University of Hong Kong-Shenzhen Hospital,, ³Department of

Poster Abstracts

General Surgery, The Peoples Hospital of Hebei Medical University, Department of Surgery, Graduate School of Hebei Medical University,

Background: For palpable cryptorchidisms with indirect inguinal hernia, traditional open surgical technique are still currently conducted, which needed to cut open the inguinal canal and longer scar were left on the abdominal wall. We explored and innovated the single-port laparoscopic assisted transcrotal approach orchidopexy(LATAO) combined with percutaneous extra-peritoneal inner ring ligation using hooked needle, to treat palpable cryptorchidism with indirect inguinal hernia with more effectiveness and less trauma.

Materials and methods: Totally 29 children with palpable cryptorchidism and indirect inguinal hernia were done with single-port LATAO between October 2010 and May 2014. Four of them were bilateral, 12 on the left side and 13 on right. Median age was 32.56 ± 3.2 month . No intra-operative complications were observed.

Results: Totally 29 children with 33 undecended testis were successfully performed by LATAO. Fifteen in 29 children with unilateral cryptorchidism were found to be associated with patent processus vaginalis on opposite side . Follow-ups were conducted at least one year post-operatively. No post- operative complications were found to date .

Conclutions: Singe-port LATAO procedure has proved to be a safe and effective procedure for palpable cryptorchidism with indirect inguinal hernia in children.

Key words: laparoscopic orchidopexy

Cryptorchidism

Indirect inguinal hernia

single-port

laparoscopic assisted transcrotal approach orchidopexy(LATAO)

P124 MODIFIED STEADY PRESSURE AUTOMATICALLY CONTROLLED ENDOSCOPY IN PEDIATRIC PATIENTS. Katsuji Yamauchi, MD, Takeo Yonekura, Tomohiro Ishii, Masafumi Kamiyama, Yuuji Morishita, Kouki Kimura; Department of Pediatric surgery, Nara hospital, Kinki univ. faculty of medicine

Background: Conventional gastrointestinal (GI) endoscopy is performed with on-demand insufflation by air or carbon dioxide (CO₂) without pressure monitoring, which can result in massive bowel distention in pediatric patients. In 2012, Nakajima et al. developed steady pressure automatically controlled endoscopy (SPACE) that prevents bowel distention based on the “pinch-cock phenomenon” during endoscopic esophageal submucosal dissection. We applied modified SPACE to GI endoscopic procedures in children.

Materials & Methods: Ten children underwent endoscopic procedures under SPACE. SPACE was performed using an automatical CO₂ insufflator with a pressure monitoring system specified for laparoscopic surgery (THEMOFLATOR: Karl Storz endoscopy, Tokyo, Japan), which was connected to a working channel on GI endoscopy (XP-240, N-40: Olympus Medical Systems, Tokyo, Japan) or naso-gastric (NG) tube at a pressure of 6-15 mmHg.

Results: Three neonates underwent SPACE; one for balloon dilatation of the duodenal stenosis, one for duodenography to reveal two stenotic lesions, and one for evaluation of the type of duodenal stenosis. Two children had SPACE for evaluation of duodenal perforation due to blunt abdominal trauma and duodenal ulcer, respectively. One child was placed a gastrojejunostomy tube of under SPACE. SPACE provided excellent visual fields without abdominal distention in these cases. Three infants and one child underwent SPACE while receiving laparoscopic assisted gastrostomy. SPACE prevented intestinal distention and facilitated a large operative field for the laparoscopic procedure.

Conclusions: SPACE is feasible, safe, and clinically effective compared with conventional endoscopy for pediatric patients.

Poster Abstracts

P125 THE APPLICATION OF SINGLE-PORT HOLDING NEEDLE TECHNIQUE IN PEDIATRIC INGUINAL HERNIA. Yonghui Peng; The subsidiary HeXian memorial hospital of Guangzhou southern medical university

Objective: To investigate the application of single-port holding needle technique in pediatric inguinal hernia.

Methods: The clinical data of 3215 cases of pediatric inguinal hernia admitted to our hospital were retrospectively analysed between May 2009 and March 2015. There were 3025 male and 190 female children with an average age of 1.2 years (range, 0.5-4 years) underwent the surgery. There were 899 cases on the left side and 1906 cases on the right side. All the operations were successfully performed without conversion and the simple surgical instruments included was ordinary needle holders, 34x11 great circle pin, 4# silk.

Results: Compared with traditional surgical methods, the technique of single-port holding needle exhibited the advantages of less trauma, shorter operative time, faster recovery, fewer complications, better cosmetic.

Conclusion: The technique of single-port holding needle is feasible and safe. combined traditional surgical methods with the laparoscopic technique, it simplifies the operational technique and is proved to be safe and effective in the management of pediatric inguinal hernia.

P126 THE LEGOMOSIS DEVICE FOR ESOPHAGEAL ANASTOMOSIS UNDER TENSION Cristobal M Abello Munarriz, MD, Ped, Surg; NORTH Clinic ORGANIZATION

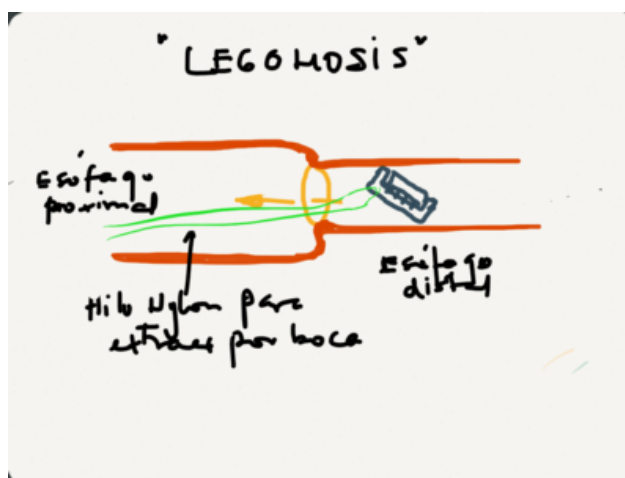
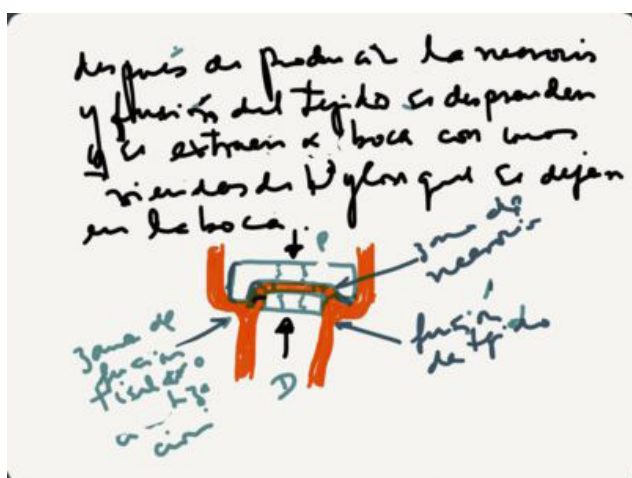
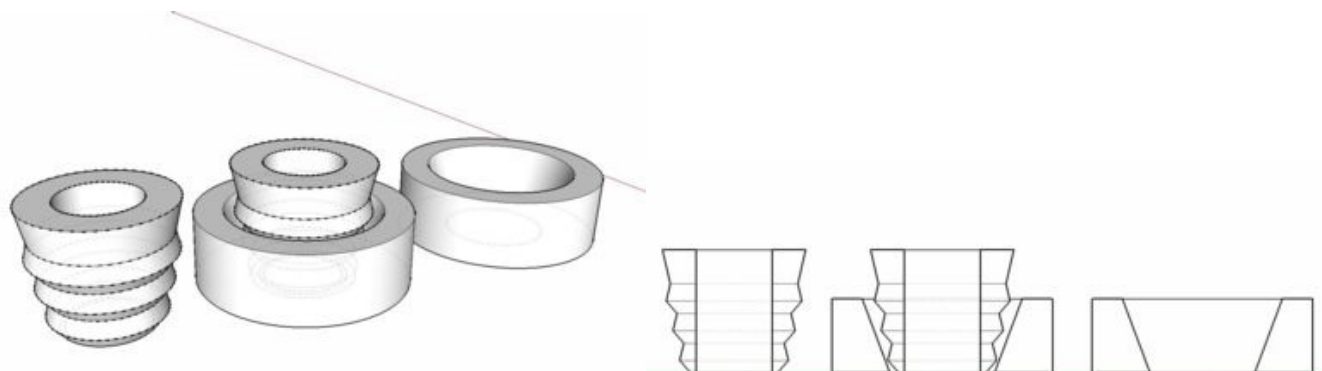
OBJECTIVES: Design and construct the prototype for **Endoluminal Esophageal Compression Anastomosis Under Tension Device** and reproduce a scale simulation procedure in an inanimate model simulator that we denominate **LEGOMOSIS**.

DEVELOPMENT: The large experience with pediatric esophageal manipulation, the magnamosis Harrison rings and the LEGO's toys, inspire me to develop this prototype. Two rings that are coupled under video thoracoscopic view, but approximation and coupled by endoluminal introduction. The anastomotic healing process is the result of the ischemic to no-ischemic progressive compressive effect by the device designed. The introducer hand piece device emulate the semirigid and malleable biliary Bakes dilators that we use to the GAP measure how we describe previously. The RINO software design and 3D printer device with ABS material we adjust the new prototype that consist in two Rings that coupled with pressure and compress the tissue, and two introducers to put the rings by orogastric and gastroesophageal way endoluminally, while are followed by direct video thoracoscopic view until the two rings are coupled and both esophageal wall folds are clamping really. The procedure is reproduced in an inanimate home made simulator model for esophageal long gap atresia that serve to training pediatric surgeon and validate the device.

RESULTS: A really prototype anastomosis device with your hand piece introducer was obtained. The material choice and the 3D printer manufacture is feasible. The entire process are reproduced in an inanimate model with success.

CONCLUSION : The LEGOMOSIS device design is near the reality by your ergonomic features, easy to introduce, guide and assembly. The LEGOMOSIS are really ready to validate in an animal model.

Poster Abstracts



P127 ROTATING RECEPTACLE (LA.VRE.PER.LA®) FOR THE PERFORMANCE OF ABDOMINAL X-RAYS IN NEONATES AND INFANTS Dimitrios Kagias, MD, PhD, Argyro Kagia, MD, Spyros B Spyarakos, MD, Emmanouel Stavroulakis, MD, PhD; GENERAL MATERNITY HOSPITAL "ELENA VENIZELOU-ALEXANDRA"

PURPOSE: Abdominal x-ray is the most common radiographic examination performed in the NICU. Among the difficulties in this age group are patients' size, the inability to immobilize them. The rotating receptacle offers immobilization of the neonates and infants and the performance of abdominal x-rays in every desirable position.

METHODS: Gypsum embossed carved effigies of newborns were used as matrix for the production of receptacles made of radio-transparent material (plexiglass). These were placed in a globe made of two plexiglass hemispheres. The receptacle is fixed on one of the hemispheres. The two hemispheres are attached to each other at the transverse axis. The whole globe is placed on a cup like an egg cup. The baby is secured in the receptacle with two or three sets of straps. There are slots on the hemisphere for the x-ray cassette and for respiratory support if the infant it is intubated.

Erect abdominal x-rays were performed in infants with either ileus or suspicion of perforation and up-side down in cases of anorectal malformations.

RESULTS: All the abdominal x-rays were performed without any complications or adverse events. There was continuous pulse oximetry for all the infants. The mean preparation time for each x-ray was approximately 3 minutes. There was no need of a parent or an assistant to hold the baby in the desired position.

CONCLUSION: It is a safe equipment, easy to use and offers the ability to perform more precise x-rays while in certain cases ameliorates the need for multiple views.

Poster Abstracts

P128 THE USE OF 3D PRINTED MODELS IN THE ACQUISITION AND VALIDATION OF LAPAROSCOPIC SKILL Semiu E Folaranmi, BSc, MBBS, MRCS, Henry Pinchbeck, BSc, PgDL, Hennessey Iain, MBCHB, BSc, MMIS, FRCSED; Ader Hey Hospital

OBJECTIVES of the technology

To create more lifelike models that can be used for the acquisition and validation of laparoscopic operative skills.

Description of the technology and method of application

A novel 3D printer will be used to produce a 3D silicon model of a tumour (sphere) within an organ (rectangle). The printer is a prototype that has a patent pending, and to our knowledge the only 3D printer in existence globally that can print in silicon to the resolution that mimics human tissue.

The model will be printed in a single piece and the density of both the sphere (tumour) and rectangle (surrounding tissue) will be matched to mimic those found in human tissue.

A 0.5mm layer will be created by the 3D printer to overlay the sphere and the rectangle in which it is embedded in different colours so that it will be apparent if the tumour capsule or surrounding normal tissue is breached during dissection.

The dimensions of the cube are 80mm by 30mm and the sphere has a diameter of 20mm.

Preliminary results: In December 2015 we designed and printed a 3D silicon model of a kidney that contained a tumour protruding from its parenchyma, which we dissected. The tissue texture and tactile feedback was found to be very similar to an actual kidney.

Future directions: This novel 3D printing technology and its application in minimally invasive surgery could revolutionise the approach to surgical training and validation of laparoscopic skills.

Training in a simulated environment with 3D printed silicon models of lifelike organ systems could be used to develop and hone one's skills in the performance of laparoscopic procedures in a manner that is ethically viable, safe, and acceptable to future generations of would be patients.

We plan to use this technology to conduct a prospective randomised unblinded study to test the performance of a new 3D camera compared to a standard 2D camera in the acquisition of laparoscopic skills.

P129 MODIFIED METHOD OF MINIMAL ACCESS SURGERY IN TREATMENT OF HYDATID DISEASE IN CHILDREN TO PREVENT RECURRENCE Gm Irfan, MS, MRCSd, MCh, Ps Reddy, MS, MCh, Vinod Kumar, MS, MCh; Niloufer Hospital Institute for Women and Child health

PURPOSE: The aim of this prospective study is to present a new modification in the management of hydatid disease in children by minimal access surgery to cure the disease and prevent recurrence. Hydatid disease is not so common in children even in endemic areas but has serious complications including recurrence if not treated properly. There are various methods for treatment of this disease both medically and surgically.

MATERIAL AND METHODS: Over a period of 6 years (2008-2014), 24 children with abdominal and pulmonary hydatid disease (ECHINOCOCCUS) were treated at our department of paediatric surgery. The anatomical location of the disease was as follows: liver 17, lungs 4 spleen 2, and mesentery 1 case. Oral antihelminthic agents were given for two weeks prior to surgery so as to make them less infective. Only medical management was used for 2 cases of liver hydatid cysts less than 5cms and in one case of deep seated liver hydatid cyst. While 8 cases (33.33%) underwent minimal access surgery (laparoscopic or thoracoscopic procedure), 13 (54.17%) had open surgery. After installation of hypertonic saline with fine needle, 10mm trocar was inserted directly into the cyst but the modification that we used was to attach a suction catheter to the gas channel of the trocar so that as soon as it enters the cyst it starts suctioning the fluid there by preventing spillage and so the recurrence. We used the same gas channel for irrigation with hypertonic saline while suctioning through the main channel

Poster Abstracts

RESULTS: Eight cases underwent minimal access surgery -- liver 4 - two fresh cases and two recurrent cases after open surgery, spleen 2, lung-1, and mesenteric-1 recurrence after open surgery. No recurrence has been seen during this follow-up period of 8 months to 6 yrs compared to 3 cases of recurrence after open surgery. The overall long-term results are good.

CONCLUSIONS: Our modified method of minimal access surgery seems to be more effective in preventing the recurrence but a larger series would be required to substantiate the findings

P130 VIDEO-GUIDED TUBE THORACOSTOMY Yu-Wei Fu, MD¹, Chih-Hao Chen, MD, PhD²; ¹Changhua Christian Hospital, ²Mackay Memorial Hospital

Purpose: Tube thoracostomy is a common and generally safe procedure. However, potential hazards can occur during placement of the chest tube. Inasmuch as unexpected injuries may arise from tube thoracostomy, we proposed a novel video-guided method.

Description: We used an independent complementary metal oxide semiconductor image sensor with a processing chip to obtain a front view image in the chest cavity. The device is connected to a aluminum shaft with four small light emitting diode crystals in the tip, and a detachable small monitor with a battery inside. The apparatus is small and can be used to direct vision-guided tools in tube thoracostomy.

Evaluation: We performed video-guided tube thoracostomy in 6 patients with pleural adhesions. All patients experienced good tolerance to the procedure and had no immediate adverse events. Tube thoracostomies were performed by a single surgeon with good acceptability and each procedure was completed within 10 minutes.

Conclusion: In some cases of pleural adhesions, the video-guided tube thoracostomy may be a safer alternative to non-image guided tube thoracostomy.

P131 NEED TO CUSTOMIZE ERGONOMICS IN MINIMAL INVASIVE SURGERY IN CHILDREN Yoga M Nagendhar, MBBSMChDNB¹, Ghulam M Irfan, MBBSMChMRCS²; ¹Apollo Hospitals, Hyderabad, ²Niloufer Hospital, HYDERABAD

Objective of the technology or device

Child positioning and setting up for a Minimal Invasive Surgical procedure is very important. Especially in children where size of the table, patient size and equipment makes a lot of difference in procedure and surgeons comfort. Ergonomics in Minimal Invasive Surgery for children is different and needs to be modified according to the age of the child and the procedure.

Description of the technology and method of its use or application

Elevating the child over the operating table using a CUSTOMISED rests according to patients size
Handles need to be reversed and handled when the hand instruments are struggling with the operating table
Modifying ergonomics accordingly and changing the positioning of the patient

P132 NEEDLE PYLOROMYOTOMY A SIMPLE AND ADJUSTABLE TECHNIQUE OF LAPAROSCOPIC PYLOROMYOTOMY

Yoga M Nagendhar, MBBSMChDNB¹, Ghulam M Irfan, MBBSMChMRCS²; ¹Apollo Hospitals, Hyderabad, ²Niloufer Hospital, Hyderabad

Objective of the technology or device

Laparoscopic pyloromyotomy is a well accepted procedure for Hypertrophic pyloric stenosis with comfortable results.

Description of the technology and method of its use or application.

We use a needle passed through the anterior abdominal from the appropriate site over the hypertrophied pylorus. Needle is adjusted in the abdomen so that the length of the sharp bevelled edge of the needle matches the pyloric muscle thickness as shown in the ultrasound.

Poster Abstracts

Conclusions/Future directions

This technique makes the laparoscopic pyloromyotomy a easy and more precise procedure .Needle length going inside the abdomen is adjustable. Acts as a third working port.

P134 LAPAROSCOPIC KIMURA PROCEDURE OF DISTAL PANCREATECTOMY IN CHILDREN Vasil Prytula, Profesor¹, Alexander Dubrovin, Profesor¹, Oleg Godik, PhD, MD², Valerie Soroutchan, MD¹; ¹National Medical University of O.O. Bogomolets, ²Oberig Clinic

Background: Solid pseudopapillary tumors are a rare condition with a frequency of 0.2-2.7% rate out of all the non- endocrinologic tumors of the pancreas. It is more common in females.

Methods: This is a case of a 9 year old girl who presented with a pseudopapillary tumor of the pancreas. The tumor was found on an US that was conducted due to complaints of periodic stomach pain. After the child was referred to our clinic a contrast CT and an MRI were performed. The finding were: a solid tumor with a thin capsule that lies on the vessels of the spleen without invasion into them, and without proliferation of the regional lymphatic nodules. The child was also tested for oncologic markers that presented negative.

At operation the child was in the French position. We used a 10mm camera placed 2cm lower than the umbilicus, and 2 work instruments that were 5mm placed in the right and left mesogastric regions. For better visualization gastropexy to the abdominal wall was performed. The tumor was found in the body of the pancreas. Dissection of the pancreatic tissue and the splenic vessels was performed with an US scalpel. The pancreatic duct was visualized and clipped. The specimen was removed through an enlarged subumbilical incision intact inside a specimen bag. A drainage tube was placed through the left mesogastric port.

Results: Duration of operation was 189 minutes, and blood loss estimated 25ml. Patient started receiving liquids on day 1 post op, and feeding on day 2 post op. The drainage tube was removed on the 3rd post op day. Final histology showed a pseudopapillary tumor of the pancreas. A biochemistry and US check up was 1 and 3 months after operation. No pathologic findings were registered.

Conclusion: Laparoscopy is effective and feasible for tumors of the pancreas.

P135 OUR EXPERIENCE WITH THORACOSCOPIC DISCECTOMY AS A FIRST STEP PROCEDURE FOR SCOLIOTIC DEFORMATIONS OF THE VERTEBRAE IN CHILDREN Anatoliy Levitskiy, Profesor¹, Alexander Dubrovin, Profesor¹, Oleg Godik, PhD, MD¹, Nikoliy Dolyanitskiy, MD², Valentin Rogozinskiy, MD¹, Valerie Soroutchan, MD¹; ¹National Medical University of O.O. Bogomolets, ²National Specialized Children's Hospital "Oxmatdet"

Background: The current state of scientific and technologic progress in orthopedics lead to the use of thoracoscopy not only for lung and heart operations, but for operations on the thoracic spine. Such procedures became useful for the treatment of early onset scoliosis, and they provide prophylaxis of the "Krankschaft phenomenon".

Methods: In our clinic since 2014 until 2016 there were 2 children who had a two- stage operation performed for scoliotic deformations of the vertebrae, where the first stage was thoracoscopic discectomy of the intervertebral discs of the thoracic spine.

Child A. was 8 years and presented with a 4th degree S-form thoracolumbar scoliosis. The second stage of operation was the posterior instrumental correction of the spine with a growing Stryker construction.

Child B. was 7 years and presented with type 1 neurofibromatosis, a 4th degree right- sided S-form thoracolumbar scoliosis, and 3rd degree pectus excavatum. The second stage of operation was also the posterior instrumental correction of the spine with a growing Stryker construction.

Results: Both operations were conducted under endotracheal anesthesia with one lung ventilation. The patients were lied on their left side and the ports were placed on the medial axially line with the approach of the bulging side of the spine deformation. A 10mm camera and two 5 mm work instruments were used. At this first stage from 3 to 5 intervertebral discs were resected.

Poster Abstracts

Duration of the thoroscopic part of operation was from 150 to 180 minutes. The size of the arch deformation prior to operation was 64 and 78 degrees by Cobb, and after surgery with thoroscopic release and posterior fixation the arch size came to be 58 and 64 degrees.

Conclusion: Thoroscopic discectomy is feasible for early onset scoliosis with an arch size up to 90 degrees, in children with uncompleted growth. Using endoscopic technologies for first step operations in patients with thoracic scoliosis provides insignificant blood loss when performing discectomy. It improves the cosmetic result of the operation and prevents the “Krankschaft phenomenon”.

S001 LAPAROSCOPY IS SAFE IN INFANTS AND NEONATES WITH CONGENITAL CARDIAC DISEASE: A NATIONAL STUDY OF 3,684 PATIENTS Jina Kim, MD, Zhifei Sun, MD, Brian R Englum, MD, Alexander C Allori, MD, Obinna O Adibe, MD, Henry E Rice, MD, Elisabeth T Tracy, MD; Duke University Medical Center

Purpose: Laparoscopic surgery has been shown to decrease length of stay and complication rates in children. However, concerns have been raised about the use of laparoscopic surgery in infants with congenital cardiac disease due to their unique physiology. Prior studies on the safety and effectiveness of laparoscopy in children with congenital cardiac disease are limited in scope and cohort size.

Methods: We identified children < 1 year of age with congenital cardiac disease who underwent abdominal surgery in the 2012-2013 American College of Surgeons National Surgical Quality Improvement Project Pediatric database. Patients were stratified by surgical approach: open surgery (OS) vs. laparoscopic surgery (LS). We then compared 30-day mortality, length of stay, and postoperative complication rates by using multivariable regression methods to adjust for patient characteristics and surgical variables.

Results: In total, 3,684 patients met study criteria: 2,502 underwent OS while 1,182 underwent LS. Infants who underwent LS were older (98 vs. 36 days), larger by weight (4.2 vs. 3.2 kg), and more likely to require nutritional support preoperatively (74.7% vs. 60.5%) (all $p < 0.001$). The most common minimally invasive surgeries were gastrostomy tube placement (47.7%), fundoplication (30.5%), pyloromyotomy (2.2%) and repair of congenital diaphragmatic hernia (1.9%). After multivariable adjustment, LS was associated with shorter length of stay (effect size -1.8 days, 95% confidence interval [CI] -1.8 – -1.2, $p < 0.001$) and lower overall complication rate (odds ratio [OR] 0.42, 95% CI 0.34 – 0.52, $p < 0.001$). LS and OS demonstrated similar 30-day mortality (OR 0.71, 95% CI 0.38 – 1.32, $p = 0.28$).

Conclusions: Laparoscopy can be performed safely in infants with congenital cardiac disease who need abdominal surgery. Although further studies may be useful in determining which infants with congenital cardiac disease benefit the most from use of laparoscopy, minimally invasive techniques can be applied to routine and complex abdominal procedures.

Outcome (reference: open surgery)	Effect Size	Lower 95% CI	Upper 95% CI	P-value
Length of Stay (days)	-1.8	-1.8	-1.2	<0.001
Overall Complications (odds ratio, OR)	0.42	0.34	0.52	<0.001
Bleeding Complications (OR)	0.35	0.26	0.46	<0.001
Wound Complications (OR)	0.6	0.39	0.93	0.02
Pulmonary Complications (OR)	0.56	0.40	0.78	<0.001
30-day Mortality (OR)	0.71	0.38	1.32	0.28

S002 HOW TO REDUCE THE RISK OF DYSPHAGIA AND RECURRENCE: LESSONS LEARNED FROM A SERIES OF MORE THAN 1500 LAPAROSCOPIC TOUPET IN CHILDREN Philippe Montupet, MD¹, Reva Matta²; ¹Bicetre University Hospital, ²University of Beyrouth

Aims: Laparoscopic fundoplication is the gold standard surgical treatment of gastroesophageal reflux disease (GERD) in children. Recent metaanalysis have shown that it is extremely difficult to conduct randomized trials to compare partial and total fundoplications. Pre and post-operative investigations are very heterogeneous. Previous reported studies showed controversial results, thus rendering a poor conviction of the referring physicians regarding the surgical indications. Due to the fear of postoperative dysphagia and the possible risk of reoperation, the number of children benefiting from this intervention is limited. The aim of our study is to review some technical details to avoid such outcomes.

Methods: Since 1992, more than 1,500 children with age ranging between 4 months and 15 years were surgically treated for GERD laparoscopically. Based on the clinical findings, by pH monitoring and endoscopy, as well as based on esophageal manometry one member of our team was involved in a large number of surgical indications. Toupet

fundoplication and Nissen fundoplication were performed in 90% and 10 % respectively. The main technical key points were: full esophageal mobilization at the gastroesophageal junction, and preservation of the short gastric vessels and the vagal nerve. Forming a wide and tension-free wrap positioned on the anterior surface of the right diaphragmatic crura, and meticulous care to avoid excessive tight sutures are of great importance. The patients were followed with a mean of x years [x-y] and a manometry was performed systematically 6 months after the operation.

Results: Loss of followup was reported in less than 5% of the patients. We noted superior results in terms of transient dysphagia (10%) and postoperative recurrences (2%), owing that to the previously described technical key points and careful calibration of the hiatal orifice in neurological patients. Early signs of symptomatic improvement were remarkably noted in non-neurologic children with respiratory, allergic and otolaryngologic disease. The recurrence of GERD required revision surgery in 1.8% of the patients and it appeared to be technically feasible and safe. As compared to recently reported articles that analyze the causes of dysphagia and revision surgery, our data are of great significance because it illustrates a follow up of more than 10 years in the majority of the patients.

Conclusion: Regarding the surgical treatment of GERD, the few randomized prospective trials and meta-analyses continue to complement the surgical discussion; but all remain poorly contributory. This surgical operation, in particular, requires special attention to fine points and knowledge of the details. Dysphagia and postoperative recurrence in children are real causes of reluctance to the parents and to the pediatricians. Nevertheless, this reconstructive surgery can be of great advantage for the children.

S003 ENDOSCOPIC DEVITALIZATION OF GASTRIC MUCOSA AS AN ALTERNATIVE BARIATRIC PROCEDURE: EXPERIMENTAL EVIDENCE OF EFFICACY. Andreas Oberbach, MD, PhD, DrPH, MPH¹, Holger Till, MD, PhD², Nadine Schliching, PhD³, Marko Heinrich⁴, Stefanie Lehmann, PhD⁴, Yvonne Kullnick, MSc⁴, Anthony N. Kalloo, MD, PhD¹, Vivek Kumbhari, MD¹; ¹Department of Medicine and Division of Gastroenterology and Hepatology. The Johns Hopkins Medical Institutions, Baltimore, ²Department of Paediatric and Adolescent Surgery, Medical University of Graz, Austria, ³Department of Pediatric Surgery. University of Leipzig. Leipzig. Germany, ⁴University of Leipzig, Fraunhofer-Institute for Cell Therapy and Immunology IZI, experimental surgery research group

Background and Aims: The gastric mucosa is a critical regulator of glucose and lipid metabolism as well as bile acid and satiation pathways. Metabolic surgery, such as sleeve gastrectomy, reduces gastric volume and mucosal surface and results in substantial weight loss. However, the influence of resecting the gastric mucosa, independent of alteration in gastric volume is unknown. Therefore, we investigated the technical feasibility, efficacy and safety of selectively ablating the gastric mucosa by performing endoscopic gastric mucosal devitalization (GMD) in a large animal model ("sus scrofa domestica"). Major outcome parameters were defined as percentage weight gain and body fat mass at 1 month compared to controls.

Methods: The study involved 3 phases to allow determination of: 1) ablation energy to be applied, 2) mucosal surface area to be treated, and 3) a randomized controlled study to assess efficacy. The first phase determined that GMD should be achieved by first performing a submucosal injection of normal saline followed by devitalizing the gastric mucosa using argon plasma coagulation (APC). The second phase (1 month survival) was performed in 10 pigs to ascertain the optimal ablation parameters, in terms of surface area necessary to be treated. This elucidated that APC applied to 80% of the gastric mucosa (the entire gastric fundus and body) allowed for optimal outcomes in terms of percentage of relative weight gained, and was well tolerated. The third phase required a further 8 pigs which were randomized into two groups: GMD (n=4) and sham (SH, n=4). SH pigs underwent endoscopy with submucosal injection of normal saline. Animals were provided food and water ad libitum for 1 month and had their body weight measured daily. To assess body fat mass, total body multi-slice MRI by Dixon-sequence was performed at the 1 month postoperatively. Histological analysis of the gastric mucosa was performed on the resected stomachs.

Results: GMD was performed using standard endoscopic equipment. The animals tolerated the procedure without intra- and postoperative complications. No analgesia was administered. GMD pigs gained a significantly lower percentage of body weight compared to SH at 7 (92.2 ± 11.3 % vs 112.3 ± 3.6 %, $p=0.007$), 14 (108.4 ± 8.8 % vs 126.6 ± 5 %, $p=0.006$), 21 (119.7 ± 7.4 % vs 137.6 ± 11.1 %, $p=0.018$) days and after 1 month (133.5 ± 12.9 % vs 155.6 ± 8.3 %,

Oral Abstracts

$p=0.014$). As determined by MRI, GMD resulted in a significantly lower body fat mass at 1 month ($5.9 \pm 0.4\%$ vs $12.7 \pm 2.3\%$, $p=0.026$) compared to controls. Macroscopic examination of the stomach at 1 month revealed early regenerative changes of the mucosa with areas of scarring, particularly in the gastric body. Histologically, there was submucosal edema with patchy areas of fibrosis on H&E and trichrome stains. The muscularis propria and serosa were unaffected.

Conclusion: Endoscopic GMD was technically feasible and safe and results in a significant reduction in weight gain and a reduction in percentage fat mass. We propose that GMD be investigated as a potential new therapy for obesity.

S004 SURGICAL MANAGEMENT OF MEDIAN ARCUATE LIGAMENT SYNDROME- A SINGLE CENTER EXPERIENCE Mikael Petrosyan, MD, Philip Guzzetta, MD, Andrea Badillo, MD, Anthony D Sandler, MD, Timothy D Kane, MD; Children's National Medical Center

Introduction: The Median Arcuate Ligament Syndrome (MALS) is a rare syndrome resulting in a compression of the celiac artery, which may be associated with severe post-prandial abdominal pain, emesis, nausea, and weight loss and thus may lead to significant debilitation. With a significant increase in referral pattern for these patients as well as refinements made in the minimally invasive approach, we sought to review our institutional operative experience and outcomes for patients undergoing laparoscopic MAL release.

Patients and Methods: Between February 2013 and September of 2015, 78 patients underwent 79 laparoscopic MAL release operations at our hospital. Our operative technique evolved over the series and included ablation of the celiac ganglion plexus during ligament release. An IRB-approved retrospective analysis was performed which included demographics, techniques, complications, and outcomes.

Results: Seventy-eight patients ages 14-26 years, 11 males (14%) and 67 females (86%) diagnosed with MALS. These 78 patients underwent 79 laparoscopic ligament release operations. The diagnosis of MALS is based upon clinical symptoms which included abdominal pain, nausea, weight loss, and difficulty eating, in addition to Ultrasound (US) and/or CT angiography results. Seventy-six patients (97%) carried the diagnosis of Postural Orthostatic Tachycardia Syndrome (POTS). Peak systolic velocities on expiration in the celiac artery were elevated in all patients (range 200-572 cm/sec) prior to operation. Forty-nine patients also had evidence of celiac artery origin compression on CT angiography. All patients underwent laparoscopic median arcuate ligament release with intraoperative US evaluation. Average operative time was 110 min. Average length of hospital stay was 2 days. One open conversion (1.2%) was required for a bleeding celiac artery. Re-operative rate was 2.5%. There were no mortalities. Fifty-one (65%) patients had partial or complete symptomatic improvement immediately post-op and 10 patients (13%) had no change in symptoms post-operatively (less than or = 30 days). Follow up ranged from 1-24 months. Specifically, POTS symptoms were improved in 38% after MAL release.

Conclusion: Our results indicate that laparoscopic release of the median arcuate ligament is safe and produced results with high efficacy. Thus, we consider ligament release and ablation of the celiac ganglion to be the gold standard for MALS. Moreover, since majority of patients with concomitant POTS had symptomatic relief of their symptoms, this treatment strategy may be a viable therapeutic intervention for this patient population.

S005 OUTCOMES OF LAPAROSCOPIC VERSUS OPEN GASTROSTOMY TUBE PLACEMENT IN CHILDREN: A REVIEW OF THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM PEDIATRIC (NSQIP-P) DATABASE Kristine Corkum, MD¹, Colin Gause, MD², Timothy Lautz, MD², Catherine Hunter, MD², Julia Grabowski, MD²; ¹Northwestern University, ²Ann & Robert H. Lurie Children's Hospital of Chicago

Purpose: Gastrostomy tube placement is one of the most common operations performed by pediatric surgeons and may be performed via a laparoscopic or an open approach. We sought to compare 30-day outcomes of the two operative approaches using a large, multi-institutional surgical database.

Methods: The ACS NSQIP-Pediatric participant user files from 2012 & 2013 were queried to identify patients who underwent open gastrostomy (CPT 43830, 43831, 43832) and laparoscopic gastrostomy (CPT 43653). Patient character-

istics, including diagnosis and preoperative risk factors, intraoperative variables, and outcomes between groups were compared.

Results: 2,757 patients underwent gastrostomy placement, of which 786 (28.6%) were performed via open approach. Open gastrostomy demonstrated an increased risk of overall post-operative complications (14.9%, OR 2.08, $p < 0.0001$), including superficial incisional infection (OR 1.74, $p < 0.0001$), unplanned intubation (OR 3.13, $p < 0.0001$), and post-operative bleeding (OR 4.14, $p < 0.0001$). Open gastrostomy was also associated with an increased risk of unplanned re-operation (OR 1.72, $p = 0.0253$) and 30-day mortality (OR 2.53, $p = 0.045$). Laparoscopic gastrostomy was associated with a significant shorter length of stay (17.3 ± 24.8 days versus 27.0 ± 30.6 days, $p < 0.0001$) and shorter operative time (48.6 ± 34.9 minutes versus 63.9 ± 47.1 minutes, $p < 0.0001$) when compared with open gastrostomy. Importantly, patients undergoing open gastrostomy had higher ASA III/IV classifications (OR 1.77, $p < 0.0001$) and more overall preoperative risk factors (OR 1.85, $p = 0.046$).

Conclusion: Laparoscopic gastrostomy tube is associated with fewer 30-day post-operative complications, shorter operative time and length of stay, and reduced overall mortality when compared to open gastrostomy in children. These outcomes may be attributed to patient selection, as children undergoing open gastrostomy had more co-morbid conditions.

S006 THE CLINICAL ENTITY OF CHRONIC APPENDICITIS DOES IT EXIST AS A CAUSE FOR RECURRENT ABDOMINAL PAIN (RAP)? Ketan Parikh, Dr; Jaslok Hospital

RAP is a common problem in children. Various protocols have been practiced for the evaluation and treatment of the same. The advent of laparoscopy has led to an increasing number of children being subjected to a diagnostic laparoscopy for the same.

We have studied our results of diagnostic laparoscopy for RAP and found a large number of children have a state of chronic inflammation of the appendix. These children often have persistent mesenteric adenitis and appendectomy relieves symptoms and the adenitis.

Materials and methods: Over the past 15 years, we have seen 916 patients referred for RAP. Each of these patients has already received empirical medications from a primary care physician before referral. The evaluation consists of detailed clinical history and examination besides relevant investigations. The clinical evaluation includes evaluation for possibility of functional disturbances. In view of the relatively high incidence of gastro-intestinal infections in our society, each of them receives another scheduled course of empirical medications by us. Of these patients, 436 patients were subjected to diagnostic laparoscopy for RAP.

Findings of diagnostic laparoscopy:

- Abdominal tuberculosis: 5
- Omental cocoon: 6
- Multiple intussusceptions: 12
- Unexplained bands and adhesions involving the small bowel/ colon or mesentery: 11
- Malrotation/ partial rotation: 1
- Appendicular pathology: 396
- Adhesion and kinks: 201
- Nodularity with multiple fecoliths: 179
- Hyperemia: 16

Terminal ileal adhesions: All the patients were treated as per the respective findings and a concomitant appendectomy was done in all these patients except for those where it was contra-indicated or where the same had already been done earlier. A biopsy of the mesenteric nodes was done in the earlier years but since it did not yield any significant

Oral Abstracts

findings in the initial 109 patients, in subsequent patients the procedure was not performed unless specifically indicated to avoid the possible morbidity of a mesenteric hematoma with such a procedure.

Results: 96% (402/419) of the appendices removed showed a variable degree of lymphoid hyperplasia and evidence of subacute/ chronic inflammation on HPE.

92% [385/419] of the patients had a significant relief of their symptoms till 6 months after the procedure. 40 of these had an occasional episode within one year post-op of which 17 had an occasional episode in the 2nd subsequent year.

A repeat USG done 6 weeks after the surgery, did not show the mesenteric adenitis in the earlier 178 patients and the same too was not performed as a routine subsequently.

In view of the clinical presentation, HPE of the appendices removed, resolution of symptoms and sonographic findings in a large majority of the patients, we are convinced as to the entity of chronic appendicitis to be a major cause of RAP. The challenge however is to ascertain the modality of patient selection for the procedure of laparoscopic appendectomy.

S007 LAPAROSCOPIC HELLERS MYOTOMY FOR ACHALASIA CARDIA: EXPERIENCE WITH YOUNGER PATIENTS. Adam Hancox, MRCS, Giampiero Soccoroso, FRCS, Singh Mike, FRCS, Tony Lander, Dakshesh Parikh, FRCS; Birmingham Children's Hospital

Introduction: Achalasia Cardia is rarely encountered in the younger paediatric population. It is much more common in late adolescence and young adults up to their late twenties. Achalasia has been known to be associated with significant morbidity and lower quality of life scores in children compared to diseases such as inflammatory bowel disease. There is very little published evidence of outcomes following Laparoscopic Heller's myotomy in younger children.

Materials and Method: We retrospectively collected data from all patients who had undergone a Heller's myotomy with or without a fundoplication at our center from 2002 to 2015. The pre and post-operative clinical details, investigations as well as post-operative ongoing symptoms, and any further medical management were recorded.

Results: A Heller's myotomy was performed in 17 achalasia patients. 15 children underwent laparoscopic Heller's myotomy at a median age of 10 years (range of 8 to 16 years); while 2 earlier patients had open surgery. A clinical presentation of weight loss, recurrent chest infections and increasing difficulty in swallowing in conjunction with a typical appearance on contrast swallow were considered to be diagnostic of achalasia. Upper GI endoscopy was performed preoperatively in 12 children with confirmed oesophagitis in 4 patients. Preoperative manometric evidence was feasible in only 7 older patients. Four patients had preoperative dilatation as a temporizing measure while waiting for surgery. Dor fundoplication was carried out at the time of laparoscopy in 8 patients, while two open cases had Nissen's fundoplication.

Three patients had oesophageal mucosal injuries of which 2 were recognized and repaired laparoscopically and covered with Dor fundoplication; while one patient presented a week later with peritonitis. On follow up a degree of persistent dysphagia in 7 patients was managed with day-case balloon dilatation, of these two non-responders required re-do extended Heller's Myotomy at an open operation. One of these 7 patients was kept on oral nifedipine and anti-reflux medication for a period of 6 months to improve his oesophageal incoordination. Follow-up endoscopy and biopsies were carried out in 7/17 patients, and the rest are awaiting endoscopy. Continuing evidence of microscopic reflux oesophagitis was present in 4 patients all of which did not receive fundoplication. Three patients had normal histology 2 of which did not have fundoplication.

Conclusion: Laparoscopic Heller's myotomy in young children is effective in improving their quality of life. The oesophageal mucosal injury is the only significant major complication at laparoscopic myotomy. Postoperative oesophageal endoscopic surveillance and biopsies should be carried out in all patients with Achalasia regardless of concomitant anti-reflux procedure. Per oral endoscopic myotomy may not be feasible in young children and needs long-term evaluation in achalasia.

S008 TUBULARIZED GASTRIC CONDUIT IS MORE DESIRABLE IN PEDIATRIC PATIENTS TREATED WITH MINIMALLY INVASIVE ESOPHAGECTOMY AND GASTRIC PULL-UP Shannon L Castle, MD, Manuel B Torres, MD, Dean M Anselmo, MD, Nam X Nguyen; Children's Hospital Los Angeles

Introduction: Conditions requiring an esophagectomy and esophageal replacement are rare in children. The preferred method and ideal replacement organ continue to be debated. We present long-term outcomes in children treated with minimally invasive esophagectomy and gastric pull-up.

Methods: We conducted a retrospective review of all patients who underwent a minimally invasive esophagectomy and gastric pull-up at two major pediatric institutions from 2004-2015. Follow up data were obtained for children when available, including any postoperative complications, need for dilation of strictures, and current feeding method.

Results: We operated on 6 patients (4 female and 2 male) with a median age of 3 (range 2-19, SD 5.6). Four patients underwent laparoscopic esophagectomy and cervical gastric pull-up; two patients underwent combined laparoscopic and right thoracoscopic (Ivor-Lewis) esophagectomy and cervical gastric pull-up. One of the Ivor-Lewis patients was converted to open due to dense adhesion secondary to a severe mediastinitis from an iatrogenic trachea-esophageal injury from enteric cyst excision. Five of the gastric conduits were tubularized and did not have pyloroplasty. The single patient converted to open had a non-tubularized stomach, due to the concern of blood supplies, and pyloroplasty. There were no intraoperative deaths or complications. Three patients developed esophago-gastric anastomotic strictures required balloon dilation ranging from 1-8 times. Follow up data were available for all patients. After an average of 4 years of follow up (ranging from 1 month to 7 years), all but one were taking full oral feeds. The patient with non-tubularized stomach and pyloroplasty continues to have delayed gastric emptying and depends on jejunostomy tube feedings.

Conclusions: Minimally invasive esophagectomy and gastric pull-up is a good alternative in managing pediatric patients in need of esophagectomy and replacement, and it offers an acceptable early and long-term outcomes. Tubularized conduit appears to be more superior than non-tubularized. Larger study is needed to validate our findings.

S009 USE OF 5-MM LAPAROSCOPIC STAPLER TO PERFORM OPEN SMALL BOWEL ANASTOMOSIS IN NEONATAL ANIMAL MODEL Ian C Glenn, Nicholas E Bruns, Todd A Ponsky; Akron Children's Hospital, Akron, Ohio, USA

Purpose: Neonatal small bowel anastomoses have traditionally been performed in a hand-sewn fashion as the surgical stapler jaws were too large for the neonatal bowel. The purpose of this study was to compare a recently-available 5-mm laparoscopic stapler to a hand-sewn anastomosis in an open animal model.

Methods: The study was conducted in the New Zealand white rabbit to simulate neonatal bowel. A total of 20 anastomoses were performed (ten each stapled and hand-sewn) in a single rabbit. The small bowel was divided sharply with a scalpel. The technique of each anastomosis was alternated between single-layer hand-sewn and stapled. Each anastomosis was resected for ex vivo testing. Measurements collected were outer diameter of the bowel prior to it being divided, time to perform the anastomosis, anastomosis inner diameter, and leak test. Inner diameters were measured by cutting the anastomosis in cross-section, taking a photograph, and measuring the diameter via computer. Additionally, the surgeons qualitatively evaluated the anastomoses for hemostasis and overall quality. Statistical significance was determined using the Student's t test.

Results: There were statistically significant differences between stapled and hand-sewn anastomosis, respectively, for average operative time (4 min 2 sec vs 16 min 6 sec, $p < 0.01$) and anastomosis inner diameter (8.2 vs 3.7 mm, $p < 0.01$). There was one leak in the stapled group which occurred at overlapping staple lines closing the enterotomy. A second stapled anastomosis required suture reinforcement, again at the enterotomy, due to operator error. Starting diameter, leak rate, hemostasis, and anastomosis quality were not statistically significant ($p = 0.36, 0.33, 0.39$, and 0.33 , respectively).

Conclusion: In a neonatal animal model, an open 5-mm stapled anastomosis is an acceptable alternative to hand-sewn small bowel anastomosis. The stapler is faster and creates a larger diameter anastomosis, however there was one leak when closing the enterotomy in the stapled group and caution should be exercised with overlapping staple lines.

S010 LAPAROSCOPIC VERSUS OPEN SURGERY IN MANAGEMENT OF CONGENITAL DUODENAL OBSTRUCTION IN NEONATES: A SINGLE CENTER EXPERIENCE WITH 112 CASES Tran N Son, MD, PhD, Hoang H Kien, MD; National Hospital of Pediatrics, Hanoi, Vietnam

Introduction: Advantages of laparoscopic surgery (LS) over open surgery (OS) in management of congenital duodenal obstruction (CDO) in neonates still remain debatable. The aim of this study is to compare the results between LS and OS in a large series of neonates with CDO from a single center.

Methods: Medical records of all neonates with weight over 1500g and without other gastrointestinal anomalies which underwent surgery for CDO (duodeno-duodenostomy or duodeno-jejunostomy) in National Hospital of Pediatrics for the period between January 2009 and July 2015 were reviewed. The choice of open or laparoscopic surgery depended on the surgeon's preference. The early results between OS and LS were compared.

Results: 112 patients were identified, with a median age and weight at surgery 8.5 days and 2500 g respectively. Forty four patients underwent OS and 68 patients – LS. There were no significant differences between the 2 groups regarding patient's age, gender, weight at surgery, associated anomalies and results of main preoperative laboratory investigations. There was no conversion from LS to OS. The mean operative time of OS and LS was 96 and 94 minutes ($p>0.05$). In comparison to OS, LS group had lower overall rate of postoperative morbidity (5.9% vs 36.4%, $p<0.0001$), shorter mean time to initial oral feeding and mean postoperative hospital stay (3.9 vs 7.1 days and 8.6 vs 12.9 days respectively, $p<0.0001$). Patients after LS had better postoperative cosmesis than OS.

Conclusions: LS decreases the postoperative morbidity rate, reduces the recovery time and postoperative hospital stay and has better postoperative cosmesis in comparison to OS and therefore should be the first choice in management of CDO for selected neonates at experienced centers.

S011 LAPAROSCOPIC AND OPEN OPERATIONS IN THE TREATMENT OF CONGENITAL DUODENAL OBSTRUCTION: A COMPARATIVE STUDY. Victor Rachkov, MD¹, Alexander Razumovsky, Prof¹, Olga Mokrushina, MD¹, Vasiliy Shumihin, MD²; ¹The Pirogov Russian National Research Medical University, ²Filatov Children's Hospital

The aim of our study was to compare the results of laparoscopic and open conventional duodenoduodenostomy in neonates with duodenal obstruction.

Material and methods: From 2010-2015, 95 neonates with congenital duodenal obstruction were treated in our hospital. 5 patients were excluded from this study: 2 neonates with body weight < 1000 gr, 2 with severe congenital heart malformations, and 1 with severe congenital malformation of CNS. Two groups were formed for this study: Group 1, with 48 neonates, underwent laparotomy diamond-shape duodeno-duodeno anastomosis; and Group 2, with 45 neonates, in whom laparoscopic diamond-shape anastomosis were performed. Groups were of the same age, body weight and risk factors. In all groups, duodeno-duodeno anastomosis was formed with interrupted monofilament sutures (6/0).

RESULTS: There were no intraoperative complications in both groups. There were no conversions in Group 2. Operative time was 67 ± 11.4 min. in Group 1, 71 ± 12.0 min. in Group 2. AVL in postoperative period prolonged 2.3 ± 0.8 days in Group 1, and 1.3 ± 0.6 days in Group 2. Initial oral feeding started on 8.6 ± 1.2 days (Group 1), and for Group 2 on 5.1 ± 1.2 days. Full enteral feeding was reestablished on 15.4 ± 3.5 days in Group 1, and on 12.6 ± 4.4 days in Group 2. There were postoperative complications in 8 (16.7%) neonates from Group 1: anastomotic leakage in 3 children (all were re-operated successfully), intestinal perforation due to neonatal necrotizing enterocolitis in 4 patients (all successfully treated with enterostomy), and chiloperitoneum in 1 child (was treated with TPN). In Group 2, in 1 (2,2%)

child there was found duodenal perforation on the 5th day after the operation. This was treated with a laparoscopic closure of the defect in the duodenal wall. Mortality rates were 3 (6,2%) in Group 1, and - 2 (4,4%) in Group 2. The cause of mortality was the severe generalized infection in neonates with low birth weight.

Conclusion: Laparoscopy is feasible and safe in the treatment of congenital duodenal obstructions. In this study, laparoscopic operations appeared to allow for a shorter need for postoperative ventilation, and a shorter time to reach full feedings. Operative time was same in both groups. We also found less postoperative complications after laparoscopy.

S013 TERMINAL ILEAL ADHESIONS- AN ENTITY NEEDING TO BE RECOGNISED AND TREATED IN RECURRENT ABDOMINAL PAIN (RAP) Ketan Parikh, Dr; Jaslok Hospital

Background: RAP is a common problem of childhood. Besides the repeated disruption of schooling, evidence suggests that RAP in childhood can lead to late onset functional bowel disorders including Irritable bowel syndrome.

One of the commonest presentation of these children is peri-umbilical pain which essentially indicates a spasm emanating from a segment of the midgut.

Over the past 15 years we have been using diagnostic laparoscopy as a tool in those selected cases which do not respond to a variety of conservative measures. In a large proportion of these patients (even if never operated earlier) we have identified adhesions of the terminal ileum to the lateral abdominal wall similar to the peritoneal folds found in a case of paracecal hernia (211/436). We have also found these adhesions in 7 children who were earlier subjected to laparoscopic appendectomy for RAP but continues to have pain.

We have been releasing these adhesions so as to straighten the terminal ileum. All these patients were pain-free for more than a year.

We feel that terminal ileal adhesions are an important etiology of recurrent abdominal pain.

Materials, methods: Over the past 15 years, we have been referred 916 pediatric patients for RAP. Each of these patients undergoes a defined protocol of evaluation consisting of detailed clinical history, examination and relevant investigations. A clinical assesment for possibility of functional disturbances is also made. In view of the relatively high incidence of gastro-intestinal infections in our society, each of them receives a scheduled course of empirical antibiotics by us. Of these patients, 436 patients were subjected to diagnostic laparoscopy.

This is performed through a standard 3 port technique. The abdomen is explored for any localised area of inflammation, , stricures if any of the bowel, adhesions/ bands and adnexal pathologies in a female child. The absence of malrotation is also confirmed.

We have found a significant number of children who had peritoneal adhesions kinking the terminal ileum or kinking the appendix. 7 of these patients had already been subjected to a laparoscopic appendectomy earlier (by other surgeons) for the RAP but had not got releief from their pain.

Adheseolysis has been done for each of these patients so as to release the ileum and avoid its kinking. Each of these patients was also subjected to an appendectomy unless contra-indicated.

Results:

Diagnostic laparoscopy for RAP done in 15 years: 436

Release of adhesions done: 211 – 100% relief of pain for more than 1 year.

Paracecal peritoneal folds have been differently described in anatomical literature. These folds anchor the terminal ileum to the lateral abdominal wall. These are known to lead to internal herniation and even intestinal obstruction. We feel that release of these peritoneal bands/folds prevents kinking of the terminal ileum and relieves intestinal spasms in a patient of RAP.

S014 CHILDREN WITH ACHALASIA TREATED WITH LAPAROSCOPIC HELLER'S MYOTOMY: HOW DO THEY RATE QUALITY OF LIFE YEARS FOLLOWING THE PROCEDURE? Amar A Alnaqi, MBBCh, MD, FRCSC, Michael H Livingston, MD, Bethany Easterbrook, Henrietta Blinder, Michael J Walton, MD, FRCSC; McMaster University

Background: Esophageal Achalasia is a disease with an approximate incidence of 1.6/105 in Canada. However, only 5% of cases present symptoms prior to the age of 15. While there is controversy surrounding management of achalasia in the pediatric population, laparoscopic Heller's myotomy is a common surgical treatment. Children with achalasia may present to clinic following laparoscopic Heller's myotomy and report low quality of life (QOL), though few studies have used disease-specific measures or assessed the long-term outcomes.

Methods: We attempted to contact all individuals who underwent laparoscopic Heller's myotomy as children by a single pediatric surgeon. Participants completed the validated, 23-item Achalasia Disease-specific Measure of the Pediatric Quality of Life Inventory (PedsQL) via self-report or parent-proxy. The Achalasia DS-QOL takes into consideration disease-related symptoms, side effects, emotions surrounding the disease and social impact of the disease. Questions were rated on a 5-point Likert scale and scores ranged from 0 (worst) to 100 (best).

Results: Eleven of 15 individuals (73%) consented to participate. Age at the time of surgery ranged from 2-17 (mean=12) years and questionnaires were completed 2-14 (mean=7) years later. Overall QOL ranged from 21 to 100 (mean=73). Six of 11 individuals had scores greater than 75, corresponding to "never" or "rarely" having problems with disease-specific issues. Scores for the domains of Swallowing (mean=70) and Feelings (mean=67) were significantly lower compared to Friends and Family (mean=80) ($p=0.006$). The items with the lowest scores were related to difficulties with swallowing hard food and feeling "different" from others.

Conclusions: Some patients treated for achalasia as children report excellent QOL years after laparoscopic Heller's myotomy. Lower reports of QOL appear to be a result of ongoing swallowing difficulties and negative feelings regarding social interactions. Long-term follow-up after Heller's myotomy is required to ensure that these issues are adequately addressed and that patients continue to feel supported.

S015 COMPARISON OF LAPAROSCOPIC TOUPET AND LAPAROSCOPIC NISSEN FUNDOPLICATIONS IN NEUROLOGICALLY NORMAL CHILDREN. Go Miyano, MD¹, Masaya Yamoto, MD², Hiromu Miyake, MD², Keiichi Morita², Mariko Koyama², Manabu Okawada¹, Takashi Doi¹, Hiroyuki Koga¹, Geoffrey J Lane¹, Koji Fukumoto², Atsuyuki Yamataka¹, Naoto Urushihara²; ¹Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine, ²Department of Pediatric Surgery, Shizuoka Children's Hospital

Background: We compared laparoscopic Toupet fundoplication (LTF) and laparoscopic Nissen fundoplication (LNF) in neurologically normal (NN) children because reports about these procedures in NN children are scarce in the literature.

Methods: We conducted a retrospective review of 40 NN children who had LTF (n=22) or LNF (n=18) performed between 2006 and 2012 and who had been followed-up for at least 3 years. Surgical technique for both procedures was the same in principle, involving dissection of the short gastric vessels, adequate dissection of the crus of the diaphragm and preparation of a 3-4 cm length of abdominal esophagus, and suturing and fixation between the crus and the esophagus but the fundoplication was partial in LTF (270 degrees) and complete in LNF. During the postoperative period, only those patients with symptoms of vomiting, pneumonia or dysphagia were investigated with an upper gastrointestinal contrast study, and 24-hour pH study to exclude recurrence.

Results: There were no significant differences between the groups for gender (15M/7F in LTF versus 12M/6F in LNF), mean age at surgery (2.5 years old in LTF versus 2.3 years old in LNF) and weight at the time of surgery (9.6kg in LTF versus 8.9 in LNF), preoperative symptoms, and pH monitoring scores (26.7% in LTF versus 21.8% in LNF). Operative time was not significantly different (117.1 minutes in LTF versus 126.1 minutes in LNF). Mean postoperative follow-up was 6.1 years (range: 3-10) in LTF and 5.6 years (range: 3-9) in LNF ($p=ns$). Intraoperative complications were esophageal trauma in LTF (n=1; 4.5%) and mild liver trauma in LNF (n=1; 5.6%) ($p=NS$). No case required conversion to open

repair. Postoperative complications were wrap stenosis in LTF (n=1; 4.5%) and wrap stenosis (n=1) and gastric outlet obstruction (n=1) in LNF (n=2; 11.1%) (p=ns). All postoperative complications were managed conservatively. Re commencement of enteral feeding (3.7 days in LTF versus 3.8 days in LNF), and duration of postoperative hospitalization 5.5 days (range: 3-11) in LTF versus 6.3 days (range: 4-14) in LNF were similar. Revisional surgery for recurrence was required for 3 LNF cases (16.7%) at 4, 11, and 13 months, respectively for sliding hernias, two associated with partial wrap disruption. No revisional surgery was required for any LTF case (n=0) (p<.05).

Conclusion: LNF and LTF appear to be equally effective in neurologically normal children, but LNF was associated with more complications.

S016 EFFECT OF ELEVATED INTRA-ABDOMINAL PRESSURE (IAP) ON TLR4 SIGNALING IN INTESTINAL MUCOSA AND INTESTINAL BACTERIAL TRANSLOCATION IN A RAT. Dragan Kravarusic, MD⁴, Igor Sukhotnik, MD¹, Adam Strier, MD¹, Arnold G Coran, MD², Isaac Srugo, MD³, Tatiana Dorfman, MD¹, Yulia Pollak, MSc¹, Drora Berkowitz, MD³; ¹The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Dept Pediatric Surgery, Bnai Zion Medical Center, ²University of Michigan, Section of Pediatric Surgery, Mott Children's Hospital, Ann Arbor, MI, ³The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Dept Pediatrics, Bnai Zion Medical Center, ⁴The Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Laboratory of Intestinal Adaptation and Recovery

Objective: Recent evidence suggests that elevated IAP may adversely affect the intestinal barrier function. Toll-like receptor 4 (TLR-4) is responsible for the recognition of bacterial endotoxin or lipopolysaccharide and for initiation of the gram-negative septic shock syndrome. The objective of the current study was to determine the effects of elevated IAP on intestinal bacterial translocation (BT) and TLR-4 signaling in intestinal mucosa in a rat model of abdominal compartment syndrome (ACS).

Methods: Male Sprague-Dawley rats were randomly assigned to one of two experimental groups: control animals (CONTR) and ACS animals who were subjected to a 15 mmHg pressure pneumoperitoneum for 30 minutes. Rats were sacrificed 24 hours later. BT to mesenteric lymph nodes, liver, portal blood and peripheral blood was determined at sacrifice. TLR4-related gene and protein expression (TLR-4, myeloid differentiation factor 88 (Myd88) and TNF- α receptor-associated factor 6 (TRAF6)) expression were determined using Real Time PCR, Western blotting and immunohistochemistry.

Results: Thirty percent of control rats developed BT in the mesenteric the lymph nodes (level I) and 20% of control rats developed BT in the liver and portal vein (level II). ACS rats demonstrated 80% BT in the lymph nodes (Level I) and 40% BT in the liver and portal vein (Level II). Elevated BT was accompanied by a significant increase in TLR-4 immunostaining in jejunum (51%) and ileum (35.9%), as well as in a number of TRAF6 positive cells in jejunum (2.1%) and ileum (24.01%) compared to control animals. ACS rats demonstrated a significant increase in TLR4 and MYD88 protein levels compared to control animals.

Conclusions: Twenty four hours after the induction of ACS in a rat model, increased bacterial translocation rates were associated with increased TLR4 signaling in intestinal mucosa.

S017 BARIATRIC SURGERY IN ISRAELI ADOLESCENT'S FACING THE "FASHION" Dragan Kravarusic, Emmanuelle Segulier-Lypszyc, Simona Tyroler, Naftali Freud; Schneider Childrens Medical Center

Background: Adolescent obesity has been identified as one of the important public health concerns. Conservative weight management programs have shown only mild / modest weight loss results. There has been increasing worldwide enthusiasm for bariatric surgery for selected adolescent morbid obese patients. Israeli guidelines proposed by Ministry of Health in 2009 seems to be extremely inappropriate.

Methods: Retrospectively collected data from all patients undergoing bariatric surgery at our institution since the inception of multidisciplinary adolescent weight loss program in 2011. Baseline data collected included age, gen-

Oral Abstracts

der, body mass index, comorbid conditions and patient/family compliance. Postoperative data collected included the length of stay, operative morbidity and percent excess weight loss - body mass index at 3-month intervals.

Results: Twenty five patients have undergone laparoscopic sleeve gastrectomy at our institution since May 2011. Of these, 14 were female and 11 were male. The mean age was 14.3 ± 1.8 years of age. The mean preoperative weight was 139 ± 21 kg with a body mass index of 46 ± 9 kg/m. There were no intra-operative complications, and single post-operative complications included re-laparoscopy in one patient for bleeding at stapler line. The mean length of stay was 2.2 ± 1.1 days. The mean follow-up was 14.9 ± 1.4 months. The percent excess weight loss at 3 / 6 / 12 months, postoperatively was 32%, 38%, and 42%, respectively, in those who had reached these time points. Significant leak of the compliance (25%), was the major issue in the post operative follow up.

Conclusion: Laparoscopic sleeve gastrectomy is a safe operation and represents an effective part in the treatment strategy with approximately 40% excess weight loss at 6 months of follow-up. Multidisciplinary approach is standard of care and local national surgical guidelines for adolescent patients should be reconsidered and standardized worldwide.

S018 THE IMPACT OF SCOLIOSIS ON LAPAROSCOPIC NISSEN FUNDOPLICATION. Tetsuya Ishimaru, PhD¹, Masahiko Sugiyama, MD¹, Mari Arai, PhD¹, Kaori Satoh, MD¹, Chizue Uotani, PhD¹, Masataka Takahashi, MD¹, Shohei Takami, MD¹, Tsubasa Goshima, MD¹, Jun Fujishiro, PhD¹, Tadashi Iwanaka, PhD²; ¹Dept. of Pediatric Surgery, The University of Tokyo Hospital, ²Saitama Children's Medical Center

Background: Laparoscopic fundoplication is frequently performed in neurologically impaired children, and these children often have scoliosis and thoracic deformity such as chest compression. The operative field could be limited by these factors and the small working space might make it more difficult to perform laparoscopic procedures. However, the relationship between the physical features and difficulty in performing laparoscopic Nissen fundoplication is unclear. The aim of this study was to assess the impact of scoliosis on performing laparoscopic Nissen fundoplication.

Method: The subjects were patients who underwent laparoscopic Nissen fundoplication between June 2006 and September 2015 at a single institution. All procedures were supervised by a board-certified pediatric surgeon. Medical charts, operative record, X-rays of the chest and abdomen, and CT images were reviewed retrospectively. Patients' characteristics such as age, height, and weight, and operative characteristics such as the duration of intraoperative pneumoperitoneum and the amount of bleeding were collected. Cobb angle was measured on the PA x-ray and the direction (right or left) of the scoliotic curve was recorded. The chest compression ratio, which was defined as the shortest length (thickness) of the thoracic cavity divided by the longest length (width) of the thoracic cavity at the level of the lower end of the sternum on CT axial image, was calculated. Statistical analysis was performed by the Steel-Dwass method for nonparametric multiple comparison and Spearman's rank correlation coefficient for identifying the strength of associations between two variables. All data are shown as median (interquartile range).

Results: Eighty-six patients, of whom seventy-six (88%) were neurologically impaired, were included in this study. Their age, height, and weight were 119 months (28 to 211), 110 cm (82 to 134), and 17 kg (9 to 24), respectively. Positive correlation was seen between age and Cobb angle ($p = 0.62$), and negative correlation was seen between age and chest compression ratio ($p = -0.56$). Upon comparison by the direction of the scoliotic curve, the right curved group showed significantly more bleeding than the non-scoliotic ($< 10^\circ$) group [$p = 0.02$, non-scoliotic 0 ml (0 to 0), right-curved 7.5 ml (0 to 81.3), left-curved 0 ml (0 to 40)]. Scoliotic severity was classified into 4 groups by Cobb angle, that is, non-scoliotic, mild ($10^\circ \leq$), intermediate ($25^\circ \leq, < 45^\circ$) and severe ($45^\circ \leq$). Upon comparison by scoliotic severity, significantly more bleeding was seen in the severe group than in the non-scoliotic group [$p = 0.03$, non-scoliotic 0 ml (0 to 0), mild 0 ml (0 to 37.5), intermediate 0 ml (0 to 32.5), severe 7.5 ml (0 to 62.5)]. Comparisons by the direction of the scoliotic curve or scoliotic severity showed no statistically significant differences in the duration of pneumoperitoneum.

Conclusions: The older the patient, the more severe their scoliosis and chest compression were. Right curved or severe scoliosis could be risk factors for intraoperative bleeding in laparoscopic Nissen fundoplication. However, the

direction and severity of scoliosis did not affect the procedure time.

S019 A COMPARISON OF LAPAROSCOPIC REDO FUNDOPLICATIONS AFTER FAILED TOUPET AND NISSEN FUNDOPLICATIONS IN CHILDREN.

Go Miyano, MD¹, Masaya Yamoto, MD², Hiromu Miyake, MD², Keiichi Morita, MD², Mariko Koyama, MD², Manabu Okawada, MD¹, Takashi Doi, MD¹, Hiroyuki Koga, MD¹, Geoffrey J Lane, MD¹, Koji Fukumoto, MD², Atsuyuki Yamataka, MD¹, Naoto Urushihara, MD²; ¹Department of Pediatric General & Urogenital Surgery, Jun-tendo University School of Medicine, ²Department of Pediatric Surgery, Shizuoka Children's Hospital

Purpose: The mechanism of recurrence after fundoplication and how to prevent recurrence have been discussed widely in the literature but there are few reports about the procedures performed for redo surgery themselves. We compared laparoscopic redo funduplications performed after failed laparoscopic Toupet and failed laparoscopic Nissen funduplications.

Methods: We performed a retrospective cohort study of all children who underwent laparoscopic Toupet fundoplication (LTF) and subsequently required redo of LTF (R-LTF), and laparoscopic Nissen fundoplication (LNF) and subsequently required redo of LNF (R-LNF) between 2007 and 2014. Children older than 16 years of age at the time of initial LTF/LNF were excluded from this study. Data were collected for severity of intraperitoneal adhesions (score: 0-3), whether the anterior/posterior/hepatic branches of the vagus nerve (VN) were identified and preserved, intra and postoperative complications, and outcome.

Results: There were 10 redo funduplications performed; R-LTF (n=4) and R-LNF (n=6). Mean ages at redo (7.7 years for R-LTF versus 7.0 years for R-LNF) and mean weights at redo (16.1kg for R-LTF versus 14.7kg for R-LNF) were similar. Pre-redo symptoms and pH-monitoring scores (6.4% for R-LTF versus 5.7% for R-LNF) were also similar. The interval between initial and redo funduplications averaged 34 months in R-LTF and 32 months in R-LNF (p=ns). Mean follow-up was 2.8 years in the R-LTF group and 4.0 years in the R-LNF group (p=ns). Indications for redo in R-LTF were sliding hernia (n=3; 2 with partial wrap dehiscence) and partial wrap dehiscence (n=1), and in R-LNF were sliding hernia (n=6; 4 with partial wrap dehiscence). The mean intraperitoneal adhesion score was 1.5 in R-LTF and 2.5 in R-LNF (p<.05). The mean number of VN branches identified was 2.0 in R-LTF and 0.7 in R-LNF (p<.05); all but 1 branch in R-LTF were preserved. Mean operative time (165 minutes in R-LTF versus 188 minutes in R-LNF) and blood loss (7.0mL in R-LTF versus 10.5mL in R-LNF) were similar. Intraoperative complications were accidental esophageal or gastric wall trauma (n=1 in R-LTF; n=3 in R-LNF, one requiring conversion to open repair) (p=ns). There were no significant differences in time taken to re-establish enteral feeding, 3.0 days for R-LTF versus 3.7 days for R-LNF, and mean postoperative hospital stays, 7.5 days for R-LTF versus 9.8 days for R-LNF, were similar. There have been no further recurrences to date but two R-LNF cases developed gastric outlet obstruction that was managed conservatively.

Conclusion: Although our series is small, adhesions were less and identification/preservation of VN was easier during R-LTF compared with R-LNF.

S020 OUTCOMES AFTER OPEN AND LAPAROSCOPIC LADD PROCEDURE IN NEONATES, CHILDREN, AND SCHOOL AGE/

ADOLESCENTS **Colin D Gause, MD¹**, Grace Hsiung, MD¹, Maria G Sacco-Casamassima, MD², Brian P Blackwood, MD¹, Kristine Corkum, MD¹, Irene Helenowski, PhD³, Fizan Abdullah, MD, PhD¹, Timothy B Lautz, MD¹, Catherine J Hunter, MD¹, Julia Grabowski, MD¹; ¹Department of Surgery, Division of Pediatric Surgery; Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, ²Department of Surgery, Division of Pediatric Surgery, Johns Hopkins Hospital, Baltimore, MD, ³Department of Preventive Medicine, Feinberg School of Medicine, Northwestern University, Chicago, IL

Purpose: Although the Ladd procedure for intestinal malrotation is most commonly performed in neonates and infants, it is also performed in children and adolescents. Population studies suggest that up to 2/3 of patients are diagnosed after infancy. The aim of this study was to examine the relationship between age at the time of procedure and operative approach on 30-day post-operative morbidity.

Methods: A retrospective review of the ACS NSQIP-Pediatric participant user file from 2013 identified patients ≤18 years of age who underwent the Ladd procedure for anomalies of intestinal fixation and volvulus. Outcomes for

Oral Abstracts

neonates (≤ 28 days of age), children (29 days – 5 years), and school age/adolescents (5-18 years) were analyzed for both open and laparoscopic/laparoscopic assisted repair. Post-operative complications, reoperations and readmissions were examined using t-test for continuous variables and Fischer's exact test for categorical variables. Multivariate logistic regression analysis was performed to determine the independent association of pre-operative demographics and procedure type on 30-day post-operative outcomes.

Results: We identified 224 patients. Seventy-eight procedures (6.4% laparoscopic) were performed in neonates, 97 (17.5% laparoscopic) in children, and 49 (28.6% laparoscopic) in school age/adolescents. In univariate analysis, neonates were more likely to undergo an open procedure, while school age/adolescents were more likely to undergo a laparoscopic procedure ($p=0.003$). Additionally, neonates were more likely to have an emergent operation, and children more likely to have an elective operation ($p<0.0001$). Analysis of treatment outcomes revealed that school age/adolescents were at increased risk of unplanned reoperation ($p=0.05$) and unplanned readmission ($p<0.0001$) related to the index procedure. Post-operative complications occurred in 15 (19.23%) of neonates, 14 (14.43%) of children, and 8 (16.33%) of school age/adolescents ($p=NS$). In multivariate analysis, pre-operative SIRS ($p=0.0006$), ASA class III ($p=0.01$), and ASA class IV ($p<0.0001$) were independent predictors for post-operative complications. Patients with major cardiac risk factors ($p=0.0005$) and those undergoing emergent procedures ($p=0.001$) were more likely to experience significant post-operative bleeding. Operative approach and age did not correlate with postoperative complications in either univariate or multivariate analysis. Three patients (mean age 0.2 ± 0.09 years) died within 30 days of operation and their procedures were all performed in an open fashion.

Conclusion: Herein, we identified differences in both operative technique and patient outcome between pediatric age groups after the Ladd procedure. Neonates are less likely to have a minimally invasive operation, and older patients are at increased risk of readmission and unplanned reoperation.

S021 ARE SKILLS TRANSFERT FROM ROBOTIC ASSISTED LAPAROSCOPIC SURGERY TO CONVENTIONAL LAPAROSCOPIC SURGERY STRAIGHTFORWARD ? Pauline Clermidi, MD¹, Quentin Ballouhey, MD², Xavier Orsoni², Evan Ap-pourchaud¹, Jerome Cros, MD¹, Bernard Longis, MD¹, Fanny Nauche¹, Laurent Fourcade, MD, PhD¹; ¹Department of pediatric surgery; Limoges University Hospital, ²Department of pediatric surgery

Introduction: Up to now, during their surgical training, fellows mainly received a classical laparoscopic (CL) training. With the dramatic implementation of robotic devices, some teams proposed for some or all procedures an exclusive use of robotic assisted laparoscopic surgery (RALS). But, for the majority of young surgeons, RALS will just be a part in their futur surgical practice in comparison to classical laparoscopy. Such an exclusive training in RALS may make them competent enough in CL ? The aim of this study was to test the hypothesis that surgical skills acquired with RALS are transposable to CL.

Design and participants: 19 subjects without laparoscopic or robotic surgical experience were enrolled and randomized in 2 groups : 11 in the RALS group and 8 in the CL group. A uniform training box was used either with the Da Vinci robotic device (Intuitive Surgical) or using classical 5mm laparoscopic instruments and camera. The 2 groups have first to be trained with 3 exercises (repeated 5 times each) selected from FSL and PLS program (transfert plot, pattern cutting, suturing with extracorporeal knot tying). Both groups had then to complete a complex procedure (cutting and suturing a balloon tube with 2 extracorporeal knots) using only CL instruments. Time and quality indicators using the OSATS score were measured quantitatively.

Results: Scores obtained during the 3 training sessions were statistically significantly higher for RALS group for the 3 exercises ($p=0.02$; $p=0.0002$; $p=0.01$). Regarding the complex procedure making, OSATS scores obtained were statistically significantly better ($p=0.006$) for subjects trained with CL.

Conclusion: Basic surgical skills acquired in this study with RALS are not to be directly transferable to perform a complex procedure using CL. This result seems to us to be considered in the development of futur educational programs for young surgeons.

S022 SKILLS COMPARISON IN PEDIATRIC RESIDENTS USING A TWO-DIMENSIONAL VERSUS A THREE-DIMENSIONAL HIGH-DEFINITION CAMERA IN A PEDIATRIC LAPAROSCOPIC SIMULATOR. Riccardo Guanà, MD, Luisa Ferrero, Riccardo Lemini, Jurgen Schleeft; Regina Margherita Children's Hospital

Introduction: Advantages in three-dimensional laparoscopy are mostly described in adults for better depth perception, precise visualization of anatomical structures, as well as for complex surgical maneuvers in small spaces.

Material and Methods: Using Visionsense II Stereoscopic Endoscopy System (Neuromed Spa), a 3D HD camera with a 4mm scope, FDA and CE approved for pediatric surgery, we performed a comparative study between surgical skills achievements using 2D and 3D laparoscopic equipment in a laparo-trainer conceived exclusively for pediatric surgery.

Pediatric Residents without any laparoscopic experience were randomly divided in two groups and evaluated doing object transfer and simple surgical maneuvers.

Switching the type of vision from 2D to 3D we evaluated bimanual dexterity, efficiency and tissue handling by 3 tasks:

- Task 1: transfer of circular objects (3 rings transferred on pegboards);
- Task 2: transfer of spherical objects (3 soft balls transferred into baskets);
- Task 3: pattern cutting (circular gauze).

Time and error rates (missed attempts, dropped objects, failure to complete the task) were recorded.

Results: Of the 20 participants included, 10 began the skills in the 2D modality and then performed them in 3D, and the others 10 began in 3D and ended in 2D.

Residents working with 3D vision achieved significantly better results than those who worked in 2D.

The accomplishment percentage in transfer of objects tasks, in 3D modality, was greater for both groups considering time and number of errors (Time-2D: 279.8 ± 52.74 seconds; Time-3D: 180.25 ± 31.89 seconds, $P=0.002$; Errors-2D: 4 ± 0.55 , Errors-3D: 2.85 ± 0.35 , $P=0.001$).

Considering the pattern cutting task, overall task performance was superior in 3D but did not reach statistical significance (Time-2D: 311.15 ± 39.49 seconds, Time-3D: 305.85 ± 40.07 seconds, $P=0.84$; Errors-2D: 0.25 ± 0.21 , Errors-3D: 0.1 ± 0.14 , $P=0.22$).

Most of the participating (65%) had the subjective perception that 3D system was overall easier than 2D.

No side-effects as headache, nausea and visual disturbance, traditionally associated with 3D vision, were reported.

Discussion: As other studies on adults have demonstrated, there was improvement in the overall performance using the 3D camera.

This was the first attempt to verify 3D skills in naïve subjects, directly on a simulator conceived exclusively for pediatric surgery, therefore bias were limited by using a population without surgical experience.

Conclusions: 3D laparoscopic surgical skills showed superior to 2D, with higher percentages of tasks completion, less time in performing them, and a shorter learning curve.

Our results confirm that 3D significantly improved visualization and ability to perform complex tasks in the skills laboratory setting.

S023 LAPAROSCOPIC STEREOSCOPIC AUGMENTED REALITY: TOWARDS A CLINICALLY VIABLE ELECTROMAGNETIC

Oral Abstracts

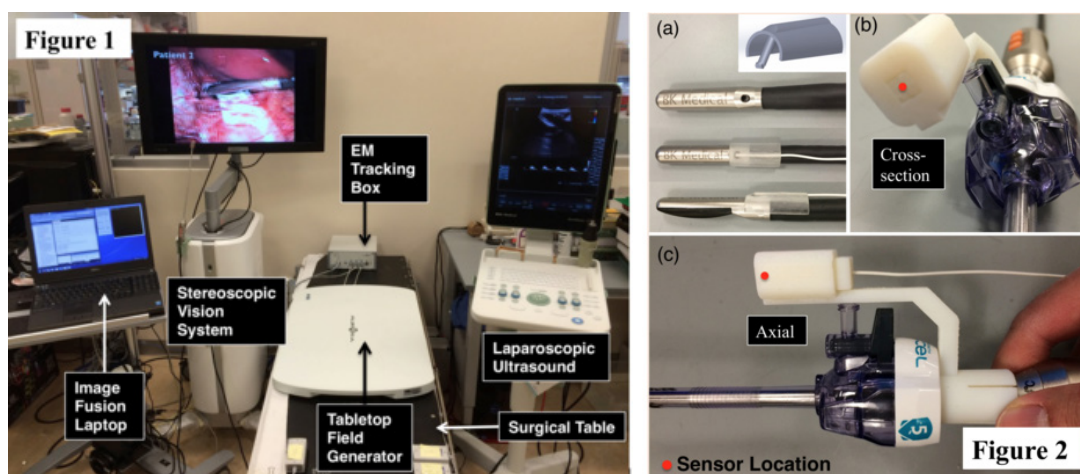
TRACKING SOLUTION Xinyang Liu, Sukryool Kang, William Plishker, George Zaki, Mikael Petrosyan, MD, Raj Shekhar, Timothy D Kane, MD; Children's National Medical Center

Objective: The purpose of this work was to develop and validate a clinically feasible laparoscopic stereoscopic augmented reality (AR) system to enhance visualization by overlaying ultrasound image on laparoscopic video in real time. The fusion of images from two modalities was enabled via electromagnetic (EM) tracking, which reports location and orientation of a small and wired positional sensor inside a 3D working volume with magnetic field, created by a field generator. Compared with optical tracking – a more established tracking method, EM tracking has the advantage of no line-of-sight restriction.

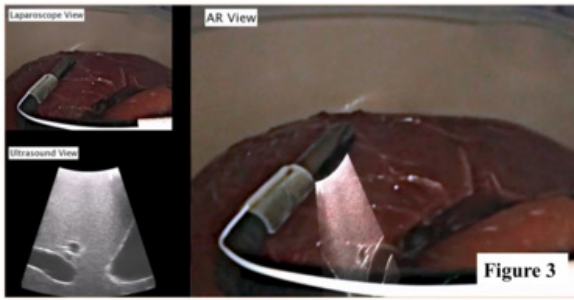
Methods: As shown in Figure 1, the AR system includes a stereoscopic vision system (Visionsense Corp.), a laparoscopic ultrasound (LUS) scanner (BK Medical), an EM tracking system with a tabletop field generator (Northern Digital Inc.), and a GPU-accelerated laptop computer running image fusion software. The tabletop arrangement of the EM tracking system is specially designed for OR use. The field generator is positioned between the patient and the surgical table and incorporates a shield that suppresses distortions caused by any metallic material underneath it. We methodically investigated appropriate locations to place the EM sensor on the stereoscopic laparoscope and the LUS probe by studying distortion and jitter errors of EM tracking. This led to a solution of integrating an EM sensor externally to the LUS probe without affecting much of the overall diameter of the probe (Figure 2a). Moreover, a solution of mounting an EM sensor on the handle of the stereoscopic laparoscope was designed to allow free rotation of the trocar and avoid touching the patient (Figure 2bc). The snap-on mechanical trackers shown in Figure 2 were printed using a 3D printer. The relationship between the laparoscopic video domain and the ultrasound image domain were calculated using the state-of-the-art camera calibration and ultrasound calibration tools.

Results: The overall spatial image-to-video registration accuracy of the AR system was quantified to be 2.59 ± 0.58 mm (left-eye channel) and 2.43 ± 0.48 mm (right-eye channel). The AR system contributed 58 ms latency to stereoscopic visualization. As a qualitative demonstration, we used the AR system on a realistic abdominal ultrasound phantom. A video clip (only the left-eye channel) showing the performance of our system while the imaging tip of the LUS probe is being flexed has been submitted with this abstract. The video shows the original laparoscopic video view, the original ultrasound image view, and the fused AR view. A sample snapshot of the video is shown in Figure 3.

Conclusion: We have developed a fully integrated, compact, and clinically feasible stereoscopic AR visualization system based on EM tracking. The system has been demonstrated to achieve clinically acceptable accuracy and latency. This work is a critical step toward clinical translation of AR methods to laparoscopic procedures.



Oral Abstracts



S024 MAGNAMOSIS VI: SENSING METHODS FOR SAFE DELIVERY OF MAGNETIC ANASTOMOTIC RINGS Claire E Graves, MD¹, Anupama Arun, PhD¹, Dillon A Kwiat, BS¹, Brandon T Gaston, BS¹, Richard Fechter, BS¹, Luzia Toselli, MD², Michael R Harrison, MD¹; ¹University of California, San Francisco, ²Fundación Hospitalaria, Private Children Hospital

Introduction: Magnetic compression anastomosis (Magnamosis) is an alternative to sutures and staples for the creation of luminal anastomoses. The device consists of two magnetic rings encased in a specially-engineered polycarbonate casing, which ensures well-formed anastomosis and healing. The rings can be deployed using open, laparoscopic, endoscopic, radiographic, or hybrid techniques. To ensure safe delivery with minimally invasive techniques, it would be ideal to determine the amount of tissue within the device without direct visualization. We can ascertain tissue thickness by the distance between the two magnets when they are mated. Thus, we sought to find accurate methods to measure distance between the magnets.

Methods: Because distance and magnetic force are directly related, we can measure either entity to determine tissue thickness. We performed bench-top testing of three different sensing methods at a range of known magnet distances:

Inductance sensor: An electromagnetic field induced by an inductor coil generates eddy currents on the surface of the metal-coated rare earth magnets. The inductor coil is integrated into a tank circuit. The resonance frequency of the tank circuit is a function of the distance between the two magnets. By measuring the change in resonance frequency of the tank circuit it is possible to detect the distance between the two magnets.

Hall Effect sensor: A Hall effect sensor measures the magnetic field flux induced by the rare earth magnets. Because the distance between the two magnets changes their total magnetic field, the output of the Hall effect sensor can be correlated to the distance between the two magnets.

Pressure transducer: When compressive pressure is applied, the resistance of the pressure transducer changes. When a pressure transducer is integrated into the polycarbonate casing of the magnet, it directly measures the compressive pressure between the two magnets.

Results: Figures 1-3 demonstrate sensor outputs at a range of magnet distances. We have previously reported that 1.8 mm tissue thickness or 6N of force is necessary for complete tissue ischemia and proper anastomosis formation with the Magnamosis device. Near this range, all three sensing methods were effective and accurate at measuring distance. However, each method has unique constraints pertinent to clinical application. For example, inductance sensing is affected by interference from nearby metal, and Hall effect sensors are dependent on precise orientation with respect to the magnet.

Conclusions: We have identified three different sensing methods to determine distance between the Magnamosis magnets. These methods can be integrated either into the device itself or the delivery mechanism to ensure safe mating and anastomosis formation. Because of the unique advantages and limitations of each sensing method, we must next customize integration of the sensing modality with Magnamosis and/or its delivery device, depending on each clinical application.

Oral Abstracts

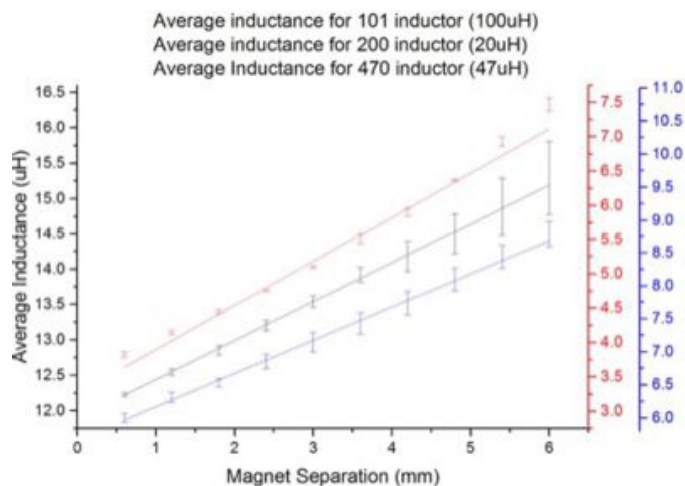


Figure 1: Inductance sensors: Average inductance at 1.8mm: 100uH, 47uH, and 20uH= 12.854 +/-0.06513, 6.528 +/-0.6001, 4.449 +/-0.02931, respectively (n=3).

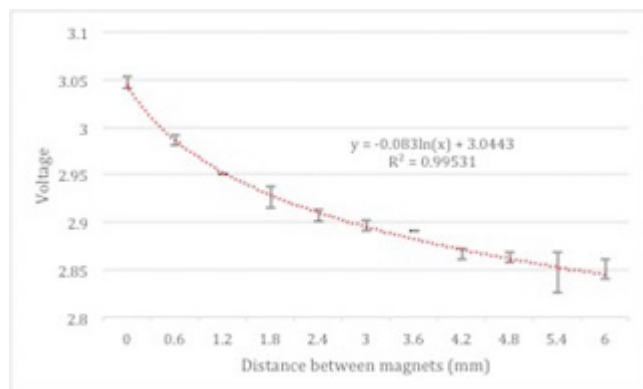


Figure 2. Hall Effect Sensor: At 1.8 mm, average voltage =2.92 +/-0.011V (n=3).

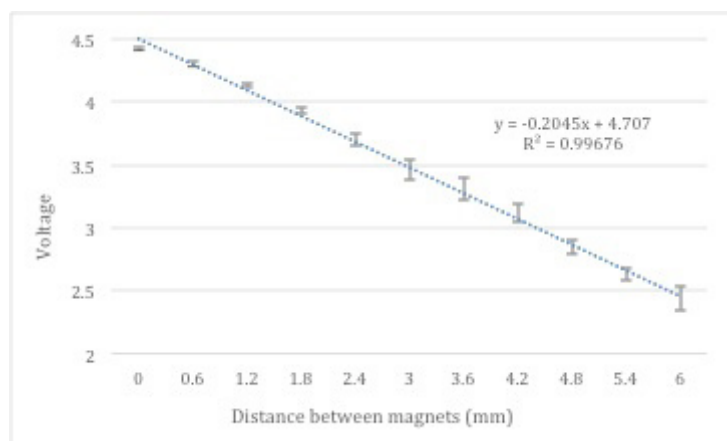


Figure 3. Pressure transducer (piezo capacitive): At 1.8mm, average voltage = 3.93 +/-0.028V (n=3).

S025 POSSIBILITIES OF ENDOSURGERY IN DIAGNOSIS OF TUMOR DISEASES OF OF THORACIC AND ABDOMINAL LOCALIZATION AT CHILDREN. D.v. Rybakova, P.a. Kerimov, A.p. Kazancev, M.a. Rybansky, A.v. Khizhnikov; Federal State Budgetary Institution «N.N. Blokhin Russian Cancer Research Center» under the Russian Academy of Medical Sciences

Relevance: Use of endosurgery in the diagnostic purposes is directed on specification of nature of the changes revealed at noninvasive methods of research, receiving enough tumor material for all types of morphological research and an assessment of prevalence of process. Diagnostic endosurgery is successfully approved in adult oncology and there are data on use of this method in children oncology in foreign literature.

Purposes: to define possibilities of endosurgery in diagnosis of tumor of thoracic and abdominal localization at children.

Materials and methods: in our institute endosurgery operations at patients with various tumor pathology are regularly performed since 2007. From 2007 to 2012 with the diagnostic purpose it is carried out the 160th operation at 153 children, from which 63 laparoscopic and 44 thoracoscopic biopsies. Except diagnostic biopsies it was executed 53 thoracoscopic resections of lungs at 51 children for the purpose of diagnostics of progressing of a disease, confirmation of metastatic defeat or inflammatory process that made 33% of all diagnostic operations. The age of patients varied from 2 months to 19 years. The ratio on a floor was approximately equal: boys was – 76 (49,7%), girls – 77 (50,3%). And children about one year there were 9,8% (15 children). Duration the thoracoscopic and laparoscopic biopsies made from 20 minutes to 260 minutes, on average 59 minutes. Blood loss during diagnostic operations averaged 78,3 ml. Intraoperative complications are in 5 cases, and postoperative in – 8. After the endosurgery operations at 59,3% of patients special treatment was carried out, 7,4% had a repeated operation, but already in radical volume and in 33,3% were written out on continuation treatment in a residence or in profile establishment. Terms of an initiation of treatment of special treatment varied from several hours to 20-30 days because of complications during operation. The average time of the beginning of special treatment made 4 days.

Conclusion: Advantages of use of endosurgery in children's oncology are: early terms of the beginning of special treatment, small injury, the minimum blood loss, low number of postoperative complications, early activation of the patient and reduction of terms staying in a hospital, good cosmetic effect. Performance the endosurgery of operations at children with malignant tumors it is possible aged from several weeks, thus the oncological principles of performance of surgery aren't broken, and also the age of the child isn't the limiting factor for performance the endosurgery of operations.

S026 MODIFIED TECHNIQUES OF LAPAROSCOPIC ASSISTED ANORECTOPLASTY FOR ANORECTAL MALFORMATIONS: PERSONAL EXPERIENCE WITH 150 CASES Liem Nt, Phd, Professor; Vinmec International Hospital

Aim: To report the technical details and early outcomes of the modified techniques of laparoscopic assisted anorectoplasty (LAARP) for anorectal malformations (ARM).

Methods: A prospective study was performed from January 2009 to 2013. The main variables included types of ARM, operative time, rate of conversion to open surgery, perioperative complications and deaths. The main outcome was fecal continence. The combined laparoscopic and perineal approach was carried out in rectovesical fistula and high cloaca. The combined laparoscopic and modified posterior sagittal approach (PSARP) preserving the external sphincter was performed in other types of anorectal malformations.

Results: 150 consecutive patients were operated by the same surgeon from January 2009 to August 2013. Patient age ranged from 2 to 30 months (Median: 3 months). Types of ARM included rectovesical fistula in 39 patients, rectourethral fistula in 56 patients, cloaca in 27 patients, and anal agenesis without fistula in 28 patients. Operative time varied between 45 and 120 minutes (Median: 65 minutes). Mean postoperative hospital stay was 4.1 ± 0.7 days.

Follow-up from 7-60 months (median: 22.5 months) was obtained in 119 children. Spontaneous defecation was reported in 115 patients. 7 patients among 65 children ≥ 3 years old suffered from soiling grade 2-3.

Conclusion: Laparoscopic modified approach is feasible and safe. The rate of fecal soiling and constipation was low in early follow-up.

S027 THE SINGLE SURGEON'S LEARNING CURVE EXPERIENCE IN LAPAROSCOPIC TRANSHIATAL ESOPHAGECTOMY AND GASTRIC PULL-UP (TEGPUL)

Alejandra M Parilli Perera, MD¹, Wilfredo García, MD¹, Angel A López Gil, MD¹, Eleonora Sánchez, MD¹, Michele Frias, CNS¹, María F Alessio, CNS², Carol Rodríguez, MD³, Diana López, MD³; ¹Hospital de Clínicas Caracas, ²Fundación LaparoKids, ³Policlínica La Arboleda

Last year we publishing our surgical technique of laparoscopic transhiatal esophagectomy and gastric pull-up (TEGPUL) in patients with LGEA (long gap esophageal atresia) and being reported as the third largest series in the world, because of high incidence of LGEA acquired in our country. We must perform 16 TEGPUL in four years, by the same surgical and multidisciplinary team. In this article we decided to publish our learning curve with focus in the relationship between the surgical technique and postoperative complications.

We performed the TEGPUL, between 2011 and 2015, in 8 boys and 8 girls with a mean age of 34 months (range, 10 – 99 months). 7 (44%) was congenital LGEA (4 type I, 1 type II and 2 type III) and 9 (56%) was acquired (type III).

The most 3 frequent postoperative complications was: high blood pressure (10/16), respiratory infections (9/16) and absence of satiety (10/13). The complications more related to the learning curve are: pleural effusion, pneumomediastinum, pneumothorax, upper digestive bleeding and gastric outlet obstruction, all they disappeared after the 8th TEGPUL case of the single surgeon serie.

We propose different ways of prevention and treatment of each of them, although we do not clear the exact pathophysiology. With the recording and further study of complications in patients undergoing progressively TEGPUL we can determine the causes and the best treatments for each, in order to increase the quality and life expectancy of patients.

S028 OPERATIVE OUTCOMES FOR APPENDICITIS IN CHILDREN < 5 YEARS OLD: NOT SUCH A DIFFERENT DISEASE

Simone M Langness, MD¹, Katherine Davenport, MD², Jonathan Halbach, DO³, Erin Ward, MD¹, Karen Kling, MD², Stephen Bickler, MD², Timothy Fairbanks, MD², Julia Grabowski, MD⁴; ¹UCSD, ²Rady Children's Hospital, ³Naval Medical Center San Diego, ⁴Lurie Children's Hospital

Background: Appendicitis is the most common pediatric surgical emergency, typically affecting children >10 years old. Appendicitis in preschool children and younger (<5 years old) is less common and often associated with differing preoperative clinical characteristics and a higher rate of perforation compared to older children. With a concern for a more complicated post-operative course, some surgeons may be inclined to alter their management of these younger patients. Currently, there is a paucity of data about operative outcomes in this age group and data guiding management is limited. In this series, we report our operative experience and post-operative outcomes of appendectomies in children <5 years old as compared to older children.

Methods: We retrospectively reviewed all appendectomies performed for presumed appendicitis from 2012-2013 at our single academic institution. Operative and post-operative outcomes were compared between preschool children and younger (<5 years old) and school-aged children (age 5-13 years old).

Results: 1451 appendectomies were performed during the time period, of which, 152 (13%) were in children <5 years of age. Perforation was present in 86 (56%) children <5 years old compared to 328 (33%) in older patients. Operative time, technique and conversion rates are summarized in Table 1. Appendectomy technique and approach was similar despite age group. Average length of stay for nonperforated and perforated appendicitis was not statistically different between children <5 years old and the older cohort (2.7 and 2.5 days, respectively for nonperforated, p=0.856 and 5.8 and 5.3 days, respectively for perforated, p=0.648). Interval appendectomy was performed in 6 patients <5 years old (6.4%) and in 13 older patients (4.5%, p=0.389). Post-operative complications are summarized in Table 2.

Conclusions: Operative and post-operative outcomes for appendicitis in children < 5 years old are similar to older patients, despite a higher rate of perforation at the time of presentation. As such, clinicians should be reassured that management modifications are not required solely based patient's age.

Oral Abstracts

Table 1. Operative Technique, Conversion Rate and Operative Time of Children <5 Years Old Compared to Older Cohort

	Nonperforated			Perforated		
	Age < 5 Years (N=66)	Age 5-13 Years (N=667)	P-value	Age < 5 Years (N=86)	Age 5-13 Years (N=328)	P-value
Operative Technique, N (%)						
SILS	12 (18.2)	135 (20.2)	0.872	23 (26.7)	63 (19.2)	0.136
Laparoscopic	54 (81.8)	532 (79.8)	0.872	61 (70.9)	261 (79.6)	0.251
Laparoscopic → Open	0	0	1.0	1 (1.2)	4 (1.2)	1.0
Open	0	0	1.0	1 (1.2)	0	0.208
Operative Time, Average +/- SD (min)	26 +/- 8	27 +/- 5	0.309	27 +/- 5	34 +/- 10	0.0001

Table 2. Postoperative Complications of Children <5 Years Old Compared to Older Cohort

	Nonperforated			Perforated		
	Age < 5 Years (N=66)	Age 5-13 Years (N=667)	P-value	Age < 5 Years (N=86)	Age 5-13 Years (N=328)	P-value
Readmission, N (%)	4	15	0.083	4	17	1.0
Reason for Readmission						
Abscess	2	7	0.191	1	10	0.47
Phlegmon	1	4	0.377	0	3	1.0
Wound Infection	0	2	1.0	0	0	1.0
Other	0	2	1.0	2	2	0.19

S029 LAPROSCOPIC PYLOROMYOTOMY IN INFANTS: A RETROSPECTIVE ANALYSIS AT SINGLE CENTER EXPERIENCE

Xinghai Yang, MD, Haitao Chen, MD, Song Lin, MD; Hubei women and children's Hospital

BACKGROUND: Laparoscopic pyloromyotomy(LP) for the treatment of hypertrophic pyloric stenosis(HPS) is one of popular laparoscopic procedures in pediatric surgery, and this procedure is used for resident training in many centers. The aim of this study was undertaken to investigate the influence of experience with LP on operative time, complication rate, learning curve and postoperative hospital stay for a large number of patients.

METHODS: between January 2007 and October 2015, 146 children were underwent LP for HPS. These procedures involved 7 surgeons including 2 consultants and 5 trainees. The outcome of all infants was retrospective analyzed.

RESULTS: laparoscopic pyloromyotomy was successfully completed in 146 patients(98.9%). Intraoperative complication occurred in 4(2.74%) patients(mucosal perforation 3; serosal injury to the duodenum,1;).all were immediately recognized during operation and uneventfully repaired. 3 patients(2.05%) required revision pyloromyotomy because of insufficient pyloromyotomy. Wound complications occurred in 5(3.42%) patients (wound infection 2; omental hernia, 2; wound bleeding, 1). The median hospital stay after surgery was 4 days, five patients were transferred to open procedure during the first 6 cases due to technique insufficient or instruments Problem. intraoperative complication and insufficient pyloromyotomy always occurred in the initial series in each trainee and rarely occurred in the later cases .after about 10 LPs, the operative time was approximately 20-25min. The length of postoperative hospital stay also dropped with increasing experience.

CONCLUSIONS: Laparoscopic pyloromyotomy has an excellent success rate with low morbidity. This procedure seems to be well teachable after about 10 LPs, the number of complications decreased significantly and operative time was approximately 20-25min with the experience increasing of surgeons.

S030 LAPAROSCOPIC DUODENODUODENOSTOMY WITH PARALLEL ANASTOMOSIS FOR DUODENAL ATRESIA Minjung

Kim, Chaeyoun Oh, Sanghoon Lee, Suk-Koo Lee, Jeong-Meen Seo; Samsung Medical Center

Background: Duodenal atresia is the main cause of congenital duodenal obstruction which occurs once in every ten thousand live births. Even after the introduction of laparoscopic repair of DA, the diamond-shape anastomosis is still considered as the gold standard of procedure.

Purpose: The purpose of this study is to report that LDPA is an easy and anatomically natural procedure compared to the diamond-shape anastomosis and shows early recovery in anastomotic function with low rate of postoperative

anastomotic leakage or stenosis.

Patients and Methods: We retrospectively reviewed 35 patients who underwent open or laparoscopic duodenoduodenostomy from June 1995 to May 2015 in Samsung Medical Center. All patients were confirmed DA in the operating field. Thirteen patients who underwent open repair were performed with diamond-shape anastomosis, while 22 patients with laparoscopic repair underwent duodenoduodenostomy with parallel anastomosis.

Result: Open repair group and laparoscopic repair group showed similar results in sex distribution, gestational age, birth weight, and age and body weight at the time of operation. There was no case that converted to open repair in laparoscopy group. Median Operation time was significantly faster in open group (74 min) compared to laparoscopy group (142 min, $p < 0.001$). Median first stool passage (4 Vs 3 days) and median first oral feeding (5 Vs 5) occurred at similar time, while time reaching full oral feeding occurred significantly faster in laparoscopy group (13 Vs 11 days; $p = 0.024$). Although median postoperative hospital days seemed shorter in laparoscopy group (18 Vs 13 days), it was statistically insignificant ($p = 0.055$). Median follow up periods were 3 months and 3.5 months, respectively. There was only one complication with a pneumothorax which resolved after conservative management in the laparoscopy group. There was no anastomotic leakage or stenosis in both groups. Currently, there is no late complication.

Conclusion: LDPA can be performed easily and safely. It is anatomically natural, associated with early recovery of anastomotic function and risk of leakage or stenosis does not seem significant. Therefore, parallel anastomosis should be considered as a safe procedural option in laparoscopic duodenoduodenostomy in DA.

S031 TRANSUMBILICAL LAPAROENDOSCOPIC SINGLE SITE SURGERY FOR CHILDHOOD CHOLEDOCHAL CYST: RESULTS AND LESSONS FROM 202 CASES Tran N Son, MD, PhD¹, Dinh A Duc, MD¹, Pham T Hung, MD¹, Tran D Phuong, MD¹, Nguyen T Liem, MD, PhD²; ¹National Hospital of Pediatrics, Hanoi, Vietnam, ²Vinmec International Hospital

Introduction: Trans-umbilical laparo-endoscopic single site surgery (TULESS) in management of childhood choledochal cyst (ChC) has been recently reported, but still in limited series. The aim of this study is to present our results of TULESS and lessons from a large series of childhood ChC.

Methods: Medical records of all children undergoing TULESS for ChC at our center from September 2012 to July 2015 were reviewed. In the early series, a Z-shaped umbilical skin incision was used, but later a modified Z incision was preferred. Three 3-5mm ports were placed at separate points in the same incision site. Roux-en-Y loop was created extracorporally through the umbilical incision. Excision of ChC and hepatico-intestinal anastomosis were performed using conventional laparoscopic instruments.

Results: 202 patients were identified with median age of 30.5 months (range 1 month -12 years). The median diameter of ChC (measured by the largest size) was 3.8 cm (range: 1.5 – 12 cm). The ChC was successfully excised by TULESS in all cases. Ladd procedure for associated intestinal malrotation was carried out at the same time in one patient. Hepatic ductoplasty was performed in 26 cases (12.9%) for common hepatic duct diameter less than 5mm and in 8 cases (4.0%) for an aberrant duct. Hepatico-jejunostomy was performed in 200 cases and hepatico-duodenostomy in 2 cases. Additional trocars were needed in just one case (0.5%). There was no conversion to open surgery. The mean operative time for the first 20 cases and the left was 251 and 191 minutes, respectively ($p < 0.0001$). TULESS for ChC in children older than 5 years was more difficult since it took longer operative time than in children up to 5 years old (219 minutes vs. 189 minutes, $p < 0.0001$). No drain was used in 93.6% of cases. Early postoperative complications were noted in 2.0%, including bile leak (0.5%), intestinal obstruction (0.5%) and mild umbilical infection (1.0%). The median postoperative hospital stay was 5 days. At follow up of 2 – 36 months, one patient needed a redo-surgery for anastomotic stenosis; all other patients were in good health. The postoperative cosmesis was excellent, especially in patients with the modified Z umbilical skin incision.

Conclusions: TULESS with conventional laparoscopic instruments for childhood ChC is feasible, safe, with excellent postoperative cosmesis. The learning curve of TULESS for surgeons experienced in conventional laparoscopic surgery

for ChC is 20 cases. This approach is feasible even for cases requiring hepatic ductoplasty. TULESS is more difficult and takes longer operative time in children older than 5 years. This procedure can be virtually scarless, especially with the modified Z umbilical skin incision.

S032 THE BURNIA: LAPAROSCOPIC SUTURELESS INGUINAL HERNIA REPAIR IN GIRLS Jorge Godoy, MD¹, Maria C Puentes, MD², E Leopold, MD³, M Ortega, MD⁴, Nathan M Novotny, MD⁵; ¹Clinica Las Condes, Santiago, Chile, ²Hospital San Juan de Dios, Santiago, Chile, ³Hospital Calvo Mackenna, Santiago, Chile, ⁴Hospital La Florida, Santiago, Chile, ⁵Beaumont Children's Hospital, Royal Oak, MI, USA

Introduction: The technique for laparoscopic inguinal hernia repair in children is in evolution. Multiple methods of passing the suture around the peritoneum at the level of the internal inguinal ring exist. Cauterization of the peritoneum at the internal ring is thought to increase scarring and decrease recurrence. We have employed a sutureless, cautery only, laparoscopic single port repair of inguinal hernias and patent processus vaginalis (PPV) in girls.

Methods: After institutional ethical review was obtained, a retrospective review of sutureless laparoscopic inguinal hernia repairs in girls by four surgeons at separate institutions was performed. Patient demographics, intraoperative findings, and postoperative outcomes were recorded and analyzed. The technique involves an umbilical 30 degree camera and either a separate 3 mm stab incision in the midclavicular line or a 3 mm Maryland grasper placed next to the camera, the distal most portion of the hernia sac is grasped and pulled into the abdomen and cauterized obliterating the sac.

Results: Eighty inguinal hernias were repaired with this technique in 67 girls between July 2009 and September 2015. The ages and weights ranged from one month to 16 years and two to 69 kg, respectively. There was one conversion to open approach due to an incarcerated ovary was too close to the ring. A single umbilical incision was utilized in 85%. Fifty seven percent had hernias on the right while 42% had left hernias. Of the patients with presumed unilateral hernias, 22 patients were found to have PPV and were treated through the same incisions, 17/22 during a contralateral hernia surgery and 5/22 were found incidentally during appendectomy. Average operative time for unilateral and bilateral hernias were 22 min (5-38 min) and 31 min (11-65 min), respectively. No patient required a hospital stay due to the hernia repair. At an average of 25 months follow up (1.6 – 75 months), there were no recurrences. The only complication was a single lateral port site hernia on a two kg, former 24 week post menstrual age girl prior to adapting the technique to single site surgery for all.

Conclusions: Laparoscopic sutureless inguinal hernia repair is a safe and effective in girls of all ages. The single site modification allows for superior cosmetic result and lower complication profile. The Burnia allows for adequate treatment of unilateral and bilateral inguinal hernias with a single incision in the umbilicus.

S033 A SIMPLE UMBILICAL NEGATIVE PRESSURE DRESSING LOWERS THE RATE OF SURGICAL SITE INFECTIONS AFTER TRANSUMBILICAL, EXTRACORPOREAL APPENDECTOMY FOR ACUTE APPENDICITIS Federico G Seifarth, MD¹, Neilendu Kundu, MD², Alfredo D Guerron, MD³, Mary M Garland, MD⁴, Michaela W Gaffley, MD⁴, Sarah Worley⁵, Colin G Knight, MD⁶; ¹Cleveland Clinic Children's Hospital, ²Cleveland Clinic, Dermatology and Plastic Surgery Institute, ³Duke University, Department of Surgery, ⁴Wake Forest University, Department of Surgery, ⁵Cleveland Clinic, Quantitative Health Sciences, ⁶Nicklaus Children's Hospital, Department of Pediatric Surgery

Purpose: To determine whether a bio-occlusive umbilical vacuum dressing lowers the rate of surgical site infections after laparoscopic appendectomies for acute appendicitis.

Methods: Following IRB approval, a multicenter retrospective chart review was performed. 1377 patients (2-20 y) undergoing laparoscopic appendectomy for acute appendicitis from 01/2007 – 12/2012 were included. 18 different operative technique/dressing-variations were documented. The five technique/dressing groups with >90 patients were assessed.

Group 1 (n=107): conventional three port appendectomy with intracorporeal amputation, periumbilical camera port

Oral Abstracts

access, retrieval of the appendix in an endocatch bag (TRIPLE), Dermabond® dressing.

Group 2 (n=408): TRIPLE-technique, Steristrip dressing®.

Group 3 (n=227): single port appendectomy with extracorporeal amputation, transumbilical camera port access (SINGLE), umbilical vacuum dressing (VAC) with gauze, without Bacitracin®.

Group 4 (n=399): SINGLE-technique, VAC-dressing with gauze with Bacitracin®.

Group 5 (n=98): SINGLE-technique, VAC-dressing with gauze, no vacuum, no Bacitracin®.

Technique of umbilical vacuum dressing: Edges of the transumbilical incision are approximated with one or two simple interrupted suture with an absorbable monofilament. The umbilicus is filled with one or two compacted 2x2 inch gauzes. Liquid skin adhesive (Mastisol®) is applied around the umbilicus. The umbilicus is covered tension-free with a bio-occlusive transparent film (Tegaderm®). A 22-gauge needle on a 10ml syringe is tunneled tangentially from laterally through skin and subcutaneous tissue into the umbilical gauze. A vacuum is created by aspirating the air from the navel.

Results: Infection rates (95% CI) were:

Group 1, 2.8% (0.6-8.0%);

Group 2, 0.7% (0.2-2.1%);

Group 3, 2.6% (1.0-5.7%);

Group 4, 4.3% (2.5-6.7%);

Group 5, 4.1% (1.1-10.1%).

Compared to Group 2, relative risks of infection were 3.6 for Group 3 (95% CI 0.9-14.2, P=0.076), 5.8 for Group 4 (95% CI 1.7-19.6, P=0.001), and 5.6 for Group 5 (95% CI 1.3-24.4, P=0.029). Groups did not differ significantly on age or weight.

Conclusion: Conventional appendectomy with periumbilical camera port, intracorporeal amputation of the appendix and retrieval of the appendix in an endocatch bag has a significantly lower umbilical infection rate compared to single incision, transumbilical extracorporeal appendectomy. However, within the group of transumbilical extracorporeal appendectomies, application of an umbilical negative pressure dressing with dry gauze lowers the rate of umbilical site infections significantly.

S034 COMPARISON OF SINGLE-PORT HYBRID CHOLECYSTECTOMY VERSUS TRADITIONAL FOUR-PORT LAPAROSCOPIC CHOLECYSTECTOMY IN THE PEDIATRIC POPULATION Maitham A Moslim, MD¹, Michael H Liu, MD¹, Dimaris Ayalá-Bocanegra, BA², Sarah Worley¹, Federico G Seifarth, MD²; ¹Cleveland Clinic Foundation, ²Cleveland Clinic Children's Hospital

INTRODUCTION: Single-port laparoscopic cholecystectomy with the use of a 10mm Storz Hopkins telescope with inbuilt 6mm working channel and two portless 2.3mm graspers (Stryker, MiniLap) has been successfully implemented in our institution in 2010. The aim of this study is to compare the outcomes and cost effectiveness of this single port hybrid technique versus traditional four-port laparoscopic cholecystectomy in the pediatric population.

METHODS: With institutional review board approval, the departmental database was interrogated to identify all children who underwent laparoscopic cholecystectomy from 2010 to 2014. A single-center retrospective study was conducted comparing single port cholecystectomies to the conventional four-port approach. Operative time, intra-operative complications, post-operative course, operative and hospitalization cost were analyzed.

RESULTS: 109 patients underwent laparoscopic cholecystectomy with hybrid single-port technique performed in 64 (59%) of cases. Ages ranged from 2-26 years. Patients with single-port procedures were less likely to have intraoperative cholangiogram (11% vs 38%, $P<0.001$). Overall, the single-port technique was associated with significantly shorter operative time (median 86 vs 113 minutes, $P=0.006$), and significantly lower operative cost (median \$3927 vs \$4626, $P=0.002$), but did not differ from the conventional technique in duration of hospitalization (median 22 vs 21 hours, $P=0.96$).

There was only 1 intraoperative complication (enterotomy), 1 conversion to open surgery, and 2 wound infections, all of which occurred in patients treated with the conventional technique.

Patients who underwent **cholecystectomy without cholangiogram (N=85)** were separately evaluated. The single-port technique was associated with shorter operative time (median 85 vs 94 minutes, $P=0.28$) and lower operative cost (median \$3933 vs \$4089, $P=0.25$), but none of these differences were statistically significant. After adjusting for BMI-for-age, procedure type was not significantly associated with operative time ($P=0.26$) or duration of hospitalization ($P=0.36$); the operative cost was marginally lower in the single incision group by approximately 11% ($P=0.097$).

For the subgroup of patients who had **cholecystectomy with cholangiogram (N=24)**, patients treated with single-port procedures (N=7, 29%) had significantly lower operative cost (median \$3817 vs \$4978, $P=0.003$) and shorter operative time (median 130 vs 99 minutes, $P=0.13$). After adjusting for BMI-for-age, the single-port procedure remains significantly associated with lower operative costs ($P=0.007$).

CONCLUSION: Hybrid single-port laparoscopic cholecystectomy is a safe and cost effective alternative to the conventional four-port technique in pediatric normal weight, overweight and obese patients with shorter operative time and lower operative cost. In the subgroup of patients who underwent cholecystectomy without cholangiogram, these differences did not reach significance due to small sample size.

S035 OPERATIVE AND IMMEDIATE POST-OPERATIVE DIFFERENCES BETWEEN MULTI-PORT AND SINGLE-INCISION LAPAROSCOPIC TOTAL SPLENECTOMY IN PEDIATRIC HEMATOLOGY PATIENTS. Aaron D Seims, MD, Lisa VanHouwelingen, MD, Jessica Mead, Amos Loh, MD, John A Sandoval, MD, Andrew M Davidoff, MD, Winfred C Wang, MD, Israel Fernandez-Pineda, MD; St Jude Children's Research Hospital

BACKGROUND: Laparoscopy offers many benefits to splenectomy, such as reduced incisional pain and shortened hospital duration. The purpose of this study is to evaluate procedural and outcome differences between Single-Incision Pediatric Endosurgery (SIPES) and multi-port (MP) splenectomy when utilized to treat pediatric hematologic conditions.

PATIENTS AND METHODS: An Institutional Review Board-approved retrospective analysis of all consecutive laparoscopic total splenectomies performed at a single institution between January 2010 and October 2015 by three surgeons was conducted. Cases where partial splenectomy was the initial goal were excluded. We evaluated demographics, surgical technique, instance of conversion, operative duration, estimated blood loss, need for intraoperative blood transfusion, postoperative length of stay, time to full feeds, complications, and follow-up duration.

RESULTS: Over a 5-year period, 66 patients under the age of 20 years underwent laparoscopic total splenectomy. SIPES splenectomy was attempted in 14 patients. The remaining 52 were MP operations, during which 3 or more access sites were utilized. MP and SIPES populations were comparable with regard to age, gender, and body mass index. Preoperative splenic volume (mL) was available for 60% of patients (50% of SIPES and 63% of MP cases). Volumes were larger in the SIPES population (median [IQR]: 1377 [747–1508] vs. 452 [242–710]). Of the 14 attempted SIPES cases, 7 required the addition of only a single port. In one instance, 2 additional ports were needed. This case was viewed as a conversion to MP, but data were analyzed with the SIPES group. In the MP population, one case required conversion to an open procedure (OP). Need for extension of the umbilical incision to allow delivery of a spleen occurred in 2 MP cases. These were not viewed as conversions to OP. SIPES demonstrated no difference when compared

Oral Abstracts

with MP splenectomy in operative time (153 vs. 138 min, $p = 0.26$), estimated blood loss (120 vs. 154 mL, $p = 0.94$), or percent of cases requiring intraoperative blood transfusion (14 vs. 23, $p = 0.72$). By the 1st post-operative day, 57% of SIPES and 17% of MP patients could be discharged ($p = 0.005$). On this day, 100% of SIPES and 78% of MP patients were tolerating a regular diet ($p = 0.10$). Within the MP population, one wound infection and one incisional hernia were identified. These complications were not observed in the SIPES group. Thirty-day readmission rates were similar, at 7% for SIPES and 8% for MP operations. Fever was the indication for all readmissions. Mean duration of follow-up is 28 months for MP and 13 months for SIPES cases. This difference is at least partially attributable to a more recent application of the minimal access technique ($p < 0.001$).

CONCLUSIONS: SIPES can be safely utilized for total splenectomy in pediatric hematology patients without increasing procedural duration or need for intraoperative blood transfusion. In addition, rate of discharge on the 1st post-operative day is higher when SIPES splenectomy is performed.

S036 A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL OF SINGLE PORT AND 3-PORT LAPAROSCOPIC APPENDECTOMY IN CHILDREN. Andrzej Golebiewski, PhD, Stefan Anzelewicz, MD, Agnieszka Wiejek, Dominika Lubacka, Piotr Czauderna; MEDICAL UNIVERSITY OF GDANSK

Aim: To evaluate single port laparoscopic appendectomy (SPLA) in comparison with conventional 3-port laparoscopic appendectomy (3PLA) in children, with special emphasis on the extent of surgical trauma after SPLA and 3PLA, and to assess whether SPLA had any advantages compared with conventional 3PLA.

Methods: A total of 50 patients with a median age of 8,2 (range 4-17) were randomized to either SPLA or 3PLA. Serum interleukin (IL) 6 and C-reactive protein (CRP) levels were measured using an enzyme-linked immunosorbent assay before surgery and 12 and 36 hours after surgery. In addition, we compared operating time, hospital stay, postoperative pain and complication rate.

Results: The operative time in the conventional laparoscopic group was significantly shorter than that in the SPLA group. Preoperative IL-6 levels were not different between the 2 groups, but the rise (preoperative vs postoperative) of IL-6 in the SPLA group was remarkably higher than that in the 3PLA group. Similar results were obtained for CRP; serum CRP levels in the basal state were not different between the 2 groups, but the rise (preoperative vs postoperative) of CRP in the 3PLA group was lower compared with that in the SPLA group. In the first 12 hours the SPLA patients had more postoperative pain (pain score: 6.6 vs 4.3) and longer inpatient opiate usage (2.9 vs 2.2 days) than 3-port laparoscopy. Only 1 SPLA case was converted to 3-port LA. The length of hospital stay and complication rate were not different between the two groups.

Conclusions: Single port laparoscopic appendectomy in children is associated with longer operative times and more severe surgical trauma as measured by postoperative CRP and IL-6 levels. Other parameter (length of hospital stay and complication rate) seems to be similar. Hence the only advantage of single port approach seems to be cosmesis.

S037 SCARLESS ILEAL POUCH ANAL ANASTOMOSIS UTILIZING AN UMBILICAL STOMA Donald Potter, MD¹, Stephanie Polites, MD¹, Matthew Alexander, MD², Christopher Moir, MD¹; ¹Mayo Clinic, ²University of Iowa

Purpose: Single incision laparoscopic surgery via the umbilicus has been touted to hold the potential for “scarless surgery.” Multistage restorative proctocolectomy most commonly utilizes a right lower quadrant ileostomy. Our goal is to describe our experience with a no scar, two stage ileal pouch anal anastomosis (IPAA) that involves an umbilical stoma at the site of entry.

Methods: Herein, we describe a retrospective case series of all patients that underwent single incision laparoscopic IPAA for ulcerative colitis or familial adenomatous polyposis (FAP) since March, 2010. Of the 21 patients that underwent single incision laparoscopic IPAA, 3 patients were completed in a single stage, 10 patients in 2 stages, and 8 patients in three. A scarless procedure was completed in 6 patients. An umbilical stoma was used in 4 children, whereas,

the remaining 2 patients underwent a single stage IPAA and were excluded from this study.

Results: Mean age was 16 ± 1 years. Three girls suffered from ulcerative colitis with the only male having FAP. Mean operative time was 398 ± 67 minutes. Length of stay was 6 ± 2 days. End ileostomy was used in 3 out of 4 patients to allow added brooking due to the need for increased elevation at the umbilicus. All patients required convex stoma bags to improve flat enterostomies. Three patients required contouring with stoma paste. Two of the 4 patients suffered stoma complications. The first developed incapacitating body image dysphoria manifested by refusing to attend school. The stoma was closed at 1.5 months without complication. The second had stoma retraction necessitating reoperation at 2 weeks. The stoma was closed and she did well. This was the only loop ileostomy. Long term complications include pouchitis in 50% of patients and bleeding from the pouch staple line necessitating transfusion in one child. Cosmetic results have been scarless except for the patient that underwent early stoma reversal.

Conclusions: Two stage scarless IPAA is feasible using an umbilical stoma. We have limited our use to only short term ostomies due to increased need for “complex” stoma management. We continue to offer scarless IPAA utilizing an umbilical stoma after counseling patients of these concerns.

S038 SINGLE-PORT LAPAROSCOPIC ASSISTED TRANSCROTAL APPROACH ORCHIDOPEXY COMBINED WITH PERCUTANEOUS EXTRA-PERITONEAL INNER RING LIGATION USING HOOKED NEEDLE FOR CRYPTORCHIDISM WITH PALPABLE TESTIS Suolin Li, MD, Yazhen Ma, MD, Xinning Wang; The Second Hospital of Hebei Medical University

Background: For most palpable cryptorchidisms, traditional open surgical technique are still currently conducted, which needed to open the inguinal canal and longer scar view left on the abdominal wall. We explored and innovated the single-port laparoscopic assisted transcrotal approach orchidopexy (LATAO) combined with percutaneous extra-peritoneal inner ring ligation using hooked needle, to treat palpable cryptorchidism with more effectiveness and less trauma.

Materials and methods: Totally 60 children with cryptorchidism were done with single-port LATAO between October 2010 and May 2014. Eleven of them were bilateral, 24 on the left side and 25 on right. Median age was 31.3 ± 3.2 month (ranging from 12.5 to 104 months). No intra-operative complications were observed.

Results: Totally 60 children with 71 testis were successfully performed by LATAO. Fourteen in 49 children with unilateral cryptorchidism were found to be associated with patent processus vaginalis on opposite side (28.57%). Mean operating time for unilateral and bilateral LATAO in this study was 47.4 ± 8.5 min and 99.1 ± 7.2 min respectively. Follow-ups were conducted at least one year post-operatively. No post-operative complications were found to date.

Conclusions: Single-port LATAO procedure has proved to be a safe and effective procedure for cryptorchidism in children.

S039 ENDOSCOPIC INTERVENTION OF GASTRIC MUCOSA: A NEW TARGET TO TREAT OBESITY AND RELATED COMORBIDITIES Andreas Oberbach, MD, PhD, DrPH, MPH¹, Vivek Kumbhari, MD², Nadine Schlichting, PhD³, Stefanie Lehmann, PhD⁴, Yvonne Kullnick, MSc¹, Marco Heinrich, PhD¹, Anthony N. Kalloo, MD, PhD², Holger Till, MD, PhD⁵; ¹University of Leipzig, Fraunhofer-Institute for Cell Therapy and Immunology IZI, experimental surgery research group, ²Department of Medicine and Division of Gastroenterology and Hepatology. The Johns Hopkins Medical Institutions, Baltimore, MD, ³Department of Pediatric Surgery. University of Leipzig. Leipzig. Germany, ⁴Integrated Research and Treatment Center (IFB) Adiposity Diseases. University of Leipzig. Leipzig. Germany, ⁵Department of Paediatric and Adolescent Surgery, Medical University of Graz, Austria

Background and Aims: The gastric mucosa is an endocrine organ that regulates satiation by the expression of orexigenic and anorexigenic hormones. Metabolic surgery, such as vertical sleeve gastrectomy (VSG), involves excision of 80% of the gastric mucosa with a corresponding reduction in gastric volume. Our study aims to investigate the inde-

pendent effects of devitalizing gastric mucosa on obesity and its related comorbidities.

Methods: Four week old male Sprague-Dawley rats received a high fat diet (HFD) for 11 weeks to induce a obesity phenotype. Rats were then randomized into three groups: Gastric mucosal devitalization (GMD, n=30), VSG (n=30) and sham (SH, n=30). GMD was achieved by opening and mobilizing the stomach and performing argon plasma coagulation (APC) to 80% of the visible mucosa. VSG was involved resection of 80% of the stomach. Sham rats received a laparotomy and mobilization of the stomach. In an 8 weeks follow-up study, we quantified oral food consumption, body weight, visceral adiposity, HOMA-IR, cholesterol- and free fatty acid profile by ELISA. Following a 2-hour oral glucose tolerance test, the kinetics of ghrelin, GLP-1, and PYY were measured. The liver lipid content and lipase activity were quantified by ELISA and adipophillin expression by western blot analysis. In an attempt to elucidate the mechanisms behind GMD, serum bile acids and cholecystokinin were measured following a 2-hour oral glucose tolerance test.

Results: Our technique utilizing APC resulted in selective devitalization of the gastric mucosa without alteration of the deeper tissue layers. Histological examination at 8 weeks revealed regenerative changes of the gastric mucosa, but hormone sensitive cells such as ghrelin, did not demonstrate a corresponding normalization. GMD resulted in a significant reduction in body weight, visceral and subcutaneous adipose tissue and hepatic steatosis. GMD resulted in improvement in glucose metabolism as demonstrated by a significant reduction in HOMA-IR. Furthermore, GMD resulted in an improvement in serum lipid profile with a significant reduction of triacylglycerides and low density lipoprotein. In addition, GMD resulted in a significant reduction in food intake and intestinal malabsorption of free fatty acids, both contributing to the improved body composition and metabolic profile. Disturbed regulation of orexigenic hormones was observed with significant reductions in total and active ghrelin. Levels of serum anorexigenic hormones GLP-1 and PYY were also significantly increased in GMD rats. A significant reduction in liver adipophillin as well as serum palmitate, both known to alter glucose and lipid metabolism, were noted in GMD rats. GMD precipitated an increase in serum bile acids as well as an increase in cholecystokinin, conceivably explaining the observed improvement in body composition and metabolic profile. Similar changes were noted when VSG rats were compared to SH.

Conclusion: Devitalization of the gastric mucosa (independent of altering gastric volume) reduces: body weight, visceral adiposity, hepatic steatosis, serum lipids and improves glucose metabolism. The mechanisms behind these findings may lie in the favorable alteration in serum gut hormones as well as serum bile acid regulation. Therefore, GMD deserves further attention as a promising method to treat obesity and its associated comorbidities.

S040 LAPAROSCOPIC PERCUTANEOUS EXTRAPERITONEAL CLOSURE FOR INGUINAL HERNIAS IN CHILDREN Xinghai Yang, MD, Hongqiong Geng, MD, Shigang Cheng, MD; Hubei women and children's hospital

PURPOSE: The pediatric hernia repair by laparoscopic technique is gaining popularity among pediatric surgeons, however, the indication for laparoscopic inguinal hernia repair in infants and children still remain controversial. There are many techniques available for laparoscopic inguinal hernia repair in children. The aim of this study was to evaluate the efficacy and safety of Laparoscopic percutaneous extraperitoneal closure (LPEC) in comparison with conventional open hernia repair (Potts).

METHODS: In our hospital, LPEC has been performed first in girls since 2005 following which the indications were gradually extended. Currently LPEC is indicated for all patients in the pediatric population regardless of sex. A retrospective analysis was performed using the surgical charts of consecutive patients who underwent LPEC or Potts during last 10 years. The outcomes of LPEC were compared with those of Potts. During LPEC, a 5-mm laparoscope is placed through an umbilical incision, and then a 2.5mm grasping forcep is inserted on the right or left side of the umbilicus. The hernia sac orifice is closed extraperitoneally using circuit suturing around the internal inguinal ring with an LPEC needle and non-absorbable suture materials percutaneously inserted at the midpoint of the inguinal line.

RESULTS: A total of 2176 infants and children (1864 males and 312 females, mean age: 36.5 ± 27.3 months) was underwent LPEC and 1942 infants and children (1765 males and 177 females, mean age: 34.2 ± 26.8 months) was underwent Potts. All surgeries were successfully performed without any serious complications. During LPEC, a

Oral Abstracts

contralateral occult hernia was identified and subsequently repaired at the same time in 1236 of the 2086 unilateral hernia cases. The mean operative time for bilateral hernia repair was shorter using LPEC than that observed with Potts (LPEC: 36.6 ± 12.9 ; Potts: 43.6 ± 26.3 MIN, $P = 0.001$). There were no differences in the mean operative time for unilateral hernia repair between the two procedures (LPEC: 27.3 ± 6.0 ; Potts: 25.9 ± 8.0 min). There were no differences in the recurrence rates (LPEC: 1.1%; Potts: 0.8%, $p = 0.557$). There was a significant reduction in the risk of developing a contralateral inguinal hernia in the LPEC cases compared with that observed in the Potts cases. Neither hydroceles nor testicular atrophy occurred after surgery with either operation method.

CONCLUSIONS: LPEC can provide shorter operative times for bilateral hernia repair and lower rates of metachronic contralateral hernias compared to Potts. The recurrence rate of LPEC is comparable to that of Potts with superior cosmetic results, and the completion rate of day surgery is comparable between the two procedures. These data show that LPEC in children is safe, reliable, cosmetic and lower complication, it is especially suitable to boys with bilateral inguinal hernia and females.

S041 PEDIATRIC THORACOSCOPIC SURGICAL SIMULATION USING A PEDIATRIC CHEST MODEL AND MOTION SENSORS CAN BETTER IDENTIFY SKILLED SURGEONS THAN A CONVENTIONAL BOX TRAINER Shinya Takazawa, MD¹, Tetsuya Ishimaru, MD, PhD¹, Kanako Harada, PhD², Kyoichi Deie, MD¹, Jun Fujishiro, MD, PhD¹, Naohiko Sugita, PhD², Mamoru Mitsuishi, DrEng², Tadashi Iwanaka, MD, PhD³; ¹Department of Pediatric Surgery, The University of Tokyo Hospital, ²School of Engineering, The University of Tokyo, ³Saitama Childrens Medical Center

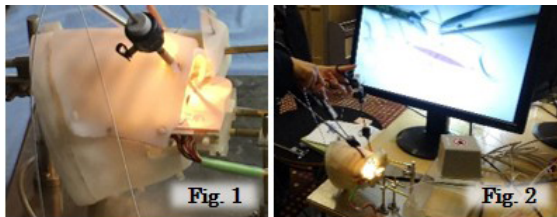
Purpose: We previously developed a pediatric thoracoscopic surgical simulator using a rapid-prototyped pediatric chest model and motion and force sensors, and its construct validity was demonstrated by performing skill assessment experiments. In this study, the same experiments were conducted for 31 surgeons and the results of 53 surgeons in total were analyzed.

Methods: A suture pad with a force-sensing capability was placed in a rapid-prototyped pediatric chest model of a 1-year-old patient (Fig. 1). Each participant completed an endoscopic intracorporeal suturing and knot-tying task, both in the pediatric chest model setup and in a box trainer setup (Fig. 2). The task completion time, number of manipulations, force applied on the suture pad, and width of the slit opening in the pad after suturing were measured. The tips of the right and left instruments were tracked using an electromagnetic motion tracking system to measure the tool paths. Videos of the endoscopic view recorded during the experiment were evaluated by two blinded surgeons and scored using a 29-point checklist and error assessment sheet. The data for 53 surgeons were analyzed by grouping the surgeons into a skilled group (surgeons qualified by the Endoscopic Surgical Skill Qualification [ESSQ] system of a domestic academic society; $n = 8$) and an unskilled group ($n = 45$).

Results: Suturing performance results are shown in Table 1. The skilled surgeons showed significantly better performance in six metrics in the pediatric chest model setup (time: $p = 0.015$; number of manipulations: $p = 0.027$; checklist compliance: $p = 0.009$; error: $p = 0.001$; right pass length: $p = 0.019$; and width of slit: $p = 0.048$). In contrast, no significant difference between the two groups was observed in the box trainer setup. In comparison between the setups, the unskilled surgeons showed worse results in six metrics in the pediatric chest model than in the box trainer (time: $p < 0.001$; number of manipulations: $p < 0.001$; error: $p = 0.001$; right pass length: $p = 0.027$; left pass length: $p < 0.001$; and applied force: $p = 0.027$), while the skilled surgeons showed equivalent performance in both setups, except for the task completion time and left pass length (time: $p = 0.041$ and left pass length: $p = 0.002$).

Conclusions: Compared to a conventional box trainer, our pediatric thoracoscopic surgical simulator was better for identifying skilled surgeons. We believe this is because the simulator can more accurately replicate the difficulties associated with pediatric thoracoscopic tasks. The simulator would also be useful as a training platform for pediatric surgeons of intermediate skill who have completed a training program using a box trainer and are seeking ESSQ certification.

Oral Abstracts



Metrics	Box trainer		Pediatric chest model	
	Unskilled Group	Skilled Group	Unskilled Group	Skilled Group
Completion Time (sec)	154 (87)	131 (80)	251 (153) [†]	196 (76) ^{*†}
Manipulation	22 (9)	18 (7.8)	29 (16) [†]	23 (10) [*]
Checklist	21 (4.3)	23 (5.4)	20 (4.5)	23 (2.6) [*]
Error	7.5 (4.5)	8.3 (5)	10.5 (5.5) [†]	5.5 (2.5) [*]
Right Pass Length (m)	2.8 (1.6)	2.4 (0.9)	3.5 (2.2) [†]	2.1 (1.4) [*]
Left Path Length (m)	2.8 (1.2)	2.6 (1.3)	5.6 (3.2) [†]	5.0 (1.3) [†]
Applied Force	1.5 (1.0)	1.8 (2.2)	2.0 (1.2) [†]	1.5 (0.8)
Width of Slit (mm)	0.6 (1.7)	0.2 (0.6)	0.8 (1.5)	0 (0.8) [*]

Table 1

Fig 1. A pediatric chest model with a suture pad

Fig 2. Endoscopic view during the experiment

Table 1. Comparison of suturing performance

All data are expressed as median values (interquartile range).

*: $p < 0.05$ vs. the unskilled group in the same setup (Wilcoxon test)

†: $p < 0.05$ vs. the same group in the box trainer setup (Wilcoxon test)

S042 DOES A 3D IMAGE IMPROVE LAPAROSCOPIC MOTOR SKILLS? Semiu E Folaranmi, MRCS, MB, BS, BSc¹, Roland W Partridge², Mark A Hughes, PhD, MRCS, MBChB, BSc², Paul Brennan², Iain A Hennessey, FRCS, MMIS, MBChB¹; ¹Alder Hey Children's Hospital, ²The University of Edinburgh

Background: One of the technical challenges of laparoscopy is the loss of depth perception that using a 2D camera and image processing entails. Experienced laparoscopic surgeons develop strategies to adjust for this loss of stereotactic vision, but novices often struggle initially.

There is growing interest in 3D laparoscopic equipment in order to overcome this barrier, however few studies directly compare the performance of using a 3D image with a 2D image using quantitative motion capture techniques.

Aim: To quantitatively determine whether a 3D 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(5) and Experts(5). Novices were defined as junior doctors or medical students 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 3D laparoscopic 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/s²), average motion smoothness (mm/s³), percentage off screen and handedness.

A paired t-test was used to compare the performance on a 2D vs 3D image within each group. An unpaired t-test was used to compare the performance between the two groups on a 2D and a 3D laparoscopic image.

Results: Among the experts the mean time taken to perform the task on the 3D image was significantly quicker com-

pared to the 2D image, 40.2s (35.1-45.3, 95% CI) vs 51.2s (44.4-58.1, 95% CI), $P < 0.0001$.

Among the novices the mean task time again was significantly quicker on the 3D image, 56.4s (27-114, 95% CI) vs 82.7s (41-207, 95% CI), $p < 0.0001$.

There was no significant difference in the mean time it took a novice to perform the task using a 3D camera compared to an expert on a 2D camera, 56.4s (27 - 114, 95% CI) vs 51.3s (29 - 80, 95% CI), $p = 0.3341$.

Among experts there was no significant difference in the distance travelled with the laparoscopic instruments when using a 2D image compared to a 3D, 1.08m (0.64-1.86, 95% CI) vs 1.01m (0.58-1.6, 95% CI), $p = 0.2721$

Among novices there was a significant difference in the distance travelled between 2D and 3D camera use, 1.37m (0.61-3.59, 95% CI) vs 1.12m (0.64-2.23, 95% CI), $P = 0.0193$.

Conclusion: The use of a 3D image confers a significant performance advantage over a 2D camera in quantitatively measured laparoscopic skills for both experts and novices. The use of a 3D image appears to improve a novices performance to the extent that it is not statistically different from an expert using a 2D image.

S043 PRELIMINARY EVALUATION OF A NOVEL PEDIATRIC RIGID BRONCHOSCOPY SIMULATION MODEL FOR AIRWAY FOREIGN BODY RETRIEVAL Grace E Hsiung, MD¹, Ben Schwab, MD¹, Ellen K O'Brien, BS², Colin D Gause, MD¹, Ferdinand Hebal, MD³, Deborah M Rooney, MD⁴, Katherine A Barsness, MD, MS³; ¹Department of Surgery, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ²Department of Medical Education, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ³Division of Pediatric Surgery, Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois, ⁴Department of Learning Health Sciences, University of Michigan Medical School, Ann Arbor, Michigan

PURPOSE: Emergent retrieval of airway foreign bodies (AFB) in children remains a priority skill set for pediatric surgeons. Unfortunately, the expansion of pediatric otolaryngology at many training programs has diminished learning opportunities for pediatric surgery trainees. In the setting of low-procedural volume and expected surgical competency, deliberate practice in a simulation-based educational environment is essential. The purposes of this study were to (1) create a realistic rigid bronchoscopy for AFB retrieval simulation model and (2) to evaluate the content validity of this novel simulation model during a training course for pediatric surgical trainees.

MATERIALS AND METHODS: After IRB exemption determination, an 18-month old pediatric tracheobronchial airway was 3D printed and connected to a commercially available infant intubation model (Figure 1). Standard pediatric rigid bronchoscopy instrumentation, retrieval baskets, and laryngoscopes were used for the study. Two foreign bodies were placed into the 3D printed airways, peanut fragments and 4mm plastic beads. Eighteen participants performed AFB retrieval for both objects, and completed a self-report, 30-item instrument consisting of twenty-nine 4-point rating scales (ranging from 1=not realistic to 4=highly realistic) and a 4-point global rating scale. Participants also reported their experience and comfort level (ranging from 1=not comfortable to 3=extremely comfortable) with performing this task and were considered to be experienced if they had performed ≥ 10 rigid bronchoscopies. Validity evidence relevant to test content and response processes was evaluated using the Many-Facet Rasch model, supported by the Wilcoxon rank sum test, while evidence of internal structure (inter-item consistency) was estimated using Cronbach alpha.

RESULTS: Novice surgeons ($n=12$) had previously performed a mean of 2.7 ± 2.0 rigid bronchoscopies, compared to 15.4 ± 7.7 by experienced surgeons ($n=6$). Overall, participants had no model preference with observed averages (OA) of 3.3 and 3.2 for bead and peanut simulations respectively ($p=0.6$). Experienced participants rated both models higher than novice participants (3.5 vs. 3.2, $p=0.01$). For both models, "Value" and "Relevance" domains received the highest ratings (OA=3.8), while "Materials Response" was rated the lowest (OA<3.0). Specifically, "mobility of oropharynx" and "amount of resistance to view vocal cords" received the lowest individual ratings. (Tab There were no differences between novice and experienced surgeons relative to "Ability to perform tasks". The overall global rating for this rigid bronchoscopy model was 2.3, consistent with "requires minor improvements before it can be considered for use in rigid bronchoscopy training." Experienced participants preferred the bead model more than the peanut model (3.0 vs. 2.0, $p=0.009$). Inter-item consistency for the 19 items used to evaluate the simulator's quality was high ($\alpha=0.94$).

Oral Abstracts

CONCLUSIONS: We successfully designed, assembled, and evaluated a novel rigid bronchoscopy model for airway foreign body. Course participants rated the model as relevant to their educational needs, and valuable as a testing and training tool. Participants recommended a number of improvements for the model, including better attachments for the airway to the intubation model and increased flexibility of the intubation model tissues. With these and other minor modifications, the rigid bronchoscopy for airway foreign body retrieval model will be ready for implementation with a Mastery Learning curriculum.



Figure 1: Assembled Retrieval of Airway Foreign Body Rigid Bronchoscopy Simulation Model Using 3D Printed 18-month old Tracheobronchial Airway

S044 ADVANCES IN PEDIATRIC SURGICAL EDUCATION: A CRITICAL APPRAISAL OF TWO CONSECUTIVE MINIMALLY INVASIVE PEDIATRIC SURGERY TRAINING COURSES Colin D Gause, MD¹, Grace Hsiung, MD¹, Ben Schwab, MD¹, Matthew Clifton, MD², Katherine A Barsness, MD, MS¹; ¹Department of Surgery, Division of Pediatric Surgery; Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, ²Department of Surgery, Division of Pediatric Surgery, Emory University, Children's Hospital of Atlanta, Atlanta, GA

Purpose: Public and private mandates for improved patient safety and outcomes, work hour restrictions, and regulations requiring greater oversight of trainees have resulted in significant changes in surgical education. As trainees and practicing surgeons seek to expand surgical skills, hands-on educational courses increasingly must meet those needs. Over 20 years ago, surgical pioneers in minimally invasive surgery (MIS) for infants and children began a hands-on training course for pediatric surgical trainees. The course has evolved into a modern simulation-based educational course. The purposes of this study were to (1) determine self-reported operative experience and technical skill levels, and (2) determine the impact of a dynamic model of simulation-based education for two cohorts of senior pediatric surgery trainees.

Materials and Methods: After IRB exempt determination, a retrospective review was performed of all evaluations for an advanced MIS course for pediatric surgery trainees. The courses, occurring in September 2014 and 2015, included a combination of didactic content and hands-on skills training. Hands-on simulation included size-appropriate neonatal/infant models for rigid bronchoscopy-airway foreign body (AFB) retrieval, laparoscopic common bile duct exploration (LCBDE), and real tissue diaphragmatic hernia (DH), duodenal atresia (DA), pulmonary lobectomy, and tracheo-esophageal fistula (TEF) models. Data are reported as mean $\pm$ SD. Chi-squared analyses were used for categorical data, with t-tests for continuous data. A P-value<0.05 was significant.

Results: Complete survey data were available for 27 and 31 trainees in 2014 and 2015, respectively. Participants had limited prior operative MIS experience, with mean case numbers ranging from 0.44 $\pm$ 0.62 (laparoscopic DA repair) to 3.8 $\pm$ 3.9 (thoracoscopic lobectomy). Trainees reported a mean of 1.95 $\pm$ 2.84 and 1.16 $\pm$ 1.54 total advanced MIS cases in 2014 and 2015 cohorts, respectively. Notably, the 2015 cohort had significantly less previous experience in lobectomy (p=0.04) and overall advanced MIS than the 2014 group (p=0.007). Prior to both courses, a significant percentage of

Oral Abstracts

participants were not comfortable with DH repair (39-42%), DA repair (50-74%), lobectomy (34-43%) or TEF repair (54-81%). In 2015, 34% of participants were not comfortable with AFB bronchoscopy, and 59% were not comfortable with LCBDE. Importantly, 35% of participants were not comfortable with pulmonary anatomy. After course completion, participants noted improvement in tying intracorporeal knots (87.5% and 82.8%), energy selection (63.6% and 69%), instrument selection (82.6% and 89.7%), and port positions for DH repair (89.7% and 96.6%), DA repair (86.2% and 96.4%), lobectomy (86.2% and 93.1%), and TEF repair (89.7% and 96.6%). Participants also reported improvement in retrieval of AFB (93.1%) and LCBDE (96.6%). Course materials and hands-on skills significantly improved participants' perceived ability to perform each operation more safely, with 100% reporting improvement for DH, 96% for DA, 96% for lobectomy, and 100% for TEF.

Conclusion: Pediatric surgery trainees continue to have limited exposure to advanced MIS during clinical training. Simulation based education results in significant improvement in both cognitive knowledge and trainee comfort with safe operative techniques for advanced MIS. Thoughtful revisions to the educational content of the MIS course continue to allow for relevant educational experiences for a large cohort of pediatric surgical trainees.

S045 PRELIMINARY EVALUATION OF A LAPAROSCOPIC COMMON BILE DUCT SIMULATOR FOR PEDIATRIC SURGICAL EDUCATION Ben Schwab, MD¹, Deborah M Rooney², Eric S Hungness, MD¹, Katherine A Barsness, MD, MS³; ¹Department of Surgery, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ²Department Of Learning Health Sciences, University of Michigan Medical School, Ann Arbor, Michigan, ³Department of Surgery, Division of Pediatric Surgery, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois

Purpose: Mirroring the trend in childhood obesity, the incidence of cholelithiasis has been increasing in the pediatric population. In adult patients, laparoscopic common bile duct exploration (LCBDE) decreases overall costs and the hospital length of stay in patients with choledocolithiasis. Despite the strength of these data, overall utilization of the LCBDE procedure remains low. Barriers to implementation include a lack of knowledge and the requisite technical skills to safely perform the procedure. To meet these needs, a LCBDE simulator was developed, evaluated, and shown to improve cognitive and technical performance metrics for general surgery trainees. We sought to evaluate the LCBDE simulator among a cohort of pediatric surgical trainees. The purposes of this study were to 1) evaluate the content validity of a LCBDE simulator and 2) determine what, if any, modifications might be necessary to use a previously developed LCBDE simulator for pediatric surgical education.

Methods: After IRB exempt determination, thirty-one participants were asked to perform a transcystic LCBDE using a previously developed simulator during a recent pediatric surgery fellows training course. Participants were then asked to complete a self-reported 26-item instrument consisting of twenty-five 4-point rating scales (from 1 = not realistic to 4 = highly realistic) and one 4-point Global Rating Scale. Participants also self-reported current comfort level with performing a LCBDE for choledocolithiasis, scored from 1 (Not comfortable) to 3 (Very comfortable). Validity evidence relevant to test content and response processes was evaluated using the many-facet Rasch model, while evidence of internal structure (inter-item consistency) was estimated using Cronbach's alpha. A *P* value <0.05 was significant.

Results: Experienced participants rated the simulator overall slightly lower [observed average (OA) = 3.2] than novice participants (OA = 3.3, *P* = 0.02). The highest combined observed averages were for the Value domain (OA = 3.8) whereas the lowest ratings were for the Visual Attributes domain (OA = 3.2). Lowest rated intra-domain items were Performing intraoperative cholangiogram and Realism of balloon dilation (OA both = 3.0). The averaged global rating was 3.1, consistent with "this simulator can be considered for use in pediatric LCBDE training, but could be improved slightly." Inter-item consistency for the nineteen items used to evaluate the simulator's quality was high (α = 0.94). Novice participants rated the simulator significantly higher in value as an educational tool (OA = 4.0) than experienced participants (OA = 3.3), *P* = 0.03.

Conclusions: Overall, course participants rated the LCBDE simulator highly in regard to value as an educational tool for pediatric surgical education. Novice surgeons rated the simulator higher than experienced surgeons in the overall global rating scale and in the simulator's value as an educational tool. Participants felt that the LCBDE simulator could be used as an educational tool with minor modifications, most predominantly in the visual attributes. Based on these data, modifications, including the use of 3D printing of the biliary system and scaling down the dimensions to better

Oral Abstracts

approximate those of a pediatric patient, are ongoing.

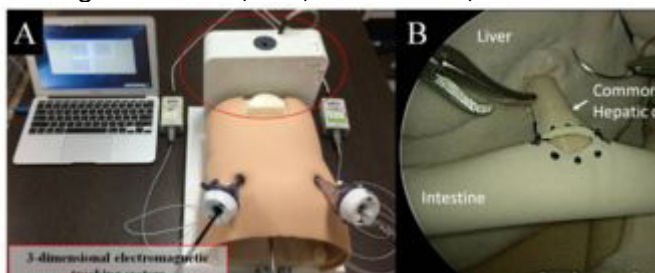
Image 1: Simulated laparoscopic view



S046 THE EFFICACY OF A NEW LAPAROSCOPIC HEPATICOENTEROSTOMY TRAINING SIMULATOR FOR OBJECTIVE SURGICAL SKILL EVALUATION Takahiro Jimbo¹, Satoshi Ieiri², Satoshi Obata¹, Ryota Souzaki¹, Munenori Uemura³, Noriyuki Matsuoka⁴, Tamotsu Katayama⁴, Kouji Masumoto⁵, Makoto Hashizume³, Tomoaki Taguchi¹; ¹Department of Pediatric Surgery, Faculty of Medical Sciences, Kyushu University, ²Department of Pediatric Surgery, Field of Developmental Medicine, Kagoshima University, ³Department of Advanced Medicine and Innovative Technology, Kyushu University Hospital, ⁴Kyoto Kagaku, Co. Ltd, ⁵Department of Pediatric Surgery, Faculty of Medicine, University of Tsukuba

Background and Aim: Pediatric surgeons requires dexterous manipulation of surgical instruments to handle fragile tissues in a small workspace as minimally invasive surgery. Despite the need for advanced surgical skills in order to avoid complications, the opportunities for pediatric surgeons to learn and practice these skills are limited. Thus, we have developed a thoracic and laparoscopic training simulator with a surgical skill evaluation system to provide surgical skill assessments and training opportunities. We newly developed the hepaticenterostomy model as one of our comprehensive training simulator series. The aim of this study was to verify the quality of skills of surgeons using our new training simulator.

Materials and Methods: We developed a hepaticenterostomy model based on the clinical situation. The infant abdominal model has been previously developed according to computed tomography using a 3D printer. Abdominal organs, including the stomach, liver, and intestine, were made of styrene ($C_6H_5CH=CH_2$) and were placed in this model (Fig. 1).



The examinees were divided into Experts ($n = 6$), with experience of more than 50 endoscopic surgeries, and Trainees ($n = 6$), with experience of less than 50 endoscopic surgeries. The examinees' laparoscopic surgical skills were assessed using a skills assessment task, laparoscopic suturing and knot tying. The common hepatic duct and intestine with three pairs of dots were placed and the examinees were required to place three sutures and tie a square knot at the pair of dots. The entry and exit points of the needle had to be placed precisely at the dots. The time to adjust the needle, tying the first half knot, and the time to complete each suture ligature were recorded for the evaluation. Errors including the number of sutures that missed the dots, injuries of organs, loose sutures, and the number of times that the forceps holding the needle dropped out of view were recorded. To analyze the spatial paths of the for-

Oral Abstracts

ceps, we evaluated the total path length and velocity of the forceps using a three-dimensional position measurement instrument. Statistical analyses were performed using the JMP® 11.0 statistical software program.

Results: The summary of all tasks is shown in Table.

	Trainees (n=5)	Experts (n=5)	p value
Time for suturing			
Time to acquire the nasolarynx	86.2 ± 12.6	121.4 ± 4.4	0.0095*
Time to complete the 1st suture ligature (sec)	389.5 ± 134.5	234.7 ± 118.9	0.0658
Time to complete the 2nd suture ligature (sec)	789.8 ± 296.3	487.5 ± 204.1	0.0475*
Time to complete the 3rd suture ligature (sec)	1163.8 ± 310.6	695.2 ± 296.3	0.0256*
Number of errors (times)	6.5 ± 3.2	1.3 ± 1.0	0.0038*
Spatial path evaluation			
Spatial path length (mm)	1758 ± 538	1404 ± 421	0.2322
Average velocity of the forceps (mm/sec)	19.6 ± 5.7	14.9 ± 4.5	0.2322

* Significantly difference

The time required to complete the tasks for the experts and trainees was 695±296 seconds and 1163±310 seconds (p=0.0256), respectively. The sum of the number of errors was 1.3±1.0 times and 6.5±3.2 times (p<0.001), respectively. The sum of the total path lengths of both forceps and the average velocities of the forceps were not significantly different between the experts and trainees. The correlations between the number of experienced endoscopic surgeries and the required time and the total number of errors were confirmed (Fig. 2).

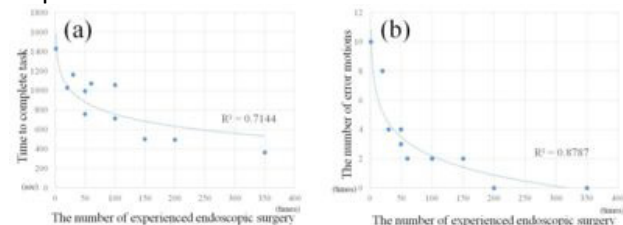


Figure 2: The correlation between the number of experienced endoscopic surgeries and the results of the task. (a) Time to complete task (sec) and (b) the number of error motions (times).

Conclusion: Our new model could validate the quality of endoscopic surgical skills and differentiate between the experts and trainees. Though no significant difference was observed in the total path length of the forceps and the velocity of the forceps, the experts performed excellent motions in a small working space. Our disease-specific simulator series is useful for training with objective technical evaluation and educational mentoring.

S047 VIDEO GAMING, PLAYING MUSIC, SURGICAL EXPERIENCE, AND THE IMPACT ON ROBOTIC SIMULATOR PERFORMANCE Julia Scholsching, MD, Dennis Muensterer, Oliver Muensterer, MD, PhD; Department of Pediatric Surgery, University Medicine Mainz, Mainz, Germany

Background: A history of video gaming has been shown to improve laparoscopic skills acquisition in some but not all studies. The impact of playing a musical instrument on laparoscopic or robotic proficiency is even less investigated. Robot-assisted surgery has become more prevalent over the last decade, and simulator systems are now available to train and evaluate aspiring robotic surgeons using virtual reality.

Purpose: This study evaluates the impact of video gaming, playing a musical instrument, and other demographic parameters, on virtual robotic proficiency and the learning curve in a cohort of 27 participants.

Methods: After obtaining informed consent, candidates performed 3 standardized exercises on a virtual reality robotic training platform (dV-Trainer®, Mimic Technologies, Inc, Seattle, WA) resulting in a proficiency score based on time to completion, economy of motion, excessive instrument force, and technical errors. Participants were subsequently asked to complete a detailed survey. Finally, the standardized exercises were repeated a second time and rescored to obtain a basic learning curve. Gaming history, playing a musical instrument, surgical experience, and demographic parameters were correlated with overall robotic proficiency and improvement during the experimental session.

Results: Participants with previous gaming history had 33% higher scores of overall robotic performance (p=0.02). Interestingly, there was no difference in performance between surgical trainees (mean years in training 2.9, average of 14 laparoscopic procedures per year) and attending physicians (mean of 10.5 years in practice) with high experience in laparoscopic surgery (average of 77 laparoscopic procedures) on the robotic console. In this cohort, playing an instru-

ment had no influence overall ($p=0.2$), but we found a trend towards increased proficiency in those playing the piano with 30% higher scores ($p=0.14$). Participants performed up to 22% better in the second run of the exercises ($p=0.02$), indicating a relatively steep learning curve across all participants.

Conclusions: A history of video gaming and -possibly- playing the piano is associated with improved performance on a virtual-reality robotic surgical simulator. On this platform, surgical trainees performed as well as experienced laparoscopic surgeons. The steep learning curve underlines the benefit of virtual robotic surgical training before performing robotic procedures on patients.

S048 SINGLE-PORT LAPAROSCOPY COMBINED TRANSPERINEAL SIGMOID VAGINOPLASTY FOR MRKH SYNDROME

Suolin Li, MD, Chi Sun, MD, Xiaofeng Yang, MD; The Second Hospital of Hebei Medical University

Background: Mayer–Rokitansky–Kuster–Hauser syndrome has vaginal agenesis and often presents in adolescence with amenorrhea. Sigmoid vaginoplasty is one of the techniques used for vaginal reconstruction, including adequate vaginal length and width, self-lubrication and infrequent shrinkage. Although conventional laparoscopic-assisted sigmoid vaginoplasty is a minimally invasive procedure, it has a few disadvantages, including multiple small incisions for port access and a mini-laparotomy for extracting the sigmoid. For better cosmetic appearance, the attempts to reduce laparoscopic wounds have begun to carry out the procedures through SILS or NOTES instead of using the conventional laparoscopic surgery. Based on these objectives, we developed a combined approach of transumbilical single-port laparoscopy hybrid transperineal pull-through for vaginoplasty using a sigmoid graft.

Method: Under transumbilical single-port laparoscopic guidance, a multichannel single-port as working access was inserted into the pelvic cavity through the transvaginal dimple between the rectum and urethra. The sigmoid was isolated using a 5-mm extra long curved grasper and a harmonic scalpel and its distal and proximal ends were respectively sealed and transected using two Endo-GIA Staplers. An intracorporeal end-to-end colorectal anastomosis was made transanal endorectal introduced circular stapler to restore the bowel continuity. At last, the perineal multichannel port was removed and the sigmoid graft was pulled down through the tunnel to the new vaginal orifice. Colon–perineal anastomosis was completed with interrupted absorbable sutures. A vaginal stent was left in the neovagina.

Results: All the procedures in 20 patients were successfully performed with no any intra-operative morbidity. The average operative time was 167.4 minutes. A functioning vagina was created in all women. All patients were satisfied with the surgery and 18 women had subsequent sexual activity.

Conclusions: Transumbilical single-port hybrid transperineal laparoscopic sigmoid vaginoplasty offers a feasible scarless approach for women with MRKH syndrome. The favorable cosmetic outcome would be used as an alternative to conventional laparoscopic approach.

S049 THREE LAPAROSCOPIC MANAGEMENT OF HIRSCHSPRUNG'S DISEASE: AN ASSESSMENT OF CLINICAL OUT-

COMES AND ERGONOMIC ANALYSIS Shao-tao Tang, Tajammool H Aubdoollah, Xi Zhang, Li Yang, Shuai Li, Guo-qing Cao; Department of pediatric surgery, Union Hospital, Tongji Medical University, HuaZhong College of Science and Technology

Purpose: To report the clinical outcomes and ergonomics analysis of three laparoscopic approaches in the management of Hirschsprung's Disease (HD).

Methods: There were 90 pediatric patients (63 boys, 27 girls; mean age: 3.6 ± 2.7 (1–90.2 months) who underwent laparoscopic endorectal pull-through Soave procedure for short and long segment HD in our hospital. Three laparoscopic approaches were used; conventional laparoscopic endorectal pull-through (CLEP) in 30 patients between 2009 and 2013, single-incision laparoscopic endorectal pull-through (SILEP) in 28 patients between 2010 and 2013 and hybrid single-incision laparoscopic endorectal pull-through (H-SILEP) in 32 patients between 2011 and 2013. We have developed a hybrid version of single-incision approach in 2011 to preserve the cosmetic advantage of SILEP and the ergonomic advantage of CLEP. We retrospectively analyzed the clinical data, cosmetic results and ergonomics (age and

transition zone related) of these three approaches to have a better understanding of the selection of one approach over another.

Results: The CLP, SILP, and H-SILP groups were similar in regard to age, sex, transition zone, blood loss, hospital stay, and intraoperative complications. Early and late postoperative results were not different, with equal daily defecation frequency and postoperative complications. No conversion to open technique was needed and none of the patients had recurrent constipation. With proper training, the ergonomics challenges were overcome and similar operative times were registered for the general operative time in the patients < 1 year of age and the short-segment HD patients. However, significantly shorter operative times were registered compared to SILP for patients > 1 year of age (CLP and H-SILP: 120 ± 15 min and 119 ± 12 min, respectively, vs 140 ± 7 min; $P < 0.05$) and for long-segment HD patients (152 ± 3.5 min and 154 ± 3.6 min, respectively, vs 176 ± 2.3 min; $P < 0.05$). The best cosmetic result was registered with the SILP (scarless), followed by the H-SILP (near scarless appearance) and the CLP (visible scars) procedures.

Conclusion: Based on the results, we believed that the laparoscopic approach should be selected according to the age, transition zone, and desired cosmetic result.

KEY WORDS: Age; Cosmetic; Ergonomic; hirschsprung's disease; Laparoscopic pull-through

S050 LAPAROSCOPY-ASSISTED DUHAMEL-Z SUTURE FOR TOTAL COLONIC AGANGLIONOSIS; OUTCOME ASSESSED BY FECAL CONTINENCE EVALUATION. Go Miyano, MD, Hiroki Nakamura, MD, Shogo Seo, MD, Ryo Sueyoshi, MD, Manabu Okawada, MD, Takashi Doi, MD, Hiroyuki Koga, Geoffrey J Lane, Tadaharu Okazaki, MD, Atsuyuki Yamataka, MD; Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine

Background: A Z-shaped colorectal side-to-side anastomosis was introduced to improve the Duhamel procedure by eliminating the rectal blind pouch (DZ). We retrospectively reviewed all total colonic aganglionosis (TCA) patients treated by laparoscopy-assisted DZ (LapDZ) between 2009 and 2014 focusing on mean annual fecal continence evaluation scores (CES) as an indicator of outcome.

Methods: We conducted a retrospective review of data from the medical records of all patients diagnosed with TCA between 2009 and 2014. Four 5mm ports were used for laparoscopic dissection of the colon. The ileostomy was taken down under laparoscopic control, and a retrorectal route was created through a small Pfannenstiel incision to and the proximal end of loop ileostomy with ganglion cells was pulled-through. The rectal stump was resected 2cm above the peritoneal reflection and a transverse incision was made on the anterior wall of the pulled-through ganglionic ileum at the level of the proximal rectal end. The posterior wall of the upper rectum and the lower edge of the incised anterior wall of the ileum were then anastomosed, anoplasty was performed by anastomosing the pulled-through ileum and rectum, and an Endo-GIA 60 device was inserted through the anus to divide the posterior rectal wall and anterior ileum wall. Finally, the anterior wall of the upper rectum and upper edge of the incised anterior wall of the ganglionic ileum were anastomosed to complete a Z-shaped colorectal side-to-side anastomosis without a blind pouch. Postoperatively, defecation was managed to be regular with medications and enemas according to our standard protocol. Stool frequency, stool consistency, fecal soiling/incontinence, and severity of enterocolitis were each scored (0-2) to give a total CES (maximum: 10).

Results: Eleven subjects (5 female; 6 male) were reviewed. Mean age at surgery was 10.2 months old (range: 7-16) and mean weight at the time of surgery was 8.4kg (range: 6.5-9.7). Mean length of the aganglionic segment was 19.5cm from the terminal ileum. There were no intraoperative complications. Mean operative time was 6.2 hours. Recommencement of enteral feeding took 5.7 days on average. There were no anastomotic leaks or strictures and no intestinal obstruction. No patient required redo surgery. No subject has been constipated postoperatively. Postoperative blood transfusion was required in 1 case complicated by chronic bleeding. Duration of follow-up was 1 year (n=11), 2 years (n=10), 3 years (n=10), 4 years (n=8), and 5 years (n=5) and mean annual CES improved gradually during follow-up from 4.5 after 1 year to 6.1 after 2 years, 7.7 after 3 years, 8.1 after 4 years, and 8.4 after 5 years, respectively.

Conclusion: CES improved annually which we attribute to Lap-DZ and strict management of bowel motions postoperatively.

S051 LAPAROSCOPIC VERSUS OPEN KASAI PORTOENTEROSTOMY: OUR EXPERIENCE. Alexander Razumovsky, Prof¹, Victor Rachkov, MD¹, Nadezhda Kulikova², Abdumanap Alhasov, MD¹, Nikita Stepanenko, PhD², Zoricto Mitupov, MD¹, Natalia Uskova, PhD¹; ¹The Pirogov Russian National Research Medical University, ²Filatov Children's Hospital, Moscow

The question of feasibility of laparoscopic Kasai procedure for biliary atresia in infants has been a subject of discussion for a long time, and still remains unsolved.

Material and methods: 110 children with different bile duct malformations were operated on in our clinic since 2000. The first laparoscopic Kasai portoenterostomy was performed in January, 2008 to a 2 month old child. Since then, laparoscopic Kasai portoenterostomies were performed in 42 children with biliary atresia. The age of the children varied from 50 days to 3.5 months. The mean weight of the patients was 4693±767g. 24 patients between the years 2000-2008 were operated on by conventional ("open") procedures.

All procedures were performed with 4 to 5 trocars using 3 and 5-mm ports. Excision of the fibrous biliary remnant was performed laparoscopically in all cases. The Roux loop was fashioned outside of the abdominal cavity through the umbilical incision in 23 children, and in 18 infants the Roux loop was performed laparoscopically. Laparoscopic biliary reconstruction was performed successfully in all patients.

Results: 79% of children who underwent laparoscopic Kasai had a normal postoperative bilirubin level, whereas the other 9 children did not drain bile and required liver transplantation. In the "open" surgery group, 74% of patients had good results. The duration of laparoscopic Kasai procedure was significantly longer than open surgery ($p < 0.05$). There were no conversions. We observed significantly fewer complications (40%) after laparoscopic hepaticojejunostomy than after traditional hepaticojejunoduodenostomy (84.6%, $p < 0.05$). The average length of stay in the ICU, and the duration of analgesia after laparoscopy was significantly lower than after open surgery ($p < 0.05$). Cholangitis was found in 21.4% in the laparoscopic group and 25% in the open surgery group. Intraperitoneal adhesions in patients who underwent liver transplantation were less pronounced after laparoscopy, compared with open Kasai procedure.

Conclusion: Our experience leads us to conclude that laparoscopic Kasai operations can be used as the procedure of choice in the treatment of children with biliary atresia.

S053 CAN LAPAROSCOPIC INTRAOPERATIVE CHOLANGIOGRAPHY BE A GOLDEN CRITERIA FOR DIAGNOSING BILIARY ATRESIA WITH PATENT DISTAL EXTRAHEPATIC BILE DUCTS? Pu Yu, Long Li; Capital Institute of Pediatrics

OBJECTIVES: Biliary atresia (BA) is an obliterative cholangiopathy with progressive hepatobiliary disease starting from the perinatal period, it is a life-threatening liver disease for infants. Some scholars consider cholangiography as a golden criteria for diagnosing BA and determining the type of BA. BA with patent distal extrahepatic bile ducts (PDEBD) is a special type belonging to type?. It was found that there were many misdiagnosis cases in BA with PDEBD diagnosed by laparoscopic intraoperative cholangiography, this article is aimed to analyze whether laparoscopic intraoperative cholangiography can be a golden criteria for diagnosing BA with PDEBD or not.

METHOD: Data was collected and analyzed for infants who were diagnosed with BA with PDEBD by laparoscopic intraoperative cholangiography from Dec'2014 to Sep'2015, there were 9 eligible cases, male: 6, female: 3, B-type ultrasonic indicated that all were cholestasis with normal size and shape of gallbladder, but laparoscopic intraoperative cholangiography indicated that all were BA with PDEBD with persistent obstructive jaundice and acholic or yellowish stools. Parents rejected to do Kasai portoenterostomy, cholecystostomy were operated with indwelling 16G tube left in the gallbladder, 10ml saline was used to wash biliary tract once per day. Cholangiography was rechecked on the 7th day after cholecystostomy and 16G tube were pulled out, the patients were followed up regularly including stool color and jaundice free or aggravating. Then 9 patients were diagnosed again, only those that the rechecked cholangiography indicated BA with jaundice aggravating and acholic or yellowish stools during the follow-up will be diagnosed with

BA, otherwise, patients will be excluded from BA.

RESULT: For the 9 patients, 6 were excluded from BA by rechecked cholangiography or follow-up: 3 were excluded in the rechecked cholangiography with intrahepatic bile duct visible (1 diagnosed with Alagille syndrome, 1 diagnosed with bile acid synthesis defect, 1 diagnosed with TPN-associated cholestasis), 3 were excluded in the follow-up due to jaundice free or alleviated and stools with normal color, 1 patient's stool color became normal 6 months with jaundice insignificantly aggravating post operation, 1 patient's stools became normal soon and further with jaundice free 2 months post operation, 1 patient's stool color became yellow 10 days and the jaundice got alleviated obviously 1 month post operation (without satisfied result during rechecked cholangiography due to tube falling off). For the 3 patients whom were finally diagnosed with BA, 1 died 8 months after the operation. Point and interval estimation of proportion was used as the statistics method during this research, 6 out of 9 patients were excluded from BA, the misdiagnosis proportion is 66.7% (95%CI, 30%-93%).

Conclusion: Laparoscopic intraoperative cholangiography which has advantages of being minimally invasive and recovering fast is considered as an effective method for diagnosing BA and determining the type, but the misdiagnosis proportion is quite high for patients that B-type ultrasonic indicated cholestasis and laparoscopic intraoperative cholangiography diagnosed BA with PDEBD. For these patients, BA should be diagnosed cautiously to avoid Kasai portoenterostomy on patient who actually doesn't need.

S055 LAPAROSCOPIC MANAGEMENT OF CONGENITAL ANOMALIES AND ACQUIRED LESIONS OF THE PANCREAS IN CHILDREN Yuri Sokolov, MD, Dmitri Donskoy, MD, Mihail Shuvalov, MD, Dmitri Pykhtev, MD, Manvel Akopyan, MD, Alexsey Vilesov, MD, Aleksandr Zykin, MD; Sent Vladimir Children Hospital

BACKGROUND: Laparoscopic pancreatic surgery in children is very special and challenging. The number of publication in this field is limited. This review is to represent our experience of laparoscopic approach to various pancreatic conditions in a series of paediatric patients.

MATERIAL AND METHODS: 35 children aged from 1 month to 16 years diagnosed with congenital anomalies and acquired lesion of the pancreas underwent surgical treatment with the use of laparoscopic techniques. The following laparoscopic procedures were carried out: excision of ectopic pancreas (n-16), external drainage or Roux-en-Y cystojejunostomy of pancreatic pseudocyst (n-5), fenestration of congenital pancreatic cyst (n-2), total excision/enucleation of gastric duplication cyst of the pancreas (n-2), pancreatic lymphangioma (n-1) and pancreatic hydatid cyst (n-1), posttraumatic cyst excision and Roux-en-Y distal pancreateojejunostomy (n-1), spleen-preserving distal pancreatectomy for solid pseudopapillary tumor (n-2), central pancreatectomy with distal pancreaticogastrostomy for solid pseudopapillary tumor (n-2), lateral pancreateojejunostomy for chronic relapsing pancreatitis and pancreatic ductal dilatation (n-2). The patient data were retrospectively analysed.

RESULTS: In 34 patients the undertaken laparoscopic procedures were successfully completed with no intraoperative complications occurred. The conversion to open distal pancreatic resection was required in 1(3%) case when laparoscopic dissection was very much complicated due to massive inflammatory changes in the peripancreatic tissue. Postoperatively, 1 patient developed small bowel obstruction due to Roux-en-Y anastomosis kinking which necessitated open anastomotic reconstruction. The rest 33 patients made prompt and uneventful recovery. At follow up, no evidence of recurrent pancreatitis or any associated gastrointestinal symptoms were recorded.

CONCLUSION: Laparoscopic surgery for congenital anomalies and acquired conditions of the pancreas in children is feasible and safe if performed by skilled laparoscopic surgeon who should be experienced in the open complex operations on the pancreas.

S056 DOES THE LEVEL OF TRANSECTION OF THE BILIARY REMNANT AFFECT OUTCOME AFTER PORTOENTEROSTOMY FOR BILIARY ATRESIA? Hiroki Nakamura, Hiroyuki Koga, Go Miyano, Manabu Okawada, Takashi Doi, Takashi Doi, Geoffrey J Lane, Atsuyuki Yamataka; Juntendo university school of medicine Department of Pediatric General & Urogenital Surgery

Oral Abstracts

Aim: Surprisingly, there are no studies about whether the level of transection (LOT) of the biliary remnant at the time of Kasai portoenterostomy (KP) influences postoperative outcome in patients with biliary atresia (BA). In this study, we assessed postoperative outcome in relation to LOT.

Methods: The subjects for this study were 14 consecutive BA patients who had laparoscopic KP at our institute between 2009 and 2014. Classification of BA was isolated type III BA (n=12), syndromic type III BA (n=1), and isolated type II BA (n=1). Four board certified specialist pediatric surgeons (2 from our institute and 2 from elsewhere with no knowledge of our subjects) who had performed at least 30 KP procedures reviewed intraoperative video recordings of each laparoscopic KP blindly. Each reviewer was asked to assess the LOT of the biliary remnant at the porta hepatis as being very shallow if above an imaginary plane between the right and left portal veins, i.e., further from the porta hepatis, shallow if below this plane, i.e., closer to the porta hepatis, deep if the liver parenchyma was excised without lateral dissection, and very deep if the liver parenchyma was excised with lateral dissection. Anastomotic suturing techniques used during laparoscopic KP were also reviewed. All cases were managed postoperatively according to the same standard protocol for postoperative management that stipulates antibiotic and steroid dose administration.

Results: Jaundice disappearance (JD) was achieved in each of the 12 isolated type III BA cases. However, 4 of these cases have since required liver transplantation (LTx group) for reappearance of jaundice and 8 patients surviving with native livers (SNL group) continue to remain anicteric after mean follow-up of 4.6 years (range: 1.3 to 7.0 years). Differences in demographic data such as gestational age, birth weight, weight and age at KP, duration between onset of symptoms and age at KP and preoperative biochemical markers (AST, ALT, ALP, bilirubin and cholinesterase) between the two groups were not statistically significant. LOT was assessed as being shallow by each reviewer for all 14 cases. Video recording reviews also confirmed that anastomotic suturing techniques used during laparoscopic KP were identical in all 12 type III isolated BA patients. The syndromic type III BA case did not achieve JD and required LTx and the isolated type II BA case achieved JD and is SNL remaining anicteric.

Conclusions: Despite there being no differences in LOT and suturing techniques between SNL and LTx cases in the 12 type III isolated BA patients in our series, outcome ranged from SNL to LTx which would suggest that factors other than LOT and suturing technique would appear to influence outcome after KP. Although our series is small, we are the first to show that provided LOT is kept shallow, outcome of KP in BA would appear to be influenced by non-surgical factors such as the status of the liver and its potential for recovery, i.e., reserve.

S057 REOPERATIVE AFTER LAPAROSCOPIC CYST EXCISION WITH CHOLEDOCHAL CYST Zhigang Gao, MD, Qixing Xiong, MD, Qiang Shu, Pro; Pediatric endoscopy Center

Objective: To explore the reason of reoperation in laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy for choledochal cyst in children.

Methods: Retrospective analyses were performed for 178 cases of laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy choledochal cyst from March 2012 to November 2015. There were 27 males and 151 females. And the types were cystic (n=143) and fusiform (n=35).

Results: Laparoscopic procedure was completed successfully for all cases. The average operative duration was 3.5 (2.5-5.5) hours. 9 cases have reoperation including 5 cases have laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy after Cholecystostomy. 2 cases have re-hepatoenterostomy after laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy due to anastomotic stenosis. 1 case has exploratory laparotomy after laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy due to bleeding. 1 case has Puncture drainage due to bile leakage after laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy. During a follow-up period of 3-42 months, reexaminations of liver function and ultrasound were made. Three cases of intrahepatic calcification were found with normal liver function.

Conclusions: Laparoscopic total cyst excision with Roux-en-Y hepatoenterostomy for choledochal cyst is a complex and high-risk procedure. Reoperative by laparoscopic procedure is still a good choice after skilled laparoscopic technology.

Oral Abstracts

for choledochal cyst

S058 APPROACH TO RECURRENT CONGENITAL DIAPHRAGMATIC HERNIA: RESULTS OF AN INTERNATIONAL SURVEY

Nicholas E Bruns, MD¹, Kelly E Arps, BS², Ian C Glenn, MD¹, Neil L McNinch, MS, RN¹, Todd A Ponsky, MD¹, Avraham Schlager, MD¹; ¹Akron Children's Hospital, ²Emory University School of Medicine

Purpose: Although congenital diaphragmatic hernia (CDH) recurrence is one of the most common and feared complications after surgery, there is minimal data on how to approach these demoralizing recurrences. The purpose of this study was to survey the international pediatric surgery community to ascertain practice patterns for minimally invasive (MIS) and open approaches for recurrent CDH.

Methods: A survey was emailed to members of an online community of pediatric surgeons. The questionnaire consisted of 10 questions that began by asking surgeons to identify their clinical experience and the continent in which they practice. Respondents then selected their preferred approach (laparotomy, thoracotomy, laparoscopy or thoracoscopy) for cases of both initial and recurrent Bochdalek CDH. In the cases of recurrent CDH, surgeons were questioned on their estimated rate of success via an MIS approach given different initial surgical approaches. Fisher's Exact Test and Chi-Square Test were used for statistical analysis.

Results: Two-hundred eighty pediatric surgeons responded to the survey. 28.6% had been in practice for 0-10 years, 29.6% for 11-20 years, and 41.8% for 20 years or more. The locations of the respondents were diverse: 39.3% were in North America; 27.5% Europe; 16.8% Asia; 7.1% South America; and 9.3 % other.

For the initial repair of a left Bochdalek CDH, 52.1% (146/280) chose an MIS approach with majority of these selecting thoracoscopy over laparoscopy (Table 1). In all cases, surgeons favored laparotomy over thoracotomy as the preferred open approach. Preference for treatment of initial CDH did not differ by location of the surgeon ($p = 0.11$). In the case of recurrent left CDH, 55.5% of those who would use MIS for an initial CDH would attempt an MIS approach after previous thoracoscopy or laparotomy versus 44.5% after previous thoracotomy. Among surgeons who prefer MIS for initial CDH, 43.8% would perform thoracoscopy after prior laparotomy versus 15.1% after prior thoracotomy. 22.6% of surgeons who approach initial CDH via laparotomy would approach recurrence following laparotomy via thoracoscopy.

Pediatric surgeons' preference for treating left Bochdalek CDH (n = 280)

	Laparoscopy	Thoracoscopy	Laparotomy	Thoracotomy
Initial CDH	6.1%	46.1%	46.8%	1.1%
Recurrence after thoracoscopy	16.4%	17.5%	60.0%	6.1%
Recurrence after laparotomy	7.5%	30.0%	53.6%	8.9%
Recurrence after thoracotomy	18.9%	9.3%	63.6%	8.2%

Conclusions: Surgeons who approach initial left CDH in an MIS fashion would frequently attempt an MIS repair for a recurrence. There is a tendency to approach a CDH recurrence from the opposite body cavity as the initial repair, illustrated by the fact that thoracoscopy is the more frequently chosen MIS approach for recurrence after laparotomy whereas laparoscopy is more common for a recurrence after thoracotomy. Among open approaches, laparotomy is favored over thoracotomy for initial and recurrent CDH. These findings may inform surgeons when confronted with a CDH recurrence.

S059 ESTABLISHING EQUIPOISE: NATIONAL SURVEY OF THE TREATMENT OF PEDIATRIC PARA-PNEUMONIC EFFUSION AND EMPYEMA

Morgan K Richards, MD, MPH, FACS¹, Jarod McAteer, MD, MPH¹, Lucas Hoffman, MD², Matthew Kronman, MD², Dennis Shaw, MD², Adam B Goldin, MD, MPH²; ¹University of Washington, Department of Surgery, ²Seattle Children's Hospital

Background: Despite two published, randomized trials of treatment for pediatric para-pneumonic effusion and empyema (PPEE), studies show that management approaches continue to vary. This variability exists between hospitals, physician specialties and even providers within the same group. In order to gain multidisciplinary insight into differing opinions and approaches to PPEE treatment, we surveyed pulmonologists, surgeons, hospitalists, intensivists and interventional radiologists. The purpose of our study was to examine the differences in utilization of antibiotics,

Oral Abstracts

type and timing of intervention and follow-up. Our goal was to establish equipoise to design an intervention trial that would help formulate consensus guidelines.

Methods: To evaluate physician opinions regarding PPEE management practices, we composed a survey based on the input of a nationwide, multidisciplinary focus group that established content validity. Specialties represented included pediatric surgery, hospital medicine, infectious disease, intensive care, interventional radiology and pulmonology. The survey was disseminated broadly to the following professional groups: International Pediatric Endosurgery Group, American Pediatric Surgical Association, Society of Pediatric Interventional Radiologists, American Academy of Pediatrics Hospitalist and Critical Care groups and the American Thoracic Society. In the consent process, we requested that respondents take the survey once.

Results: Seven hundred forty-one physicians responded. Denominator data were unavailable given potential overlap between surveyed organizations and our effort to preserve anonymity. Of the 741 respondents, 315 (50.9%) were surgeons, 92 (14.9%) hospitalists, 86 (13.9%) pulmonologists, 75 (12.1%) intensivists and 36 (5.8%) interventional radiologists. A majority of respondents primarily cared for pediatric patients (97.3%) in either free-standing children's hospitals or a pediatric wing of an academic adult hospital (79.7%). Additionally, most (97.2%) actively cared for PPEE patients. While only 20% had a written guideline or hospital policy, 74% reported having a standard approach to PPEE management. The most common absolute indication for PPEE drainage reported was radiographic mediastinal shift (67.2%) followed by loculations on imaging (74.4%) and persistent or worsening work of breathing (45.0%). There were significant differences among specialties in the preferred first-line drainage method: surgeons preferred either chest tube (CT) placement with fibrinolytics (39.6%) or video-assisted thoracoscopic surgery (VATS) (39.2%), interventional radiologists and intensivists preferred CT placement alone (41.9% and 34.3% respectively) and pulmonologists favored VATS (32.9%) ($p < 0.001$). Most respondents were willing to participate in a randomized trial that would initially include antibiotics either alone (60.8%) or with one of the following: CT placement (91.1%), CT with fibrinolytic therapy (91.9%), VATS and CT placement (90.0%), or thoracentesis (63.8%). Seventy-five percent of respondents did not feel that the published evidence is clear as to the best intervention.

Conclusion: The findings of this survey indicate lack of consensus opinion regarding the optimal treatment of PPEE and, as a result, management approaches currently vary. The information acquired in this survey indicates equipoise between different treatment options, including how and when to intervene in PPEE and the duration of treatment. Moreover, there appears to be widespread willingness to participate in a randomized trial. These findings will help inform the design and execution of a randomized, pragmatic clinical trial to optimize PPEE management.

S060 REGENERATIVE SURGERY IN THE TREATMENT OF COSMETIC DEFECTS FOLLOWING NUSS PROCEDURE Flavio Facchini, Marco Ghionzoli, Alessandra Martin, Sara Tanini, Roberto Lo Piccolo, Antonio Messineo; Meyer Childrens' Hospital - University of Florence

Background: In the last decade the minimally invasive repair of the pectus excavatum (MIRPE), reshaping chest wall to normal configuration by inserting one or two metallic bars behind the sternum, has become the treatment of choice for patients with severe PE. Three years after insertion, at bar removal, cosmetic results range from excellent to acceptable; in few cases they are considered unsatisfactory. Autologous fat grafting (FG) has been identified as the ideal material to treat volume and contour defects in aesthetic and reconstructive surgery. We envisioned the use of FG in order to ameliorate chest contour for selected patients who still had a minor volume defect following MIRPE. The aim of our study was to report the results obtained from our initial experience.

Methods: The study included 127 patients who underwent bar removal from April 2012 to April 2015. At last outpatient check-up before bar removal, a simple questionnaire was submitted to all patients and to two independent health workers in order to assess the aesthetic outcome: options to define cosmetic result were: a) excellent, b) very good, c) good, d) acceptable and e) unacceptable, scoring respectively from 4 to 0. We offered FG to those patients whose mean aesthetic outcome was deemed less than "good" (i.e. mean score less or equal to 2). FG was performed during the same operating session for bar removal. The donor area varied among patients, the most frequently harvesting region was from the abdomen or the trochanteric region. The fat was gently collected through a thin cannula,

Oral Abstracts

sieved through a sterile gauze, filtrated and transferred into a syringe to be promptly injected into the subcutaneous defect.

Results: Out of 127 patients who underwent bar removal, 11 (8.8%) were considered candidates for FG and the procedure was carried out. Age varied between 17 and 23 years (median age 20 years); seven were females and 4 males. The quantity of injected fat varied from 25 to 100 ml in males and from 90 to 250 ml in females, respectively. No surgery related complications were reported in the 11 treated patients. The fat absorption rate was variable. A second injection, at least 3 months after first injection was performed in 3 patients. The mean score following FG at 6 months follow up increased from 1,8 to 2.7.

Conclusion: Cosmetic results using FG should be considered satisfactory: for those patients who underwent FG following MIRPE, mean cosmetic score increased up to a “very good” aesthetic outcome. From these preliminary results we conclude that FG could be an important tool in the hands of surgeons who are involved in the treatment of chest wall malformations because it is easy to be performed, inexpensive, safe and repeatable technique.

S061 SCOLIOSIS AND PECTUS EXCAVATUM IN ADOLESCENTS: DOES THE NUSS PROCEDURE AFFECT THE SCOLIOTIC CURVATURE? Marco Ghionzoli¹, Alessandra Martin¹, Martina Bongini¹, Ubaldo Bongini¹, Gastone Ciuti², Laura Grisotto¹, Vito Monaco², Arianna Menciassi², Claudio De Filippi¹, Antonio Messineo¹; ¹Meyer Childrens' Hospital - University of Florence, ²The Biorobotic Institute - Scuola Superiore Sant'Anna - Pisa

Background: Pectus excavatum (PE), the most common anterior chest wall deformity, is known to be associated with adolescent idiopathic scoliosis (AIS). The correction of severe PE requires a mini-invasive procedure (MIRPE), with a metal bar positioned and left in the chest for three years. Taking into account that adolescence seems to be the more appropriate time not only for MIRPE procedure but also for AIS peak progression, the aim of this study was to answer to the question whether, in adolescents, MIRPE procedure could affect mild/moderate AIS.

Methods: We proceeded as follows: a) We carried out a meta-analysis focused on defining the natural progression of untreated AIS in adolescents. Computerized literature search was done using PubMed, Cochrane Library and Scopus databases. Inclusion criteria were the following: AIS patients (1) aged from 10 to 18 years old (2) Cobb angle <40 degrees (3) none treated as orthotics, electrical stimulation or surgery. The expected outcome was the percentage of patients who improved, worsened or hold steady of their condition at follow-up. b) From 2008 and 2014 we followed up a cohort of 67 adolescents with severe PE treated with MIRPE, assessing whether AIS underwent a modification in the period between bar insertion and bar removal. A complete archival dataset (i.e. - perioperative chest X-rays - chest X-rays following bar removal) was used to measure Cobb angles for each patient. Data were then analyzed by paired t-test with a < 0.05 level of significance.

Results:

a) Meta-analysis allowed to include 9 studies with a total of 1641 AIS patients. Although heterogeneous (I²=99.5%, p-value<0.0001), the overall percentage of progression for untreated AIS was 42.5% (CI 18.2%-72.2%).

b) In our follow-up group of adolescents who underwent MIRPE, 34 out of 67 patients had concurrent AIS with a Cobb angle greater than 10 degrees (range 10 to 45 degrees). We demonstrated that MIRPE had a favorable effect on AIS, with a mean improvement of 1.5° (CI-0.64-2.44; p=0.0011).

Conclusion: In our series, when PE was associated with AIS, MIRPE had a beneficial effect also on the spine. Although still to be validated, it seems that MIRPE should be offered during puberty as a timely option for treating PE and stabilizing mild/moderate scoliosis progression, when concurrent.

S062 IS FETAL THERAPY A CONTRAINDICATION FOR THORACOSCOPY IN CONGENITAL PULMONARY MALFORMATIONS? EXPERIENCE FROM A SINGLE CENTRE. Sara Costanzo, MD, Claudio Vella, MD, Claudia Filisetti, MD, Giovanni Di Iorio, MD, Cristina Ciulli, Giovanna Riccipetroni, MD; Pediatric Surgery Department “V. Buzzi” Children’s Hospital Milan Italy

Oral Abstracts

Background and aim: Congenital pulmonary malformations (CPM) comprise different histological entities: cystic/congenital pulmonary airways malformations (CPAM), bronchopulmonary sequestration (BPS), hybrid lesions, congenital lobar emphysema (CLE). Thoracoscopic resection of CPM has been demonstrated to be a safe and effective procedure in a number of published experiences. Nevertheless, patients have to be accurately selected in order to implement the advantages of this technique. Aim of our study is to present a series of CPM managed at a single Centre, focusing on their surgical treatment, and to make a correlation between prenatal variables and the choice of the surgical approach.

Methods: We retrospectively reviewed the charts of patients diagnosed with a CPM and treated at our Institution in the period between January 2007 and September 2015. Details about demographics, prenatal complications and treatment, type of malformation and surgical approach are provided.

Results: 48 patients have been diagnosed and managed, 24 males and 24 females. 4 of them died in the early postnatal period for severe prematurity and were excluded from the analysis. 42/44 patients were prenatally diagnosed. 14 of them developed fetal complications (mediastinal shift, hydrops, hydrothorax) and a fetal treatment was indicated in 9/14: 1 thoraco-amniotic shunt (TAS) positioning (BPS), 7 steroid therapy (3 BPS, 4 CPAM), 1 not treated for parental refusal (CPAM). 37 patients were surgically treated for excision of their CPM. Median age at surgery was 4 months (range 0.03-37, mean 4.87, DS±6.48). The surgical approach was thoracotomy in 22 patients, thoracoscopy in 14 and laparoscopy in 1. Thoracotomy was the technique of choice in unstable patients who required surgery in the neonatal period and in case of lesions affecting more than one lobe. Histology was conclusive for CPAM in 13, BPS in 3, CLE in 2, hybrid/mixed lesion in 2, bronchial atresia in 1 and pleuropulmonary blastoma in 1. Median age at operation was 1 month (range 0.03 -12, mean 2.96, DS±3.65). Among the thoracoscopy group, 6 patients had a CPAM, 6 a BPS and 2 a CLE. Median age at surgery was 5.5 months (range 0.33 – 37, mean 7.74, DS±8.71). Focusing attention on the 14 patients who developed fetal complications, we found that 12 of them underwent postnatal surgery, 9 through thoracotomy, while 3 extralobar BPS could be planned for a thoracoscopic treatment, carried out at 10 days, 1 month and 4 months respectively (median age 53,4 days). No intraoperative nor postoperative complications occurred. All 3 thoracoscopy patients had undergone a fetal treatment (1 TAS, 2 steroid therapy); TAS patient did not present any respiratory distress at birth and could be treated through elective thoracoscopy at 4 months of age.

Conclusions: Our data suggest that an accurate prenatal and preoperative management, together with a proper selection of patients, allows a safe and effective application of thoracoscopy in neonates and infants affected by CPM, particularly in BPS cases. An history of prenatal complications and fetal treatment does not seem to be a contraindication to the application of a minimally invasive approach in this group of patients.

S063 THORACOSCOPIC RESECTIONS OF MULTI-LOBAR. BILATERAL CONGENITAL PULMONARY LUNG MALFORMATIONS AND THOSE COMBINED WITH FOREGUT DUPLICATIONS AND SUPRA AND INFA-DIAPHRAGMATIC LESIONS M Short, Dr, M Singh, Dr, D Parikh, Dr; Birmingham Childrens Hospital

Introduction: Isolated cases of complex multi-lobar, bilateral congenital lung lesions and those situated in both infra and supra-diaphragmatic regions have been reported in surgical literature. We report our experience of a large number of these cases of these pulmonary airway malformations (CPAM).

Method: We reviewed our institutional 20 years thoracoscopic experience between 1995 - 2015 for multilobar lesions (6); supra and infra diaphragmatic lesions (3); bilateral lesions (5); combined foregut duplications and CPAM (6) and 2 cases associated with congenital diaphragmatic hernias (CDH). Case note data was reviewed for patient demography, clinical presentation, investigations, surgery and outcome.

Results: There were twenty two congenital malformations: 15 antenatal diagnoses were asymptomatic and two were associated with antenatally diagnosed CDH had an incidental ipsilateral bronchogenic cyst and an antenatally diagnosed intra-lobar sequestration. The other five were diagnosed during postnatal investigations to have complex lesions of which three had antenatal diagnosis of CPAM. Two presented late with recurrent chest infections. All cases underwent a CT scan with IV contrast. Four cases had an upper GI contrast study while an abdominal ultrasound was

carried out only in selected cases. Multi-lobar lesions accounted for six; four were left sided lesions diagnosed antenatally and approached postnatally thoracoscopically. Of these six, two were large lesions requiring conversion to open, to perform parenchyma preserving surgery, whilst two left and one right sided lesions were managed thoracoscopically with segmental resections. All bilateral lesions and supra and infra diaphragmatic lesions were successfully resected by sequential thoracoscopic and laparoscopic surgery. All cases have remained asymptomatic and recurrence free at follow up.

Conclusions: This is the first large single institutional experience of these complex congenital multi-lobar lesions that are bilateral, combined with foregut duplications and/or supra and infra-diaphragmatic lesions. Thoracoscopic parenchyma preserving segmental or partial lobectomy is effective and safe in these complex congenital malformations

S064 MINIMALLY INVASIVE REPAIR OF CDH RECURRENCE: FACING THE FACTS Kelly Arps, BS¹, Avraham Schlager, MD², Ragavan Siddharthan, MD³, Mark L Wulkan, MD¹, Matthew S Clifton, MD¹; ¹Emory University / Children's Healthcare of Atlanta, ²Akron Children's Hospital, ³Oregon Health and Sciences University

Background: Minimally invasive (MIS) repair of congenital diaphragmatic hernia (CDH) has been well described, and there is a growing body of literature comparing the outcomes of MIS and open CDH approaches. Recurrence rates are quoted between 5-40%. However, there is a paucity of data regarding a minimally invasive approach to repair of recurrent CDH. The purpose of this study is to evaluate the feasibility and relative success of a MIS approach to recurrent CDH.

Methods: We performed a retrospective analysis of patients at our institution who underwent primary and recurrent CDH repair between January 2004 and May 2015. We compared MIS to open technique. Primary outcomes were successful completion of MIS procedure and re-recurrence. Secondary outcomes were adhesive complications, ventilator duration, and length of hospitalization. We excluded procedures performed within the past 2 years for analysis of recurrence and adhesive complications.

Results: 174 patients were identified who underwent CDH repair between 2004 and 2015 (94 open, 80 MIS). 30 patients suffered a recurrence. Of the 30 patients who experienced a recurrence, 8 recurred at least one additional time. MIS repair of recurrences was successful in 64% of cases. Though surgeons were more likely to attempt MIS repair in patients with only prior MIS approaches (91% vs. 67%, $p = 0.05$), there was no difference in successful completion of MIS procedure based on prior approach or between thoracoscopic and laparoscopic attempts. Median time to extubation was longer after open than MIS repairs of original defects (8 days [range 0-86] vs. 5 days [0-22], $p < 0.01$). Median time to discharge was longer after open than MIS repairs of original defects (43 days [3-245] vs. 23.5 days [1-155], $p < 0.01$) and recurrences (4 days [2-75] vs. 3 days [0-18], $p = 0.03$).

There was no statistically significant difference in open vs. MIS recurrence rates (primary: 13% vs. 20%; patch 17% vs. 33%); although the trend is toward a higher recurrence rate with MIS. Additionally, there was a trend toward increasing numbers of adhesive complications after any open repair than after only MIS procedures (9% vs. 3%, $p = \text{NS}$).

Conclusions: MIS repair of CDH recurrences is feasible after an initial open or MIS repair. The rates of re-recurrence trends toward an increased rate if a minimally invasive approach is used, though this study was not sufficiently powered to draw definitive conclusions. There is a statistically significant decrease in the time to extubation and length of hospitalization for MIS repairs. While there appears to be an advantage to MIS repair of recurrent CDH, a multi-institutional study is warranted to define the appropriate algorithm for repair of recurrent CDH.

S065 SURGICAL INTERVENTION FOR SPONTANEOUS PNEUMOTHORAX IN PAEDIATRIC POPULATION: WHEN AND WHY? Fanny Yeung, Dr, Patrick Ho Yu Chung, Dr, Kenneth Kak Yuen Wong, Dr, Esther Ling Yin Hung, Dr, Chi Sum Yuen, Dr, Paul Kwong Hang Tam, Professor; Queen Mary Hospital

Background: Spontaneous pneumothorax in paediatric patients is a relatively rare disease entity, with reported

Oral Abstracts

incidence of 3.4 per 100,000 children. The management strategy varies in different centers due to dearth of evidence-based paediatric guidelines. In this study, we reviewed our experience of thoracoscopic management of spontaneous pneumothorax in children and adolescents and identified risk factors associated with post-operative air leakage and recurrence.

Methods: A retrospective analysis of patients who had surgical management of spontaneous pneumothorax between April 2008 and March 2015 in our institution was performed. Demographic data and surgical outcomes were analyzed.

Results: All surgery were performed thoracoscopically. A total of 92 patients with 110 thoracoscopic surgery for spontaneous pneumothorax were identified. Eighty-one episodes were large pneumothorax (73.6%) as defined by the British Thoracic Society (BTS) and American College of Chest Physicians (ACCP). The median pneumothorax volume was 47.4% calculated with Collins method. Fifty-three episodes of pneumothorax occurred on left side (48.2%), forty-six episodes on right side (41.8%) and eleven episodes of bilateral pneumothorax (10.0%). The most common presenting symptom was chest pain (92.7%), followed by dyspnea (49.1%). Thoracotomy tube insertion was performed in ninety episodes (81.8%). The indications for surgery were failed non-operative management with persistent air leakage more than 4 days in 32.7%, recurrent ipsilateral pneumothorax in 36.4%, first contralateral pneumothorax in 14.5%, simultaneous bilateral pneumothorax in 10.0% and significant haemopneumothorax in 5.5%. The median age of patients at operation was 17.0 years. Bulla was identified in 101 thoracoscopy (91.8%) with staple bullectomy performed. Pleurodesis was performed mechanically in all thoracoscopic operation. Median post-operative thoracotomy tube drainage was 3.0 days and median hospital stay after operation was 4.0 days. Persistent post-operative air leakage occurred in sixteen patients (14.5%), in which majority were treated with reinsertion of thoracotomy tube and chemical pleurodesis using oxytetracycline (Oxylim®). Post-operative recurrence occurred in nineteen patients (17.9%) at mean time of 11 months. Operation within 7 days of symptoms onset was associated with less post-operative air leakage ($p=0.04$). Bilateral pneumothorax has significantly more post-operative air leakage ($p=0.002$) and recurrence ($p<0.01$) than unilateral pneumothorax. Pneumothorax with abnormal radiographic features such as pleural thickening, irregularities and adhesion was associated with more post-operative air leakage ($p<0.01$) and recurrence ($p=0.006$).

Conclusion: Early thoracoscopic staple bullectomy and mechanical pleurodesis after thoracotomy tube insertion could be offered as a primary option for management of large spontaneous pneumothorax in paediatric population since most of these patients had bulla identified as the culprit of the disease. Patients with delayed operation more than 7 days from symptoms onset, bilateral pneumothorax or abnormal radiographic features had higher risk of post-operative air leakage, which could be treated with prolonged post-operative thoracotomy tube drainage and chemical pleurodesis.

S066 TUBE THORACOSTOMY AT THE TIME OF CDH REPAIR: RE-ASSESSING THE RISKS AND BENEFITS Avraham Schlager, MD¹, Kelly Arps, BS², Ragavan Siddharthan, MD³, Matthew S Clifton, MD²; ¹Akron Children's Hospital, ²Emory University / Children's Healthcare of Atlanta, ³Oregon Health and Sciences University

Purpose: Post-operative pneumothorax and effusion remain a concern following congenital diaphragmatic hernia (CDH) repair. Despite a recent trend away from intra-operative chest tube placement, few studies have actually compared outcomes with and without a chest tube. The rationale commonly cited for the more minimalistic approach include the presumed low likelihood of significant post-operative complications, potential increased risk of mesh patch infection, and prolonged intubation secondary to chest tube-related pain. We evaluate these theories as well as the potential benefit of intraoperative chest tube placement and risk of patch infection.

Methods: We performed a retrospective chart review of 174 patients who underwent CDH repair at our academic children's hospital from 2004-2015. We compared the incidence of clinically significant pneumothoraces and pleural effusions, defined as those requiring postoperative surgical intervention, between patients who received an intraoperative chest tube (IOCT, $n = 49$) and those who did not (NIOCT, $n = 124$). We also evaluated time to extubation and rate of patch infections. Descriptive statistics were used with significance level $p = 0.05$.

Results: Clinically significant pneumothorax or effusion occurred in 28% of the NIOCT group vs. 10% of the IOCT

Oral Abstracts

group ($p = 0.01$). After thoracoscopic repair, average time to extubation was 5.2 days in the IOCT group, 5.4 days in the NIOCT subgroup with no post-operative complications, and 6.4 days in the NIOCT subgroup requiring post-operative intervention. After open repair, average time to extubation was 13.8 days, 13.6 days, and 22.5 days, respectively. There were no documented patch infections.

Conclusions: Intra-operative chest tube placement during CDH repair is associated with significantly lower incidence of clinically significant pneumothorax or effusion, does not delay extubation, and results in shorter ventilator times than cases that require post-operative intervention. Patch infections are extremely rare. There is no evidence that chest tube placement increases this risk.

S067 A MULTI INSTITUTIONAL REVIEW OF TOTAL THORACOSCOPIC APPROACH FOR NEONATAL CONGENITAL DIA-PHRAGMATIC HERNIA (CDH) REPAIR Katrina L Weaver, MD¹, Go Miyano, MD², Martin Lacher, MD³, Manabu Okawada, MD², Joanne Baerg, MD⁴, Lena Perger, MD⁵, George W Holcomb III, MD, MBA¹, Shawn D St. Peter, MD¹; ¹Children's Mercy Hospital, ²Juntendo University Hospital, ³Children's of Alabama, ⁴Loma Linda University Children's Hospital, ⁵Baylor Scott & White Health

INTRODUCTION: The thoracoscopic approach for repair of a congenital diaphragmatic hernia (CDH) in the neonatal period is controversial due to reports of increased hernia recurrence. Various surgical techniques have been employed by pediatric surgeons to attempt to overcome this dilemma. We conducted a multicenter review on thoracoscopic CDH repair to evaluate outcomes and identify factors associated with recurrence.

METHODS: A multicenter retrospective review was conducted from August 2009 to January 2015 in all infants three months of age or less that were treated for CDH with thoracoscopic repair. Demographics, preoperative, intraoperative and postoperative variables were all analyzed using descriptive statistics. Comparative analysis was performed on the technical variations, including the use and type of patch, and extracorporeal/rib fixation suturing, between those patients with recurrence versus those without, utilizing a Pearson chi-square and Fisher's exact test.

RESULTS: 78 infants, of whom 59% were male with an average gestational age at time of surgery of 39.5 ± 4.8 weeks and a weight of 3.3 ± 1.2 kg were included. The median age at repair was 5 days (range 3-10) with 62% requiring vasopressor support, average of 4.2 ± 3.6 days, and 3% requiring ECMO cannulation prior to surgical repair. None were repaired on or required ECMO after CDH repair. The oscillator was used in 57%. The repair was completed thoracoscopically in 59 patients (76%), of which 46 (78%) were repaired with suture only and 13 (22%) with a patch (11 on-lay, 1 replacement, and 1 both on-lay and replacement). Extracorporeal/rib fixation sutures were used in 35 (59%) of patients. Recurrence has occurred in 7 (12%) of those completed thoracoscopically. When comparing technical variations to those patients that did not recur, there was no significant difference between primary repair vs patch use ($p = 0.59$) or the use of extracorporeal/rib fixation sutures ($p=0.90$).

CONCLUSION: These data suggest that the thoracoscopic approach for repair of CDH is feasible in carefully selected patients and we are continuing data collection to identify factors associated with recurrence.

S068 SUPERIOR MEDIASTINUM FOREGUT DUPLICATIONS: BEWARE OF A COMMON WALL WITH THE TRACHEO-BRONCHIAL TREE Rajay Rampersad, Dr, Michael Singh, Mr, Dakshesh Parikh, Mr; Birmingham Childrens Hospital

Background: It is well known the existence of a common wall between foregut duplications and the oesophagus. This case series is presented to raise the clinical suspicion amongst the surgeons of the occurrence of common wall between the superior mediastinal foregut cysts and the tracheo-bronchial tree.

Materials and Methods: Over the last 20 years our centre has thoracoscopically resected 41 foregut duplications. Five cases were identified to have a common wall with tracheo-bronchial tree at operation. The X-rays, scans and findings at operation were evaluated to highlight any learning points. [Thoracoscopic technique will be shown if accepted as an oral presentation]

Oral Abstracts

Results: Five superior mediastinal cysts (3 antenatal and 2 postnatal) were identified and detected to have been situated between trachea and oesophagus. Symptoms of respiratory compromise and stridor were the common feature in 2 of the 3 antenatally diagnosed and 2 postnatal cases. Only one neonate was relatively asymptomatic before resection. Additionally dysphagia was a feature in three cases. All cases on CT scan were situated in the superior mediastinum posterior to trachea with some deviation of oesophagus (2 were predominantly towards left hemithorax; 3 towards the right). All five cases underwent thoracoscopic resection. Two cysts were resected by avoiding any injury to the posterior wall of trachea, while 3 had inadvertent tracheo-bronchial injury. It was possible to repair tracheal injury in one case thoracoscopically while two cases needed conversions for its repair. The need for conversion was related to inability of adequate oxygenation despite on-table endotracheal tube and thoracoscopic manoeuvres. All cases had excellent outcomes following surgery (median: 2 years, range: 6 months to 10 years) with resolution of symptoms and no recurrences.

Conclusions: The superior mediastinal foregut cysts situated between trachea and oesophagus presenting with stridor could have a common wall with the tracheo-bronchial tree. It is difficult to pre-empt this occurrence prior to surgery. Tracheal injury can be repaired thoracoscopically provided adequate oxygenation can be maintained.

S069 THORACOSCOPIC GRETEX PATCH REPAIR FOR CONGENITAL DIAPHRAGMATIC HERNIA : A TECHNICAL CHALLENGE? M Short, Dr, N Coleman, D Parikh, Dr, I Jester; Birmingham Childrens Hospital

Introduction: Recently, many centres have reported and questioned the continuing practice of thoracoscopic repair of Congenital Diaphragmatic Hernias (CDH). High recurrence rates and increasing need for a patch repair, has led to conversion to open surgery in many centres practicing thoracoscopic surgery for CDH. This study reports our novel and refined thoracoscopic technique and early results of repairing large CDH with a goretex patch.

Method: Six patients underwent thoracoscopic goretex patch CDH repair in the last two years. (The final refined technique will be shown as a video if accepted for oral presentation).

Technique: Patient in the lateral position, three ports inserted; 1x5mm (anterior to the tip of scapula), 2x3mm (anterior and posterior axillary lines). CO₂ insufflated at a pressure of 5mmHg and a flow rate of 1.5L/min, initially to reduce the herniated contents into abdomen. The defect is assessed; if primary approximation was not possible the goretex patch repair is carried out. A cone is created extra-corporeally with a 10cmx15cm goretex patch using 3-0 Ethibond suture. The cone is then inserted through the 5mm port site after removing the port. The cone (tip of the cone staying inside the chest) is then positioned at the defect site and sutured to the anterior and medial diaphragmatic muscle with either continuous or interrupted 3-0 Ethibond suture. Whilst suturing, the edges of the cone are kept below the diaphragm muscle defect, so that the edges of the patch are sutured to the 12th rib and buried in the subcutaneous tissue. In one case a sac was present. The sac wall was gradually excised to allow safe suturing of the patch to the defect. Port sites are closed without leaving a chest drain in situ.

Results: We repaired six neonates (3females) with large defects (4 left sided) with this technique. In all of our cases, the lateral and posterior margins of the diaphragm were found to be absent. There were two recurrences. One was during the weaning process whilst the other was late. In the case of the late recurrence, we could repair the suture breakdown thoracoscopically; while the early recurrence required a laparotomy for a repair. Suture breakdown had occurred medially between the patch and a thin diaphragmatic membrane. This was due to a misjudged diaphragmatic agenesis at the primary procedure (histology confirmed absent muscle). All patients remain recurrence free at follow up.

Conclusion: We recommend our novel thoracoscopic technique of patch repair of CDH that has produced good early outcome. The follow up of patch repair of CDH patients is considered to be prudent as recurrences can occur and may not be related to the operative technique as such.

S070 UNIDIRECTIONAL BARBED SUTURES CAN BE USED SAFELY IN PEDIATRIC GASTRO-INTESTINAL SURGERY. Ravindra K Vegunta, MD, FRCSEd, FACS, FAAP, Erin M Kloos, MD, Kristina L Morgan, PAC; Cardon Children's Medical Center

Oral Abstracts

Background: Since the sterilization of catgut in 1907, though suture material has evolved greatly to include synthetic and blended sutures, the essential structure of surgical suture has not advanced, until recently, from that of a simple thread and needle. First approved in 2007 for approximation of soft tissue, barbed sutures (BS) are specially engineered sutures that slide through tissue in only one direction. These sutures stay in position once placed, without need for knots at each end and without need for maintaining tension during placement. A barbed suture of a small diameter can be used with equivocal tensile strength. This has the potential to allow surgeons to complete an intestinal anastomosis in less time and when used during minimally invasive surgery, without need for additional trocars. Thus far, these type of specially engineered sutures have been used primarily in plastic, orthopedic and gynecological applications. These sutures have only been used sparingly in children. To date, there are no publications that document the use of barbed sutures in gastrointestinal (GI) surgery in children. Our report consists of a short series of cases demonstrating that the use of barbed sutures in laparoscopic GI procedures in children is safe.

Methods: A retrospective chart review was performed for the four children in whom unidirectional BS – V-Loc (Medtronic, Minneapolis, MN, USA), was used for GI application, between January 1, 2013 and December 31, 2014. Variables including patient age and gender, duration of surgery and specific suture used as well as time to feeds, post-operative length of stay and post-operative complications were collected.

Results: The first patient was a 12 year old boy who underwent excision of a gastric leiomyoma followed by repair of the gastrotomy using BS (this case was presented as a poster at IPEG in 2014). Two patients were neonates with duodenal atresia. They underwent laparoscopic duodenoduodenostomy at two days of age using BS for the anastomosis. The fourth patient underwent laparoscopic duodenojejunostomy using BS for distal duodenal stenosis at seven months of age. All procedures were completed without adverse events and without subsequent complications including wound infection and readmission for wound dehiscence or anastomosis breakdown. See Table 1 below.

Conclusions: We conclude that the use of V-Loc absorbable unidirectional barbed sutures in laparoscopic gastrointestinal anastomosis is feasible and safe in children including neonates.

Table 1.

Case Number	Age, days	Laparoscopic Procedure	Number of trocars	Duration of surgery, minutes	Postoperative length of stay, days
1	4455 (12y)	Gastric leiomyoma excision	4	202	4
2	2	Duodenoduodenostomy	4	174	21
3	2	Duodenoduodenostomy	3	162	14
4	232 (7m)	Duodenojejunostomy	3	190	9

S071 LAPAROSCOPIC SURGERY FOR DUODENAL ATRESIA & STENOSIS Joel Cazares, MD; Department of Pediatric Surgery, Hospital Regional de Alta Especialidad Materno Infantil

Purpose: To date, few pediatric surgeons have described laparoscopic repair for duodenal atresia and stenosis (DAS) because it is generally considered to require advanced skills. We report our initial experience of treating 11 cases of DAS laparoscopically.

Methods: A retrospective study of all babies diagnosed with high intestinal obstruction within a year of birth was performed. Initial management involved assessment of routine blood biochemistry, nil by mouth, orogastric tube insertion, X-ray radiography, abdominal ultrasonography, and upper gastrointestinal (UGI) series. Cardiology consultation and genetic counselling were arranged as required.

Patients diagnosed with DAS were prepared for conventional three port laparoscopic surgery but incisions in both the proximal and distal duodenum were made wider (1.5cm) to perform laparoscopic Kimura's diamond-shaped duodeno-

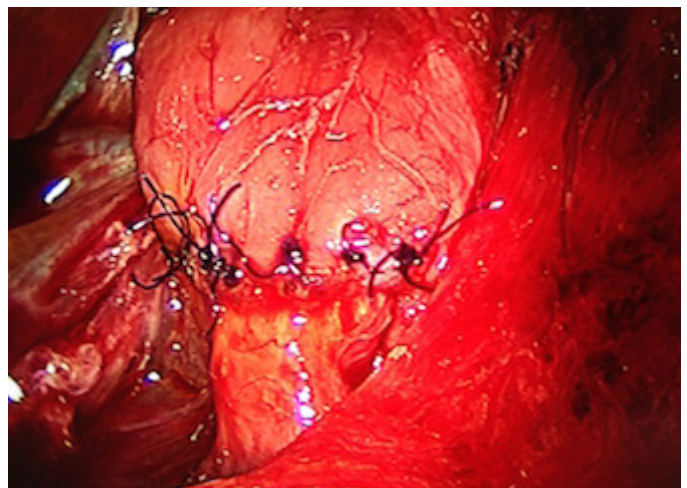
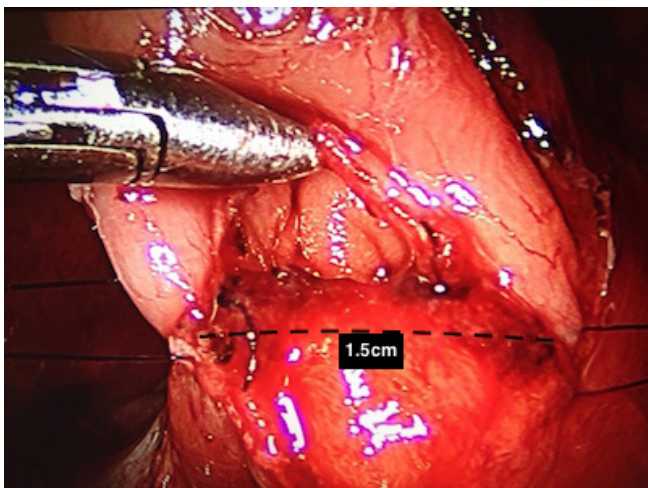
Oral Abstracts

duodenostomy (LKDD). The anastomosis was meticulous in each case using full thickness interrupted sutures. Patency and leakage were tested using 20mL of saline solution plus 20mL of air through the orogastric tube, respectively. Nil by mouth was continued until the 5th postoperative day when UGI was repeated prior to commencement of oral intake.

Results: From January 2014 to June 2015, 28 children presented with high intestinal obstruction. Eleven were diagnosed with DAS and prepared for laparoscopic repair. Mean gestational age at delivery was 38.4 weeks and there was a male: female ratio of 2:1. Polyhydramnios was diagnosed prenatally in 2 cases. One case also had intestinal malrotation and another case also had patent ductus arteriosus. Six cases had trisomy 21. Etiology of DAS was type I duodenal atresia (n=4), one case with a duodenal web windsock sign; type III atresia (n=1), and annular pancreas (n=6). Ten cases had LKDD as neonates. Mean operative time was 210 minutes. The case with malrotation had a Ladd procedure as well and the case with a duodenal web windsock sign was treated by laparoscopic resection and Heineke-Mikulicz duodenoplasty. Our first two cases (18%) were converted to open surgery due to distention of the stomach, technical difficulties and very low weight. One case leaked postoperatively requiring open reoperation.

The postoperative course was uneventful in 9 cases (81%). Oral intake was commenced on the 5th postoperative day. Discharge from hospital was organized once oral intake was stabilized. None of our cases has developed signs or symptoms of complications on regular follow-up.

Conclusion: In our experience, laparoscopic repair of DAS would appear to be feasible despite technical challenges. There is an obvious learning curve but our complication and conversion rates were lower than reported in the literature. From our current series clinical outcomes would appear to be similar to open repair with superior cosmesis. To further improve our performance we recommend a wide anastomosis with meticulous interrupted sutures and avoid excessive use of monopolar diathermy (Figs.1-2). Better outcomes and fewer complications are expected with further experience and increased number of cases.



S072 SINGLE-PORT ROBOTIC CHOLECYSTECTOMY IN PEDIATRIC PATIENTS: SINGLE INSTITUTION EXPERIENCE Armando Rosales, MD¹, Federico Seifarth, MD², Fuad Alkhouri, MD³; ¹Cleveland Clinic Florida, ²Cleveland Clinic Foundation, ³Nicklaus Children's Hospital

Background: Modifications to conventional laparoscopic cholecystectomy are aimed to decrease abdominal pain and improve cosmetic results. Single-port robotic cholecystectomy is a safe and feasible approach that has been reported in adults. This study aims to report our experience with single-port robotic cholecystectomy in pediatric patients, and to evaluate the safety, feasibility and outcomes of this approach.

Methods: After single-port robotic approach was available at our institution, we prospectively followed our patients who underwent a single-port robotic cholecystectomy from March 2013 to May 2015 in our pediatric hospital.

Results: There were 14 patients [females 11 (79%) vs. male 3(21%)], the average age was 12.20 ± 4.97 years, with a mean BMI of 28.01 ± 8.57 m/kg². Of the 14 patients, 4 (29%) had cholelithiasis with choledocolithiasis and had undergone an endoscopic retrograde cholangiopancreatography prior to the operation, 6 (43%) had symptomatic cholelithiasis, and 4 (28%) had acute cholecystitis. The median time of operation was 77.5 minutes (range 64 – 169), the median estimated blood loss was 2 ml (range: 2 – 25), and the median length of stay after the operation was 1 day (range: 0 - 2). There were no conversions to another approach. The median follow-up was 7 months (range: 3 – 22), during this period, one patient (7%) developed an umbilical port site seroma, which was managed conservatively, no other complications occurred.

Conclusions: single-port robotic cholecystectomy is a feasible and safe approach for cholecystectomy in the pediatric population. More studies are required to compare it to different approaches.

S073 APPLICATION OF ENDOSCOPY COMBINED WITH LAPAROSCOPY IN THE TREATMENT OF BILE DUCT CALCULI IN CHILDREN Shuguang Jin, Bo Xiang, Chuncheng Wu, Lin Zhong, Fuyu Li; West China Hospital

Objective: To summarize the experiences in treatment of bile duct stones used endoscopy combined with laparoscopy, and to explore the best surgical methods.

Methods: Twenty-eight patients treated with endoscopy combined with laparoscopy from March 2010 to June 2015 in Pediatric Surgery Department of West China Hospital were analysed retrospectively. The mean age was 8.50 ± 4.34 . Thirteen were male, and fifteen were female. The primary diseases included nine common bile duct stones (eight distal end of common bile duct stones and one proximal's), fourteen common bile duct stones combined with gallbladder stones (twelve distal end of common bile duct stones and two proximal's), and five left/right hepatic duct calculi combined with gallbladder stones.

Results: In regard to the eight distal end of common bile duct calculi without gallbladder stones, ERCP combined with EST were the first choice. As a result, six children were successfully removed the stones, but one children failed because of papillary duodenal diverticulum and converted to open surgery, another was unable to place the catheter into the duodenal papilla and changed to laparoscopy combined with cholangioscopy. After ERCP combined with EST, two children emerged acute pancreatitis, one child emerged cholangitis, and they all relieved by symptomatic treatment. For twelve children with distal end of common bile duct calculi combined with cholecystolithiasis, five of them were treated firstly by laparoscopic cholecystectomy, and then removed the common bile duct stones by ERCP, however, one children changed to open surgery due to calculus incarcerated duodenal papilla; three of them were removed stones by ERCP firstly, and then were carried out laparoscopic cholecystectomy, but one was discovered choledocholithiasis shortly after operation, and a ERCP was conducted again. The rest of children with distal end of common bile duct stones combined with or without gallbladder stones, two proximal end of common bile duct stones, and five left/right hepatic calculi combined gallbladder stones were conducted the surgical procedures as laparoscopic common bile duct exploration and intraoperative cholangioscopy and with or without laparoscopic cholecystectomy, the stones larger than 1cm were applied by holmium laser lithotripsy, and a T-tube was implanted in common bile duct for drainage and check for residual stones after surgery. All of these children recovered well without cholangitis, pancreatitis and other complications except mild biliary leakage in three children.

Conclusions: common bile duct and hepatic bile duct calculi treated by endoscopy combined with laparoscopy were safe and effective. However, the appropriate methods or procedures should be adopted carefully to improve success, to reduce reoperations and complications, and to alleviate the suffering of children and their families' financial burden.

S074 SINGLE SITE LAPROSCOPIC TREATMENT FOR HEPATIC DUCT OBSTRUCTIONS CAUSED BY COMPRESSION OF ABERRANT RIGHT HEPATIC ARTERIES WITH CHOLEDOCHAL CYSTS Jian Wang, PhD, MD, Jie Zhu, MD; Children's hospital of Soochow University

BACKGROUND: Laparoscopic operation for choledochal cyst (CDC) becoming popular. The complications may be oc-

curred in postoperative periods. Among these complications, hepatic duct obstructions were attracted more and more attention. The current study is to review CDC children who suffered hepatic duct obstructions caused by compression of aberrant right hepatic arteries(RHA) after laparoscopic hepaticojejunostomy.

METHODS: Ten CDC children (mean age: 5.24 years, range: 8 months-7 years, F/M: 7/3) who suffered hepatic duct obstructions after laparoscopic hepaticojejunostomies were reviewed between January 2006 and September 2015. All patients were underwent transumbilical single site laparoscopic redo hepaticojejunostomy.

RESULTS: The chief complaints included abdominal pain, recurrent jaundice and fever at postoperative 3 month to 2 years. ALL patients experienced prolonged abnormal liver functions. The direct bilirubin ranged from 5.6mg/dL to 17mg/dL (mean 9.8mg/dL). We measured the diameters of stenotic anastomotic stoma by ultrasonographies and CT scans before the operations, meanwhile, dilation of intrahepatic ducts were detected by intraoperative investigations. The mean diameter of stenotic anastomotic stoma was 0.18 cm (0.1-0.3cm). The mean maximal diameter of dilated proximal hepatic duct was 2.2 cm (1.6-3.8cm). All patients were found aberrant right hepatic arteries in front of anastomotic stoma (common hepatic duct side) led to biliary obstruction. We isolated arteries and the surrounding tissues attentively to make sure the anastomosis smoothly and perfectly. The hepatic arteries were replaced behind Roux loop and hepaticojejunostomy were redone. Calculus or protein plugs in the bile duct should be removed to avoid reoperative surgery. Postoperative pathological results verified that 4 patients (40%) had grade I to IV of liver fibrosis. All patients recovered well. Median follow-up period was 18 months (3-36months). No mortality or morbidities of recurrent anastomotic stenosis, bile leak or cholangitis was observed. Liver function parameters reversed to normal level after operation.

CONCLUSIONS: Laparoscopic operation for hepatic duct obstructions caused by aberrant right hepatic arteries with choledochal cyst is suitable, safety and effective. Early surgical correction is advocated to avoid severe liver damage. We recommend to explore whether there exists the aberrant right hepatic artery in the first operation avoiding the unwanted second one.

S075 LAPAROSCOPIC MANAGEMENT FOR CHOLEDOCHAL CYST ASSOCIATED WITH ACCESSORY HEPATIC DUCT Zhe Wen, MD, Qifeng Liang, Jiankun Liang, MD; Guangzhou Women and Children's Medical Center

Purpose: To discuss the feasibility and results of laparoscopic management for choledochal cyst associated with accessory hepatic duct(AHD), focusing on laparoscopic biliary reconstruction.

Methods: From Nov. 2013 to Sept. 2015, 4 cases of choledochal cyst associated with AHD treated in our medical center were reviewed. The operation procedures and the results of the 4 cases were analyzed. All the patients were followed up from 1 month to 2 years.

Results: The age of the 4 patients were from 6 months to 4 years old. Abdominal ultrasound and magnetic resonance cholangiopancreatography (MRCP) revealed cystic common bile ducts in all the 4 cases. A tiny duct seemed to be connected to the cystic duct from the liver was shown in three MRCP images, which could be regarded as a possible abnormal bile duct, but this could not be diagnosed as an AHD for a certainty. In the 1st case, during the laparoscopic radical excision of the cyst, the accessory hepatic duct was overlooked and transected, but soon recognized because of bile leakage from the cut end. The accessory duct was derived from the right hepatic lobe and the diameter of the duct was about 2 mm. The laparoscopic operation was converted to open surgery and the AHD was rejoined to the common hepatic duct to create a common channel followed by end-to-side anastomosis with the Roux-en-Y jejunal loop. In the 2nd patient, the AHD was found to be from the right hepatic lobe to the junction of the cystic duct and the common hepatic duct. The AHD was dissected together with the common hepatic duct, and was implanted into the Roux-Y loop. In the 3rd and 4th case, the AHD was all detected during the operation which was drained into the cystic ducts from the right hepatic lobe. The AHD and the common hepatic duct were dissected respectively, and they were joined together to create a common channel implanted as a single duct into the Roux-en-Y jejunal loop. The diameters of the latter 3 cases were from 1 to 2 mm. The postoperative courses of the 4 cases were smooth, and the patients were discharged uneventfully 1 to 2 weeks after surgery in satisfactory clinical condition. Follow-up abdomi-

nal sonography or MRCP revealed neither evidence of biliary tract obstruction nor atrophic change of the liver.

Conclusion: Preoperative MRCP has a little benefit to identify AHD, and intra-operative exploration is most important for the detection of AHD. With the development of the laparoscopic technique, laparoscopic meticulous bile duct reconstruction is feasible for choledochal cyst associated with AHD and result is good.

Key words: laparoscopy, choledochal cyst, accessory hepatic duct

S076 LONG-TERM RESULTS OF LAPAROSCOPIC HEPATICOJEJUNOSTOMY IN CHILDREN WITH CHOLEDOCHAL CYSTS

Mei Diao, MD, PhD, Long Li, MD, PhD, Zhen Chen, B, Med; Department of Pediatric Surgery, Capital Institute of Pediatrics

Purpose: The current study is to evaluate long-term results of laparoscopic hepaticojejunostomy in children with choledochal cysts (CDC).

Methods: Fifty-four CDC children who underwent laparoscopic hepaticojejunostomies between October 2001 and October 2005 were reviewed. Ultrasonographic studies, upper gastrointestinal contrast studies, and laboratory tests were performed during follow-up period. The operative time, intraoperative blood loss, postoperative hospital stay, resumption of full feeding, postoperative complications, and perioperative laboratory tests were evaluated.

Results: Three patients converted to open procedures. Fifty-one children successfully underwent laparoscopic hepaticojejunostomies. Age at surgery ranged from 29 days to 18 years. The average operative time was 3.80 hours (range: 3.17-6.67 hours). The blood loss was minimal. None of patients required blood transfusion. Mean postoperative hospital stay was 7.61 days. Mean time to resume full diet was 2.96 days. The median follow-up period was 12 years. Postoperative liver function tests and serum amylase levels returned to normal within 1 year. Postoperative complications included bile leak (2/51, 3.9 %), Roux-loop obstruction (2/51, 3.9 %), and gastrointestinal bleeding (2 /51, 3.9 %). One patient (1.9%) who underwent laparoscopic ductoplasty and wide hepaticojejunostomy to correct common hepatic duct stricture at 2 months of age developed cholangitis at postoperative 11 years. Ultrasonographic study and CT scan showed left hepatic duct stricture and intrahepatic duct stone formation. Unrecognized multiple hepatic strictures induced postoperative biliary re-obstruction. Redo laparoscopic ductoplasty (left hepatic duct) and wide hepaticojejunostomy were carried out. None of patients suffered from anastomotic stricture, intrahepatic reflux, pancreatic leak, pancreatic calculi formation, pancreatitis, or adhesive intestinal obstruction. To date, no patients developed carcinoma.

Conclusion: Our results demonstrated that laparoscopic hepaticojejunostomies is feasible and safe. The long-term outcomes are satisfactory.

S077 FEASIBILITY OF A NEW THORACOSCOPIC TRAINING SIMULATOR FOR ESOPHAGEAL ATRESIA WITH AN ENDOSCOPIC SURGICAL SKILL VALIDATION SYSTEM

S Obata, MD¹, S Ieiri, MD, PhD², T Jimbo, MD¹, R Souzaki, MD, PhD¹, M Uemura, PhD⁴, N Matsuoka³, T Katayama³, M Hashizume, MD, PhD, FACS⁴, T Taguchi, MD, PhD, FACS¹; ¹Department of Pediatric Surgery, Kyushu University, ²Department of Pediatric Surgery, Field of Developmental Medicine, Kagoshima University, Graduate School of Medical and Dental Sciences, ⁴Department of Advanced Medicine and Innovative Technology, Kyushu University Hospital, ³Kyoto Kagaku Co., Ltd.

Background and aims: Pediatric surgeons require both basic and, highly-advanced endoscopic surgical skills because of the various operations and different physical sizes of the patients. Thus, appropriate training and skill evaluation systems are necessary for young pediatric residents in order to develop a wide spectrum of endoscopic surgical skills. The goal of our study was to develop a comprehensive disease-specific training simulator with an objective endoscopic surgical skill validation system. We previously developed and reported a thoracic repair model of congenital diaphragmatic hernia of the newborn with an objective endoscopic surgical skill evaluation system. In this study, we initially developed a thoracoscopic anastomosis model of esophageal atresia of the newborn with a skill evaluation system. The aim of this study was to verify the feasibility of this new simulator model as a skill validation model.

Oral Abstracts

Methods: We developed a thoracoscopic anastomosis simulator of esophageal atresia mimicking a newborn case (body weight: 3 kg, Fig. 1a). This simulator consists of a thorax model made by a 3D printer and a demountable esophageal unit with an esophageal sheet with a 10 mm anterior wall defect (Fig. 1b), mimicking anterior wall anastomosis. The examinees performed a task which was to perform 3 suture ligatures on the esophageal anterior wall defect using intracorporeal knot tying (Fig. 1c). The evaluation points were: 1) the time required to complete the 1st and 3rd ligations, 2) maximum air-pressure tolerance, and 3) the deformation ratio of the anastomotic site as a parameter of the suture tension, using the Suture Simulator Instruction Evaluation Unit (Kyoto Kagaku Co., Ltd). Additionally, we evaluated the total path length and the average velocities of each tip of the forceps using a 3-dimensional position measurement instrument with an electromagnetic tracking system (AURORA; Northern Digital Inc. Canada). All data were expressed as the mean $\pm$ standard deviation. Statistical analyses were performed using two-tailed paired and unpaired *t*-tests and $p < 0.05$ was considered to be statistically significant.

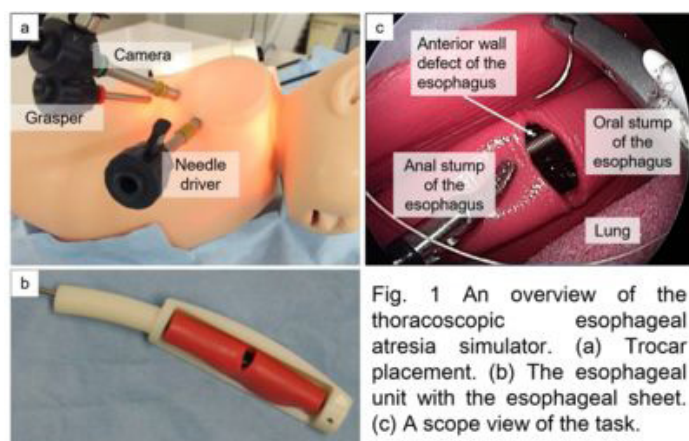


Fig. 1 An overview of the thoracoscopic esophageal atresia simulator. (a) Trocar placement. (b) The esophageal unit with the esophageal sheet. (c) A scope view of the task.

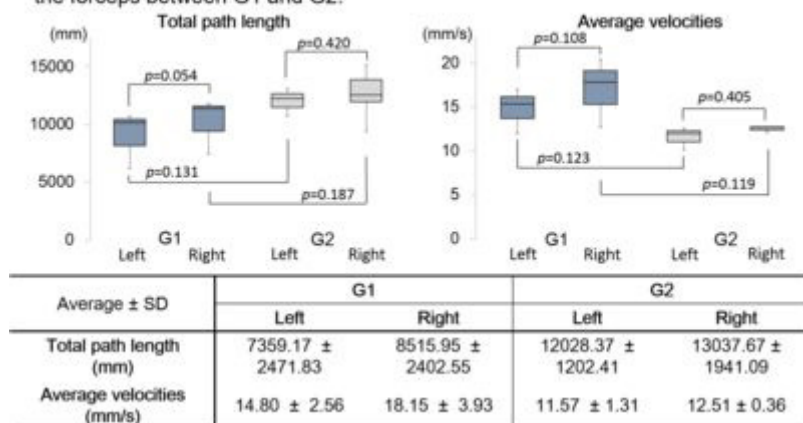
Results: Six pediatric surgeons participated in this study. According to the endoscopic surgery experience of the operator, the surgeons were divided into 2 groups (G1: >100 operations, G2: <100) and 1) the time required to complete the 1st and 3rd ligations, 2) maximum air-pressure tolerance, and 3) the deformation ratio were evaluated. Significant differences were only observed between G1 and G2 regarding the time required to complete the 1st ($p=0.035$) and 3rd ligations ($p=0.016$) (Table). Although there were no significant differences between G1 and G2 regarding the total path length and average velocities of the forceps, G1 showed an economical forceps motion in the narrow operative field (Fig. 2).

Table. The time required to complete the 1st and 3rd ligation, maximum air-pressure tolerance, and the deformation ratio of the anastomotic site

	Time required to complete		Maximum air-pressure tolerance	Deformation ratio of the anastomotic site
	the 1 st ligation	the 3 rd ligation		
G1 (n=3)	215.75 $\pm$ 116.05	617.50 $\pm$ 194.71	20.97 $\pm$ 16.92	82.33 $\pm$ 3.71
G2 (n=3)	591.0 $\pm$ 155.91	1368.0 $\pm$ 218.99	6.53 $\pm$ 3.48	91.23 $\pm$ 6.53
<i>p</i> -value	0.035	0.016	0.221	0.109

Oral Abstracts

Fig. 2 Comparison of the total path length and the average velocities of the tip of the forceps between G1 and G2.



Conclusions: The results tended to express good accordance with the number of endoscopic surgical operations. In addition, due to the clearly-limited operative field in the thoracic space of this model, the examinees require not only quick and accurate, but also economical motions depending on the situation. Thus, our simulator model and evaluation system could validate the quality of endoscopic surgical skills objectively.

S078 OUTCOMES OF SINGLE PORT LAPAROSCOPIC APPENDECTOMY VERSUS CONVENTIONAL THREE PORT LAPAROSCOPIC APPENDECTOMY FOR THE COMPLICATED APPENDICITIS IN CHILDREN: A PROSPECTIVE RANDOMIZED TRIAL

Soo Min Ahn, MD, Tae Ah Kim, MD, Won Me Kang, RN; Hallym Univ Sacred Heart Hospital

Introduction: Single port laparoscopic appendectomy becomes popular in children with acute appendicitis. However, to date, prospective comparative data on single incision laparoscopic appendectomy especially for the complicated appendicitis are lacking.

Subjects and Methods: We designed a prospective randomized trial to compare the outcomes of a single incision laparoscopic appendectomy (SLA) with a conventional three port laparoscopic appendectomy (CLA) in children with complicated appendicitis.

Results: We analyzed the outcome safety and feasibility variables from 78 patients who preoperatively presented with perforated appendicitis or periappendiceal abscess (39 in SLA and 39 in CLA). There were no differences in patients' characteristics at presentation between the two groups. Only two patients needed additional trocar insertion in SLA during the operation. There was no difference in length of hospital stay, post-operative pain score, use of analgesics, and cosmetic result score. Postoperative intra-abdominal fluid collection or abscess formation rate and wound complication rates were similar in both study groups (SLA vs. CLA=5.1% vs. 2.6% in terms of intraabdominal fluid collection or abscess, and 17.9% vs. 20.5% in terms of wound complication; $p=1.00$ and 0.77). The total anesthesia time tended to be longer in SLA group without statistical significance (75.3 ± 30.6 vs. 63.3 ± 24.4 ; $p=0.08$).

Conclusion: The single incision laparoscopic appendectomy for the treatment of complicated appendicitis could be safely performed and the outcomes of SLA were comparable with CLA in children.

S079 TRANSPERITONEAL LAPAROSCOPIC HEMINEPHRECTOMY IN DUPLEX KIDNEYS IN INFANTS AND CHILDREN.

Delphine Demede, MD¹, Stephane Thiry, MD², Pierre-Yves Rabattu³, Jacques Birraux, MD⁴, Isabelle Vidal, MD⁴, Pierre DE Mouriquand, MD¹, Pierre-Yves Mure, MD, PHD¹; ¹HFM hospital, ²Clinique universitaire St Luc, Belgique, ³Hôpital Couple-Enfant, Grenoble, ⁴Hôpital des enfants, Genève

Objective: To report the feasibility, safety and results of transperitoneal laparoscopic heminephrectomy (TLHN) for non-functional moiety in duplex kidneys.

Oral Abstracts

Material and Method: Forty-seven TLHN (36 upper pole and 11 lower-pole nephrectomies) were retrospectively reviewed in a single-institution. Median age at surgery was 20 months (range 7-108). We studied postoperative morbidity. The mean follow up was 13 months (range 2-56) and was based on clinical review, renal ultrasound, and nuclear investigation in a subgroup of 24 patients.

Results: TLHN was feasible in all patients. No conversion was needed. The median operating time was 130 min (range 75-210), and the median hospital stay was 4 days (range 2-29). We had no significant bleeding or digestive injuries. Three complications were observed: one persistent secreting moiety, one ureteral injury requiring open surgical repair, and one abscess of the nephrectomy space. Postoperative nuclear renographies showed no significant loss of function of the remaining moiety with a median difference of 2% (range 0-8%).

Conclusion: TLHN in duplex kidneys appeared to be a safe and effective procedure even in small children. Advantages compared to open surgery are a shorter hospital stay and a better cosmetic result. When compared to retroperitoneal approach, TLHN seems to provide a smaller conversion rate maybe due to a better operating space especially in infants. Furthermore, results are similar with no significant loss of function and no major complication.

S080 MICRO-ENDOSCOPIC ASSISTED TREATMENT OF BENIGN BONE LESIONS IN CHILDREN Martin Schwind, MD¹, Sven-Oliver Dietz, MD², Stephan Rohleder, MD², Oliver Muensterer, MD, PhD²; ¹University Medicine Mainz, Department of Pediatric Surgery, Mainz, Germany, ²University Medicine Mainz, Department of Orthopaedics and Traumatology, Mainz, Germany

Background: Curettage and bone grafting or bone void filling is frequently used for the treatment of pediatric benign bone lesions with a risk of fracture, such as aneurysmal or solitary bone cysts and non-ossifying fibroma. In cases of subchondral localisation, there is a risk of intraoperative perforation into the joint space with subsequent cartilage damage. Incomplete curettage of the lesions may cause recurrence.

Purpose: We describe a novel technique of endoscopic-assisted curettage using bone cystoscopy.

Patients: Five Children (4 boys, 1 girl) aged 7 to 14 years (median 11.8y) underwent endoscopic assisted surgical treatment of benign bone lesions. Two aneurysmal bone cyst of the proximal humerus, one of the proximal ulna, one solitary bone cyst of the proximal humeral shaft and one non-ossifying fibroma of the distal tibia were treated.

Technique: In all cases, the equipment comprised of a 2.4 mm 30° endoscope, a 8G T-Lok™ Bone marrow Biopsy needle and a variety of sharp curettes. A 1.5cm incision was made over the bone cyst. After exposure of the cortex, the cyst wall was opened with the biopsy needle, tissue or fluid were removed. After preliminary reaming with sharp curettes and irrigation, the endoscope was inserted. Definitive curettage of the lesion was performed under direct visual control. All tissue was sent for histological examination. In cases of bleeding, a long monopolar needle-cautery was used to cauterize the source under endoscopic vision. The defects were filled either with sterilized cancellous bone allograft and/or hydroxyapatite calciumsulfate bone void filler. In one case, additional intramedullary nail stabilization and continuous decompression was carried out. Plain radiography was performed to assess the postoperative outcome.

Results: In all cases, postoperative radiography showed a complete filling of the bone void. Despite very good postoperative result, two patients had wound drainage related to the self-hardening, resorbable biphasic (hydroxyapatite, calciumsulfate) bone void filler. In the other cases further imaging showed a complete healing of the defects. There were no recurrences in any of the patients.

Conclusions: In cases of benign bone tumors, endoscopic-assisted curettage and bone grafting is a good alternative to the conventional procedure. Bone cystoscopy allows verification of complete removal of the pathologic tissue, and targeted cautery of any bleeding sources. Further controlled trials are necessary to delineate any further advantages.

S082 CLINICAL DECISIONS OF LAPAROSCOPICALLY-DISCOVERED CONTRALATERAL OPEN INTERNAL RINGS DURING LAPAROSCOPIC REPAIR OF PEDIATRIC UNILATERAL INGUINAL HERNIAS Yang Wu, MD, Bo Xiang; Department of Pediatric Surgery, West China Hospital, Sichuan University

Background: Around 10% of children with clinically diagnosed unilateral pediatric inguinal hernias had been found to have open internal rings during laparoscopic repairs.

Purpose: To explore and discuss the clinical decision-making strategy about laparoscopically-discovered contralateral open internal rings during laparoscopic repair of pediatric unilateral inguinal hernias

Methods: We performed a retrospective analysis on medical data of children with inguinal hernia in three pediatric medical centers in China from June 2001 to December 2014. A total of 7082 patients had been included with median age to be 1.58 year-old. There were 6157 males(86.9%) and 925 females (13.1%). 5024 patients presented with unilateral hernias and 2058 presented with bilateral hernias. The follow-up period ranged from 18 to 24 months. We explored the contralateral internal rings through direct vision under laparoscopic procedure. We also observed the incidence of the occurrence contralateral hernias after open high ligation on single side. With these data we intended to investigate the clinical strategy of laparoscopically-discovered contralateral open internal rings.

Results: (1) 1098 patients had received open inguinal hernia repair and 986 of them had unilateral hernias. During the 18-month follow-up of these patients, only 14(1.4%) (10 right new hernias, 4 left new hernias) of them experience developed contralateral clinical hernias. Eight of the new occurrence happened within 12-month age and six of them happened between 12 to 24 months-old. No kids were older than 24 months. (2) 5984 patients received laparoscopic surgeries. 4038 of them had clinically-diagnosed unilateral hernia. Under the intra-abdominal pressure of 10mmHg explorations revealed that 557(13.8%) of the 4038 patients had contralateral open internal rings. One kind of the open internal ring was the hole-type, the diameter of which usually exceeded 5mm and was obvious under inspection. The other kind was the gap-type which was not obviously-open under inspection and needed grasper to expose. The rates of laparoscopically-discovered contralateral open internal rings were 14.5% (100 of 691) in infants(< 12 months) and neonates, 15.5% (219 of 1414) in children between 12 and 24 month-old and 12.3%(238 of 1933) in children older than 2 years. All of them received laparoscopic ligation of the contralateral discovered patent internal rings. During the 18-24 month follow-up, 16 of 5984(0.3%) patients had recurrence. None of the contralateral repairs had recurrence.

Conclusions: Our laparoscopic exploration showed that 13.8% of the clinically diagnosed unilateral pediatric inguinal hernias had contralateral patent internal rings. Only 1.4% of patients receiving open single-side hernia repair would develop new hernias on the other side and all of them were younger than 2-years old. Based on our primary findings, we recommended that for children younger than 2 years especially those with the hole-type internal ring during laparoscopic surgeries, contralateral repair would be beneficial. And for children older than 2 years, or those with the gap-type, contemporary repair of the other side would not be recommended. Long-term follow-up should be provided for them.

S083 EVALUATION ON THE EFFICACY AND SAFETY OF FLEXIBLE URETEROSCOPY FOR UPPER URINARY TRACT CALCULI IN CHILDREN Yao-wang Zhao, MS, Li Liu, Lei Tu, Chuang-ye Li; Hunan children's hospital

Objective: To evaluate the efficacy and safety of flexible ureteroscopy for upper urinary tract calculus in children.

Methods: The clinical data of 215 children(141 males and 74 females, 239sides) with upper urinary tract calculus treated with flexible ureteroscopy combined holmium laser lithotripsy in our hospital from March 2010 to March 2015 were analyzed retrospectively(range from 1 year 2 months to 14 year 5 months old, average in 5 and a half years old). 179 cases(19 cases bilateral) were with renal calculi and 36 cases(5 cases bilateral) were with upper ureteral calculi. 5 cases were after ESWL, 15 cases after MPCNL. 5 cases were with renal calculi in solitary kidneys and 19 cases were with recurrent calculi. Urinary tract ultrasound preoperatively or spiral CT: the renal calculi were located at the renal pelvis, middle or upper calyx in 121 sides, at the the renal pelvis and multiple calyces in 28 sides, at the lower calyx in 54 sides and at the upper ureter in 36 sides. The diameter of calculi ranged from 5 to 28mm. All of the patients were

without severe urinary tract anomalies.

Result: The insertion of ureteric access sheath and flexible ureteroscopy was successful in 8 sides in the first time. 209 sides inserted ureteric access sheath successfully by a double-J stent dilating the ureter for 4 weeks. Among the 209 sides, 143 sides had stone clearance successfully after a one-stage procedure, 46 sides after a two-stage operation and 15 sides after a three-stage operation. Calculi can't be detected in the other 5 sides, among them, 2 sides were treated with MPCNL and 3 sides chose to be under observation. Among 19 sides which can't be inserted ureteric access sheath successfully, 8 sides were inserted flexible ureteroscopy along guide wire to renal pelvis and had stone clearance successfully, other 7 sides were treated with MPCNL and 4 cases were lost. A total of 220 sides were successfully inserted the flexible ureteroscopy with calculi cleared. Stone-free status was routinely determined by ultrasonography or spiral CT. 178 sides out of 239 (74.5%) had stone clearance at 1 month post operation, 203 sides (84.9%) at 2 months and 219 sides (91.5%) at 3 months. Residual calculi were detected in 5 cases. The average operation time was 55 minutes and postoperative length of stay was 3.5 days. Renal hematoma was observed in one case, laceration of ureteral orifice in 5 cases, mucosal injury at pelviureteric junction in 3 cases, obvious extravasation of urine in 2 cases and renal pelvis perforation in 1 case. At the end of the procedure, double J stent was placed for every operated side. 17 patients had postoperative fever. No ureteral stricture were observed by 3-24 months' follow-up. Recurrent calculi were detected in 10 cases one year later.

Conclusion: This data show that flexible ureteroscopy combined holmium laser lithotripsy is a safe and effective procedure for upper tract calculi in children by selecting appropriate flexible ureteroscopy and mastering the technology.

Key words: children; upper urinary tract lithiasis; flexible ureteroscopy; holmium laser

S084 LAPAROSCOPIC PARTIAL NEPHRECTOMY IN DUPLEX KIDNEYS IN INFANTS AND CHILDREN: A SINGLE CENTRE EXPERIENCE OF 53 CASES. Tobias Luithle, MD, Verena Ellerkamp, MD, Florian Obermayr, MD, Joerg Fuchs, MD; Department of Pediatric Surgery and Pediatric Urology, University Children's Hospital, Tuebingen, Germany

Introduction: Laparoscopic partial nephrectomy is a well-established technique in pediatric urology and is increasingly becoming the treatment of choice for duplex kidneys with non-functioning moieties in infants and children. We report the outcome of 53 cases operated on at our institution.

Methods: A retrospective analysis was performed on a consecutive series of 51 patients (53 renal units) who underwent a laparoscopic partial nephrectomy using a transperitoneal laparoscopic approach at our institution between January 2003 and October 2015. The median follow-up was 24 months (range: 1-133 months).

Results: We operated on 22 boys and 29 girls with a median age of 8 months (range: 1-189 months). The affected moiety was the upper-pole in 39 renal units and the lower-pole in 14 renal units. The left side was affected in 32 patients, the right side in 17 patients and both sides in 2 patients. Associated anomalies were the following: ectopic ureter (n=18), ureterocele (n=19) and vesicoureteral reflux (n=27). Median operative time was 121 minutes (range: 55-280 minutes). There were no intraoperative complications in all patients. Neither conversion to open surgery nor intraoperative relevant bleeding was reported. Postoperative complications occurred in 6 renal units (11%). In one case nephrectomy of the remaining moiety was necessary due to disturbed blood flow with loss of renal function. In one patient the renal function of the remaining moiety decreased from 40 to 24%. In two cases urinomas were managed operatively. Urinary tract infection due to vesicoureteral reflux into the remaining stump was managed by operative resection in one case and by endoscopic treatment in another.

Conclusion: Laparoscopic partial nephrectomy remains a technically challenging procedure. Although the transperitoneal approach provides an excellent visualisation of the kidney, damage of the remaining moiety vessels is the major complication.

S085 ROBOTIC-ASSISTED PARTIAL NEPHRECTOMY IN DUPLICATED COLLECTING SYSTEMS FOR SMALL CHILDREN- Quentin Ballouhey, MD¹, Pauline Clermidi, MD¹, Karim Braik, MD², Thierry Villemagne, MD³, Hubert Lardy, MD, PhD³,

Oral Abstracts

Laurent Fourcade, MD, PhD¹; ¹Department of pediatric surgery; Limoges University Hospital, ²Department of pediatric surgery; Tours university hospital, ³Department of pediatric surgery ; Tours University hospital

Introduction: Laparoscopic transperitoneal approach for heminephrectomy has been reported as a safe technique with a low conversion rate for children.

Objective: The aim of our study was to report the outcomes of robotic-assisted heminephrectomy (RAHN) for duplex kidney in children below 15 kg.

Study design: This was a retrospective and multicentric analysis in which we reviewed the records of RAHN performed from 2007 to 2014. Demographic data, weight, surgical time, hospital stay, complications and outcome were recorded. Follow-up was based on clinical review, renal sonography and diuretic renogram.

Results: Fifteen patients weighing less than 15 kg underwent robotic –assisted PN. All of them had prenatal diagnosis of duplicated system. Mean age at surgery was 20.2 (7-39) months with a policy of early surgical intervention in cases of massively dilated upper renal tract. All procedures started with a cystoscopic evaluation as this allowed catheterization of the preserved ureter before transperitoneal approach with four laparoscopic ports. There was no conversion to open and mean total operative time was 201 min (130-245). Mean length of stay was 3.4 days (1-7). No patient lost his or her remaining healthy moiety after a mean follow-up of 29.7 months (range 11-58 months). One patient had an omentum hernia and required a second operation. Ultrasound demonstrated an asymptomatic fluid collection and at one month and it was managed conservatively.

Discussion: Compared to previously published literature evaluating open and laparoscopic heminephrectomy in small children, RAHN can be performed safely. Specific technical adjustments are necessary and increase the set up time.

Conclusion: Robotic system provides comparable feasibility regarding renal outcomes in comparison to laparoscopy for small children.

S086 MID-TERM OUTCOMES OF ABDOMINAL TESTIS FOLLOWING LAPAROSCOPIC SURGERY Kensuke Ohashi, MD¹, Minoru Tada, MD¹, Daigo Funakoshi, MD¹, Hiroshi Kawashima, MD², Yujiro Tanaka, MD², Hiroo Uchida, MD³, Tadashi Iwanaka, MD²; ¹Saitama Children's Medical Center, Urology, ²Saitama Children's Medical Center, Pediatric Surgery, ³Nagoya University Graduate School of Medicine, Department of Pediatric Surgery

Purpose: Clinical factors related to post-orchiopey testicular growth are still controversial. In literatures, congenital and operative factors are described as important. We retrospectively reviewed our operative cases of abdominal testes and compared these factors with post-operative testicular growth after mid-term follow up period.

Materials and methods: One hundred abdominal testes in 95 patients who underwent laparoscopic surgery in Saitama children's medical center from 1998 to 2015 were evaluated. As congenital factors, affected testicular volume ratio (ATVR) (affected testicular volume divide healthy side testicular volume) was measured using ultrasonography pre- and post-operatively. The locations of abdominal testes were classified into three groups (high: around kidney, middle: between high and low and low: around internal inguinal ring). As operative factors, age at the operation, surgical procedures (conventional laparoscopic orchiopexy (LO), one-stage laparoscopic Fowler-Stephens (OSFS), two-stage laparoscopic Fowler-Stephens (TSFS)) and operative time were reviewed from the medical records. Outcome was that post-operative non-atrophied testicle rate (PONAT) after mid-term follow-up period (about five years after the surgery). PONAT was defined that post-operative ATVR showed larger than 10%.

Results: Total PONAT was 90.8%(79/87 testes). PONAT in each procedures were that LO 98% (50/51), OSFS 73% (9/12) and TSFS 83%(20/24). PONAT in each location revealed that low group was 96.5%(56/58), (in each procedures: LO 100% (48/48), OSFS 100% (2/2), TSFS 75% (6/8)), middle group was 80%(21/26): (in each procedures: LO 67% (2/3), OSFS 71% (5/7), TSFS 87% (14/16)) and high group was 67% (OSFS only: 2/3). As congenital factor, pre-operative average ATVR reveled 86.3% in LO and 62.1% in OSFS with TSFS. As operative factors, age and location at the time of

operation was average two years old in low group (n=67), six years old in middle (n=27) and eleven years old in high (n=4)). The average age of each procedure showed that 4 years old in LO and seven years old in OSFS with TSFS.

Discussion: Our results indicated that conventional LO for lower abdominal testis was satisfactory in the point of post-operative testicular growth. However the mid-term outcome of laparoscopic Fowler-Stephens procedures had still have a room for improvement. As the limitation of this study, the condition of testis at the time of operation was different congenitally. Age at operation for higher abdominal testis tended to be delayed. Furthermore the volume of testis was smaller in higher abdominal testis. These limitations gave a major negative impact to the outcome of Fowler-Stephens cases. Even if in such a biased condition, TSFS seemed to be superior than OSFS in the point of post-operative testicular growth. We conclude that if Fowler-Stephens procedure is unavoidable to the high abdominal testis, TSFS is recommended to expect more testicular growth.

S087 LAPAROSCOPIC RESECTION AND END-TO-END URETEROURETEROSTOMY FOR MIDURETERAL OBSTRUCTION IN CHILDREN Liangsheng Lu, MD, Yunli Bi, Xiang Wang, Shuangui Ruan; Division of Pediatric Urology, Children's Hospital of Fudan University

PURPOSE: Midureteral obstruction is an extremely rare entity. We describe the outcomes of laparoscopic ureteroureterostomy for children's midureteral obstruction in a single tertiary medical centre.

METHODS: We retrospectively reviewed consecutive cases of midureteral obstruction underwent laparoscopic end-to-end ureteroureterostomy between July 2011 and August 2015. The medical records were collected including patient demographics, intraoperative details, postoperative outcomes, and complications. Renal ultrasound, magnetic resonance urography and radioisotope renography were applied for pre and postoperative assessment. Success was defined by symptomatic improvement of obstruction or improvement of hydronephrosis.

RESULTS: A total of 13 patients, aged 4.9 years (range 3 months-12 years) were identified. Six of the patients presented with asymptomatic hydronephrosis on renal ultrasonography, three with intermittent abdominal pain and two with gross hematuria. The other two cases presented with urinary extravasation after inguinal hernia repair and Soave procedure respectively. All patients underwent laparoscopic end-to-end ureteroureterostomy. Procedures were performed through laparoscopic transperitoneal approach (n =11) or laparoscopic-assisted retroperitoneal approach (n =2). All cases were finished successfully except for one converted to open surgery for the difficult anastomosis. No intra-operative or immediate postoperative complications occurred. The etiology of midureteral obstruction included congenital midureteral stricture, ureteral polyp, retrocaval ureter, and iatrogenic injury. The mean surgical time was 140.8 min (range, 90-300 min), and length of postoperative hospital stay was 5-9 days. Postoperative outcomes were successful in 13/13 patients (100%), with a median follow-up of 19.1 months (range 2-51).

CONCLUSION: Our preliminary experience shows laparoscopic ureteroureterostomy is feasible and safe for the management of midureteral obstruction in children.

KEYWORDS: midureteral obstruction; ureteroureterostomy; laparoscopy

S088 PNEUMOVESICAL URETERIC REIMPLANTATION USING T-FASTENER: A NOVEL TECHNIQUE Ct Lau, Lawrence Lan, Kenneth Wong, Paul Tam; Department of Surgery, Queen Mary Hospital, The University of Hong Kong

Introduction: Pneumovesical ureteric reimplantation has been a major advancement for the treatment of vesico-ureteric reflux and vesicoureteric junction obstruction. Despite the same principles applied, there exist various technical refinements between different centres. Here we describe our new technique of employing T-fastener (Kimberly Clark, USA) in pneumovesical reimplantation.

Techniques: T-fastener is a device commonly used to anchor the stomach to the anterior abdominal wall in gastrostomy procedures. It was first applied to pneumovesical ureteric reimplantation in our centre since 2011. The device is inserted percutaneously for bladder anchoring before proceeding with a pneumovesical reimplantation. Before the use of T-fastener the bladder was anchored by means of passing a suture between 2 percutaneously inserted angioca-

theter, which was technically demanding. All T-fasteners were removed at the end of operation.

Results: 17 cases had been performed since 2011. The mean operative time was 30 minutes faster than using the previous method. No complication has been associated with the use of T-fasteners.

Conclusion: The use of T-fastener in pneumovesical ureteric reimplantation is feasible and safe in children. The technique is simple to learn and transferrable, and the operative time can be shortened significantly. We therefore advocate its application as the device of choice for bladder anchoring during pneumovesical ureteric reimplantation.

S089 MININVASIVE TREATMENT OF CONGENITAL MEGAURETER: THE ROLE OF ENDOSCOPIC DILATATION Federica Marinoni, MD, Claudio Vella, MD, Sara Costanzo, MD, Claudia Filisetti, MD, Giovanni Di Iorio, MD, Giorgio Selvaggio, MD, Giovanna Riccipetoni, MD; Pediatric Surgery Department, $\square$ V.Buzzi $\square$ Children $\square$ s Hospital ICP, Milan $\square$ Italy

Background and aim: Congenital obstructive megaureter has a high percentage of spontaneous resolution. Despite this favorable trend, cases with worsening of the hydroureteronephrosis, decreasing renal function and recurrent urinary tract infections have been reported. The standard treatment is distal ureter plication or tapering and reimplantation. This surgical approach is not free from complications, especially in young children. For this reason, the minimally invasive approach, using endoscopic balloon dilation and stent placement, has been proposed as a first line therapy.

Materials and methods: From September 2009 to October 2015 18 patients, median age 33 months (range 2-80) affected by congenital megaureter were submitted to cystoscopy and high-pressure balloon dilation of the ureterovesical junction. The treatment was carried out with introduction of hydrophilic guidewire 0:35", 6 Ch catheter, balloon 4 cm in length, 5 mm diameter, for four cycles of 2 minutes at 300 psi-20 atm. After the procedure a double-J stent 4.8 Ch was left in place for 4 months. An ultrasound was performed at 1 and 4 months after the procedure and at 1 and 3 months following the stent removal.

Results: We did not observe any immediate or late complications related with the maneuver, in 2/18 patients it was not possible to perform the dilatation, that was completed in 16 cases. At a follow-up period of at least 6 months post removal of double-J stent 13 cases have significant regression of hydroureteronephrosis; 2 patients are still in follow-up, 1 case needed a second dilation, 1 patient was unresponsive to endoscopic treatment and submitted to Hendren's ureteral procedure. No secondary reflux was detected at the indirect radionuclide cystography studies.

Conclusions: High-pressure balloon dilation of the ureterovesical junction appears a viable alternative to traditional surgery. Considering the 13 out of the 14 patients with adequate follow-up we can affirm that 93% of the patients have been successfully treated without complication. In our series we also observed patients older than 24 months who responded positively. In cases where the papilla is stenotic with pseudoureterocele aspect (as in the 2 cases in whom the dilatation was not possible) we must consider the possibility not to proceed. We believe that minimally invasive treatment may be extended in selected cases and without limit of age as first line therapy.

S090 PAEDIATRIC LAPAROSCOPIC CHOLECYSTECTOMY IN SCOTLAND: A NATIONAL REVIEW OF INCIDENCE AND OUTCOMES (1998-2015) P Sekaran, Mr¹, Ar Ross, Mr², A Rooney, Miss¹, G Duthie, Miss³, M Clarke, Miss³, Fd Munro, Mr², Aj Sabharwal, Mr¹; ¹RHSC Glasgow, ²RHSC Edinburgh, ³RHSC Aberdeen

Background: The UK Institute for Innovation and Improvement, which aims to reduce patient morbidity and mortality, recommend that laparoscopic cholecystectomy (LC) in adults is only undertaken by surgeons who perform at least 40 per year. For the paediatric surgeon in the UK this target is unachievable due to infrequent requirement for this procedure. We present here a national data series to determine the incidence, indications and complications for LC among children <16yrs when performed by paediatric surgeons.

Methods: A retrospective case review was undertaken of all children who underwent LC performed by paediatric surgeons in Scotland between 1998–2015. Age and sex specific annual incidence rates were derived using the National Records Scotland Database mid-year population estimates. Trends in the observed case mix were tested using univari-

ate linear regression and students t-test.

Results: Between 1998 – 2015; 141 paediatric LC were performed. Median age was 12yrs (range: 2-16yrs). The most common indications were cholelithiasis (63, 44%), spherocytosis (57, 40%) and cholecystitis (11, 7.8%). The annual incidence of cholecystectomy increased from 0.1/100,000 to 0.88/100,000 ($p = 0.069$). Sex specific incidences were identified; 0.0 – 0.9/100,000 ($p = 0.098$) in girls and 0.2 – 0.86/100,000 in boys ($p=0.28$). Cholecystectomy was more frequent in girls (63%; $p=0.04$). No major complications defined as common bile duct injury or mortality were identified. One conversion was required due to dense adhesions. Other complications included; 1 post op wound infection, 4 respiratory tract infections and bleeding from the splenic capsule during a splenectomy following successful cholecystectomy for spherocytosis which was not converted. No patient needed to be readmitted within 30 days of surgery.

Conclusions: Despite a rising requirement to perform laparoscopic cholecystectomy in Scotland, during a 17yr period no bile duct injury occurred when performed by paediatric surgeons. We have demonstrated that despite a low case load (8 LC's per year) paediatric surgeons can undertake LC safely and are meeting the standards expected by the UK Institute for Innovation and Improvement.

S091 LAPAROSCOPIC PARTIAL SPLENECTOMY IN CHILDREN AND ADOLESCENTS: A 20-YEAR EXPERIENCE Edward Esteves, PhD, Calebe P Souza, MD, Juliana V Gomes, MD; University of Goias and Cancer Hospital of Goias

Background: Partial splenectomy is a specially indicated procedure for children under 13 years of age, due to the immunological role of the spleen against capsulated bacteria attacks. Otherwise, total splenectomy is mostly indicated for splenic diseases, even for focal compromise. The authors show a 20-year experience with the pediatric laparoscopic partial splenectomy (LPS), considering indications, evolution of the techniques, tricks, types of retrieval bags and complications.

Patients and methods: From Jun/1995 to May/2015, a total of 13 patients required LPS in 4 institutions, performed by the author, aging 2-14 years (9 males : 5 females). The indications included trauma (4), hydatid cyst (3), cystic hamartoma (2), lymphemangioma (2), teratoma (1) and hemangiopericytoma (1). The location of the diseases made us classify them in 3 different types for resection: 10 cases were located at either the upper or lower pole of the spleen (type A). One cystic hamartoma was located at the medium third of the organ, near the splenic hylum (type B), and two compromised 2 thirds of the spleen (type C, both at the lower spleen). Type A lesions were managed by polar splenectomy, and selective vessel divisions. Type B required subtotal splenectomies, keeping only the upper pole vascularized by the short gastric or the left gastroepiploic vessels. Type C were treated by marginal resection of the cyst. Vascular management included clips, lap staplers and bipolar coagulation before the year 1998. Then, no clips had been used. Since 2001, harmonic scissors or vessel ligations (sutures) had been applied, coupled with bipolar or monopolar coagulation, depending on the vascular sizes, the institution logistic and the location of the lesions. Marginal resection required the use of harmonic scalpel. One girl had a concomitant cholecystectomy due to lithiasis. The retrieval bags included endopouches (3), endobags (3), transfusion bags (3) and washed gloves (4).

Results: All procedures could be finished laparoscopically, with no conversions, no transfusion, no major complications. No cyst had been ruptured. The hydatid cyst specimens were removed intact through a suprapubic incision inside a bag. All the other specimens were removed by fragmentation inside a bag, through the umbilical incision. Operative times ranged from 115-165 minutes, the larger times at the beginning of our practice. Mean hospital stay of 1.1 day. The last 10 cases had been treated using only 3 ports. After a follow-up of 3m-20 years, one never came back and 12 patients have remained asymptomatic.

Conclusions: LPS is a good and safe procedure for most focal benign lesion in children, specially when not protected by previous special vaccination, with all the advantages of MIS. Technical improvement on the surgical devices had favored LPS to be easier and safer than before.

S093 LAPAROSCOPY IN THE MANAGEMENT OF COMPLEX CLOACA MALFORMATIONS Bhargava Mullanpudi, MD, Lesley Breech, MD, Jason S Frischer, MD, Beth A Rymeski, MD, Belinda His Dickie, MD; Cincinnati Children's Hospital and Medical Center

Purpose: Cloaca anomalies can be one of the most challenging pediatric surgical malformations. In patients with long common channel or high rectal fistulas, a laparotomy is required for the mobilization and separation of rectum, gynecologic and urinary structures. The purpose of this paper is to present our case series on laparoscopy in the management of these complex cloacas.

Methods: A retrospective review of all patients between 2014-15, who underwent primary cloacal repair requiring an abdominal approach at our institution, was performed. Demographics, preoperative imaging, length of common channel, length of stay, operative times and initial outcomes were reviewed.

Results: Fifteen patients underwent primary cloaca repair. The initial evaluation of these patients is based on our protocol which includes cystoscopy, vaginoscopy and 3-D cloacogram. All patients had common channels longer than 5 cm or a high rectal fistula requiring an intraabdominal approach. Seven patients had attempted laparoscopy of which five were successfully completed. 2 patients were converted to a laparotomy due to poor visibility and extensive adhesions from previous surgeries. Ten patients underwent open approach. Mean postoperative stay was 6 days (range 4-9) in the laparoscopy group and 8.8 days (range 4-15) in the open group, $p = 0.04$; Mean operative time in the laparoscopic group was 8.1 hrs (5.61 – 9.75) compared to 8.7 hrs (6.75-12.01) in the open group, $p = 0.54$. All patients had postoperative examinations under anesthesia with cystoscopy and vaginoscopy.

There were no intraoperative or postoperative complications in the laparoscopic group. Two patients in the open group required re exploration for obstruction and prolapsed ostomy.

Conclusion: Our goal is to demonstrate that a minimally invasive technique can be done safely with potentially less morbidity in repair of cloaca malformations. Whether approached open or laparoscopic, a meticulous dissection is imperative for adequate mobilization and separation of structures for complete reconstructive repair.

S094 CHANGING FACE OF PEDIATRIC CHOLECYSTECTOMY: EXPERIENCE IN THE CURRENT ERA Jonathan Halbach, DO¹, Erin Ward, MD¹, Simone Langness, MD¹, Katherine Davenport, MD¹, Stephen Bickler, MD¹, Karen Kling, MD¹, Timothy Fairbanks, MD¹, Julia Grabowski, MD²; ¹Rady Children's Hospital, San Diego, CA, ²Lurie Children's Hospital, Chicago, IL

Purpose: Over the last decade, laparoscopic cholecystectomy (LC) has been performed in pediatric patients with increasing frequency. In the past, gallstone disease in children has been attributed to pigmented stones related to hemolytic disease. Cholesterol stones and complicated cholelithiasis were thought to be rare. We set to examine the current operative indications, patient characteristics, and complications of LC in our pediatric population.

Methods: We performed a retrospective chart review of all pediatric patients who underwent LC at our single academic institution from 2010-2014. Patients with incomplete medical records were excluded. Patient demographics, pathology, and surgical outcomes were analyzed.

Results: 266 patients underwent LC over our study period and 253 were reviewed. Operative indications were symptomatic cholelithiasis (65.2%), acute calculous cholecystitis (14.6%), gallstone pancreatitis (10.7%), choledocolithiasis (7.11%), gallbladder polyps (1.19%), biliary dyskinesia (0.79%), and acalculous cholecystitis (0.4%). Although cholelithiasis was noted in 98% of cases, only 6% of patients had hemolytic disorders. Chronic or acute inflammation was noted in all specimens. Serious complications occurred in 2.6% of patients. There were 5 conversions to an open procedure. Mean Body Mass Index (BMI) of those with complications was 29.5 vs. 27.1 for the cohort. Mean age was the same (14 years) for those with complications and those without.

Conclusion: Indications for pediatric LC have been shifting towards cholecystitis and symptomatic cholelithiasis unrelated to hemolytic diseases. Increased BMI correlated with serious complications.

S095 NATIONAL OUTCOMES AFTER ADOLESCENT LAPAROSCOPIC CHOLECYSTECTOMY COMPARING ADULT WITH PEDIATRIC SURGEONS Grace E Hsiung, MD¹, Timothy B Lautz, MD², Catherine J Hunter, MD², Fizan Abdullah, MD, PhD², Julia Grabowski, MD²; ¹Department of Surgery, Northwestern University, Feinberg School of Medicine, Chicago, Illinois, ²Division of Pediatric Surgery, Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois

Purpose: Both adult and pediatric general surgeons share the management of adolescents with biliary disease, but little is known about the correlation between the surgeon and surgical outcomes following laparoscopic cholecystectomy(LC). The purpose of this study is to evaluate 30-day surgical outcomes in adolescents undergoing LC based on surgeon type—pediatric compared with adult.

Methods: After IRB exemption determination, a retrospective review was performed of adolescent patients(ages 16-19) undergoing LC(including cholecystectomy with intraoperative cholangiogram and common bile duct exploration) by surgeon type(adult general surgeon vs pediatric general surgeon) in the NSQIP participant user file(PUF)2006-2013 and the NSQIP-Pediatric PUF2012-2013. Patient risk factors, intraoperative characteristics and postoperative surgical outcomes between groups were compared using the chi-squared or Fisher's Exact Test.

Results: 2,438(70.5%) adolescents underwent LC by an adult general surgeon compared to 1,018(29.5%) by pediatric surgeons. Those operated on by a pediatric surgeon were more likely to be younger, have higher ASA class, and have pulmonary comorbidities(Table 1). Mean time to discharge operation, length of stay, and operative times were significantly less in cholecystectomies performed by adult general surgeons compared with pediatric surgeons. The leading three indications for LC for both groups were Cholecystitis(adult-70%,pediatric-42%), Cholelithiasis(adult-18%,pediatric-35%), and other biliary-related conditions(adult-6%, pediatric-18%). Neither grouped nor individual complications differed between study groups except that readmission was significantly higher with adult surgeons compared with pediatric surgeons(p=0.005).

Conclusion: Although adolescents undergoing LC by adult surgeons have shorter hospital length of stay and operative times, however they have higher readmission rates. Overall morbidity did not differ by surgeon type. Future study of cost differences and patient preference may help provide more insight into the transition of care from pediatric to adult surgical care.

Table 1. Distribution of Risk Factors & Outcomes for Laparoscopic Cholecystectomies Based On Surgeon Type

	Adult Surgeons (n=2,438; 70.5%)	Pediatric Surgeons (n=1,018; 29.5%)	p-value
RISK FACTORS			
Age			
16 years	119(4.9)	700(68.8)	<0.001
17 years	226(9.3)	314(30.8)	
18 years	666(27.3)	4(0.4)	
19 years	1,427(58.5)	0(0.0)	
ASA Classification			
1-No Disturbance	853(35.0)	207(20.3)	<0.001
2-Mild Disturbance	1,434(58.9)	649(64)	
3-Severe Disturbance	143(5.9)	159(15.6)	
4-Life Threatening	5(0.2)	3(0.3)	
Grouped Comorbidity			
Pulmonary	11(0.5)	89(8.7)	<0.001

Oral Abstracts

Any	66(2.7)	101(9.9)	<0.001
Time From Admission to Operating Room(hours, mean±SD)	17.5±0.7	26.7±3.2	0.006
Operative Time(min, mean±SD)	61.5±0.7	83.6±1.2	<0.001
Postoperative Length of Stay(hours, mean±SD)	16.4±0.5	29.9±1.4	<0.001
OUTCOMES			
Any Complication	59(2.4)	19(1.9)	<0.001
Superficial SSI	8(0.3)	5(0.5)	0.475
Readmission(Unplanned &Related)	27(3.8)	17(1.7)	0.005

S096 TWO-INCISION LAPAROSCOPIC CHOLECYSTECTOMY IN CHILDREN Sarah Lai, MD, Steven S Rothenberg, MD, Kay Sandra, MD, Kristen Shipman, MD, Bethany J Slater, MD, FACS; Rocky Mountain Hospital for Children

PURPOSE: To evaluate a novel two-incision laparoscopic cholecystectomy (2I-LC) technique in children with gallbladder disease, and compare outcomes with the traditional four-port laparoscopic cholecystectomy (4P-LC) method.

METHODS: With IRB approval, a retrospective chart review was performed on children (≤ 21 years of age) with gallbladder disease (cholecystitis, gallstones, gallbladder polyps, biliary dyskinesia) treated with laparoscopic cholecystectomy at a single center between February 2010 to September 2015 with the 2I-LC and 4P-LC techniques. The 2I-LC technique is performed using two 5 mm ports and a 2 mm endoscopic grasper within a 12 mm umbilical incision, and a 3 or 5 mm epigastric port for dissection. The 4P-LC method is performed using the standard technique. In both techniques, the critical view is demonstrated and the gallbladder removed in the standard fashion. Demographic, diagnostic imaging, operative, pathology and outcome data were recorded and the two groups compared with c2 tests, Fisher exact tests and t-tests. Patients who initially received 2I-LC and required conversion to 4P-LC were examined to determine factors which may predict the need for more ports and the effect on outcomes.

RESULTS: A total of 363 laparoscopic cholecystectomy procedures were performed for cholecystitis (30/363 [8.3%]), gallstones (103/363 [28.4%]), gallbladder polyps (6/363 [1.7%]), and biliary dyskinesia (221/363 [60.9%]). The 2I-LC technique was used in 265/363 (73.0%) compared to 4P-LC in 72/363 (19.8%), while 26/363 (7.2%) had other variations in port placement. There were no differences between the groups with respect to sex and age, but body mass index (BMI) was significantly greater in the 4P-LC group (mean±SD: 28.2±1.1 kg/m² vs. 21.3±0.3 kg/m², $P<0.0001$). 4P-LC was more likely to be performed for cholecystitis (62.5% vs. 37.5%), while 2I-LC was more commonly used for gallstones (59.8% vs. 40.2%), polyps (100.0% vs. 0.0%) and biliary dyskinesia (91.6% vs. 8.4%). Mean operative time was greater in the 4P-LC group (61±3 minutes vs. 45±1 minutes, $P<0.0001$). There were 5 wound infections (2I-LC 4/265 [1.5%], 4P-LC 1/72 [1.4%]), 1 common bile duct injury (2I-LC 1/265 [0.4%], 4P-LC 0/72 [0.0%]), and 1 small bowel injury (2I-LC 0/265 [0.0%], 4P-LC 1/72 [1.4%]). 8/265 (3.0%) patients in the 2I-LC group required conversion to 4P-LC, with mean BMI 30.6±2.0 kg/m² and operative time 75±10 minutes, significantly different from remaining patients in the 2I-LC group ($P<0.0001$), but no different from 4P-LC with no additional complications.

CONCLUSIONS: We conclude that 2I-LC is a safe alternative to 4P-LC for pediatric gallbladder disease. Operative time was longer in the 4P-LC group; this was likely secondary to selection bias with higher BMI and preoperative diagnosis of cholecystitis. Overweight patients are more likely to require additional ports to complete their cholecystectomy safely with a similar operative time as 4P-LC. As opposed to a single site technique, the 2I-LC technique allows for optimal triangulation with traction-countertraction while improving cosmesis with minimal scars. Further prospective studies should be performed comparing single- and two-incision techniques to determine effects on surgical outcomes.

S097 SURGICAL COMPLICATIONS OF LAPAROSCOPIC CHOLEDOCHAL CYST EXCISION AND ROUX-EN-Y HEPATICOJEJUNOSTOMY FOR CHILDREN EVALUATED BY CLAVIEN-DINDO GRADING SYSTEM : A 10-YEAR SINGLE CENTER EXPERIENCE

Oral Abstracts

RIENCE Fan Lyu, Yeming Wu, Prof, Jun Wang, Prof; Shanghai Jiaotong University School of Medicine affiliated Xinhua Hospital

Objective: To evaluate the safety of laparoscopic technique by using the modified Clavien-Dindo Classification of Surgical Complications to grade complications after choledochal cyst (CCC).

Method: We retrospectively analyzed the clinical data of 185 children (72 boys and 113 girls, age ranged from 10 days to 13 years) who underwent laparoscopic choledochal cystic excision and Roux-en-Y hepaticojejunostomy in our Hospital from June 2006 to December 2014. The data of 135 children who underwent open procedure of the same period in our hospital were used as control. Clavien-Dindo grading of surgical complications was analyzed.

Result: 155 patients were successfully underwent laparoscopic choledochal cyst excision and Roux-en-Y anastomosis while 30 patients were converted to open procedure. Complications include bile leakage, abdominal infection, GI bleeding, hepaticojejunal anastomotic stricture, incisional hernia and bowel ileus. The overall complication rate of CCC was 12.25%. There were 5 case of grade I, 4 cases of grade II, 10 cases of grade III, 0 case of grade IV and grade V. The complication rate in laparoscopic group is similar to that of open group (12.25% vs 15.56 %, $P>0.05$).

Conclusions: Laparoscopic total cyst excision with Roux-en-Y hepaticojejunostomy is a safe option for the resection of congenital choledochal cyst in children compared with open procedure.

S098 COMPARATIVE ANALYSIS OF MODIFIED LAPAROSCOPIC DUHAMEL AND LAPAROTOMIC DUHAMEL PULL-THROUGH: CLINICAL OUTCOME AND BOWEL FUNCTION AFTER SURGICAL TREATMENT FOR HIRSCHSPRUNG □ S

DISEASE Masaya Yamoto, Naoto Urushihara; Department of Pediatric Surgery, Shizuoka Children's Hospital

Purpose: Various pull-through techniques, both open and laparoscopic, have been performed for Hirschsprung disease (HD). A Z-shaped anastomosis using a linear stapling device has been used as the treatment of choice for HD at our clinic. The aim of the study was to compare outcomes, obtained in a single center, with laparoscopic modified Duhamel procedure comprising Z-shaped colorectal anastomosis (LSD) and laparotomic Duhamel (LTD).

Materials and Methods: From 1985 to 2015, 140 children were treated for HD. There were 46 children who underwent LSD and 94 who had LTD. Preoperative, operative, and postoperative data were collected to compare short-term outcomes among the two groups. Furthermore, we investigated of long-term bowel function for 4 years old or older, excluding the patients with trisomy 21 among the two groups by questionnaire survey. We included 26 children who underwent LSD and 45 who had LTD.

Results: In term of length of the aganglionic tract, the patient distribution was as follows: 35 with classic rectosigmoidal, 9 with descending colon, 1 with transverse colon, and 1 with Total colon in LSD: 70 with classic rectosigmoidal, 18 with descending colon, 3 with transverse colon, and 2 with Total colon in LTD ($p=0.69$). Patients in the LSD group had significant shorter operating times (236 versus 281 minutes, $p < .01$), and fewer of intraoperative bleeding (5.7 versus 28.2 g, $p < .01$). Overall early complications rate was had no significant in the LSD (3.4%) and the LTD (5%) groups ($p = .57$). In 4 years old or older, excluding the patients with trisomy 21, As to functional complications, constipation rate was 23% in the LSD versus 10% in the LTD group ($p = .12$). Incontinence rate was 0% in the LSD versus 4% in the LTD group ($p = .32$). Enterocolitis rate was 3.8% in the LSD versus 2.4% in the LTD group ($p = .64$). Urinary incontinence rate was 0% in the LSD versus 2% in the LTD group ($p = .48$). Dysesthesia rate was 0% in the LSD versus 2% in the LTD group ($p = .5$). Surgical methods do not seem to have affected bowel function.

Conclusions: We conclude that the laparoscopic Duhamel pull-through can be performed safely. This technique is quick and effective and our results show it to be as good as laparotomic Duhamel pull-through.

S099 THE SHORT-TERM OUTCOME OF LAPAROSCOPIC KASAI PORTOENTERSTOMY FOR BILIARY ATRESIA WITH 60 CASES Zhicheng Xu, Yin Zhou, Yibo Li, Yi Ji; West China Hospital of Medicine, Sichuan University

Aim: The aim of this study was to present the short-term result of laparoscopic Kasai portoenterostomy (LKPE) for

biliary atresia (BA) in our hospital.

Materials and Methods: From May 2009 to May 2012, the charts of infants with BA underwent LKPE were reviewed retrospectively. 3-year native liver survival rate and the current status of the survivors were analyzed.

Results: LKPE was carried out in sixty infants (23 boys and 37 girls) with non-syndromic BA (type? 59,type? 1). The mean age was 88 days (range 42-135 days) at operation. There were 10 cases of LKPE converted to open Kasai portoenterostomy (OKPE). The mean operative time of LKPE was 190 min (range 150-260 min) without any perioperative complications. After a median follow-up of 49 months (range 36–65 months), 30 patients survived with native liver, 1 patient underwent liver transplantation, and the remaining 29 patients died of hepatic function failure. Of the survivors with native liver, 14 children are totally normal, 10 children have early hepatic fibrosis and splenomegaly with abnormal value of hepatic enzymes, 6 children with severe portal hypertension are listed for liver transplantation.

Conclusion: LKPE in children with BA is technically feasible. 3-year native liver survival rate of fifty patients with BA was 50%. A longer follow-up is required to assess the long-term outcome.

Keywords: Pediatric Laparoscopy Biliary atresia Portoenterostomy

S100 INITIAL SINGLE INSTITUTION EXPERIENCE USING A 5-MM ENDOSTAPLER Andrew P Rogers, MD, Tiffany J Zens, MD, Hau D Le, MD, Jonathan E Kohler, MD, MA, Peter F Nichol, MD, PhD, Charles M Leys, MD, MSCI; University of Wisconsin School of Medicine and Public Health

Background: Pediatric surgery requires surgeons to operate in small spaces. These physical constraints are more challenging in minimally invasive operations. Recently, a 5-mm stapler with 2-mm staple height (JustRight 5-mm stapler, JustRight Surgical, Boulder, Colorado, USA) was approved by the U.S. Food and Drug Administration (FDA) for use in pediatric surgery. To date, there have been no reports regarding use of this device. Here, we present our initial experience using the 5-mm stapler.

Methods: A retrospective chart review identified 5-mm stapler cases. Demographic data included age, weight, and indication for use. Operative data included number of loads, stapler complications, and interventions to address the complications. We then identified age- and weight-matched patients undergoing the same operations using a 10-mm stapler with 2-3.5 mm staple height. Means and proportions were compared by two-sample t-tests and chi-squared tests.

Results: Twenty-eight patients who underwent 32 procedures from February 2015 to October 2015 were identified. Median age was 7 months (range: 1 day-17 years); median weight was 8.6 kg (range 1.94-79.83 kg). Eight patients were neonates (<4 kg). The most common indication was appendectomy. Indications are shown in Table 1.

A total of 60 loads were deployed in 32 procedures. There were four complications, all recognized intraoperatively (Table 2). The bleeds resulted from application to irradiated lung tissue and from application to a thin, noninflamed mesoappendix. The bronchial staple line leak resulted from improper reloading by the surgeon.

When compared with a cohort of thirty-two cases using a 10-mm stapler, there was no difference in age (50.21 months vs 39.11 months)($p=0.49$) or weight (19.93 kg vs. 16.34kg)($p=0.51$). A total of 60 loads were used, with one bleed noted. The overall complication rate was not different than that of the 5-mm stapler (1/60 vs 4/60) ($p=0.17$).

Conclusion: Our initial experience suggests that although there were more complications with the 5-mm stapler, there is no statistically significant difference in complication rates when compared to the 10-mm stapler. Furthermore, some of the 5-mm complications can be eliminated by proper device training and patient selection. In appropriately selected cases, the 5-mm stapler can be used to minimize the invasiveness of the operation.

Table 1: Indications for use of 5-mm stapler

Indication	N
Appendectomy	11
Bowel resection	6
Lung resection	5

Oral Abstracts

Table 1: Indications for use of 5-mm stapler

Indication	N
Bronchus closure	4
Bowel anastomosis	4
Gastrostomy closure	1
Cystic duct division	1

Table 2: Stapler load complications and interventions

Complication	Intervention
5 mm stapler	
Bronchus air leak	5-mm clip applier
Failed saline test (bowel anastomosis)	Oversewn with single stitch
Bleeding mesoappendix staple line	Endoloop
Failed hemostasis (lung parenchyma)	10-mm stapler
10 mm stapler	
Mesenteric bleeding	Second load applied

S101 SURGEON NECK PAIN IS REDUCED WITH USE OF VIDEO TELESCOPIC OPERATING MONITOR (VITOM) COMPARED WITH SURGICAL LOUPES Philip K Frykman, MD, PhD, MBA¹, Andrew L Freedman, MD¹, Timothy D Kane, MD², Zhi Cheng, MD¹, Mikael Petrosyan, MD², Kenneth Catchpole, PhD¹; ¹Cedars-Sinai Medical Center, ²Children's National Medical Center

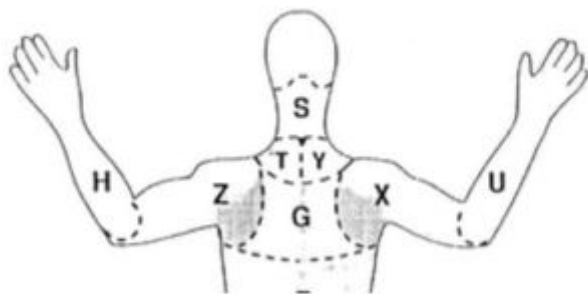
INTRODUCTION: Neck pain is commonly experienced by surgeons in various disciplines, but has not been studied in pediatric surgeons and pediatric urologists. Based on preliminary study, we hypothesized that the compact video monitor (VITOM®) which displays high-definition magnified images on a video screen would reduce neck strain by placing the head position in a more neutral position compared with surgical loupes for those operations requiring magnification.

OBJECTIVE: To evaluate upper body musculoskeletal pain in surgeons using VITOM with, and without, surgical loupes on pediatric surgical and urological operations.

METHODS: An IRB approved two-center study included four surgeons (two in each center) who performed 67 operations utilizing the 90° VITOM II in which the images were viewed on a 26-inch flat screen monitor. The decision to utilize surgical loupes in addition to VITOM was up to the discretion of the individual surgeon. Twenty operations were performed with VITOM alone, 47 were performed with surgical loupes and VITOM. At the conclusion of each operation, the surgeon completed a Borg CR 10 localized musculoskeletal discomfort (LMD) questionnaire (Figure), assigning a level of discomfort to each region of the upper body (0-10).

Oral Abstracts

Borg CR 10



Regional discomfort scores were compared between those operations performed with surgical loupes to those performed without loupes. Multiple linear regressions explored the effects on discomfort scores in each location with operative duration and whether loupes were used.

RESULTS: Not surprisingly, we found that operation length correlated with increased discomfort in regions S, T, Y, G and X (see Table). With operation length taken into account, surgeons experienced reduced neck discomfort (region S; $r^2=0.38$ $p=0.043$) and right shoulder discomfort (region X; $r^2=0.11$, $p=0.017$) when the VITOM was used for magnification alone, compared with the use of loupes and VITOM. There were no differences between the groups in any other regions studied.

Linear regression of Operative Time and use of Surgical Loupes. Statistical significance is denoted with (*)

Area	Time	Loupes	r^2
S	<0.0001*	0.043*	0.38
T	<0.0001*	0.322	0.44
Y	<0.0001*	0.338	0.40
G	0.0005*	0.796	0.17
X	0.0059*	0.017*	0.11

CONCLUSION: Surgeons who used VITOM exclusively for magnification experienced little to no neck pain compared to those who used surgical loupes and VITOM. The most likely explanation for the findings is improved posture with the neck at a neutral position when the VITOM images were viewed, while the neck was flexed when surgical loupes were used, thus creating musculoskeletal strain from the less favorable ergonomic position. These findings may have implications for pediatric surgeons and urologists who experience significant neck pain, as the VITOM may provide an alternative to using loupes.

S102 RETROPERITONEOSCOPIC ADRENALECTOMY FOR SOLID ADRENAL TUMOR IN CHILDREN: A SINGLE SURGEON EXPERIENCE WITH 23 CASES Tran N Son, MD, PhD, Tran A Quynh, MD; National Hospital of Pediatrics

Introduction: Retroperitoneal laparoscopic approach is less frequently used for adrenal tumor in children than the transperitoneal approach. The aim of this study is to present the authors' results of retroperitoneoscopic adrenalectomy (RA) for adrenal tumor in children.

Methods: Medical records of all patients undergoing RA for solid adrenal tumor at our center from December, 2009 to August, 2015 were reviewed. Only relatively small adrenal tumors with well defined border, without encasement of the great vessels and without lymph node involvement on CT scan were selected for RA. All cases were operated by the same surgeon using lateral retroperitoneal approach.

Results: 23 patients were identified, 11 girls and 12 boys, with a median age of 5 years (range: 8 months to 14 years).

Oral Abstracts

Tumors were on the left side in 4 cases, on the right – in 19, with a median size of 4.2 cm (range: 3.0 to 9.0 cm). Three ports were used in 19 cases (82.6%) and 4 cases (17.4%) required an additional fourth port. RA completed successfully without conversion in 22 cases (95.6%) with minimal blood loss. The median operative time was 110 minutes (range: 70 to 220 minutes). Conversion to open surgery was needed in a case of 9cm pheochromocytoma due to bleeding. There was no perioperative death or major complication. Most patients resumed oral feeding within 24 hours after the operation. Pathology study showed neuroblastoma in 8 cases (34.8%, all were classified as low risk), ganglioneuroma in 7 cases (30.4%), pheochromocytoma in 4 cases (17.4%), ganglioneuroblastoma in 4 cases (17.4%). At a median follow up of 35 months (range 1 – 60 months), all patients were alive without recurrence.

Conclusions: RA for pediatric adrenal tumor is feasible and safe in carefully selected cases. This approach can give good results not only for benign tumors but also for some malignant tumors, including low risk neuroblastomas.

S103 A STUDY OF OPERATING TEAM USAGE OF VITOM IN PEDIATRIC SURGERY AND UROLOGY: APPLICATION OF THE TECHNOLOGY ACCEPTANCE MODEL Philip K Frykman, MD, PhD, MBA¹, Andrew L Freedman, MD¹, Timothy D Kane, MD², Zhi Cheng, MD¹, Mikael Petrosyan, MD², Kenneth Catchpole, PhD¹; ¹Cedars-Sinai Medical Center, ²Children's National Medical Center

INTRODUCTION: The Video Telescopic Monitor (VITOM®) – exoscope system is a unique technology that displays high-definition magnified images of open surgery on a video screen. The VITOM has been used in various surgical fields, although little information exists regarding how surgeons, surgical technologists, circulating nurses and residents view and accept this novel technology.

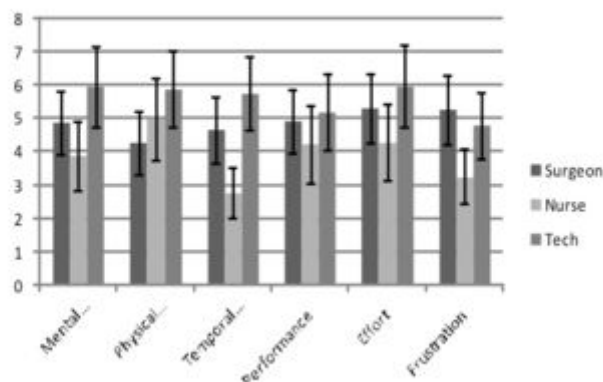
OBJECTIVE: To evaluate how operating room personnel interact with VITOM system for pediatric surgical and urological cases. The elements to be evaluated include perceptions of usefulness, image quality, ease of use, workload, and assessment of set up time.

METHODS: An IRB approved two-center study included four surgeons (two in each center), who performed operations utilizing the 90o VITOM II with the articulating stand in which the images were viewed on a 26-inch flat screen monitor. Participating OR personnel included: 7 surgical technologists, 7 circulating nurses and 13 surgical residents. All participants answered identical questionnaires with five questions regarding perceptions of VITOM usefulness and 8 components of image quality. The operating team (excluding residents) assessed workload using the NASA TLX. Metrics of VITOM system set up time and surgical time were recorded. Multi-variable linear regression was employed to model the relationships between team role, experience, and setup time.

RESULTS: Seventy VITOM operations were performed on a patient group with a median age 24 months (0.8-204 months), median weight 12.7 kg (2.33-71.8 kg), mean surgical time 1:32 ± 0:42. Subjective views of all team members towards VITOM were consistently positive, with 69-74% “agreeing” or “strongly agreeing” that VITOM improved anticipation, enhanced ability to perform job effectively, improved operation flow, improved the surgical process, and that they would want to see VITOM used in the future for similar cases. The surgical techs and circulating nurses generally agreed more strongly with the value and utility of VITOM, than surgeons and residents. Perceptions of image quality were universally high, with all groups with a mean score of 6.1 ± 1.0 (scale of 1- 7). Workload was satisfactory at less than 7 (scale 0-20) across all dimensions (Figure A).

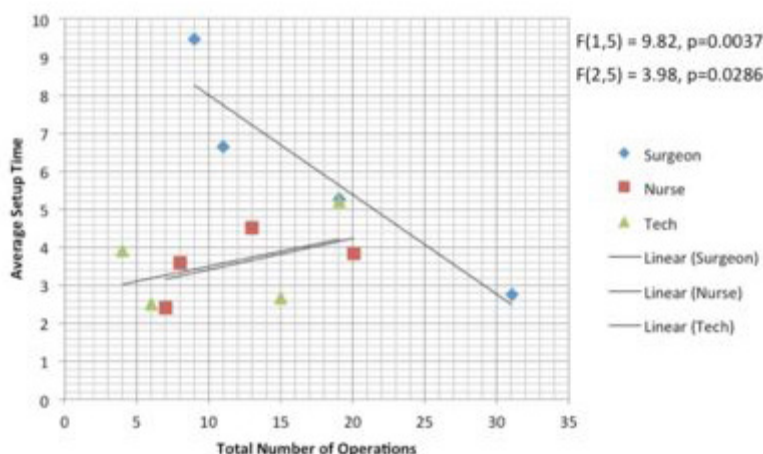
Oral Abstracts

Workload Ratings of OR Personnel NASA TLX



There are significant effects across different workload ratings between professional groups. In general, the surgical tech ratings are highest, and the nurse ratings lowest. When VITOM set up time was analyzed using a multi-variable model, we found that setup time was significantly affected by surgeon experience ($F(1,5) = 9.82, p=0.0037$) and by surgical tech experience ($F(2,5)=3.98, p=0.0286$), but not nurse experience ($p=0.59$) (Figure B).

Average Setup Time vs. Number of Operations



CONCLUSION: VITOM was perceived as having excellent image quality, which enhanced awareness and performance. This was especially true for scrub techs and circulating nurses who felt they benefitted from the VITOM images. Workload is weighted towards surgeon and tech, although in a satisfactory range. VITOM setup time is reduced with surgeon and tech experience. Clear effect of surgeon expertise in relationship to proportion of case time used for set up. The study suggests there may be small drawbacks associated with VITOM use, but these reduce with increased experience and benefit both the surgeon and operative team.

S104 TOWARD SAFER LAPAROSCOPIC INGUINAL HERNIA REPAIR: DEVELOPMENT OF NEW DEVICE AND EVALUATION OF THE EFFECTIVENESS Takaki Emrua¹, Noboru Oyachi¹, Takeyuki Suzuki¹, Hiroshi Ohta²; ¹Yamanashi Prefectural Central Hospital, ²Yamagata Prefectural Central Hospital

Background: During laparoscopic percutaneous extraperitoneal closure (LPEC), it is necessary to separate the spermatic ducts and testicular arteries from the peritoneum in boys, rendering the procedure more complex than that for girls. Because of the risk involved in performing this separation, some facilities limit this surgery to girls. To safely

separate the spermatic ducts and testicular arteries, we have developed a needle-shaped surgical instrument (E.Z Closure), which enables blunt separation. Here, we report the effectiveness of E.Z Closure.

New device: E.Z Closure is a ligature carrier consisting of (1) an inner tube (19-G blunt needle) through which slides a rod with a loop wire at the tip that can hold and open sutures and (2) an outer tube (17-G needle) with a cutting edge. This device enables blunt separation using the blunt-structured inner tube. In the LPEC method, all actions (stab, separate, and catch) required for closure of the hernia orifice using a thread are made possible through a simple small incision by switching between the inner tube, and the outer tube.

Subjects and methods: From 1/2013 to 9/2015, 100 boys with inguinal hernias were operated upon using the LPEC method; of these, E.Z Closure was used in 51 cases. We performed a comparative study of surgical results between cases (EC) in which E.Z Closure was used for surgery (EC) and cases in which the conventional device (LPEC needle) was used (LC).

Results: The average age at the time of surgery was 47 months for the EC Group and 41 months for the LC Group. The average duration of surgery was 31.1 minutes for the EC Group and 33.2 minutes for the LC Group. Neither group experienced complications during or after surgery.

Conclusion: Although further accumulation of cases and long-term follow-up are needed in the future, our findings suggest that new device (E.Z Closure) improves the LPEC procedure.

S105 MINIMALLY INVASIVE SURGERY FOR THE TREATMENT OF NEUROBLASTOMA WITHOUT IMAGE-DEFINED RISK FACTORS IN LOW-TO-HIGH-RISK PATIENTS Chiyoe Shiota, MD, Hiroo Uchida, MD, PhD, Akihide Tanano, MD, PhD, Akinari Hinoki, MD, PhD, Takahisa Tainaka, MD, PhD, Kzuki Yokota, MD, Oshima Kazuo, MD, Naruhiko Murase, MD, Ryo Shiotsuki, MD, Kousuke Chiba, MD; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

Introduction: Neuroblastoma is a common pediatric malignant solid tumor and is responsible for 15% of pediatric cancer deaths. Survival rate for high-risk patients has been historically poor, with fewer than 40% surviving 5 years. Depending on Children's Oncology Group Neuroblastoma Risk stratification, a combination of surgery, chemotherapy, and radiation therapy is used for treatment. Surgical resection is one part of the multidisciplinary approach to therapy, and it is important to minimize surgery-related complications to facilitate a prompt transition to subsequent treatments. Laparoscopic surgery is generally associated with reduced invasiveness and rapid recovery compared to laparotomy. There have been several reports that minimally invasive surgery (MIS) should be considered to resect neuroblastoma without image-defined risk factors (IDRFs). However, few reports have compared laparoscopic surgery and laparotomy for the resection of neuroblastoma without IDRFs. Thus, we compared both methods in IDRF negative patients, and investigated the feasibility of MIS.

Patients and Methods: All protocols were approved by the ethics review board at our hospital prior to this study. The medical records of patients who underwent resection of abdominal neuroblastoma in our department between August 2003 and April 2014 were retrospectively reviewed. To evaluate the effects of laparoscopic surgery we conducted a matched case-control study comparing neuroblastoma patients who underwent laparotomy with those who underwent laparoscopy. Members of the control group were individually matched for sex, gender, body weight and Kaup index. The following clinical factors were compared retrospectively: MYCN; VMA; HVA; NSE; largest tumor dimension; duration of surgery; volume of blood loss; interval to start of postoperative feeding and survival.

Results: Nine patients without IDRFs (3 low-to-mid-risk patients and 6 high-risk patients) underwent laparotomy, and 6 patients without IDRFs (2 low-to-mid-risk patients and 4 high-risk patients) underwent laparoscopy. Total resection was performed on all patients who underwent both laparotomy and laparoscopy, and there were no surgical complications. No significant differences in the expression of tumor makers or largest tumor dimension were apparent between the groups. Median duration of surgery was 221 min in the laparotomy group and 205 min ($P=0.45$) in the laparoscopy group. There was no significant difference in the median postoperative day of resumption of meal consumption between the laparotomy group (4 days) and the laparoscopy group (3 days). Median blood loss was signifi-

Oral Abstracts

cantly greater in the laparotomy group (5 ml/kg body weight) compared to the laparoscopy group (2.1 ml/kg body weight; $P=0.022$). There were no significant differences in 1-year progression-free survival (78% laparotomy group vs 100% laparoscopy group) or overall survival (67% laparotomy group vs 100% laparoscopy group (Table.1). Moreover, when considering high-risk patients specifically, apart from a significant difference in the amount of bleeding between the laparotomy and laparoscopy groups, no other significant differences were observed (Table.2).

Conclusion: While the limited number of cases and short-term observation period prevented investigation of long-term outcomes, MIS in the treatment of neuroblastoma without IDRFs in low-to-high-risk patients could be safe and feasible without compromising treatment outcome.

Table1. Comparing laparotomy to laparoscopy in the IDRF-negative patients

Risk	Laparotomy (n=6)		Laparoscopic surgery (n=6)		p
	Low/intermediate 3	High 3	Low/intermediate 2	High 4	
Age(month)	12(9-60)		27.5(10-51)		0.58
Sex	male 6		male 3		0.26
Body weight (Kg)	8.65(7.89-21.35)		11(10-14.8)		0.52
Kaup index	15.35(12.75-18.72)		15.55(11.90-18.31)		0.47
MYCN amplified	amplified + 2 single copy 2		amplified + 2 single copy 2		0.26
VMA	11.10(8-22.8)		10.65(2-29.5)		0.48
HVA	21(12.8-41.2)		25.7(11.2-67.8)		0.43
NSE	9.8(7.8-35.7)		19.2(4.1-26.4)		0.13
Largest tumor dimension (cm)	3.3(1.8-4.7)		4.5(2.8-8.7)		0.42
Follow up (month)	88(14-102)		135(-18)		0.002
Duration of surgery(min)	221(79-340)		205(148-286)		0.45
Loss of blood volume(ml/Kg)	6(1-22)		2.1(0.1-4.5)		0.022
Time to start postoperative feeding(days)	4(1-5)		3(1-5)		0.14
progression free survival(1 year)	78%		100%		0.49
overall survival(1 year)	67%		100%		0.23

Table2. Comparing laparotomy to laparoscopy in the IDRF-negative and high-risk patients

Risk	Laparotomy (n=6)		Laparoscopic surgery (n=4)		p
	Low/intermediate 3	High 3	Low/intermediate 2	High 4	
Age(month)	30(9-18)		27.5(23-51)		0.46
Sex	male 5		male 1		0.19
Largest tumor dimension (cm)	3(1.8-4.1)		4.5(2.8-5.0)		0.10
Duration of surgery(min)	244(79-340)		187(148-286)		0.85
Loss of blood volume(ml/Kg)	4.7(1.2-22)		1.3(0.1-4.5)		0.02
Time to start postoperative feeding(days)	4(1-5)		3(2-5)		0.14
progression free survival(1 year)	50%		100%		0.47
overall survival(1 year)	87%		100%		0.20

S106 3D LAPAROSCOPY IN NEONATES AND INFANTS Yury Kozlov¹, Konstantin Kovalkov², Vladimir Novozhilov³, Polina Baradieva⁴; ¹Irkutsk Municipal Pediatric Clinical Hospital, ²Kemerovo Clinical Pediatric Hospital, ³Irkutsk State Medical University, ⁴Irkutsk State Medical Academy of Continuing Education

Background: This study focuses on the successful application of 3D laparoscopic surgery in the treatment of congenital anomalies and acquired diseases in pediatric population. The purpose of this scientific work consists in highlighting the spectrum, indications, applicability, and effectiveness of 3D endosurgery in children.

Methods: Our experience based on experience of 110 endosurgical operations performed in neonates and infants in three-dimensional format between January 2014 and May 2015. Depending on type of operations all patients were divided into some groups:

- 1) inguinal herniorrhaphy (IH) — 63 patients;
- 2) Nissen fundoplication (NF) — 22 patients;
- 3) pyeloureteral anastomosis (PUA) — 15 patients;
- 4) nephrectomy — 5 patients;
- 5) ovarian cystectomy — 5 patients.

The patients of first three groups were compared with babies who underwent standard laparoscopic surgery, performed in two-dimensional format in same time period. The groups were opposed for patients demographics, operative report and postoperative parameters.

Results: The patients were similar in terms of demographics and others preoperative parameters. There were significant differences in mean operative time between 3D and 2D procedures in the groups of patients with hydronephrosis and gastroesophageal reflux, which was used manipulation with internal sutures (NF — 37,95 vs 48,42 min, $p=0.014$; PUA — 61,31 vs 78,75 min, $p=0.019$), but not in group after IH (IH — 15,88 vs 15,57 min, $p=0.681$). Postoperative parameters such as length of hospital stay and level of complications were equivalent between groups.

Conclusion: In this study we demonstrated a success of 3D laparoscopy at small babies with inguinal hernia, gastro-

esophageal reflux, hydronephrosis, ovarian cyst and multicystic kidney. Laparoscopy in three-dimensional format allows to reduce the duration of the complex operations, which are combined with the use of suture technique. The perception of depth and presence of tactile feedback makes 3D laparoscopic surgery more acceptable in comparison with traditional laparoscopy.

S107 SUBCUTANEOUS ENDOSCOPICALLY ASSISTED LIGATION (SEAL) USING MINIORT FOR REPAIR OF INGUINAL HERNIAS IN GIRLS Akinari Hinoki¹, Hiroo Uchida¹, Rie Ikeda², Akihide Tanano¹, Takahisa Tainaka¹, Chiyoe Shiota¹, Naruhiko Murase¹, Kazuki Yokota¹, Kazuo Oshima¹, Ryo Shiotsuki¹, Shigeki Takahashi²; ¹Department of Pediatric Surgery Nagoya University Graduate School of Medicine, ²Department of Pediatric Surgery Fukaya Red Cross Hospital

Background: There are numerous minimally invasive surgery techniques that can be used for pediatric inguinal hernias. Subcutaneous endoscopically assisted ligation (SEAL) is a novel technique in minimal access surgery for pediatric inguinal hernias. However, a high recurrence rate with the previous SEAL technique was the main concern with its use. To overcome this recurrence issue, we designed a new technique where we closed the hernia sac percutaneously, aided by a 5-mm laparoscope and a 2-mm miniport. Our SEAL technique has evolved and now includes the application of an external purse string suture around the hernia sac, without any division of the hernia sac. The purpose of this report is to introduce our modified SEAL technique for the treatment of inguinal hernia in girls.

Patients and methods: A total of 57 SEAL procedures were performed on 43 girls at Fukaya Red-Cross Hospital, Saitama, Japan (April 2014–October 2015). The diagnosis of an inguinal hernia was confirmed during a preoperative examination for each patient. The SEAL procedure was selected based on parental preference after informed consent was obtained. We analyzed the short-term outcomes of 43 girls who underwent the SEAL procedure. The main outcome measurements of this study included operative time, intra- and postoperative complications, and recurrence. This technique was performed using two ports (a 5-mm port placed using the open technique and an additional 2-mm miniport). A 5-mm laparoscope was inserted via the umbilicus. The miniport was introduced percutaneously in the inguinal region under laparoscopic guidance and manipulated around the medial or lateral hemi-circumference of the internal ring extraperitoneally to place a purse-string around the internal ring. The hernia sac and patent processus vaginalis were closed at the level of the internal inguinal ring extraperitoneally with circuit suturing using the 2-mm miniport. Only the umbilical fascia was closed with an absorbable suture. No skin sutures were applied. We collected data regarding operative time, complications, and recurrence.

RESULTS: 43 girls (mean age 5.7 ± 3.1 years; range 10–158 months) were identified for the report. A total of 57 procedures were performed, and the mean operative time was 20 ± 7 min (unilateral, $n = 29$) or 32 ± 9 min (bilateral, $n = 14$). With experience, the surgery time gradually decreased. The patients felt little pain after surgery, so most patients did not need painkiller, and no intraoperative complications associated with the procedure occurred. The cosmetic result was very good in all cases. There were no operative complications and there was no evidence of early recurrence.

Conclusions: Our data suggest that the SEAL using miniport is a safe and effective operative procedure compared with other laparoscopic percutaneous extraperitoneal closure procedures and produced excellent cosmetic results for inguinal hernias in girls. We think the SEAL using miniport renders the technique easier and safer by reducing chances of complications. The long-term follow-up of the SEAL using miniport is awaited.

S108 ENDOSCOPIC SACROCOCCYGEAL PILONIDAL SINUS TREATMENT IN PEDIATRICS João Moreira-Pinto, MD, Angélica Osório, MD, Sara Fernandes, MD, Jorge Correia-Pinto, MD; 1. Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga; 2. ICVS/3B's-PT Government Associate Laboratory, Braga/Guimarães, Portugal; 3. Pediatric Surgery Department, Hospital de Braga, Braga, Portugal.

Introduction and Aims: Many operative methods have been proposed for treatment of sacrococcygeal pilonidal sinus (SPS), but none had revealed excellent results. Recently, it was suggested a new Endoscopic Pilonidal Sinus Treatment (EPSiT) in adults with promising results. Briefly, using a 8° angled scope (Meinero fistuloscope, Karl Storz), the endoscopic technique visualizes the sinus cavity and its lateral trajets, removes all infected/necrotic tissue including any hair found inside the cyst. We present our experience with this technique in pediatric setting.

Methods: Twenty-four consecutives patients presenting with SPS were submitted to EPSiT, between February and

Oral Abstracts

August 2015. Demographic data and operative time were collected. Pain was assessed 24h postoperatively using a numeric scale (0-no pain to 10-very painful). Moreover, time off school, time sitting without pain, time for complete cicatrization and recurrence were analysed.

Results: Two patients were lost in the short follow up period and were excluded from our study (n=22). Median age of patients was 16 years old (range, 8 to 18 y). Four patients had one previous SPS open excision whereas one patient had two previous interventions. Median time for surgery was 30 minutes (range, 20 to 60'). All patients reported between 0 to 1/10 (pain score). Median time off school was 1 day (range, 1 to 5 days), median time to sitting without pain was 1 day (range, 0 to 7 days). Median time for complete cicatrization was 4 weeks (range, 1 to 7 wk). With a median follow-up of 18 weeks (range, 9 to 34 wk), we had two early recurrences (4 weeks after apparent complete cicatrization).

Conclusions: Our results are encouraging and suggest that this technique may offer better results concerning postoperative pain management, return to regular activity and scarring-associated complications.

S109 ASSESSING THE ADEQUACY OF ABSORBABLE BRAIDED SUTURE FOR LAPAROSCOPIC HIGH LIGATION IN RABBITS Nicholas E Bruns, MD¹, Domenic R Craner, BA¹, Ian C Glenn, MD¹, Neil L McNinch, MS, RN¹, Steve J Schomisch, PhD², Todd A Ponsky, MD¹; ¹Akron Children's Hospital, ²University Hospitals Case Medical Center

Purpose: Our previous work has demonstrated that intentional peritoneal injury maintains laparoscopic closure of a patent processus vaginalis even after removal of the suture. Therefore, due to the risk of suture granuloma formation, the necessity of permanent suture has been brought into question. The purpose of this study is to evaluate the efficacy of absorbable braided suture versus permanent braided suture for laparoscopic percutaneous ligation of the processus vaginalis with addition of peritoneal injury in a rabbit survival model.

Methods: Eighteen New Zealand White rabbits underwent bilateral subcutaneous endoscopically assisted ligation (SEAL) of the internal ring. Prior to SEAL, peritoneal injury was caused with endoscopic shears. Each animal was randomized to receive absorbable braided suture on one side and permanent braided suture on the other side. The rabbits were survived for eight weeks to allow for complete hydrolysis of the absorbable suture. Necropsy was performed during which the integrity of the repair was assessed with insufflation of CO₂ up to 30 mm Hg. McNemar's Test for Paired Data was performed for statistical analysis.

Results: Seventeen rabbits survived the eight weeks. One rabbit died in the early postoperative period due to urinary tract obstruction. After insufflation, 4 (24%) recurrences were present in the absorbable group and 2 (12%) recurrences were present in the permanent group. This difference was not statistically significant ($p = 0.50$). Both rabbits with a recurrence on the side with permanent suture also had a recurrence with absorbable suture on the contralateral side. In all rabbits, the permanent suture was identified while there was no visual evidence of absorbable suture.

Conclusions: A trend toward a higher recurrence rate with the use of absorbable braided suture was present, although, in this study, the finding was not statistically significant. Caution should be used when considering implementation of absorbable suture for laparoscopic inguinal hernia repair.

S110 LAPAROSCOPIC GROSS TOTAL RESECTION (LGTR) IN NEUROBLASTOMA Paula Flores, MD, Martin Cadario, MD, Yvonne Lenz, MD; Garrahan Hospital

Gross total resection (GTR) defined as removal of all visible and palpable neuroblastoma from the primary site and regional lymphatic nodes has shown to improve overall survival even in high-risk tumors. Several data revealed that vascular encasement does not preclude GTR with acceptable morbidity after neodyuvant therapy. According to the International Society of Paediatric Oncology European Neuroblastoma Group (ISPOENG) patients with image defined risk factors (IDRF) including major visceral arteries encasement are considered unresectable and neodyuvant chemotherapy is highly recommended. Laparoscopic GTR (LGTR) remains a feasible approach in selective cases. This study assesses the indications and complications of this technique.

Between 2009 and 2015, 14 LGTR were performed. All patients followed the European protocol. Tumors confined to the adrenal gland and with renal or iliac pedicle involvement were considered candidates for LGTR. Tumors with superior mesenteric artery, celiac axis or aorta encasement and those that crossed the midline were excluded. High risk categorized patients (n:4) according to biological and histological factors, which underwent LGTR, had tumors in the adrenal gland. Patients with LGTR and low risk factors did not receive additional therapy. Four patients in this group, presented renal vessels encasement and two had iliac vessel location. The global mean tumor volume was 29 cc. One of the patients with renal pedicle involvement underwent conversion, because of the adhesion of the artery to the tumor. This patient required nephrectomy a month later due to renal ischemia. Other two patients required open surgery, because of tumor bleeding in one case and inadequate vision in the other.

There were no operative or perioperative deaths. Follow-up period was 24 months with no local recurrence. One patient with high risk died because of systemic disease progression. The other 13 patients are alive with normal renal function and blood pressure.

Resectability has been reported to affect the incidence of tumor relapse even in high-risk patients. Laparoscopic adrenalectomy is widely accepted in neuroblastoma. On the other hand, preservation of the kidney and renal function is extremely important. Low risk categorized patients with LGTR and renal or iliac pedicle involvement did not receive additional therapy although the IDRF. Patients having a 360 renal artery encasement can also be candidates to LGTR. Dividing the tumor and sparing the renal vessels from the tumor may achieve complete resection. However, there are other aspects such as tumor consistency that is unpredictable and may determine conversion. The nephrectomy rate is related to this aspect and not to the surgical technique in our cohort. Laparoscopic approach remains an alternative even in the presence of vascular involvement.

S111 SURVEY ON ROBOT-ASSISTED SURGICAL TECHNIQUES UTILIZATION IN AMERICAN PEDIATRIC SURGERY FELLOWSHIPS Ilan I Maizlin, MD¹, Robert T Russell, MD, MPH¹, Michelle C Shroyer, MPH¹, David C Yu, MD², Colin A Martin, MD¹, Mike K Chen, MD¹; ¹Children's Hospital of Alabama, Department of Pediatric Surgery, University of Alabama at Birmingham, ²Department of Pediatric Surgery, Louisiana State University

Introduction: Robotic technology has grown rapidly and has had a transforming effect on both practice and education in many adult surgical subspecialties, but no standardized training guidelines in pediatric surgery exist. The purpose of our study is to assess the prevalence of robotic procedures and the extent of robotic surgery education in pediatric surgery fellowships.

Methods: An anonymous, web-based survey was designed to query utilization of the robot in pediatric surgery, perception of the utility of the robot, and incorporation of the robot in training of pediatric surgery fellows. All sections were composed of multiple-choice 5-point Likert scales, which were then analyzed using a Friedman test. The survey was sent to the program directors of all 47 Accreditation Council for Graduate Medical Education (ACGME) approved pediatric surgery fellowships in the United States.

Results: Forty-one of the 47 fellowship programs (87%) responded to the survey. While 67% of respondents indicated the presence of a robotic surgical system in their facility, only 26% reported utilizing the robot in their surgical practice. An additional 5% of respondents intend to introduce the surgical system in the near future. The most common robot-assisted surgeries were hepatobiliary (79%) and foregut (64%) procedures. Among programs not utilizing the robotic surgical system, the most common reasons provided were lack of clear supportive evidence (81% Agree or Strongly Agree), increased intraoperative time (80%), and incompatibility of instrument size to pediatric patients (79%). While 58% of program directors believe that there is a future role for robot-assisted minimally invasive surgery in children, only 18% indicated that robotic training should play an important part in pediatric surgery education. Two-thirds of attending surgeons reported that they have had some training in robot-assisted surgery (33% received robotic simulation, 36% proctor sessions, 31% formal didactic education, 28% animal laboratory and 21% self-directed reading). Only 28% of fellows receive robot-assisted training during their fellowship. Moreover, only 27% of fellows participate in live robotic-assisted procedures and only 24% operate the console. Twelve percent of fellowships are

currently researching the use of robotic-assisted surgical techniques in the pediatric population.

Conclusions: A majority of ACGME accredited fellowship training programs have access to a robotic surgical system within their hospital, but few utilize the technology in their current practice. Current barriers to utilization include lack of convincing supportive evidence, increased operative time, and lack of appropriate scaling of instruments. As such, further investigation is required into both the technology's potential benefits in the pediatric population and its role in pediatric surgery training.

S112 CLINICAL OUTCOME OF LAPAROSCOPIC SURGERY FOR NEUROBLASTOMA IN CHILDREN: A SINGLE-INSTITUTION EXPERIENCE. Ryota Souzaki, MD¹, Satoshi Obata, MD¹, Takahiro Jimbo, MD¹, Yoshiaki Kinoshita, MD¹, Makoto Hashizume, MD², Tomoaki Taguchi, MD²; ¹Department of Pediatric Surgery, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan, ²Department of Advance Medicine and Innovative Technology, Kyushu University Hospital, Fukuoka, Japan

Background: Laparoscopic surgery has become the standard procedure for treating most benign adrenal tumors. However, the evidence and indications are lacking with respect to laparoscopic resection of adrenal and retroperitoneal neuroblastoma (NBs) in children. The NBs have various tumor biology, size and metastasis. Surgeons must decide on the surgical procedures, including laparoscopic resection, according to the tumor location, tumor size, international neuroblastoma staging system (INSS) stage, image-defined risk factors (IDRF) and MYCN gene status in each case. The aim of this study was to describe our indications and our experience with laparoscopic surgery for NBs in children.

Methods: We applied laparoscopic surgery for eight NBs. Concerning our institutional indications for laparoscopic surgery, we performed total extirpation of NB with an Image Defined Risk Factor (IDRF) negative and biopsies of NBs with an IDRF-positive, regardless the tumor size and INSS stage. However, the cases with MYCN amplification if a tumor sample had been obtained previously, were performed laparotomy. In addition, the laparotomy was not performed through the abdominal wall during previous operation such as biopsy. If the tumor was too large to be removed via the umbilical port, we removed the lesion using a Pfannenstiel incision. We focused on early surgical outcomes.

Results: Four of the eight patients were male, with a mean age of 17.4 ± 12.3 months. Six of eight cases showed neuroblastoma and two of eight cases showed ganglioneuroblastoma. Regarding the primary site, seven of the eight cases were the adrenal glands and one case was the retroperitoneum. The mean tumor size was 4.6 ± 2.3 cm (1.8-8.6 cm). Two of eight cases were treated by preoperative chemotherapy and no cases treated by preoperative radiotherapy. All eight patients exhibited non-MYCN amplification. Four cases showed INSS stage1, one case showed stage 2A and stage 3, and two cases showed stage 4. We performed total extirpation of six tumors with IDRF-negative and biopsies of two tumors with IDRF-positive. The mean tumor size of extirpation cases was 4.0 ± 2.0 cm (1.8-6.0 cm). Three of the eight patients required a Pfannenstiel incision because the tumor was too large to remove from the port. The average surgical time was 164.8 ± 57.8 minutes. No cases required conversion to laparotomy or a blood transfusion. In addition, all eight patients resumed an oral intake on postoperative day 1. Four cases were performed postoperative chemotherapy. There were no episodes of recurrence, and the mean follow-up time was 21.5 ± 17.4 months.

Conclusions: Our laparoscopic surgical indications for NBs are appropriate in children with good outcomes.

S113 DIAGNOSTIC AND CURATIVE MINIMALLY INVASIVE SURGERY FOR PEDIATRIC ABDOMINAL TUMOR. Chaeyoun Oh, MD, Jung-Kee Yoon, MD, Ji-Won Han, MD, Hyun-Young Kim, MD, PhD, Sung-Eun Jung, MD, PhD; Department of Surgery, Seoul National University College of Medicine, Seoul, Korea

Background: Minimally invasive surgery (MIS) in pediatric patients has been increasing steadily in recent years. However it is still limited in use as compared to adults for abdominal tumor, in particular malignancy is a matter of debate. So we want to introduce a diagnostic and curative MIS for pediatric abdominal tumor.

Method: Retrospective study, and from January 2010 to August 2015 who underwent diagnostic or curative exploration for abdominal tumor were enrolled.

Oral Abstracts

Result: 32 Diagnostic explorations and 173 curative resections were performed. Among them, MIS was 11 cases (34.4%) and 38 cases (21.9%), respectively. Subject disease for MIS is a neuroblastoma (n=14), ovarian tumor (n=11), benign adrenal tumor (n=4), solid pseudopapillary tumor (n=3), lymphoma (n=3), lymphangioma (n=2), mature teratoma (n=2), germ cell tumor (n=2), rhabdomyosarcoma (n=2) and others (n=6). Three cases (27.2%) in the diagnostic MIS and 5 cases (13.1%) in the curative MIS had an conversion. Most common cause of conversion was a severe adhesion (5/8) due to previous surgical history. Curative operation for malignancy was performed a lot in open surgery group (OSG). (39.4% Vs. 80%, $p < 0.001$). OSG received a more blood fusion than MIS group during curative operation. (34.2% Vs. 58.5%, $p = 0.01$) Postoperative hospital day was shorten in MIS group after curative operation. (4.66 ± 2.36 Vs. 7.21 ± 5.09 , $p < 0.001$). The relapse rate after curative operation was lower in MIS group. (6.7% Vs. 35.1%, $p = 0.035$)

Conclusion: MIS is a feasible and effective for the diagnosis and curative operation of pediatric abdominal tumor. But still it seems that MIS is confined to a simpler case than open surgery. The role of MIS has yet to be defined in this study.

S114 LEARNING CURVES IN PAEDIATRIC MINIMALLY INVASIVE SURGERY: A SYSTEMATIC REVIEW OF THE LITERATURE AND A FRAMEWORK FOR REPORTING Alexander L Macdonald, Munther Haddad, Simon A Clarke; Chelsea and Westminster NHS Foundation Trust

Aims: There exists a learning curve (LC) with the adoption of any minimally invasive surgical (MIS) technique with implications for training, implementation and evaluation. A standardised approach to describing and analysing LCs in paediatric MIS is lacking. We sought to systematically review the literature to determine how paediatric MIS LCs are quantified and we present a framework for reporting.

Methods: Systematic search of the MEDLINE and EMBASE databases 1985-October 2015 for original English language articles describing MIS in the paediatric population and presenting formal analysis of the LC. Articles were screened by two independent reviewers. Quality assessment was undertaken on included articles utilising established criteria.

Results: 29 articles (n=17 general abdominal/thoracic surgery, n=12 urological surgery) from an 18 year period (1997-2015) were included representing 3345 procedures (n=3116 laparoscopic, n=10 thoracoscopic, n=219 robotic). 7 (24%) were prospective, 3 multi-centre. 22 (76%) presented data pertaining to >1 operating surgeon. Operative time was the most commonly employed surrogate of proficiency (n=26 [90%] studies). 20 (69%) studies described >1 LC outcome measure. 16 additional measures were described including; conversion (n=11 studies); blood loss (n=4 studies); complications (n=10 studies) and post-operative outcomes (n=14 studies). 3 studies assessed the impact of the LC on trainee involvement and 1 study considered the economic impact. LCs were presented in tabular form (n=14 studies) and graphically (n=19). 11 (38%) studies undertook statistical appraisal of LC utilising comparative statistics (n=8 studies) and regression analysis (n=4 studies). Study quality was found to be generally poor.

Conclusions: Multiple proxies of proficiency are employed in the reporting of paediatric MIS experience and analysis of LCs is inconsistent. A standardised multi-outcome approach to reporting MIS LCs along with graphical representation and statistical analysis should be encouraged. Additionally, attempts should be made to quantify the impact of LCs on trainee involvement. We present an idealised framework for reporting LCs in paediatric MIS.

Video Abstracts

V001 A MODIFICATION OF THE HEINEKE-MIKULICZ CONCEPT APPLIED TO CONGENITAL ANAL STENOSIS Taiwo A Lawal, MD, Carlos Reck, MD, Richard J Wood, Victoria A Lane, MBChB, Alessandra Gasior, MD, Karen Diefenbach, MD, Marc A Levitt, MD; Nationwide Children's Hospital, Columbus, Ohio, USA

Background/aim: Anal stenosis is a rarely seen type of anorectal malformation for which a variety of treatments have been described including cutback anoplasty, posterior sagittal anorectoplasty and a formal anoplasty, all done with or without colostomy, with in-patient stays and a significant anorectal dissection. The aim of this video is to demonstrate the use of an innovative and less invasive technique to treat congenital anal stenosis in a two-year-old boy.

Method: The patient presented with recurrent episodes of constipation and fecal impaction from birth. He was found on examination to have anal stenosis, with a 2 mm depth of narrowed area and healthy rectum more proximal to this. Under general anesthesia, he was positioned prone, traction silk stitches were placed on the anal skin circumference and radial incisions were made using cautery on the skin and adjoining mucosa, sequentially, at the 12, 3, 6 and 9 o'clock positions to release the stenosed ring. The resulting rhombus became a concentrically oriented line with a pull on the traction sutures, and this was then closed mucosa to skin.

Result: The patient's anal size went from a Hegar dilator size 9 to 16 immediately. The anal canal and dentate line were preserved, and no rectal mobilization was performed. The surgery lasted 12 minutes. He did well clinically and was discharged on the first postoperative day after passing normal stools.

Conclusion: The Heineke-Mikulicz technique can be adapted for management of congenital anal stenosis via a minimally invasive treatment that preserves the dentate line and anal canal, and is useful for narrow, skin level strictures. The technique has potential application to other thin strictures, such as those occurring post PSARP.

V002 PERORAL ENDOSCOPIC MYOTOMY FOR PEDIATRIC ACHALASIA: POEM TECHNIQUE Mikael Petrosyan, MD, Timothy D Kane, MD; Children's National Medical Center

Introduction: Per-oral endoscopic myotomy (POEM) has become an increasingly utilized approach for the initial therapy of esophageal achalasia in adults. The adoption of this operation in the pediatric age group has been slower but ought to be employed as first line therapy for pediatric achalasia as well. This video demonstrates the technique and steps for a POEM in a teenager with achalasia.

Case: An 18 year old girl with a past medical history of cloacal malformation had undergone a posterior sagittal anorectal vaginourethroplasty reconstruction and subsequent umbilical appendicostomy, at 9 months and 10 years of age, respectively. Since the age of 15 years, she had worsening dysphagia, regurgitation, retrosternal chest pain, and weight loss. She had findings of achalasia with lower esophageal sphincter (LES) spasm on both barium esophagram and esophageal high resolution manometry. LES pressure was over 30 mm Hg. She received Botox injections under endoscopy a total of 5 times since age 16, but her symptomatic relief was only lasting for about 3 months following those interventions. She was referred for Heller myotomy at 18 years of age. Her Eckardt score was 7 (normal < 2) and she had lost 5 kg in the preceding 6 months. She was deemed a candidate for POEM (especially since she had a trans umbilical appendicostomy).

A POEM procedure was done with a myotomy of 8 cm length (5 cm on esophagus; 3 cm on gastric aspect). The video demonstrates the 1) mucosotomy, 2) submucosal tunnel creation, 3) circular myotomy, and 4) mucosotomy closure. The procedure was completed in 92 minutes. There were no intraoperative complications. She underwent esophagram on post-operative day 1 which revealed no contrast leak and free flow of contrast across the gastroesophageal junction, as well as some intraperitoneal free air. She was started on a diet and discharged on post-op day 3 after resuming her bowel regimen. At 3 month follow-up, she was doing very well with an Eckardt score of 2, tolerating regular diet and only complaint was of recumbent heartburn which responds to antacids.

Conclusion: The POEM procedure as introduced by Haruhiro Inoue in 2008, is an innovative approach for achalasia. Its application in the pediatric population is feasible and should eventually be considered as first line therapy for achalasia as it has become for adults.

Video Abstracts

V003 LAPAROSCOPIC RIGHT HEPATECTOMY FOR HEPATOBLASTOMA IN A 25 MONTH GIRL Ya Gao, MD, Qiang Huang, MD, Wei Gong, MS, Weikong Pan, MD, Peng Li, MD, Baijun Zheng, MS, Xuanlin Wu, MS, Yitao Duan, BS; The Second Affiliated Hospital of Xi'an Jiaotong University School of Medicine

INTRODUCTION: Although adult laparoscopic liver resection (LLR) has been recognized as a safe and efficient approach since the Louisville Conference in 2008, limited experience on pediatric laparoscopic hepatectomy has reported at present. The first author has performed on LLR in 6 children of left lateral, left hepatectomy with various pathologies since 2006, 1 of S57 segmentectomy, and 2 of right hepatectomy with hepatoblastoma since 2013. Here, a case report of laparoscopic right hepatectomy for hepatoblastoma is presented.

CASE HISTORY: A 25 month girl diagnosed as hepatoblastoma was referred to our department in June 2015. A solid mass of 13X11X9cm was found in the right liver with AFP measuring 132965 ng/ml. The tumor was evaluated as non-resectable PRETEXT III hepatoblastoma on admission. After 3 cycle of chemotherapy with Cisplatin+Vincristine+5-FU, the size of mass was markedly reduced to 8X7X6.5 cm (PRETEXT II) and AFP decreased to 78818 ng/ml. Preoperative radiology studies showed clear tumor borders with no evidence of local infiltration. Other examination including liver function test revealed no remarkable except for a lower Hb of 92g/L.

SURGICAL TECHNIQUE: At June 25, laparoscopic hepatectomy was underwent. The patient was placed in a supine position with levated head and the author standed in the French position. A CO2 pneumoperitoneum was induced with Hansion technique and abdominal pressure was maintained at 12 mmHg. Four trocars were placed along an ideal semicircular line, with the concavity facing the right subcostal margin, and a 30 angled laparoscope was used. After cholecystectomy and preparation of Pringle maneuver was done, selective control of the right lobe vessels was achieved by dissecting, ligating or clipping the right hepatic artery, right portal vein, and 4 of hepatic short vein. The planned resection line was marked with diathermy. The peripheral parenchyma was transected with the harmonic scalpel, and the deep parenchyma with a microwave scalpel (Maintained at 75W, SurgiNeer M120, Beijing, China) caudalocephally. All large vascular vessels was controlled by clips or by ties in the case of a major vessel or biliary duct during transectioning the liver parenchyma. The right hepatic vein was lastly divided by application of a linear vascular endostapler. The specimen was extracted using a plastic retrieval bag through an enlarged trocar incision.

RESULT: The procedure was completed with an operative time of 385 min, and estimated bleeding of 200 ml (transfusion of 200 ml of RBC suspension). The postoperative course was uneventful except for a 3 weak bile leakage, which stopped spontaneously. The postoperative pathology revealed a CCG stage I hepatoblastoma (FH, Standard risk). In the end of Sept., her 3 cycle of postoperative chemotherapy was complete, and in follow-up examination showed her a normal development WITHOUT sign of recurrence.

CONCLUSION: Laparoscopic right hepatectomy is feasible and safely performed on in selected children with experience both in open and laparoscopic surgery. The caudal approach enhanced by clear anatomic landmarks (IVC, Cantlie line), seems optimal to lead to reduced morbidity and improved oncological outcome.

V004 INNOVATIVE TECHNIQUES SOLVE RESECTIVE COMPLICATIONS IN PECTUS EXCAVATUM C Millán, MD, G Bellía, MD, M Floria, MD, C Fraire, MD, F Rabinovich, MD, H Bignón, MD, L Toselli, MD, S Valverde, MD, C Abdenur, MD, M Martinez Ferro, MD; Fundación Hospitalaria, Private Children Hospital, Buenos Aires, Argentina

Introduction: Corrective surgeries of chest wall deformities can be classified as resective or non resective. Resective techniques remove malformed cartilage and preserve the perichondrium, so that, in time, the regenerated cartilage adds firmness to the unstable chest. Surgical complications such as recurrence, thoracic hypoplasia and lack of cartilage regeneration due to the injury or secondary necrosis of the perichondrium may occur.

The repair of the most serious relapses of open respective surgeries, associated with secondary necrosis of sternum, cartilage and skin represents a huge challenge.

Case Description: A 16 year-old boy with previous diagnosis of Pectus Excavatum treated at another institution with Ravitch surgery plus Harvard bar insertion visits our hospital due to several post-operative complications. Surgical

Video Abstracts

wound infection and necrosis of sternum, costal cartilages and anterior chest wall had precipitated another surgery for wound toilet and implant removal, to allow for secondary-intention healing.

A broad scar was present on the anterior chest wall. Heart beats were palpable and also visible. A CT scan 3D reconstruction evidenced sternum and multiple costal cartilage necrosis and Haller index of 3.37.

Surgical Technique: Thoracic, plastic and cardiovascular surgeons participated in subsequent surgical stages to accomplish the final thoracoplasty.

1) Nuss' Thoracoplasty: with the patient in supine position on the operating table, asepsis was performed from neck to suprapubic area, sterile fields were placed and the intervention field was completely covered with Ioban™. A 6 mm trocar with a 5 mm and 30° optical was introduced at the 7th intercostal level, on the mid-axillary line. 5 mmHg of CO₂ were used for controlled collapse of the lung. A vacuum bell, placed on the outer chest wall, was used to elevate the chest defect and minimize the risks of passing the introducer between the heart and the necrotic area. The introducer progressed smoothly, leading the course of the 14-inches, Biomet surgical steel Nuss bar through two lateral incisions. The bar was fixed bilaterally with polyamide material.

2) Positioning of the omental flap: complete dissection of the greater omentum was performed by laparoscopic surgery. The vascularized flap was externalized to the subcutaneous space, laid-out to fill the depressed area of necrotic subcutaneous tissue and, finally, secured with percutaneous traction stitches.

3) Partial resection of sternum, scar and excess omentum: the residual scar was excised, the protruding end of the sternum was removed and the external wound was covered with advancement flaps using separate 5/0 nylon stitches.

Results: All 3 stages elapsed free of complications, with a total hospital stay of 6 days. Complete repair of the chest wall was accomplished, resulting in increased protection of the heart but also in esthetic corrections of soft tissue and skin.

Conclusion: A step by step approach and a combination of innovative surgical techniques in the hands of a multidisciplinary team of surgeons is a safe and effective approach and can produce optimal esthetic and functional results even in extreme/severe complications of resective surgery of Pectus Excavatum.

V005 LEFT THORACOSCOPIC TWO-STAGE REPAIR OF TRACHEOESOPHAGEAL FISTULA WITH A RIGHT AORTIC ARCH AND A VASCULAR RING. Kazuo Oshima, MD, Hiroo Uchida, MD, PhD, Takahisa Tainaka, MD, PhD, Akihide Tanano, MD, PhD, Chiyoie Shiota, MD, Kazuki Yokoi, MD, Naruhiko Murase, MD, Ryo Shiotsuki, MD, Kosuke Chiba, MD, Akinari Hinoki, MD, PhD; Department of Pediatric Surgery, Nagoya University Graduate School of Medicine

Introduction: A right aortic arch (RAA) is found in 5% of neonates with esophageal atresia and tracheoesophageal fistulae (TEF) and is often associated with vascular rings. Their presence may require left-sided thoracoscopy as an operative approach. Here, we report a successful two-stage repair by left-sided thoracoscope of a patient showing TEF with an RAA and a vascular ring.

Case Report: After 37-week gestation, an infant was born by normal vaginal delivery with no fetal diagnosis, but with difficulty breathing on the first day of life and was subsequently intubated. A nasogastric tube could not proceed through the upper esophagus and chest X-rays revealed a potential TEF. Cardiac ultrasonography could not detect any cardiac abnormalities.

We performed an operation by right thoracoscope on the first day after birth and found an RAA and a right descending aorta. We changed the thoracoscopy to the left side. A substantial artery was found, forming a complete vascular ring. A proximal esophageal pouch was hemmed into the vascular ring. We planned a two-stage repair. We dissected the TEF and used simple internal traction in the upper and lower esophagus.

Video Abstracts

After the first operation, we examined the cardiac anomaly by three-dimensional reconstruction of computed tomography (3D-CT) and repeated cardiac ultrasonography. The substantial artery, which was the left patent ductus arteriosus (Lt-PDA), passed from the diverticulum of Kommerell to the left pulmonary artery and completed a vascular ring. The lumen of the Lt-PDA almost closed naturally.

At ten days old, we performed left thoracoscopic esophagoesophagostomy. The Lt-PDA was divided with suture clips. Using left-handed sutures, the surgeon easily performed the left thoracoscopic esophagoesophagostomy.

The infant showed no surgical complications. A postoperative fluoroscopic contrast examination indicated no anastomotic leakage or stenosis of the esophagus.

Discussion: An RAA with esophageal atresia and TEF may significantly complicate exposure and repair of the esophagus via the right side of the chest. The proximal esophageal pouch lies on the left side of the aortic arch, and the distal TEF lies to the left side of the descending aorta.

An RAA may be associated with a vascular ring that encircles the trachea and esophagus. There are two main types of RAA: (1) RAA with mirror image branching (59.3%), and (2) RAA with an aberrant left subclavian artery and left ductus arteriosus (39.9%). We found the vascular ring during the first operation without preoperative diagnosis, and planned to divide the vascular ring following further evaluation. If the vascular ring had been left intact at the time of esophagoesophagostomy, the patient could become symptomatic at a later date. Respiration and swallowing could be disrupted.

We conclude that left thoracoscopic repair could be more suitable than right thoracoscopic repair for TEF with an RAA, as left thoracoscopy is a more manageable treatment for vascular rings, should they occur. We propose that left-sided thoracoscopic anastomosis of the esophagus should be sutured by the left hand due to the angle of the needle-holder.

V006 THORACOSCOPIC RESECTION OF AN ECTOPIC MEDIASTINAL PARATHYROID ADENOMA UTILIZING A GAMMA PROBE AND INTRAOPERATIVE PTH MONITORING IN A CHILD Taizo Furukawa, MD, Shigehisa Fumino, Kohei Sakai, Mayumi Higashi, Shigeyoshi Aoi, Tatsuro Tajiri; Kyoto prefectural university of Medicine

We herein report a the case of 13-year-old years old boy treated for an ectopic mediastinal parathyroid adenoma with thoracoscopic surgery utilizing a gamma probe and intraoperative parathyroid hormone (PTH) monitoring. The patient had experienced repeated abdominal pain.

An abdominal CT scan showed right hydronephrosis and a right ureter stone. His serum calcium level was elevated at 12.9 mg/dl and intact parathyroid hormone PTH was also elevated at 124 pg/ml. He was referred to our hospital for further examination and treatment.

A 3D chest CT scan showed a high density nodule in the anterior mediastinum region. 99mTc-sestamibi SPECT scanning revealed an increased uptake in the same region. Therefore, we highly suspected mediastinal parathyroid adenoma. We selected thoracoscopic resection because of it is less invasive, uses a small incision and less results in less postoperative pain compared with sternotomy. Three ports were inserted, two 5.5 mm ports in the mid-axillary line in the 4th and 6th right intercostal space, and a 12 mm port for a gamma probe in the anterior axillary line in the 6th intercostal space. 370MBq 99mTc-sestamibi were was injected 2 hours preoperatively. Radioactivity The radioactivity was measured over several areas using a the gamma probe during surgery.

The count rate over the area suspected to be parathyroid adenoma was 100 cps.

However, the count rate over the surrounding tissue was 50 to 100 cps. We performed partial thymectomy resection because it was difficult to definitely precisely determine the localization of the parathyroid tissue.

The right lobe of the thymus including the area above the brachiocephalic vein and ascending aorta was resected.

Video Abstracts

After resection of the adenoma, the count rate over the residual thymus tissue decreased.

On the other hand Conversely, the count rate over the ex vivo resected tissue was 50 cps. Preoperative The preoperative intact PTH level was 154 pg/ml. 15 Approximately 15 minutes after resection of the adenoma, the intact PTH level significantly fell decreased down to 22 pg/ml. We confirmed complete resection of the mediastinal parathyroid adenoma. Postoperative The postoperative course was uneventful. Serum The patient's serum intact PTH level was maintained within the normal limits postoperatively.

In conclusion, Tthoracoscopic resection of an ectopic mediastinal parathyroid adenoma is minimally invasive and safe for the pediatric patients.

Intraoperative Furthermore, intraoperative PTH monitoring is useful to confirm complete resection of the parathyroid adenoma.

V007 THORACOSCOPIC REPAIR OF A RARE ESOPHAGEAL ATRESIA AND TRACHEOESOPHAGEAL FISTULA VARIANT (KLUTH SUBTYPE V5) Samir Pandya, MD, Shirley Hu, BS, Whitney McBride, MD; New York Medical College

Background: Thoracoscopic repair of esophageal atresia with tracheoesophageal fistula (EA/TEF) has been well established previously. This approach however, has not been frequently reported in a low birth weight (LBW) premature infant with unusual anatomic variants of this anomaly.

Methods and Materials: We present a case of a 1700g premature infant born hemodynamically stable without supplemental oxygen requirement but with increased oral secretions. A postnatal x-ray demonstrated the tip of the orogastric tube in the distal esophagus. A low-lying proximal pouch was confirmed on fluoroscopic contrast study. Intraoperative findings confirmed a common wall between the distal fistula and the long proximal pouch. This was consistent with a Kluth Subtype V5 anatomic variant of EA / TEF.

A proximal fistula and distal congenital esophageal stenosis was excluded with endoscopy, bronchoscopy and intra-operative fluoroscopy. Using a three-port technique, 3 mm thoracoscopy was performed. A common muscular wall was found between the proximal pouch and distal fistula. A thoracoscopic repair was completed with intracorporeal knot tying techniques.

Results: The postoperative course was unremarkable. There anastomosis was intact and at 12-month follow-up no dilations have been required.

Conclusions: Minimally invasive techniques can also be helpful in the management of rare anatomic variants of congenital anomalies in low birth weight infants.

V008 THORACOSCOPIC LEFT LOWER LOBECTOMY FOR TREATMENT OF INTRAPULMONARY SEQUESTRATION WITH ASSOCIATED CONGENITAL PULMONARY AIRWAY MALFORMATION (CPAM) AND BRONCHOGENIC CYST: SAFE EARLY INTERVENTION Stephen P Oh, MD¹, Daniel M Relles, MD², Gudrun Aspelund, MD², Iskander Bagautdinov¹, Steven S Rothenberg, MD³; ¹Weill Cornell Medicine, ²Morgan Stanley Children's Hospital, Columbia University Medical Center, ³Rocky Mountain Children's Hospital at Presbyterian/St. Luke's Medical Center

PURPOSE: This video demonstrates a step by step method for performing a thoracoscopic lobectomy in an infant with an intrapulmonary sequestration and concomitant congenital cystic lung malformations. The anterior approach with the use of the 3mm sealer and 5mm stapler facilitated safe removal of these lesions.

METHODS: A 4 month old female with a prenatally diagnosed left lower lobe lesion and one episode of a resolved respiratory infection underwent elective left lower lobectomy. The procedure was performed through 3 trocars, a 4mm port for the 30 degree 4mm telescope and two 3mm ports. One of the 3mm ports was changed to a 5mm port during the procedure to apply the 5mm stapler for the vessels, bronchus, and completion of the fissure.

Video Abstracts

RESULTS: The procedure took 110 minutes. There were no failed seals, no intraoperative bleeding, and no airleak postoperatively. The chest tube was removed on postoperative day 1 and the patient was discharged home on postoperative day 2. Pathology report confirmed lung lobe with sequestration and secondary changes of cystic pulmonary airway malformation.

CONCLUSIONS: Early thoracoscopic surgery can be safely performed with the anterior approach in patients with multiple congenital lung malformations and a history of respiratory infection. The 3mm sealer and 5mm stapler work efficiently and ergonomically in a small chest cavity, improving the ease of operation. This early approach promotes conservation of pulmonary parenchyma while decreasing the risk of postoperative thoracic musculoskeletal deformity.

V009 ROBOTIC HYSTERECTOMY AND MINIMALLY INVASIVE PSARP FOR CLOACA Erik R Barthel, MD, PhD, Paul J Kokorowski, MD, Kasper S Wang, MD, FACS, FAAP; Children's Hospital Los Angeles

Cloacal malformations present a challenge for planning of a staged repair. We present the case of a 2 year-old girl with a cloacal malformation including a common channel communicating via an atretic cervix to an enlarged uterus, to the rectum, and to the urinary tract. She had been diagnosed prenatally with hydronephrosis and given the finding of cloaca at birth, she had a diverting colostomy and mucus fistula constructed. Given poor urinary drainage and a very narrow connection between the common channel and the bladder, in the perinatal period she also had a suprapubic catheter placed, followed by a vesicostomy, to improve urinary drainage. Despite this, she still required a six-month period of peritoneal dialysis due to chronic renal insufficiency. At 8 months of age she also required a laparoscopic Nissen fundoplication and gastrostomy tube for reflux and failure to thrive. For the following 20 months she had normal bowel function, grew to the 38th percentile for weight by the time of the surgery described here, but her renal function declined to a creatinine of 4 requiring twice-weekly hemodialysis. The patient was then taken to the operating room for a robotic / laparoscopic assisted hysterectomy and takedown of rectovaginal fistula, with intracorporeal sutured repair of the vaginal pouch. We chose not to perform a traditional total urogenital mobilization given her lack of a cervix, with no prospect for fertility in the future. The procedure began with a cystoscopy that confirmed a short, narrow communication with the urinary tract, and no cervix was identified. The anal sphincter complex was identified with a Pena muscle stimulator and marked. After 4 robotic ports were placed, the hysterectomy was performed first, followed by identification of and dissection of the rectum with closure of the rectovaginal fistula. When the uterus was detached from the common channel, leaving an atretic vaginal pouch, the defects in the posterior wall that had been created by taking down the rectovaginal fistula and the hysterectomy were repaired via a robotic suturing technique. A posterior sagittal anorectoplasty (PSARP) was then performed by placing a Veress step trocar under direct robotic vision through the previously identified sphincter muscle complex, and using an endoscopic grasper to pass the freed distal rectum out of the trocar site. The rectum was then opened and secured to the anal verge in the standard fashion. Postoperatively, the patient had a mild ileus but this resolved with nasogastric decompression. The patient was started on clear liquids on postoperative day 6, her diet was advanced, and she was discharged on postoperative day 10. Six weeks out from surgery, she is tolerating dilations at 14 French and repeat contrast enema showed no recurrence of rectovaginal fistula. She will be scheduled for colostomy closure. The robotic approach in this case allowed for a combined genitourinary / colorectal procedure with the added benefit of a minimally invasive PSARP for the patient's anorectal malformation, and would be an excellent choice for properly selected patients.

V010 PERCUTANEOUS ENDOSCOPIC PLACEMENT OF GASTROJEJUNAL FEEDING TUBE: A NOVEL MODIFIED SELDINGER TECHNIQUE Maitham A Moslim, MD¹, Arathi Mohan², Federico G Seifarth, MD³; ¹Cleveland Clinic Foundation, ²Case Western Reserve University, ³Cleveland Clinic Children's Hospital

Introduction: Gastrojejunal feeding tube placement is a common pediatric surgical procedure which normally involves endoscopic placement of a transcutaneous guidewire or the tube directly into the small bowel. We describe a technique using a novel U-stitch for fixation of the gastric wall to the peritoneum and direct intubation of the pylorus with a dilator under endoscopic visualization. This technique omits the use of T-fasteners for gastric wall fixation and the sometimes technically demanding endoscopic guidance of a guidewire or GJ tube into the small bowel.

Operative Technique: The pediatric endoscope is advanced into the stomach and the stomach is insufflated with air.

Video Abstracts

Indentation and trans-illumination are verified. An 18-Gauge spinal needle with a #0 polydioxanone loop is advanced through the abdominal wall into the stomach. A second needle is introduced inferiorly. Through the second needle, a single #0 polydioxanone strand is advanced such that the loop snares the single strand. Retraction of the loop creates a U-stitch. A second U-stitch is placed medially in an identical fashion. Gentle traction is applied to the U-stitches to ensure direct apposition of the gastric wall to the peritoneum. In between the U-stitches a small longitudinal incision is made using the needle tip electrocautery. For gastric access, a placement kit containing a metal guidewire, an 18G needle, and dilators of sequential size is used. Seldinger technique is used to sequentially dilate a tract to 16 French. After removal of the guidewire, the tip of the dilator is advanced into the pylorus. For the intestinal placement we use a 0.038" Glidewire which is a hydrophilic coated J-tip guidewire. The Glidewire is advanced through the dilator into the small bowel under fluoroscopic guidance. While manually stabilizing the Glidewire in place, the dilator is retracted. Using Seldinger technique, the lubricated GJ tube is advanced over the Glidewire into the jejunum. This is done under live fluoroscopy. The Glidewire is removed and the U-stitches are tied around the GJ tube. The balloon is inflated with sterile water.

Conclusion: Percutaneous endoscopic gastrojejunostomy tube placement with U-stitch fixation and direct intubation of the pylorus with a dilator is a safe and efficient technique. It should be considered as an alternative for the standard endoscopic placement of a gastrojejunal tube.

V011 USEFULNESS OF THE ENSEAL® TISSUE SEALER DURING PULMONARY RESECTION IN A NEONATE WITH CONGENITAL PULMONARY AIRWAY MALFORMATION (CPAM) Atsuyuki Yamataka, Hiroshi Murakami, Junya Ishii, Manabu Okawada, Geoffrey Lane, Hiroyuki Koga; Department of Pediatric General & Urogenital Surgery, Juntendo University School of Medicine, Tokyo, Japan

Incomplete fissure is a major obstacle during pulmonary resection and various instruments such as bipolar/monopolar diathermy, Harmonic scalpel, Ligasure® and endoscopic staplers have been used for dividing the thick tissue in an incomplete fissure. Disadvantages encountered to date include endoscopic staplers being too big for neonatal thoracic cavities, bipolar/monopolar diathermy being associated with air leakage postoperatively and being ineffective if tissue is too thick, and Harmonic scalpel and Ligasure® being more effective for thin tissue and vessels with a tendency for lung tissue damage and air leakage as both require complete closure of opposing graspers before sealing commences. Enseal® Tissue Sealing devices seal tissue as the graspers of the device are gradually closed, resulting in little or no bleeding or air leakage as tissue is divided, irrespective of thickness.

Here, we report a right lower lobe (RLL) resection in a female neonate with congenital pulmonary airway malformation (CPAM) with incomplete fissure using an Enseal® device. Our case was diagnosed prenatally with CPAM in the RLL. She was born at 40 weeks gestation, weighing 3580g. After vaginal delivery, respiratory status was stable and computed tomography confirmed CPAM in the RLL. On day 21 of life, thoracoscopic lung resection was planned. She was placed in the left lateral position, anesthetized, prepped, and draped. One-lung ventilation was used. Four 5mm trocars were inserted; the initial trocar below the tip of the scapula in the posterior axillary line, and three trocars in the anterior axillary line, one each in the 4th, 6th, and 8th intercostal spaces, respectively. The anterior basal segmental artery usually located at the intersection of the oblique and horizontal fissures was exposed and dissection commenced carefully using Kelly forceps to create a tunnel into the posterior mediastinum underneath the lung tissue in the incomplete fissure. One grasper of the Enseal® device was inserted carefully into the tunnel to seal the thick tissue in the incomplete fissure between the upper and lower lobes and repeated to release the incomplete fissure without bleeding or air leakage, following which all pulmonary arteries in the RLL were clipped with hemolock clips proximally, sealed distally with a Ligasure® device and divided. There was no incomplete fissure between the middle and lower lobes. All pulmonary veins to the RLL were then exposed, clipped with hemolock clips proximally, sealed distally with a Ligasure® device and divided. Finally, the bronchi to the lower basal and lower superior segments were clipped separately with hemolock clips and divided, allowing the RLL to be excised in toto and removed through the initial trocar site after enlarging the initial trocar site (5mm) to 10mm. A drainage tube was inserted. Blood loss was less than 1mL. Operative time was 2 hours and 32 minutes. The postoperative course was uneventful. Our case was extubated on day 2 after surgery and ready to go home on day 3. Enseal® was extremely useful for dividing the thick lung tissue in the incomplete fissure without causing bleeding or air leakage.

Video Abstracts

V012 THORACOSCOPIC SEGMENTAL RUL RESECTION Anne C Kim, MD, MPH; Rainbow Babies and Children's Hospital

A 7 month old, 9.6kg male presented with a prenatally-diagnosed congenital pulmonary airway malformation (CPAM). After an unremarkable post-natal course, he was seen in follow-up and discussion was held about obtaining imaging in anticipation of resection. A computed tomography scan obtained for preoperative planning revealed a segmental lesion that was thought to be arising from the right lower lobe. The parents were therefore counseled on the risks and benefits of a segmental resection vs lobectomy, including the need for post-operative imaging for follow-up of a segmental resection. After discussion, they expressed a preference for attempting segmental resection and the patient was brought to the operating room for thoracoscopic segmental resection vs possible lobectomy.

Following induction of general anesthesia, the patient was positioned in left lateral decubitus position. A low mid-axillary 5mm port was placed for the thoracoscope and two stab incisions were created to triangulate on the major fissure, under direct visualization. Utilizing the 3mm JustRight sealer, dissection commenced with opening up the pleura and dividing the small vessels along the nearly complete major fissure. Once the fissure was divided, the remaining medial tissue was easily divided using two staple loads of the 5mm JustRight stapler. Though this approach did not identify the major bronchus to this segment, we preferred to avoid skeletonizing the tissue, in order to provide some heft to the staple line and minimize any risk of post-operative air leak. The staple line was then examined and a chest tube left in place until early on post-operative day 2. Once the chest tube was removed, he was discharged later that day.

His post-operative follow up was remarkable for the progression of some preoperative congestion into what was eventually diagnosed as a pneumonia. He had been examined several times preoperatively by both the pediatric surgeon and the anesthesiologist to ensure he did not have a true upper respiratory infection and mother was sure that the preoperative congestion was essentially his baseline. Following discharge, he was readmitted when he developed a fever and mild tachypnea with a worsening cough; chest x-ray showed some mild haziness of the right lung and he was treated empirically for a community-acquired pneumonia, with no sign of pneumothorax. His subsequent course was unremarkable and his respiratory symptoms resolved shortly thereafter.

With the aid of the smaller JustRight instruments, thoracoscopic segmental resection was successfully carried out with relative ease and expediency in this child.

V013 LOOK BEFORE YOU CUT: ANOMALOUS ARTERIAL SUPPLY TO A PULMONARY SEQUESTRATION Victoria K Pepper, MD, Karen A Diefenbach, MD; Nationwide Children's Hospital

Introduction: Bronchopulmonary sequestrations represent a small portion of congenital pulmonary malformations. In the majority of cases, the arterial blood supply arises from the descending thoracic aorta. However, the arterial supply may also arise from the abdominal aorta, intercostals, subclavian, innominate, internal thoracic, pericardiophrenic, celiac, or even the splenic artery. For this reason, vigilance is necessary when surgical management of these malformations is undertaken. We present as case of a 5-month-old female with a left lower lobe intralobar sequestration who was found at surgery to have multiple arterial vessels, including two branches that traversed the inferior pulmonary ligament from the abdominal aorta and three branches directly from the thoracic aorta.

Methods/Results: The patient was diagnosed prenatally, and at birth, was asymptomatic. She underwent computed tomography scan of the chest at 1 month of age prior to follow up in the office. This revealed a left lower lobe sequestration with 2 systemic feeding vessels from the abdominal aorta and venous drainage into the azygous vein. At 5 months of age, she underwent a thoracoscopic resection. When the chest was explored, the lesion was confirmed to be an intralobar lesion and the inferior pulmonary ligament was noted to contain two arterial vessels. Once these vessels were divided, three additional arterial branches were identified coming directly off of the thoracic aorta. In total, 5 anomalous vessels were isolated and divided using clips, endostapler, or vessel sealing device. The lobectomy was completed by dividing the pulmonary artery and vein to the left lower lobe. The bronchus was divided using a 5mm endostapler. Post-operatively, the patient's chest tube was removed on postoperative day one and she was discharged home that same day.

Video Abstracts

Conclusion: While vascular supply to pulmonary sequestrations typically arises from the thoracic aorta, care must be taken during dissection due to the potential for less common origins of blood supply.

V014 THORACOSCOPIC DRAINAGE OF LARGE POSTERIOR MEDIASTINAL ABSCESS AND RETRIEVAL OF INGESTED FOREIGN BODY AFTER ESOPHAGEAL PERFORATION Keith A Kuenzler, MD¹, Jason C Fisher, MD¹, Dare V Ajibade, MD², Luciana D Roman, APN²; ¹NYU Langone Medical Center and Hackensack University Medical Center, ²Hackensack University Medical Center

This video describes the case of a 12-year-old girl who accidentally ingested a shard of glass from a broken mayonnaise jar. She developed a large retropharyngeal abscess over the next 6 days which caused increasing difficulty with breathing and swallowing due to mass effect. Over this period, the abscess extended into the posterior mediastinum. The radiographs and CT scan images demonstrate the extent of the collection, as well as the foreign body. Via right thoracoscopy, we were able to widely open and drain the abscess, successfully retrieve the foreign body, and examine the thoracic esophagus. Despite a high cervical/pyriform sinus injury, the patient subsequently recovered well. Although the cervical extent of the abscess was initially well drained by way of the chest tube, the patient did subsequently require cervical drainage of a residual collection. Now 7 months postoperative, she is doing well, and is asymptomatic on a regular diet. We conclude that thoracoscopic techniques may successfully be used in children to drain mediastinal abscesses and retrieve ingested, extraesophageal foreign bodies. With these techniques, the avoidance of thoracotomy appears to assist in the pulmonary and overall recovery of these critically ill patients.

V015 MAGNAMOSIS: FIRST-IN-HUMAN PROCEDURE Claire E Graves, MD, Ryan Hsi, MD, Selma Masic, MD, Jill Imamura-Ching, RN, Marshall Stoller, MD, Michael R Harrison, MD, FACS; University of California, San Francisco

Introduction and Objective: Bowel anastomosis is a critical component of many pediatric surgical procedures. Currently, most anastomoses are hand-sewn. Though staplers are now commonplace in adult procedures, they remain often too large for use in infants and small children. Hand-sewn anastomoses are time-intensive, allow for human error, and leave suture material behind, which can impede healing and lead to inflammation and stricture. Magnamosis is a novel device for the creation of compression anastomosis consisting of two self-aligning, symmetric magnetic rings encased in a specially-engineered polycarbonate casing. The device's unique geometry creates a gradient of compression, which promotes necrosis and lumen formation centrally, while allowing for tissue remodeling and healing at the periphery. We have studied the device in over 70 pigs and 10 monkeys, all with excellent results, including burst pressures that were similar to or better than hand-sewn or stapled techniques. We have obtained an FDA Investigational Device Exemption to perform magnetic anastomosis in 10 human subjects to ensure safety and efficacy of the device, and we now report our experience with our first-in-human procedure.

Methods: We performed magnetic compression anastomosis with Magnamosis in a 28 year-old male with neurogenic bladder undergoing creation of a continent catheterizable ileal channel. The magnets were placed through ileal enterotomies, and the two ends of intestine were arranged in parallel for a side-to-side, functional end-to-end, isoperistaltic configuration. Our technique is further demonstrated in the accompanying video.

Results: The patient tolerated the procedure well with no adverse events, and his postoperative course was uneventful. His diet was advanced slowly until he tolerated regular food, and the magnet's passage was followed with serial abdominal x-rays.

Conclusions: We report the first-in-human application of the Magnamosis device for magnetic compression anastomosis. Though demonstrated here in open bowel anastomosis, the device has the ability to be deployed not only open, but also using laparoscopic, endoscopic, radiographic, or hybrid techniques in a variety of sizes. This scalable technology can be adapted to a variety of intra-luminal anastomoses, such as esophageal atresia repair, small bowel atresia, and stricture dilatation, and has wide-reaching implications for the future of minimally invasive pediatric surgery.

Video Abstracts

V016 LOW COST SIMULATION MODEL FOR TRAINING MIS REPAIR OF DUODENAL ATRESIA (DA) COMBINED WITH TELEMENTORING TECHNOLOGY. INITIAL ASSESMENT Maria M Bailez, MD, Maximiliano Maricic, MD, Juan J Aguilar, MD, Paula Flores, MD, Paula Losada, Roberto Debbag, MD, Pablo Schiavo, Technician; Garrahan Childrens Hospital Buenos Aires

Introduction .The use of MIS simulation models has been included into our residency program curricula and hands on courses since 2013. We have previously presented our low cost TEF esophageal atresia simulation model for training in IPEG 2013.

SAGES describes telementoring as a relationship, facilitated by telecommunication technology, in which an expert provides guidance to a less experienced learner from a remote location. MIS procedures are an ideal platform for real time transmission and thus applying telementoring for surgery . We started a project to look at the efficacy of telementoring starting with simulation.

The aim of this video is to present a low cost simulation model for training MIS repair of duodenal atresia and our first steps with combining telementoring technology.

Material and Methods :The base model was introduced into the abdominal cavity of a rubber doll that resembles a 3kg newborn . We use silicone finger covers and tubular latex balloons (as proximal and distal duodenum and bowel). The cost of materials was less than 50U\$. Video endoscopic equipment and 3mm instruments were used.We reproduced all steps of the procedure: dissection of the proximal pouch , finding the distal duodenum bellow the transverse mesocolon, opening of both blind duodenal ends and performance of a duodenoduodenal anastomosis .

We use a validation sheet to evaluate the performance; number of errors and type of injuries, quality of the anastomosis and time of practice.

The videocamara was connected with a videoconference equipment via internet under 1MB for telementoring

Two pediatric surgery fellows were mentored by 3 faculties with focus in both the use of the lens and performance of the correct steps to repair a DA. Both of them had previously attended a basic and advanced MIS hands on programs in our institution and developed skills for advanced suturing and working in small spaces .Mentors and mentees had a human and academic previous relationship . The development check list sheet was filled after consensus.

Results: The procedure was completed without injuries in 75 minutes.Interaction was successful without need to assist them in person .

Telementoring MIS simulation could assist in the provision of teaching advanced skills worldwide .

V017 TOTAL ABDOMINAL LAPAROSCOPIC COLLIS-NISSEN FUNDOPLICATION FOR THE TREATMENT OF ACQUIRED SHORT ESOPHAGUS IN CHILDREN. Carlos Garcia-Hernández, MD, Lourdes Carvajal Figueroa, MD, Sergio Landa Juarez, MD, Edmur Salinas-Hernández, MD; Universidad Nacional Autónoma de Mexico

Background: Esophageal shortening is an infrequent situation in pediatrics that can be related to gastro esophageal reflux as a cause of chronic inflammation, which can result in fibrosis. The aforesaid might affect the esophagus on a transmurally manner producing a scar that also generates stenosis and esophageal shortening. The surgical resolution of esophageal shortening must include reflux control and reestablishment of functionality that allows oral feeding. An alternative could also be a Collis gastropasty related to a Nissen fundoplication using laparoscopy. Reports in pediatric patients are scarce, Rothenberg published in 2010 a series of cases with esophageal atresia and recurring hiatal hernias that were treated successfully using this technique. The laparoscopic state of the art until now recommends the introduction of the stapler from the thorax or a circular stapler linked to the lineal on an abdominal approach.

Objective: Present the case of a pediatric patient with acquired short esophagus and severe peptic esophageal stenosis treated with the Collis-Nissen technique using an abdominal laparoscopic approach and a single linear stapler.

Video Abstracts

Clinical case: Patient is of male gender with 13 years old and no previous relevant medical history for this purpose. Patient presents disorder 12 months before admission to hospital with progressive dysphagia until oral feeding capability is lost. An esophagram showed the existence of severe esophageal stenosis with shortening and a hiatal hernia of the size of 3 vertebrae. Consequently, an endoscopy showed the existence of severe punctate esophageal stenosis. Thus, patient underwent a Collis-Nissen laparoscopic procedure that was performed using 4 ports, trans operator endoscopy assistance and esophageal dilatation. A hiatal dissection was practiced until the endoscope could be introduced to identify the esophageal union. A staple was placed with a linear stapler of 45 mm introduced through the superior abdomen, which created a neo esophagus that facilitated the placement of an intra-abdominal fundoplication. The patient evolved positively without further complications and oral feeding was possible five days after surgery with an adequate esophageal size and no reflux documented in a radiological and endoscopic study. Up to this point the Patient successfully continues with oral feeding after 12 months of follow up.

Conclusion: The total abdominal laparoscopic Collis-Nissen procedure is an effective, efficient and safe alternative for the treatment of acquired short esophagus in children that can be conducted using an abdominal approach with a single linear stapler.

V018 THORACOSCOPIC KIMURA, AN EXTREME TECHNIQUE. TECHNICAL DETAILS AND LESSONS LEARNED C Millán, MD, H Bignón, MD, F Rabinovich, MD, G Bellía, MD, L Toselli, MD, S Valverde, MD, C Abdenur, MD, M Martinez Ferro, MD; Fundación Hospitalaria, Private Children Hospital, Buenos Aires, Argentina

Introduction: Kimura's technique of sequential extra-/intra-thoracic elongation for the correction of long-gap esophageal atresia is used in selected cases with the purpose of preserving the native esophagus. The aim of this video is to share valuable technical details of this complex technique, which may be completed by thoracoscopy.

Clinical Case: Subject with type I esophageal atresia who underwent esophagostomy and gastrostomy on his second day of life. Two sequential extra-thoracic elongations of the proximal end were performed at 3 and 5 months old, respectively. The definitive anastomosis by thoracoscopy was scheduled at 8 months old.

A. Clearance of the elongated esophagus: Subject in supine position; an incision is made on the skin of the anterior chest wall exposing the entire esophagus; it is then mobilized to the level of the cricoid cartilage preserving the esophageal branch of the inferior thyroid artery and avoiding lesions of the recurrent laryngeal nerve. A space between the trachea and the spine is created by blunt maneuvers, by which the esophagus is brought to the upper portion of the posterior mediastinum.

B. Thoracoscopic Esophageal Anastomosis: The subject is rotated to prone position. Three trocars are placed: 6th intercostal space on the posterior axillary line, 10th intercostal space on the posterior axillary line, and 3rd intercostal space inside the axilla. Dissection and fulguration of the azygos vein is performed. The lower esophagus is identified and dissected from the surrounding tissues. A prevertebral tunnel is created from the neck by blunt maneuvers until the dissector is visualized entering the thorax through the right thoracic operculum. Traction sutures are placed in the proximal esophagus, which is reintroduced inside the chest. Distal and proximal ends were sectioned. Anastomosis with separate stitches of absorbable suture 5-0 is performed. Once the posterior side is sutured, a transanastomotic silicon probe is placed. Finally, the anterior side is completed with separate stitches. Pleural drainage for the anastomosis is placed.

Result: The subject showed favorable evolution, presenting early dehiscence of the anastomosis, which resolved spontaneously. He belatedly presented a moderate esophageal stenosis, which was managed with periodic expansions with balloon without affecting his enteral feeding.

Conclusion: Kimura's technique is an option for the treatment of selected cases of long-gap esophageal atresia. While correction by thoracoscopy is a safe, effective, and reproducible procedure, it requires that multiple technical details are implemented in order to achieve satisfactory outcomes.

Video Abstracts

V019 LAPAROSCOPIC RESECTION OF A PRENATALLY DIAGNOSED INTESTINAL DUPLICATION WITH INTRACORPOREAL STAPLED ANASTOMOSIS Sarah Lai, MD, Steven Rothenberg, MD; Rocky Mountain Hospital for Children

INTRO: A full term with with a prenatal diagnosis of an intra-abdominal cyst. Postnatally the baby was asymptomatic at birth but an abdominal ultrasound confirmed the presence of a 6 cm cyst, consistent with a intestinal duplication. The child was schedule for elective laparoscopic resection at 3 weeks of age and a weight of 3.5 Kg..

Method: The procedure was performed using 3 ports, a 4mm port in the umbilicus for a 4 mm 30 degree scope. A 3mm in the right mid quadrant and a 5mm in the left mid quadrant. The cyst was found in the proximal ileum. The bowel was divided proximally and distally with the 5 mm stapler. A sided to sided stapled anastomosis was then performed. The specimen was placed in specimen bag made from the finger of a sterile glove and was brought out through the 5 mm trocar site.

Results: The procedure was completed successfully laparoscopically. The procedure took 50 minutes. The patient was kept NPO for 24 hours and started on feeds POD #2. The patient was discharged on POD#3. There were no post-operative complications.

Conclusion: Total intracorporeal resection and anastomosis of intestinal lesions is safe and effective In neonates. Use of the 5 mm stapler eliminates intra-abdominal spillage of intestinal contents and shortens the operative time.

V020 SCARLESS RIB STITCH FOR LAPAROSCOPIC MORGAGNI HERNIA REPAIR Nicholas E Bruns, MD¹, Priya A Rajdev, MD², Aaron P Garrison, MD¹, Todd A Ponsky, MD¹, Avraham Schlager, MD¹; ¹Akron Children's Hospital, ²Emory University School of Medicine

Laparoscopic Morgagni hernia repair may leave unsightly "train-track" scars along the chest due to the necessary multiple consecutive rib stitches. We present a new method to secure the diaphragm to the rib in conjunction with the traditional technique that reduces the number of unattractive scars. This technique results in fixation of the diaphragm to the rib with a single needle hole in the skin and an intrathroacic knot, resulting in minimal scarring. Due to difficulty maintaining tension, this could be alternated with the traditional extracorporeal rib stitch.

V021 THORACOSCOPIC ASSISTED VENTRICULO-ATRIAL SHUNT PLACEMENT Samir Pandya, MD, Erwin Rusli, MD, Jennifer Ronecker, MD, Michael Tobias; New York Medical College

Background: Establishing internal, long term drainage of cerebrospinal fluid is essential in the successful management of children with significant hydrocephalus. In children with hostile abdomens, drainage into the right atrium has been well established. Thoracoscopic access to the right atrium (RA) has been a valuable technique in patients with thrombosis of the superior vena cava (SVC). This approach however, has not been previously reported in for the placement of a ventriculo-atrial shunt (VAS).

Methods and Materials: We present a case of a 10 month old ex-23 week premature infant with shunt dependant hydrocephalus. A history of multiple laparotomies had rendered the abdomen hostile and made an atrial necessary. The SVC was occluded by an intraluminal thrombus.

Percutaneous access to the SVC / RA junction was establish under thoracoscopic visualization. The shunt was then placed using the Seldinger technique.

Results: No chest tubes were required in the perioperative period and no injuries to the great vessels were incurred. The postoperative course was unremarkable. The shunt was patent at 6 month follow up.

Conclusions: Thoracoscopy is a valuable tool for difficult access to the SVC / RA. Combination of multiple modalities for vascular access is beneficial.

Video Abstracts

V022 LAPAROSCOPIC REPAIR OF TRAUMATIC DIAPHRAGMATIC AND VENTRAL HERNIAS Erol M Knott, DO, PhD, Katrina L Weaver, MD, David Juang, MD, Sohail R Shah, MD, Richard J Hendrickson, MD; Children's Mercy

A 17 month old male presented as one of five siblings involved in an motor vehicle collision. He was an unrestrained passenger ejected from the vehicle. There was a fatality on the scene. Initial exam and workup in the trauma bay was concerning for a left traumatic diaphragmatic hernia and an unclear injury to the right upper abdomen. We demonstrate laparoscopic repair of a left traumatic diaphragmatic hernia and an unusual right traumatic ventral hernia. We also demonstrate laparoscopic repair of an early recurrence of the ventral hernia using permachol mesh. The patient recovered from the operations well and was discharged home. He has been seen in follow up and has no evidence of recurrent hernia.

V023 LAPAROSCOPIC APPROACH FOR PREDUODENAL PORTAL VEIN AND COMMON BILE DUCT IN ASSOCIATION WITH INTESTINAL MALROTATION Juan I Bortagaray, MD, Gayathri Panabokke, MBBS, Peter Ferguson, MBBS, FRACS, Chris Kimber, MBBS, FRACS, FRCS, FAICD; Monash Children's

Introduction: A pre-duodenal portal vein (PDPV) is a rare congenital anomaly with a reported incidence in adults having biliary tract surgery of 3 in 1000. It can be isolated or coexist with other anomalies, such as intestinal malrotation (IM), polysplenia or heterotaxy. A preduodenal common bile duct (PDCBD) is an even rarer congenital anomaly. Symptomatic duodenal obstruction occurs in approximately 50% of patients due to the PDPV itself or its associated anomalies (IM, annular pancreas, duodenal web.) In most paediatric reports an open duodeno-duodenostomy has been performed. The authors present a video of a laparoscopic duodeno-duodenostomy and Ladd's procedure for a case of "Polysplenia Syndrome" with PDPV, PDCBD and IM

Material and Method: A premature infant (born at 27 weeks gestation) presented with failure to thrive secondary to feed intolerance and persistent non bilious vomits. An abdominal ultrasound was performed which excluded pyloric stenosis. An upper gastrointestinal contrast performed at 40 weeks of corrected age due to persistence of symptoms diagnosed intestinal malrotation.

A 3 port laparoscopic approach was performed (5mm umbilical and 3 mm ports on each flank). Intestinal malrotation was confirmed with absent Ladd's bands. The PDPV and PDCBD were identified on duodenal inspection. Since the emesis was always non bilious, the PDPV and the PDCBD were assumed as the cause of the duodenal obstruction. A laparoscopic duodeno-duodenostomy and Ladd's procedure were performed, bypassing the portal structures. Polysplenia was also identified at the operation.

Results: Operative time was 150 minutes with minimal blood loss. Oral feeds was resumed at 4 days postop with no further vomiting. The patient was discharged at postoperative day 14.

At 8 weeks review, patient was asymptomatic with good weight gain.

Conclusions: The authors present the first report of a laparoscopic duodeno-duodenostomy for PDPV and PDCBD in association with IM with good postoperative outcome. This rare cause of duodenal obstruction is important in the differential diagnosis when presented with feed intolerance and incomplete duodenal obstruction in order to prevent portal injury during dissection. PDPV might not be the cause of duodenal obstruction therefore a duodeno-duodenostomy is not always necessary. Longer follow-up is required to assess long term outcome.

V024 LAPAROSCOPIC IMPLANTATION OF DIAPHRAGMATIC PACING SYSTEM Daniel Solomon, MD, Saleem Islam, MD, MPH; University of Florida

This video describes the Laparoscopic Implantation of a Diaphragmatic Pacing System. The patient is a 5yo female with Pompe disease who had previously undergone failed diaphragmatic gene therapy. Prior to surgery she was completely ventilator dependant. Placement of the diaphragmatic pacer allowed her to be off her ventilator for 10-12 hours every day.

Video Abstracts

V025 TRANSRECTAL ENDOSCOPIC RESECTION OF A PRESACRAL MASS IN A TEENAGE GIRL Ben Tabak, MD, Carol M Harmon, MD, PhD, David H Rothstein, MD, MS; Department of Pediatric Surgery, Women & Children's Hospital of Buffalo and Department of Surgery, University at Buffalo, State University of New York

A 14 year old girl was found to have a 3 cm cystic presacral mass on computed tomography imaging obtained at a referring hospital during workup of upper abdominal pain. There were no other findings on CT scan and the pain resolved. After referral to our hospital for this incidental finding, the patient underwent pelvic MRI, which suggested no communication with the spinal canal. She underwent transrectal endoscopic removal of the mass without incident, using the Covidien triport device and CO2 insufflation. The patient was discharged the following day and returned to full activity without complaints within three days of the operation. The pathology revealed an epidermoid cyst. At two months follow-up the patient remained asymptomatic. Repeat pelvic MRI is planned for one year post-operatively. This is the first report of a transrectal approach to a presacral mass in a pediatric patient.

V026 LAPAROSCOPIC RECTOPEXY FOR A FULL THICKNESS RECTAL PROLAPSE IN AN EX-EXTREME PREMATURE INFANT. Juan Bortagaray, MD, Tom Clarnette, MBBS, MD, FRACS, Paeds, Ram M Nataraja, MBBS, BScHons, FRCSEd, PaedsSurg; Monash Children's Hospital

Aims: To demonstrate the technique of laparoscopic rectopexy which was performed for a full thickness rectal prolapse in an ex-26/40 neonate.

Methods: A 26/40 neonate with multiple sequelae of prematurity including chronic lung disease and pulmonary hypertension requiring ongoing therapy with Sildenafil, developed a full thickness rectal prolapse. Previous surgical interventions included bilateral inguinal herniotomies performed at metachronous times under spinal anaesthesia. The rectal prolapse had been managed conservatively as there was a reliance on high frequency ventilation. There was still a dependence on oxygen therapy at operation and he weighed 4kg from a birth weight of 814g. .

Results: At the time of operative intervention the rectal prolapse was 14cm in length and contained areas of ulcerated mucosa. The operation was completed in 30mins using 3mm instruments with a 5mm 30 degree laparoscope. Low insufflation pressures were used due to anaesthetic respiratory concerns. Laparoscopic reduction of the prolapsed was achieved combined with external pressure. Once fully reduced positions in the left iliac fossa were chosen for incisions to parachute non-absorbable sutures to the rectosigmoid. There was no recurrence at short-term follow up.

Conclusions: Laparoscopic rectopexy may be utilised for this rare condition of a full thickness rectal prolapse in an ex-extreme premature neonate. This is a quick and minimally invasive technique with low morbidity.

V027 NEW TECHNIQUE TO IDENTIFY THE EXACT LOCATION OF THE FISTULA IN PATIENTS WITH ANORECTAL MALFORMATIONS Cristobal A Adolfo Abello Munarriz, md, Msh; OCGN NORTH CLINC ORGANIZATION

Although the gold standard for the diagnosis of anorectal malformations (ARM) is the "Under Pressure Colostogram", we propose an alternative approach: "Video Urethrocystoscope Assited Distal Pneumocoloinsufflation". Our proposed approach enables the verification of the precise location of the fistula and a direct visual study of the anatomy. In a study of 13 patients with a variety of ARM and Cloaca, we found a 100% clinicopathologic correlation between endoscopic findings and PSARP.

Our proposed technique for the identification of the exact location and characteristic of the fistula in patients with anorectal malformations is an easy procedure to perform and the equipment necessary to perform it is generally available . This proposed approach offers certainty in the diagnosis of the location of the fistula for purposes of dissection and closure, particularly when there is uncertainty in the conventional colostogram results. Sometimes the underpressure colostogram has had false positive results for indetified if the fistula is to mebranous or prostatic urethra.

We propose the following denomination for this procedure: PNEUMO COLO INSUFFLATION WITH ENDOSCOPIC VIDEOASSISTANCE.

This procedure does not replace the under pressure colostogram and is just a complement than can be perform before start the PSARP. (1)

Video Abstracts

TRANSECTION OF THE COMMON HEPATIC DUCT DURING LAPAROSCOPIC CHOLECYSTECTOMY Takashi Sasaki¹, Ryuta Saka¹, Takaharu Oue¹, and Hiroomi Okuyama²; ¹Department of Pediatric Surgery, Hyogo College of Medicine, Hyogo, ²Department of Pediatric Surgery, Osaka University Graduate School of Medicine, Osaka, Japan

[Case]: 11-year-old girl with cerebral palsy

[Past history] She has previously undergone fundoplication and re-do fundoplication.

[Diagnosis] Acute gallstone cholecystitis

[Treatments] Initial conservative therapy was ineffectual. An emergent percutaneous trans-hepatic gall bladder drainage (PTGBD) was undertaken, and the infectious symptoms diminished quickly. After the evaluation by the radiographic contrast study of PTGBD, the laparoscopic cholecystectomy was conducted.

[Operation] We tried to identify and secure the dilated cystic duct from the common hepatic duct (CHD); however the dissection was not enough. When we tried to tape the cystic duct, both the cystic duct and the CHD had been taped in a lump by mistake because these two structures were firmly adhered in each other. Therefore when we attempted to remove the gall bladder, CHD was transected twice with the cystic duct. The immediate conversion laparotomy was undertaken, and the direct cholangiography showed that the CHD had been transected just below the confluence of the main hepatic ducts. The Rou-en Y reconstruction was performed, and she fully recovered and returned to the previous facility on 15 postoperative day.

[Conclusion] The suitable management policy for acute gallstone cholecystitis is still controversial. Open approach should be considered in such the severe inflammatory cases.

SERIOUS COMPLICATION: PUNCTURE OF THE SUPERIOR VENA CAVA DURING VIDEO-ASSISTED THORACOSCOPIC MEDIASTINAL TUMOR NEEDLE BIOPSY Michimasa Fujiogi¹, Yujiro Tanaka¹, Hiroshi Kawashima¹, Tetsuya Ishimaru², Keisuke Suzuki¹, Kyohei Miyakawa¹, Hizuru Amano¹, Kaori Morita¹, and Tadashi Iwanaka¹; ¹Department of Pediatric Surgery, Saitama Children's Medical Center, ²Department of Pediatric Surgery, The University of Tokyo Hospital

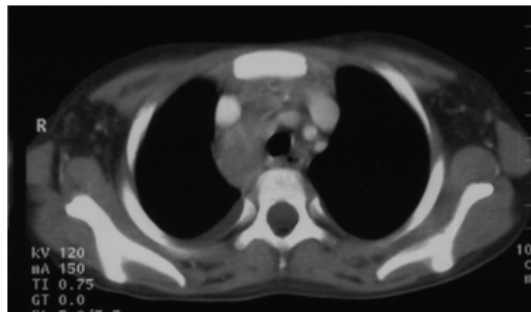
Introduction: In our hospital, video-assisted thoracoscopic tumor biopsy or needle biopsy is performed for mediastinal and intrathoracic tumors if there is no metastatic superficial lymph node or diagnosis cannot be achieved by biopsy of superficial metastatic lymph nodes. We encountered a case of accidental puncture of the superior vena cava, which was treated by thoracotomy.

Case report: A 7-year-old girl with high fever, pancytopenia, cervical lymphadenopathy, and splenomegaly was suspected of having a hemophagocytic syndrome and was treated with steroids and cyclosporine at another hospital. However, the treatment was not effective, and the patient was transferred to our hospital. Chest computed tomography showed a solid mass measuring approximately 4.5 × 2.5 cm between the superior vena cava and trachea. (Fig. 1a) Therefore, we performed video-assisted thoracoscopic mediastinal tumor needle biopsy for definitive diagnosis.

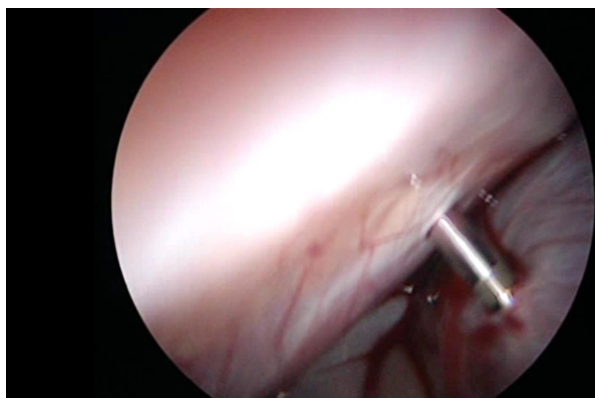
The procedure was performed in the left half lateral decubitus position using 2 ports and 1 puncture site. Artificial pneumothorax was maintained at 4 mmHg. The size of the biopsy needle was 16 G. The operator stood on the left side of the patient, opposite the camera operator. Although the thoracoscope was viewing the right thoracic cavity, the needle entered the right thoracic cavity outside the visual field and punctured the pericardium. (Fig. 1b) the thoracoscope did not show the needle until the needle had already punctured the pericardium. After the needle was removed, blood spouted out from the hole. (Fig. 1c) We tried a striction by forceps, but a striction was not effective and it caused hemorrhagic cardiac tamponade. Therefore, thoracotomy was performed to open the pericardium and remove the hematoma. At this time, hemostasis had already been obtained. Based on the puncture site, the superior vena cava was supposed to be punctured. The total amount of bleeding was 350 ml.

Video Abstracts

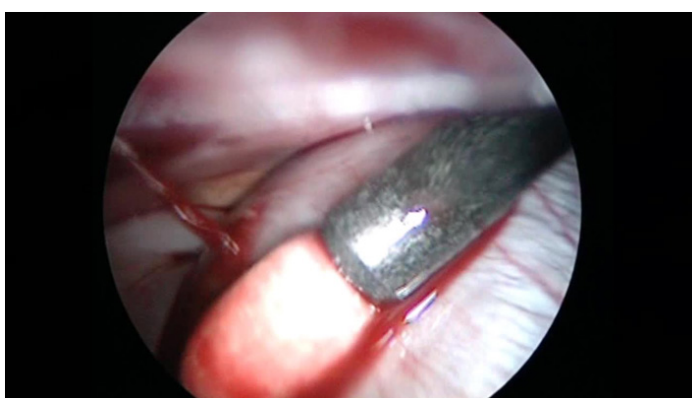
Discussion/Conclusion: This complication occurred because of puncturing the tumor under inappropriate surgical view, due to communication error between the operator and camera operator and by the mirror image seen by the camera operator. This case reaffirms the importance of cooperation between the operator and camera operator as part of the surgery team.



(Fig. 1)



(Fig. 2)



(Fig. 3)

OPTICAL TROCAR INSERTION AND THE NIGHTMARE Atsuyuki Yamataka, Go Miyano, Hiroyuki Koga, Manabu Okawada, Takashi Doi, Ryo Sueyoshi, Hiroki Nakamura, Shogo Seo, Hiroshi Murakami; Department of Pediatric Surgery, Juntendo University School of Medicine, Tokyo, Japan

Case 1: Lung injury during initial trocar insertion for thoracoscopic esophageal atresia (EA) repair. While inserting a 5mm optical trocar as the initial trocar just below the lower tip end of the scapula using a closed technique in a neonate with EA with tracheoesophageal fistula, the surgeon forgot to ask the anesthetist to cease mechanical ventilation and the lung expanded onto the tip of the trocar. Luckily, the injury was superficial and bleeding ceased readily and there was no air leakage when surgery was completed. It is mandatory for mechanical ventilation to be ceased during insertion of the initial trocar using a closed technique for thoracoscopy.

Case 2: Optical trocar penetration to the renal calices in the retroperitoneoscopic pyeloplasty for hydronephrosis. A 5mm incision was made at the initial access point where is below the costovertebral angle at the lateral border of the sacrospinalis muscle. A bladeless optical trocar was advanced directly into the retroperitoneal space under direct vision. After penetration of Scarpa's fascia, flank muscles, and the lumbosacral fascia can be visualized, then the presence of fat supposed to be characteristic of the retroperitoneal space. However, the view suddenly opens up, the watery space was spread, instead of fat tissue, and then we realized that the tip of optical trocar was accidentally penetrated thin renal parenchyma into renal calices. Fortunately, since there was no bleeding from the penetrated site without any suture repair required, the pyeloplasty was completed through the retroperitoneoscopic approach without conversion to open surgery. Additional care is required for an optical trocar insertion in retroperitoneoscopic approach, especially for high grade hydronephrosis with thin renal parenchyma.

Video Abstracts

DISLODGEEMENT OF THE VASCULAR CLIP DURING THORACOSCOPIC PULMONARY LEFT UPPER LOBE

SEGMENTECTOMY Atsuyuki Yamataka, Hiroyuki Koga, Manabu Okawada, Go Miyano, Takashi Doi, Ryo Sueyoshi, Hiroshi Murakami; Department of Pediatric Surgery Juntendo University School of Medicine, Tokyo, Japan

We report a case with hilar bleeding during thoracoscopic left upper lobe (LUL) segmentectomy (apical, posterior, and anterior segments; LULS). After dividing and clipping all arteries and all veins in preparation for LULS, an endoscopic stapler was gently applied to the bronchus of the LUL, fired, and withdrawn. LULS was successful, but slight bleeding from near the pulmonary hilum caused concern even though it could be controlled by compression with an endoscopic swab. A mini-thoracotomy was performed and one of the clips on a small branch of the pulmonary artery to the LUL was found to be dislodged. Another clip was applied to the small branch of the pulmonary artery proximal to the dislodged clip, which controlled the bleeding. Extremely careful usage of the endoscopic stapler is needed in pediatric small thoracic cavity.

DISCONNECTION OF THE ESOPHAGUS IN RECURRENT TRACHEOESOPHAGEAL FISTULA IS TROUBLE David C. van der Zee; Department of Pediatric Surgery, University Medical Center Utrecht, The Netherlands

A 9-month old girl was referred with disconnection of the esophagus after recurrent tracheoesophageal fistula. The proximal esophagus was led out in the left neck. There was no marking of the distal part of the proximal esophagus. The distal esophagus was led out as a gastrostomy, with no marking of the proximal end of the distal esophagus.

During thoracoscopic repair of the fistula the proximal part of the intrathoracic esophagus had to be completely dissected to find the proximal ending. The same was necessary in order to find the distal end, leaving an almost completely devascularized esophagus. The esophagus ultimately survived, but the surgery took 23 hours.

There is general consensus that the native esophagus should be preserved if ever possible.

If a complication occurs after repair of esophageal atresia that the department can't cope with, the patient should be referred to a center of expertise with a nasogastric tube and an adjacent Replogle tube to prevent overflow to the trachea, if necessary. Disconnection of the esophagus should be prevented at all cost.

PERFORATION OF THE PROXIMAL POUCH IN ESOPHAGEAL ATRESIA David C. van der Zee; Dept. Pediatric Surgery, University Medical Center Utrecht, The Netherlands

A patient with long gap esophageal atresia was operated to attach traction sutures for thoracoscopic elongation. During dissection of the proximal esophagus and closure of the proximal fistula the anesthesiologist pushed too hard on the Replogle tube and perforated the proximal pouch.

The lesson is not to have the anesthesiologist push too hard but make him look at the screen while applying pressure so he is aware of what he is doing.

The perforation was oversewn and traction sutures were applied. After two days a NICU nurse changed the plasters from the intubation tube and inadvertently advanced the Replogle tube and perforated the proximal pouch again. Due to suspected contamination the traction technique was abandoned and a gastric pull-up was performed.

The lesson is not to replace the Replogle tube too deep after a perforation has occurred to avoid new damage.

