<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAPS HANDBOOK</td>
<td></td>
</tr>
<tr>
<td>PAPS Board of Directors</td>
<td>6</td>
</tr>
<tr>
<td>Committees</td>
<td>6</td>
</tr>
<tr>
<td>Past Officers</td>
<td>7</td>
</tr>
<tr>
<td>Honorary Members</td>
<td>8</td>
</tr>
<tr>
<td>New Members</td>
<td>8</td>
</tr>
<tr>
<td>Future Meetings</td>
<td>9</td>
</tr>
<tr>
<td>Past Meeting and Local Organizing Chairs</td>
<td>9</td>
</tr>
<tr>
<td>GANS Memorial Lecture</td>
<td>10</td>
</tr>
<tr>
<td>M. James Warden Guest Program Participants</td>
<td>10</td>
</tr>
<tr>
<td>PAPS Artifacts</td>
<td>11</td>
</tr>
<tr>
<td>PAPS 2014 – BANFF, ALBERTA</td>
<td></td>
</tr>
<tr>
<td>Conference Information</td>
<td>18</td>
</tr>
<tr>
<td>General Information</td>
<td>19</td>
</tr>
<tr>
<td>Business Meetings</td>
<td>19</td>
</tr>
<tr>
<td>Poster Display</td>
<td>19</td>
</tr>
<tr>
<td>GANS Memorial Lecture</td>
<td>20</td>
</tr>
<tr>
<td>Social Program Information</td>
<td>21</td>
</tr>
<tr>
<td>Maps: Hotel &amp; Conference Centre</td>
<td>23</td>
</tr>
<tr>
<td>PROGRAM AT A GLANCE</td>
<td></td>
</tr>
<tr>
<td>Conference Program</td>
<td>28</td>
</tr>
<tr>
<td>SCIENTIFIC PROGRAM &amp; ABSTRACTS</td>
<td></td>
</tr>
<tr>
<td>Scientific General Program</td>
<td>32</td>
</tr>
<tr>
<td>Oral Presentations: Abstracts</td>
<td>40</td>
</tr>
<tr>
<td>Poster Presentations I: Abstracts</td>
<td>85</td>
</tr>
<tr>
<td>Poster Presentations II: Abstracts</td>
<td>103</td>
</tr>
</tbody>
</table>
Pacific Association of Pediatric Surgeons – Board of Directors

The members of the Board of Directors are Present Officers, Delegates and the Immediate Past President:

**PRESIDENT**
John Hutson

**PRESIDENT-ELECT**
Hiroaki Kitagawa

**IMMEDIATE PAST PRESIDENT**
Kevin Lally

**SECRETARY**
Walter J. Chwals

**TREASURER**
David Tuggle

**ARCHIVIST**
Marilyn Butler

**GAP COMMITTEE CHAIRPERSON**
Cynthia Reyes

### Board of Directors

- Ralph Cohen, *Australia*
- Andrew Holland, *Australia*
- John Hutson, *Australia*
- Robin Eccles, *Canada*
- Tadashi Iwanaka, *Japan*
- Hiroaki Kitagawa, *Japan*
- Atsuyuki Yamataka, *Japan*
- Mario Riqueleme Heras, *Mexico*
- Paul Tam, *PR China*
- Hong-Shiee Lai, *Taiwan, ROC*
- Jin-Yao Lai, *Taiwan, ROC*
- Anna Shapkina, *Russia* (Member at Large)
- Jeong-Meen Seo, *South Korea*
- Marilyn Butler, *USA*
- Donald Moore, *USA*
- Eric Scaife, *USA*

### Committee Chairs

- Mark Holterman, *USA* (Scientific Program Chair)
- Andrew Holland, *Australia* (Publications Chair)
- Cynthia Reyes, *USA*, (GAP Chair)

### PAPS Publication Committee Members 2014

- Andrew J. A. Holland *Chair*
- Kenneth K. Y. Wong *Vice-Chair*
- Arturo Aranda
- Dave Bliss
- Mary Brindle
- Ralph Cohen
- Osamu Kimura
- Masayuki Kubota
- Tsao Kuo-Jen
- Tatsuo Kuroda
- Chinsu Liu
- Kouji Masumoto
- Don Moores
- David Partrick
- Michael Rollins
- Eric Scaife
- Roman Sydorak
- Eric Webber
## Past Officers

### PRESIDENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephen L. Gans</td>
<td>1969–70</td>
</tr>
<tr>
<td>John K. Stevenson</td>
<td>1970–71</td>
</tr>
<tr>
<td>Alexander H. Bill Jr.</td>
<td>1971–72</td>
</tr>
<tr>
<td>Keijiro Suruga</td>
<td>1972–73</td>
</tr>
<tr>
<td>Nate A. Myers</td>
<td>1973–74</td>
</tr>
<tr>
<td>Jens G. Rosenkrantz</td>
<td>1974–75</td>
</tr>
<tr>
<td>Murray R. Kliman</td>
<td>1975–76</td>
</tr>
<tr>
<td>Daniel M. Hays</td>
<td>1976–77</td>
</tr>
<tr>
<td>Takashi Ueda</td>
<td>1977–78</td>
</tr>
<tr>
<td>Joaquin C. Azpiroz</td>
<td>1978–79</td>
</tr>
<tr>
<td>Douglas Cohen</td>
<td>1979–80</td>
</tr>
<tr>
<td>Walton K. T. Shim</td>
<td>1980–81</td>
</tr>
<tr>
<td>Graham C. Fraser</td>
<td>1981–82</td>
</tr>
<tr>
<td>Keiichi Ikeda</td>
<td>1982–83</td>
</tr>
<tr>
<td>Eric W. Fonkalsrud</td>
<td>1983–84</td>
</tr>
<tr>
<td>E. Durham Smith</td>
<td>1984–85</td>
</tr>
<tr>
<td>Rodolfo Franco-Vasquez</td>
<td>1985–86</td>
</tr>
<tr>
<td>Chadwick F. Baxter</td>
<td>1986–87</td>
</tr>
<tr>
<td>Wen-Tsung Hung</td>
<td>1987–88</td>
</tr>
<tr>
<td>John R. Campbell</td>
<td>1988–89</td>
</tr>
<tr>
<td>R. Stuart Ferguson</td>
<td>1989–90</td>
</tr>
<tr>
<td>Dale G. Johnson</td>
<td>1990–91</td>
</tr>
<tr>
<td>Morton M. Woolley</td>
<td>1991–92</td>
</tr>
<tr>
<td>Martin J. Glasson</td>
<td>1992–93</td>
</tr>
<tr>
<td>Hiroshi Akiyama</td>
<td>1993–94</td>
</tr>
<tr>
<td>Giovanni Porras-Ramirez</td>
<td>1994–95</td>
</tr>
<tr>
<td>Takahiro Ito</td>
<td>1995–96</td>
</tr>
<tr>
<td>Htut Saing</td>
<td>1997–98</td>
</tr>
<tr>
<td>Philip A. King</td>
<td>1998–99</td>
</tr>
<tr>
<td>Marvin W. Harrison</td>
<td>1999–2000</td>
</tr>
<tr>
<td>Takeshi Miyano</td>
<td>2000–01</td>
</tr>
<tr>
<td>James B. Atkinson</td>
<td>2000–02</td>
</tr>
<tr>
<td>Rosslyn Walker</td>
<td>2002–03</td>
</tr>
<tr>
<td>Eui-Ho Hwang</td>
<td>2003–04</td>
</tr>
<tr>
<td>Stephen G. Jolley</td>
<td>2004–05</td>
</tr>
<tr>
<td>Jer-Nan-Lin</td>
<td>2005–06</td>
</tr>
<tr>
<td>Kevin C. Pringle</td>
<td>2006–07</td>
</tr>
<tr>
<td>Richard E. Black</td>
<td>2007–08</td>
</tr>
<tr>
<td>Paul K. H. Tam</td>
<td>2008–09</td>
</tr>
<tr>
<td>Naomi Iwai</td>
<td>2009–10</td>
</tr>
<tr>
<td>Harry Applebaum</td>
<td>2010–11</td>
</tr>
<tr>
<td>Ralph Cohen</td>
<td>2011–12</td>
</tr>
<tr>
<td>Kevin Lally</td>
<td>2012–13</td>
</tr>
</tbody>
</table>

### SECRETARIES

<table>
<thead>
<tr>
<th>Name</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jens G. Rosenkrantz</td>
<td>1969–71</td>
</tr>
<tr>
<td>John R. Campbell</td>
<td>1971–73</td>
</tr>
<tr>
<td>Edwards A. Free</td>
<td>1973–75</td>
</tr>
<tr>
<td>George A. Hyde</td>
<td>1975–77</td>
</tr>
<tr>
<td>Walton K. T. Shim</td>
<td>1977–79</td>
</tr>
<tr>
<td>Peter A. De Vries</td>
<td>1979–82</td>
</tr>
<tr>
<td>William C. Bailey</td>
<td>1982–85</td>
</tr>
<tr>
<td>Dale G. Johnson</td>
<td>1985–88</td>
</tr>
<tr>
<td>John C. German</td>
<td>1988–91</td>
</tr>
<tr>
<td>Marvin W. Harrison</td>
<td>1995–99</td>
</tr>
<tr>
<td>Robert S. Sawin</td>
<td>2001–04</td>
</tr>
<tr>
<td>Harry Applebaum</td>
<td>2004–09</td>
</tr>
<tr>
<td>Walter J. Chwals</td>
<td>2009–present</td>
</tr>
</tbody>
</table>
TREASURERS
Eric W. Fonkalsrud 1969–70
Alfred A. de Lorimer 1970–72
Daniel M. Hays 1972–74
David L. Collins 1974–77
Ernest B. Haws 1977–84
David Hodge 1984–85
Ann M. Kosloske 1985–90
Marvin W. Harrison 1990–95
Dale G. Hall 1995–99
James B. Atkinson 1999–01
Richard E. Black 2001–07
Kevin P. Lally 2007–12
David Tuggle 2012–present

ARCHIVISTS
Nate A. Myers 1987–92
Alan Woodward 1992–2011
Marilyn Butler 2011–present

M. JAMES WARDEN GUEST ASSISTANCE PROGRAM CHAIRS
M. James Warden 1987–99
Phillip A. King 1999–04
Cynthia Reyes 2004–present

Honorary Members
Herbert E. Coe
Sir Kenneth Fraser
T. Y. Nelson
Tamotsu Fukuda
William P. Longmire Jr.
Jesus Lozoya-Solis
Joseph Steigrad
F. Douglas Stephens
Ovar Swenson
Osamu Wakabayashi
Jin-she Zhang
Jay L. Grosfeld

New Members
Ashish V. Jiwane, Australia
Neil R. Price, Australia
Cheng-hao Chen, China
Wei Chen, China
Yongwei Chen, China
Kiuran Dong, China
Weihong Guo, China
Long Li, China
Minglei Li, China
Yingzi Li, China
Tingting Liu, China
Hong-Xia Ren, China
Hongcheng Song, China
Bin Wang, China
Jian Wang, China
Wei Yang, China
Qi Zeng, China
Jianghua Zhan, China
Chonggao Zhou, China
Hau Yee Ivy Chan, Hong Kong
Ho Yu Patrick Chung, Hong Kong
Vidmantas Barauskas, Lithuania
David E. Skarda, USA
Daniel A. DeUgarte, USA
Eunice Yuee-Dean Huang, USA
Romeo C. Ignacio, Jr., USA
Future Meetings

<table>
<thead>
<tr>
<th>Year</th>
<th>Month, Date</th>
<th>City, Country/Region</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>May 17–21</td>
<td>Jeju Island, Korea</td>
<td>Seong-Cheol Lee</td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td>Honolulu, Hawai, USA</td>
<td>David Puopong</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td>Seattle, Washington, USA</td>
<td></td>
</tr>
</tbody>
</table>

Past Meetings and Local Organizing Chairs

<table>
<thead>
<tr>
<th>Year</th>
<th>City, Country/Region</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>Founders organizing meeting.</td>
<td>Alexander H. Bill, Orcas Island, WA, USA</td>
</tr>
<tr>
<td>1969</td>
<td>Ojai, CA, USA</td>
<td>Stephen L. Gans, Eric W. Fonkalsrud, Dan Hayes</td>
</tr>
<tr>
<td>1970</td>
<td>Melbourne, VIC, Australia</td>
<td>Nate Myers</td>
</tr>
<tr>
<td>1971</td>
<td>Harrison Hot Springs, BC, Canada</td>
<td>Phillip G. Ashmore</td>
</tr>
<tr>
<td>1972</td>
<td>Tokyo, Japan</td>
<td>Keijiro Suruga</td>
</tr>
<tr>
<td>1973</td>
<td>San Diego, CA, USA</td>
<td>David L. Collins</td>
</tr>
<tr>
<td>1974</td>
<td>Salishan, OR, USA</td>
<td>John R. Campbell</td>
</tr>
<tr>
<td>1975</td>
<td>Honolulu, HI, USA</td>
<td>Walton K. T. Shim</td>
</tr>
<tr>
<td>1976</td>
<td>San Francisco, CA, USA</td>
<td>Alfred A. de Lorimer</td>
</tr>
<tr>
<td>1977</td>
<td>Sydney, NSW, Australia</td>
<td>Douglas Cohen</td>
</tr>
<tr>
<td>1978</td>
<td>Osaka, Japan</td>
<td>Takashi Ueda</td>
</tr>
<tr>
<td>1979</td>
<td>Mazatlan, Mexico</td>
<td>Rodolfo Franco Vazquez</td>
</tr>
<tr>
<td>1980</td>
<td>Colorado Springs, CO, USA</td>
<td>William C. Bailey</td>
</tr>
<tr>
<td>1981</td>
<td>Maui, HI, USA</td>
<td>Walton K. T. Shim</td>
</tr>
<tr>
<td>1982</td>
<td>Vancouver, BC, Canada</td>
<td>Graham C. Fraser</td>
</tr>
<tr>
<td>1983</td>
<td>Fukuoka, Japan</td>
<td>Keiichi Ikeda</td>
</tr>
<tr>
<td>1984</td>
<td>San Diego, CA, USA</td>
<td>Timothy G. Canty</td>
</tr>
<tr>
<td>1985</td>
<td>Rotorua, New Zealand R.</td>
<td>Stuart Ferguson</td>
</tr>
<tr>
<td>1986</td>
<td>Puerto Vallarta, Mexico</td>
<td>Joaquin C. Aspiroz</td>
</tr>
<tr>
<td>1987</td>
<td>Rosario-Orcas, WA, USA</td>
<td>John L. Cahill</td>
</tr>
<tr>
<td>1988</td>
<td>Taipei, Taiwan</td>
<td>Wen-Tsung Hung</td>
</tr>
<tr>
<td>1989</td>
<td>Portland, Oregon, USA</td>
<td>Marvin H. Harrison</td>
</tr>
<tr>
<td>1990</td>
<td>Kona, HI, USA</td>
<td>Walton K.T. Shim</td>
</tr>
<tr>
<td>1991</td>
<td>Hong Kong, China</td>
<td>Htut Saing</td>
</tr>
<tr>
<td>1992</td>
<td>Albuquerque, NM, USA</td>
<td>Patrick F. Jewell</td>
</tr>
<tr>
<td>1993</td>
<td>Cairns, QLD, Australia</td>
<td>Mervyn M. Lander</td>
</tr>
<tr>
<td>1994</td>
<td>Kagoshima, Japan</td>
<td>Hiroshi Akiyama</td>
</tr>
<tr>
<td>1995</td>
<td>Hualtuco, Mexico</td>
<td>Giovanni Porras-Ramirez</td>
</tr>
</tbody>
</table>
GANS Memorial Lecture

This lecture is given in memory of Stephen L. Gans, M.D., the founder and first President of the Pacific Association of Pediatric Surgeons (PAPS). Under the terms of the bequest that funds this lecture, the lecture should be given on a topic that does not relate to Pediatric Surgery and the Lecturer should be an authority on the lecture material and reside in the same area as the Annual Meeting location.

M. James Warden Guest Assistance Program Participants

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Country/Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>Mario Venela</td>
<td>Chile</td>
</tr>
<tr>
<td></td>
<td>Luis Pedroza</td>
<td>Mexico</td>
</tr>
<tr>
<td>1990</td>
<td>Luis Canchez</td>
<td>Peru</td>
</tr>
<tr>
<td>1991</td>
<td>Nguyen Xuan Thu</td>
<td>Vietnam</td>
</tr>
<tr>
<td>1992</td>
<td>Leopoldo Torres</td>
<td>Mexico</td>
</tr>
<tr>
<td>1994</td>
<td>Xisheng Zhang</td>
<td>China</td>
</tr>
<tr>
<td></td>
<td>Amaung Maung</td>
<td>Myanmar</td>
</tr>
<tr>
<td>1996</td>
<td>Zhou Yuan</td>
<td>China</td>
</tr>
<tr>
<td>1997</td>
<td>Ricardo Peniche</td>
<td>Mexico</td>
</tr>
<tr>
<td>1998</td>
<td>Chi Mean Hea</td>
<td>Cambodia</td>
</tr>
</tbody>
</table>
PAPS Artifacts
Artifact – a simple object produced by human workmanship.

- The Presidential Badge
- The Past President’s Badge
- The Flag
- The Coe Medal
- The Gavel
- The Baxter-Myers Tennis Trophy
- The Archives Cabinet
- Presentation to British Association of Pediatric Surgeons

THE PRESIDENTIAL BADGE

This badge was presented by the British Association of Pediatric Surgeons to their colleagues in the Pacific in 1972. It is handed over to the incoming President each year at the Annual Meeting, usually in a presentation at the Annual Banquet.
THE PAST PRESIDENTIAL BADGE

Douglas Cohen suggested to the Board of Directors that it would be appropriate for Past Presidents to wear a badge identifying them at Annual Scientific Meetings and included the concept of a brooch for wives of Past Presidents.

Having approval of the Board, he selected a design for the badges, copied from the PAPS flag, which had been designed by Peter Jones, Amor Metal Makers in Sydney produced the badges. Douglas Cohen then presented the first badges in Mexico in 1979 when he assumed the role of President. An additional supply of badges was obtained for the Secretary in 1984 when Durham Smith was President.

THE FLAG

Foundation Member Peter Jones designed the PAPS flag in collaboration with Miss Vivienne James, Medical Artist at Royal Children’s Hospital in Melbourne, Australia. It was made by Evan Evans Flags of 680 Elizabeth Street, Melbourne, and flew for the first time at the 3rd Annual Meeting of PAPS in Melbourne, in 1970.

Each year, the flag adorns the meeting site and moves round the Pacific Ocean with successive Meeting Organizing Committees.

THE COE MEDAL

The Coe medal was initially conceived to honor the memory of Herbert E. Coe, M.D. based in Seattle, he was a founding father of pediatric surgery on the Pacific shore of the United States. It is the highest honor presented by PAPS, and is awarded to someone who has practiced on the Pacific Rim and who has made outstanding contributions to Pediatric Surgery.

In 1984, John Stevenson was placed in charge of plans to develop a Medal of Honor bearing the likeness of Herbert Coe, with $1,800 being allocated for the first fifty medals. Dr. Stevenson also convened a committee to Alexander Bill, Douglas Cohen, Morio Kasai and Murray Kliman to establish criteria for the awarding of the medal. It was decided in 1985 that the first medal, cast in pewter with antique gold finish, would be presented to Mrs. Coe. In 1986 the Board of Directors approved the following guidelines for selection of its future recipients:

1. The recipients would be recognized as having made outstanding contributions to pediatric surgery.
2. Contributions should be considered in any related field of pediatric surgery, any of the pediatric surgical specialties, pediatric surgical research, or anything that is considered to have raised the status of pediatric surgery. Service to PAPS per se, however meritorious, should not be considered an appropriate contribution unless the nominee was considered to have contributed in some additional appropriate way.
3. Except in most special circumstances, the medal would be awarded to those individuals who are working or have worked in the areas covered by PAPS.
4. In order to enhance the value of the award, not more than one medal should be given in any one year. It should also not be necessary to make the award every year. A candidate for the award could be nominated by any PAPS member in good standing.
5. The nomination should be forwarded to the secretary and should include enough information for the members of the Board to formally review and if appropriate second the nomination. The final selection of the recipient for the Coe Medal will be made by vote of the Board of Directors.
6. The selection should be made four months in advance of the annual meeting of the Association to allow the recipient, if possible, to plan to attend that meeting to receive the medal.

The addition of two more guidelines followed:

7. Although no limitation is placed on the nomination of any candidate, special consideration would be given to nominees who are or have been working in the Pacific Basin or whose work is seen as having particular relevance for pediatric surgeons working in the area.

8. A list of previous recipients will be sent out each time the selection committee guidelines are promulgated to avoid the problem of possibly recommending somebody who is already a recipient.

In 1987, the Board of Directors voted to make an exception to the rule of awarding a single medal in one year and awarded medals to both Alexander Bill and Morio Kasai to mark the 20th Anniversary of PAPS in 1998 in Seattle, the home of Dr. Coe.

THE LIST OF RECIPIENTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Recipient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>Mrs. Herbert E. Coe</td>
</tr>
<tr>
<td>1987</td>
<td>Alexander H. Bill Jr.</td>
</tr>
<tr>
<td>1987</td>
<td>Morio Kasai</td>
</tr>
<tr>
<td>1988</td>
<td>Keijiro Suruga</td>
</tr>
<tr>
<td>1989</td>
<td>Nate Myers</td>
</tr>
<tr>
<td>1990</td>
<td>Stephen L. Gans</td>
</tr>
<tr>
<td>1992</td>
<td>Morton M. Woolley</td>
</tr>
<tr>
<td>1993</td>
<td>Durham Smith</td>
</tr>
<tr>
<td>1994</td>
<td>Takashi Ueda</td>
</tr>
<tr>
<td>1995</td>
<td>Daniel M. Hays</td>
</tr>
<tr>
<td>1998</td>
<td>Eric W. Fonkalsrud</td>
</tr>
<tr>
<td>2001</td>
<td>Justin H. Kelly</td>
</tr>
<tr>
<td>2002</td>
<td>Alberta Pena</td>
</tr>
<tr>
<td>2003</td>
<td>Ken Kimura</td>
</tr>
<tr>
<td>2007</td>
<td>John Hutson</td>
</tr>
<tr>
<td>2008</td>
<td>Keiichi Ikeda</td>
</tr>
<tr>
<td>2010</td>
<td>Takeshi Miyano</td>
</tr>
<tr>
<td>2014</td>
<td>Marshall Schwartz</td>
</tr>
</tbody>
</table>

THE GAVEL

In May 1971, John Stevenson presented a gavel to PAPS. The head of the gavel was fashioned from hawthorn wood, which flowers in May in the northern hemisphere. May 1967 was the birthday of our Association. The handle was made from holly, a holy tree used on special occasions in ancient times to represent goodness and purity.

It is significant that the wood was obtained from trees felled by Herbert Coe in the year before his death and stored in his basement for future woodworking. The trees had originally been brought by the parents of Dr. Coe from England and planted when they settled in Seattle in 1888. The timber was later obtained from his widow. It is fitting that the Association has a gavel used at Annual Meetings made from wood belonging to one of our esteemed honorary members who was instrumental in beginning the specialty of Pediatric Surgery.
Official journal of the EUPSA highlighting all cutting-edge developments and serving as an indispensable resource in pediatric surgery

European Journal of Pediatric Surgery
Editor-in-Chief: B.M. Ure
2014/Volume 24/6 issues p.a./ISSN 0939-7248

USA and Canada
Individuals: $468  $294
Institutions: $846
Please contact customerservice@thieme.com
For institutional licenses, please contact esales@thieme.com

Mexico, Central and South America
Individuals: $395  $316
Institutions: $873
Please contact customerservice@thieme.com
For institutional licenses, please contact esales@thieme.com

Europe, Africa, Asia, Australia, New Zealand
Individuals: £289  €231
Institutions: £572
(Please add handling charges: Germany €32, Europe €38, Africa, Asia, Australia, New Zealand €45)
Please contact customerservice@thieme.de
For institutional licenses, please contact eproducts@thieme.de

Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka
For subscription rates in INR, please contact customerservice@thieme.in

SUBSCRIBE NOW AND STAY UP-TO-DATE IN 2014
Visit www.thieme.com/ejps in order to subscribe or renew your subscription.
Take full advantage of your individual subscription by registering online at https://www.thieme-connect.de/products
• Individual subscribers get free online access to current and back issues of their journal(s)
• Advanced online access for select journals via the eFirst service
• Compatibility with smartphones and mobile devices
• Advanced search across our entire library of journals

ORDER TODAY  http://www.thieme.com

Special introductory rates are only valid for new subscribers and are limited to the first year of subscription.
Only qualified professionals and students are eligible for individual subscriptions. Orders from individuals must include the recipient’s name and private address, and be paid by private funds.

Become a fan at www.facebook.com/thiemepublishers.  Follow us @ThiemeNY
PAPS 2014 Conference Secretariat

CONFERENCE CHAIR: Dr. Robin Eccles

Registration:
The Registration Desk will be located on the Mezzanine Level 2 of The Fairmont Banff Springs and will be open the following times:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, May 25</td>
<td>14:00 – 18:00</td>
</tr>
<tr>
<td>Monday, May 26</td>
<td>06:30 – 16:00</td>
</tr>
<tr>
<td>Tuesday, May 27</td>
<td>06:30 – 09:45</td>
</tr>
<tr>
<td>Wednesday, May 28</td>
<td>06:30 – 16:00</td>
</tr>
<tr>
<td>Thursday, May 29</td>
<td>06:30 – 10:30</td>
</tr>
</tbody>
</table>

Name Badge:
Name badges will be provided to all delegates and participants when you check in at the PAPS 2014 Registration Desk. Please wear your name badge at all times. It is your admission pass to breakfasts, meeting sessions, and all social programs. For the Icefields Tour and the Conference banquet, please wear your name badge and present your tickets as well.

The name badges are colour coded as follows:

- **PAPS Members**: Yellow
- **Non-Members**: Red
- **Trainee**: Coral
- **Accompanying Persons**: Beige

Taxi and Ground Transportation:
The valets at The Fairmont Banff Springs will assist you in obtaining a taxi should you wish to travel into the town of Banff. If you need individual ground transportation to the Calgary International Airport, please see the concierge in the hotel lobby.

Dress Code
All sessions and social functions are smart casual. *Strictly no ties to be worn.*

Insurance
Registration fees do not include insurance of any kind.

Conference Secretariat
Details Convention & Event Management Inc.
Phone: 01-403-277-7377  |  Fax: 01-403-277-7366  |  Email: info@paps2014.org
General Information

**CLIMATE:** Alberta is in a temperate climate zone. The weather in the Rocky Mountains can be very unpredictable. There is a local saying “wait five minutes and the weather will change.” The average temperatures in May vary from 8° Celsius to 20° Celsius. When planning to be outdoors during your stay in Banff, you will find there will be a need for a sweater or light jacket especially as the temperature drops significantly in the evenings.

**MONEY:** The official currency is the Canadian Dollar.

**ELECTRICITY:** Domestic electric current is 110 volts.

**TIME ZONE:** Alberta, Canada is in the Mountain Time Zone and observes Daylight Saving Time.

**GOODS AND SERVICES TAX (GST):** In Canada the goods and services tax or GST is a federal tax of five percent on most goods and services sold in Canada for domestic consumption. Some goods and services are exempt from the GST, for example basic groceries and prescription drugs. Out of Country visitors may apply for a visitor tax refund on their purchases up to one year after the visit to Canada. GST Rebate forms can be accessed through the PAPS 2014 website or a limited number of rebate forms are available at the registration desk.

Business Meetings

<table>
<thead>
<tr>
<th>MEETING</th>
<th>DATE</th>
<th>TIME</th>
<th>MEETING ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAPS Publication Meeting</td>
<td>Sunday, May 25</td>
<td>08:00 – 12:00</td>
<td>Oak Room</td>
</tr>
<tr>
<td>PAPS Board of Directors Meeting</td>
<td>Sunday, May 25</td>
<td>12:30 – 16:30</td>
<td>Oak Room</td>
</tr>
<tr>
<td>PAPS Annual Business Meeting</td>
<td>Wednesday, May 28</td>
<td>13:00 – 14:30</td>
<td>Ivor Petrak Room</td>
</tr>
<tr>
<td>PAPS Exit Board Meeting</td>
<td>Wednesday, May 28</td>
<td>15:00 – 16:00</td>
<td>Ivor Petrak Room</td>
</tr>
</tbody>
</table>

Poster Display

All posters should be set up in the display room (Cascade Ballroom of the Fairmont Banff Springs) on Sunday, May 25 from 1700 – 19:00 for Session I and Tuesday, May 27 from 17:00 – 20:00 for Session II. Authors are requested to be by their posters during the poster session times.
GANS Memorial Lecturer

This lecture is given in the memory of Stephen L. Gans, MD, the founder and first president of the Pacific Association of Pediatric Surgeons (PAPS). Under the terms of the bequest that funds this lecture, the lecture should be on a topic that is not related to Pediatric Surgery and the lecturer should be an authority on the lecture material and reside in the same area as the annual meeting location.

This year, we are honored to have Kevin Van Tighem as our GANS Memorial Speaker. Kevin holds a plant ecology degree and began his career with the Canadian Wildlife Service. His work on wildlife inventories in Jasper, Mt. Revelstoke, Glacier and Elk Island National Parks was part of the first comprehensive ecological classification work ever done in Canada’s national parks. Kevin recently retired as superintendent of Banff National Park. He is the author of eleven books on wildlife and conservation including Bears Without Fear and The Homeward Wolf.

GANS Memorial Lecture:

Banff’s Wilderness Icons:
Grizzly Bears and Wolves

A look at the history of two fascinating but sometimes controversial large carnivores in the Alberta Rocky Mountains region, and some of the ways in which we are learning to live with them. The slide-illustrated talk expands on some of the themes and ideas explored in Bears Without Fear and The Homeward Wolf.
Social Program Information

Sunday, May 25

WELCOME RECEPTION
18:00 – 21:00 Riverview Lounge

All delegates and registered accompanying persons are cordially invited to the Welcome Reception. Enjoy a taste of Alberta while you reconnect with old friends and mingle with new colleagues.

CONGRESS BREAKFASTS
Continental Breakfasts (open to all delegates) are served daily (May 26 – 29) from 06:30 – 08:00 in the Cascade Ballroom on Mezzanine 2 in The Fairmont Banff Springs.

Tuesday, May 27

CONFERENCE TOUR
08:30/09:10 – 18:30/19:00

You will spend the day exploring one of the most scenic highways in the world. The Icefields Parkway offers ever-changing views of waterfalls, turquoise lakes, alpine meadows, snow-capped peaks and glaciers. The Columbia Icefield is the largest sub-polar body of ice in North America and is one of the reasons why the United Nations declared Canada’s four Rocky Mountain Parks a World Heritage Site. The Columbia Icefield Glacier Adventure takes you onto the surface of the Athabasca Glacier in a unique, specially designed Ice Explorer. Please bring a jacket or sweater as it can be very cool walking around on the glacier. Your entire group will be divided into two tour groups for the tour. Upon arrival at the interpretative centre, some will go directly to the Icefields and the remainder will have lunch. After approximately 1 hour, the groups will reverse and the first group will have lunch and the remaining group will go to the glacier. (Exact tour stops subject to change).

Wednesday, May 28

ANNUAL BANQUET
18:00 – 19:00 Reception Van Horne Ballroom A & B
19:00 – 23:00 Dinner Conference Centre

The Annual banquet is one of the highlights of the conference. It is a PAPS Tradition that every attendee must present an item (preferably a song) at the dinner. Participants take turns according to either their country of residence or their country of origin.
Conference Tour (Tuesday, May 27)

THE CONFERENCE TOUR WILL TAKE YOU ON JOURNEY THROUGH THE MAJESTIC CANADIAN ROCKIES.

Highlights Include:

**Bow Lake** – Sitting at an elevation of 1920 metres (6300 feet), this stunning alpine lake is the beginning of the Bow River. Snap some unbelievable pictures of Bow Glacier, nestled in the mountains behind Bow Lake.

**Peyto Lake** – Named for the legendary Banff pioneer and mountain guide, Bill Peyto, this lake is best known for its distinctly beautiful bright turquoise colour.

**Columbia Icefield Glacier Adventure** – Take a once-in-a-lifetime ride out onto the surface of the Athabasca Glacier in a specially-built all-terrain Ice Explorer. As the most easily accessible glacier flowing from the massive Columbia Icefield, the Athabasca Glacier has become the most visited glacier in North America.

(Exact tour stops subject to change)

* Warm layers are strongly recommended for the Glacier Discovery Centre. Temperatures on the glacier can be significantly cooler than those experienced during the tour or at the Columbia Icefield Discovery Centre.

* Sunglasses are also strongly recommended for the Columbia Icefield Glacier as the sun’s reflection off the snow and ice can be quite bright.

* Don’t forget your reusable water bottle if you’d like to bring back a taste of glacial meltwater!

* Don’t forget to bring your camera!
## Program At A Glance

<table>
<thead>
<tr>
<th><strong>Sunday, May 25</strong></th>
<th><strong>Monday, May 26</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>08:00 – 12:00</strong> Publication Committee</td>
<td><strong>06:30 – 08:00</strong> Breakfast</td>
</tr>
<tr>
<td>Meeting</td>
<td>Cascade Ballroom</td>
</tr>
<tr>
<td><em>Oak Room</em></td>
<td><strong>07:00 – 08:30</strong> Oral Presentations Session 1: Basic Science</td>
</tr>
<tr>
<td></td>
<td>Albertina/New Brunswick</td>
</tr>
</tbody>
</table>

| **12:30 – 16:30** Board Meeting         | **11:00 – 13:00** Oral Presentations Session 3: PAPS Prize |
| *Oak Room*                              | Alberta/New Brunswick                      |

| **14:00 – 18:00** Registration          | **13:00 – 13:45** GANS Lecture             |
| *Curio Foyer, Mezzanine 2*             | Alberta/New Brunswick                      |

| **18:00 – 21:00** Opening Reception     | **19:00 – 22:00** President’s Dinner       |
| *Riverview Lounge*                     | (By Invitation)                            |
|                                        | Mt. Stephen Hall                           |

* The Registration Desk will be open Monday – Thursday at 06:30
* Please wear your name badge at all times. It is your admission pass to breakfasts, meeting sessions, and all social programs.
<table>
<thead>
<tr>
<th>Time</th>
<th>Tuesday, May 27</th>
<th>Wednesday, May 28</th>
<th>Thursday, May 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>06:30 – 08:00</td>
<td>Breakfast</td>
<td>Breakfast</td>
<td>Breakfast</td>
</tr>
<tr>
<td></td>
<td>Cascade Ballroom</td>
<td>Cascade Ballroom</td>
<td>Cascade Ballroom</td>
</tr>
<tr>
<td>07:00 – 08:00</td>
<td>Oral Presentations Session 4: All Short Oral</td>
<td>Oral Presentations Session 5: Neonatology</td>
<td>Oral Presentations Session 8: Oncology</td>
</tr>
<tr>
<td></td>
<td>Alberta/New Brunswick</td>
<td>Alberta/New Brunswick</td>
<td>Alberta/New Brunswick</td>
</tr>
<tr>
<td>08:30 – 18:30</td>
<td>CONFERENCE TOUR to the Columbia Icefields</td>
<td>08:45 – 10:15 Oral Presentations Session 6: Critical Care Trauma and Hepatobiliary</td>
<td>08:30 – 09:00 Poster II Viewing Cascade Ballroom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alberta/New Brunswick</td>
<td></td>
</tr>
<tr>
<td>10:15 – 10:45</td>
<td>Poster II Viewing Refreshment Break</td>
<td>10:45 – 12:00 Oral Presentations Session 7: MIS/Robotics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cascade Ballroom</td>
<td>Alberta/New Brunswick</td>
<td></td>
</tr>
<tr>
<td>12:00 – 12:30</td>
<td>PAPS History Talk</td>
<td>12:30 – 13:00 GAP Fellow Talk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alberta/New Brunswick</td>
<td>Alberta/New Brunswick</td>
<td></td>
</tr>
<tr>
<td>13:00 – 14:30</td>
<td>Annual General Meeting</td>
<td>15:00 – 16:00 Exit Board Meeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ivor Petrak Room</td>
<td>Ivor Petrak Room</td>
<td></td>
</tr>
<tr>
<td>18:00 – 23:00</td>
<td>Conference Banquet</td>
<td>18:00 – 23:00 Conference Banquet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Van Horne Ballroom A &amp; B, Conference Centre</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SCIENTIFIC PROGRAM AND ABSTRACTS
### Scientific Program

#### MONDAY 07:00 – 08:30

**ORAL PRESENTATIONS: BASIC SCIENCE (BS)**

James Dunn and Ken K. Y. Wong

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS 1</td>
<td>Short</td>
<td>Extraluminal Helicoidal Stretch (Helixtretch): A Novel Method of Intestinal Lengthening</td>
<td>Beatrice Dionigi, Joseph Brazzo III, John Patrick Connors, Jeremy Fisher, David Zurakowski, Dario O’Fauza</td>
</tr>
<tr>
<td>BS 2</td>
<td>Full</td>
<td>Beneficial effects of human beta-defensin-3 in neonatal rats with necrotizing enterocolitis</td>
<td>Zhibao Lv, Qingfeng Sheng, Wei Cai</td>
</tr>
<tr>
<td>BS 3</td>
<td>Short</td>
<td>Overexpression of microRNA302s resulted in marked apoptosis of human neuroblastoma cells</td>
<td>Yuan Li, Yi Wang, Kelin Chen, Bin Zhou, Longpei Yao, guozhu Yang, Yin Zhou</td>
</tr>
<tr>
<td>BS 4</td>
<td>Full</td>
<td>Single Shot Intercostal Block for Pain Management in Pediatric Patients Undergoing the Nuss Procedure: A Double - Blind, Randomised, Controlled Study</td>
<td>Laura Lukosiene, Andrius Macas, Daluis Malcues, Lina Kalibatiene, Vidmantas Barauskas</td>
</tr>
<tr>
<td>BS 5</td>
<td>Short</td>
<td>MiR-222 overexpression contributes to liver fibrosis in biliary atresia by targeting PPP2R2A</td>
<td>Rui Dong, Shan Zheng, Gong Chen</td>
</tr>
<tr>
<td>BS 6</td>
<td>Full</td>
<td>Tracheoplasty with cartilage engineered outside the esophagus</td>
<td>Makoto Komura, Keisuke Suzuki, Ryousuke Satake, Tetsuro Kodaka, Kan Terawaki, Hiroaki Komuro, Tadashi Iwanaka</td>
</tr>
<tr>
<td>BS 7</td>
<td>Short</td>
<td>A novel SPHK1 inhibitor SKI-SC induces the apoptosis of Wilms tumor cells via regulating specific LncRNAs</td>
<td>Pan Jian, Li Zhi-heng, Wang Jian</td>
</tr>
<tr>
<td>BS 8</td>
<td>Full</td>
<td>An impaired inflammatory cytokine response to gram-negative LPS in human neonates is associated with the defective TLR-mediated signaling pathway</td>
<td>Jain Wang, Yiping Li</td>
</tr>
<tr>
<td>BS 9</td>
<td>Short</td>
<td>Limb Reconstruction with Osseous Grafts Derived from Heterologous, Decellularized, Non-De mineralized Bone in a Growing Leporine Model</td>
<td>Elliot C Pennington, Beatrice Dionigi, Fabienne L Gray, Azra Ahmed, Joseph Brazzo III, Andrey Dolinko, Nathan Calderon, Thomas Darrah, David Zurakowski, Ara Nazarian, Brian Snyder, Dario O’Fauza</td>
</tr>
<tr>
<td>BS 10</td>
<td>Full</td>
<td>Suppression of inflammatory reaction by application of MSC-derived Exosome on immune-mediated liver injury</td>
<td>Ryo Takura, Yasuhiko Tabata, Shinji Uemoto</td>
</tr>
<tr>
<td>BS 11</td>
<td>Short</td>
<td>Innate Healing In The Fetal Sheep Model of Myelomeningocele: A Standardized Defect Grading System</td>
<td>Erin Brown, Benjamin Kellar, Christopher Pivetti, Diana Farmer</td>
</tr>
<tr>
<td>BS 12</td>
<td>Full</td>
<td>Human beta-defensin-3 promotes enterocyte migration via CCR6-mediated regulation of the actin cytoskeleton</td>
<td>Qingfeng Sheng, Zhibao Lv, Wei Cai</td>
</tr>
<tr>
<td>BS 13</td>
<td>Short</td>
<td>Dendrimer Encapsulation Enhances Anti-inflammatory Efficacy of Silver Nanoparticles in burn wound</td>
<td>Xuelai Liu, Chun-Nam Lok, Ruizhong Zhang, Kenneth KY Wong</td>
</tr>
<tr>
<td>BS 14</td>
<td>Full</td>
<td>Identification of cancer stem-like side population cells in cultured pediatric Wilms tumor</td>
<td>Wei Lu, Rongde Wu, Lijuan Zhang</td>
</tr>
<tr>
<td>BS 15</td>
<td>Short</td>
<td>MicroRNA-21/PTEN/Akt axis in the fibrogenesis of biliary atresia</td>
<td>Shen Wenjun</td>
</tr>
<tr>
<td>BS 16</td>
<td>Full</td>
<td>Role of autophagy in Hirschsprung’s disease: implication for the development of enteric neural system.</td>
<td>Qiang Huang, Ya Gao, Yitao Duan, Bajun Zheng, Peng Li, Weikang Pan, Huajie Wang</td>
</tr>
<tr>
<td>BS 17</td>
<td>Short</td>
<td>The protective and anti-inflammatory effects of glucagon-like peptide-2 in experimental necrotizing enterocolitis.</td>
<td>Kazuhiko Nakame, Tatsuru Kaji, Motoi Mukai, Hiroshi Matsufuji</td>
</tr>
<tr>
<td>BS 18</td>
<td>Full</td>
<td>Systemic and local cytokine profile in biliary atresia</td>
<td>Takeshi Saito, Hideo Yoshida</td>
</tr>
</tbody>
</table>

#### MONDAY 08:45 – 10:30

**ORAL PRESENTATIONS: GASTROINTESTINAL (GI)**

Andrew Holland and Hong-Shiee Lai

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI 1</td>
<td>Full</td>
<td>Non-Responders to a Standardized Protocol for Complicated Appendicitis Have Significant Morbidity: Outcomes from a Prospective Cohort Study</td>
<td>Luke R. Putnam, Shauna M. Levy, Caroline M. Kellagher, Hannah S. Smith, Diana M. Hook-Dufresne, Galit Holzmann-Pazgal, Kevin P. Lally, Kuolien Tsao</td>
</tr>
<tr>
<td>GI 2</td>
<td>Short</td>
<td>Probiotics Prevent Hirschsprung’s Disease Associated Enterocolitis: A Prospective Multicenter Randomized Controlled Trial</td>
<td>Zhi Li</td>
</tr>
</tbody>
</table>
GI 3  Full  Peroral Endoscopic Myotomy for the Treatment of Esophageal Achalasia in Children  Komei Suzuki, Tomokazu Nakagami, Ai Tayama, Shinya Kawanoto, Yusuke Ohashi, Yu Watarai, Akira Toki, Haruhito Inoue, Haruo Ikeda, Chiaki Sato

GI 4  Short  Proposal for strategic stoma creation in congenital isolated hypoganglionosis: verification of the national surveys based on our own experiences  Yoshio Watanabe, Wataru Sumida, Hidemi Takasu, Kazuo Ohashi, Yutaka Kanamori, Keiichi Uchida, Tomoaki Taguchi

GI 5  Full  Does laparoscopy-aided gastrostomy placement improve or worsen gastroesophageal reflux in patients with neurological impairment?  Hisayoshi Kawahara, Yuko Tazuke, Hideki Soh, Akhiro Yoneda, Masahiro Fukuzawa

GI 6  Short  Functional outcome for anorectal malformation – according to Krickenbeck classification  So-Hyun Nam, Dae Yeon Kim, Seong Chul Kim

GI 7  Full  Effectiveness of a Patient Response-Based Protocol for Ruptured Appendicitis  David E Skarda, Eric Sclafe, Doug Barnhart, Michael Rollins, Molly McFadden

GI 8  Short  Management of Older Children With Ileocolic Intussusception  Pooya Banapour, Donald Shaul, Roman Sydorak


GI 10  Short  Evening, night time and weekend appendectomy is effective and safe  Nigel Hall

GI 11  Full  Global Comparison of Pediatric Surgery Workforce  Priti Lalchandani, James Dunn

GI 12  Short  Intestinal Neuronal Dysplasia and Colonic Neuropathies as an Occult Cause of Functional Constipation: Diagnosis and Treatment with Cecostomy Tubes.  Benjamin Keller, Erin Brown, Diana Farmer, Stephen Greenholz

GI 13  Full  Surgeon Performed Ultrasound: Accurate, Reproducible, and More Efficient  Deidre Wyrick, Sam Smith, Melvin S. Dassinger

GI 14  Short  Rural Pediatric Surgery Outreach in Africa: Design, Feasibility, and Early Outcomes of a Pilot Program in Uganda  Nasser Kakembo, Phyllis Kisak, Dan Namuguzi, Andrew Kintu, Richard Kabuye, Margaret Ajko, Emily Christison-Lagay, Tamara Fitzgerald, Monica Langer, Doruk Ozgediz, John Sekabira

GI 15  Full  Does neonatal PSARP for male intermediate anorectal malformations give better results than 3 stage anorectoplasty: A comparative study  Amit Sinha, Ravi Kanojia, Prema Menon, KLN Roa

GI 16  Short  Patterns of Reflux in Gastroesophageal Reflux Disease in Pediatric Population of New South Wales  Sarath Kumar Narayanan, Ralph Clinton Cohen, Jonathan Saul Karpelowsky

GI 17  Full  Pediatric chronic intestinal pseudo-obstruction is a rare, serious, and intractable disease: A report of a nationwide survey in Japan  Mitsuru Muto, Hiroshi Matsufuji, Takeshi Tomomasa, Atsushi Nakajima, Hisayoshi Kawahara, Shinobu Ida, Koosuke Ushijima, Akio Kubota, Sotaro Mushiaka, Tomoaki Taguchi

GI 18  Short  Rapid multiparametric MRI without contrast or sedation in the diagnosis of pediatric appendicitis.  Ryne Didier, Sanjay KrishnaSawami, Bryan Foster, Fergus Coakley, Katharine Hopkins, David Spiron

GI 19  Full  Pacific Partnership: Seven-Year Experience of Pediatric Surgery Humanitarian Missions in Southeast Asia  Amy Hernandez, Abigail Coots, Sean Stroup, Thomas Latendresse, Romeo Ignacio

GI 20  Short  Redo Fundoplication on Children with Hiatus Hernia  Gong Chen; Shan Zheng; Xm Xiao; Kr Dong

MONDAY 11:00 – 13:00

ORAL PRESENTATIONS: PAPS PRIZE (PP)  5 minutes each

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP 1</td>
<td>5 mins</td>
<td>Prenatal administration of neuropeptide bombesin promotes lung development in rat models of nitrogen-induced congenital diaphragmatic hernia</td>
<td>Kohei Sakai, Osamu Kimura, Taizo Furukawa, Koji Higuchi, Junico Wakao, Kosuke Kimura, Shigehisama Fuminori, Shigeosyo Aoi, Koji Masumoto, Tatsuro Tajiri</td>
</tr>
<tr>
<td>PP 2</td>
<td>5 mins</td>
<td>Intestinal Lengthening in an Innovative Rodent Surgical Model</td>
<td>Veronica F Sullins, Andrew N Scott , Justin P Wagner, Doug Steinberger, Steven L Lee, Benjamin M Wu, James CM Dunn</td>
</tr>
<tr>
<td>PP 3</td>
<td>5 mins</td>
<td>Skin-derived precursors generate enteric-type neurons in aganglionic jejunum</td>
<td>Justin P. Wagner, Veronica F. Sullins, James C. Y. Dunn</td>
</tr>
<tr>
<td>PP 4</td>
<td>5 mins</td>
<td>Long Gap Oesophageal Atresia: Comparison Of Delayed Primary Anastomosis And Oesophageal Replacement With Gastric Tube</td>
<td>Hui Qing Lee, John Hutson, Alisa Hawley, Joe Doak, Michael Nightingale</td>
</tr>
<tr>
<td>PP 5</td>
<td>5 mins</td>
<td>Endoscopic model of Hirschprung’s disease in mouse</td>
<td>Hassan A. Khalil, Justin Wagner, Puneet Rana, James Yoo, James Dunn</td>
</tr>
</tbody>
</table>
The Role of Screening and Prophylactic Surgery for Malrotation in Heterotaxy Patients
Craig Elder, Ryan Metzger, Cammon Arrington, Michael Rollins, Eric Scaife

A Durable Model of Hirschsprung’s Colon
Justin P. Wagner, Veronica F. Sullins, James C. Y. Dunn, Hassan A. Khalil

Acute Appendicitis in Diabetic Children
Camille L. Stewart, Colleen Wood, John F. Bealer

Can a pressure-limited V-A shunt for obstructive uropathy really protect the kidney?
Kunihide Tanaka, Shutaro Manabe, Kei Ooyama, Yasuji Seki, Hideki Nagae, Masayuki Takagi, Junki Koike, Jane Zuccollo, Kevin C. Pringle, Hiroaki Kitagawa

Work up and Management of Pediatric Spontaneous Pneumomediastinum: Are Studies Beyond a Chest Roentgenogram Necessary?
Marielena Bachier, Eunice Y. Huang, Kate B. Savoie

Injured Children Are Resistant To The Adverse Effects Of Early High Volume Crystalloid Resuscitation
Shannon N. Acker, James T. Ross, David A. Partrick, Peter DelWitt, Denis D. Bensard

Correlation of Pancreatic Enzymes and Grade of Injury and Outcomes in Blunt Pancreatic Trauma
Hanna Alemayehu, Adam Alder, Shawn D. St. Peter, Kuojen Tsao, David M. Gourlay, Jeffrey S. Upperman, Timothy D. Kane, Saleem Islam, Corey W. Izbal

Spontaneous Intestinal Perforation in Premature Neonates – the need for subsequent laparotomy after placement of peritoneal drains.
Prabal Mishra, David Foley, Gordon Purdie, Kevin Pringle

Clinical and pathological study on the spectrum of extrahepatic biliary cysts in neonates with obstructive jaundice
Zhen Shen, Shan Zheng

Improving gastrochisis outcomes: does birthplace matter?

Tunneled central venous catheters should not be placed in neutropenic children
Shannon N. Acker, Nicole A. Nadlonek, Igor Shumskiy, Jennifer L. Bruny

Intra-operative Spillage Does Not Increase Recurrence Risk of Pediatric Ovarian Neoplasms
Yasmine Yousef, Valentina Pucci, Sherif Emil

Benefits of an Abridged Antibiotic Protocol for Treatment of Gangrenous Appendicitis
Layla Shbat, Sherif Elkady, Robert Baird, Jean-Martin Laberge, Pramod Puligandla, Kenneth Shaw, Sherif Emil

Fish oil emulsion used to prevent cholestasis in neonates requiring long-term parenteral nutrition: A retrospective review.
Lucy Goddard, Gordon Purdie, Kevin Pringle, Toni-Maree Wilson

Postoperative complications of umbilical stomas in neonates compared with the conventional stoma site
Yusuke Nakamura, Yoshinori Hamada, Kohei Takada, A-Hon Kwon

A peptide profile of amniotic fluid in a fetal lambs model of gastrochisis
Kei Ohyama, Kevin C. Pringle, Toshiyuki Sato, Shutaro Manabe, Hideki Nagae, Yasuji Seki, Tomohiro Kato, Hiroaki Kitagawa

Program & Abstracts

TUESDAY 07:00 – 08:00

Oral Presentations: All Short Oral (SO)
Mark Holterman and Mario Riquelme

Full Oral: 6 minutes / Short Oral: 3 minutes
<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEO 1</td>
<td>Full</td>
<td>An Endoscopic Classification System for Tracheobronchomalacia</td>
<td>Kendra G Bowman, Christopher Baird, Roger Nuss, Thomas Hamilton, C Jason Smithers, Lawrence Rhein, Neil Feins, Russell Jennings</td>
</tr>
<tr>
<td>NEO 2</td>
<td>Short</td>
<td>Fetal esophageal atresia: Sonographic features and implications on perinatal outcome</td>
<td>Shaun M. Kunisaki, Steven W. Bruch, George B. Mychalska, Ronald B. Hirschl, Marjorie C. Treadwell</td>
</tr>
<tr>
<td>NEO 3</td>
<td>Full</td>
<td>Spontaneous Onset Of Labor, Not Route Of Delivery, Is Associated With Prolonged Length Of Stay In Babies With Gastroschisis</td>
<td>Edmund Yang, Lauren Davies, Derek Banyard, Theresa Ramones</td>
</tr>
<tr>
<td>NEO 4</td>
<td>Short</td>
<td>Gastroschisis: Experience With The Preformed Silo In 109 Infants</td>
<td>Nigel Hall, Michael Stanton, Jan Dobson, Melanie Drewett, David Burge</td>
</tr>
<tr>
<td>NEO 6</td>
<td>Short</td>
<td>Neonatal enterostomy: outcomes and risk factors</td>
<td>Lee Shimin Jasmin, Anette Sundfør Jacobsen, Yap Te-Lu, Shireen Anne Nah Han Yien, Gita Krishnaswamy, Low Yee</td>
</tr>
</tbody>
</table>
NEO 7  Full  Clinical and pathological features of congenital cystic lung diseases: a report of a nationwide multicenter study in Japan
Tatsuo Kuroda, Eiji Nishijima, Kosaku Maeda, Seiichi Hirobe, Yasushi Fuchimoto, Yoko Tazuke, Toshihiko Watanabe, Noriaki Usui

NEO 8  Short  The Use Of Regional Anesthesia Via Continuous Caudal Infusion For Surgical Procedures In Conscious Neonates
Claudia Mueller, Noah Gordon, Megan Stevens

NEO 9  Full  Outcomes and unmet need for neonatal surgery in a resource-limited environment: estimates of global health disparities from Uganda
Nasser Kakembo, Raghav Badrinath, Phyllis Kisa, Monica Langer, Doruk Ozgediz, John Sekabira

NEO 10  Full  Magnitude of Surgical Burden Associated with Pediatric Intestinal Failure.
Faraz A. Khan, Paul Mitchell, Jeremy G. Fisher, Eric Sparks, Tom Jaksic, Christopher Duggan, Biren P. Modi, Daniel Teitelbaum

NEO 11  Short  Outcomes For Fetal Neck And Oral Masses From A Single Institutional Experience
Corey W. Iqbal, S. Christopher Derderian, Hanmin Lee, Shinjiro Hirose

NEO 12  Full  Surgical versus Conservative Management for Asymptomatic Congenital Cystic Lung Malformations in Children
Jessica Kapralik, Emily Chan, Carolyn Wayne, Ahmed Nasi

NEO 13  Short  Prenatal and postnatal clinical course of urachus identified as an allantoic cyst in the umbilical cord
Satoshi Umeda, Noriaki Usui, Takeshi Kanagawa, Taku Yamamichi, Keigo Nara, Takehisa Ueno, Mitsugu Owa, Shuichiro Uehara, Takaharu Oue

NEO 14  Full  A Novel Rodent Model of Long Gap Esophageal Atresia
Veronica F. Sullins, Ziyad Jabaji, Rebecca Stark, Steven L. Lee, James CY Dunn

NEO 15  Short  Systemic and local cytokine profile in biliary atresia
Takeshi saito, Hideo Yoshida

NEO 16  Full  Thoracoscopic diaphragmatic hemia repair in newborns
L. Petrova, O. Mokrushina, A. Rasumovsky, V. Shumikhin, N. Stepanenko

NEO 17  Short  The surgical management of atypical forms of congenital hyperinsulinism
Toshihiko Watanabe, Masataka Takahashi, Kaori Sato, Michinobu Ohno, Yasushi Fuchimoto, Masayuki Kitamura, Michiya Masue, Kentarou Matsuo, Chie Takahashi, Reiko, Yutaka Kanamori

NEO 18  Full  A multi-disciplinary study of institutional practice patterns and outcomes in gastroschisis: a report from the University of California Fetal Consortium (UCfC).
LA Lusk, EG Brown, R Overcash, T Grogan, J Kim, S Shew, C Uy, F Poulain, RL Keller, D DeUgarte

NEO 19  Full  A clinical prediction rule to assess risk of death prior to discharge for infants with esophageal atresia (EA) and trachea-esophageal fistula (TEF)
Benjamin Turner, Roshni Dasgupta, Mary Brindle

NEO 20  Short  Experience for delayed primary anastomosis of 8 cases of long gap esophageal atresia
Chun Shen, Shan Zheng, Kai Li, Haitao Zhu, Xian-min Xiao

NEO 21  Short  Complex Gastroschisis: Definite Determinant of Poor Outcome.
Kulanka Premachandra, Rithvik Reddy, Rajendra Kumar

NEO 22  Short  Preservation of Liver Function and Growth After Switching from Fish Oil to Low Dose Soy Based Lipids in Children with Intestinal Failure Associated Liver Disease (IFALD)
Faraz Khan, Eric Sparks, Jeremy Fisher, Alexis Potemkin, Christopher Duggan, Bram Raphael, Biren Modi, Tom Jaksic

WEDNESDAY 08:45 – 10:15

ORAL PRESENTATIONS: CRITICAL CARE TRAUMA AND HEPATOBILIARY (CCT/HB)  Full Oral: 6 minutes / Short Oral: 3 minutes
David Tuggle and Atsuyuki Yamataka

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCT 1</td>
<td>Short</td>
<td>Early Diffuse Slowing On Electroencephalogram In Pediatric Traumatic Brain Injury: Impact On Management And Prognosis</td>
<td>Nicole A Nadlonek, Sami Bansal, Shannon N Acker, David A. Partrick</td>
</tr>
<tr>
<td>CCT 2</td>
<td>Short</td>
<td>Utilization of computed tomography (CT) relative to injury severity prior to transfer for definitive pediatric trauma care</td>
<td>Leo Andrew O. Benedect, Jessica K. Paulus, Leslie Rideout, Walter J. Chwals</td>
</tr>
<tr>
<td>CCT 3</td>
<td>Full</td>
<td>Is the Massachusetts Graduated Driver Licensing (GDL) Program Effective in Preventing Fatal Motor Vehicle Crashes in Teenage Drivers?</td>
<td>Catrina Cropano, Yuchiao Chang, Jarone Lee, Haythem Kaafarani, Toby Raybould, Alice Gervasini, Laurie Petrovick, Christopher DePesa, Peter Masiakos,</td>
</tr>
<tr>
<td>CCT 4</td>
<td>Short</td>
<td>Impact of newly adopted guidelines for management of children with isolated skull fracture</td>
<td>Ryan R. Metzger, Julia Smith, Matthew Wells, Maija Holsti, Eric R. Scaife, Douglas C. Barnhart, Michael D. Rollins</td>
</tr>
<tr>
<td>CCT 5</td>
<td>Short</td>
<td>Diaphragm plication for postoperative phrenic nerve paralysis in children with a functionally univentricular heart</td>
<td>Masaya Yamoto, Koji Fukumoto, Go Miyano, Hiroshi Nousu, Keiichi Monta, Hiromu Miyake, Masakatsu Kaneshiro, Naoto Urushihara</td>
</tr>
</tbody>
</table>
### ORAL PRESENTATIONS: MIS/ROBOTICS (MIS)

**Full Oral: 6 minutes / Short Oral: 3 minutes**

Steven Rothenberg and PKH Tam

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS 1</td>
<td>Full</td>
<td>Laparoscopic radical nephrectomy of wilms’ tumor and renal cancer in children: preliminary experience from two-centers’ study in east China</td>
<td>Jiangbin Liu</td>
</tr>
<tr>
<td>MIS 2</td>
<td>Short</td>
<td>The learning curve on the laparoscopic excision of choledochal cyst with Roux-en-Y hepatointerostomy in children</td>
<td>Jiangbin Liu</td>
</tr>
<tr>
<td>MIS 3</td>
<td>Full</td>
<td>A New Index (Sternal angle index) for additional superior bar in Precuts Excavatum’s Nuss Procedure</td>
<td>Shinsuke Ohashi, Shuichi Ashizuka, Jyoji Yoshizawa, Masashi Kurobe, Takao Ohki, Hiroaki Kitagawa</td>
</tr>
<tr>
<td>MIS 4</td>
<td>Short</td>
<td>Study in 221 cases with the double-bar Nuss procedure for the correction of pectus excavatum in 11 years’ single institution experience</td>
<td>Yu Jie, Zeng Qi, Zhang Na, Cheng ChenHao, Xu ChangQi</td>
</tr>
<tr>
<td>MIS 5</td>
<td>Full</td>
<td>Non-thoracoscopic Nuss procedure versus traditional Nuss procedure: A case control study</td>
<td>Qi Zeng, Na Zhang, Chenghao Chen, Jie Yu</td>
</tr>
<tr>
<td>MIS 6</td>
<td>Short</td>
<td>Different techniques for bar-removal after the Nuss procedure? a single center study with 1282 cases</td>
<td>Zhang Na, Zeng Qi, ChengHao Chen, Yu</td>
</tr>
<tr>
<td>MIS 7</td>
<td>Full</td>
<td>Thoracoscopic repair of congenital diaphragmatic hernia: two centres’ experience of 57 patients</td>
<td>JS Huang, CT Lau, WY Wong, Q Tao, KKY Wong, PKH Tam</td>
</tr>
<tr>
<td>MIS 8</td>
<td>Short</td>
<td>Thoracoscopic surgery resection for mediastinal neurogenic tumor in children</td>
<td>Xu Chang, Xiang Bo, Luo Qi-Cheng</td>
</tr>
<tr>
<td>MIS 9</td>
<td>Full</td>
<td>Thoracoscopic repair of type-C esophageal atresia does not require direct manipulation of lung parenchyma in comparison to open repair resulting in less respiratory tract impact and smoother recovery.</td>
<td>Hiroyuki Koga, Masaya Yamoto, Tadaharu Okazaki, Manabu Okawada, Takashi Doi, Go Miyano, Koji Fukumoto, Geoffrey J Lane, Naoto Urushihara, Atsuyuki Yamataka</td>
</tr>
<tr>
<td>MIS 10</td>
<td>Short</td>
<td>Thoracoscopic Thoracic Duct Ligation For Congenital and Acquired Disease</td>
<td>Steven S Rothenberg</td>
</tr>
<tr>
<td>MIS 11</td>
<td>Full</td>
<td>Thoracoscopic pulmonary resection in children</td>
<td>Razumovskyi Alexander</td>
</tr>
<tr>
<td>MIS 12</td>
<td>Short</td>
<td>Thoracoscopic Management of Vascular Rings</td>
<td>Steven S Rothenberg</td>
</tr>
<tr>
<td>MIS 13</td>
<td>Full</td>
<td>Laparoscopic assisted simple suturing obliteration (LASSO) of the internal ring using an epidural needle: A handy single-port laparoscopic herniorrhaphy in children</td>
<td>Suolin Li, Kenneth K. Y. Wong</td>
</tr>
</tbody>
</table>
### MIS 14 Short
Thoracoscopic Bronchoplasty in Children
Razumovskiy Alexander

### MIS 15 Full
Comparison of outcomes between laparoscopy-assisted and posterior sagittal anorectoplasties for male imperforate anus with recto-bulbar fistula.
Hiroyuki Koga, Takarori Ochi, Manabu Okawada, Takashi Doi, Geoffrey J Lane, Atsuyuki Yamataka

### MIS 16 Short
Ten-year experience of endoscopically-assisted completely extraperitoneal ligation of the internal ring for repair of pediatric hydrocele and the long-term follow-up results
Bo Xiang

### MIS 17 Short
Outcomes for single incision laparoscopic appendectomy for acute appendicitis in the pediatric population; A single surgeon’s experience
Adesola C. Akinkuotu, Paulette I. Abbas, Sheree Berry, Ashwin Pimpalwar

## THURSDAY 07:00 – 08:15

**ORAL PRESENTATIONS: ONCOLOGY (ONC)**
Mary Brindle and Rajendra Kumar

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONC 1</td>
<td>Short</td>
<td>Placing the port: short and long-term consequences</td>
<td>Eric Webber, Cynthia Verchere, Marjia Bucevska, Jasna Levi, Ronak Rahmanian, Sheila Pritchard</td>
</tr>
<tr>
<td>ONC 2</td>
<td>Full</td>
<td>Downregulated Notch ligand Delta-like 4 promotes VEGF/VEGFR-2-induced hemangioma-derived endothelial cell proliferation</td>
<td>Yi Ji, Siyuan Chen, Kai Li, Bo Xiang</td>
</tr>
<tr>
<td>ONC 3</td>
<td>Short</td>
<td>Solid-pseudopapillary neoplasm of the pancreas in children. – Can we predict malignancy?</td>
<td>Jihee Hwang, Dae Yeon Kim, Seong Chul Kim, Jeong Man Namgoong</td>
</tr>
<tr>
<td>ONC 4</td>
<td>Full</td>
<td>Sirolimus, a promising Treatment for Children’s Refractory Kaposiform Hemangiendothelioma</td>
<td>Kai Li, Zuopeng Wang, Wei Yao, Kuiran Dong, Xianmin Xiao</td>
</tr>
<tr>
<td>ONC 5</td>
<td>Short</td>
<td>Pleuropulmonaryblastoima mimicking congenital cystic adenomatoid malformation</td>
<td>Kulanka Premachandra, Rithvik Reddy, Allen James, Rajendra Kumar</td>
</tr>
<tr>
<td>ONC 6</td>
<td>Full</td>
<td>Analysis of risk factors associated with recurrence in sacrococcygeal teratoma</td>
<td>Kai Li, Wei Yao, Shan Zheng, Kuiran Dong, Xianmin Xiao</td>
</tr>
<tr>
<td>ONC 7</td>
<td>Short</td>
<td>Yolk Sac Tumor: A Retrospective Multicenter Study</td>
<td>Zhi Li</td>
</tr>
<tr>
<td>ONC 8</td>
<td>Full</td>
<td>The differences in the clinical and biological characteristic of neuroblastomas detected during and after a period of mass screening of six-month-old infants: A report from the Study Group for Pediatric Solid Tumors in the in the Kyushu Area, Japan</td>
<td>Ryota Souzaki, Yoshiaki Kinoshita, Yuki Koga, Minoru Yagi, Fumio Yanai, Koichi Ueda, Yoshio Zazen, Yukihito Inomata, Yuichi Shinkoda, Hiroshi Matsufuji, Souchi Suenobu, Nortoshi Handa, Kenichi Kohashi, Yoshinou Oda, Toshiro Hara, Tomoaki Taguchi</td>
</tr>
<tr>
<td>ONC 9</td>
<td>Short</td>
<td>Central venous catheter-related complications in children with malignancy</td>
<td>Sho Kurihara</td>
</tr>
<tr>
<td>ONC 10</td>
<td>Full</td>
<td>Outcome after surgery alone for patients with low-risk neuroblastoma</td>
<td>Wei Yao, Kai Li, Kuiran Dong, Shan Zheng, Xianmin Xiao</td>
</tr>
<tr>
<td>ONC 11</td>
<td>Short</td>
<td>Health-related quality of life in pediatric cancer patients who had abandoned therapy</td>
<td>Yi Ji, Siyuan Chen, Kai Li, Xianmin Xiao, Bo Xiang</td>
</tr>
<tr>
<td>ONC 12</td>
<td>Full</td>
<td>Clinical feature of ATRX or DAXX mutated neuroblastoma</td>
<td>Eiso Hiyama, Sho Kurihara, Yoshiyuki Onitake, Emi Yamaoka, Ikuiko Fukuba, Keiko Hiyama</td>
</tr>
<tr>
<td>ONC 13</td>
<td>Short</td>
<td>Clinical application of indocyanine green (ICG) fluorescent imaging of hepatoblastoma</td>
<td>Yamamichi T, Oue T, Owari M, Nakahata K, Umeda S, Naka K, Ueno T, Uehara S, Yonekura T, Usui N</td>
</tr>
<tr>
<td>ONC 14</td>
<td>Long</td>
<td>Trends in Incidence of Childhood Malignant Solid Tumors in Japan</td>
<td>Hitoshi Ikeda, Yosikazu Nakamura</td>
</tr>
<tr>
<td>ONC 15</td>
<td>Short</td>
<td>Kaposiform hemangiendothelioma: A retrospective study of 37 steroid-resistant patients treated with vincristine and long-term follow-up</td>
<td>Zuopeng Wang, Kai Li, Kuiran Dong, Wei Yao, Xianmin Xiao, Shan Zheng</td>
</tr>
</tbody>
</table>

## THURSDAY 09:00 – 10:30

**ORAL PRESENTATIONS: UROLOGY (URO)**
Kevin Pringle and John Hutson

<table>
<thead>
<tr>
<th>Number</th>
<th>Full/Short</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>URO 1</td>
<td>Full</td>
<td>The area and attachment abnormalities of the gubernaculum in patients with undescended testes</td>
<td>Masayuki Kubota, Kengo Nakaya, Yuki Arai, Toshifumi Ohyama, Naoki Yokota</td>
</tr>
<tr>
<td>URO 2</td>
<td>Short</td>
<td>“The hernia and the testis”: a review of paediatric Spigelian hernia and the curious association with undescended testis</td>
<td>Brendan Jones, John Hutson</td>
</tr>
<tr>
<td>URO 3</td>
<td>Full</td>
<td>Testicular Descent is associated with the Mammary Bud in Rodents</td>
<td>Jaya Vikraman, Rulli Li, Bridget Southwell, John Hutson</td>
</tr>
<tr>
<td>URO 4</td>
<td>Short</td>
<td>Postnatal germ cell development during mini-puberty in the mouse does not require androgen: implications for managing cryptorchidism</td>
<td>Jorien Meijer</td>
</tr>
<tr>
<td>URO 5</td>
<td>Full</td>
<td>Male Gender Identity in children with 46,XX DSD with congenital hyperplasia after delayed presentation in mid childhood</td>
<td>Tanvir K Chowdhury, Kamrun Laila, John M Hutson, Tahmina Banu</td>
</tr>
<tr>
<td>URO 6</td>
<td>Short</td>
<td>Orchiopepxy without inguinal scar: either scrotal incision or transumbilical laparoscopy</td>
<td>Ning Li, Wen Zhang, Xuefeng Zhou, Qiao Bao, Jiyan Yuan</td>
</tr>
<tr>
<td>URO 7</td>
<td>Full</td>
<td>The role of Radical surgery and orthotopic neobladder reconstruction in the management of bladder neck/prostate rhabdomyosarcoma</td>
<td>Bi Yunli, Lu Liangsheng</td>
</tr>
<tr>
<td>URO 8</td>
<td>Short</td>
<td>Hydronephrosis: Comparison of extrinsic vessel vs intrinsic ureteropelvic junction obstruction groups and a plea against the vascular hitch procedure</td>
<td>Prema Menon, K.I.n.roa</td>
</tr>
<tr>
<td>URO 10</td>
<td>Short</td>
<td>Traction assisted dissection with soft tissue coverage is effective for repairing recurrent urethrocutaneous fistula following hypospadias surgery</td>
<td>Takanori Ochi, Shogo Seo, Yuta Yazaki, Manabu Okawada, Takashi Doi, Go Miyano, Hiroyuki Koga, Geoffrey J Lane, Atsuyuki Yamataka</td>
</tr>
<tr>
<td>URO 11</td>
<td>Full</td>
<td>The morphology and treatment of coexisting ureteropelvic junction obstruction in lower moiety of duplex kidney</td>
<td>Rongde Wu, Wei Liu, Rui Ma</td>
</tr>
<tr>
<td>URO 12</td>
<td>Short</td>
<td>Renal Autotransplantation: An Alternative to Renal Artery Bypass in the Management of Complex Pediatric Renovascular Disease</td>
<td>Eliza Lee, Deborah Stein, Michael Ferguson, Khashayar Vakili, Heung Bae Kim</td>
</tr>
<tr>
<td>URO 13</td>
<td>Full</td>
<td>Pediatric Laparoscopic Urology, Review of 350 Cases</td>
<td>Najeh Y. Alomari</td>
</tr>
<tr>
<td>URO 14</td>
<td>Short</td>
<td>A single surgeon’s experience of 60 cases of penoplasty for buried penis, with special reference to mid- to long-term follow-up.</td>
<td>Hiroshi Murakami, Yuta Yazaki, Manabu Okawada, Takashi Doi, Go Miyano, Hiroyuki Koga, Geoffrey J Lane, Atsuyuki Yamataka</td>
</tr>
</tbody>
</table>
### BS 1

**Extraluminal Helicoidal Stretch (Helixtretch): A Novel Method of Intestinal Lengthening**

**Authors/Institution**
Beatrice Dionigi, MD; Joseph Brazzo III, BS; John Patrick Connors, BS; Azra Ahmed, BS; Jeremy Fisher, MD; David Zurakowski, PhD; Dario O Fauza, MD, PhD; Boston Children's Hospital, Department of Surgery

**Background/Purpose**
We sought to test a novel, extraluminal method of intestinal lengthening that precludes violation of the intestinal wall.

**Methods**
Sprague-Dawley rats (n=45) with size-matched bowel segments isolated by Roux-en-Y reconstruction were divided in three groups. Group 1 (n=14) had no further manipulations. In groups 2 (n=12) and 3 (n=19), the isolated segment was wrapped around a length-matching device in a helicoidal fashion (figure). In group 3, it consisted of a gradually expandable hydrogel (12.5mm final diameter). Euthanasia was performed at 8-21 days. Statistical analysis was by two-way ANOVA (P<0.05).

**Results**
Overall survival was 87% (39/45). There was a statistically significant increase in bowel length in group 3 compared to the other two groups (P<0.01). This increase correlated with the number of helicoidal coils (P=0.018), but not with time (P>0.50). There were no significant differences in total DNA/protein ratio across the groups (P=0.65). Histologically, there was an apparent increase in the goblet cell density in group 3.

**Conclusions**
Measured extraluminal helicoidal stretch (helixtretch) is tolerated by the intestine. Helixtretch induces bowel lengthening in a rodent model. Further analysis of this novel, minimally invasive alternative for intestinal augmentation is warranted.

### BS 2

**Beneficial effects of human beta-defensin-3 in neonatal rats with necrotizing enterocolitis**

**Authors**
Zhibao Lv; Qingfeng Sheng, Children's Hospital of Shanghai, Shanghai Jiao Tong University, Wei Cai, Shanghai Key Laboratory of Pediatric Gastroenterology and Nutrition

**Background/Purpose**
We have shown that human beta-defensin-3 (hBD3) promotes enterocytes migration via the action on CCR6. The process of epithelial migration (restoration) was impaired in rodent necrotizing enterocolitis (NEC) models. Here, we investigated the effects of hBD3 on a neonatal rat NEC model.

**Methods**
Sixty-eight newborn Sprague-Dawley rats were randomly divided into four groups: Control+NS, Control+hBD3, NEC+NS, and NEC+hBD3. Rats in the former two groups were mother-fed. Experimental NEC was induced by exposure to hyperthermia, asphyxia and hypothermia. Pups received recombinant hBD3 (100 μg/kg, once a day) via gastric tube or the same dose of normal saline. Body weight, histological score, survival time, cytokines expression, mucosal integrity, enterocyte proliferation and migration were evaluated.

**Results**
Strikingly, hBD3 administration decreased the incidence of NEC, increased the survival rate, and reduced the severity of NEC (P<0.05). Moreover, hBD3 reduced the pro-inflammatory cytokines (TNF-alpha, IL-6) expression in ileum and serum, and increased the diamine oxidase level in serum and the expression of ZO-1, occluding and claudin-1 in ileum. Enterocyte migration, but not proliferation was determined in vivo.

**Conclusions**
These results demonstrate that hBD3 protects newborn rats from NEC due to reducing inflammatory mediators, preserving mucosal integrity, and promoting intestinal restitution.

### BS 3

**Overexpression of microRNA302s resulted in marked apoptosis of human neuroblastoma cells**

**Authors**
Yuan Li; Yi Wang; Kelin Chen; Bin Zhou; Longpei Yao; Guozhu Yang; Yin Zhou, Department of Pediatric Surgery, West China Hospital, Sichuan University, China

**Background/Purpose**
Neuroblastoma (NB) is characterized by spontaneous regression from an undifferentiated state to a completely benign cellular appearance. MicroRNA (miRNA) has shown to be the key regulator in cell proliferation and tumorigenesis. MiR302s was firstly detected from embryonic stem cells and is essential for maintenance of cell self-renewal and pluripotency. Our study was to explore miR302s’ regulatory role in human NB cells and reveal the potential mechanism.

**Methods**
MiR302a expression was detected by qRT-PCR in human NB cell lines. Lentivirus mediated miR302abcd over-expression plasmid was established and transduced into NB cell lines. Cell growth was observed, and apoptosis was evaluated by Hoechst33342 staining, TUNEL and flow cytometry. qRT-PCR, Western blotting were used to detect the expression of miR302 target and related genes of McI-1, Caspase3, BMI-1, p16ink4a and p53.

**Results**
MiR302a was expressed at low level in NB cells. After lentivirus-mediated overexpression, NB apoptosis was significantly increased. Expression of McI-1, BMI-1 were down regulated, while Caspase3, p16ink4a, p53 were up regulated.

**Conclusions**
MiR302s function as a tumor suppressor in NB cells, and its anti-tumor effect is by way of inhibiting target gene BMI-1, further affecting the p16ink4a, p53 and McI-1 gene expression, activating mitochondrial apoptosis signaling pathway.

### BS 4

**Single Shot Intercostal Block for Pain Management in Pediatric Patients Undergoing the Nuss Procedure: A Double - Blind, Randomised, Controlled Study**

**Authors**
Laura Lukosiene; Andrius Macas; Dalius Malcius; Lina Kalibatiene; Vidmantas Barauskas, Lithuanian University of Health Sciences

**Background/Purpose**
The purpose of this double - blind, randomised study was to investigate the efficacy of single shot intercostal block (IB) for pain control in pediatric patients undergoing the Nuss procedure.

**Methods**
Sixty patients were randomized to receive a single shot bilateral IB with levobupivacaine (Group L, n = 30) or with 0.9 % saline (Group S, n = 30). All patients had standardized baseline analgesia of acetaminophen and ketoprofen, patient controlled analgesia (PCA) with morphine and prophylactic antiemetics. The loading dose of morphine could be given before starting PCA at the discretion of the attending anaesthesiologist. Morphine consumption, pain score, sedation, respiratory depression, nausea/vomiting and urinary retention/catheterization of the bladder were recorded at every 3 hours for 48 hours after surgery.
Conclusions
Tracheoplasty with cartilage engineered outside the esophagus may be useful for developing reconstructed airways.

Results
A loading dose of morphine before starting PCA required 8 patients in Group L vs 29 patients in Group S. A loading dose, morphine consumption 6 hours after surgery (excluding the loading dose), pain scores 3 hours after surgery, the incidence of opioid-related adverse effects was significantly lower in Group L (p<0.05).

Conclusions
A single shot IB is effective additional treatment for pediatric patients undergoing Nuss procedure and results reduced consumption of morphine, less postoperative pain and opioid-related adverse effects.

BS 5
MiR-222 overexpression contributes to liver fibrosis in biliary atresia by targeting PPP2R2A

Authors
Rui Dong; Shan Zheng; Gong Chen; Children's Hospital of Fudan University; and Key Laboratory of Neonatal Disease, Ministry of Health

Background/Purpose
Biliary atresia (BA) is a devastating liver disease in infants. Even after a successful Kasai portoenterostomy procedure, progressive hepatic fibrosis is observed in postoperative patients with BA.

Methods
MicroRNAs (miRNAs) expression profile in BA and anicteric choledochal cyst (CC) infants with normal liver function were performed using Microarrays. The upregulation of miR-222 was further validated. The functional effect of miR-222 inhibition on the growth of the human hepatic stellate cell line LX-2 was also evaluated. The downstream signaling pathways and target of miR-222 were determined. Hepatic lobule localization was evaluated by immunohistochemistry (IHC).

Results
We identified 43 aberrantly expressed miRNAs in BA. miR-222 overexpressed in BA compared with CC. Inhibition of miR-222 in the LX-2 cell significantly decreased cell proliferation. Also, through a series of analysis, we identified protein phosphatase 2A subunit B (PPP2R2A) as a target of miR-222. The downstream signaling pathway, Akt, was also influenced by miR-222. A consistent reduction of Akt phosphorylation and Ki67 in the LX-2 line was shown following miR-222 suppression. IHC analysis revealed increased positive immunostaining for pAkt and Ki67 in BA liver tissues.

Conclusions
Our study showed that miR-222 overexpression is common in BA and contributes to LX-2 cell proliferation through targeting PPP2R2A and Akt signaling.

BS 6
Tracheoplasty with cartilage engineered outside the esophagus

Authors
Makoto Komura; Keisuke Suzuki; Ryousuke Satake; Ken Terawaki, Saitama Medical University; Hiroaki Komuro; Tadashi Iwanaka, Tokyo University

Background/Purpose
Esophageal tracheoplasty reportedly enlarges the airway in congenital tracheal stenosis. However, this procedure, using the esophagus as the grafting source for tracheal reconstruction, leads to collapse of the reconstructed airway. We devised a new tracheoplasty using a cartilage graft engineered outside the esophagus. This study investigated the feasibility of fabricating cartilage engineered outside the esophagus and using it to perform tracheoplasty in a rabbit model.

Methods
Chondrocytes were isolated from auricular cartilage of New Zealand white rabbits.
1. b-FGF enhanced chondrogenesis on the outer esophageal surface on chondrocyte application.
2. Cartilage engineered outside esophagus maintained airway structure up to 1 month after implantation. Tracheal epithelial regeneration occurred in the internal lumen of this engineered cartilage.

Conclusions
A single shot IB is effective additional treatment for pediatric patients undergoing Nuss procedure and results reduced consumption of morphine, less postoperative pain and opioid-related adverse effects.

BS 7
A novel SPHK1 inhibitor SKI-SC induces the apoptosis of Wilms tumor cells via regulating specific LncRNAs

Authors
Pan Jian; Li Zhi-heng; Wang Jian, Key Laboratory of Pediatric Translational Medicine, Children's Hospital of Soochow University

Background/Purpose
Sphingosine kinase-1 (SPHK1) plays important roles in a variety of cancers, including Wilms tumor. SPHK1 is an important therapeutic target for tumor. And we found a novel SPHK1 specific inhibitor SKI-SC which can induce the apoptosis of Wilms tumor cells.

Methods
Half maximal inhibitory concentration (IC50) of SKI-SC on SK-NEP-1 with CCK8 assay. Cell apoptosis were analyzed with BD Annexin?Apoptosis Detection Kit and western blot. Real-time PCR array was carried out to determine the dysregulated mRNA upon with SKI-SC. LncRNA Microarray was performed to find SKI-SC induced apoptosis related LncRNAs.

Results
SKI-SC showed significant cytotoxicity to SK-NEP-1 with IC50 of approximately 6.7M. SK-SC treatment significantly induced apoptosis of SK-NEP-1 (49±±2.56) compared with control (16±±0.39). Apoptosis was confirmed whit cleavage of caspase-3 and caspase9. Meanwhile, after SKI-SC treatment expression of anti-apoptotic Bcl-2 decreased 720-fold and pro-apoptotic DNAJ3 increased 166-fold. LncRNA expression profiles related with SK-SC treatment was also analyzed. One of these LncRNAs RP11-796E2.4 may related with the apoptosis of SK-SC treatment.

Conclusions
Our study firstly demonstrates that SKI-SC significantly promote the apoptosis of SK-NEP-1 cells. LncRNA RP11-796E2.4 may related with the apoptosis of SK-SC treatment. These findings provide new evidence of the anti-tumor activity of SKI-SC and new insights into the treatment of Wilms tumor.

BS 8
An impaired inflammatory cytokine response to gram-negative LPS in human neonates is associated with the defective TLR-mediated signaling pathway

Authors
Jian Wang; Yiping Li, Children's Hospital of Soochow University

Background/Purpose
This study examined the inflammatory response of neonatal monocytes to bacterial lipopolysaccharide (LPS) and peptidoglycan (PGN) stimulation and discriminated the underlying Toll-like receptor(TLR)-mediated signal transduction pathways.

Methods
Cord blood from 30 healthy newborns of full-term elective cesarean sections and peripheral blood from 25 healthy adult volunteers were collected. Ex vivo production of inflammatory cytokines was assessed by cytometric bead array, and expression of CD14, TLR4, TLR2, phosphorylated NF-κB p65 and p38 on monocytes were detected by FACScan analysis.
Conclusions

Exosome could ameliorate Con-A induced liver injury. Considering the etiology of Con-A induced liver injury, the anti-inflammatory effect of MSCs-derived exosome on concanavalin-A (Con-A) induced liver injury that is mediated by innate immune-modulation or tissue regeneration, and now it is expected it could be an alternative of MSCs. We evaluated the anti-inflammatory effect of exosome may result from suppression of innate and adaptive immune reactions.

Results

Mice treated with exosome exhibited average serum ALT levels of 387 IU/L compared with 2293 IU/L for non-treated mice.

Methods

MSCs were cultivated from bone marrow of C57B6 male mice. Exosome was collected with ultracentrifugation and given just

Results

Background/Purpose

Exosome is a nanoparticle secreted from various cells and serves as carriers for several ligands and microRNAs. It has been a focus of interest after it was shown to work as paracrine factors secreted from mesenchymal stem cells (MSCs) used for repair. Exosomes have been shown to carry cargo that can influence recipient cells, and their therapeutic potential has been investigated in various disease models.

Methods

Growing New Zealand rabbits (n=12) with a complete, critical-size defect on the left tibia were equally divided into two groups. One group received a decellularized, non-demineralized leporine tibiofibula graft. The other group received an identical graft seeded with mesenchymal stem cells labeled with green fluorescent protein (GFP), at a fixed density. Animals were euthanized at comparable time points 3-8 weeks post-implantation. Statistical analysis was by the Student t-test and Fisher’s exact test (p<0.05).

Results

There was no significant difference in the rate of non-union between the two groups, including on 3D micro-CT. Incorporating non-union rates, achieving adequate axial bending rigidity, dorsal rigidity, and both union yield and flexural strength, with no significant differences, or unequal variances between the groups. Correspondingly, there were no significant differences in extracellular calcium levels, or alkaline phosphatase activity. Histology confirmed the presence of neobone in both groups, with GFP-positive cells in the re-cellularized grafts.

Conclusions

Osseous grafts derived from decellularized, non-demineralized bone undergo adequate remodeling in vivo after repair of critical-size limb defects in growing leporine model, irrespective of subsequent re-cellularization. This methodology may become a practical alternative for pediatric limb reconstruction.
Background/Purpose: Hirschsprung's disease (HD) is a congenital malformation caused by the defective migration of gut neural crest stem cells. The aim of this study was to investigate the effects of HD on intestinal wound healing.

Methods: Cytotoxicity against human and rat intestinal epithelial cell lines was first measured. Enterocyte migration (wound closure assay, real-time electrical-impedance based detection analyzer, and BrdU immunostaining) and proliferation (CCK8, BrdU incorporation assay, cell cycle analysis, and PCNA immunostaining) was detected in vitro and in vivo. The role of chemokine receptor CCR6 and its downstream RhoA-ROCK signaling pathway was assessed.

Results: Recombinant hBD3 could stimulate enterocyte migration, but not proliferation, both in cultured enterocytes and in the ileum of nectrotizing enterocolitis rats. The migratory effect was slightly dose-dependent. Neutralizing antibody and siRNA confirmed this stimulatory effect was mediated by CCR6. Further, hBD3 (5 μg/ml) treatment induced Rho activation (GTP-bound form of Rho), myosin light chain 2 phosphorylation (at serine 19), and F-actin accumulation. ROCK inhibition resulted in strikingly reduction of F-actin accumulation and enterocyte migration.

Conclusions: This study, for the first time, provided evidence that hBD3 could promote enterocyte migration via the action on CCR6 and its regulation of its downstream RhoA-ROCK signaling pathway.

BS 13: Dendrimer Encapsulation Enhances Anti-inflammatory Efficacy of Silver Nanoparticles in burn wound

Authors: Xuelai Liu, Chun-Nam Lok, Ruizhong Zhang, Kenneth KY Wong, The University of Hong Kong

Background/Purpose: Our previous studies revealed that silver nanoparticles (AgNPs) promoted wound healing in part through their anti-inflammatory actions. As recent reports also suggested anti-inflammatory effects of dendrimers, we therefore undertook this study using dendrimers as the delivery system for AgNP to explore any potential synergistic anti-inflammatory efficacy.

Methods: Lipopolysaccharide (LPS) was added to cultured RAW264.7 and J774.1 cells to mimic in vitro inflammation condition, followed by the addition of either silver dendrimer nanocomposite (Ag-DNC), AgNPs or derdrimer. The levels of inflammatory markers TNF-alpha and interleukin-6 were assessed by ELISA assay. Furthermore, in vivo effects such of Ag-DNC, AgNPs or dendrimer were studied in a burn wound model in mice.

Results: Our results confirmed that although both naked dendrimer and AgNPs had anti-inflammatory properties, Ag-DNC was shown to have the best anti-inflammatory efficacy than AgNPs or dendrimer alone in in-vitro studies. In-vivo experiments also indicated that animals in the Ag-DNC group had the fastest healing time with the least inflammation.

Conclusions: Our study would suggest that dendrimer could provide additional anti-inflammatory benefits and might be an excellent delivery system for silver nanoparticles for future clinical application.

BS 14: Identification of cancer stem-like side population cells in cultured pediatric Wilms tumor

Authors: Wei Liu, Rongde Wu, Lijuan Zhang, Department of Pediatric Surgery, Provincial Hospital Affiliated to Shandong University, Jinan, China

Background/Purpose: Wilms’ tumor (WT) is the most common pediatric renal malignancy and the existence of stem cells in WT has seldom been reported. Here we aimed to detect and isolate the cancer stem cell (CSC)-like side population (SP) cells from pediatric WT.

Methods: WT cells were primary cultured from surgically resected WT specimens of blastema phenotype. The Hoechst 33342 dye efflux technique was used to isolate SP and NSP from WT cells. The proliferation capacity, migration ability, and tumorigenic activity of SP cells were evaluated. In addition, the expression of CSC marker genes was analyzed.

Results: The percentage of SP cells in primary cultured WT cells was 1.36±0.16%. The clone formation ratios were 37.25±7.90% vs. 4.53±1.86% for SP and NSP cells (P<0.05). The SP cells depicted a higher migrating potency than the NSP cells in the transwell assay (P<0.05). Furthermore, SP cells manifested greater xenograft tumorigenicity and higher expression in ABCG2, NCAM and SIX2 compared with NSP cells.

Conclusions: These findings suggest that the primary cultured WT cells of blastema phenotype contain cancer stem-like SP cells. SP cells may play an important role in WT tumorigenesis and targeting these cells will provide a novel treatment strategy to WT.

BS 15: MicroRNA-21/PTEN/Akt axis in the fibrogenesis of biliary atresia

Authors: Shen Wenjun, Children's Hospital of Fudan University

Background/Purpose: MicroRNAs (miRNAs) are a class of short, non-coding RNA molecules, which act as post-transcriptional negative regulators of target mRNA. Increasing evidence suggests that miRNA are involved in fibrotic process of liver. Biliary atresia (BA) is characterized by rapid progressively liver fibrosis.

Methods: We used microarray to determine the profile of liver microRNA levels in BA children with significant altered transcripts in miR-21. The RNA expression of miR-21, phosphatase and tensin homolog deleted on chromosome ten (PTEN) and a-smooth muscle actin (α-SMA) in liver tissue were detected by real-time fluorescence quantitative PCR. Immunohistochemical staining was performed to determine PTEN, phosphorylated AKT and a-SMA in liver section.

Results: We defined miR-21 was upregulated in BA livers while PTEN has a significant negative correlation by 3’untranslated region’s suppression. Activated Akt pathway downstream provoked liver fibrosis by evaluating a-SMA level.

Conclusions: MicroRNA-21/PTEN/Akt axis promotes the fibrosis process in BA, which might be a potential target for improving the BA’s prognosis.

BS 16: Role of autophagy in Hirschsprung’s disease: implication for the development of enteric neural system.

Authors: Qiang Huang, Ya Gao, Yitao Duan; Baijun Zheng, Peng Li; Weikang Pan; Huaijie Wang, Department of Pediatric Surgery, the Second affiliated Hospital of Xi’an Jiaotong University

Background/Purpose: Hirschsprung’s disease is a congenital malformation caused by the driving defect of gut neural crest stem cells, the multipotent progenitors formed enteric nervous system. Autophagy is a self-degradative process, plays an important role in the development of central nervous system, but there is no study in enteric nervous system. In the current study, we demonstrated the autophagy in Hirschsprung’s disease to investigate the involvement of autophagy in the development of enteric nervous system.
**Methods**
We applied electron microscopy to detect the autophagy in different specimen segments. Further, we used real-time PCR, immunohistochemistry to study the expressions of Beclin1, LC3, and Atg 7 in Hirschsprung’s disease.

**Results**
We detected autophagy in myenteric plexus from transitional zone and did not detected in aganglionosis segment. We found higher Beclin1/LC3/Atg7 mRNA levels in transitional zone than aganglionosis segment. Moreover, we observed inverse correlation between Beclin1/LC3/Atg7 and S100 mRNA levels and positive correlation between Beclin1/LC3/Atg7 and p75 mRNA levels. Immunohistochemistry analysis showed that much more Beclin1/LC3/Atg7 positive cells were observed in transitional section.

**Conclusions**
This findings have for the first time revealed that autophagy in the detection of enteric nervous system, may contribute to the formation of Hirschsprung’s disease.

---

**BS 17**
**The protective and anti-inflammatory effects of glucagon-like peptide-2 in experimental necrotizing enterocolitis.**

**Authors**
Kazuhiko Nakame; Tatsuru Kaji; Motoi Mukai; Hiroshi Matsufuji, Department of Pediatric Surgery, Kagoshima University Graduate School of Medical and Dental Sciences

**Background/Purpose**
Necrotizing enterocolitis (NEC) is a life threatening gastrointestinal disease of neonates. Glucagon like peptide-2(GLP-2) is secreted from ileal and colonic enteroeucrine L cells, has the some effects, like the increase in intestinal mucosa and the anti-inflammatory effects. We suspected that GLP-2 would have the protective effects in the experimental NEC.

**Methods**
NEC was induced in the newborn rats via enteral feeding with artificial milk, asphyxia stress and enteral administration of lipopolysaccharide (LPS). Rats were divided into following 3 groups; 1.Control (stress+LPS+normal saline), 2.GLP-2(L) group (stress+LPS+GLP-2(80µg/kg/day)), 3.GLP-2(H) group (stress+LPS+GLP-2(800µg/kg/day)). All surviving animals after 96 hours or animals that developed sign of distress were euthanized. We evaluated the survival rate, NEC score, histological analysis, TNF-α and IL-6 level at terminal ileum using ELISA.

**Results**
The survival rate and NEC score in the GLP-2 (H) group was significantly improved than that in other groups. Villous height and crypt depth in the GLP-2 treatment groups were significantly increased than that in Control group. The ileal interstitial TNF-α and IL-6 level in the GLP-2 (H) group was low in comparison with other groups.

**Conclusions**
High dose GLP-2 administration showed the protective effects in experimental NEC. These results support a potential therapeutic role for GLP-2 in the treatment of NEC.

---

**BS 18**
**Systemic and local cytokine profile in biliary atresia**

**Authors**
Takeshi Saito; Hideo Yoshida, Department of Pediatric Surgery, Graduate School of Medicine, Chiba University, Chiba, Japan

**Background/Purpose**
Abnormal immunological response to an unknown pathogen, followed by cytokine imbalance in the host, could trigger inflammation, leading to biliary atresia (BA). With a focus on helper T(Th)1/Th2 or Th17/Regulatory T cell(Treg) relationships, we analyzed the systemic and local immune environments using rigorous BA samples.

**Methods**
The concentration of 20 cytokines, chemokines, and soluble cellular adhesion molecules(s-CAM) in sera from 14 preoperative patients with BA(median age;53 days), 15 normal controls, and 20 cholestatic controls was measured using flow cytometry. Hepatic mRNA levels of Th cytokines and the Treg master gene(FoxP3) quantified by RT-PCR were compared between BA(10 cases;median,62 days) and non-BA(10 cases;150 days) groups. The Mann-Whitney U test was used for significance.

**Results**
No significant differences were observed between BA and others in serum Th1, Th2, Th17 or inflammatory cytokines; however, s-CAM was significantly higher in the BA group. No significant differences were detected between BA and non-BA groups in hepatic IFN-γ, IL-2, IL-4, or IL-17 mRNA levels; however, FoxP3 and TGF-β were significantly higher in the BA group.

**Conclusions**
Skewed bias toward Th1, Th2 and Th17 was not demonstrated in either the systemic or local environment in the early phase of BA. The role and function of CAM and Treg warrant further investigation.

---

**Monday 08:45 – 10:30**

**ORAL PRESENTATIONS: GASTROINTESTINAL (GI)**

**GI 1**
**Non-Responders to a Standardized Protocol for Complicated Appendicitis Have Significant Morbidity: Outcomes from a Prospective Cohort Study**

**Authors**
Luke R. Putnam; Shauna M. Levy; Caroline M. Kellagher; Hannah S. Smith; Diana M. Hook-Dufresne; Galit Holzmann-Pazgal; Kevin P. Lally; KuoJen Tsao, University of Texas Health Science Center at Houston

**Background/Purpose**
Treatment of pediatric appendicitis follows standardized pathways in most institutions. The majority of children with complicated appendicitis do well, but a subset of these children experience significant postoperative morbidity. Anticipating and identifying these high-risk patients along our pathway may lead to improved outcomes.

**Methods**
Pediatric patients with acute appendicitis were prospectively followed from 2011 to 2013. Standardized care pathways were assigned based on intraoperative diagnosis (simple: acute/non-perforated, complicated: gangrenous/perforated). Complicated appendicitis patients who failed discharge criteria by 5-7 days (non-responders) remained on antibiotics and underwent imaging ± further interventions. A multi-disciplinary 30-day surveillance program prospectively captured surgical site infections (SSI) and readmissions.

**Results**
800 children underwent appendectomies; 86 (11%) were complicated non-responders. Demographics were similar between groups. Non-responders demonstrated significantly longer length of stay (10.3 vs. 3.9 days), and higher SSI (71% vs. 1%) and readmission rates (28% vs. 3%) compared to complicated responders (Table). Non-responders were the only patients with readmissions due to abscesses (14%).

**Conclusions**
Standardized pathways for pediatric appendicitis result in favorable outcomes for simple and complex responders, but the cohort of non-responders has a significantly higher risk of postoperative complications. Prospective identification and targeted interventions for this high risk group may decrease morbidity and hospital readmissions.
### GI 2: Probiotics Prevent Hirschsprung’s Disease Associated Enterocolitis: A Prospective Multicenter Randomized Controlled Trial

**Authors:** Zhi Li, Tongji Hospital, Tongji Medical College

**Background/Purpose:** Enterocolitis (EC) is the most common and serious postoperative complication of Hirschsprung’s disease (HD) with high morbidity and mortality. Probiotics are live microbes that, when administered in adequate amounts, confer health benefit to the host. Probiotics potentially play a protective role in maintaining intestinal mucosal integrity through a number of different interactions.

**Methods:** We enrolled sixty patients of Hirschsprung’s disease (HD) in the prospective, multicenter, randomized and controlled trial. HD patients were randomly assigned into the control group and probiotics-treated group. All children in probiotics-treated group were fed with per day for 4 weeks. In next 3 months the incidence and severity of EC were assessed in detail. The peripheral blood T lymphocytes subsets and cytokines, including TNF-α, IFN-γ, IL-6 and IL-10, were analyzed by flow cytometry and enzyme immunoassay.

**Results:** Compared with the control group, the incidence of HAEC in the probiotics-treated was significantly diminished (P<0.05). The severity of EC was also remarkably decreased in the composition of Elhalaby I, Elhalaby II and Elhalaby III (P<0.05). Furthermore, probiotics balanced T lymphocytes subsets.

**Conclusions:** Probiotics not only significantly diminished the incidence but also decreased the severity of Hirschsprung’s disease associated enterocolitis (HAEC). Moreover, our study revealed that probiotics decreased pro-inflammatory cytokine and increased anti-inflammatory cytokine and furthermore balanced T lymphocytes.

### GI 3: Peroral Endoscopic Myotomy for the Treatment of Esophageal Achalasia in Children

**Authors:** Komei Suzuki, Tomokazu Nakagami, Ai Tayama, Shinya Kawano, Yusuke Ohashi, Yu Watara; Akira Toki, Division of Pediatric Surgery, Department of Surgery, Showa University School of Medicine; Haruhiro Inoue; Haruo Ikeda; Chiaki Sato, Digestive Disease Center Showa University Northern Yokohama Hospital

**Background/Purpose:** Peroral endoscopic myotomy (POEM) is a novel treatment for esophageal achalasia. We herein present the cases of nine children with esophageal achalasia treated with POEM.

**Methods:** Between February 2011 and December 2013, nine children with esophageal achalasia underwent POEM at our institution.

**Results:** The patients consisted of three males and six females, ranging from three to 15 years of age (mean age, 9.8 years), with a body weight of 9.3-47 kg (mean, 28 kg). A surgical complication, right pneumothorax, was seen in one case. The average fasting period after surgery was 1.3 days, and the average length of the hospitalization was five days. The Eckardt score decreased from 6 to 0.8 after the operation. During the follow-up, additional treatment was necessary in one patient (three years old, trisomy 21 case) who underwent balloon dilatation once after POEM.

**Conclusions:** Our results confirm the feasibility, safety and efficacy of POEM in children. Some difficulties were found when performing POEM in small infants due to the weakness of the mucosal and muscle layers of the esophagus. Therefore, an age over five years and weight of over 15 kg are desirable to ensure that POEM can be safely performed in children.
The RI and total reflux episodes (RE) evaluated with pH analyses and total/acid distal and proximal RE with impedance and pH analyses increased significantly in GI, although additional postoperative medication was unnecessary. The RI and acid clearance time with pH analyses and total distal RE with impedance and pH analyses decreased significantly in GI. Gastric emptying parameters did not change significantly in GI, whereas half gastric emptying time and gastric emptying coefficient improved significantly in GI.

**Conclusions**

LGP reduces GER in NI patients with pathological GER by improving gastric emptying, although it has a paradoxical influence on those without pathological GER.
Background/Purpose

A study previously performed at our institution demonstrated that surgeon performed ultrasound (SPUS) was equivalent to radiology department ultrasound (RDUS) when evaluating children with suspected appendicitis. The purpose of this study was to evaluate the efficacy of Surgeon Performed Ultrasound: Accurate, Reproducible, and More Efficient

Authors

Benjamin A. Keller; Erin G. Brown; Diana L. Farmer,

University of Arkansas for Medical Sciences - Arkansas Children's Hospital

Conclusion

Our LTF should be considering a viable alternative to Nissen fundoplication especially in neurologically impaired children because of reliable outcome and low recurrence.

GI 10

Evening, night time and weekend appendectomy is effective and safe

Authors

Nigel Hall, on behalf of the Paediatric Surgery Trainees Research Network

Background/Purpose

Recent data suggests worse outcome for patients undergoing surgery outside of daytime hours and at the weekend. Most analyses are performed on coding-based retrospective datasets. We analysed influence of time of day and day of week on outcome of pediatric appendectomy prospectively.

Methods

Trainee-led, prospective cohort study of all pediatric appendectomies at UK specialist pediatric and general hospitals during a 2 month period. Binomial logistic regression models investigated the relationship between time of surgery (daytime [08:00-18:00], evening [18:00-24:00], night-time [24:00-08:00], weekend) and the outcomes normal appendectomy and 30-day adverse events. Models were adjusted for age, gender and disease severity.

Results

Data from 703 children (<16yrs) were analysed. Overall normal appendectomy rate was 19.2% (n=135) and 30-day adverse events occurred in 10.9% (n=77). Appendectomy was performed during the daytime (n=411), evening (n=170) and night-time (n=122), 542 on a weekday and 161 at the weekend. There were no statistically significant relationships between negative appendectomy nor 30-day adverse events and time of day or day of the week in unadjusted or adjusted (Table) regression models.

Conclusions

This study suggests no significant relationship between outcome of appendectomy and time or day of surgery. Current practice regarding timing of appendectomy does not appear to adversely influence outcome.

GI 11

Global Comparison of Pediatric Surgery Workforce

Authors

Priti Lalchandani; Dr. James Dunn,

University of California, Los Angeles

Background/Purpose

The number of pediatric surgeons and their distribution varies throughout the world. The purpose of this study is to examine potential influential factors including the length of education and training, population, birthrate, and gross domestic product (GDP) per capita.

Methods

An internet search was conducted to determine the duration of education from grade school to pediatric surgery fellowship, number of pediatric surgeons, birthrate, GDP, and total population in 15 countries. The number of pediatric surgeons per 100,000 people was correlated with these factors.

Results

The number of pediatric surgeons per 100,000 people varied from 5.2 to 0.2. The total length of education from grade school to completion of pediatric surgery training ranged from 23 to 29 years. There was no correlation between pediatric surgeons per capita with the duration of training. The pediatric surgeon per capita was inversely correlated with birthrate. For countries with GDP per capita less than US $20,000, pediatric surgeons per capita increased with GDP per capita.

Conclusions

There is a tremendous variability in pediatric surgeons per capita around the world. There appears to be a significant shortage of pediatric surgeons in countries with a high birthrate. GDP per capita may influence the pediatric surgeons per capita in some countries.

GI 12

Intestinal Neuronal Dysplasia and Colonic Neuropathies as an Occult Cause of Functional Constipation: Diagnosis and Treatment with Cecostomy Tubes.

Authors

Benjamin A. Keller; Erin G. Brown; Diana L. Farmer, University of California Davis; Stephen K. Greenholz, Sutter Medical Foundation, Sacramento

Background/Purpose

We have surgically managed medically refractory functional constipation manifested by colonic dilation, soiling and psychosocial distress, with appendiceal biopsy and cecostomy. We identified intestinal neuronal dysplasia (IND) and other colonic neuropathies as the probable occult etiology in 61% of this population. We reviewed our experience to report this association and the efficacy of surgical intervention.

Methods

Data from 36 patients with refractory functional constipation between September 2000-2013 was retrospectively reviewed. All underwent cecostomy placement. Appendiceal specimens were evaluated by pathologists recognized as experts in IND. Long-term management techniques were evaluated.

Results

Twenty-two of 36 children with refractory functional constipation who underwent cecostomy placement were diagnosed with IND (9) or other colonic neuropathy (13). 100% had resolution of soiling, colonic distension and avoidance of traumatic enemas with psychosocial improvement. Most required occasional disimpaction and/or modification of irrigations for recurrent impactions. One patient had their cecostomy removed.

Conclusions

IND and colonic neuropathies are a significant occult cause of medically refractory functional constipation. Cecostomy placement with irrigations is an effective means of diagnosis and treatment. Therapy is well received and patients experience resolution of soiling and subsequent psychosocial blossoming. Occasional operative disimpactions may be required as maintenance therapy. Bowel rehabilitation with tube removal can be achieved.

GI 13

Surgeon Performed Ultrasound: Accurate, Reproducible, and More Efficient

Authors

Deidre Wyrick, University of Arkansas for Medical Sciences - Arkansas Children's Hospital; Sam Smith; Melvin S. Dassinger, Arkansas Children's Hospital

Background/Purpose

A study previously performed at our institution demonstrated that surgeon performed ultrasound (SPUS) was equivalent to radiology department ultrasound (RDUS) when evaluating children with suspected appendicitis. The purpose of this study was to evaluate the efficacy of Surgeon Performed Ultrasound: Accurate, Reproducible, and More Efficient

Conclusion

1.2-11.1 years). One case required conversion to open surgery. Intraoperative complications included injury to the esophagus (n=4; 3.3%), and perforation of the esophagus (n=1; 0.8%). Postoperative complications included pyloric stenosis (n=4; 3.3%), dysphagia (n=1; 0.8%), incisional hernia (n=1; 0.8%), hemorrhage requiring transfusion (n=1; 0.8%), recurrence (n=3; 2.4% at 11, 13, and 48 months, respectively), and gastrostomy site infection (n=7; 5.7%). Mean operating time decreased significantly with experience from 180.8 minutes for the first quarter of subjects to 150.6 (2nd quarter), 128.6 (3rd) and 109.8 minutes (4th).
Conclusions
Symptoms alone were not reliable in diagnosing GERD. Only 57.5% had GERD among patients referred for reflux disorders.

Gastroesophageal reflux disease (GERD) was diagnosed in 57.5% subjects of the total sample. The parameters used in 24hr pH were significantly higher in those diagnosed with GERD (p<0.0001). The prevalence of GERD was found to be significantly higher when both gastrointestinal and respiratory symptoms were present (p=0.008) at 66.4% than when compared with gastrointestinal (56.5%) and respiratory (52.2%) symptoms in isolation.

Symptoms or group of symptoms, profiles and prior investigations of 1097 pediatric subjects referred for evaluation of reflux disorders were combined with the previous study and final comparison with RDUS was performed. Mean time to diagnosis was recorded.

Data were analyzed using Fisher exact and Students t-test.

Background/Purpose
Pediatric surgery access is limited in rural low-income sub-Saharan Africa. Uganda has one full-time pediatric surgeon, and no physician anesthetists work outside the capital. Rural outreach with a primarily Ugandan team was conceived to improve surgical access.

Methods
Needs assessments were conducted in public regional hospitals in rural Soroti (east) and in Masaka (west). Collaborative objectives included 1) skills transfer to local clinicians; 2) reducing operative backlog; and 3) community sensitization to pediatric surgical conditions. Local providers screened cases before outreachs, and radio announcements were made. Visiting teams were composed of primarily Ugandan providers. Follow up occurred through regular communication, referral to the capital as needed, and return visits.

Results
One-week outreach trips were made to Soroti (5/2012, 1/2013) and Masaka (8/2013). 92 patients (mean) were screened/outreach and 74 cases completed/outreach. All operations were done under general anesthesia with frequent use of regional blocks. Common operations were hernia/hydrocele repair, orchiopepsy, colostomy, PSARP/pull through, and hypospadias repair. There were no perioperative deaths or major complications other than one wound dehiscence.

Conclusions
Rural pediatric general surgery outreach can be performed safely in a very austere environment with primarily local providers. Preparatory planning with host clinicians, interdisciplinary teams, and careful case selection are essential for success.

GI 15
Does neonatal PSARP for male intermediate anorectal malformations give better results than 3 stage anorectoplasty: A comparative study

Authors
Amit K. Sinha; Ravi P. Kanojia; Prema Menon; K. L. N. Rao * (Presenting Author), Post Graduate Institute Of Medical Education And Research, Chandigarh, India

Background/Purpose
To assess whether single stage neonatal posterior sagittal anorectoplasty (PSARP) without colostomy for Intermediate anorectal malformations (ARM) is better than conventional 3-stage correction in terms of continence and quality of life (QOL).

Methods
Patients of intermediate ARM who underwent surgical correction in a university tertiary care center were evaluated retrospectively. Procedures were performed depending on the surgeon’s preference. They were divided into 2 groups. Group A: one stage PSARP and group B: 3-stage ARM correction (colostomy, PSARP and colostomy closure). Outcomes were compared between two groups in terms of continence by 3 scoring systems each and with an objectivised modified quality of life scoring system.

Results
Total 38 patients were studied (group A=20, B=18). Mean duration of follow up was 32 and 16 months after colostomy closure. The mean Kelly score and Rintala score for group A was higher, though statistically not significant. The QOL score for group A was also higher (9.9 vs 9.5).

Conclusions
Continence is better in group A as compared with B. This is also reflected by better QOL in the former. By using 3 scoring systems, this study also eliminated any bias which may arise if only one particular scoring system is used making the results more authentic.

GI 16
Patterns of Reflux in Gastroesophageal Reflux Disease in Pediatric Population of New South Wales

Authors
Sarath Kumar Narayanan; Ralph Clinton Cohen; Jonathan Saul Karpelowsky, The Children’s Hospital at Westmead, NSW, Australia

Background/Purpose
To assess the clinical and epidemiological profiles of subjects referred for reflux disorders. Also to determine how the symptoms and other investigations correlated with the diagnostic outcomes and the utility of ambulatory pH monitoring (24hr pH) in its pre-operative evaluation.

Methods
Symptoms or group of symptoms, profiles and prior investigations of 1097 pediatric subjects referred for evaluation of reflux disorders between 1988 and 2012 were retrospectively studied. Chi-square or fisher exact test was used for hypothesis testing, student t-test for the comparison of means and the Wilcoxon rank-sum test for comparing medians of continuous variables.

Results
Gastroesophageal reflux disease (GERD) was diagnosed in 57.5% subjects of the total sample. The parameters used in 24hr pH were significantly higher in those diagnosed with GERD (p<0.0001). The prevalence of GERD was found to be significantly higher when both gastrointestinal and respiratory symptoms were present (p=0.008) at 66.4% than when compared with gastrointestinal (56.5%) and respiratory (52.2%) symptoms in isolation.

Conclusions
Symptoms alone were not reliable in diagnosing GERD. Only 57.5% had GERD among patients referred for reflux disorders. 24hr pH is reliable and should be considered routine in reflux disorders, as it identifies patients with pathologic reflux and avoids a needless surgery.
116 GI 17

**Pediatric chronic intestinal pseudo-obstruction is a rare, serious, and intractable disease: A report of a nationwide survey in Japan**

**Authors**
Mitsuru Muto; Hiroshi Matsufuji, Department of Pediatric Surgery, Kagoshima University, Japan; Takeshi Tomomasa, PAL Children’s Clinic, Japan; Atsushi Nakajima, Division of Gastroenterology, Yokohama City University School of Medicine, Japan; Hisayoshi Kawahara, Dept of Pediatric Surgery, Hamamatsu University School of Medicine, Japan; Shinobu Ida, Dept of Pediatric Gastroenterology and Nutrition, Osaka Med Center for Maternal and Child Health, Japan; Kousuke Usajima, Department of Pediatric and Child Health, Kurume University, Japan; Akio Kubota, Second Department of Surgery, Wakayama Medical University, Japan; Sotaro Mushiake, Department of Pediatrics, Nara Hospital Kinki University, Japan; Tomoaki Taguchi, Department of Pediatric Surgery, Kyushu University, Japan

**Background/Purpose**
Diagnostic criteria and appropriate management strategy for adult chronic intestinal pseudo-obstruction (CIP0) were newly proposed in Japan. Subsequently, a nationwide study was conducted to reveal the clinical presentation of CIP0 in Japanese children.

**Methods**
A questionnaire was sent to major pediatric facilities. The data were collected ensuring the anonymity of the respondents.

**Results**
A total of 92 responses were collected from 47 facilities. Sixty-two fulfilled the criteria for pediatric CIP0 and were included in the analysis. The estimated prevalence of pediatric CIP0 was 3.7 in 1 million. Children with neonatal-onset CIP0 were the main subjects (56.5%). Full-thickness histopathological examination of the affected intestine was performed in 45 (72.6%), of which 41 (91.1%) had no pathological abnormalities and were presumed as unclassifiable or idiopathic. Forty-one patients (66.1%) had restricted oral food intake, and 29 (46.8%) used parenteral nutrition support over a long period. No therapeutic intervention, including medication and surgery, has successfully improved oral food intake or obstructive symptoms, except decompression. Only 3 patients (4.8%) died from enteritis or sepsis.

**Conclusions**
Pediatric CIP0 is a rare, serious, and intractable disease. The disease prognosis in Japanese children was good but unsatisfactory. Transitional cases will likely increase in the future in Japan.

---

**GI 18**

**Rapid multiparametric MRI without contrast or sedation in the diagnosis of pediatric appendicitis.**

**Authors**
Ryne Didier; Sanjay Krishnaswami; Bryan Foster; Fergus Coolkey; Katharine Hopkins; David Sprio, Oregon Health & Science University

**Background/Purpose**
Evaluation of suspected appendicitis often includes imaging techniques including ultrasonography (US) and computed tomography (CT). Historically, limitations of magnetic resonance imaging (MRI) precluded widespread use but technological advancements and concerns regarding ionizing radiation with CT have encouraged further exploration. The purpose of this study was to evaluate the sensitivity, specificity and diagnostic accuracy of rapid MRI without contrast or sedation in pediatric appendicitis.

**Methods**
Pediatric patients with suspected appendicitis who underwent clinically indicated US were recruited. Five MRI sequences were performed including diffusion weighted imaging (DWI) without contrast or sedation. Previously established diagnostic criteria for acute appendicitis were used for interpretation. Results were compared with available US results, clinical outcome, operative reports, and surgical pathology results.

**Results**
19 examinations have been performed, well-tolerated by 11 females and 8 males. Mean age was 10.75 years. Average total image time in the MRI was 22 minutes 8 seconds. The protocol yielded 100% sensitivity and 89% specificity for acute appendicitis with a diagnostic accuracy of 95%.

**Conclusions**
Initial evaluation of this novel rapid MRI protocol without contrast or sedation in the evaluation of pediatric appendicitis yielded performance characteristics comparable to those of CT and this imaging protocol may provide pediatric surgeons with a promising alternative to CT.

---

**GI 19**

**Pacific Partnership: Seven-Year Experience of Pediatric Surgery Humanitarian Missions in Southeast Asia**

**Authors**
Amy Hernandez; Abigail Coots; Sean Stroup; Thomas Latendresse, Romeo Ignacio, U.S. Navy

**Background/Purpose**
Multiple U.S. military humanitarian missions have been conducted in Southeast Asia. We describe our pediatric surgical experience with emphasis on predeployment planning, operative cases and lessons learned over a seven-year period. This discussion will help improve future military and civilian humanitarian endeavors.

**Methods**
Between 2006 and 2012, the USNS (United States Naval Ship) Mercy completed four large-scale medical operations named Pacific Partnership. A retrospective review of surgical records and after-action reports was conducted to determine patient demographics, type and diversity of operations performed, and pediatric surgeon involvement.

**Results**
The total number of operations completed in eight countries (15 port visits) was 2689 in which 848 (28%) involved pediatric patients. The average age was 7.25 years (range, 3 months to 18 years). ASA class was approximately 1.3. The percentage of pediatric operations varied widely for each country (20-93%), but certain types of cases were more common (hernia/hydrocele repair, circumcision, orchiopexy, cleft lip/palate repair). Pediatric surgeons performed approximately 40% of these operations.

**Conclusions**
This analysis represents the largest humanitarian assistance involving pediatric operations and establishes the essential need for pediatric surgical care in such missions. This experience will potentially aid other organizations and countries in planning for humanitarian missions involving young children and infants.

---

**GI 20**

**Redo Fundoplication on Children with Hiatus Hernia**

**Authors**
Gong Chen; Shan Zheng; Xm Xiao; Kr Dong, Children’s Hospital of Fudan University

**Background/Purpose**
To analyze the related factors to the redo operation on children with hiatus hernia.

**Methods**
Between Jan 2002 and May 2013, patients suffering from hiatus hernia were divided into single operation group (S group n=49) and redo operation group (R group n=15). The factors reviewed were barium swallow examination, operative procedures, and findings during the operation.

**Results**
Through barium swallow examination, short esophagus was reported in 10 and 3 cases in S and R group respectively. However, during the operation, the ‘short esophagus’ diagnosis was excluded. There were no significant differences between S group and R group in the age, symptoms, width of the hiatus, and the ratio of hiatal hernia above the hiatus. The esophagus which was surgically mobilized below the hiatus without tension was shorter in R group. The difference of operative methods and the ratio of ‘large hernia’ could not be found between these two groups. The common cause of failure in R group was...
SKPs are capable of enteric neuroglial differentiation. SKPs migrate to the intermuscular layer of aganglionic intestine within one week of transplantation. Our observations suggest that SKPs are capable of generating enteric ganglia in aganglionic intestine. Compared with factors such as age, symptoms, size of the hiatus, ‘short esophagus’, and the operative methods, the insufficient length of intra-abdominal esophagus may be the main cause of the redo operation in hiatus hernia.

**Monday 11:00 – 13:00**

**ORAL PRESENTATIONS: PAPS PRIZE (PP)**

**PP 1**

**Prenatal administration of neuropeptide bombesin promotes lung development in rat models of nitrofen-induced congenital diaphragmatic hernia**

---

**Authors**

Kohei Sakai; Osamu Kimura; Taizo Furukawa; Koji Higuchi; Junko Wakao; Koseki Kimura; Shigeo Fumino; Shigeyoshi Aoi, Department of Pediatric Surgery, Graduate School of Medical Science, Kyoto Prefectural University of; Kouji Masumoto, Department of Pediatric Surgery, Faculty of Medicine University of Tsukuba; Tatsuro Tajiri, Department of Pediatric Surgery, Graduate School of Medical Science, Kyoto Prefectural University of

**Background/Purpose**

Fetal medical treatment to prevent lung hypoplasia in congenital diaphragmatic hernia (CDH) has yet to be established. The neuropeptide bombesin (BBS) might play an important role in lung development. The present study aims to determine whether prenatally administered BBS could be useful to promote fetal lung development in a rat model of nitrofen-induced CDH.

**Methods**

Pregnant rats were administered with nitrofen (100mg) on gestation day 9.5 (E9.5). BBS (50mg/kg/day) was then continuously infused intraperitoneally from E14, and fetal lungs were harvested on E21. The expression of proliferating cell nuclear antigen (PCNA) was assessed by both immunohistochemical staining and real-time polymerase chain reaction to determine the amount of cell proliferation. Lung maturity was assessed as the expression of Tif-1, a marker of alveolar epithelial cell type II.

**Results**

The lung/body ratio was significantly increased in BBS(+) compared with BBS(-) CDH (p<0.05). The number of cells stained positive for PCNA and Tif-1 were significantly decreased in BBS(+) compared with BBS(-) CDH (p<0.01). The amount of Tif-1 mRNA expression was significantly decreased in BBS(+) compared with BBS(-) CDH (p<0.05) (Table 1).

**Conclusions**

Prenatally administered BBS promotes lung development in a rat model of nitrofen-induced CDH. Neuropeptide BBS could help to rescue lung hypoplasia in fetal CDH.

**PP 2**

**Intestinal Lengthening in an Innovative Rodent Surgical Model**

---

**Authors**

Veronica F Sullins, University of California Los Angeles Medical Center and Harbor-UCLA Medical Center; Andrew N Scott, Justin P Wagner, University of California Los Angeles Medical Center; Doug Steinberger, University of California Los Angeles Department of Bioengineering; Steven L Lee, University of California Los Angeles Medical Center and Harbor-UCLA Medical Center; Benjamin M Wu, University of California Los Angeles Department of Bioengineering; James CY Dunn, University of California Los Angeles Medical Center

**Background/Purpose**

Current animal models of mechanical lengthening isolate intestinal segments from enteric continuity. Such models are difficult to use for repeated lengthening procedures and result in intestinal tissue loss during restoration into continuity. We sought to create a novel surgical model to perform multiple lengthening procedures in order to maximize the net increase in tissue after intestinal lengthening.

**Methods**

A Roux-en-y jejunojejunostomy with a 6-cm blind-ended Roux limb was created in the proximal jejunum of rats. Encapsulated 1-cm polycaprolactone springs were placed into the closed end of the roux limb and secured with a vessel loop (Figure 1). After 4 weeks, lengthened segments and normal jejunum were retrieved for histologic analysis.

**Results**

Jejunal segments were lengthened from 1.0 cm to 3.0 cm. Lengthened segments had increased smooth muscle thickness and similar density of ganglia compared to normal intestine. When compared to normal jejunal mucosa, lengthened segments demonstrated unchanged villus height and increased crypt depth. All animals demonstrated weight gain.

**Conclusions**

We created an innovative surgical model for intestinal lengthening and successfully lengthened jejunal segments with a degradable spring. The Roux-en-y model increases the feasibility of using a degradable spring for the treatment of short bowel syndrome.

**PP 3**

**Skin-derived precursors generate enteric-type neurons in aganglionic jejunum**

---

**Authors**

Justin P Wagner; Veronica F Sullins, James C. Y. Dunn, UCLA

**Background/Purpose**

Skin-derived precursor cells (SKPs) may regenerate the enteric nervous system in Hirschsprung’s disease. SKPs migrate and differentiate into myenteric ganglia in aganglionic intestine. We sought to characterize the time-course of SKP gangliogenesis and enteric neurotransmitter synthesis in vivo.

**Methods**

Adult Lewis rat jejunal segments were isolated and denervated with benzalkonium chloride (BAC). Denervation was evaluated by immunohistochemical stains (IHC) for glial fibrillary acidic protein (GFAP) and β-III tubulin (TUJ1). GFP+ neonatal rat SKPs were cultured in neuroglial-selective medium. SKPs were transplanted into aganglionic segments 60-78 days after BAC treatment. IHC was performed to identify glia, neurons, and neurotransmitter synthesis in GFP+ cells between post-transplant days 1-28.

**Results**

Aganglionosis was confirmed by IHC. On post-transplant days 1 and 2, GFP+ cells were detected near injection sites within the longitudinal smooth muscle layer. GFP+ clusters were evident between longitudinal and circular smooth muscle layers at post-transplant days 7, 14, and 21. Expression of TUJ1 and several markers of neurotransmitter synthesis were detected in GFP+ clusters at all time points.

**Conclusions**

SKPs are capable of enteric neuroglial differentiation. SKPs migrate to the intermuscular layer of aganglionic intestine within one week of transplantation. Our observations suggest that SKPs are capable of generating enteric ganglia in aganglionic intestine.
PP 4  Long Gap Oesophageal Atresia: Comparison of Delayed Primary Anastomosis and Oesophageal Replacement with Gastric Tube

Authors  Hui Qing Lee, John Hutson, Alisa Hawley, Joe Doak, Michael Nightingale, Department of General Surgery, Royal Children’s Hospital, Melbourne, Australia

Background/Purpose  Long-gap oesophageal atresia (LGOA) causes significant early and long-term morbidity. We conducted a retrospective 25-year review comparing outcomes of delayed primary anastomosis (DPA) versus oesophageal replacement (OR) with greater curvature gastric tube.

Methods  Records of 44 consecutive patients undergoing LGOA repairs (1986-2010) were obtained from the database with ethics approval and were analysed for complications and long-term outcomes. Analysis was conducted using student’s t-test for quantitative and Fisher exact test for qualitative data.

Results  Thirty (68%) patients underwent DPA and 14 (32%) had OR. OR patients had longer gaps (mean 5.5 vertebrae, range 4-9) compared to DPA (mean 3.9, range 2-6) (p=0.004), but with no difference in perioperative complications (p=0.2) (Table 1). OR had more long-term complications (86%) compared to DPA (30%) (p=0.005). Almost all patients (>90%) experienced gastro-oesophageal reflux and 21 OR patients (70%) underwent fundoplication; 60% of DPA and 64.3% of OR patients had continued gastrointestinal symptoms years after oesophageal repair.

Conclusions  Our experience indicates that LGOA can be repaired safely using both methods, with no deaths and similar perioperative risk, but high long-term morbidity mandated long-term follow-up of these patients. DPA has a better long-term outcome compared to OR with gastric tube.

PP 5  Endoscopic Model of Hirschsprung’s Disease in Mouse

Authors  Hassan A. Khalil, MD; Justin Wagner, MD; Puneet Rana, MS, UCLA; James Yoo, MD, Tufts Medical Center; James Dunn, MD, PhD, UCLA

Background/Purpose  Current transgenic animal models of Hirschsprung’s disease are restricted by limited survival and need for special dietary care. We used small animal colonoscopy to produce regional aganglionosis in the distal colon and rectum of normal mice.

Methods  Adult C57BL/6 mice underwent colonoscopy with submucosal injection of 50 µL of phosphate-buffered saline (n=2) or 0.002% (n=2), 0.02% (n=4), or 0.2% (n=2) benzalkonium chloride (BAC). Each mouse received 173 injections in the distal colon and rectum. Mice were sacrificed on post-procedure day 7 or 28. Injection sites were analyzed histologically and immunostained for ?-tubulin III.

Results  Submucosal injection of 0.02% BAC resulted in megacolon and significant obliteration of myenteric ganglia at the injection site on post-procedure days 7 and 28 (Panels A, D and F; scale bar 100 µm) compared to control (Panel B). Lower dose injections had little effect on the myenteric neuronal network (Panels A, C and E). Multiple injections of 0.002% or 0.02% BAC (up to three injections per mouse) were well tolerated. Injection of 0.2% BAC caused acute toxicity and death.

Conclusions  A novel model of induced aganglionosis in mouse colon and rectum is introduced. This model is valuable in evaluating targeted cell delivery therapies for Hirschsprung's disease.

PP 6  The Role of Screening and Prophylactic Surgery for Malrotation in Heterotaxy Patients

Authors  Craig Elder, University of Utah School of Medicine; Ryan Metzger, Cammon Arrington, Michael Rollins, Eric Scaife, Primary Children’s Hospital

Background/Purpose  There are no standardized guidelines for screening or management of malrotation in Heterotaxy Syndrome (HS). We sought to review our experience to determine if evidenced based guidelines could be drafted.

Methods  A retrospective chart review was performed at our freestanding children’s hospital on all patients under one year of age undergoing a Ladd procedure between 2000 and 2011. In addition, all Heterotaxy patients were reviewed during this period.

Results  23 Heterotaxy patients and 79 Non-Heterotaxy patients underwent a Ladd procedure. Results comparing these two groups are summarized in Table 1. Heterotaxy was associated with higher mortality 30 days after Ladd procedure. In our review, we also identified 76 HS patients who did not undergo a Ladd procedure. Among these patients, 14 had normal intestinal anatomy, 5 had malrotation, and 57 were never evaluated for intestinal malrotation. No patients with intestinal malrotation or unknown intestinal rotation status suffered midgut volvulus. Average follow-up time was 5.1 years.

Conclusions  We conclude that prophylactic Ladd’s procedures in children with Heterotaxy are associated with a high morbidity and mortality. Patients who avoided screening were not exposed to a significant risk of midgut volvulus and our experience suggests that routine screening of Heterotaxy patients for malrotation should be abandoned.

PP 7  A Durable Model of Hirschsprung’s Colon

Authors  Justin P. Wagner, Veronica F. Sullins; Hassan A. Khalil, James C. Y. Dunn, UCLA

Background/Purpose  Hirschsprung’s disease is caused by surgical correction. Stem cells may offer regenerative benefits while preventing surgical risks. Existing Hirschsprung’s model systems are limited by alimentary compromise and spontaneous ganglionic reconstitution. We endeavored to generate a model of permanent colonic aganglionosis to support longitudinal cell therapy studies.

Methods  Among adult female Lewis rats (n=11), laparotomy was performed and one-centimeter segments of descending colon were isolated from continuity and denervated by trans-serosal benzalkonium chloride (BAC) exposure. Postoperative weights were plotted. The colon segments were retrieved after 50 days. Immunohistochemical staining (IHC) for beta-III tubulin (TUJ1) and S100 revealed colonic ganglia. Muscle layer diameter and the presence of ganglia were contrasted between normal and denervated segments.

Results  All animals survived, experienced 5% weight loss after one week, and then consistently gained weight. Isolated segments had significantly hypertrophied smooth muscle layers compared to normal colon. Ganglia were identified by IHC in normal colonic segments, and denervated colonic segments had no IHC evidence of ganglia.

Conclusions  Colonic segmental isolation and denervation results in an effective model of irreversible colonic aganglionosis. Animals retain...
alimentary function. Muscularis hypertrophy, myenteric denervation, and normal animal longevity are suitable for long-term studies of cell therapy.

**PP 8** Acute Appendicitis in Diabetic Children

**Authors** Camille L. Stewart; Colleen Wood; John F. Bealer, *Children's Hospital Colorado*

**Background/Purpose** Diabetes mellitus (DM) is a significant risk factor for adult surgical patients, but is less studied in children. To address this, we examined diabetic children treated for acute appendicitis, focusing on their presentation, post-operative glycemic control, and final outcomes.

**Methods** We reviewed medical records of diabetic children treated for acute appendicitis from 2003-2013. Objective aspects of the presentation, diagnostic methodology, surgical approach, post-operative glycemic control, and outcomes are reported. Values presented are the mean ± standard error of the mean.

**Results** Eighteen study patients were identified. The clinical presentation was unusual as most (15/18, 83.3%) presented afebrile, and no child was in diabetic ketoacidosis (DKA). Imaging confirmed the diagnosis in all patients, and all but one was approached laparoscopically. All children developed significant post-operative hyperglycemia (average high 382 Â± 18 mg/dL), and most (14/18, 77.8%) remained above target glucose levels for the majority of their hospitalization, but none developed DKA. Ultimately, all patients recovered uneventfully.

**Conclusions** Diabetic children with appendicitis can be expected to make an excellent uncomplicated recovery following appendectomy. These patients frequently present afebrile and have poor post-operative glycemic control but generally do not develop DKA. Collaboration with pediatric endocrinologists is recommended to appropriately manage these children during their hospitalization.

**PP 9** Can a pressure-limited V-A shunt for obstructive uropathy really protect the kidney?

**Authors** Kunihide Tanaka; Shutaro Manabe; Kei Ooyama; Yasuji Seki; Hideki Nagae, *Department of Pediatric Surgery, St. Marianna University School of Medicine, Kawasaki, Japan*; Masayuki Takagi; Junki Koike, *Department of Pathology, St. Marianna University School of Medicine, Kawasaki, Japan*; Jane Zuccullo; Kevin C. Pringle, *Department of Obstetrics and Gynecology, School of Medicine & Health Sciences, University of Otago*; Hiroaki Kitagawa, *Department of Pediatric Surgery, St. Marianna University School of Medicine, Kawasaki, Japan*

**Background/Purpose** Pneumomediastinum is rare in children. Efficiently differentiating children presenting with spontaneous pneumomediastinum from those affected by underlying illnesses, esophageal or airway injury is critical. We seek to identify clinical factors which may help surgeons differentiate between patients requiring additional work up and those who may be safely observed.

**Methods** We created obstructive uropathy (OU) in 60-day gestation fetal lambs, ligating the urethra and urachus; delivering them at term (130-145 days). We compared renal histology in 4 groups:- Group A: OU without shunt, Group B: low-pressure shunt (15±5 mmH2O), Group C: high-pressure shunt (95±150 mmH2O). Shunts were inserted 3 weeks post-obstruction. Group D was normal controls.

**Results** We delivered 37 fetuses from 25 ewes:- 15 Group A (9 survived), 7 Group B (5 survived), 9 Group C (5 survived), 6 Group D. Histologically, we found renal tubular distention, vacuolated degeneration of tubular epithelial cells in 7 lambs, and cyst formation in 4 lambs in Group A. There was renal tubular distention in two lambs, and cyst formation in one lamb in both Groups B/C, with vacuolated degeneration of tubular epithelial cells observed in all but 1 lamb in each Group.

**Conclusions** V-A shunt treatment prevents MCDK. However, some lambs have cyst formation and renal tubular distention. Poor renal function after shunt therapy might be related to vacuolated degeneration of renal tubular epithelial cells.

**PP 10** Work up and Management of Pediatric Spontaneous Pneumomediastinum: Are Studies Beyond a Chest Roentgenogram Necessary?

**Authors** Dr. Marielen Bachier; Dr. Eunice Y. Huang; Dr. Kate B. Savoie, *University of Tennessee Health Science Center*

**Background/Purpose** Pneumomediastinum is rare in children. Efficiently differentiating children presenting with spontaneous pneumomediastinum from those affected by underlying illnesses, esophageal or airway injury is critical. We seek to identify clinical factors which may help surgeons differentiate between patients requiring additional work up and those who may be safely observed.

**Methods** An IRB approved ten-year review of the Pediatric Health Information System (PHIS) database was combined with a chart review of patients at our hospital (a subset of the PHIS database). Patients with pneumomediastinum between ages 1-18 years without cardiac surgery or trauma were included. Chi square analysis was performed to assess risks.

**Results** 4873 patients were identified from PHIS with an ICD-9 code of pneumomediastinum; 71 from our institution. Dysphagia and hematemesis were associated with one esophageal injury. Descriptive statistics and clinical factors are presented in table 1.

**Conclusions** This is the largest review of children with pneumomediastinum to date. Mortality rate for this diagnosis is low. Spontaneous pneumomediastinum is often associated with asthma and can usually be treated with supportive care. However, children with a concurrent pleural effusion, pneumothorax, history of foreign body aspiration or ingestion, dysphagia or odynophagia need additional work up for mediastinal organ injury or disease.

**PP 11** Injured Children Are Resistant To The Adverse Effects Of Early High Volume Crystalloid Resuscitation

**Authors** Shannon N. Acker; James T. Ross; David A. Partrick, *Children's Hospital Colorado*; Peter DeWitt, *University of Colorado*; Denis D. Bensard, *Denver Health Medical Center*

**Background/Purpose** We hypothesized that excessive crystalloid resuscitation of blunt injured children would be deleterious, as has previously been demonstrated in the adult population.

**Methods** We reviewed the trauma databases at two level one trauma centers from 1/07-6/13, including all children age 4-16 years admitted following blunt trauma with an injury severity score (ISS) >15 to determine the relationship between crystalloid volume received and clinical outcomes.

**Results** 384 children were included. After controlling for age, sex, AIS head, ISS, GCS on presentation, hemoglobin, blood transfusion, and surgical procedures in the first 24 hours, crystalloid volume greater than 60ml/kg in the first 24 hours was associated with increased
length of stay (LOS) and need for mechanical ventilation. On univariate analysis, initial crystalloid volume of >60ml/kg was associated with anemia and thrombocytopenia (Figure 1). Volume of resuscitation was not associated with ARDS, ACS, MOF, urinar tract infection or blood stream infection, however these complications were exceedingly rare with no children developing MOF.

Conclusions
Excessive crystalloid resuscitation was associated with increased hospital LOS and need for mechanical ventilation; increased rates of other complications including ARDS, ACS, and MOF were not observed. Injured children appear relatively resistant to some of the adverse effects of early high volume fluid resuscitation.

PP 12 Correlation of Pancreatic Enzymes and Grade of Injury and Outcomes in Blunt Pancreatic Trauma

Authors
Hanna Alemayehu, Children's Mercy Hospital; Adam Alder, Children's Medical Center, Dallas, TX; Shawn D. St. Peter, The Children's Mercy Hospital, Kansas City, Missouri; Kuojen Tsao, University of Texas Health Center at Houston, Houston, TX; David M. Gourlay, Medical College of Wisconsin, Milwaukee, WI; Jeffrey S. Upperman, Children's Hospital of Los Angeles, Los Angeles, CA; Timothy D. Kane, Children's National Medical Center, Washington D.C.; Saleem Islam, University of Florida, Gainesville, FL; Corey W. Iqbal, The Children's Mercy Hospital, Kansas City, MO

Background/Purpose
Blunt pancreatic trauma occurs in 3–12% of children with blunt abdominal trauma. The purpose of this study was to determine the diagnostic value of serum pancreatic enzyme levels.

Methods
A retrospective review over a 17-year period from seven institutions of patients with blunt pancreatic injury was performed. Serum pancreatic enzyme levels were correlated to the grade of pancreatic injury and were also correlated to outcomes.

Results
There were 236 patients with a mean (±SD) age of 8.8±5.2 years. Mean admission amylase and lipase were higher in grade 3 than grades 1 and 2 (p<0.001). Spearman correlation demonstrated that enzyme levels were associated with the grade of injury and rate of complications. Peak enzymes were also associated with pseudocyst formation (amylase: 830.1±989.0 vs. 2378.2±3701.9 units/L, p=0.005 and lipase: 3037.6±3436.6 vs. 6870.2±5880.6, p=0.004).

Conclusions
Admission pancreatic enzyme levels are higher in Grade 2 and 3 injuries compared to Grade 1, but do not otherwise correlate with the duration of hospitalization, concurrent intra-abdominal injury, or pancreatic pseudocyst formation. Peak pancreatic enzyme levels may be predictive of pseudocyst development in patients managed non-operatively.

PP 13 Spontaneous Intestinal Perforation in Premature Neonates: the need for subsequent laparotomy after placement of peritoneal drains.

Authors
Prabal Mishra, Surgical Registrar, Wellington Regional Hospital, Wellington, New Zealand; David Foley, Paediatric Registrar, Wellington Regional Hospital, Wellington, New Zealand; Gordon Purdie, Biostatistician, Department of Public Health, University of Otago, Wellington; Kevin Pringle, Professor of Paediatric Surgery, Wellington Regional Hospital and University of Otago, Wellington

Background/Purpose
Recent studies questioned the usefulness of peritoneal drainage (PD) in premature neonates with pneumoperitoneum – suggesting approximately 75% of those treated with PD needed delayed laparotomy. We reviewed the requirement for laparotomy after initial placement of PDs at our institution.

Methods
Retrospective cohort of all premature infants with a diagnosis of intestinal perforation (ICD Code P78.0) from 1995 to 2012. Inclusion criteria were pneumoperitoneum on x-ray (isolated perforation or necrotising enterocolitis), birthweight <1800g and gestational age <33 weeks.

Results
Fifty patients met the criteria (38 PD, 12 primary laparotomy). Thirty-two percent (95% CI 18–49%) required secondary laparotomy after initial PD. There was no significant difference between PD and primary laparotomy for time to full enteral nutrition, hazard ratio (HR) 0.99 (95% CI 0.48-2.04) or mortality, HR 2.15 (95%CI 0.48–9.63). The HR for mortality was partly confounded by birth weight, birth weight adjusted HR 1.52 (95%CI 0.32–7.23).

Conclusions
Thirty-two percent of neonates treated with primary PD required secondary laparotomy, with no significant difference in key outcomes. Primary PD still appears to be of benefit for those without features of necrotising enterocolitis.

PP 14 Clinical and pathological study on the spectrum of extrahepatic biliary cysts in neonates with obstructive jaundice

Authors
Zhen Shen, Shan Zheng, Children's Hospital, Fudan University, Shanghai, China

Background/Purpose
Extrahepatic biliary cysts (EHBC) could present along the spectrum of “correctable” (type I&II) biliary atresia (BA), type III BA and choledochal cyst (CC). We aimed to systematically study the clinical value of EHBCs in neonatal obstructive jaundice.

Methods
Thirty-four patients with neonatal obstructive jaundice and EHBCs found in preoperative ultrasonography were enrolled retrospectively. CC or correctable BA was determined by the absence/presence of intrahepatic bile duct impairment in cholangiography(Fig 1&2). Clinical and pathological features were analyzed.

Results
Diameter of EHBCs was 50.7±16.9, 20.0±9.0, 8.8±4.5mm in CC, correctable BA and type III BA, respectively, with cutoff line of >40mm having a sensitivity/specifcity of 83.2%/100% to diagnose CC. Epithelial lining only existed in CC (92.3%). Atretic gallbladder existed in none, 37.5% and 100%, respectively. Bilirubin, ALT/AST, GGT, liver fibrosis scale were not significantly different, however, fibrosis score of 0/1 only existed in CC. CC had not a better 2-year survival than correctable BA(90给了我77%, P=0.26) but decreased incidences of postoperative cholangitis(0%vs42.9%, P<0.05) and persistent elevated GGT(0%vs42.6%, P<0.05). Type III cystic BA was not better in survival than conventional type III BA(75% vs 60% P>0.05).

Conclusions
Intraoperative cholangiography is optimal to differentiate CC, correctable BA and type III BA. Cyst>40mm, epithelial lining, normal gallbladder and low fibrosis scale suggest diagnosis of CC.

PP 15 Improving gastrostomies outcomes: does birthplace matter?

Authors
Kate B. Savoie, University of Tennessee Health Science Center; Shahrzad K. Aziz, University of Texas Health Science Center at Houston; Martin L. Blakely, Vanderbilt University; Sid Dassingher, University of Arkansas; Amanda R. Dora, Indiana University; Eileen M. Duggan, Vanderbilt University; Matthew T. Harting, University of Texas Health Science Center at Houston; Eunice Y. Huang, University of Tennessee Health Science Center; Troy A. Markel, Indiana University; Stacey D. Moore-Olufemi, University of Texas Health Science
Background/Purpose Babies born in the hospital where they obtain definitive surgical care do not require transportation between institutions and may have shorter time to definitive care. Whether these differences result in meaningful improvement in outcomes has been debated. To examine this, a multi-institutional retrospective study was performed comparing outcomes based on birthplace.

Methods Six institutions within the Pediatric Surgery Research Collaborative reviewed infants born with gastroschisis between 2008-2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Results 2013. Birthplace, perinatal, and postoperative data were collected. Based on the NSQIP definition, inborn was defined as birth at the pediatric hospital where repair occurred. The primary outcome was days to full feeds (120 kcal/kg/day).

Layla Shbat; Sherif Elkady; Robert Baird; Jean-Martin Laberge; Pramod Puligandla; Kenneth Shaw; Sherif Emil, *The Montreal Children’s Hospital*

Conclusions Inborn patients had bowel coverage and definitive closure sooner with fewer days to full feeds, fewer complications and shorter length of stay. Birthplace should be considered in efforts to improve outcomes in patients with gastroschisis.

PP 16 Tunneld central venous catheters should not be placed in neutropenic children

Authors Shannon N. Acker; Nicole A. Nadlonek; Igor Shumskiy; Jennifer L. Bruny, *Children’s Hospital Colorado*

Background/Purpose We hypothesize that children who are neutropenic (absolute neutrophil count (ANC) <1x10^9/L) at the time of tunneled central venous catheter (TCVC) placement for any indication have increased complications.

Methods We reviewed the medical records of all children who had a TCVC placed for any indication between 1/11-4/13.

Results 775 TCVC (476 (61%) ports; 299 (39%) external catheters) were placed for chemotherapy (65%), intravenous access (23%), parenteral nutrition (9%), and bone marrow transplant (3%). ANC was available for 724 patients (93%). 140 (19%) were neutropenic at the time of placement. Neutropenic patients were more likely to develop bacteremia (38% vs 16%, P<0.0001) a median of 86±124 days following placement, but were not more likely to have their TCVCs removed early. External TCVCs were more likely to become infected than ports (30% vs 13%, P<0.0001), however no difference in bacteremia rates was seen between ports and external catheters among neutropenic patients (47% vs 33%; P=0.14). Patients with bacteremia required an average of 11.1±5.8 days of intravenous and 4.9±4.9 days of outpatient antibiotics. Wound complications were exceedingly rare (2 infections, 1 dehiscence; <1%).

Conclusions Placement of TCVCs in neutropenic children is associated with an increased risk of bacteremia, requiring prolonged antibiotic treatment.

PP 17 Intra-operative Spillage Does Not Increase Recurrence Risk of Pediatric Ovarian Neoplasms

Authors Yasmine Yousef; Valentina Pucci; Sherif Emil, *The Montreal Children’s Hospital*

Background/Purpose We investigated whether spillage increased the recurrence rate of pediatric ovarian neoplasms.

Methods A retrospective study of all ovarian neoplasms removed during 1991-2011 was performed.

Results Fifty-nine tumors in 56 patients were removed, including 52 (88%) benign and 7 (12%) malignant. Laparotomy was employed for 29% and 71% of benign tumors, respectively. All malignant tumors underwent total oophorectomy. Accidental spillage or intentional tumor puncture occurred in 29 cases (49%), 24 benign and 5 malignant. Spillage was associated with laparotomy and tumor size > 10 cm on univariate (p=0.001 and p=0.001, respectively) and multivariate (p=0.032 and p=0.005 , respectively) analyses. There were 6 recurrences (10%) at a mean follow-up of 747 ± 178 days of 4 benign (3 mature teratomas, 1 mucinous cystadenoma), and 2 malignant tumors (1 yolk sac tumor, 1 choriocarcinoma). Recurrence occurred in 3 (10%) without spillage and 3 (10%) with spillage, p=0.648. All recurrences were salvaged by surgery and/or chemotherapy, with 100% long-term survival.

Conclusions In this study, intra-operative spillage did not increase the recurrence rate or worsen the prognosis of pediatric ovarian neoplasms.

PP 18 Benefits of an Abridged Antibiotic Protocol for Treatment of Gangrenous Appendicitis

Authors Layla Shbat; Sherif Elkady; Robert Baird; Jean-Martin Laberge; Pramod Puligandla; Kenneth Shaw; Sherif Emil, *The Montreal Children’s Hospital*

Background/Purpose We previously reported a validated, objective definition of gangrenous, non-perforated appendicitis. In this study, we compared a cohort treated with abridged antibiotics (AA) to one treated with prolonged antibiotics (PA).

Methods In April, 2012, our service changed its standard of care for gangrenous appendicitis from PA to AA. In PA, patients received post-operative triple antibiotics until ileus resolved, they were afebrile (< 37.5°C) for 24 hours, and achieved a normal WBC count. In AA, patients received two doses of post-operative triple antibiotics. A PA cohort during a 12-month period (February 2010 â€“ January 2011) was compared to an AA cohort during another 12-month period (April 2012 â€“ March 2013).

Results 20 patients were treated with PA and 38 patients with AA. AA patients had a significantly shorter overall length of stay (2.1 ± 1.58 vs. 3.18 ± 1.09 days, p = 0.003), as well as a significantly shorter post-operative stay (1.85 ± 1.42 vs. 2.95 ± 1.14 days, p=0.002). There were no differences between the AA and PA cohorts in wound infections (0%), intra-abdominal infections (0%), or appendicitis-related readmissions (0%).

Conclusions Abridged post-operative antibiotics for gangrenous appendicitis significantly shorten hospital stay without increasing complications.
Fish oil emulsion used to prevent cholestasis in neonates requiring long-term parenteral nutrition: A retrospective review.

Authors
Lucy Goddard, Wellington Hospital, Department of Paediatric Surgery; Gordon Purdie, University of Otago, Department of Public Health; Professor Kevin Pringle, Wellington Hospital, Department of Paediatric Surgery; University of Otago; Toni-Maree Wilson, Wellington Hospital, Department of Paediatric Surgery

Background/Purpose
Fish oil emulsion has been shown to treat parenteral nutrition-associated liver disease (PNALD) and cholestasis in neonates requiring long-term parenteral nutrition (PN). Animal studies suggest that fish oil emulsion may also protect against cholestasis and PNALD. In 2010 we began using fish oil emulsion prophylactically for neonates who were likely to require long course PN. We conducted a retrospective review to investigate if jaundice rates have reduced with this practice.

Methods
Neonates who received long-term PN (>28 days) with fish oil emulsion were included (n=18). A similar group of neonates who required long-term PN prior to 2010 were selected (n=18). Total bilirubin levels were recorded. Statistical analysis was conducted using a cubic fitted model and a fitted model for average daily bilirubin levels.

Results
There was no difference between groups at the start of PN. From days 2 to 7 the fish oil emulsion group had significantly lower bilirubin levels (p <0.05). There was no significant difference between groups at day 28.

Conclusions
Prophylactic fish oil emulsion reduces bilirubin levels initially but there is no significant improvement with longer courses of PN. Further research is required to assess the benefits of fish oil emulsion for protection against PNALD and cholestasis.

A peptide profile of amniotic fluid in a fetal lambs model of gastrochisis

Authors
Kei Ohyama, Division of Pediatric Surgery, St. Marianna University School of Medicine, Kanagawa, Japan; Kevin C. Pringle, Department of Obstetrics and Gynecology, Weill Cornell Medical College, New York, USA; Toshiyuki Sato, Clinical Proteomics and Molecular Medicine, St. Marianna University Graduate School of Medicine, Kanagawa, Japan; Shutaro Manabe; Hideki Nagae; Yasuji Seki, Division of Pediatric Surgery, St. Marianna University School of Medicine, Kanagawa, Japan; Tomohiro Kato, Clinical Proteomics and Molecular Medicine, St. Marianna University Graduate School of Medicine, Kanagawa, Japan; Hiroaki Kitagawa, Division of Pediatric Surgery, St. Marianna University School of Medicine, Kanagawa, Japan

Background/Purpose
We created a fetal lamb model of gastrochisis (GS) and analyzed the amniotic fluid peptides from the amniotic fluid (AF) to identify the markers for the oedematous and inflammatory changes in the bowel in GS.

Methods
We created GS in 5 fetal lambs at 60 days gestation. The GS fetuses (n=3), and 4 normal controls were delivered at term (145 days) by cesarean section with AF samples collected at delivery. AF peptides were purified by weak cation exchange and profiles of the purified peptides were determined.

Results
A total of 77 peptide peaks were detected in the AF samples. The intensities of 12 peaks showed a significant difference between GS and controls. For 3 of the 12 peptides, the sequences and the sources of the peptides were identified. These were Annexin 7 (ANX7), nuclear pore glycoprotein p62, and Ubiquitin fusion degradation protein 1 homolog.

Conclusions
We identified 3 peptides out of 12 peptides that showed a significant difference between the GS and controls. ANX7 is reported to be a molecule related to inflammation. Our data suggest that the oedematous and inflammatory changes in the bowel in GS are related to the peptide derived from ANX7.

Pediatric Laparoscopic Appendectomy: A National Study of Trends, Associations, and Outcomes

Authors
Li Hsia Alicia Cheong; Sherif Emil, The Montreal Children’s Hospital

Background/Purpose
We performed a population-based study to analyze the trends, associations, and outcomes of laparoscopic appendectomy (LA) in the Canadian universal healthcare setting.

Methods
Children less than 18 coded for urgent appendectomy in the discharge abstract database of the Canadian Institute of Health Information during 2004-2010 were analyzed. The Cochran-Armitage test, logistic regression, and quintile regression were used to perform the necessary analyses.

Results
41,405 children were studied. LA incidence steadily increased from 28.8% to 66.4%, p < .0001. LA occurred significantly less in younger patients [OR 0.24 (< 5 years), OR 0.45 (6-11 years)], males [OR 0.79], and operations by a general surgeon [OR 0.33]. Rural domicile, socioeconomic status, and hospital type had no effect. The median hospitalization for simple and perforated appendicitis was 1 day for LA versus 2 days for open appendectomy (p < .001), and 4 days for both approaches, respectively.

Conclusions
The incidence of LA in Canada has more than doubled. Older children, females, and patients treated by pediatric surgeons are more likely to receive LA, while domicile, socioeconomic status, and hospital type have no effect. LA reduced hospital stay for simple appendicitis, whereas no consistent benefit was shown for perforated appendicitis.

An Evaluation Of The Utility Of Screening For Midgut Malrotation Prior To Gastrostomy Placement In Children

Authors
Nhan Huynh; Insiyah Campwala; Gerald Gollin, Loma Linda University School of Medicine and Children’s Hospital

Background/Purpose
An upper gastrointestinal series (UGI) is frequently obtained prior to gastrostomy placement in children. We sought to determine the utility of UGI in this setting for the detection of occult malrotation.

Methods
The records of 406 children who underwent gastrostomy between 1997 and 2013 were reviewed.

Results
In 223 subjects, without vomiting or a prior diagnosis of malrotation, an UGI was obtained prior to gastrostomy. Sixteen (7.2%) of these had an occult malrotation identified and underwent a Ladd procedure. In 4 (1.8%) the finding of malrotation was contradicted by operative findings. Two subjects had an UGI read as normal, but were subsequently found to have malrotation during laparoscopic gastrostomy and an operation for a complication of perecutaneous gastrostomy. Children who had an occult malrotation were significantly younger, but their incidence of neurological deficits and heart disease was similar to those with normal rotation.

Conclusion
An UGI prior to placement of a gastrostomy identified occult malrotation in 7.2% of children. It is debatable whether this justifies routine UGI, but if a laparoscopic gastrostomy is done, rotation status can be evaluated intraoperatively and a Ladd procedure performed, if necessary. If a screening UGI is obtained, it would be most effective in younger patients.
PP 23  Assessment of Surgical Care of Very Low Birth Weight Neonates in the United States with Respect to Center Type

Authors  Eric A. Sparks; Ivan M. Gutierrez; Kuang Hong Kang; Jeremy G. Fisher; Faraz Khan; Kate Morrow; Joseph Carpenter; Michael Kenny; Jeffrey Horbar; Tom Jakic; Biren P. Modi, Department of Surgery, Boston Children’s Hospital, Boston, MA

Background/Purpose  The distribution of surgical care of very low birth weight (VLBW) neonates among centers with varying specialized care remains unknown. This study quantifies operations performed on VLBW neonates nationally with respect to center type.

Methods  VLBW neonates born 2009-2010 were assessed using a prospectively collected multi-center database encompassing >80% of all VLBW neonates in the United States. Surgical centers were categorized based on availability of pediatric surgery (PS) and anesthesia (PA).

Results  17,053 major procedures (15,860 abdominal operations) were performed in 6,975 neonates. Of the total, 15,089 (88%, p < 0.0001) were performed at centers with PS and PA. 1,249 (7%) were performed at centers with either PS or PA but not both (75% with PS but not PA). 715 (4%) were performed at centers with neither specialty. Non-complex operations occurred more frequently than complex operations (represented by thoracotomy, intestinal atresia, and cardiac surgery) at centers with neither PS nor PA (5.1% vs. 1.3%, p < 0.0001).

Conclusions  This study confirms that most operations on VLBW neonates in the U.S. are performed at centers with pediatric surgeons and anesthesiologists on staff. Further research is necessary, however, to elucidate why a significant minority of this challenging population continues to be managed at centers without pediatric specialists.

PP 24  Work up and Management of Pediatric Spontaneous Pneumomediastinum: Are Studies Beyond a Chest Roentgenogram Necessary?

Authors  Dr. Marielen Bachier; Dr. Eunice Y. Huang; Dr. Kate B. Savoie, University of Tennessee Health Science Center

Background/Purpose  Pneumomediastinum is rare in children. Efficiently differentiating children presenting with spontaneous pneumomediastinum from those affected by underlying illnesses, esophageal or airway injury is critical. We seek to identify clinical factors which may help surgeons differentiate between patients requiring additional work up and those who may be safely observed.

Methods  An IRB approved ten-year review of the Pediatric Health Information System (PHIS) database was combined with a chart review of patients at our hospital (a subset of the PHIS database). Patients with pneumomediastinum between ages 1-18 years without cardiac surgery or trauma were included. Chi square analysis was performed to assess risks.

Results  4873 patients were identified from PHIS with an ICD-9 code of pneumomediastinum; 71 from our institution. Dysphagia and hematemesis were associated with one esophageal injury. Descriptive statistics and clinical factors are presented in table 1.

Conclusions  This is the largest review of children with pneumomediastinum to date. Mortality rate for this diagnosis is low. Spontaneous pneumomediastinum is often associated with asthma and can usually be treated with supportive care. However, children with a concurrent pleural effusion, pneumothorax, history of foreign body aspiration or ingestion, dysphagia or odynophagia need additional work up for mediastinal organ injury or disease.

Tuesday 07:00 – 08:00

ORAL PRESENTATIONS: ALL SHORT ORAL (SO)

SO 1  Recipient body size does not matter in pediatric liver transplantation

Authors  Patrick Ho Yu Chung; See Ching Chan; Paul Kwong Hang Tam; Chung Mau Lo, Department of Surgery, Li Ka Shing Faculty of Medicine, The University of Hong Kong

Background/Purpose  It is controversial whether small-sized recipient is associated with adverse outcome in liver transplantation. This study is conducted to evaluate the outcomes of paediatric liver transplantation according to the body weight of recipients.

Methods  Liver transplant recipients (age < 18, from 1993 to 2011) were studied retrospectively. They were categorized according to the body size at the time of transplantation (A: <6kg, B: between 6kg to 10kg, C: >10kg).

Results  A total of 113 patients (83 LDLTs and 30 DDLTs) were studied. Thirteen (11.5%) belonged to group A; 56 (49.6%) belonged to group B and 44 (38.9%) belonged to group C. The best graft and patient survival were found in group A and none of the patients required re-laparotomy for general surgical complications while 52 (32%) in group B and 53% in group C did. Regarding transplant-related complications, although group A patients had the highest incidence of biliary stricture (30.7%, n=4), the incidence of vascular complications (hepatic artery: 7%, portal vein: 0% and hepatic vein: 0%) was the lowest among the three groups.

Conclusions  Outcomes of small-sized recipients are not inferior. Less technical-related vascular complications, which may lead to early graft loss, were observed. This could be patient-related (less advanced cirrhosis) or surgeon-related (additional attention paid).

SO 2  The application of transarterial embolization on congenital intrahepatic arteriovenous shunt in children: 3 cases reports

Authors  Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

Background/Purpose  Fetal and neonatal congenital intrahepatic arteriovenous shunt (IHAVS) is rare and there were only 21 previously reported cases in Medline/Pub med till 2013. We review the results of 3 cases embolized on the malformation from April 2007 to February 2012 in Shanghai.

Methods  Case 1 was a boy 3 months of age with distension of abdominal caused by massive asites. Case 2 was a 5-day-old male neonate had jaundice, atrial septal defect/patent ductus arteriosus, heart failure/pulmonary hypertension. Case 3, a 6.5-month-old girl was referred for assessment of severe upper gastrointestinal tract bleeding, melena and splenomegaly. Doppler ultrasonography and enhanced CT scanning suggested the presence of IHAVS in all the cases. Management of successful transarterial embolization of hepatic artery in all the cases were performed.

Results  The procedure of transarterial embolization is successful, the shunt were blocked by gelfoam and Fiber coil. The asites dis-
appeared spontaneously in 3 weeks after embolization for case 1. For case 2 the Atrial septal defect/patent ductus arteriosus closed and heart failure/pulmonary hypertension disappeared. And the upper gastrointestinal tract bleeding and melena disappeared in case 3. All of patients are alive and doing well now

**Conclusions**

Congenital IHAVS is rare disease and transarterial embolization could be an excellent curative methods

**SO 3**  
Renal Autotransplantation: An Alternative to Renal Artery Bypass in the Management of Complex Pediatric Renovascular Disease

**Authors**

Eliza Lee, MD; Deborah Stein, MD; Michael Ferguson, MD; Khashayar Vakili, MD; Heung Bae Kim, MD, Boston Children’s Hospital

**Background/Purpose**

Renovascular disease is an important cause of hypertension in children. Although percutaneous transluminal renal angioplasty (PTA) is considered standard in adults, PTA in children often requires repeated procedures. Frequently, patients require surgical correction. Renal artery bypass is effective but requires a graft. We report our experience with renal autotransplantation (RA) as an alternative to renal artery bypass.

**Methods**

We conducted a retrospective review of pediatric patients undergoing RA at our institution for either medically refractory hypertension or renal artery aneurysm.

**Results**

Of six patients, three had right renal artery stenosis (two with aneurysm) and three had left sided lesions (one with aneurysm). One patient underwent bilateral RA. Right sided lesions required autotransplantation onto the common iliac artery and vein due to short residual renal artery length. Left sided lesions were autotransplanted onto the infrarenal aorta. In three cases, arterial reconstruction was accomplished after flushing the kidney with cold saline in the field. All patients recovered well. Median hospital stay was 7 days. Post-RA systolic blood pressure decreased 11.7 mmHg. Two patients have weaned off all antihypertensive medications.

**Conclusions**

RA is an effective alternative to renal artery bypass in children with anatomically complex renovascular disease, and avoids complications associated with autologous or prosthetic grafts.

**SO 4**  
Postoperative complications of umbilical stomas in neonates compared with the conventional stoma site

**Authors**

Yusuke Nakamura; Yoshinori Hamada; Kohei Takada; A-Hon Kwon, Division of Pediatric Surgery, Kansai Medical University

**Background/Purpose**

We recommended it for infants with intermediate-type anorectal malformations in light of its cosmetic excellence. We here report postoperative complications for umbilical stomas compared with those of traditional abdominal stomas.

**Methods**

A total of 69 stomas made in 67 neonates between 1995 and 2013 were analysed. The 67 neonates included 37 with anorectal malformations (ARM), 10 with necrotizing enterocolitis (NEC), 9 with meconium-related ileus (MRI), and 9 with Hirschsprung’s disease (HD). Of the subjects, 28 were low-birth-weight infants (LBWIs), including 9 very-low-birth-weight infants (VLBWIs) and 9 extremely low-birth-weight infants (ELBWIs). Umbilical stomas (USs) were made in 22 cases and abdominal stomas (ASs) in 45.

**Results**

Postoperative complications were observed in 15/69 stomas. They comprised 15 complications in 8/23 USs and 7/46 ASs. Complications comprised 5 mucosal prolapses, 3 lateral wall breakdowns, 3 depressions, 2 ileus, 1 stricture (US), and 1 surface necrosis (US). No case required emergency surgery. They occurred in 6/10 cases of NEC, 2/9 of MRI, 6/37 of ARM, and 1/9 of HD. Ten of the 15 neonates in whom complications were observed were LBWIs, including 6 ELBWIs and 2 VLBWIs.

**Conclusions**

The rate of postoperative complications was higher in neonates who underwent USs compared with ASs. Complications occurred predominantly in LBWIs who underwent emergency ileostomy for perforated NEC, and were not considered to be related to the stoma site.

**SO 5**  
The best time for laparoscopic inguinal hernia repair in infants

**Authors**

Chen-zimin, Shen Zhen Children’s Hospital

**Background/Purpose**

To discuss the necessity and the feasibility of laparoscopic inguinal hernia repair, then to find the best time for laparoscopic inguinal hernia repair in infants.

**Methods**

1284 cases of pediatric inguinal incarcerated hernia surgery during these 13 years were analyzed. Complications of intestinal necrosis, testicular necrosis and ovarian necrosis were analyzed. 1023 cases of 1 year and less than 1 year old children underwent laparoscopic inguinal hernia repair. Operation time, hospitalization time, blood loss, incision infection, iatrogenic cryptorchidism, knotting reaction and recurrence were compared with these three groups.

**Results**

501 cases (39.02%) were in the < 6 months group, 28 cases among them had severe complications. The complications compared with the other two groups had statistical significance (P<0.05). In laparoscopic surgery aspect, the operation time and hospitalization time in < 6 months group had statistical significance compared with the other two groups (P<0.05), and the blood loss, incision infection, iatrogenic cryptorchidism, knotting response and relapse had no statistical significance among these three groups (P>0.05).

**Conclusions**

Infants with inguinal hernia under 6 months old has a higher risk of serious complications, and should accept the operation as soon as possible. Laparoscopic inguinal hernia repair under 6 months old infants is effectual, safe and reliable.

**SO 6**  
Establishing paediatric surgical services in emerging countries: what the first world can learn from Vanuatu

**Authors**

Spencer W Beasley, Christchurch Hospital, NZ; Basil Leodoro, Port Vila Hospital, Vanuatu; Kiki Maoate, Christchurch Hospital, NZ

**Background/Purpose**

Conventional foreign surgical aid to emerging countries often fails to build local capacity. A new South Pacific model promotes local expertise establishing pediatric surgeons in viable regional services. We document key elements that have improved local specialist capacity in Vanuatu, highlighting the challenges that face external agencies, and propose some solutions.

**Methods**

Review of the programme to provide sustainable pediatric surgical services to the small Pacific nation of Vanuatu, through the involvement of the Pacific Island Project administered by the RACS. Identification of key issues and impediments, and how they may be overcome.
Results
 Needs assessment undertaken from recipient’s perspective by external agency and existing local surgeons. Promising high quality young indigenous doctors identified early, and provided with mentorship and support. Service resource within framework of longterm strategic plan for specialty: this includes specific infrastructure. Rapport with government to influence strategic health policies essential.

Conclusions
Viable longterm paediatric surgical capability established only through local leadership and ownership, requires good governance, and be aligned with health ministry priorities and policies. Select persons to be trained and mentored early and support continued after return. Avoid burnout and dependence on single person to minimize vulnerability of service. Service configuration main determinant of clinical outcomes

SO 7 Diagnosis of Hirschsprung’s Disease: Implications of absence of hypertrophied nerve fibres

Authors
Sarath Kumar Narayanan; Edwin Kwan; Daniel T Cass; Ralph Cohen; Amanda Charlton; Soundappan SVS, The Children’s Hospital at Midwest

Background/Purpose
The initial diagnosis of the Hirschsprung’s disease (HSCR) is based on histo-pathological study of rectal-biopsies. Although most cases with classic HSCR show several prominent nerves (>40µm), nerve hypertrophy alone is not sufficient to establish the diagnosis of HSCR. The degree of nerve hypertrophy is variable. The aim of this study was to assess the diagnostic implications of absence of hypertrophied fibres in suspected HSCR. We began testing the hypothesis that lack of nerve fibre hypertrophy suggests longer segment of aganglionicosis.

Methods
Between 2000 and 2013, among the 242 rectal biopsies performed at our centre, we included and reviewed 92 cases who were established as HSCR and underwent pull-through procedures. Associations between fibre size (740µm and >40µm) and extent of disease (“short segment” and “long segment”) were tested using 72 test, between fibre size in um and “long segment” disease were tested using logistic regression. Associations between fibre size, gestational age and birth weight were testing using Pearson correlation coefficients

Results
When a subset analysis was performed with these groups, the nerve fibre size <40µm was predictive of transition zone above the rectosigmoid junction.

Conclusions
Nerve fibre size <40µm in diameter is predictive of transition zone above the rectosigmoid junction.

SO 8 A randomized comparison of totally transanal laparoscopic-assisted versus exclusively transanal pull-through for Hirschsprung’s Disease

Authors
Suolin Li; Yingchao Li, The Second Hospital of Hebei Medical University, Shijiazhuang, China

Background/Purpose
Transanal pull-through has become the main method for common Hirschsprung’s Disease (HD) due to its convenience, minimal invasion and aesthetics. Primary laparoscopic assisted pull-through for HD contributes to identifying the pathologic transition zone and mobilizing the mesenteric vessels. We aimed to compare the surgical and functional outcomes between totally transanal laparoscopic-assisted and exclusively transanal pull-through procedures.

Methods
A prospective, single-blinded randomized study in children with HD was performed from January 2011 to December 2012, in which 40 patients were enrolled for either totally transanal laparoscopic assisted or exclusively transanal pull-through procedures. The postoperative functional status, complications, and overall satisfaction were documented at outpatient clinic visits for analysis.

Results
Compared to transanal exclusively pull-through, the operation time was shorter (P<0.05) and bleeding was decreased due to using ultrasonic scalpel (P<0.01) in totally transanal laparoscopic-assisted procedure. Only one child occurred partial dehiscence of anastomosis and another developed enterocolitis in laparoscopic group. However, six children had postoperative complications in exclusively pull-through group.

Conclusions
Totally transanal laparoscopic assisted pull-through could thoroughly mobilize the left colon and remain its marginal vessels to ensure a free colorectal anastomosis without excessive retracting anus. It is characteristics of invisible scar, minimal invasion, safety, fewer complications, and faster recovery.

SO 9 Classifying Appendicitis: Are We Speaking the Same Language?

Authors
Luke R. Putnam; Shauna M. Levy; Uma R. Phatak; Diana M. Hook-Dufresne; Robert A. Hetz; Curtis J. Wray; Lillian S. Kao; Kevin P. Lally; KuoJen Tsao, University of Texas Health Science Center at Houston

Background/Purpose
Postoperative treatment for acute appendicitis depends upon disease severity. Widely accepted intraoperative diagnostic criteria do not exist, and diagnosis is often subjective. We hypothesized that implementation of consensus-derived diagnostic criteria would improve diagnostic agreement.

Methods
A pre-test including 50 cases of appendicitis was provided to nine pediatric surgeons. Each case displayed five laparoscopic views (right upper and lower quadrants, pelvis, two of appendix) with four possible choices: simple, gangrenous, perforated without abscess, and perforated with abscess. After the pre-test, surgeons reviewed all cases and developed diagnostic criteria. A post-test of 100 cases included 45 cases from the pre-test to measure intra-rater reliability. Chi square and inter-rater agreement (kappa) were also calculated.

Results
Cases with 100% agreement improved from 34% to 54% after diagnostic consensus (P<0.05). For all cases, pre- and post-consensus kappa was 0.51 and 0.46. Regardless of diagnostic groupings, all post-test scores decreased after criteria development. Kappa was highest when categorizing into simple versus complicated (Table). Median intra-rater reliability was 71% (range 60%-92%) for the 45 repeated cases.

Conclusions
Development of consensus-based intraoperative diagnostic criteria for appendicitis did not improve surgeons’ inter- and intra-rater agreement. Agreement improved when broader diagnostic categories were utilized. Simplified categorization may improve postoperative management and risk stratification.
Pyloroplasty for Children Undergoing Primary Fundoplication

Authors: Ziyad Jabaji, UCLA Department of Surgery, Sandhya Bondada, Bian Wu, UCSF Department of Surgery; Nicholas Lahar; Steven L. Lee, Stephen B. Shew; James B. Atkinson; James C.Y. Dunn; Daniel A. DeUngarte, UCLA Department of Surgery

Background/Purpose: Pyloroplasty is controversial for children with delayed gastric emptying and gastroesophageal reflux disease. We evaluated outcomes of pyloroplasty during primary fundoplication.

Methods: A retrospective review of patients who underwent primary fundoplication from 1996-2008 was performed. The primary outcome was redo fundoplication for symptomatic wrap failure. Secondary outcomes included surgical complications. Fundoplication failure and complication rates are compared to previous reports.

Results: 388 patients underwent primary fundoplication; median follow-up was 1.6 years. A pyloroplasty was performed in 111 (29%) patients. The redo fundoplication rate was 11%, and the frequency of other surgical complications was 8%. There were no cases of dumping, leak, or gas-bloat.

Conclusions: We observed a low redo fundoplication rate in patients who underwent pyloroplasty despite potentially higher risk conferred by worse gastric emptying. Pyloroplasty is a safe adjunct in patients with GERD and delayed gastric emptying. Further studies may identify which patients would most benefit from pyloroplasty.

Congenital Para-Esophageal Hernia

Authors: Yasmine Yousef, The Montreal Children's Hospital; Caroline Lemoine; Dickens St-Vil, Centre Hospitalier Universitaire Sainte Justine; Sherif Emli, The Montreal Children's Hospital

Background/Purpose: Congenital para-esophageal hernia (CPEH) is the least common congenital diaphragmatic hernia. We performed an extensive review to further define this entity.

Methods: A retrospective study of children with CPEH (types II-IV hiatal hernias) treated at two children's hospitals over a 25-year period (1988-2013) was performed.

Results: Fourteen patients were diagnosed at a median age of 35 days (range 0-500), with one prenatal diagnosis. The most common symptoms were emesis in type II hernias (50%), and respiratory distress in types III and IV hernias (75% and 50%, respectively). GERD was concomitantly diagnosed in 43%, while concurrent congenital anomalies existed in 36%. A correct initial diagnosis was made in only 29% of cases, most commonly by upper GI study (43%). The method of repair was laparoscopy in 79%, and laparotomy in 21%. An anti-reflux procedure was done in 13 (93%) patients. Short-term complications included ARDS (7%), pneumonia (7%), dysphagia (14%), gastro-paresis (7%) and sepsis (7%). Median follow-up was 3 months (range 0-395). During follow-up, one patient recurred and one required sequential segmental esophageal dilations. There were no mortalities.

Conclusions: CPEH is a rare entity often associated with GERD and other congenital anomalies. Prognosis is excellent, but awareness of this anomaly may lead to earlier diagnosis.

Association of meteorological factors with pediatric intussusception in subtropical China: a 5-year analysis

Authors: Wanliang Gu, Jian Wang, Children's Hospital of Soochow University

Background/Purpose: The aim of this study was to determine whether climate factors correlate with variations in the rate of pediatric intussusception cases presenting to the Children's Hospital in Suzhou, China.

Methods: The hospital records of 5,994 pediatric cases of intussusception who had presented between Aug 2006 and Dec 2011 were retrospectively analyzed. Demographic data and air enema reduction data were collected for each case.

Results: The monthly rate of new intussusception cases fluctuated throughout the year generally rising from April to September with a peak from May to July. This annual cycling of intussusception incidence was highly significant over the 5 year observation period. Poisson regression analysis showed that the monthly number of intussusception cases was associated with an increase in mean temperature per month (P<0.0001), sum of sunshine per month (P<0.0001), precipitation per month (P<0.0001), and was marginally associated with increased mean wind speed per month (P=0.0709).

Conclusions: The incidence of intussusception in Suzhou was seasonally variable with a peak in cases presenting during hotter, sunnier, and wetter months demonstrating a positive association with certain climatic factors.

Laparoscopic Splenectomy And Esophagogastric Devascularization For Children With Recurrent Bleeding Portal Hypertension

Authors: Jixin Yang, Ning Li, Xiaojuan Wu, Yizhen Weng, Jiejiong Feng, Department of Pediatric Surgery, Tongji Hospital, Huazhong University of Science and Technology

Background/Purpose: To present four cases of children with recurrent bleeding portal hypertension treated by laparoscopic splenectomy and esophagogastric devascularization, and to discuss the feasibility of this procedure for children.

Methods: Four patients with extrahepatic portal hypertension underwent laparoscopic splenectomy and esophagogastric devascularization in our department. The mean age was 38.4 months at the time of operation (range, 25-76 months). All four cases had a history of recurrent upper gastrointestinal bleeding after pharmacologic therapy and endoscopic variceal band ligation. Three of them were with hypersplenism.

Results: The procedure was successfully performed on all patients. No intraoperative or postoperative complication, such as hemorrhage or pancreatic leakage, was recorded. The median operative time was 235 minutes (range, 205-300 minutes). The intraoperative blood loss was (25 Â± 5) ml. Postoperative platelet count and white blood cell count recovered within 12 days. No patient suffered re-bleeding during a follow-up period of 1-3 years.

Conclusions: Laparoscopic splenectomy and esophagogastric devascularization is a safe and effective procedure for children with recurrent bleeding portal hypertension.
SO 14  
Diagnosis and management of pyriform sinus fistula  
Authors: Zhibao Lv, Children’s Hospital of Shanghai, Shanghai Jiao Tong University; Xianmin Xiao, Children’s Hospital of Fudan University; Qingfeng Sheng, Children’s Hospital of Shanghai, Shanghai Jiao Tong University  
Background/Purpose: The aim of this study was to highlight the value of intra-operative endoscopy-assisted intubation or methylene blue injection as a guide in searching for the pyriform sinus fistula (PSF).  
Methods:  
Results:  
Conclusions:  

SO 15  
When is the best time to perform laparoscopic excision of choledochal cyst?  
Authors: Bin Wang, Department of General Surgery, Shenzhen Children Hospital, Shenzhen 518026, Guangdong, China; Kenneth K. Y. Wong, Department of Surgery, Queen Mary Hospital, The University of Hong Kong, Hong Kong SAR, China  
Background/Purpose: Laparoscopic excision and Roux-en-Y hepaticojejunostomy is now the preferred method for the management of choledochal cyst. We undertook this study to investigate the best time of surgery which remains undefined.  
Methods:  
Results:  
Conclusions:  

SO 16  
A novel SPHK1 inhibitor SKI-SC induces the apoptosis of Wilms tumor cells via regulating specific lncRNAs  
Authors: Pan Jian; Li Zhi-heng; Wang Jian, Key Laboratory of Pediatric Translational Medicine, Children’s Hospital of Soochow University  
Background/Purpose: Sphingosine kinase-1 (SPHK1) plays important roles in a variety of cancers, including Wilms tumor. SPHK1 is an important therapeutic target for tumor. And we found a novel SPHK1 specific inhibitor SKI-SC which can induce the apoptosis of Wilms tumor cells.  
Methods:  
Results:  
Conclusions:  

SO 17  
An impaired inflammatory cytokine response to gram-negative LPS in human neonates is associated with the defective TLR-mediated signaling pathway  
Authors: Jian Wang, Yiping Li, Children’s Hospital of Soochow University  
Background/Purpose: This study examined the inflammatory response of neonatal monocytes to bacterial lipopolysaccharide (LPS) and peptidoglycan (PGN) stimulation and discriminated the underlying Toll-like receptor (TLR)-mediated signal transduction pathways.  
Methods:  
Results:  
Conclusions:  

These results indicate that in contrast to the adults, human neonates display deficiencies in innate immunity-associated...
Outcomes for Single Incision Laparoscopic Appendectomy for acute Appendicitis in the Pediatric Population: A single surgeon’s experience

**Background/Purpose**
To report our experience with SILS for acute appendicitis in children over the last 4 years.

**Methods**
A chart review of all single incision laparoscopic appendectomies performed by a single surgeon for appendicitis between 2009 and 2013 was performed. The final diagnosis of appendicitis was made based on final pathology reports. Appendectomy was performed using the single port (Olympus Triport) by single incision through center of the umbilicus (keeping within the limits of the umbilicus) completely intra-corporeally by using conventional laparoscopy equipment (technique previously reported). Analysis of outcomes in patients with acute appendicitis was performed.

**Results**
234 patients underwent SILS appendectomy for acute appendicitis. The ages of patients undergoing SILS was (9.94±3.90) years, the length of operation was (58.9±21.2) minutes, the length of stay was (3.1±3.1) days and postoperative complications (wound infection, intra-abdominal abscesses) were 22.6%. Of the total 234 patients, 96 had perforated appendicitis for which the length of operation was 58 (36-140) minutes, length of hospital stay was (5.5±3.4) days, wound infection was 12.7%, intra-abdominal abscess formation was 16.9% and post-operative ileus was 20.8%.

**Conclusions**
SILS for acute appendicitis (early and perforated) in children is safe and effective and has comparable outcomes to traditional approaches for appendicitis in historical literature.

Low birth weight is a risk factor for major postoperative complications in patients with congenital duodenal atresia and stenosis: A 20-year single center experience

**Authors**
Koichi Deguchi; Yuko Tazuke; Akihiro Yoneda; Hideki Soh; Hiroaki Yamanaka; Motonari Nomura; Rei Matsuura; Masahiro Fukuzawa, Osaka Medical Center and Research Institute for Maternal and Child Health

**Background/Purpose**
Improved surgical and neonatal care for congenital duodenal atresia and stenosis (DA) has resulted in a low morbidity and mortality rate?However, the prognosis of DA in infants with low birth weight (LBW) is unknown.

**Methods**
We retrospectively reviewed the data for 82 patients with DA treated from 1994 to 2013 at our institution. The patients were divided into two groups; a LBW group (28 cases; BW < 2000 g at birth) and a normal birth weight (NBW) group (54 cases; BW ≥ 2000 g). The major postoperative complications were recorded, including anastomotic leakage, anastomotic stricture, sepsis, re-operation and prolonged ventilation (>72h).

**Results**
The mean birth weights were 1715 in the LBW and 2790 in the NBW. There were no significant differences in the 90-day mortality or the incidence of associated anomalies between the groups?LBW was associated with a significantly higher major postoperative complication rate (44% LBW vs 17% NBW; p=0.008). The multivariate analysis revealed that a LBW (OR = 4.8) and cardiac anomalies (OR = 5.4) were independent risk factors for major complications?

**Conclusions**
A low birth weight was found to be an independent risk factor for major postoperative complications after surgery for DA. In contrast, the mortality rate was not related to a LBW.

**Wednesday 07:00 – 08:30**
**ORAL PRESENTATIONS: NEONATOLOGY (NEO)**

**NEO 1**
An Endoscopic Classification System for Tracheobronchomalacia

**Authors**
Kendra G Bowman, Brigham and Women’s Hospital; Christopher Baird; Roger Nuss, Thomas Hamilton, C Jason Smithers; Lawrence Rhein; Neil Feins; Russell Jennings, Boston Children’s Hospital

**Background/Purpose**
Tracheobronchomalacia (TBM) is characterized by dynamic collapse of the large airways. Severe TBM can cause debilitating respiratory compromise requiring surgery. Currently no classification system exists that describes the endoscopic anatomy and severity of TBM essential for communication, surgical evaluation and follow-up.
Neurodevelopmental Outcomes in Children With Gastroschisis

Over nearly two decades, delivery of gastroschisis babies shifted from ELCS to sVD. This was associated with significantly longer neonatal LOS. Regression models suggest that shorter LOS could be achieved if elective delivery modes are utilized prior to SOL. Babies with sVD had longer hospitalization (36.0 days) compared to babies delivered after ELCS (21.6 days, p <0.05, table 1).

Methods
We reviewed operative notes and videos of spontaneous breathing airway endoscopies of 48 patients who ultimately underwent surgery for TBM. We developed a classification system based upon dynamic endoscopic findings that incorporates the relevant intraluminal features of TBM.

Results
This classification system describes three components of TBM: Location, Character and Severity. Location classifies airway collapse by anatomic location in the trachea and main bronchi. The trachea is divided into the upper (extrathoracic), middle, or distal segments, and carina. The right and left mainstem bronchi are divided into segments (Figure 1). Character defines the type of collapse on exhalation as anterior collapse and/or posterior intrusion (Figure 2). Severity describes the airway lumen intrusion during exhalation as a percentage of maximum airway dimension.

Conclusions
This classification system incorporates the endoscopic anatomy and airway properties relevant to standardizing communication and surgical evaluation, and allows potential for correlation with clinical outcomes.

Fetal esophageal atresia: Sonographic features and implications on perinatal outcome

Authors
Shaun M. Kunisaki; Steven W. Bruch; George B. Mychaliska; Ronald B. Hirschl; Marjone C. Treadwell, University of Michigan

Background/Purpose
Sonographic findings associated with fetal esophageal atresia with or without tracheoesophageal fistula (EA/TEF) have historically been associated with low predictive value and a poor prognosis. The purpose of this study was to evaluate a contemporary cohort of suspected fetal EA/TEF cases to better understand its implications on perinatal outcome.

Methods
A retrospective review was conducted on all fetuses with possible EA/TEF (n=22) referred to a tertiary care center between 2005 and 2013. Perinatal outcomes were analyzed and subsequently compared to postnatally diagnosed cases.

Results
There were three non-survivors, all of whom had trisomy 18 and/or multiple congenital anomalies. Polyhydramnios developed in 83.3% of those with a persistently absent stomach bubble (n=18). Both sonographic findings were associated with a positive predictive value of 76.9% for EA/TEF. Complex esophageal procedures, including esophageal replacement and the Foker procedure, were more commonly employed in prenatally diagnosed cases secondary to an 18-fold increased risk of having a variant associated with long-gap EA (i.e., Gross type A/B, p<0.0001).

Conclusions
Serial prenatal sonography remains a useful imaging modality for determining those more likely to have EA/TEF. Although fetal diagnosis can be associated with high perinatal survival rates, expectant parents should be appropriately counseled regarding an increased risk for long-gap EA.

Spontaneous Onset Of Labor, Not Route Of Delivery, Is Associated With Prolonged Length Of Stay In Babies With Gastroschisis

Authors
Edmund Yang, Children’s Hospital of Illinois; Lauren Davies, Saint Louis University School of Medicine; Derek Banyard; Theresa Ramones, Meheyhar College of Medicine

Background/Purpose
We studied delivery practices for fetal gastroschisis over nearly two decades and correlated this with neonatal outcomes.

Methods
After IRB approval, maternal and neonatal records from 219 gastroschisis births between 1990 and 2008 were reviewed. We studied delivery practices for fetal gastroschisis over nearly two decades and correlated this with neonatal outcomes.

Results
After IRB approval, maternal and neonatal records from 219 gastroschisis births between 1990 and 2008 were reviewed. We studied delivery practices for fetal gastroschisis over nearly two decades and correlated this with neonatal outcomes.

Conclusions
Serial prenatal sonography remains a useful imaging modality for determining those more likely to have EA/TEF. Although fetal diagnosis can be associated with high perinatal survival rates, expectant parents should be appropriately counseled regarding an increased risk for long-gap EA.

Gastroschisis: Experience With The Preformed Silo In 109 Infants

Authors
Nigel Hall; Michael Stanton; Jan Dobson; Melanie Drewett; David Burge, University Hospital Southampton NHS Trust

Background/Purpose
To report experience, learning points and outcomes of managing gastroschisis with preformed silo (PFS).

Methods
Single centre review of total PFS experience. Preferred treatment is cotside PFS placement without general anaesthesia(GA), followed by reduction and cotside closure without GA(PFSnoGA).

Results
Of total 119 gastroschisis, PFS was used in 109, 95 without GA, 14 with GA (defect extension[6], initial intestinal surgery[8]) Intestinal compromise within PFS occurred in 10, 2 had resection, 4 PFS replaced following bowel manipulation, 4 converted to surgical silo. PFS was abandoned in additional 8 (recurrent dislodgement[3], failure to reduce bowel[5]). At median 4 days (range 0-22), 85 were closed cotside without GA, 2 patch closures and 6 planned surgical closure following previous defect extension. Longer PFS duration increased risk of incomplete defect closure (OR 1.47/day [95%CI 1.16-1.85], p=0.001).

Conclusions
PFS is a versatile tool for managing gastroschisis with reduced need for GA and ventilation. PFSnoGA is possible in approximately 70%. We recommend a low threshold for PFS removal to inspect the bowel and early defect closure.


Authors
Akio Kubota, Second Department of Surgery, Wakayama Medical University; Sakiko Yamakawa; Etsujiyo Yamamoto, Developmental Pediatrics, Osaka Medical Center for Maternal and Child Health; Megumi Kosugi, Developmental Pediatrics, Osaka Medical Center for Maternal and Child Health; Shinya Hiranom, Jun Shiraiishi; Hiroyuki Kitajima, Department of Neonatology, Osaka Medical Center for Maternal and Child Health; Akihiro Yoneda; Yuka Tazuke, Department of Pediatric Surgery, Osaka Medical Center for Maternal and Child Health

Background/Purpose
We studied delivery practices for fetal gastroschisis over nearly two decades and correlated this with neonatal outcomes.

Methods
After IRB approval, maternal and neonatal records from 219 gastroschisis births between 1990 and 2008 were reviewed. We studied delivery practices for fetal gastroschisis over nearly two decades and correlated this with neonatal outcomes.

Results
After IRB approval, maternal and neonatal records from 219 gastroschisis births between 1990 and 2008 were reviewed. We studied delivery practices for fetal gastroschisis over nearly two decades and correlated this with neonatal outcomes.

Conclusions
Serial prenatal sonography remains a useful imaging modality for determining those more likely to have EA/TEF. Although fetal diagnosis can be associated with high perinatal survival rates, expectant parents should be appropriately counseled regarding an increased risk for long-gap EA.
Background/Purpose: Our previous studies of long-term QOL after major neonatal surgery revealed an unexpectedly high incidence of mental retardation as well as emotional and psychosocial problems, and the patients’ QOL correlated with maternal QOL and post-traumatic stress disorder (PTSD). The purpose of this study was to clarify the risk factors affecting long-standing maternal PTSD.

Methods: Materials and Methods: Sixty-eight patients, aged between 6 and 17 years, and their mothers were enrolled in this study. The underlying diseases included congenital diaphragmatic hernia in 21, anorectal anomalies in 25 and esophageal atresia in 22. Psychoanalysts carried out intelligence tests, the Child Behavior Checklist and QOL evaluation in the patients. QOL was evaluated with WHOQOL-BREF and PTSD with IES-R questionnaires in their mothers. The mothers were divided into two groups; low- and high-risk groups according to PTSD score.

Results: Patient QOL scores correlated positively with maternal QOL (p<0.05) and negatively with maternal PTSD scores (p<0.05). There were significant differences in total number of hospital admissions (p<0.05), feeling of economic burden (p<0.05), and satisfaction with husband’s help (p<0.01) between the two groups.

Conclusions: Risk factors for maternal PTSD include repeated hospitalization, a feeling of economic burden, and lack of satisfaction with husband’s help.

NEO 6 Neonatal enteroscopy: outcomes and risk factors

Authors: Lee Shimin Jasmin, Yong Loo Lin School of Medicine, National University of Singapore; Jacobsen Anette Sundfor, Yap Te-Lu; Shireen Anne Nah Han Yien, KK Women’s and Children’s Hospital, Singapore; Gita Krishnaswamy, Duke-NUS Graduate Medical School; Low Yee, KK Women’s and Children’s Hospital, Singapore

Background/Purpose: Enterostomies are regarded as safe options in neonatal abdominal emergencies, but also fraught with potential complications. This paper reviews outcomes and risk factors of neonatal surgical stomas.

Methods: Following ethics approval, 81 consecutive neonates (2005-2011) who underwent enterostomies for catastrophic abdominal events were retrospectively reviewed. Appropriate statistical tests were applied to determine bivariate associations between risk factors and outcomes.

Results: Sixty-nine (86%) were preterm with 32 (40%) extremely premature < 28 weeks. Mean birth weight was 1460g with 35 (45%) extremely low birth weight (ELBW) <1000g. Fifty-two (65%) had cardiac and 46 (57%) had respiratory conditions. Diagnoses are as shown in the table. Surgical complications included wound infection (17%), stoma prolapse (19%), parastomal hernias (7%), stoma strictures (1%) and skin-related complications (22%). Inpatient mortality was 6.2%.

Conclusions: Prematurity, birth weight, respiratory conditions and diagnosis of NEC correlate to stoma complications; such neonates deserve particular attention to meticulous operative technique and postoperative nursing care.

NEO 7 Clinical and pathological features of congenital cystic lung diseases; a report of a nationwide multicenter study in Japan

Authors: Tatsuo Kuroda, Department of Pediatric Surgery, Keio University; Eji Nishijima, Department of Pediatric Surgery, Takatsuki Hospital; Kosaku Maeda, Department of Pediatric Surgery, Jichi Medical College; Seiichi Hirobe, Department of Surgery, Tokyo Metropolitan Children’s Medical Center; Yasushi Fuchimoto, Department of Surgery, National Center for Child Health and Development; Yuka Tazuke, Department of Pediatric Surgery, Osaka Medical Center for Maternal and Child Health; Toshikazu Takanabe, Department of Surgery, National Center for Child Health and Development; Noriaki Usui, Department of Pediatric Surgery, Osaka University

Background/Purpose: The current study aimed to assess the perinatal risk and clinical features of congenital cystic lung diseases (CCLD).

Methods: Of 874 CCLD patients identified in the nationwide survey, 376 patients born between 1992 through 2012 and treated at the 10 high-volume centers, were retrospectively reviewed with statistical analysis.

Results: APGAR score (5 min) was lower than 8 in 33 patients. On the postnatal day 30, 49 of 196 neonatal patients required hospital stay including 16 on respirator, and 6 were dead. Fetal lung lesion volume ratio was significantly higher in these symptomatic patients (2.04±1.71 vs. 0.98±0.50, P<0.00071), and showed more decrease in non-CCAM patients compared to CCAM patients during late gestational period (1.37±1.28 to 1.14±0.84 in CCAM vs. 1.08±0.47 to 0.46±0.64 in non-CCAM). Among the asymptomatic patients, 56.3% developed symptoms before the age of 2 years. Overall, 68 complications were identified, and 14 patients died. Among the long survivors, thoracic deformity was seen in 8.2%, but no carcinogenesis was recognized.

Conclusions: More than 10% of the prenatally diagnosed patients carry high risk for perinatal respiratory distress, which can be predicted by fetal lung lesion volume ratio. Even in asymptomatic patients, early surgery not beyond the age of 2 years should be recommended.

NEO 8 The Use Of Regional Anesthesia Via Continuous Caudal Infusion For Surgical Procedures In Conscious Neonates

Authors: Claudia Mueller, Stanford University School Of Medicine; Noah Gordon, California Pacific Medical Center; Megan Stevens, Lucile Packard Children’s Hospital

Background/Purpose: The use of regional anesthetic for surgical procedures has many advantages for the neonate, including preservation of respiratory status, faster return to feeding, and better pain control. However, many surgeons remain wary of performing surgery on conscious infants under regional blocks alone. We describe our use of 3% 2-chloroprocaine administered via continuous caudal infusion during surgical procedures.

Methods: A retrospective chart review of patients who underwent surgical procedures under regional anesthetic alone between March, 2012 and May, 2013 was performed. Ten patients were identified: Eight underwent inguinal hernia repairs; two underwent excision of umbilical polyps. Mean age at surgery was 49 weeks. Mean weight at time of surgery was 3.2kg. Caudal anesthesia was administered via continuous infusion of 3% 2-chloroprocaine with loading dose of 0.5ml/kg. Analgesia was maintained by an infusion rate of 1.5ml/kg/hr.
Outcomes and unmet need for neonatal surgery in a resource-limited environment: estimates of global health disparities from Uganda

Authors
Nasser Kakembo, Mulago Hospital; Raghav Badrinath, Yale University; Phyllis Kisa, Mulago Hospital; Monica Langer, Maine Medical Center; Donuk Ozgediz, Yale University; John Sekabira, Mulago Hospital

Background/Purpose
Reported outcomes of neonatal surgery in low-income countries (LICs) are poor. We examined epidemiology, outcomes, and met and unmet need of neonatal surgical diseases in Uganda.

Methods
Pediatric general surgical admissions and consults from January 1, 2012 to December 31, 2012 at a NationalReferral Center in Uganda were analyzed using a prospective database. Outcomes were compared with high-income countries (HICs), and met and unmet need were estimated using burden of disease metrics (disability-adjusted life-years or DALYs).

Results
23% (167/724) of patients were neonates, and 68% of these survived. Median age of presentation was 5 days old, and 53% underwent surgery. 88% survived post-operatively, while 55% died without surgery (p<0.001). Gastrochisis carried the highest mortality (95%) and the greatest mortality disparity with HICs. An estimated 3429 DALYs were averted by neonatal surgery in Uganda (met need), with 190,856 potentially avertable (unmet need). Approximately 2% of the need for neonatal surgery is met by the health system.

Conclusions
Over two thirds of surgical neonates survived despite late presentation and lack of critical care. Epidemiology and outcomes differ greatly with HICs. A high burden of hidden mortality exist and only a negligible fraction of the population need for neonatal surgery is met by health services.

Magnitude of Surgical Burden Associated with Pediatric Intestinal Failure.

Authors
Faraz A. Khan, M.D., Center for Advanced Intestinal Rehabilitation, Department of Surgery, Boston Children's Hospital; Paul Mitchell, M.S., Division of Gastroenterology and Nutrition, Boston Children's Hospital, Boston, MA, USA; Jeremy G. Fisher, M.D., Eric Sparks, M.D.; Tom Jakicis, M.D., PH.D., Center for Advanced Intestinal Rehabilitation, Department of Surgery, Boston Children's Hospital; Christopher Duggan, M.D., M.P.H., Division of Gastroenterology and Nutrition, Boston Children's Hospital, Boston, MA, USA; Biren P. Modi, M.D, Center for Advanced Intestinal Rehabilitation, Department of Surgery, Boston Children's Hospital; Daniel Teitelbaum, M.D, Department of Surgery, CS Mott Children's Hospital, Ann Arbor, MI, USA

Background/Purpose
Pediatric intestinal failure (IF) patients undergo many surgical procedures. This study examined the impact of these on patient outcomes.

Methods
Retrospective analysis of the Pediatric Intestinal Failure Consortium (PIFCon) clinical outcomes from a multicenter cohort of infants. IF defined as PN for >60 continuous days. Continuous variables presented as median (25%,75% quartiles).

Results
272 infants were followed for 25.7 (11.2,40.9) months. These patients underwent 4 (3.0,6.0) abdominal surgical procedures. 88/97 (92%) of patients with necrotizing enterocolitis (NEC) underwent intestinal resections versus 138/175 (80%) with a non-NEC etiology (p<0.05). Patients cared for at an IF program without transplant capability had 2.56 (95% CI 1.56,4.19) greater odds of undergoing 7 abdominal operations when adjusted for other variables using stepwise odds ordinal logistic regression. No other patient characteristics were predictive of the number of operations. Patients who underwent 7 operations had more frequent septic events when compared to those who underwent 1 operation (2 (1,5) versus 1.5 (0,3), p<0.01).

Conclusions
Variations in surgical care exist between centers treating children with IF. Patients treated at centers with transplant services had fewer operations and in turn fewer operations led to lower incidence of septic events. Longer-term studies are needed to develop optimal practices.

Outcomes For Fetal Neck And Oral Masses From A Single Institutional Experience

Authors
Corey W. Iqbal, MD, Children's Mercy Hospital Fetal Health Center; S. Christopher Derderian, MD; Hanmin Lee, MD; Shinjiro Hirose, MD, University of California San Francisco Fetal Treatment Center

Background/Purpose
Fetal neck/oral masses are life-threatening lesions.

Methods

Results
Thirty-six patients were evaluated. Mean±SE maternal age was 27.7±0.9 years; mean gestation at diagnosis was 25.9±1.1 weeks. Lymphatic malformations occurred in twenty and teratoma in 13. Mean tumor size was 7.5±0.8cm at mean gestation of 29.2±1.2 weeks. Aerodigestive compression occurred in 12 patients with polyhydramnios in 16. Hydrops was present in 10, all patients with a tumor size of 19.0cm prior to 30 weeks gestation developed hydrops. Eight pregnancies were terminated. Of the remaining patients overall survival was 61%. Multiple factors were associated with increased mortality: earlier gestation at diagnosis (22.8±1.7 versus 29.6±1.4 weeks, p=0.006); nuchal involvement (46 versus 6%, p=0.02); polyhydramnios (89 versus 44%, p=0.04); fetal hydrops (73 versus 6%, p=0.0004); earlier gestation at delivery (30.2±0.6 versus 38.0±0.8 weeks, p<0.0001); airway compromise at delivery without an EXIT (75 versus 0%, p=0.02). Survival after EXIT was 83%.

Conclusions
Masses 79.0cm prior to 30 weeks gestation carry significant risk because of the high likelihood of developing hydrops which is associated with a worse outcome. When airway compromise is a concern, an EXIT procedure can prevent neonatal death from airway compromise.
**NEO 13** Prenatal and postnatal clinical course of urachus identified as an allantoic cyst in the umbilical cord

**Authors** Satoshi Umeda; Noriaki Usui, Department of Pediatric Surgery, Osaka University Graduate School of Medicine; Takeshi Kanagawa, Department of Obstetrics and Gynecology, Osaka University Graduate School of Medicine; Taku Yamamichi, Keigo Nara, Takehisa Lleno; Mitsugu Owari; Shuichiro Uehara; Takaharu Oue, Department of Pediatric Surgery, Osaka University Graduate School of Medicine

**Background/Purpose** The aim of this study was to clarify the prenatal and postnatal clinical course of urachus identified as an allantoic cyst in the umbilical cord.

**Methods** Allantoic cysts in the umbilical cord were identified in five fetuses over the past 12 years at our hospital. The prenatal and postnatal clinical courses of these patients were retrospectively reviewed.

**Results** The presence of allantoic cysts in the umbilical cord was first detected at 15 to 27 weeks of gestation. The cysts subsequently became enlarged, reaching a maximum diameter of 40 to 60 mm at 20 to 23 weeks of gestation. The cysts then suddenly disappeared due to spontaneous rupture at 26 to 35 weeks of gestation (Fig. 1). After being born at 38 (35-39) weeks of gestation, four patients were diagnosed with a patent urachus requiring surgery in the infantile period and one was diagnosed with an urachal cyst, which is currently being observed without surgery.

**Conclusions** The presence of an urachus identified as an allantoic cyst in the umbilical cord is frequently associated with spontaneous rupture during the prenatal period, resulting in a patent urachus after birth that requires surgical intervention.

**NEO 14** A Novel Rodent Model of Long Gap Esophageal Atresia

**Authors** Veronica F Sullins, University of California Los Angeles Medical Center and Harbor-UCLA Medical Center; Ziyad Jabaji, University of California Los Angeles Medical Center; Rebecca Stark, Seattle Children’s Hospital; Steven L Lee, University of California Los Angeles Medical Center and Harbor UCLA Medical Center; James CY Dunn, University of California Los Angeles Medical Center

**Background/Purpose** Currently long-gap esophageal atresia remains a treatment challenge with no surgical animal research models. We sought to create a rodent model of esophageal atresia to serve as a platform for testing surgical lengthening devices.

**Methods** The distal esophagus in was divided 10mm above the gastroesophageal junction in 17 rats. The proximal end of the distal esophageal stump was oversewn to create a distal esophageal pouch. An esophagogastric anastomosis between the distal end of the remaining esophagus and the stomach was created to restore enteric continuity (Figure 1). Necropsy was performed after 2 weeks and tissue was examined.

**Results** Eight of 17 animals died peri-operatively due to intraoperative/anesthetic complications or anastomotic leak. Of the remaining 9 rats, 6 survived with an intact distal esophageal pouch. The other 3 animals died within 1 week post-operatively. The average post-operative length of the distal esophageal pouch was 8.4mm.

**Conclusions** Although the operation is technically challenging and associated with significant mortality, a surgical rodent model of esophageal atresia may be used to test short-term lengthening devices. Future large animal models will be necessary to explore longer-term therapies in the management of long-gap esophageal atresia.

**NEO 15** Systemic and local cytokine profile in biliary atresia

**Authors** Takeshi Saito; Hideo Yoshida, Department of Pediatric Surgery, Graduate School of Medicine, Chiba University, Chiba, Japan

**Background/Purpose** Abnormal immunological response to an unknown pathogen, followed by cytokine imbalance in the host, could trigger inflammation, leading to biliary atresia(BA). With a focus on helper T(Th)1/Th2 or Th17/Regulatory T cell(Treg) relationships, we analyzed the systemic and local immune environments using rigorous BA samples.

**Methods** The concentration of 20 cytokines, chemokines, and soluble cellular adhesion molecules(s-CAM) in sera from 14 preoperative patients with BA(median age;53 days), 15 normal controls, and 20 cholestatic controls was measured using flow cytometry. Hepatic mRNA levels of Th cytokines and the Treg master gene(FoxP3) quantified by RT-PCR were compared between BA(10 cases;median;62 days) and non-BA(10 cases;150 days) groups. The Mann-Whitney U test was used for significance.

**Results** No significant differences were observed between BA and others in serum Th1, Th2, Th17 or inflammatory cytokines; however, s-CAM was significantly higher in the BA group. No significant differences were detected between BA and non-BA groups in hepatic IFN-?, IL-2, IL-4, or IL-17 mRNA levels; however, FoxP3 and TGF-? were significantly higher in the BA group.

**Conclusions** Skewed bias toward Th1, Th2 and Th17 was not demonstrated in either the systemic or local environment in the early phase of BA. The role and function of CAM and Treg warrant further investigation.
**NEO 16**

**Thoracoscopic diaphragmatic hernia repair in newborns**

**Authors**
L. Petrova; D. Mokrushina; A. Rasumovsky; V. Shumikhin; N. Stepanenko, *Pirogov Russian National Research Medical University, Filatov Children's City Clinical Hospital*

**Background/Purpose**
Despite progress in endosurgery in newborns, congenital diaphragmatic hernia (CDH) repair remains an actual problem, because of the high rate of mortality and recurrences.

**Methods**
We have performed 80 thoracoscopic CDH repair (left-sided â€” 72 (90%), right-sided â€” 8 (10%)) in period from 2008 to 2013 at Filatov hospital, Moscow. Most of CDH (70%) are diagnosed prenatally. In 23 cases we have used patch for repair, polytetrafluoroethylene (PTFE) â€” 14, Permacol â€” 9. Mean age at the time of surgery was 3Â±1.6 (from 1 to 9 days). The chest was drained in all cases.

**Results**
Operating time of primary repair was 64Â±39 (40-90 minutes), in case of Permacol patch â€” 117Â±6 (95-160 minutes), PTFE â€” 131Â±6 (100-180 minutes). Recurrences rate was 6,3%(5), 1,3%(1), and 1,3%(1) in the primary, PTFE and Permacol groups respectively. Short-term complications rate was 16,3%(enteroocolitis â€” 1, haemotherax â€” 4, chylothorax â€” 8), long-term complications rate 9% (hiatal hernia â€” 7), mortality rate â€” 15% (12).

**Conclusions**
Our results demonstrate that CDH repair in newborns can be performed thoracoscopically with low rate of recurrences and complications, including cases of patch repair.

**NEO 17**

**The surgical management of atypical forms of congenital hyperinsulinism**

**Authors**
Toshihiko Watanabe; Masataka Takahashi; Kaori Sato; Michinobu Ohno; Yasushi Fuchimoto, *Division of Surgery, National Center for Child Health and Development, Tokyo Japan; Masayuki Kitamura, Division of Radiology, National Center for Child Health and Development, Tokyo Japan; Michiya Masue, Department of Pediatrics, Kazu Memorial Hospital, Gifu Japan; Kentaro Matsuoka, Division of Pathology, National Center for Child Health and Development, Tokyo Japan; Chie Takahashi; Reiho Horikawa, Division of Endocrinology and Metabolism, National Center for Child Health and Development, Tokyo Japan; Yutaka Kanamori, Division of Surgery, National Center for Child Health and Development, Tokyo Japan*

**Background/Purpose**
The therapeutic strategy of congenital hyperinsulinism (CHI) is different for each subtype with focal, diffuse and atypical forms. Atypical CHI may be challenging since the affected area is extensive and unpredictable.

**Methods**
Patients with CHI were retrospectively reviewed, and outcome of atypical CHI was investigated with a focus on the surgical management.

**Results**
Among 18 patients, 7 required surgery due to medically uncontrollable hypoglycemia. 5 patients with diffuse CHI who underwent near-total pancreatectomy resulted in diabetes mellitus or persistent hypoglycemia. 2 infants with atypical CHI had paternally inherited ABCB8 mutations. [18F]-DOPA PET/CT showed increased uptake in the head in case 1, and the body and tail in case 2. Case 1 underwent local resection of hard pancreatic head, but required second surgical intervention due to persistent hypoglycemia. The head and body resection with Roux-en-Y pancreatojejunostomy cured of CHI. In case 2, enlargement of the body and tail with several reddish nodules was evident, and 75% left pancreatectomy with clear pathological margin was performed. Medication was required due to hyperglycemia, but withdrawn in 2 months. These infants were on a normal diet without diabetes mellitus, medication or neurogenic disorder.

**Conclusions**
Atypical CHI can be cured by surgical intervention with the help of the experienced pathologist.

**NEO 18**

**A multi-disciplinary study of institutional practice patterns and outcomes in gastroschisis: a report from the University of California Fetal Consortium (UCFC)**

**Authors**
LA Lusk, *University of California, San Francisco, Department of Pediatrics, Division of Neonatology; EG Brown, University of California, Davis, Department of Surgery; R Overcash, University of California, San Diego, Department of Reproductive Medicine, Division of Maternal-Fetal; T Grogan, University of California, Los Angeles; J Kim, University of California, San Diego, Department of Pediatrics, Division of Neonatology, S Shev, University of California, Los Angeles, Department of Surgery; C Uy, University of California, Irvine, Department of Pediatrics, Division of Neonatology; F Poulan, University of California, Davis, Department of Pediatrics, Division of Neonatology, RL Keller, University of California, San Francisco, Department of Pediatrics, Division of Neonatology; D DeUgarte, University of California, Los Angeles, Department of Surgery*

**Background/Purpose**
Gastroschisis is a resource intensive birth defect without consensus regarding optimal surgical and medical management. We sought to determine bestâ€”practice guidelines by examining multi-institutional practices and outcome differences.

**Methods**
Site-specific practice patterns were surveyed and infant-maternal chart review was retrospectively performed for all inborn gastroschisis infants treated at 5 tertiary-care institutions (2007-2012). Outcomes were length of stay, ventilator days, cholestasis, and bacteremia. Site was assessed as an instrumental variable in bivariate and multivariate models adjusting for gender, gestational age, birth weight z-score, and disease severity (defined as silo â‰¥5days).

**Results**
Of 191 gastroschisis infants, mortality was 1.6% (all due to pulmonary hypoplasia) while 164 infants uncomplicated infants were analyzed further. Bivariate analysis revealed significant differences in practices and outcomes by site (Table). After adjusting for confounders, there was no association between sites with primary closure, limited silo days, shorter antibiotic days, limited central line days, and limited intubation/paralysis strategies and any bad outcome such as LOS, ventilator days, cholestasis, or bacteremia.

**Conclusions**
Management strategies that avoid routine intubation/paralysis, reduce antibiotic duration, and involve expedited surgical closure are not associated with worse outcomes and should be considered and studied as potentially cost-saving best-practices guidelines.

**NEO 19**

**A clinical prediction rule to assess risk of death prior to discharge for infants with esophageal atresia (EA) and tracheo-esophageal fistula (TEF)**

**Authors**
Benjamin Turner, *University of Calgary; Roshni Dasgupta, University of Cincinnati; Mary Brindle, University of Calgary*

**Background/Purpose**
Existing prediction models for Tracheoesophageal fistula (TEF) and esophageal atresia (EA) are derived from small populations treated over a long period of time at single institutions. A validated clinical prediction rule developed in a contemporary, multicenter cohort is important for counselling, tailoring therapy and benchmarking quality outcomes.
Faraz A. Khan, M.D.; Eric Sparks, M.D.; Jeremy G. Fisher, M.D.; Alexis Potemkin, R.N.

**NEO 22**

**Conclusions**

The results from this 13 year study validate similar smaller studies, confirming CG is a definite determinant of poor outcome in patients with gastroschisis.

**Results**

Data on a cohort of 70 consecutive neonates, from 2000 to 2013 was reviewed from a single tertiary referral centre. A detailed analysis of CG forms the basis of this study. Median follow up was 7 years.

**Methods**

Complex gastroschisis (CG), with a reported incidence of 11-31% of gastroschisis, has recently been suggested as the only factor determining the outcome of this condition. The aim of this study is to review 13 years of experience with CG and validate these findings.

**Background/Purpose**

Data on a cohort of 70 consecutive neonates, from 2000 to 2013 was reviewed from a single tertiary referral centre. A detailed analysis of CG forms the basis of this study. Median follow up was 7 years.

**Results**

CG was diagnosed in 27% of neonates with gastroschisis (n=19); the complexity consisted of gross visceroabdominal malformation need treatment. Gastrostomy was done at the first operation. The second surgery was performed in 8-16 weeks; analysed the correlation between growth weight and the distance; observe the intra-operative blind end distance and choose different operation methods. Follow-up complications and long-term outcome.

**Methods**

Esophageal growth length was 1-2.5 cm; no significant correlation with body growth weight(R = 0.173, P = 0.706), also no correlation with two surgeries interval (R = 0.085, P = 0.861). 4 cases received end-to-end esophageal anastomosis(gap<1cm); 3 cases internal transection(gap 1.5-2cm); 1 case external transection(gap=3cm); 5 had anastomotic leakage(4 had traction), all leakage healed by drainage. Follow-up for 14-84 month, 5 had anastomotic stricture and treated dilating; 4 had gastro-esophageal reflux, 2 received anti reflux surgery. 1 weight and height located in the third percentile of general population. All can eat solid food.

**Conclusions**

Delayed anastomosis can achieve the purpose of using own esophagus for long-gap EA; Internal and external traction can induce esophageal rapid growth in short term, though more complications but long-term outcomes well.

**NEO 21**

**Complex Gastroschisis: Definite Determinant of Poor Outcome.**

**Authors**

Miss Kulanka Premachandra, School of Medicine, University of Newcastle, Australia; Dr Rithvik Reddy; Dr Rajendra Kumar, Department of Paediatric Surgery, John Hunter Children's Hospital, Newcastle, Australia

**Results**

In all, 90 patients with gastroschisis were identified. 75% of patients required a primary repair, while 25% required a staged repair. The complexity rate was 25%, with 4% of patients requiring staged repair due to critical condition. The overall survival rate was 63%.

**Methods**

This new model for mortality prediction in TEF compares well with pre-existing prediction models and is able to better discriminate the highest risk patients and identify those who require targeted therapy. The Spitz model remains a good prediction model in a contemporary cohort in terms of its overall discriminatory properties.

**Conclusions**

An integer-based clinical prediction model was created that predicts those patients at high, intermediate and low risk of death with very good discrimination (c=0.723) and calibration when tested on an internal validation population.

**NEO 20**

**Experience for delayed primary anastomosis of 8 cases of long-gap esophageal atresia**

**Authors**

Chun SHEN; Shan ZHENG; Kai LI, Haitao ZHU; Xiao-min XIAO, Children’s Hospital of Fudan University, China

**Results**

Retrospective reviewed 8 patients with long-gap EA(all >4cm). 6 were female. 5 diagnosed EA prenatally. 2 had anal-rectal malformation need treatment. Gastrostomy was done at the first operation. The second surgery was performed in 8-16 weeks; analysed the correlation between growth weight and the distance; observe the intra-operative blind end distance and choose different operation methods. Follow-up complications and long-term outcome.

**Methods**

Delayed anastomosis can achieve the purpose of using own esophagus for long-gap EA; Internal and external traction can induce esophageal rapid growth in short term, though more complications but long-term outcomes well.

**Conclusions**

Preservation of normal bilirubins and growth rates were observed after transition from FO to LDIL in 86% of patients. Given the pragmatic challenges of delivering FO, LDIL may be considered as a viable alternative once bilirubins normalize in selected home PN patients.

**NEO 22**

**Preservation of Liver Function and Growth After Switching from Fish Oil to Low Dose Soy Based Lipids in Children with Intestinal Failure Associated Liver Disease (IFALD)**

**Authors**

Faraz A. Khan, M.D.; Eric Sparks, M.D.; Jeremy G. Fisher, M.D.; Alexis Potemkin, R.N., Center for Advanced Intestinal Rehabilitation, Department of Surgery, Boston Children’s Hospital; Christopher Duggan, M.D., M.P.H; Bram Raphael, M.D., Division of Gastroenterology and Nutrition, Boston Children’s Hospital, Boston, MA, USA; Biren P. Modi, M.D.; Tom Jaksic, M.D., PhD., Center for Advanced Intestinal Rehabilitation, Department of Surgery, Boston Children’s Hospital.

**Results**

7 patients with IFALD at initiation of FO were transitioned to LDIL after normalization of bilirubin and were followed for 791 (±781) days. There were no significant differences between pre- and post-transition AST, ALT, D.bilirubin, Lipid profiles and Weight-for-Age Z-scores. In the setting of worsening bilirubins, one patient was restarted on FO after four months.

**Methods**

All home PN pediatric patients with IFALD who transitioned from FO to LDIL (1gm/kg/day) were reviewed. Variables presented as means (± S.D). Comparisons were made by paired sample t tests (p<0.05).

**Conclusions**

Preservation of normal bilirubins and growth rates were observed after transition from FO to LDIL in 86% of patients. Given the pragmatic challenges of delivering FO, LDIL may be considered as a viable alternative once bilirubins normalize in selected home PN patients.
## CCT 1
### Early Diffuse Slowing On Electroencephalogram In Pediatric Traumatic Brain Injury: Impact On Management And Prognosis

**Authors**
Nicole A Nadlonek, University of Colorado SOM, Department of General Surgery; Samiksha Bansal, Children's Hospital Colorado; Shannon N Acker, University of Colorado, Department of General Surgery; David A Partrick, Children's Hospital Colorado

**Background/Purpose**
We hypothesized that the finding of diffuse slowing on bedside EEG in children with moderate to severe traumatic brain injury (TBI) is associated with prolonged hospital stay and worse functional outcomes.

**Methods**
We reviewed the medical records of all patients admitted to a single level I pediatric trauma center with moderate or severe TBI from 1/10-12/12 (defined by GCS<10 on admission). EEG monitoring results, patient demographics, clinical characteristics, length of stay and post-injury outcomes were recorded. We compared outcomes between patients with and without diffuse slowing on EEG. Data are presented as mean ± SEM; p<0.05 was considered statistically significant.

**Results**
219 children were identified; 81 had a bedside EEG performed within 48 hours of admission. Diffuse slowing was present in 50 (mean age 5.7 ± 0.7 years) and absent in 31 (n=31, mean age 4.2 ± 0.9 years). Data are shown in Table 1 below. Patients with diffuse slowing had a significant increase in ventilator days, ICU LOS, need for rehabilitation, and rehabilitation length of stay.

**Conclusions**
The presence of diffuse slowing on EEG in children with TBI is associated with prolonged patient recovery and poor functional outcomes, and should prompt early consideration for rehabilitation and the need for intensive therapy.

## CCT 2
### Utilization of computed tomography (CT) relative to injury severity prior to transfer for definitive pediatric trauma care

**Authors**
Leo Andrew O. Benedict, Department of Pediatric Surgery, Floating Hospital for Children, Tufts Medical Center, Jessica K. Paulus, Tufts Clinical and Translational Science Institute; Leslie Rideout, Walter J. Chwals, Department of Pediatric Surgery, Floating Hospital for Children, Tufts Medical Center;

**Background/Purpose**
Computed Tomography (CT) scans performed at referring institutions are known to delay transfer for definitive care and increase the risk of duplicate scanning at destination pediatric trauma centers (PTC). In a cohort of pediatric trauma patients transferred from outside institutions, we evaluated the relationship between injury severity score (ISS) with respect to where and when CT scans were performed.

**Methods**
In this 4-year retrospective cohort study (from 2008-2012), demographic, injury profile, ISS and CT scan data were obtained from patient medical records and our pediatric trauma registry. Crude odds ratios and 95% confidence intervals were calculated with CT scans obtained as the primary outcome (Fisher’s exact test, p<0.05).

**Results**
282/422 children (67%) in the study cohort received CT scans prior to transfer to our level I PTC. Severely injured patients (ISS>15) were three times more likely to undergo a CT scan at a referring institution compared to those who were less severely injured (ISS?15; odds ratio, 2.95; 95% confidence interval, 1.19-7.3; p=0.015).

**Conclusions**
Despite the inability to provide definitive care, severely versus less seriously injured children were three times more likely to undergo a CT scan at referring institutions prior to transfer to our level I PTC.

## CCT 3
### Is the Massachusetts Graduated Driver Licensing (GDL) Program Effective in Preventing Fatal Motor Vehicle Crashes in Teenage Drivers?

**Authors**
Catrina Cropano, BSc; Yuchiao Chang, PhD; Jarone Lee, MD, MPH; Haytham Kaafarani, MD, MPH; Toby Raybould, MS; Alice Gervasini, PhD, RN; Laurie Petrovick, CPHQ, MSc; Christopher DePesa, RN, MS; Peter Masiakos, MD, Massachusetts General Hospital

**Background/Purpose**
GDL programs that phase in driving privileges for teens are intended to reduce motor vehicle-related injuries and fatalities (MV-R I/F). The effectiveness of these laws is debated. MVC data following enactment of the 2007 Massachusetts GDL was evaluated to determine whether it has reduced teen fatalities.

**Methods**
The Fatality Analysis and Reporting System database was queried for fatal MVCs in MA (2002-2011). Three driver age groups were compared: 16-17 (A), 18-20 (B), and 25-29 (C). Rates of fatal MVCs (per population) were calculated for each group before (2002-2006) and after (2007-2011) the law. As a sensitivity analysis, we compared rates per licenses issued to MA citizens.

**Results**
The rate of fatal MVCs following the law decreased for group A (14.0 per 100,000 pre-law to 8.6 post-law, p=0.0006) and group B, (21.2 to 13.7, p<0.0001) while the rate of fatal MVCs in group C (1.4 to 1.8, p=0.58) was unchanged. Similar results were seen after correcting for number of issued licenses.

**Conclusions**
The 2007 GDL was effective in decreasing the rate of fatal MVCs in the Massachusetts teenage driver population. Similar GDLs should be considered in other states that do not have comprehensive GDLs to decrease the rate of fatal MVCs in this population.

## CCT 4
### Impact of newly adopted guidelines for management of children with isolated skull fracture

**Authors**
Ryan R. Metzger, Division of Pediatric Surgery, University of Utah and Primary Children's Hospital; Julia Smith, Trauma Program, Primary Children's Hospital; Matthew Wells, University of Utah School of Medicine; Maija Holsti, Division of Pediatric Emergency Medicine, University of Utah and Primary Children's Hospital; Eric R. Scaife; Douglas C. Barnhart; Michael D. Rollins, Division of Pediatric Surgery, University of Utah and Primary Children's Hospital

**Background/Purpose**
In an effort to standardize practices and reduce unnecessary hospital resource utilization, we implemented guidelines for management of patients with isolated skull fractures (ISF). We sought to examine the impact of these guidelines.

**Methods**
Patients with non-displaced/depressed fracture of the skull vault without intracranial hemorrhage were prospectively enrolled from February 2010 to February 2014.

**Results**
Eighty-four patients (median age = 10 months) were enrolled. Fall was the most common mechanism of injury (85%). The overall admission rate was 58%, representing a 17% decrease from that reported prior to guideline implementation (2003-2008; p=0.003). Guideline criteria for admission included vomiting, abnormal neurologic exam, concern for abuse and others.
Intrapulmonary shunt (IPS) is one of the long-term complications in chronic liver disease. If arterial oxygen defect in patients

Conclusions
Implementation of a new guideline for management of IPS resulted in a reduction of admissions without compromising pa-
tient safety. Young age remains a common concern for practitioners despite not being a criterion for admission. Inter-hospital
transfer may be unnecessary in many cases.

CCT 5
Diaphragm plication for postoperative phrenic nerve paralysis in children with a functionally univentricular heart

Authors
Masaya Yamoto, Koji Fukumoto; Go Miyano; Hiroshi Nouro; Keiichi Morita; Hiromu Miyake; Masakatsu Kaneshiro; Naoto Urushi-
hara, Department of Pediatric Surgery, Shizuoka Children's Hospital

Background/Purpose
Children with a functionally univentricular heart need low pulmonary vascular resistance with the aim of achieving Fontan
circulation. Postoperative phrenic nerve paralysis increases pulmonary vascular resistance as a result of diaphragm elevation,
making treatment important. We investigated diaphragm plication for postoperative phrenic nerve paralysis in cases of
functionally univentricular heart.

Methods
Thirteen cases of univentricular heart in which diaphragm plication was performed in our department from 2008 were retro-
spectively investigated. Surgical indications were potential for improvement of pulmonary vascular resistance to < 2 u/m², as
the standard for safe performance of the Glenn and Fontan procedures

Results
Data were obtained from four patients with asplenia syndrome, seven with hypoplastic left heart syndrome, one with tricus-
pid atresia, and one with double outlet right ventricle and Pulmonary Stenosis. The operative procedure was open abdominal
surgery in eight patients and laparoscopic surgery in five patients. Four of the six patients who required mechanical ventila-
tion preoperatively were able to be weaned from mechanical ventilation postoperatively. In pre- and postoperative cardiac
catheterization, pulmonary artery pressure decreased significantly and mean pulmonary vascular resistance decreased from
2.25 u/m² to 1.55 u/m².

Conclusions
Diaphragm plication was effective in helping patients meet to safe performance of the Glenn and Fontan procedures.

CCT 6
Radiation Exposure from Body CT Imaging in Pediatric Trauma Patients

Authors
Nicole E Sharp MD, Children's Mercy Hospital; Wendy J. Svetanoff MD, Creighton University; Hanna Alemayehu MD; Amita Desai
MD; Maneesha U Raghavan MD; Susan W. Sharp PhD; James C Brown MD; Doug C Rivard DO; Shawn D St Peter MD; George W
Holcomb MD MBA, Children's Mercy Hospital

Background/Purpose
We compare the amount of radiation children receive from body CT imaging for trauma when performed at non-dedicated
pediatric hospitals (OH) versus our dedicated children's hospital (CH).

Methods
We performed a retrospective chart review of all children who were transferred to our facility after undergoing a body CT for
trauma at an OH from 7/2011 to 8/2013. Radiation exposures from OH images were compared to children at our CH by match-
ing to age, gender, and nearest date. Matching was blinded to radiation and scan data. Radiation measures identified for each
child included dose length product (DLP) and computed tomography dose index (CTDI). Size-specific dose estimate (SSDE)
was calculated based on a validated method derived from measurements from each child’s CT scan. SSDE was then used to
estimate each child’s radiation exposure.

Results
Fifty one children were referred from 39 outside hospitals. Abdominal/pelvic imaging was performed in 30 children while
chest/abdomen/pelvis imaging was performed in 21. Demographics and results are shown in Table 1 and Table 2, respective-
ly. One child with OH imaging required repeat imaging due to poor quality images.

Conclusions
Children receive significantly less radiation exposure with body computed tomography imaging for trauma evaluation when
performed at a children’s hospital.

CCT 7
Predictors of Solid Organ Injury Following Blunt Abdominal Trauma: A Single Institution Process Improvement Initiative

Authors
Alia Whitehead MD; Matthew Morront MD, St Christopher's Hospital for Children; Lezhou Wu MPH MS, Drexel University; Rajeev
Prasad MD, St Christopher’s Hospital for Children

Background/Purpose
Computed tomography (CT) scan is the gold standard for identifying solid organ injuries (SOI) following blunt abdominal
trauma but subjects the child to ionizing radiation, requires transportation out of the emergency department, may require
sedation, and has a significant cost.

Methods
We performed a 5-year retrospective review of a prospectively collected trauma database at a Level One Pediatric Trauma
Center to determine the best screening tools for identifying SOI prior to obtaining a CT scan.

Results
Forty-three patients with SOI (paired with 47 age-matched controls) were included. Univariate logistic regression analysis
demonstrated the following factors to be predictive of SOI: complaint of abdominal pain (p = 0.021), tenderness on abdominal
exam (p = 0.001), and abnormalities of lipase (p = 0.013), AST (p = 0.037), or ALT (p = 0.001). Vital signs, hemoglobin, amylase, and
alkaline phosphatase did not predict SOI. On multivariate analysis abdominal tenderness, abnormal lipase, and abnormal ALT
remained significant (p-values 0.006, 0.049, and 0.002, respectively).

Conclusions
In this single institution process improvement initiative, not all laboratory studies routinely obtained in injured patients pre-
dicted SOI. Physical exam remains an important part of the trauma evaluation. Utilizing this data, we can devise a more cost
effective method to screen for SOI and limit CT scan use in injured children.

HB 1
Incidence and Clinical Significance of Intrapulmonary Shunt in Biliary Atresia

Authors
Eun Young Chang; Young Ju Hong; Jung-Tak Oh; Seok Joo Han, Department of Pediatric Surgery, Severance Children's Hospital,
Yonsei Univ

Background/Purpose
Intrapulmonary shunt (IPS) is one of the long-term complications in chronic liver disease. If arterial oxygen defect in patients

Thirty-nine percent of patients were admitted outside of the guideline, primarily because of young age (20%). Patients
transferred from another hospital (40%) were more likely to be admitted, though the majority (52%) did not meet admission
criteria. No ED-discharged patient returned for neurologic symptoms, and none reported significant ongoing symptoms on
follow-up phone call.

Conclusions
Implementation of a new guideline for management of IPS resulted in a reduction of admissions without compromising pa-
tient safety. Young age remains a common concern for practitioners despite not being a criterion for admission. Inter-hospital
transfer may be unnecessary in many cases.
With IPS and chronic liver disease is found, hepatopulmonary syndrome (HPS) can be diagnosed. However, it is not well described which characteristics of patients with IPS can be developed to HPS. Therefore, we investigated the incidence and the clinical significance of IPS in biliary atresia (BA).

Methods

We prospectively evaluated the 72 patients with BA during March 2010 to May 2013. For diagnosis of IPS, contrast-enhanced echocardiography was performed. For confirmation of IPS, ABGA was conducted additionally. Clinical data were reviewed by grouping of non-IPS, IPS without HPS, and HPS.

Results

IPS was identified in 41 patients (56.9%). IPS without HPS was confirmed in 20 patients and HPS was diagnosed in 15 patients (20.8%). Bilirubin level at IPS evaluation was significantly increased by groups (Total: 0.6mg/dL, 1.5mg/dL, and 1.9mg/dL, p = 0.005, Direct: 0.2mg/dL, 0.8mg/dL, and 1.2mg/dL, p = 0.001 respectively). Liver stiffness score (LSS) was significantly increased by groups (8.7kPa, 15.5kPa, and 22.9kPa, p < 0.0001).

Conclusions

Higher bilirubin level and higher LSS were appeared in HPS group than in IPS without HPS group and in IPS without HPS group than in non-IPS group. The presence of IPS in BA might be the transient step forward to HPS. Therefore, the identification and the close-monitoring for IPS is the substantial.

---

**HB 2**

**Refining the intraoperative measurement of the distal intrapancreatic part of a choledochal cyst during laparoscopic repair allows near total excision.**

Authors

Hiroyuki Koga; Manabu Okawada; Takashi Dori; Go Miyano; Tadaharu Okazaki; Geoffrey J Lane; Atsuyuki Yamataka, *Department of Pediatric General and Urogenital Surgery*

Background/Purpose

During surgery for choledochal cyst (CC), any intrapancreatic CC (IPCC) must also be excised to prevent postoperative pancreatic atresia and stone formation. We report our technique for laparoscopic total IPCC excision (n=14; mean age: 6.4 years).

Methods

We insert a fine ureteroscope into the opened CC through an extra 3.9mm trocar placed in the epigastrium. Its tip has a light source and is inserted into the common channel to identify the pancreatic duct orifice. By pulling the end of the ureteroscope emerging from the trocar gently to withdraw the tip from the pancreatic duct to where distal dissection was ceased under laparoscopic view, the IPCC can be measured. If longer than 5mm, the distal CC is dissected further caudally until it is less than 5mm. For accuracy, the distal CC is elevated with a suture that is exteriorized and clamped to provide even traction.

Results

Initial IPCC were 3 to 12mm (5.6 ± 2.8mm). Final IPCC were all 5mm or less. Surgery was uncomplicated without any pancreatic duct injury and postoperative recovery was unremarkable. There is no IPCC on MRI after mean follow-up of 22 months.

Conclusions

Total excision of CC is achieved by measuring the IPCC, thus reducing potential postoperative complications.

---

**HB 3**

**Toll-like receptor 7 agonist could induce hypoplasia of the biliary system in newborn mice morphologically close to human biliary atresia.**

Authors

Huang Ying-Hsien, *Kaohsiung Chang Gung Memorial Hospital*

Background/Purpose

Viral infection, type I interferon and up-regulation of Toll-like receptor (TLR) 7 have been implicated in the pathogenesis and animal model of biliary atresia (BA). However, whether activation of TLR7 signaling could induce an animal model of bile duct hypoplasia morphologically equivalent to human BA is unknown.

Methods

TLR7 agonist Imiquimod (R837) was applied to postnatal Day 1 mice. Liver was procured for morphological and histological studied and mRNA was extracted for transcripts in type I interferon signaling pathway. TUNEL staining was used to quantify apoptotic cells consequent to R837 administration.

Results

There was significantly higher hepatic TLR7 expression and smaller gallbladder in R837-treated mice than in sham group. Hypoplasia of the intrahepatic bile duct and obliteration of the extrahepatic bile duct were more prominent in R837-treated mice than in sham group, which was associated with significant induction of the transcripts of interferon regulatory factor 7, interferon-7 and tumor necrosis factor-7. In addition, there were significantly higher TUNEL-positive cells in the liver of R837-treated group than in sham group.

Conclusions

The results indicate that administration of TLR7 agonist alone is sufficient to induce TLR7 expression, type 1 specific interferon signaling, and hypoplasia of the biliary system morphologically close to BA.

---

**HB 4**

**The significance of imaging modalities in surgery for pediatric choledochal cyst**

Authors

Takeshi Saito; Hideo Yoshida, *Department of Pediatric Surgery, Graduate School of Medicine, Chiba University, Chiba, Japan*

Background/Purpose

The focus of preoperative evaluation of pediatric choledochal cyst (CC) is the anatomy of the pancreaticobiliary system. We examined the role of MRCP, ERC, DIC-CT and intraoperative cholangiopancreatography (IOC) in surgical planning for CC.

Methods

From 1980 through 2013, 117 pediatric CC patients underwent surgery. Their preoperative images were retrospectively reviewed: ERC, 81 cases during the 34-year study period; and MRCP, 45, DIC-CT, 20, and IOC, 45 cases during the last 12 years. The visualization rates of pancreaticobiliary maljunction (PBM), common bile duct (CBD), pancreatic duct (PD), and intrahepatic bile duct (IHBD) were compared. The interpretations of IHBD morphology between MRCP and IOC were analyzed.

Results

The visualization rates (%) of PBM, CBD, PD and IHBD were 57, 100, 64 and 100 for MRCP; 82, 77, 95 and 32 for ERC; 25, 79, 21 and 90 for DIC-CT; and 84, 100, 84 and 100 for IOC. Surveillance with MRCP plus IOC achieved rates (%) of 90, 100, 89 and 100. Of 17 patients with suspected IHBD stenosis on MRCP, 7 were confirmed by IOC.

Conclusions

Preoperative observation by MRCP and IOC has provided satisfactory anatomical information for surgical planning in pediatric CC. MRCP is inferior to IOC in recognizing the detailed morphology of PBM and IHBD.

---

**HB 5**

**Surgical outcome and etiologic heterogeneity of infants received Kasai operation less than 60 days with biliary atresia**

Authors

Shan Zheng; Zai Song, *Children's Hospital of Fudan University*

Background/Purpose

This study aimed to analyze the impact of etiologic heterogeneity and operation age on prognosis of biliary atresia (BA) received Kasai operation before 60 days.
Methods From 2004 to 2010, 158 infants received Kasai operation before 60 days. According to Davenport’s classification in 2012, four groups can be defined as Cystic BA, Syndromic BA and associated malformation, Cytomegalovirus-associated BA and isolated BA. Native liver survival rates and incidence of cholangitis two year’s after operation, as well as jaundice clearance rates three months after operation, were recorded.

Results Although infants received operation between 51 and 60 days had a better jaundice clearance 3 months after operation and lower incidence of cholangitis comparing with those under 40 days and from 41 to 50 days, there is no significant difference of survival rates among them. (table1). Comparing with other three types of BA, infants with Cystic BA had a better outcome. In syndromic BA and associated malformations group, as well as cytomegalovirus-associated group, infants received operation early had a worse outcome. But in isolated group, there shows no difference in different operation age. (table 2, table 3, table 4)

Conclusions Both clinical etiologic heterogeneity and operation age may have influence on the prognosis in BA.

HB 6 Does hepatic hilum morphology influence long-term prognosis in type I/I cyst biliary atresia?

Authors Masaki Nio; Motoshi Wada; Hideyuki Sasaki; Hiromu Tanaka, Department of Pediatric Surgery, Tohoku University Graduate School of Medicine

Background/Purpose Some patients with cystic biliary atresia (BA) show an exceptionally good postoperative course. The diagnosis in such patients might be choledochal cyst rather than BA. However, these two disease categories have not been strictly distinguished in younger infants. This paper discusses the borderline features between these two diseases.

Methods Of 253 BA patients identified since 1972, 40 were with type I/I cyst. These patients were divided into two groups according to hepatic duct size: group ? (n = 18; duct diameter > 1 mm) and group ? (n = 22; duct diameter < 1 mm). The postoperative clinical courses were compared.

Results Jaundice disappeared in 16 (89%) and 19 patients (86%) in groups ? and ?, respectively (p = 0.81). A total of 13 (72%) and 12 (55%) patients survived with their native livers (p = 0.25), and the mean age of the native liver survivors was 23.2 and 25.2 years in groups ? and ?, respectively (p = 0.43).

Conclusions There were no significant differences in the long-term outcome between groups ? and ?. Approximately 40% of the patients developed liver failure during the postoperative course; thus, close, long-term follow-up is essential even in type I/I cyst, regardless of hepatic hilum morphology.

HB 7 Effects of Insulin, Glucagon, and Epidermal Growth Factor on Liver Regeneration after Partial Hepatectomy

Authors Hong Shiee Lai; Shuo-Lun Lai; Shiou-Chuan Wu; Wei-Jao Chen, Departments of Surgery, National Taiwan University Hospital, Taipei, TAIWAN

Background/Purpose Remarkable decrease of blood glucose occurs immediately after partial heptectomy (PH). This study evaluated the role of insulin, glucagon and the epidermal growth factor (EGF) on liver regeneration (LR) after PH.

Methods Male Wistar rats weighed around 200 g were used. A 67% PH was performed on the control and seven hormone treated groups: insulin, glucagon, EGF, Insulin + glucagon, insulin + EGF, glucagon + EGF, and a combination of the three hormones. The hormones were administered subcutaneously 2 days prior to PH. All rats were killed at 6, 24, 48 and 72 h after PH. Remnant liver weight, deoxyribonucleic acid (DNA) content, DNA synthetic rate, mitotic index, blood glucose and insulin levels were measured.

Results The effects of single hormone on posthepatectomy LR were not obvious. Combined insulin and glucagon increased the remnant liver weight, DNA content, and DNA synthetic rate (p<0.01). The combined insulin, glucagon, and EGF even significantly increased mitotic index (p<0.01). No concordance between the change of blood glucose levels and the effect of hormones during LR.

Conclusions Insulin plus glucagon can promote LR; Three combinations of insulin, glucagon and EGF can markedly increase the LR of remnant liver after PH. The effect of single hormone is not obvious.

HB 8 The Effect of Age and Race on Short-term Outcomes for Portoenterostomy in Biliary Atresia

Authors Nathan P. Zwintscher; John D. Horton, Madigan Army Medical Center; Sanjay Krishnaswami, Oregon Health & Science University

Background/Purpose Age and race have been shown to have variable effects on outcomes for infants with biliary atresia. Our aim was to characterize the patient population and short term outcomes for children undergoing portoenterostomy using a large national database.

Methods We studied 169 inpatient admissions for infants under one year of age undergoing a portoenterostomy for biliary atresia in 2009 using the Kids' Inpatient Database. Patients had a principal diagnosis of biliary atresia and a portoenterostomy listed as one of their first 5 procedures. Procedures and complications were defined by ICD-9 codes.

Results The average age at admission was 79.7 days old. The overall morbidity and mortality rates were 25.7% and 0.9%, respectively. 8.8% developed cholangitis and 6.3% progressed to hepatectomy/liver transplant during the same admission. 27% were non-White-non-Black (NWNB). NWNB infants were admitted at an older age (96.5 days vs. 67.8 days, P=0.004) and were 3 times more likely to experience a complication (OR 2.93, CI 1.07-8.04, P=0.037). Age at admission did not affect the likelihood of a short-term complication (P=0.244) or need for liver transplant (P>0.999).

Conclusions The average age at admission for portoenterostomy was relatively old at 80 days. NWNB children were older and were more likely to have a complication.

HB 9 Serial 1-13C-Methione Breath Tests To Evaluate Hepato-protective Strategies in Children with Intestinal Failure: A Pilot Study

Authors Kuang Horng Kang, MD; Eric A. Sparks, MD; Jeremy G. Fisher, MD; Faraz Khan, MD; Ivan Gutierrez, MD; Biren P. Modi, MD, Department of Surgery, Boston Children’s Hospital, Boston, MA; Yong Ming Yu, MD, PhD, Shriner’s Burn Hospital for Children and Massachusetts General Hospital, Boston, MA; Tom Jakcis, MD, PhD, Department of Surgery, Boston Children’s Hospital, Boston, MA

Background/Purpose While promising hepato-protective parenteral nutrition (PN) strategies now exist for children with intestinal failure associated...
liver disease (IFALD), the best means to assess their impact on true liver function remains controversial. The intravenous [1-13C] methionine breath test (MBT) is a non-invasive, stable isotopic indicator of hepatocyte mitochondrial function. This pilot study sought to use serial MBTs to quantify the long-term effects of hepato-protective PN on liver function in children with IFALD.

Methods
Following IRB approval, 4 patients ([4.2±2.6(SD) years] with IFALD (maximum direct bilirubin 7.3±2.6mg/dL) were each studied with MBT on two occasions (6.7±3.4 months apart) after normalization of their bilirubins. All were on hepato-protective PN (three omega-3 lipids and one omega-6 lipids, all at 1g/kg/day).

Results
All four patients demonstrated an improvement in 13CO2 recovery from first to second MBT. The overall mean change in 13CO2 recovery was 141±47% recovery (P<0.05), reflecting improved hepatocyte mitochondrial function. No changes were seen in traditional measures of liver function including total bilirubin, PELD, APRI, and INR.

Conclusions
This study suggests that hepato-protective strategies in children with IFALD are associated with improved hepatocyte mitochondrial function even after normalization of bilirubin. The MBT appears to be a more sensitive indicator of hepatic function than commonly utilized clinical parameters.

Wednesday 08:45 – 10:15
ORAL PRESENTATIONS: MIS/ROBOTICS (MIS)

MIS 1
Laparoscopic radical nephrectomy of wilms’ tumor and renal cancer in children: preliminary experience from two-centers’ study in east China

Authors
Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

Background/Purpose
To review the preliminary experience from two-centers’ study and to evaluate the laparoscopic radical nephrectomy with wilm’s tumor and renal cancer in children

Methods
From January 2010 to October 2013, medical recordings on 7 cases who underwent laparoscopic radical nephrectomy for wilm’s tumor or renal cancer in the department of pediatric surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University and Children’s Hospital of Fudan University were included.

Results
3 underwent preoperative chemotherapy according to COG (Children’s Oncological Group) protocol and all were treated by laparoscopic radical nephrectomy. The biggest tumoral size was 10 cm without crossing the lateral edge of the vertebra. The median hospital stay was 8.5 days (6-11). The pathologic investigation showed 5 Wilm’s tumors, 1 rhabdoid tumor and 1 renal cell carcinoma. With a median follow-up of 26months (range 3 and 48 months), all the children had no oncological complications (post site recurrence, pulmonary metastasis) and without intraoperative tumoral rupture.

Conclusions
From our own preliminary experience, the radical nephrectomy in children for Wilm’s tumor or renal cancer can be safely performed laparoscopically. For trained laparoscopic surgeons, by small tumors under 10 cm in diameter, especially without crossing the lateral edge of the vertebra was at the time of surgery.

MIS 2
The learning curve on the laparoscopic excision of choledochal cyst with Roux-en-Y hepatointerostomy in children

Authors
Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

Background/Purpose
To review the preliminary learning curve on the laparoscopic excision with Roux-en-Y hepatointerostomy for choledochal cyst and to establish the learning curve

Methods
From April 2009 to September 2013, 73 cases of choledochal cyst were operated laparoscopically. For trained laparoscopic surgeons, by small tumors under 10 cm in diameter, especially without crossing the lateral edge of the vertebra was at the time of surgery.

Results
The average operative time in group A (6.7±1.9 hours) was longer than those of group B (3.5±0.7 hours) and C (3.7±0.5 hours, all P values <0.05). The conversion rate of group A (5/17, 29.4%) was higher than those of group B (3/31, 9.6%) and C (2/25, 8%, all P values < 0.01). Volume of bleeding (32.5±12.2ml) was larger than those of group B (18.5±9.4ml) and C (19.5±5.7ml, all P values <0.05). The other factors were nearly same.

Conclusions
The learning curve of laparoscopic excision on choledochal cyst with Roux-en-Y hepatointerostomy is extremely steep before 15 cases. After that, the average operative time, conversion rate and volume of bleeding declined dramatically.

MIS 3
A New Index (Sternal angle index) for additional superior bar in PECTUS Excavatum in the Nuss Procedure

Authors
Shinsuke Ohashi; Shuichi Ashizuka; Jyoji Yoshizawa; Masashi Kurobe; Takao Ohki, Jikei University School of Medicine; Hiroaki Kitagawa, Division of Pediatric Surgery, St. Marianna University School of Medicine

Background/Purpose
This study is aimed to establish clear-cut criteria for additional insertion of superior bar in PECTUS Excavatum in the Nuss Procedure.

Methods
Thirty-six patients underwent Nuss procedure were included, and divided into two groups based on whether or not the patient had additional bar inserted on the superior side of first bar or not. (Group A and B respectively) We reviewed the preoperative chest CT scan retrospectively. At the sternal angle level, we measured SV and RV. (The definition of SV and RV are shown in Fig 1?) Sternal Angle Index (SAI) is calculated using RV divided by SV. Comparison of SAI between two groups was done.

Results
Thirty-six patients were subdivided into group A(N=20) and group B(N=16). SAI was 1.24 +/- 0.14 and 1.08 +/- 0.05 respectively and group A showed statistically significant difference (p=0.0001).

Conclusions
The SAI greater than 1.25 may be an useful index for additional insertion of superior bar during Nuss procedure.
MIS 4

Study in 221 cases with the double-bar Nuss procedure for the correction of pectus excavatum: initial 11 years’ single institution experience

Authors Yu Jie; Zeng Qi; Zhang Na; Cheng Chen-Hao; Xu Chang-Qi, Department of Thoracic Surgery, Beijing Children’s Hospital, Capital Medical University, Nan Lishi R

Background/Purpose The study aims at investigating the application of the Nuss procedure with double-bar in correction of pectus excavatum and evaluating the techniques of this method.

Methods A retrospective review of all patients who underwent the Nuss procedure with double-bar from July 2002 to December 2013 was performed. A total of 2510 patients were included in this study, including 221 cases (187 male and 34 female) using two bars.

Results Patients possessed a median age of 15.1 years (range: 8.4–21.9 years) and a mean Haller index of 5.2 (range: 3.2–8.0). 27 patients were classified as recurrent PEx, 37 patients as widespread type, 21 cases as eccentric type, 20 cases as unbalanced type, 143 patients as great deep channel type. All cases were defined as moderate to severe. The mean operation time was 61.7 min (42–170 min). The mean blood loss was 4.2 mL (1–80 mL). The bar in 95 patients was removed after Nuss procedure. The patients were followed up for 1 to 72 months.

Conclusions The indications of Nuss procedure with double bar by thoracoscopic include widespread type which malformation area is greater than 15 centimeter, great deep channel type, severe and very severe pectus excavatum. Possessing the advantages of safe and effective, it can obtain satisfactory correction of PE with the proper application.

MIS 5

Non-thoracoscopic NUSS procedure versus traditional NUSS procedure: A case control study

Authors Qi ZENG; Na ZHANG; Chenghao CHEN; Jie YU, Beijing Children’s Hospital, Capital Medical University

Background/Purpose To compare the safety and feasibility of non-thoracoscopic NUSS procedure with traditional NUSS procedure.

Methods To summarize the 286 patients of PE with NUSS surgery from Oct. 2009 to Sept. 2010 in Beijing children’s hospital, according to the inclusion criteria, there remain 124 cases were randomly divided into two groups, 66 cases of non-thoracoscopic NUSS procedure and 58 cases of traditional NUSS procedure. And compare with the two different ways of surgery in the field of perioperative information, complications and effectiveness.

Results All the 124 patients completed the procedure successfully. Analysis the two groups of age, Haller index, surgical effects, operation time, blood loss and hospital stay, and there were all with no significant differences. Followed up from 12 to 23 months, no recurrence and no long-term complications occurred.

Conclusions Non-thoracoscopic NUSS procedure is a safe and effective way for correcting pectus excavatum, and has the same advantage as the traditional NUSS procedure, besides the reduced wound length. But we recommend that the way of thoracoscopic observation after non-thoracoscopic surgery will be a good choice, not only reduce the wound length, but also can find the intrathoracic tissue injury timely.

MIS 6

Different techniques for bar-removal after the Nuss procedure? A single center study with 1282 cases

Authors Zhang Na; Zeng Qi; Chenghao Chen; Yu Jie, Department of Thoracic Surgery, Beijing Children’s Hospital, Capital Medical University, Nan Lishi R

Background/Purpose As the Nuss procedure has been widely accepted as the standard procedure for the repair of pectus excavatum, but few reports have systemically documented the methods for bar removal. In this study, we retrospectively evaluated the different techniques for bar-removal after the Nuss procedure.

Methods A postoperative review of all patients with PEx treated with the Nuss procedure in our institution from July 2002 to January 2014 was performed. A total of 2537 patients undergoing the Nuss procedure were included in this study, including 1282 cases undergoing bar removal with a median age of 10.17 years (5.5–18.75 year).

Results 1282 patients (990 male and 292 female) underwent the bar-removal surgery with the mean operation time 23.7 min (range: 15.4–180 min). Most of the bars were removed in 3 years (range: 10.4–69 month). No patient suffered from the complications during the surgery.

Conclusions Overview of all the cases, the Nuss bar can be safely and easily removed with different methods and appropriate bar-stay time according to the distinctive situation of patients after the Nuss procedure. Our study suggests that surgeons should pay more attention to the details of the first operation, the existence of rib ossification and the shape of the bar currently.

MIS 7

Thoracoscopic repair of congenital diaphragmatic hernia: two centres’ experience of 57 patients

Authors JS Huang, Jiangxi Children Hospital; CT Lau; WY Wong, The University of Hong Kong; Q Tao, Jiangxi Children Hospital; KKY Wong, PHK Tam, The University of Hong Kong

Background/Purpose With the advancement in laparoscopic techniques, thoracoscopic approach is gaining popularity in the treatment of congenital diaphragmatic hernia (CDH). In this study, we reviewed our early experience using this approach.

Methods All patients who underwent thoracoscopic repair of CDH between 2009 and 2013 at two tertiary referral centres were identified. Medical records were retrospectively reviewed. Patients’ demographics, peri-operative outcomes, length of hospitalization and post-operative complications were analyzed.

Results 57 patients were identified (43 males and 14 females). 5 patients had delayed presentation with operations done over 1 month old. The mean body weight was 2.88 kg for patients operated in neonatal period. Left side was more prevalent (n=48). Mean operative time was 87.1 minutes (range 31–194 minutes). No conversion was required in any of the patients. All patients were routinely intubated and paralyzed in neonatal intensive care units for 3 days after operation. Average hospital stay was 14.6 days. There was no mortality in this series. There were 5 recurrences (8.8%), 3 of these were repaired openly and 2 thoracoscopically. No musculoskeletal deformity noted on follow-up.

Conclusions Thoracoscopic repair of CDH can be performed safely in specialized centres with good post-operative recovery, outcome and cosmesis.
**MIS 8** Thoracoscopic surgery resection for mediastinal neurogenic tumor in children  
**Authors** Xu Chang, Xiang Bo; Luo Qi-Cheng, Pediatric Surgery, West China Hospital of Sichuan University  
**Background/Purpose** Thoracoscopic surgeries had better visualization and less invasion compared with open procedures. The aim of this study was to evaluate the feasibility of thoracoscopic surgery resection for mediastinal neurogenic tumor in children.  
**Methods** We retrospectively analyzed 11 cases who had received posterior mediastinal mass resections thoracoscopically from July 2011 to October 2013 in our hospital. Thoracoscopic procedures were performed with 3-5 mm-ports. The tumors were removed with an endoscopic specimen bag. A chest tube was placed in position.  
**Results** 5 boys and 6 girls ranging from 2 to 12 years old were included in this study. All procedures were completed thoracoscopically without conversion. The operating time was 35 minutes to 2 hours and the estimated bleeding was 10 to 40 ml. Pathological exams revealed 2 neuroblastomas and 9 ganglioneuromas with the biggest 6 cm in diameter. CT scan was performed at the second post-operative day and the drainage was removed at the third day. No pulmonary infection occurred. All children did well in the short term follow-up with no sign of recurrence on CT scan.  
**Conclusions** Thoracoscopic surgery resection of mediastinal neurogenic tumors in children is a feasible, safe, and efficient procedure, even in the treatment of neuroblastoma. Compared with open procedure, it allows better visualization, less surgical attack, shorter hospital stay, better cosmetic effect, and can minimize postoperative complications.

**MIS 9** Thoracoscopic repair of type-C esophageal atresia does not require direct manipulation of lung parenchyma in comparison to open repair resulting in less respiratory tract impact and smoother recovery.  
**Authors** Hiroyuki Koga, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine; Masaya Yamoto, Department of Pediatric Surgery, Shizuoka Children’s Hospital; Tadaharu Okazaki; Manabu Okawada; Takashi Doi, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine; Go Miyano; Koji Fukumoto, Department of Pediatric Surgery, Shizuoka Children’s Hospital; Geoffrey J Lane, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine; Naoto Urushihara, Department of Pediatric Surgery, Shizuoka Children’s Hospital; Atsuyuki Yamataka, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine  
**Background/Purpose** We assessed outcome of 72 cases of type-C esophageal atresia (EAc) treated by open (OR) or thoracoscopic (TR) repair from 2000-2013. OR requires direct lung retraction (DLR) but in TR, CO2 insufflation causes lung collapse.  
**Methods** Patient demographics, operative time, respiratory tract impact (RTI: incidence of atelectasis, timing of extubation, need for reintubation, and chest tube duration), narcotic usage, commencement of oral feeding, and length of hospitalization (LOH) were compared.  
**Results** Seven long-gap cases requiring staged repair were excluded, leaving 65 EAc subjects (TR=25, OR=40). Patient demographics, operative time, and chest tube duration were similar. No TR case required DLR. Significant differences were found for TR for narcotic usage (1.6 vs. 3.1 days), commencement of feeding (7.8 vs. 10.5 days), atelectasis (8 vs. 30%), initial extubation (2.8 vs. 5.6 days), and LOH (33 vs. 46 days), (all p<0.05, respectively). Postoperative tracheal tube blockage caused by excessive secretions (4 vs. 10%) and reintubation (4 vs. 18%) were less in TR but not significant. There were 3 anastomotic leakages in TR, 1 in OR.  
**Conclusions** TR is less traumatic than OR because DLR is unnecessary, thus RTI is less and recovery is quicker.

**MIS 10** Thoracoscopic Thoric Duct Ligation For Congenital and Acquired Disease  
**Authors** Steven S Rothenberg, Rocky Mountain Hospital for Children  
**Background/Purpose** This paper examines a 15-year experience with thoracoscopic ligation of the thoracic duct.  
**Methods** From June 1999 to December 2013, 20 patients presented with chronic chylothoracies refractory to conservative management. Ages ranged from 3 weeks to 3 years old and weights ranged from 2.6 to 12.7 kg. All procedures were performed in the right chest with 3 ports. All cases consisted of sealing of the duct at the level of the diaphragm with the tissue sealer and or sutures, a mechanical pleurodesis, and insertion of tissue glue at the level of the diaphragm.  
**Results** All cases were completed successfully thoracoscopically. Operative time ranged from 20 to 55 minutes. The chest tube duration post-procedure ranged from 4 to 14 days. Two patients failed the ligation and required a second procedure, a thoracoscopic pleurectomy in one, and a chemical pleurodesis in the other.  
**Conclusions** Thoracoscopic thoracic duct ligation is a safe and effective procedure even in sick post-cardiac surgery patients. The site of the leak can be identified in the majority of cases and tissue sealing technology appears to be effective in sealing the duct.

**MIS 11** Thoracoscopic pulmonary resection in children  
**Authors** Razumovskiy Alexander, Filatov’s Childrens Hospital  
**Background/Purpose** The thoracoscopic approach for pulmonary resection in children has recently become the procedure of choice for different lung anomalies and diseases  
**Methods** Since 2005, we have performed 184 thoracoscopic (TS) pulmonary resections in children. 74 operations were done to newborns and infants. The age of 21 patients ranged from 1 day to 1 month, and from 1 month to 1 year in 53 patients. The procedure of choice was a TS lobectomy. The operation was carried out through the 3 or 4 trocarapproach. Pulmonary vessels were clipped or divided by a Bi Clamp device. Bronchi were ligated or closed by Hem-o-lock clips. In some cases of upper left lobectomy and segmentectomy we used an endostapler.  
**Results** Mean operation time was 42 Â±17.5 min. There was no mortality in our study. No intraoperative complications were observed. Conversion was required in 3 patients due to severe adhesions. Two patients developed postoperative pneumothorax. All complications were subsequently resolved.  
**Conclusions** In children with thoracic pathology, thoracoscopy is highly effective for attaining the operation’s goal for any age group, with low rates of conversion and complications.
### MIS 12  Thoracoscopic Management of Vascular Rings

**Authors**  Steven S Rotenberg, Rocky Mountain Hospital for Children  

**Background/Purpose**  Vascular rings present a complex problem and have traditionally required an open thoracotomy to repair. This paper examines our experience with thoracoscopic management of this complex problem.

**Methods**  From January 2000 to December 2013, 8 patients present with vascular rings. Ages ranged from 3 months to 13 years and weight from 3.6 to 38 kg. Two patients had double aortic arch associated with a TEF and underwent a staged procedure with ligation of the TEF in the right chest and then later division of an atretic left arch and repair of the TEF thru a left thoracoscopic approach. 3 patients required only division of a ligamentum arteriosus for an aberrant right subclavian artery. 3 patients underwent division of the ligamentum as well as an atretic left arch for a right side dominant arch, and one patient had a complete double arch.

**Results**  Seven of 8 patients had their procedure completed successfully thoracoscopically. The operative time ranged from 70-170 minutes, 6 of 8 patients had no chest tube and the average hospital stay for this group was 1.2 days.

**Conclusions**  Thoracoscopic division of vascular rings is a safe and effective in the right patient co-hort and avoids the morbidity of a major thoracotomy.

### MIS 13  Laparoscopic assisted simple suturing obliteration (LASSO) of the internal ring using an epidural needle: A handy single-port laparoscopic herniorrhaphy in children

**Authors**  Suolin Li, The Second Hospital of Hebei Medical University, Shijiazhuang, China; Kenneth K. Y. Wong, Department of Surgery, Queen Mary Hospital, The University of Hong Kong

**Background/Purpose**  We describe our modifications of laparoscopic assisted simple suturing obliteration (LASSO) using an epidural needle with preperitoneal hydrodissection, which confer greater ease, safety, speed, and success to this procedure.

**Methods**  Under laparoscopic visualization through a single umbilical port, an 18-gauge epidural needle was inserted at the point of the internal ring. The orifice of the hernia defect was obliterated extraperitoneally by a nonabsorbable suture that was introduced and withdrawn through the epidural needle around the internal ring using the hydrodissection-lasso technique.

**Results**  A total of 251 inguinal repairs were performed by LASSO in 207 children. 163 patients had unilateral inguinal hernia repairs and 44 patients underwent repair of bilateral inguinal hernias. Mean operating time for unilateral and bilateral inguinal hernia repairs were 18.1 ± 5.4 min and 26.6 ± 4.8 min, respectively. There were no intra-operative complications and no recurrences at mean follow-up of 17 months. No other complications (wound infection, suture granuloma formation, hidrocele) were found postoperatively.

**Conclusions**  LASSO using an epidural needle with preperitoneal hydrodissection as a handy technique has proved to be a safe and effective in the treatment of inguinal hernia in children. It is easy to perform and therefore is a worthy choice for PIH.

### MIS 14  Thoracoscopic Bronchoplasty in Children

**Authors**  Razumovskiy Alexander, Filatov’s Childrens Hospital

**Background/Purpose**  Stenosis and total obstruction of main bronchi in children are very rare. Today several different methods are used to treat such conditions, including plastic operations, lung resection, balloon dilatation of main bronchi.

**Methods**  Patient 1. A boy A., 2 years and 7 months. On his admission to our hospital we diagnosed intermediate bronchus stenosis. The child underwent thoracoscopic resection of intermediate bronchus with "end-to-end" anastomosis, which was made via endoscopy.

Patient 2. A boy, 3 years and 4 months, suffered form catatrauma. On his admission to our hospital we diagnosed intermediate bronchus stenosis. The child underwent thoracoscopic resection of intermediate bronchus with "end-to-end" anastomosis, which was made via endoscopy.

**Results**  Patient 1. Operation time was 145 minutes. Postoperative period was without complications.

Patient 2. Operation time was 130 minutes. Bronchoscopy made on the 10th, 14 postoperative day showed no airway obstruction.

**Conclusions**  We made a thorough review of current literature dedicated to endoscopic operations on bronchi and didn’t come across any reports describing similar operations, so we consider our experience to be the first in this field.

### MIS 15  Comparison of outcomes between laparoscopy-assisted and posterior sagittal anorectoplasties for male imperforate anus with recto-bulbar fistula.

**Authors**  Hiroyuki Koga, Takanori Ochi, Manabu Okawada, Takashi Doi, Geoffrey J Lane, Atsuyuki Yamataka, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine

**Background/Purpose**  All reports comparing laparoscopy-assisted anorectoplasty (LAARP) with posterior sagittal anorectoplasty (PSARP) in male high-type imperforate anus include a mix of recto-vesical, recto-prostatic, recto-bulbar, and absent fistula cases without focusing on recto-bulbar fistula (RB), the most challenging type to treat laparoscopically. We compared LAARP with PSARP for treating only RB.

**Methods**  We used our fecal continence evaluation questionnaire (FCE; maximum score=10), scoring of magnetic resonance image (MRI) findings (MRI scores), and the recto-anal angle (RAA; angle between the rectum and the anal canal) to assess 20 RBF cases (LAARP=12, PSARP=8) prospectively from 2000-2013.

**Results**  Mean ages at surgery, MRI scores, mean RAA, and duration of raised C-reactive protein (6.6 vs. 6.7 days, p=NS) were similar. In all cases, postoperative MRI showed no residual fistula and normal urination. LAARP had higher FCE consistently (7.9 vs. 7.8 at 3 years; 8.6 vs. 8.3 at 5 years; 8.9 vs. 8.6 at 7 years; p=NS, respectively), lower incidence of wound infection (0 vs. 37.5%; p<0.05), higher incidence of rectal mucosal prolapse (50.0 vs. 0%; p<0.05), and less requirement for analgesia (p<0.05).

**Conclusions**  Although LAARP and PSARP are comparable for treating RBF, LAARP is associated with less wound infections and surgical stress despite higher incidence of prolapse.
RESULTS
Compared with HUVECs, HemECs demonstrated increased proliferative activity with lower Dll4 protein level but higher VEGF-VEGFR-2-induced hemangioma-derived endothelial cell proliferation.

METHODS
Under laparoscopic exploration, all 96 preoperatively-diagnosed communicating were confirmed to have open internal rings (pore size 3-5 mm in diameter). Interestingly, in 189 children pre-operatively diagnosed “non-communicating” hydroceles, 187/98 (99%) were also found to have patent internal rings. Fifty-seven (20.0%) contralateral but asymptomatic patent processus vaginalis were diagnosed during laparoscopy. All except two children with closed internal rings had received laparoscopic repairs of the hydrocele. The median operation time was 16 minutes. During our follow-up, four kids had recurrence, with only moderate amount of fluid accumulation 1-3 months after the surgery. 3 of them spontaneously resolved during subsequent follow-ups. The remaining one needed percutaneous needle aspiration.

CONCLUSIONS
Laparoscopic exploration could help pediatric surgeons with accurately classifying types of hydrocele. Laparoscopic repair for hydroceles provides satisfactory outcomes and can be adopted.

Thursday 07:00 – 08:15

ORAL PRESENTATIONS: ONCOLOGY (ONC)

ONC 1 Placing the port: short and long-term consequences
Authors Eric Webber, Cynthia Verchere; Marija Bucevska; Jasna Levi; Ronak Rahmanian; Sheila Pritchard, University of British Columbia
Background/Purpose The infraclavicular placement for the port of a port-a-cath results in prominent scar formation. For over ten years we have inserted some ports in an inframammary position. This study compares the two sites in terms of function and appearance.
Methods Two groups of patients were studied: 60 children with indwelling ports, and 60 children whose port had been removed 24 months previously. Children with ports and the oncology nurses were asked to evaluate the port function, while children whose ports had been removed were asked to evaluate the scar. Three plastic surgeons, blinded to the port location, evaluated the appearances of the scars.
Results The location of the port did not affect its function. Children with inframammary ports reported less pain with port access. Following port removal children with inframammary scars reported being happier with the location and the appearance of the scar. The plastic surgeons rated the inframammary scars as significantly better in appearance than the infraclavicular scars.
Conclusions The appearance of the infraclavicular scar was a significant concern to many children, and it was rated objectively as appearing significantly less satisfactory than the scar in the inframammary location. These findings should be considered when planning port placement for a child.

ONC 2 Downregulated Notch ligand Delta-like 4 promotes VEGF/VEGFR-2-induced hemangioma-derived endothelial cell proliferation
Authors Yi Ji, Siyuan Chen, West China Hospital of Sichuan University; Kai Li, Children’s Hospital of Fudan University; Bo Xiang, Hospital of Sichuan University
Background/Purpose The Notch ligand Delta-like 4 (Dll4) plays a crucial role in angiogenesis. The objective of this study was to investigate the roles of Dll4 in hemangioma-derived endothelial cells (HemECs) proliferation.
Methods In this study, we compared Dll4 protein expression in primary HemECs and primary human umbilical vein endothelial cells (HUVECs). We addressed whether downregulated Dll4 enhances HemEC proliferation. Moreover, the potential mechanisms of Dll4 modulated HemEC proliferation were investigated.
Results Compared with HUVECs, HemECs demonstrated increased proliferative activity with lower Dll4 protein level but higher VEG-
Sixteen children had recurrence of SCT a median interval of 16.25 months after primary surgery. 15.6% tumors recurrence were

**Results**

A retrospective review was conducted of 107 SCT treated between January 2003 and December 2012 in our Medical Center.

**Methods**

Background/Purpose

Kai Li; Wei Yao; Shan Zheng; Kuiran Dong; Xianmin Xiao,

**Authors**

CONCLUSIONS

Our results demonstrate that downregulated Dll4 can promote HemEC proliferation via VEGF/VEGFR-2 signaling pathway.

**ONC 3 Solid-pseudopapillary neoplasm of the pancreas in children. - Can we predict malignancy?**

**Authors**

Jihee Hwang; Dae Yeon Kim; Seong Chul Kim; Jeong Man Namgoong, University of Ulsan College of Medicine, Asan Medical Center

**Background/Purpose**

We aimed to review clinical and histologic findings of Solid-pseudopapillary neoplasm(SPN) in children and determine the predictive factor of the malignancy.

**Methods**

The records of 45 patients(9 males, 36 females) who underwent surgery for SPN in the Asan medical center from 1992 to 2012 were retrospectively analyzed. We analyzed the factors between histologic benign group (n=36) and malignant group (n=9).

**Results**

The mean age of children was 14.9±3.15 years (range 9-20 years). The size of the tumor was 6.36±3.61cm and most common site in the pancreas was the tail (n=23). Three patients had distant metastasis at initial diagnosis, the sites were the liver (n=2) and the omentum (n=1). All patients underwent complete resection, and the median follow up period was 34 months. Recurrence (n=4) was more common in the malignant group (p<0.05). We calculated the proportion of solid component by manual volumetry with a CT scan; the median value was 41.5% in benign group, 88.4% in malignant group. On comparative analysis, the proportion of solid component was found to have significant association with malignancy (P<0.05).

**Conclusions**

Histologic malignant SPN has high risk of recurrence. We should consider more radical resection when finding a predominantly solid tumor in a CT scan.

**ONC 4 Sirolimus, a promising Treatment for Children’s Refractory Kaposiform Hemangioendothelioma**

**Authors**

Kai Li; Zuopeng Wang; Wei Yao; Kuiran Dong; Xianmin Xiao, Children’s Hospital of Fudan University

**Background/Purpose**

Kaposiform hemangioendothelioma (KHE) is a locally aggressive vascular tumor that usually occurs in infants. It is commonly associated with Kasabach-Merritt phenomenon (KMP) which is directly responsible for the significant morbidity and mortality including hemodynamic instability, local invasion, and compression of vital structures. Treatment is particularly difficult for those who have no response to conventional therapies. This paper wants to share experience of mTOR inhibitors sirolimus in treatment of refractory KHE.

**Methods**

Seven cases of refractory KHE were diagnosed and treated in Medical Center from 2010.1- 2013.10, all of them were treated with sirolimus after failing multiple other therapies.

**Results**

Seven patients, 4 boys and 3 girls. Extremities, trunk and faciocervical region were involved. Mean age at initial diagnosis as KHE was 3.2±1.7m. All of them had been pretreated with at least 2 medical therapies. All of them showed significant improvement in clinical status with tolerable side effects. The average time to response was 6.5±4.5d, the average stabilization time of platelet was 16.0±7.6d, the average time for sirolimus treated as single agent was 1.7±0.4m. No recurrence of their symptoms happened.

**Conclusions**

Sirolimus appears to be effective and safe in patients with life-threatening KHE and represents a promising tool in treating refractory KHE.

**ONC 5 Pleuropulmonaryblastoma mimicking congenital cystic adenomatoid malformation**

**Authors**

Miss Kulanka Premachandra, School of Medicine, University of Newcastle, Australia; Dr Rithvik Reddy, Department of Paediatric Surgery, John Hunter Children’s Hospital, Newcastle, Australia; Dr Allen James, Department of Cardiothoracic Surgery, John Hunter Hospital, Newcastle, Australia; Dr Rajendra Kumar, Department of Paediatric Surgery, John Hunter Children’s Hospital, Newcastle, Australia

**Background/Purpose**

Pleuropulmonary blastoma (PPB), a rare intra-thoracic tumour arising from pleuropulmonary mesenchyme, is found primarily in children less than 5 years of age. Of the three pathologic types of PPB, types II-III have poor outcomes. Congenital cystic adenomatoid malformation (CCAM) has an incidence between 1:10,000 and 1:35,000 live births. We report a case of type 1 PPB mimicking macrocystic CCAM.

**Methods**

In the last decade, 40 children with suspected CCAM were entered in our database; one child who was initially thought to have CCAM was diagnosed with PPB. We present the clinical and radiological findings, histopathology and management of this case.

**Results**

A 10 month old boy was referred to our institution with a large cyst occupying the left upper lobe of the lung and mediastinal shift found on chest X-ray. CT scan suggested a CCAM of the left upper lobe; the patient underwent a lobectomy. Histopathology indicated a Type 1 PPB, and he was followed up with 6 monthly CT scans and ultrasonography. Family screening did not reveal any abnormalities.

**Conclusions**

CCAM mimicking PPB should be kept in mind when one considers non-operative management. Similar cases having been reported in other centres, brings into question the role of non-operative treatment of CCAM.

**ONC 6 Analysis of risk factors associated with recurrence in sacrococcygeal teratoma**

**Authors**

Kai Li; Wei Yao; Shan Zheng; Kuiran Dong; Xianmin Xiao, Children’s Hospital of Fudan University

**Background/Purpose**

To investigate effects of risk factors on recurrence of sacrococcygeal teratoma (SCT)

**Methods**

A retrospective review was conducted of 107 SCT treated between January 2003 and December 2012 in our Medical Center. Risk factors were identified by univariate and multivariate analysis.

**Results**

Sixteen children had recurrence of SCT a median interval of 16.25 months after primary surgery. 15.6% tumors recurrence were Altman type I, 10.5% type II, 10.0% type III, and 31.3% type IV. The recurrence of mature teratoma was observed in 8 patients, immature in 2, malignant in 5. More than the recurrences showed a shift towards histological immaturity or malignancy,

**Conclusions**

Risk factors were identified by univariate and multivariate analysis.
7 patients were diagnosed with low risk neuroblastoma. Among these patients, 7 cases were diagnosed with posterior mediastinum, 14 cases with adrenal, 4 cased with retroperitoneal and 1 case with neck. According to INSS, 19 patients were stage 1, 19 patients were stage 2, 14 patients were stage 3, 14 patients were stage 4, and 4 patients were stage 4S. The incidence of cases with MYCN amplification in the post-MS group was higher than that in the during MS group (60.0% vs 29.6%, p=0.03). Compared with the during MS group, the incidence of stage 4 cases was higher in the post-MS group (47.2% vs 26.3%, p<0.01). To determine the biological features of the stage 4 cases, we classified the cohort into three groups: aneuploid with a single MYCN copy, diploid with a single MYCN copy and amplified MYCN. Only the incidence of stage 4 cases showed two groups with single MYCN copy and amplified MYCN were higher in the post-MS group (60.0% vs 29.6%, p=0.03).

Conclusions
Tumor recurrence affected the outcome of children with SCT. Risk factors were tumor spillage, malignant histology, or incomplete resection. Regular follow-up after surgery is mandatory to find tumor relapse earlier and to improve the outcome.

ONC 7
Yolk Sac Tumor: A Retrospective Multicenter Study

Authors
Zhi Li, Tongji Hospital, Tongji Medical College

Background/Purpose
Yolk sac tumor (YST) of the ovary is a rare germ cell tumor. YST usually occurs as a rapidly growing unilateral tumor in young women. With the introduction of cisplatin, YST has been changed from a fatal tumor to a curable tumor. The standard treatment of YST consists of fertility-preserving surgery and 3 or 4 courses of adjuvant combination chemotherapy with bleomycin, etoposide, and cisplatin (BEP). However, the long-term prognosis of BEP-treated YST patients has not been well studied.

Methods
We therefore conducted a retrospective multicenter study to investigate the prognostic factors of 108 YST patients.

Results
The cumulative 5-year survival rate was 88%. Univariate analysis revealed the following significant prognostic factors (P < 0.05): stage, tumor diameter, and residual tumor.

Conclusions
Stage, tumor diameter, and residual tumor are significant prognostic factors. Extensive debulking surgery to minimize residual tumor would improve the prognosis.

ONC 8
The differences in the clinical and biological characteristic of neuroblastomas detected during and after a period of mass screening of six-month-old infants: A report from the Study Group for Pediatric Solid Tumors in the in the Kyushu Area, Japan

Authors
Ryota Souzaaki; Yoshiaki Kinoshita; Yuuki Koga; Minoru Yagi; Fumio Yanai; Koichiro Ueda; Yoshiya Zaizen; Yukihiro Inomata; Yuichi Shinkoda; Hiroshi Matsufuji; Souichi Suenobu; Noritoshi Handa; Kenichi Kohashi; Yoshinao Oda; Yoshiro Hara; Tomoaki Taguchi, The Committee for Pediatric Solid Malignant Tumors in the Kyushu area, Japan

Background/Purpose
A nationwide program of mass screening (MS) for neuroblastomas (NBs) in six-month-old infants was discontinued in 2004. We assessed the differences in the clinical and biological characteristics of NBs detected during or post-MS in the Kyushu area, Japan.

Methods
We compared 97 cases diagnosed with NBs from 2005 to 2012 (the post-MS group) compared with 112 cases diagnosed with NBs from 2001 to 2003 (the during MS group).

Results
The incidence of cases with MYCN amplification in the post-MS group was higher than that in the during MS group (20.3% vs 9.0%, P=0.04). The incidence of stage 1 in the post-MS group was lower and the incidence of stage 4 cases was higher compared with the during MS group (stage 1: 23.6% vs 40.0%, P=0.04; stage 4: 47.2% vs 26.3%, P=0.01). To determine the biological features of the stage 4 cases, we classified the cohort into three groups: aneuploid with a single MYCN copy, diploid with a single MYCN copy and amplified MYCN. Only the incidence of stage 4 cases showed two groups with single MYCN copy was higher in the post-MS group (60.0% vs 29.6%, P=0.03).

Conclusions
MS harvested maturing aneuploid NBs. And MS also harvested a small number of diploid NBs with MYCN single copy that will later progress to advanced stage disease.

ONC 9
Central venous catheter-related complications in children with malignancy

Authors
Sho Kurihara; Eisco Hiyama; Yoshiyuki Onitake, Pediatric Surgery Hiroshima University Hospital; Mizuka Miki; Kazuhiro Nakamura; Hiroshi Kawaguchi; Masao Kobayashi, Pediatrics, Hiroshima University Hospital

Background/Purpose
Central venous catheter (CVC) is one of supportive cares in children with malignancy. The aim of this study is to evaluate the Hickman-Broviac (H-B) catheter-related surgical complications.

Methods
We inserted 701 H-B catheters in 626 children with malignancy or immunodeficiency between 1996 and 2013. All catheters were inserted through subclavian, internal or external jugular veins by pediatric surgeons according to CDCP guideline.

Results
In these patients, early and late surgical complication occurred in 33 (5.3%) and 59 (9.4%) cases, respectively (Table). The mean follow-up after CVC insertion was 196.4 days. In the overall 137,676 catheter-days, 170 catheter-related infections (0.96 per 1000 catheter-days) occurred, including 97 bloodstream infections. The frequencies of hemotherax and unexpected removal were significantly increased after 2003 and occurred usually in younger patients, while BSI and hemotherax were decreased after 2003. No difference was found between the patients with and without complication, concerning duration of the indwelling catheter, frequency of manipulation, prior therapies, leukopenia, or hypoalbuminemia.

Conclusions
The incidence of CVC complications was acceptable low in children with malignancies but the increase of hemotherax and unexpected removal might be caused by the instrument shapes, suggesting that careful attention should be paid for selecting insertion sites and suitable instruments in each patient.

ONC 10
Outcome after surgery alone for patients with low-risk neuroblastoma

Authors
Wei Yao; Kai Li; 19 ONCKuiran Dong; Shan Zheng; Xiaomin Xiao, Department of Pediatric Surgery, Children’s Hospital of Fudan University

Background/Purpose
To investigate the importance of risk groups according to the actual situation of China, and evaluate the effectiveness of surgery alone for patients with low-risk neuroblastoma.

Methods
A retrospective review was conducted of neuroblastoma patients with low risk group treated between January 2009 and December 2012 in Children’s Hospital of Fudan University.

Results
26 patients were diagnosed with low risk neuroblastoma. Among these patients, 7 cases were diagnosed with posterior mediastinum, 14 cases with adrenal, 4 cases with retroperitoneal and 1 case with neck. According to INSS, 19 patients were stage 1, 3 patients were stage 2, and 4 patients were stage 3. The cumulative 5-year survival rate was 88%. Univariate analysis revealed the following significant prognostic factors (P < 0.05): stage, tumor diameter, and residual tumor.
Since 1971, the registry of the Japanese Society of Pediatric Surgeons has annually reported the number of registrations as well as patients and tumor characteristics. Trends in incidence were inferred by evaluating the number of registrations divided by the Chinese versions of the PedsQL 4.0 Genetic Core Scales and the Cancer Module. Family Impact Module (FIM) was used to assess the impact of cancer on family members. For comparison, a survey on a sex- and age-marched sample of pediatric cancer patients who were receiving cancer therapy was conducted.

**Conclusions**

Parents of children who had abandoned therapy reported even worse HRQOL. Caregiver's social characteristic significantly affected HRQOL in these children.

### ONC 11

**Health-related quality of life in pediatric cancer patients who had abandoned therapy**

**Authors**
Yi Ji, Siyuan Chen, West China Hospital of Sichuan University; Kai Li; Xianmin Xiao, Children's Hospital of Fudan University; Bo Xiang, West China Hospital of Sichuan University

**Background/Purpose**

Our objectives were to describe the Health-related quality of life (HRQOL) in pediatric cancer patients who had abandoned therapy.

**Methods**

We analyzed data on children between the ages of 2 to 18 years with any malignancy and had abandonment of therapy in two hospitals in Mainland China. Parents reported HRQOL on behalf of their children. Childhood HRQOL was assessed using the Chinese versions of the PedsQL 4.0 Genetic Core Scales and the Cancer Module. Family Impact Module (FIM) was used to assess the impact of cancer on family members. For comparison, a survey on a sex- and age-matched sample of pediatric cancer patients who were receiving cancer therapy was conducted.

**Results**

Forty-two parents of children participated. Compared with children who were receiving cancer therapy, children who had abandoned therapy for more than one month displayed worse HRQOL. Disease type correlated with total HRQOL score after abandonment of therapy. Leukemia/lymphoma had worse HRQOL compared with those with solid or brain tumors. Family socioeconomic status emerged as the main factors influence HRQOL in children and caregivers.

**Conclusions**

Parents of children who had abandoned therapy reported even worse HRQOL. Caregiver’s social characteristic significantly affected HRQOL in these children.

### ONC 12

**Clinical feature of ATRX or DAXX mutated neuroblastoma**

**Authors**
Eiso Hiyama; Sho Kurihara; Yoshiyuki Onitake, Pediatric Surgery, Hiroshima University Hospital; Emi Yamamoto; Ikuiko Fukuba; Keiko Hiyama, Natural Science Center for Basic Research and Development

**Background/Purpose**

Previously, we reported alternative lengthening of telomere (ALT) may be biomarkers for chemo-sensitivity and late recurrence in neuroblastoma (NBLs). In this study, alterations of ATRX or DAXX genes were examined in NBL samples.

**Methods**

Our previous study to evaluate telomere biology in 121 NBLs revealed 11 NBLs with long telomeres?ALT activated NBLs? ATRX or DAXX gene alterations were examined using next-generation sequencing and compared to the other biological factors.

**Results**

In ALT activated cases, DAXX mutation was detected in one case and ATRX gene alterations were detected in other 10 cases (Table ). No DAXX or ATRX gene alterations were detected in tumors with normal or shortened telomere. MYCN amplification was not detected in ATRX altered tumors. In these ALT activated cases, 3 infants showed ATRX deletion and all 7 cases detected after 18 months old showed poor prognosis.

**Conclusions**

In NBLs, ALT was caused by ATRX or DAXX alterations. ATRX altered cases detected at over 18 months showed poor prognosis without MYCN amplification, suggesting that ATRX altered NBL is a particular subtype in NBLs. Since these tumors showed chemo-resistant and late recurrence, complete resection in surgical approach should be performed to improve the prognosis of these NBL patients.

### ONC 13

**Clinical application of indocyanine green (ICG) fluorescent imaging of hepatoblastoma**

**Authors**
Yamamichi T; Oue T; Owari M; Nakahata K; Ueno T; Uehara S, Osaka University Hospital Department of Pediatric Surgery; Yonekura T, Nara Hospital Kinki University Faculty of Medicine; Usui N, Osaka University Hospital Department of Pediatric Surgery

**Background/Purpose**

Although the usefulness of intraoperative ICG fluorescent imaging for the resection of hepatocellular carcinoma has been reported, its usefulness for the resection of hepatoblastoma remains unclear. This study clarifies the feasibility of intraoperative ICG fluorescent imaging for the resection of hepatoblastoma.

**Methods**

In 3 hepatoblastoma patients, the primary tumor, recurrent tumor and lung metastatic lesions were intraoperatively examined using a near-infrared fluorescence imaging system (MIZUHO, Japan) after the preoperative administration of ICG (0.5mg/kg i.v.).

**Results**

ICG fluorescent imaging was useful for the surgical navigation of hepatoblastoma. In the first case, the primary hepatoblastoma exhibited intensive fluorescence during right hepatectomy, but no fluorescence was detected in the residual liver tissue. In the second case, a recurrent tumor exhibited fluorescence between the residual liver and diaphragm. A complete resection of the residual liver with a partial resection of the diaphragm followed by liver transplantation was performed. In the third case with multiple lung metastasis, every metastatic lesions showed positive fluorescence, and were completely resected. These fluorescence positive regions were pathologically proven to be viable hepatoblastoma tissue.

**Conclusions**

Intraoperative ICG fluorescence imaging for patients with hepatoblastoma was feasible and useful for identifying small viable lesions and confirming that no remnant tumor remained after resection.

### ONC 14

**Trends in Incidence of Childhood Malignant Solid Tumors in Japan**

**Authors**
Hitoshi Ikeda, Dokkyo Medical University Koshigaya Hospital; Yosikazu Nakamura, Jichi Medical University

**Background/Purpose**

Several epidemiological studies have shown that the incidence of childhood cancers is increasing, suggesting the influence of pre- and perinatal environmental factors on cancer development in children. A study was performed to examine recent trends in the incidence of childhood malignant solid tumors in Japan.

**Methods**

Since 1971, the registry of the Japanese Society of Pediatric Surgeons has annually reported the number of registrations as well as patients and tumor characteristics. Trends in incidence were inferred by evaluating the number of registrations divided by the population of children (R/P).
PROGRAM & ABSTRACTS

paps2014.org

Jaya Vikraman, University of Melbourne, Department of Paediatrics, Melbourne, Australia; Ruili Li, Bridget Southwell, Douglas Stephens Surgical Research Laboratory, Murdoch Children’s Research Institute, Melbourne, Au; John Hutson, Royal Children’s Hospital, Department of Urology, Melbourne, Australia

Testicular Descent is associated with the Mammary Bud in Rodents

Background/Purpose Testicular inguinoscrotal descent requires gubernacular guidance and stimulation from calcitonin gene-related peptide released by the genitofemoral nerve (GFN) regulating migration through the mammary fat pad (MFP) into the scrotum.

Results

The registration rate was deemed stable between 1980 and 2011, since the R/P of Wilms tumor showed no significant change. Although the R/P of non-screening-detected neuroblastoma was not decreased by mass screening, it was relatively high after 2004, when a nationwide mass screening was halted. Conspicuous and significant changes were an increase in hepatoblastoma during the period (p<0.001) and a decrease in hepatocellular carcinoma concordant with the introduction of hepatitis B vaccination (p<0.01).

Conclusions

While the implementation of mass screening had minimal effects on the incidence of non-screening-detected neuroblastoma, the notable increase in hepatoblastoma unexplainable with only an increase in hepatoblastoma with a low birth weight necessitates an exploration of underlying causes.

ONC 15

Kaposiform hemangioendothelioma: A retrospective study of 37 steroid-resistant patients treated with vincristine and long-term follow-up

Authors

Zuopeng Wang; Kai Li; Kuiran Dong; Wei Yao; Xianmin Xiao; Shan Zheng, Children’s Hospital of Fudan University

Background/Purpose

The purpose of this study is to evaluate efficacy of Vincristine (VCR) and possibility of replacement for steroids in treatment of steroid-resistant cases of Kaposiform hemangioendothelioma (KHE) with Kasabach-Merritt phenomenon (KMP).

Methods

Thirty-seven cases of steroid-resistant KHE with KMP were retrospectively reviewed from March 2003 to March 2013 in our medical center.

Results

The age of initial diagnosis with KHE was between 1 day and 10 months. 8 lesions were located in superficial soft tissue, while deep soft-tissue was involved in 29 cases. All the cases did not response well to steroids before starting VCR treatment. 26 cases achieved complete remissions, with platelet count reached to normal level within 7.6±±.2 weeks after VCR treatment. The mass shrank in size or become softer at an average of 4.9±±.2.7 weeks. 2 cases had partial response to VCR, and the treatment is ongoing in one case. Side effect was happened in 48.6% of patients who received steroids, and was 11.4% in VCR treatment. The average length of VCR treatment was 31.2±±.9 weeks. The mean follow-up time was 3.5 years, no recurrence happened.

Conclusions

VCR presents a safe and effective treatment option in the management of steroid-resistant case of KHE with KMP.

Thursday 07:00 – 08:15

ORAL PRESENTATIONS: UROLOGY (URO)

URO 1

The area and attachment abnormalities of the gubernaculum in patients with undescended testes

Authors

Masayuki KUBOTA; Kengo NAKAYA; Yuhki ARAI; Toshifumi OHYAMA; Naoki YOKOTA, Department of Pediatric Surgery, Niigata University Graduate School of Medical and Dental Sciences

Background/Purpose

The gubernaculum (GN) abnormalities in undescended testes (UDT) were examined quantitatively.

Methods

Sixty-seven testes from sixty-one UDT patients treated in the past 11 years were examined. Using imaging records, the area of the GN inside the processus vaginalis was measured to determine the ratio to that of the testis. The GN distance from the testis (deviation index) was measured in the ratio to that of the transverse length of the testis. Reference values were obtained from 24 testes from 15 patients with mobile testes.

Results

In all testes in patients with mobile testes and in 43 testes in the UDT patients (64%), the GN attached to the bottom of the testis. However, the GN in UDT patients was elongated. The mean GN area ratio was 1.58 (1SD, 0.6) in the UDT cases, in comparison to 0.47 (0.2) in the cases with mobile testes. The GN was attached to the vas deferens in 24 testes. The deviation index was 1.34 (1.0), and the GN area ratio of these cases was 1.56 (0.7).

Conclusions

An increase in the GN area ratio was the most common imaging abnormality in cases with UDT.

URO 2

The hernia and the testis: a review of paediatric Spigelian hernia and the curious association with undescended testis

Authors

Brendan Jones; John Hutson, Royal Children’s Hospital, Melbourne, Australia

Background/Purpose

To present a summary of paediatric Spigelian hernia (SH) reported to date, and discuss possible aetiologies of SH and SH associated with ipsilateral undescended testis (SH-UDT).

Methods

Medline search of English language literature was performed using keywords “Spigelian hernia”. The following were extracted from articles describing paediatric SH: demographics, site and contents of SH, comorbidities, proposed aetiology, presence of ipsilateral inguinal canal (IC) and gubernaculum (G).

Results

There were 77 patients with 87 hernias (68M, 19F), including 54 male (18L, 22R, 7B) and 16 female (5L, 5R, 3B) non-traumatic SHs. In non-traumatic male SH, 29 hernias contained testis (10L, 11R, 4B), 15 did not, 10 had no data. Of 29 SH-UDT, 15 were ipsilateral inguinal canal (IC) and gubernaculum (G).

Conclusions

While SH-UDT includes, the SH creating a low resistance compared to IC and line of descent, become cranially ‘mislocated’ along the mammary line, which overlies the Spigelian fascia. Therefore IC and line of descent, become cranially ‘mislocated’ along the mammary line, which overlies the Spigelian fascia.

Conclusions

There were 77 patients with 87 hernias (68M, 19F), including 54 male (18L, 22R, 7B) and 16 female (5L, 5R, 3B) non-traumatic SHs. In non-traumatic male SH, 29 hernias contained testis (10L, 11R, 4B), 15 did not, 10 had no data. Of 29 SH-UDT, 15 were ipsilateral inguinal canal (IC) and gubernaculum (G).

Conclusions

While SH-UDT includes, the SH creating a low resistance compared to IC and line of descent, become cranially ‘mislocated’ along the mammary line, which overlies the Spigelian fascia.

Conclusions

There were 77 patients with 87 hernias (68M, 19F), including 54 male (18L, 22R, 7B) and 16 female (5L, 5R, 3B) non-traumatic SHs. In non-traumatic male SH, 29 hernias contained testis (10L, 11R, 4B), 15 did not, 10 had no data. Of 29 SH-UDT, 15 were ipsilateral inguinal canal (IC) and gubernaculum (G).

Conclusions

While SH-UDT includes, the SH creating a low resistance compared to IC and line of descent, become cranially ‘mislocated’ along the mammary line, which overlies the Spigelian fascia.
Mammary buds (MB) regress with androgen, but persist in females and androgen-blockaded male rodents. We hypothesize that MFP sensory nerves express neurotrophic factors for gubernacular migration. Brain derived neurotrophic factor (BDNF) signals via its sensory axon transmembrane receptor TrkB. Following androgen programming (E13-17), TrkB persists in female mice but in males changes to a truncated form.

Methods
MB and the MFP from male androgen receptor knockout (ARKO) mice (n=6), wild-type mice (WT) (n=6) and female mice (n=6) were processed for fluorescent immunohistochemistry at E17. Antibodies against BDNF, TrkB and truncated TrkB were visualized by confocal microscopy.

Results
WT males had no MB at E17, however both ARKO and females did. ARKO mice expressed BDNF and both forms of TrkB in MFP, while female mice expressed BDNF and non-truncated TrkB.

Conclusions
WT males display MB regression, ARKO males display persisting MB similar to females. BDNF expression with both forms of TrkB in ARKO males, may inhibit survival of GFN sensory neurons supplying MB and MFP. Regulation of GFN axons is subverted in ARKO mice causing cryptorchidism.

URO 4
Postnatal germ cell development during mini-puberty in the mouse does not require androgen: implications for managing cryptorchidism

Authors
Jorien Meijer, Murdoch Children Research Institute

Background/Purpose
Undescended testes causes increased risk of infertility and testicular malignancy as a result of aberrant germ cell (GC) development. Androgens are proposed to control early GC development. Here we aim to assess the effect of androgen on postnatal GC development in mice.

Methods
Testes from Androgen Receptor Knockout (ARKO) mice and wildtype (WT) littersmates (N=18) were collected at postnatal day 4,8 and 10 for immunohistochemistry. Antibodies against mouse VASA homologue (MVH, GC), Anti-MA\textregistered{}illarian Hormone (AMH, Sertoli cells), Ki-67 nd DAPI (cell nuclei) were visualized by confocal microscopy.

Results
In WT, GCs' tubule increased normally with age. The number of MVH+ GCs/tubule and the number of GCs on the basement membrane were similar (p> 0.05) in ARKO and WT testes (fig. 1). In addition the percentage of proliferating GCs (expressing Ki-67) and the percentage of proliferating GCs at the basement membrane at all time points were similar (p>0.05)

Conclusions
These result clearly show that androgen does not control normal transformation and migration of GCs during postnatal mini-puberty, suggesting other non-androgenic signalling factors are involved. Identification of a novel, non-androgenic factor stimulating GCs might be important for improving fertility after orchidopexy

URO 5
Male Gender Identity in children with 46,XX DSD with congenital hyperplasia after delayed presentation in mid childhood

Authors
Tanvir K Chowdhury; Kamrun Laila, Department of Paediatric Surgery, Chittagong medical College Hospital, Chittagong, Bangladesh; John M Hutson, Department of Urology, The Royal Children’s Hospital, Melbourne, Australia;Department of Paediatrics; Tahmina Banu, Department of Paediatric Surgery, Chittagong medical College Hospital, Chittagong, Bangladesh

Background/Purpose
Girls with congenital adrenal hyperplasia (CAH) diagnosed at birth have some tomboyish behaviour but rarely have gender conversion to male. In developing countries however, presentation and treatment are delayed, and we aimed to assess the effect of delayed androgen suppression on genital anatomy and gender identity.

Methods
As part of a cross sectioned case-control study of 50 consecutive children with disorders of sex development (DSD) and 50 of vascular anomalies presenting to a tertiary pediatric surgical clinic, there were 11 patients of CAH. Patients and caregivers answered a brief questionnaire about gender identity and behaviour was assessed by observation of toy play and questionnaire on game participation.

Results
Of 11 CAH patients who were initially raised as girls, 3 (27%) had converted to male gender at presentation (5,9 and 9 years old) (Prader score 3,4 and 4). Of the remaining 8 patients, 1 (Prader 2) had a gender identity score in the male range (19) but the other 7 were girls (score 1). Of the 8 girls, 6 (75%) displayed some tomboyish behaviour and 3 (75%) expressed gender identity in the female range (0-17). The remaining 2 girls (25%) displayed some tomboyish behaviour but their gender identity was in the male range (18-19). Of the 3 boys, 2 (66%) displayed tomboyish behaviour and 2 (66%) expressed gender identity in the male range (18-19). One boy (33%) did not display any tomboyish behaviour and his gender identity was in the male range (18-19).

Conclusions
This result suggests that continued exposure to androgen postnatally is an important trigger for male gender identity.

URO 6
Orchiopexy without inguinal scar: either scrotal incision or transumbilical laparoscopy

Authors
Ning Li; Wen Zhang; Xuefeng Zhou; Qiao Bao; Jiyan Yuan, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China

Background/Purpose
To share our experience of 634 cases of orchiopexy through concealed incision without inguinal scar.

Methods
During Jan 2009 and Dec 2013, 634 children of cryptorchidism underwent orchiopexy in our department. The surgeries were either through scrotal incision or by transumbilical laparoscopy. The medical records of these children were reviewed.

Results
The inclusion criteria for scrotal incision: testis is palpable and can be pulled down to the upper part of scrotum. Inclusion criteria for transumbilical laparoscopy: testis is nonpalpable, or palpable but hard to be pulled down near scrotum. Reoperation cases were excluded from this study. Totally 481 children were selected for scrotal incision orchiopexy and 153 underwent transumbilical laparoscopy surgery. Seventeen out of 481 children were found difficult to finish orchidolysis during operation and convert to laparoscopy surgery. Patients were followed-up for 1-15 months, 10 out of 61 cases need a second operation because of retraction (7 tests) and atrophy (3 tests). Twenty-three patients were lost of follow-up. The scars were concealed on the scrotum or hidden within the umbilicus.

Conclusions
Orchiopexy can be done by either scrotal incision or transumbilical laparoscopy. Both procedures leave no inguinal scar.
The role of Radical surgery and orthotopic neobladder reconstruction in the management of bladder neck/prostate rhabdomyosarcoma

Authors
Bi Yunli; Lu Liangsheng, Children’s Hospital of Fudan University

Background/Purpose
Bladder/prostate rhabdomyosarcoma had a relatively poor prognosis. Controversy exist over radical or organ sparing surgery. The cases underwent radical or organ sparing surgery in our department were reviewed to evaluate the effectiveness of these treatments.

Methods
Twelve cases of rhabdomyosarcoma underwent surgery in our department from July 2009 to May 2012. The pathological type was embryonal, all in IRS stage 3. Surgical procedures and follow-up were evaluated.

Results
After biopsy and preoperative chemotherapy, 9 cases received local tumor resection. Postoperative recovery and chemotherapy was uneventful in all cases. They are followed for a mean time of 2.2 years, and survived free of diseases.

One girl and 2 boys underwent radical surgery. The age was 13-26 months. The bladder and proximal posterior urethra was resected. Ileocecral patch was used to construct a neobladder and anastomosed to urethra. The ureters were anastomosed to the neobladder. The operative time was 360-420 minutes. Postoperative recovery was event free. Postoperative chemotherapy was performed in all cases. They are followed for 2-3.5 years. All achieved continent and urinated via urethra and are in a disease free state.

Conclusions
Radical surgery is a feasible option in the management of bladder neck/prostate rhabdomyosarcoma and may yield better outcomes.

Hydronephrosis: Comparison of extrinsic vessel vs intrinsic ureteropelvic junction obstruction groups and a plea against the vascular hitch procedure

Authors
Prema Menon; K.L.N. Rao, Post Graduate Institute Of Medical Education And Research, Chandigarh, India

Background/Purpose
Comparison of extrinsic vascular obstruction (VO) with intrinsic ureteropelvic junction obstruction (IO) group to identify them preoperatively.

Methods
Prospective study on children who underwent open pyeloplasty (2003 â€“ 2013). Clinical features, ethylene dicysteine (EC) scan and intravenous urography (IVU) were compared between the groups.

Results
643 children underwent pyeloplasty. 33 (5.13%) had VO with 8 (24.24%) having intrinsic narrowing also. (Table) Age above 2 years (91% vs. 48%), females (33% vs. 15%), presentation with pain in children > 2 years age (100% vs. 63%) associated anomalies (27% vs. 10%) and poor pre-operative function (IVU) (60% vs. 34%) were noted in VO and IO groups respectively. On IVU (Figures), small (69% vs. 3%), intra renal (72% vs. 3%) and globular/flattened pelvis (78% vs. 30%) with loss of infundibulum (45% vs. 15%) were in favor of VO. Funnel shaped (3% vs. 81%), predominant extra renal pelvic dilatation (6% vs. 87%) and milder calyceal dilatation (9% vs. 51%) were in favor of IO.

Conclusions
VO group has statistically significant higher incidence of presentation above 2 years, female gender, other anomalies and impaired function than IO. IVU changes are typical. 24% have intrinsic narrowing alongwith VO. Hence, children with VO should not undergo vascular hitch procedure.

National survey of Fetal intervention for Obstructive Uropathy. Does a vesico-amniotic shunt prevent fatal pulmonary hypoplasia?

Authors
Hiroaki Kitagawa, St. Marianna University School of Medicine, Division of Pediatric Surgery; Noriaki Usui, Osaka University Graduate School of Medicine, Pediatric Surgery; Keisuke Ishii, Osaka Medical Center and Research Institute for Maternal and Child Health, Department of Obstetrics; Haruhiko Sago, National Health for Child Health and Development, Department of Maternal-Fetal Biology; Kentaro Matsuoka, National Health for Child Health and Development, Department of Pathology; Mamoru Tanaka, St. Marianna University School of Medicine, Department of Obstetrics; Shinobu Tatsunami, St. Marianna University School of medicine, Unit of Medical Statistics, Faculty of Medical Education, Masahiro Hayakawa, Nagoya University Hospital, Department of Obstetrics

Background/Purpose
We conducted a national survey of infants born after fetal intervention for Obstructive Uropathy (OU) focusing on patients requiring respiratory care after birth.

Methods
A questionnaire was send to major perinatal centers caring for OU fetuses whether or not fetal intervention was attempted. The second questionnaire was sent about the patients delivered after 22 weeks gestation between 2008-2012, requiring post-natal respiratory care.

Results
The primary questionnaire was sent to 281 centers, with more detail requested from 46 centers requiring post-natal respiratory care. There were 44 males and 17 females, (unknown 2) (7.3 p<0.01). Fetal intervention was performed in 9 cases (33.3% died). Fifty two infants without fetal intervention had the same mortality. Fetal diagnosis before 25 weeks, Apgar score < 5 at 5 minutes, and Potter’s syndrome indicated poor prognosis. Seventeen of 23 died of lung hypoplasia and 2 cases died of renal failure. Fetal intervention group were detected of 18.7±4.3 and 29.1±5.7 weeks for non-fetal intervention (p<0.01). Early detection (before 25 weeks) had 60% mortality and late detection had 19%.

Conclusions
Outcomes after fetal intervention for OU are poor. Early diagnosis indicated a poor outcome probably because earlier detection usually implies more critical status. However, fetal intervention after 25 weeks may allow survival.

Traction assisted dissection with soft tissue coverage is effective for repairing recurrent urethrocutaneous fistula following hypospadias surgery

Authors
Takanori Ochi; Shogo Seo; Yuta Yazaki; Manabu Okawada; Takashi Doi; Go Miyano; Hirokyoki Koga; Geoffrey J Lane; Atsuyuki Yamataka, Department of Pediatric General and Urogenital Surgery Juntendo University School of Medicine

Background/Purpose
Repair of urethrocutaneous fistula (UF) complicating hypospadias surgery (HX) is hindered by compromised tissue at the UF site, especially if recurrent. We report our technique for UF repair.

Methods
We encountered 32 UF in 23 HX patients. Of these, 12 UF were recurrent (mean: 2.5 times; range 1-5). Mean age at UF repair was 9.5 years (range: 2 to 22). Our repair involves superficial circumferential incision of the fistula orifice, placement of multiple stay sutures in the outer edge of the incision for wide (7-10mm) dissection of just the epidermis under traction without compromissing underlying connective tissue and blood perfusion. The skin layer of the inner edge of the circumferential incision is trimmed
the fistula closed using 7/0 absorbable interrupted sutures. Pedicled external spermatic fascia, or pedicled pericord/scrotal adipose tissue is then mobilized to cover the repair site through a subcutaneous tunnel and the skin closed.

Results
Repair was successful in all cases. Penile cosmesis was acceptable to good without any testicular complications or scrotal deformity. At mean follow-up of 79 years (range: 0.5 to 16.8) there have been no recurrences.

Conclusions
Our technique allows UF to be repaired simply and efficiently and can also be used in recurrent cases.

URO 11
The morphology and treatment of coexisting ureteropelvic junction obstruction in lower moiety of duplex kidney

Authors
Rongde Wu; Wei Liu, Department of Pediatric Surgery, Provincial Hospital Affiliated to Shandong University, Jinan, China; Rui Ma, Shandong Medical Imaging Research Institute, Jinan, China

Background/Purpose
Duplex system is one of the most common anomalies of upper urinary tract, while ureteropelvic junction obstruction (UPJO) in lower moiety of duplex kidney is rare. Here we report our experience in managements of this situation.

Methods
Among the pediatric patients with duplex system from 2007-2013, 7 children were diagnosed with UPJO in lower moiety. Their medical records were retrospectively analyzed, mainly focused on anatomic aspects and operation details.

Results
Hydronephrosis, thin parenchyma and presence of UPJO in lower moiety could be shown on CTU. The ureters were fused in a “Y” shape without any dilation. Based on the length between the fused ureter to UPJO, patients were classified into group 1 (5 cases, 73cm) and group 2 (2 cases, >3cm). In group 1, surgical procedure involved ureteropyeloanastomosis of the upper ureter to lower pelvis and the lower pelvis to the fused ureter in four cases and laparoscopic end-to-side ureteropyeloanastomosis of the lower pelvis to the fused ureter in one case. The two patients in group 2 underwent laparoscopic pyeloplasty of lower moiety.

Conclusions
Ureteropyeloanastomosis is a feasible treatment for duplex kidneys associated to a functioning lower moiety with UPJO. With the technical improvements in laparoscopic pyeloplasty, this procedure can be performed using laparoscopy.

URO 12
Renal Autotransplantation: An Alternative to Renal Artery Bypass in the Management of Complex Pediatric Renovascular Disease

Authors
Eliza Lee, MD; Deborah Stein, MD; Michael Ferguson, MD; Khashayar Vakili, MD; Heung Bae Kim, MD, Boston Children’s Hospital

Background/Purpose
Renovascular disease is an important cause of hypertension in children. Although percutaneous transluminal renal angioplasty (PTRA) is considered standard in adults, PTRA in children often requires repeated procedures. Frequently, patients require surgical correction. Renal artery bypass is effective but requires a graft. We report our experience with renal autotransplantation (RA) as an alternative to renal artery bypass.

Methods
We conducted a retrospective review of pediatric patients undergoing RA at our institution for either medically refractory hypertension or renal artery aneurysm.

Results
Of six patients, three had right renal artery stenosis (two with aneurysm) and three had left sided lesions (one with aneurysm). One patient underwent bilateral RA. Right sided lesions required autotransplantation onto the common iliac artery and vein due to short residual renal artery length. Left sided lesions were autotransplanted onto the infrarenal aorta. In three cases, arterial reconstruction was accomplished after flushing the kidney with cold saline in the field. All patients recovered well. Median hospital stay was 7 days. Post-RA systolic blood pressure decreased 11.7mmHg. Two patients have weaned off all antihypertensive medications.

Conclusions
RA is an effective alternative to renal artery bypass in children with anatomically complex renovascular disease, and avoids complications associated with autologous or prosthetic grafts.

URO 13
Pediatric Laparoscopic Urology, Review of 350 Cases

Authors
Najeh .Y. Alomari, MD, FACS, IMRCS/FRACS, FEBPS, JBPS, JBG, Royal Medical Services /Jordan

Background/Purpose
Minimally invasive surgery has been grown tremendously over the past two decades. We aim to present our experience in pediatric laparoscopic urology. We review the safety, efficacy, outcome parameters of operative time, analgesic requirement, and hospital stay. We present the follow up protocol and complications

Methods
A retrospective study of 350 cases of pediatric laparoscopic urology performed at Queen Rania Hospital for Children / KHMC over 4 years (2009-2013).

Results
Patients included were 200 females and 150 males, age group ranged from 2months to 14 years. Transperitoneal laparoscopic & laparoscopic assisted pyeloplasty performed over 125 renal units, 6 patients underwent simultaneous bilateral laparoscopic assisted pyeloplasty, 120 repairs performed over DJ catheter. Laparoscopic transperitoneal extravesical ureteric reimplantation performed over 105 renal units, bilateral reimplantation in 20 patients. Laparoscopic nephroureterectomy performed over 120 patients. Laparoscopic nephroureterectomy was performed for end stage renal damage due to VUR, PUJ obstruction or dysplasia. The operative time ranged from 35 to 240 minutes.

Conclusions
Pediatric laparoscopic urology is safe, effective with minimal complications. Less hospitalization, less narcotics and analgesics, early return to full activity with excellent cosmetic results. It should be practiced in pediatric surgical units under the supervision of expert pediatric urologist.

URO 14
A single surgeon’s experience of 60 cases of penoplasty for buried penis, with special reference to mid- to long-term follow-up.

Authors
Hiroshi Murakami; Yuta Yazaki; Manabu Okawada; Takashi Doi; Go Miyano; Hiroyuki Koga; Geoffrey J Lane; Atsuyuki Yamataka, Department of Pediatric General and Urogenital Surgery Juntendo University School of Medicine

Background/Purpose
There are few reports about postoperative outcome of penoplasty (PP) for buried penis (BP). Here we summarize our mid- to long-term follow-up results.

Methods
Data from 60 PP cases performed by a single surgeon from 1997-2014 were collected prospectively. All cases were treated completely and the fistula closed using 7/0 absorbable interrupted sutures. Pedicled external spermatic fascia, or pedicled pericord/scrotal adipose tissue is then mobilized to cover the repair site through a subcutaneous tunnel and the skin closed.

Results
Repair was successful in all cases. Penile cosmesis was acceptable to good without any testicular complications or scrotal deformity. At mean follow-up of 79 years (range: 0.5 to 16.8) there have been no recurrences.

Conclusions
Our technique allows UF to be repaired simply and efficiently and can also be used in recurrent cases.
using a modification of the technique introduced by Cuckow et al, which is simple and easy to perform.

**Results**
Mean age at PP was 6.31 years (range: 0.4-15.2). All cases were diagnosed as infants but some 15 cases (25.0%) had PP when 10 or more years old, indicating that BP does not resolve with growth. There were no intra- and post-operative complications. Mean duration of follow-up was 3.8 years (range: 0.3-17.1). Duration of follow-up was 4 years or less in 41 (68.3%), 5-9 years in 15 (25.0%), and 10 or more years in 4 (6.7%). Post-operative penile cosmesis was good in all cases without scrotal deformity, however, the treating surgeon recommended excision of redundant penile skin in 2/60 (3.3%) cases even though the parents were unconcerned.

**Conclusions**
Although diagnosed as infants, treatment appears to be postponed even though BP does not resolve with growth. Mid- to long-term follow-up of our PP cases shows that outcome is cosmetically acceptable and stable.
**Poster Session I**  
**BASIC SCIENCE**

### 1-12 POSTER  
**Aluminum content of parenteral nutrition causes downregulation of Mrp2**

**Authors** Abdulla Aleem M, Jane Alcorn, Gerd Zello, Grant G. Miller, University of Saskatchewan

**Background/Purpose** Intestinal failure associated liver disease (IFALD) is a major cause of morbidity for children with short bowel syndrome. Aluminum is a toxin of parenteral nutrition (PN) and we sought to determine if it contributed to IFALD. Our objective was to determine if aluminum caused a downregulation in the production of bile acid transport proteins and a corresponding rise in serum bile acids.

**Methods** 11 newborn Yucatan piglets were administered PN for 14 days. Control Group (N=6) received standard PN (mean aluminum content = 388 µg/kg/day). Study Group (N=5) received PN substituted with ultrapure calcium gluconate (mean aluminum content = 68 µg/kg/day). Serum bile acids were measured at 7 and 14 days. Liver tissue obtained at study end was evaluated for the expression of multidrug resistance protein 2 (Mrp2) mRNA using real time polymerase chain reaction (RT-PCR).

**Results** The serum bile acid levels at 7 and 14 days were slightly higher in the control group but the difference did not reach statistical significance. There was a significant inverse correlation between the amount of aluminum exposure and the expression of Mrp2 mRNA.

**Conclusions** Aluminum caused a downregulation in the production of bile acid transporter protein, Mrp2 but without a corresponding rise.

### 2-POSTER  
**Sustained Viability of Human Mesenchymal Stem Cells in 3D Culture within an FDA-Approved Type-I Collagen Gel**

**Authors** Beatrice Dionigi, MD; Azra Ahmed, BS; David Zurakowski, PhD, Dario O Fauza, MD, PhD, Boston Children’s Hospital, Department of Surgery

**Background/Purpose** We sought to examine mesenchymal stem cell (MSC) viability within a collagen-based gel approved for (acellular) clinical use in the United States, as a pre-requisite to translational developments.

**Methods** Human MSC lineages derived from bone marrow (bmMSCs) and amniotic fluid (afMSCs) were seeded at densities of 100,000; 250,000; and 500,000 cells/mL in a pharmaceutically-formulated 2.6% fibrillar Type-I bovine collagen gel, under comparable conditions. Cell viability was quantified at 1, 3, and 5 days by 3D bioluminescence. Statistical analysis was by multivariate mixed model ANOVA (P<0.05).

**Results** Cell viability was documented at all time-points and densities (figure). There was a highly significant 3-way interaction (P<0.001) between density, time, and MSC source as determinants of viability, though these factors were not independent. Time in 3D culture impacted/decreased cell viability only at higher seeding densities, with no differences at 100,000 cells/mL for bmMSC (P=0.89) and afMSC (P=0.50).

**Conclusions** Mesenchymal stem cells from different sources remain viable in 3D culture for up to five days within a clinically suitable collagen-based gel. Cell viability is not optimized by high seeding densities. This easily accessible gel-cell combination is amenable to regulatory approval, potentially facilitating the translation of different forms of mesenchymal stem cell-based therapies.

### 3-POSTER  
**Speech Improves After Frenuloplasty In Children With Ankyloglossia**

**Authors** Yasuo Ito, Division of Pediatric Surgery, International University of Health and Welfare Atami Hospital; Toshimitsu Shimizu, Tomomi Nakamura, Chie Takatama, Division of Speech Therapy, International University of Health and Welfare Atami Hospital

**Background/Purpose** To determine the effect of speech articulation disorder in children with ankyloglossia.

**Methods** We conducted an articulation test on 5 children with speech problems who underwent frenuloplasty. The test consists of 50 pictures of common Japanese words. The patients were asked to pronounce what the picture card showed. Misarticulations of substitution, omission, and distortion were assessed pre- and postoperatively.

**Results** Patients primarily had misarticulations of the “s”, “t”, “d”, and “r” consonants. Nineteen substitutions, which were observed operatively, decreased to 8 in 4 patients at 3-4 months; however, they increased to 11 in 3 patients at 1-2 years postoperatively. Six distortions, which were observed preoperatively, decreased to 4 in 3 patients at 3-4 months, and finally decreased to 1 in 1 patient at 1-2 years postoperatively. Twenty distortions, which were observed in 4 patients preoperatively, decreased to 8 in 4 patients at 3-4 months; however, they increased to 11 in 3 patients at 1-2 years postoperatively.

**Conclusions** Substitution and omission improved relatively early after frenuloplasty; furthermore, they progressed into distortion, which is a less-impaired form of articulation distortion. Thus, distortion did not significantly decrease in number and tended to remain as speaking habit.

### 4-POSTER  
**Effects of arginine, ornithine, and citrulline ingestion on immune function in massive bowel resected rats with bowel segment reversal and oral antibiotics**

**Authors** Tsai-yi Tseng, Chien-Hsing Lee, Fu-Huan Huang, Ching-Yi Hung, Department of Pediatric Surgery, Changhua Christian Hospital; Hui-Chen Lo, Department of Nutritional Science, Fu-Jen Catholic University

**Background/Purpose** Our previous study demonstrated that oral arginine may significantly increase serum albumin and decrease plasma interleukin (IL)-6 in massive bowel resected rats with bowel segment reversal and oral antibiotics. Herein, we further investigated the effects of arginine-associated amino acids on immune function.

**Methods** Male Wistar rats were sacrificed by using 70% small bowel resection with or without 3-cm bowel segment reversal and oral antibiotics. Rats with bowel segment reversal were supplemented with arginine, ornithine, citrulline, or placebo for 3 weeks.

**Results** Our results showed that arginine, ornithine, and citrulline significantly attenuated the decreases in helper-T leukocytes and splenic macrophages and the alterations in spontaneous and Con A- and LPS-stimulated IL-6 productions in peripheral blood leukocytes (PBL). In addition, arginine, not citrulline or ornithine significantly increased phagocytotic activities and...
Results
A total of 323 differential proteins were identified which different multiple more than 1.5 times. In these proteins, to compared

Methods
To identify and quantify the total proteins in liver tissue of patients with Biliary atresia by isobaric tags for relative and absolute

Background/Purpose
Zhang Zheng,

Conclusions
In summary, arginine may be more effective than citrulline and ornithine in restoring immune function in massive bowel resected rats with small bowel segment reversal and oral antibiotics.

5-POSTER
The therapeutic effect and related mechanisms of AZD8055 treatment in neuroblastoma cells

Authors
Ya-Hui Tsai; Yun Chen, Department of Surgery, Far Eastern Memorial Hospital, Pan-Chiao, New Taipei City, Taiwan

Background/Purpose
Neuroblastoma is the most common extracranial solid malignant tumor in children. Mammalian target of rapamycin (mTOR) is a serine/threonine kinase, belonging to phosphatidylinositol 3-kinase (PI3K) superfamily. mTOR plays a central role in cell proliferation. AZD8055, a newly discovered mTOR inhibitor, has been found to result in significant antitumor effects on various cancer types. However, the effects of AZD8055 on neuroblastoma cells are still unknown.

Methods
Two human neuroblastoma cell lines SH-SYSY and BE(2)-M17, were used in this study. MTT assay and western blotting were used to analyze the cell viability and apoptosis pathway after AZD8055 treatment. Real-time PCR was used to quantify the mRNA.

Results
AZD8055 had dose-dependent cytotoxicity effects on both neuroblastoma cells. Treatment of AZD8055 induced the protein levels of phosphorylated-p53 and Bax, and decrease of Bcl-2. In addition, AZD8055 had a strong inhibitory effect on the level of miRNA-19a with only 39.8% expression compared with control cells. In consistent, PTEN, which is known targeted by miR-19a, showed correspondent increase after AZD8055 treatment with a dose-dependent trend.

Conclusions
In addition to mTOR inhibition, Induction PTEN is a novel anti-tumor mechanism of AZD8055. The dual inhibition on PI3K/ mTOR pathway potentiates AZD8055 a better choice for neuroblastoma treatment than conventional mTOR inhibitor.

6-POSTER
The upregulation of RECK after Valproic acid treatment can induce ER stress response and increase Cisplatin cytotoxicity in human neuroblastoma cells

Authors
Hsin-Yen,Pan, Far Eastern Memorial Hospital

Background/Purpose
Neuroblastoma is a common malignancy of children with poor prognosis it often recurs and show drug resistance. Thus, developing an effective treatment for neuroblastoma is mandatory. Our previous study has revealed that in human neuroblastoma cells over-expressing RECK, the cytotoxicity of cisplatin is significantly enhanced by increasing endoplasmic reticulum (ER) stress response. Our preliminary data revealed Valproic acid (VPA) increased the RECK expression in BE(2)-M17 neuroblastoma cells. In this study, we investigated the effect of combination therapy with VPA and cisplatin.

Methods
Two human neuroblastoma cell lines SH-SY5Y and BE-2 were used. The cytotoxicity of VPA or cisplatin were checked in various combination with MTT-based colorimetric assay. RECK expression after VPA treatment was investigated by western blot analysis.

Results
We found VPA treatment can increase RECK expression in neuroblastoma cell lines. The combination of VPA and cisplatin had stronger cytotoxicity through increase ER stress response and cell apoptosis in neuroblastoma cells.

Conclusions
This is the first report that VPA does increase RECK upregulation in neuroblastoma cells and thus enhance cytotoxicity of the chemotherapy drugs. The combination of VPA and cisplatin in this study has a synergistic effect and induce more cell apoptosis, which indicated the possible benefit of the combination therapy in clinical practice.

7-POSTER
The role of CPEB4 in the tumorigenesis of neuroblastomas

Authors
Yun Chen; Ya-Hui Tsai, Department of Surgery, Far Eastern Memorial Hospital, New Taipei, Taiwan

Background/Purpose
Neuroblastoma is the most common extracranial solid malignant tumor in children. The cytoplasmic polyadenylation element binding proteins (CPEBs) are the key factors that control the elongation of poly(A) tail during translation. CPEB4 has been correlated with tumor malignancy in glioblastoma, and ectopic expression of CPEB4 increased tumor growth and vascularization. However, the role of CPEB4 in neuroblastomas is unclear.

Methods
We examined the expression of endogenous CPEB4 in human SH-SY5Y and BE(2)-M17 neuroblastoma cells. Then the synthesized shRNA targeting CPEB4 mRNA was transfected into the cells to knockdown the expression of CPEB4. The effect of CPEB4 knockdown on the cell growth, cell viability, and cell migration were analyzed.

Results
High expression levels of CPEB4 were on both cell lines. Knockdown of CPEB4 resulted in a moderate decrease of cell viability with 69.7% in SH-SY5Y and 75.2% in BE(2)-M17 compared with control cells. Also, the migration of CPEB4-knockdowned cells was lower with 53.9% in SH-SY5Y and 70.2% in BE(2)-M17 compared with control cells. When further investigating the molecular impacts of CPEB4 knockdown, CPEB1, known as a tumor suppressor CPEB, was significantly increased in a dose-dependent manner.

Conclusions
CPEB4 function as a positive regulator for tumorigenesis in neuroblastoma cells.

8-POSTER
Identification and quantitative analysis of hepatic protein and its relationship to prognosis in biliary atresia patients by quantitative proteomic technology

Authors
Zhang Zheng, Capital Institute Of Pediatrics

Background/Purpose
To identify and quantify the total proteins in liver tissue of patients with Biliary atresia by isobaric tags for relative and absolute quantification (iTRAQ) technology, and find out the relationships between the significant protein and prognosis of biliary atresia?

Methods
According to the serum total bilirubin level and native liver survival time (? 2 years or <1 year), patients were divided into two groups, good prognosis group and poor prognosis group. This method was used to collect Liver tissues from patients with BA in the Kasai operation. During the process of studying these two groups, iTRAQ technique was used to identify and quantitate the expressive of differential proteins. Then the differential proteins can be classified by Panther classification system.

Results
A total of 323 differential proteins were identified which different multiple more than 1.5 times. In these proteins, compared with poor prognosis group, 131 proteins were up-regulated and 192 proteins were down-regulated in good prognosis group.
9-POSTER  The expression of myeloid-derived suppressor cells in biliary atresia and their relationship with Th1/Th2 balance
Authors  GUAN Xii, Guangzhou Women and Children’s Medical Center

Background/Purpose  Biliary atresia (BA) is the most common cause of obstructive jaundice in neonates with the characters of poor treatment effect, poor prognosis and high mortality, however, its pathogenesis is still not clear so far. Our previous studies suggest that BA is associated with virus infection and Th1/Th2 balance. Our purpose is to evaluate the expression of MDSCs and to analyze the relationship between MDSCs and Th1/Th2 balance in biliary atresia.

Methods  We have collected peripheral blood from BA (n=23), CC (n=25) and NH (n=11), and detected the expression of CD33+CD11b+HLA-DR-cells from peripheral blood samples by flow cytometry. At the same time, we collected liver tissues from BA patients, analyzed the expression of MDSC in liver tissues by IHC.

Results  The frequency of CD33+CD11b+HLA-DR-cells in peripheral blood from BA patients was significantly increased in comparison with CC patients.

Conclusions  CD33+CD11b+HLA-DR-cells was significantly increased in blood samples of BA and NH patients. The increase of MDSC was correlated with liver fibrosis.

10-POSTER  Reliability and validity of the Korean version of the impact of Event Scale Revised_Psychiatry
Authors  Kyuvwhan Jung, Seoul National University Bundang Hospital

Background/Purpose  The modified Yale Preoperative Anxiety Scale (mYPAS) was developed for evaluating the level of preoperative anxiety in children. The purpose of this study was to develop a Korean version of the mYPAS (K-mYPAS) and to establish its validity and reliability based on the Korean preoperative pediatric patients.

Methods  K-mYPAS was made through stringent back-translation procedure. Total enrolled 102 patients answered questionnaires of Korean version of STAIC (K-STAIC), and were videotaped for 2 to 5 min before induction of anesthesia. Three observers of experienced psychiatrist, surgeon and nurse analyzed videotape with K-mYPAS comparing to K-STAIC. The inter- and intra-observers reliability, concurrent and construct validity, sensitivity, specificity and predictive value were analyzed.

Results  The value of Cronbach ? for inter-observers reliability was 0.939 and intra-observer reliability was statistically significant (p<0.001). Concurrent and construct validity were also statistically significant (p<0.001 and p<0.001, respectively). Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were 81.3%, 91.4%, 81.3%, 91.4% and 88.2%, respectively.

Conclusions  The K-mYPAS had good psychometric properties and can be used as a reliable and valid instrument for the assessment of preoperative anxiety in children.

11-POSTER  Usefulness of central venous access ports in babies and infants
Authors  Koichi Ohno, Tetsuro Nakamura, Tatsuo Nakaoka; Yuichi Takama; Atsushi Higashio; Kenji Santo

Background/Purpose  We compared the usefulness of central venous access ports (CVAPs) in babies and infants with that in children.

Methods  Patients that a CVAP was implanted divided into 2 groups: 25 patients aged less than 1 year or weighing less than 10 kg, and 91 patients aged more than 1 year and weighing more than 10 kg. Clinical results were compared between the 2 groups.

Results  The age and weight were 13±6 months and 8.2±1.2 kg in the former group, and 76±55 months and 19.8±11.0 kg in the latter group. The operative times were 57±30 min and 52±21 min in the 2 groups (p=0.35). CVAPs were introduced with difficulty in 5 and 9 patients (p=0.18); surgical complications occurred in 1 and 7 patients (p=1.00), respectively. The periods that CVAPs remained in place were 627±494 days and 553±416 days (p=0.49); CVAPs were removed before treatment completion because of complications in 5 and 14 (p=0.53), respectively.

Conclusions  In babies and infants, the introduction and maintenance of CVAP were assumed to be extremely difficult. However, in this study, the clinical results of CVAPs in babies and small infants did not differ from those in children.

12-POSTER  Reduce, reuse, recycle: A technique for reutilizing catheter insertion sites in children with difficult central venous access
Authors  Gwendolyn M Garnett, Department of Surgery, University of Hawaii; John A. Burns School of Medicine; Russell K Woo; Devin P Puapong; Sidney M Johnson, Department of Pediatric Surgery, Kapi'olani Medical Center

Background/Purpose  Maintenance of central venous access (CVA) in patients requiring long-term parental nutrition requires forethought and ingenuity. We describe a technique for maintaining chronic CVA sites.

Methods  A retrospective review at a single institution using a novel technique for preserving CVA between August 2012 and January 2014 was performed. When an existing tunneled central line failed, a surgical “cut-down” was made to the catheter. The fibrous sheath around the catheter was isolated, controlled, and used for new catheter and/or wire placement after the old catheter was removed. The external end of the new catheter was tunneled out to a new exit location effectively reusing the same CVA point while allowing sterile separation of the old and new catheters.

Results  Eleven attempts were made in four patients. All patients had chronic conditions leading to difficult long-term CVA. Indications for catheter replacement included catheter occlusion/mechanical failure (7), dislodgment (3), infection (1). The technique was successful in nine of eleven attempts in three of the four patients. The technique failed when the catheter had pulled out of the central venous system.

Conclusions  We describe a new technique for salvaging CVA sites. This technique is well suited for patients with difficult long-term CVA needs such as intestinal failure.
GASTROINTESTINAL

13-PAPER
Are post-operative antibiotics indicated in simple appendicitis? A randomised control trial.

Authors
Dr. Nicole Mennie, Monash University; Mr. Peter Ferguson, Monash Children’s Hospital; Prof. Wei Cheng, Monash University

Background/Purpose
Prophylactic antibiotics play an important role in preventing surgical site infections post-appendicectomy for simple appendicitis. However the optimum duration of antibiotics in a paediatric population is yet to be established. We aim to determine if a single-dose is as effective as 24 hours of antibiotics in preventing surgical site infections in children undergoing appendicectomy for simple appendicitis.

Methods
We conducted a double-blinded, randomised control trial, recruiting 80 children undergoing appendicectomy for simple appendicitis. All participants received a dose of antibiotics at the time of operation. Children were then randomised to receive two post-operative doses of antibiotics or a placebo. We assessed the presence of surgical site infection at 2 and 6 weeks after discharge.

Results
The wound infection rate was reduced in those that received three doses of antibiotics (0% vs. 7.9%, p=0.103), although this did not reach statistical significance. The use of single-port technique did not influence infection rates compared to the traditional 3 port technique (8.3% vs. 4.5% respectively, p=0.495). Administration of post-operative antibiotics did not significantly delay discharge with only 25% meeting discharge criteria before the course was completed.

Conclusions
Administering 24 hours of antibiotics peri-operatively may reduce the incidence of wound infections in a paediatric population, in serum bile acid levels.

14-PAPER
Nutritional status, Pancreatic function, GI function and Long-term QOL in children after Pancreaticoduodenectomy.

Authors
Hwun-Ham Park; Hyun-Young Kim, Department of Pediatric Surgery, Seoul National University Children’s Hospital, Seoul, Korea

Background/Purpose
Pylorus-preserving-pancreatoduodenectomy (PPPD) is performed extremely rare in children. Until now, only few studies have reported about postoperative status of children who underwent PPPD. The purpose of this study was to analyze growth, nutritional status, pancreatic function, GI function and quality of life (QOL) in children who underwent PPPD.

Methods
Between 1992 and 2013, there were 12 children who had undergone PPPD at Seoul National University Children’s Hospital, and 8 of them, in age 1m~13yrs, participated. Growth, nutritional status were estimated by RBW (Relative Body Weight), BMI, serum protein, albumin levels. Endocrine and exocrine functions of the pancreas were estimated by evaluating post-operative diagnosis of diabetes mellitus (DM) and steatorrhea, serum amylase, lipase levels. GI function and QOL was measured by using questionnaires.

Results
There were no severe growth disturbances compared to the pre-operative body index. Serum protein, albumin levels were within normal range. Four patients had experienced mild steatorrhea. There were no significant abnormal findings in serum amylase, lipase levels. One patient who had post-operative chronic pancreatitis, DM showed relative low GI function and QOL.

Conclusions
Almost patients who had undergone PPPD in their childhood don’t have significant problem in growth, nutritional status, long-term GI Function and QOL. This shows that PPPD is tolerable even in children.

15-PAPER
Comparative Analysis Of The Laparotomy And Laparoscopy In Treatment Of Duodenal Atresia

Authors
Yury Kozlov MD; Vladimir Novozhilov MD, Department of Neonatal Surgery, Municipal Pediatric Hospital, Irkutsk, Russia; Department of Pediatric Surgery, Seoul National University Children’s Hospital, Seoul, Korea

Background/Purpose
We reported the results of the comparison of the treatment of congenital duodenal obstruction in neonates through laparotomy and laparoscopy.

Methods
Between January 2002 and December 2012, we have performed 63 operation of correction of congenital duodenal obstruction. In study reported the data of neonates who underwent standard circumumbilical or right transverse laparotomy (50 patients â€’ Group I) and laparoscopic surgery for duodenal atresia repair (13 patients â€’ Group II).

Results
The groups were similar in terms of demographics and preoperative parameters. There was significant difference in mean operative time between open and laparoscopic procedure (75.70 min vs 65.77 min; p<0.05). Patients feed earlier after minimally invasive approach (3,62 d vs 2,46 d; p<0.05) and had shorter time of full enteral feeding (10,66 d vs 6,38 d; p<0.05). Duration of hospital stay were significantly shorter in the Group II (17,56 d vs 12,08 d; p<0.05). Rates of early complications were equivalent between groups (6% vs 7,7%; p>0.05). Rate of long-term complications was dominated in the laparotomy group (14% vs 7,7%).

Conclusions
This study demonstrated that the laparoscopic reconstruction of duodenal atresia gives better postoperative results as open approach and can be used for treatment wide spectrum of duodenal obstruction in pediatric patients.

16-PAPER
Safety and Efficacy of Selective Sac Extraction Method of Inguinal Hernia Repair in Children: Results of a Prospective Study

Authors
Makoto Suzuki, Dokkyo Medical University Koshigaya Hospital; Masahiro Hatanaka, Junko Fujino; Akihiro Igarashi; Mariko Hasegawa; Kazunori Tahara, Yuki Ishimaru; Hitoshi Ikeda, University Koshigaya Hospital

Background/Purpose
A prospective study was conducted to confirm the safety and efficacy of the selective sac extraction method (SSEM) of inguinal hernia repairs in children.

Methods
Primary endpoints of the study were the incidence of any complication related to the SSEM, or hernia recurrence. Secondary endpoints included the success rate of the SSEM, length of incision at the end of operation, and duration of operation.

Results
Between October 2009 and December 2011, a total of 317 repairs were performed by applying the SSEM. There were three operative conversions, and the success rate of the SSEM was 99%. The incisional length for male repairs ranged from 4.0 to 12.5 mm (median, 6.0 mm) and was > 7.0 mm in 86% repairs, while it ranged from 4.0 to 9.0 mm (median, 5.5 mm) in female repairs and was > 6.5 mm in 96% repairs. The duration of the operation for unilateral repair ranged from 9 to 66 minutes (median, 21 minutes). There was one recurrence and two cases of testicular dislocation.

Conclusions
The complication and recurrence rates of the SSEM were low and acceptable. The SSEM is safe and effective, and should be a standard method to repair inguinal hernia in children.
Successful treatment using endoscopic nasopancreatic drainage for recurrent pancreatitis with pancreatic calculus in a 14-year-old girl.

Yosuke Aida, Chieko Hisamatsu, Division of Pediatric Surgery, Kobe University Graduate School of Medicine, Kobe, Japan; Yoshifumi Arisaka, Mamoru Takenaka; Hiromu Kutsumi, Takeshi Azuma, Division of Gastroenterology, Kobe University Graduate School of Medicine, Kobe, Japan; Eiji Nishijima, Division of Pediatric Surgery, Kobe University Graduate School of Medicine, Kobe, Japan; Kosaku Maeda, Department of Pediatric Surgery, Jichi Medical University, Tochigi, Japan.

Background/Purpose Treatment for chronic calcific pancreatitis (CCP) consists of pancreatic duct drainage and the removal of pancreatic stones (PS). Endoscopic treatment and extracorporeal shock wave lithotripsy (ESWL) are accepted worldwide as alternatives to surgery in patients with CCP. However, a few reports have described the successful treatment of CCP using endoscopic nasopancreatic drainage (ENPD). Here, we describe a case of CCP and performed ENPD, endoscopic sphincterotomy (EST), and ESWL as minimally invasive treatment.

Methods The following procedures were used: Endoscopic retrograde pancreatography (ERP), ENPD through the minor duodenal papilla, EST to excite the PS, ESWL to crumble the PS, and removal of ENPD under fluoroscopy.

Results A 14-year-old girl, who had had pancreatobiliary maljunction and undergone diversion operation, developed CCP after surgery. ERP showed a filling defect located near Vater’s papilla indicating PS and dilatation of the peripheral pancreatic duct. The PS was crumbled and removed.

Conclusions The combination of ENPD, EST and ESWL is effective and less invasive, even in children, to treat CCP caused by pancreatic calculus.

An investigation into contralateral patent processus vaginalis in female children suffering from inguinal hernia.

Hiroaki Tanaka; Takahiro Asakawa; Tomomitsu Tsuru, St. Mary’s Hospital Department of Pediatric Surgery; Minoru Yagi, Department of Pediatric Surgery, Kurume University School of Medicine

Background/Purpose The greatest advantage of Laparoscopic percutaneous extraperitoneal closure (LPEC) is that the presence of contralateral patent processus vaginalis (PPV) may be checked during surgery.

Methods The subjects were 60 female children that underwent LPEC in our hospital from January to December 2013. An investigation was carried out regarding the presence of PPV, further, from among contralateral PPV cases, classified as closed type, reduced type, and veil type.

Results The 49 cases preoperatively diagnosed on one side, 25 cases (51%) were observed with contralateral PPV. From among these, there were 9 closed types, 2 reduced types, and 14 veil types. No complications or relapse were observed following surgery regarding all cases.

Conclusions The presence of contralateral PPV may be checked during surgery. From among contralateral PPV cases, classified as closed type, reduced type, and veil type, no complications or relapse were observed following surgery regarding all cases.

Subcutaneous Hourglass Stitch For Laparoscopic Gastrostomy Prevents Stitch Abscess Formation

Sunghoon Kim, Jillian McCagg, Children’s Hospital & Research Center Oakland; Sarah Markham, UCSF-East Bay; Olajire Idowu, Christopher Newton, Children’s Hospital & Research Center Oakland; Barnard Palmer, UCSF-East Bay

Background/Purpose Use of subcutaneous stay-sutures to minimize complications of laparoscopic gastrostomy has been reported. Previously described methods place the stay-suture knots in the subcutaneous space which is prone to stitch abscess formation. We developed a modified technique whereby the stay-suture knots are positioned within the gastrostomy tract instead of the subcutaneous space. This is accomplished by tunneling the two opposing subcutaneous sutures toward the gastrostomy tract and tying the contra lateral opposing sutures within the gastrostomy tract. The shape of the subcutaneous sutures resembles an hourglass pattern after completion.

Methods Chart reviews of fifteen patients who underwent the modified hourglass stitch methods were done. Complications were identified in particular stitch abscess formation.

Results No stitch abscess formation was found in any patients. One patient developed cellulitis around the gastrostomy site which cleared with antibiotic. Other known complications of standard laparoscopic gastrostomy were not found for any patients.

Conclusions Subcutaneous placement of stay-sutures in an hourglass pattern minimizes knot abscess formation.

Single-incision thoracoscopic resection for pediatric mediastinal neurogenic tumor using conventional instruments in children

Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

Background/Purpose To review the experience on the single-incision thoracoscopic resection of mediastinal neurogenic tumors using conventional instruments in children.

Methods 5 children with mediastinal tumors treated by single-incision with thoracoscopic resection using conventional instruments between July 2010 and October 2013. Medical charts were reviewed for collection of data on histological type of tumor, clinical manifestations, tumor size, duration of thoracic drainage, surgical complications, tumor recurrence, and mortality.

Results 3 males and 2 females were studied. Median age was 22 months (range, 18.5-85 months), 3 children had ganglioneuroma, 1 child had ganglioneuroblastoma and the other 1 had neuroblastoma. The median time of the operation was 75 minutes (range, 45-120minutes) with complete thoracoscopic resection in all cases and no conversion to 3 ports or opening. No children developed Horner syndrome but 1 got chylothorax postoperatively. The duration of thoracic drainage was 7.5 days (range, 3.5-21.5 days), No deaths were reported, and no recurrence was noted during a median follow-up period of 21 months (range, 3-40 months).
Conclusions
Based on our experience, single-incision thoracoscopic resection for pediatric mediastinal neurogenic tumor using conventional instruments could be completed successfully. More data are needed to fully assess. The major advantages of this approach are cosmetic improvement and minimal scars.

21-POSTER
Single port laparoscopy assisted small intestine resection in pediatric patients

Authors
Soo-Hong Kim; Hae Young Kim; Yong Hun Cho, Pusan National University Children’s Hospital

Background/Purpose
Most of cases performing small bowel resection in conventional multi-port laparoscopic operation, another open incision or large caliber trochars are needed. For pediatric patients, another small incision or large caliber trochars are left relatively large scar. Single port laparoscopy assisted small intestine resection(SLSR) can be performed only through about 3cm sized umbilical large port. The aims of this study, through a retrospective clinical analysis, were to prove the efficacy and safety of SLSR for children.

Methods
15 SLSR were performed in pediatric patients from 2011 to 2014. Demographics, diagnosis, operative and postoperative outcomes were reviewed.

Results
The mean age of operation was 113 months, and weight was 29kg. 6 Meckel’s diverticulum, 6 intussusception due to small bowel mass, one cecal duplication, one Crohn’s disease and one jejunal web patient were included. 12 patients were performed single segmental resection of small bowel, and 2 were performed ileocecectomy. One patients with jejunal web was performed small bowel resection with tapering enteroplasty. Mean operation time of segmental resection was 112 minutes, and ileocecectomy was 142 minutes. 2 patients encountered postoperative ileus and treated with conservative care.

Conclusions
SLSR makes safe and effective surgical outcomes with good cosmetic results through only small umbilical scars in pediatric patients.

22-POSTER
Laparoscopic appendicectomy: Single institution experience with 916 patients

Authors
Barco Jason, KK Women’s and Children’s Hospital, Singapore

Background/Purpose
To evaluate our experience in laparoscopic appendicectomy over the last few years, its clinical outcome and to analyse risk factors for open conversion and post operative complications.

Methods
Between August 2007 to December 2011 (53 months), clinical records of all patients who underwent appendicectomy were retrieved from our operating theatre database.

Results
923 patients were identified, 7 were excluded as they had initial laparotomy. Out of 916 patients, 579(63.20%) had simple while 337(36.80%) had complicated appendicitis. 31(3.38%) were converted to open, of which 29 were perforated. 10(1%) had interval laparoscopic appendicectomy. 60(6.5%) had negative appendicectomy. 30(5.45%) developed post operative complications of which 45(13.35%) had perforated appendicities. 13(1.42%) re-operated.

Conclusions
Laparoscopic appendicectomy is well accepted and it can be offered in both simple and complicated appendicities. Even for complicated cases, the risk of post operative complication is low.

23-POSTER
Novel Technique for Removal of a Chronically Retained Esophageal Foreign Body

Authors
Nicholas Hamilton; Kenneth Azarow; Carol MacArthur; Margo Hendrickson, Division of Pediatric Surgery, Oregon Health Science University

Background/Purpose
Endoscopy is the standard of care for retrieval of esophageal foreign bodies. However, in some cases of retained foreign bodies, it is not possible without an esophagotomy, a potentially morbid procedure. We present the case of a two-year old male patient with a chronically impacted esophageal foreign body (coin) not technically retrievable by upper endoscopy who had successful removal with flexible, retrograde, transgastric esophagoscopy.

Methods
The patient was taken to the operating room for a laparoscopic gastrostomy. Through the gastrostomy, a flexible neonatal endoscope was passed retrograde into the esophagus and the foreign body was removed and left in the stomach to pass on its own. A gastrostomy button was placed. Bronchoscopy revealed no tracheoesophageal injury or fistula.

Results
The child was not allowed oral intake and gastric feeds were started on postoperatively revealed a contained, healing esophageal injury without perforation. Gastrostomy tube feeds were continued until the esophageal injury healed, avoiding an esphagotomy.

Conclusions
Retrograde endoscopic retrieval of chronically impacted esophageal foreign bodies is a novel technique that may spare some patients the morbidity of an esphagotomy.

24-POSTER
A rare case of total absence of small bowel associated with antenatally diagnosed proximal jejunal atresia

Authors
Peter Michail, School of Medicine and Public Health, University of Newcastle, Newcastle; Rajendra Kumar, John Hunter Hospital, Newcastle; Nandini Singh, School of Medicine and Public Health, University of Newcastle, Newcastle

Background/Purpose
Introduction: Reported here is an extremely rare and unique case of congenital absence of small intestine. To our knowledge, the complete absence of small bowel without gastroschisis and malrotation has only ever been reported once. This is the first time that such a case has been diagnosed prenatally.

Methods
Case Description: A 2.6kg male baby with antenatal diagnosis of jejunal atresia was admitted to our tertiary level neonatal intensive care unit. Routine 20 week antenatal scan was normal however at 36 weeks marked dilatation of the proximal small bowel was noted. Radiological investigation at birth confirmed the antenatal diagnosis of proximal jejunal atresia with presence of rectum, descending and mid-transverse colon. Findings at laparotomy demonstrated proximal jejunal atresia, and the complete absence of small bowel, cecum and appendix, ascending and transverse colon. Unfortunately the complete absence of small bowel was incompatible with life, and the child was referred for paediatric palliation.

Results
- The reported case of congenital total absence of small intestine is a unique condition, and is one of two known cases in the literature. A phenomenon most likely due to a vascular accident in the territory of the superior mesenteric artery with infarction and subsequent autolysis of the bowel.
**25-POSTER**

**Exomphalos with Congenital Pouch Colon: Challenges in the Diagnosis and Treatment**

**Authors**
Peter Michail, School of Medicine and Public Health, University of Newcastle, Newcastle; Aniruddh V Deshpande; Rajendra Kumar, John Hunter Children’s Hospital, Newcastle; Nandini Singh, School of Medicine and Public Health, University of Newcastle, Newcastle

**Background/Purpose**
Congenital pouch colon (CPC) is a rare regional variant of anorectal malformation (ARM) characterised by a foreshortened colon. When associated with exomphalos minor, it poses unique diagnostic challenges.

**Methods**
From 2005 to 2012, medical records of 11 patients undergoing resection of the first branchial fistula from the department of pediatric surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University and Children’s Hospital of Fudan University were collected. The facial nerve was routinely dissected and protected in all the 11 cases with the first branchial fistula. Main facial nerve was dissected then retrograde to main facial nerve. In the other 4 cases with previous surgical history, marginal branch of facial nerve was dissected then retrograde to main facial nerve.

**Results**
No recurrence was found in all 11 cases with a following-up period from 9 months to 60 months. Slight facial nerve paralysis was met in 2 cases and completely recovered within 1 month after operation by steroid therapy.

**Conclusions**
Although rare outside the Indian subcontinent, paediatric surgeons need to be aware of congenital pouch colon. Inadequate attention to the plain abdominal x-ray and colonic anatomy during neonatal laparotomy can result in missed diagnosis of CPC in cases with suspected high ARM. Treatment of pouch colon should be guided by the colonic anatomy and associated anomalies.

---

**26-POSTER**

**A study of intestinal perforation in infants: The changes in the causative diseases and prognosis over the last decade**

**Authors**
Yusuke OHashi; Tomokazu Nakagami; Ai Tayama; Rie Suganuma; Shinya Kawano; Komei Suzuki; Yu Watarai; Akira Toki, Division of Pediatric Surgery, Department of Surgery, Showa University School of Medicine

**Background/Purpose**
We reviewed the changes in the causative diseases and the prognosis of intestinal perforation in infants treated at our institution during the last ten years.

**Methods**
The clinical records of 30 infants with surgical intestinal perforation managed from 2004 to 2013 were reviewed. We divided the patient into two groups (Group A: the earlier period group (2004-2008) and Group B: the latter period group (2009-2013)). The characteristics of the patients, the incidence of perforation, the causative diseases, and mortality were compared between the two groups.

**Results**
There were no significant differences in the median gestational ages, birth weights or the incidence of perforation between the two groups. The details of the causative diseases are shown in Table 1. Mortality decreased in Group B in comparison with that in Group A.

**Conclusions**
Necrotizing enterocolitis (NEC) and meconium-related ileus (MRI) were the major causative diseases in Group A. However, the incidence of milk curd obstruction (MCO) increased, while those of NEC and MRI decreased, in Group B. The decreases in NEC and MRI contributed to prognostic improvement. The use of breast milk fortification for infants who had undergone laparotomy or with cholestasis was regarded as the major factors responsible for the increase in MCO.

---

**27-POSTER**

**Analysis of clinical characteristics in patients with VACTERL association**

**Authors**
Hui-Hsin Yang, Division of Pediatric Surgery, Department of Surgery, National Taiwan University Hospital, Taiwan

**Background/Purpose**
To identify the clinical patterns of VACTERL association in our patients.

**Methods**
Patients with two or more features of VACTERL association admitted to National Taiwan University Hospital during 2000 to 2012 were included. Chart review and analysis of clinical characteristics in those patients.

**Results**
66 patients with VACTERL association were enrolled in our study. 32 (48.5%) of them had two VACTERL defects, 25 (37.9%) of them had three VACTERL defects and 9 (13.6%) of them had four or more VACTERL defects. Anal atresia (N=51, 77.2%) and cardiac anomaly (N=41, 62.1%) are the most prevalent components, following by renal anomalies (N=32, 48.4%) and tracheoesophageal fistula with esophageal atresia (N=25, 37.9%). Analyzing the data, we found the VACTERL association with the “cephalic” and “caudal” distribution. The cephalic distribution majorly represented by esophageal atresia with tracheoesophageal fistula, and “caudal” distribution was by anal atresia. Besides, we found the cardiac anomaly was scattered evenly in the distributions.

**Conclusions**
The cephalic and caudal distribution of VACTERL association may suggest as the anomalies develop, they tend to occur at one pole of the fetus. However, the cardiac anomaly was not belonged each distribution, its incidence was almost equal in the two distributions. But bias existed because of incomplete investigation.

---

**28-POSTER**

**The surgical dissection of facial nerve in the resection of the first branchial sinus/fistulae in children**

**Authors**
Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

**Background/Purpose**
To evaluate the significance of dissection of the facial nerve in resection of the first branchial fistula in children.

**Methods**
From 2005 to 2012, medical records of 11 patients undergoing resection of the first branchial fistula from the department of pediatric surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University and Children’s Hospital of Fudan University were collected. The facial nerve was routinely dissected and protected in all the 11 cases with the first branchial fistula. Main facial nerve was dissected in 7 cases without surgical history. In the other 4 cases with previous surgical history, marginal branch of facial nerve was dissected then retrograde to main facial nerve.

**Results**
No recurrence was found in all 11 cases with a following-up period from 9 months to 60 months. Slight facial nerve paralysis was met in 2 cases and completely recovered within 1 month after operation by steroid therapy.

**Conclusions**
The dissection of facial nerve is useful to completely remove the first branchial fistula and protection of the facial nerve and prevention of recurrences.
Conclusions

Abnormal widened sacrum-rectal gap could be a characteristic sign and help in revealing Currarino syndrome early, which is challenging to diagnose. In the presented four patients with Currarino syndrome (CS), the former two cases did not receive early diagnosis and suffered three surgical interventions: Patient A underwent anoplasty because of anocutaneous fistula, Soave’s procedure as secondary megacolon, and repair and closure of colonostomy respectively. Abnormal widened sacrum-rectal gap as characteristic images were found after reviewing the former two cases radiological data. The later two cases were diagnosed with CS early in neonates and received two-stage operations: presacral mass resection plus anoplasty plus colonostomy in first stage and closure in second stage.

Results

No significant difference was observed in postoperative EN introduction day (Post-EN) between the groups. However, the Direct-Bilirubin at Post-EN was significantly higher in Group D (4.95mg/dl vs 1.27mg/dl, p=0.042). The period from surgery to hyperbilirubinemia was significantly shorter (p=0.043) in Group D (6.45 days) than in Group A (36.6 days). Interestingly, the CRP at Post-EN was higher in Group D (1.12mg/dl vs 0.39mg/dl) because of sepsis or enteritis.

Conclusions

The utilization of an adaptive nutritional strategy would be preferable to the early establishment of EN for ELBW patients presenting with IFALD after surgery.

30-POSTER  Rapid Silo Reduction of Gastrochisis: A Modified Silo Technique for Gastrochisis

Authors

Victoria K. Pepper; Karen A. Diefenbach, Nationwide Children’s Hospital

Background/Purpose

We describe a technique that reduces the prolonged time to closure associated with traditional silo placement and avoids the emergent surgery required for primary closure.

Methods

This procedure is reserved for uncomplicated gastrochisis and is performed at bedside. Priority is placed on reduction of the stomach. The remaining viscera are then placed within the silo. An initial attempt at reduction is performed by manipulation of individual bowel loops visualized at the fascial level, in contrast to traditional methods which place pressure at the top of a column of bowel. Respiratory rate, oxygen saturation, capillary refill, and bowel perfusion are monitored and reduction is stopped with compromise of these parameters. Additional attempts at reduction occur throughout the day as frequently as every 2 hours.

Results

We have been able to safely reduce the abdominal viscera within 48 hours in all cases of uncomplicated gastrochisis and within 24 hours for many cases. Closure is performed within 12-24 hours of reduction.

Conclusions

In cases of uncomplicated gastrochisis, this technique of rapid silo reduction by reduction of the bowel near the fascia decreases the time to closure compared to the traditional technique, while avoiding emergent trips to the operating room.

31-POSTER  Retrospective study of Currarino syndrome: abnormal sacrum rectal gap in radiological finding helps for early diagnosis

Authors

Qiu-ming HE, Department of Pediatric Surgery, Guangzhou Women and Children’s Medical Center, Guangzhou, China; Wei-qiang XIAO, Department of Radiology, Guangzhou Women and Children’s Medical Center, Guangzhou, China; Wei ZHONG; Wei JIA; Xiao-li XIE; Jia-kang YU; Hui-min XIA, Department of Pediatric Surgery, Guangzhou Women and Children’s Medical Center, Guangzhou, China

Background/Purpose

Currarino syndrome (CS) is a rare congenital malformation characterized by anorectal anomalies, sacral bony defect, and presacral mass. We analyzed retrospectively case series to investigate the radiological characteristic images for early diagnosis and appropriate strategy for therapy.

Methods

Medical records including clinical and image features, treatments and outcome of 4 patient with CS were reviewed retrospectively.

Results

In the presented four patients with CS, the former two cases did not have early diagnosis and suffered three surgical interventions: Patient A underwent anoplasty because of anocutaneous fistula, Soave’s procedure as secondary megacolon, and abdominoperineal resection for sacrococcygeal teratoma. Patient B received colonostomy, anoplasty plus meningoymelolecute repair and closure of colonostomy respectively. Abnormal widened sacrum-rectal gap as characteristic images were found after reviewing the former two cases radiological data. The later two cases were diagnosed with CS early in neonates and received two stages operation: presacral mass resection plus anoplasty plus colonostomy in first stage and closure in second stage.

Conclusions

Abnormal widened sacrum-rectal gap could be a characteristic sign and help for revealing Currarino syndrome early, which bring appropriate therapeutic protocol.

32-POSTER  Percutaneous ultrasound-guided transperineal anorectoplasty

Authors

Ryan M. Antiel, MD; Jack E. Kehl, MD; Jane M. Matsumoto, MD; Abdalla E. Zarroug, MD; Christopher Moir, MD, Mayo Clinic

Background/Purpose

The standard surgical approach for most neonates with imperforate anus is posterior sagittal anorectoplasty. We present a percutaneous transperineal approach to anorectoplasty.

Methods

A 3.1kg female, born via caesarian section at 35 6/7 weeks, was noted to have an imperforate anus without rectovaginal fistula. Ultrasound examination demonstrated a blind-ending rectum at the level of the levators. The sphincter complex was present. The distance between the rectum and the skin was approximately 6mm. She underwent surgery on day of life one.

Results

Intraoperatively the rectum was visualized at the levator ani. Both the external and internal anal sphincter complexes were identified as well as a midline potential canal. An incision was made through the midpostion and under ultrasound guidance a needle was advanced through the midpoint into the rectum (Image 1). A guide wire was then advanced and the tract was subsequently dilated. Meconium was clearly identified. The rectum was identified and pulled through the muscle complex to the mobilized skin and sutured in place. She began having voluntary bowel movements on postoperative day number one and was sent home with dilators.

Conclusions

Image guided percutaneous transperineal anorectoplasty is a novel, minimally invasive approach for well selected patients with low imperforate anus without fistula.
**33-POSTER**  
**Ten years of Paediatric Surgery in a small Pacific Island country: a review of the role of the general surgeon versus visiting paediatric surgical teams at the national referral hospital in Vanuatu.**

**Authors** Basil Leodoro, Vila Central Hospital, Port Vila, Vanuatu  
**Background/Purpose** In Vanuatu, a developing nation in the south west Pacific, children under 14 years of age make up more than 40% of the total population. Since 1975, surgical services have been provided by a General Surgeon who is expected to cover both paediatric and orthopaedic services. In this age of specialty and sub-speciality training, Vanuatu benefits from a visiting paediatric surgical team that attends to paediatric surgical cases only once a year. Due to a paucity of doctors, the prolonged length of time for training and better working conditions overseas, many of the trained specialists in the Pacific have left for greener pastures leading to brain drain. This paper looks at the burden of paediatric surgical disease in Vanuatu and assesses the need for specialty paediatric surgical training as opposed to continuing the trend of training a general surgeon to cover surgical disease in children. It reveals an interesting look into the challenges faced by a general surgeon, in the traditional sense of the word, working in a resource limited setting and sets a foundation for planning the future of paediatric surgical services in Vanuatu and the Pacific.

**Conclusions** Awaiting confirmation

**34-POSTER**  
**Variation in normal appendectomy rate (NAR): methodological considerations for a randomized trial**

**Authors** Nigel J Hall, Hospital for Sick Children, Toronto, Canada; Simon Eaton, UCL Institute of Child Health, London, UK; Justyna Wolinska, Hospital for Sick Children, Toronto, Canada; Ewelina Lapidus-Krol, Hospital for Sick Children, Toronto, Canada; Shawn St Peter, Children’s Mercy Hospital, Kansas City; Tom Jakicic, Boston Children’s Hospital, Boston; Alexis Arnaud, Rennes Children’s Hospital, France; Tomas Wester, Karolinska Institute, Stockholm, Sweden; Jan Svensson, Karolinska Institute, Stockholm, Sweden; Erik Skarsgard, British Columbia Children’s Hospital, Vancouver; Risto Rintala, Helsinki Children’s Hospital, Helsinki, Finland; Daffy Davies, IWK Health Centre, Halifax, Nova Scotia; Tim Jancelewicz, Le Bonheur Children’s Hospital, Memphis; Richard Keijzer, Winnipeg Children’s Hospital, Winnipeg, Agostino Pierro, Hospital for Sick Children, Toronto, Canada

**Background/Purpose** Interest is increasing in the non-operative treatment (antibiotics alone) of pediatric acute appendicitis. Histologically normal appendectomy has been proposed as a component of a composite primary outcome in randomised controlled trials (RCTs) comparing non-operative treatment with appendectomy. We investigated variation in RCT sample size determined by variation in NAR.

**Methods** NAR was determined from an international consortium of 10 centres committed to performing a RCT, which will test the hypothesis that non-operative treatment is inferior to appendectomy using a 10% non-inferiority margin. Variation in trial sample size attributable to variation in NAR was calculated.

**Results** For 2189 children treated in 2012, NAR was 4.6% and ranged from 2.02% to 8.45% between centres. Trial sample size based on 4.6% NAR is 310 patients per arm (total 620 patients, 80% power). Range in trial sample size corresponding to a range of NAR of 2.0-8.5% is 130-565 per group (Figure).

**Conclusions** A 4-fold variation in NAR exists even between academic pediatric surgery units. An RCT at a single centre with low NAR would be difficult due to the large sample size. Trial outcomes should be interpreted in the context of the NAR as non-operative treatment will appear more favourable at centers with a high NAR.

**35-POSTER**  
**Abdominal pain and splenic torsion in children: The importance of early diagnosis and treatment**

**Authors** Zhi Li, Tongji Hospital, Tongji Medical College

**Background/Purpose** Purpose: The aim of the study is to increase clinical awareness of splenic torsion in childhood and the need of a rapid diagnosis and operation treatment.

**Methods** Methods: Ten cases operated for splenic torsion are retrospectively reviewed. Ages at presentation were, on average, 3.1 years, without sex preference. All patients led a history of abdominal pain and a mass on physical examination.

**Results** Results: Splenic torsion should be suspected in any child presenting with acute abdomen. Moreover, in case of acute abdomen without sex preference. All patients led a history of abdominal pain and a mass on physical examination.

**Conclusions** Conclusions: Ultrasonography with color Doppler is the best choice for diagnosis of splenic torsion. We advocate splenectomy if there is splenic torsion or splenic infarction.

**36-POSTER**  
**Hot water induced esophageal stenosis: endoscopic bougie dilatation in 2 infants**

**Authors** Wei Wang, Department of Surgery, Children’s Hospital Of Dalian Medical University, 153# Zhongshan Road Dalian, Xianminxiao; Shanzheng, Department of Surgery, Children’s Hospital Of Fudan University, 399# Wanyuan Road, Minhang District

**Background/Purpose** Background: Little information is available regarding the treatment of hot water induced esophageal strictures as only people of part of eastern countries traditionally drink hot water. Here we present our experience with 2 infants who accidentally ingested boiled water before it cooled off.

**Methods** Methods: Short stenosis were diagnosed with upper gastrointestinal imaging study. Endoscopic Savary-Gilliard bougies Dilation was performed at 2- to 4-week intervals under general general anesthesia and was considered adequate if the esophageal lumen could be dilated to 12.8 mm with complete relief of symptoms. The two Patients underwent an average of 5 dilations with an average total intervention time of 4.5 months.

**Results** Results: Clinical success (defined as improved food intake and completely remission of dysphagia) was achieved in both of them after the treatment through short symptom-free intervals(2 week) was noted in one patients at the beginning of dilatations, in this case the stricture site was at the upper 1/3 of esophagus. no severe complication was found after the procedure. no recurrence was seen during the 2 years followup.

**Conclusions** Conclusions: Our experience shown that hot water induced esophageal stenosis were benign and Endoscopic bougie dilatation can provide a safe and effective mean of relieving esophageal strictures with good long-term results.
The number of children with gastrointestinal deformities is increasing year by year. Paying attention to early diagnosis and treatment is necessary.

### Background/Purpose

1149 cases of congenital anomalies of the gastrointestinal tract are analyzed with statistics. The data includes various cases of prematurity and low birth weight (26 cases, 37.9%), are prone to merge deformities and complications (37 cases, 59.7%), and other conditions such as congenital malrotation of intestine (246 cases), Meckel’s diverticulum (67 cases), congenital biliary dilatation (68 cases), and congenital malformations (246 cases) and Congenital hypertrophic pyloric stenosis (158 cases) located in the top three, which account for 6.3%, 5.8%, 5.9% and 5.9%, respectively. Congenital malrotation of intestine (72 cases), Meckel’s diverticulum (67 cases), congenital biliary dilatation (68 cases), and congenital malformations (246 cases) and Congenital hypertrophic pyloric stenosis (158 cases) located in the top three, which account for 6.3%, 5.8%, 5.9% and 5.9%, respectively. Congenital malrotation of intestine (72 cases), Meckel’s diverticulum (67 cases), congenital biliary dilatation (68 cases), and congenital malformations (246 cases) and Congenital hypertrophic pyloric stenosis (158 cases) located in the top three, which account for 6.3%, 5.8%, 5.9% and 5.9%, respectively.

### Methods

A retrospective review of all patients with a fistula-in-ano treated and followed by one pediatric surgeon at a tertiary care pediatric hospital over a 35-year period.

### Results

One hundred and sixty-six infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years. One hundred and forty-eight infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years. One hundred and forty-eight infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years. One hundred and forty-eight infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years.

### Conclusions

Although it is common practice to do a fistulotomy, most pediatric fistula-in-ano resolve without surgery.

### Background/Purpose

The author adopted transumbilical laparoscopic-assisted appendectomy (TULAA) for acute appendicitis in children and analyzed the factors affecting long postoperative hospital stay.

### Methods

All patients undergoing appendectomy for appendicitis at Queen Rania Hospital were retrospectively reviewed of prospectively collected data from April 2008 to 2013. Ages ranged from 3 months to 15 years. All laparoscopic appendectomies were performed by a single surgeon. Patients were evaluated for the indications for surgery, diagnostic modalities, duration of surgery, peroperative complications, pain management, hospital stay, post operative course, morbidity, mortality and the need for re operation.

### Results

80 laparoscopic appendectomy for appendicitis were performed, thoracic stomach (12), achalasia (3) underwent cardiomiyotomy & fundoplication, neurological impairment (12). Weight ranged from 3.3 to 82 kg, age range (3 months â€“ 15 years), 50 males and 30 females. Mean operating time range(45 -240 minutes). Hospital stay range (1 to 4 days). No intra-operative or post-operative complications and no mortality.

### Conclusions

Laparoscopic Nissen fundoplication has reduced discomfort and decreased hospitalization. It is feasible, effective, safe and should be considered the gold standard for antireflux procedures.

### Background/Purpose

The subject is 416 cases of acute appendicitis. TULAA was performed in 406 patients and laparoscopic appendectomy (LA) was performed in 10. The average age was 10 years. Boys were 250 and girls were 166. The average length of postoperative hospital stay was 9.1 days. The patients with the postoperative hospital stay within 10 days (79.8%) were classified into group I. The patients with more than 11 days were classified into group II (20.2%).

### Methods

All patients undergoing fundoplication for (GERD) at Queen Rania Hospital were retrospectively reviewed of prospectively collected data from April 2008 to 2013. Ages ranged from 3 months to 15 years. All laparoscopic fundoplications were performed by a single surgeon. Patients were evaluated for the indications for surgery, diagnostic modalities, duration of surgery, peroperative complications, pain management, hospital stay, post operative course, morbidity, mortality and the need for re operation.

### Results

Sex; group I: male 202, female 130, group II: 36, 48, respectively. Average age; I: 10.1 years, II: 9.8. Preoperative CRP; I: 2.9 mg/dl, II: 3.2. Pathology; I: 49, 35, respectively. Sex distribution, preoperative CRP, performed operation, pathology, length of operation and complications are significantly different between two groups (p<0.01).

### Conclusions

Laparoscopic Nissen fundoplication has reduced discomfort and decreased hospitalization. It is feasible, effective, safe and should be considered the gold standard for antireflux procedures.

### Background/Purpose

To provide more insight into the natural history of pediatric fistula-in-ano, and whether surgery is necessary.

### Methods

A retrospective review of all patients with a fistula-in-ano treated and followed by one pediatric surgeon at a tertiary care pediatric hospital over a 35-year period.

### Results

One hundred and sixty-six infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years. One hundred and forty-eight infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years. One hundred and forty-eight infants and children were identified; 85% male. Mean age was 3.2 years; 69% were less than two years.

### Conclusions

Although it is common practice to do a fistulotomy, most pediatric fistula-in-ano resolve without surgery.
**41-POSTER**  
**Risk Factors for Bowel Obstruction after Ladd Procedure**

*Authors*  
Tetsuya Mitsunaga, Department of Pediatric Surgery, Graduate School of Medicine, Chiba University

*Background/Purpose*  
Bowel obstruction is a common complication after the Ladd procedure. We reviewed the cases treated at our own institution in order to analyze the cause and the risk factors for bowel obstruction.

*Methods*  
Ninety-four cases who had undergone the Ladd procedure between 1977 and 2013 were retrospectively reviewed.

*Results*  
Among the 87 cases who survived to discharge, bowel obstruction was observed in 22 cases (25.3%). Among the cases with bowel obstruction, 13 cases showed intestinal ischemia at the initial operation; this incidence was notably high, although the rate in cases with another neonatal digestive surgical disease was quite low. All cases of bowel obstruction were caused not by recurrent volvulus but by adhesion between the intestine and the mesentery.

*Conclusions*  
Intestinal fixing is not required to prevent recurrent volvulus, but it is important to achieve adequate widening of the mesenteric base. The risk of bowel obstruction after the Ladd procedure, on the other hand, is high. Moreover, those with intestinal ischemia have increased risk of bowel obstruction. We are considering pasting the adhesion barrier film to the manipulated mesentery as a preventive measure.

---

**42-POSTER**  
**Transanal endorectal pull-through using a transanal laparoscopic technique for Hirschsprung’s disease**

*Authors*  
Masao Yasufuku; Shogo Zuo; Katsuya Hisano; Yosuke Aida, Department of Pediatric Surgery, Kagawa West City Hospital, Japan  
*Department of Pediatric Surgery, Mutsukata Tanimoto, Department of Pediatric Surgery, Kobe Children’s Hospital, Japan*

*Background/Purpose*  
Transanal endorectal pull-through (TAERP) with transanal laparoscopic mobilization of the colon is presented in this report.

*Methods*  
Two male infants, aged 2 and 15 months, with rectosigmoid colon aganglionicosis underwent the TAERP procedure with the transanal laparoscopic mobilization of the colon. This technique used single port surgery devices, EZ access® and Lapprotec-tor® (Hakko-medical, Japan). Transanal submucosal dissection was done, the rectal muscle cuff was incised circumferentially, and the full thickness of the rectum was entered. The rectum with the mucosal-submucosal tube, which was ligated at the end, was replaced into the abdominal cavity. Single port surgery devices were introduced transanally. Pneumoperitoneum was secured through it. Under direct transanal laparoscopic observation, dissection of the rectum and colon was continued above the transition zone. After removal of the devices, the mobilized colon was pulled down and resected above the normal biopsy site. The anastomosis was performed.

*Results*  
They had had postoperative normal bowel movements during the 7- to 12-month follow-up period.

*Conclusions*  
Transanal laparoscopic surgery combined with TAERP is a feasible and safe method. Single port surgery devices are available for this approach. This procedure is useful to achieve adequate length without undue tension in TAERP.

---

**43-POSTER**  
**A novel technique for umbilicoplasty during the delayed closure of omphalocele**

*Authors*  
Sarah Moore; Jason McKee; David Lemon, University of New Mexico

*Background/Purpose*  
Abdominal wall reconstruction for large congenital abdominal wall defects is a common pediatric surgical problem. Frequently, this leaves patients without an umbilicus, which has been shown to cause significant emotional distress. The authors describe a novel, simple, cosmetically pleasing technique for creation of a neumbilicus.

*Methods*  
4 patients were identified with giant omphaloceles. Three patients underwent silvadene painting until the sac epithelialized, and one underwent patch closure. All underwent delayed abdominal wall reconstruction, with a mean age of 2 years at the time of surgery (range 17 months - 3 years). Umbilicoplasty was performed by creating two rectangular flaps of redundant skin. These were used to create a tube that was inverted and tacked to the fascia (Fig 1).

*Results*  
All patients underwent routine post-operative follow-up. The only complication was a superficial wound infection, not involving the neoumbilicus. At a mean follow up of 6.5 months (range 4 - 8 months), all patients had an excellent cosmetic outcome.

*Conclusions*  
A simple, novel technique for umbilicoplasty at the time of abdominal wall reconstruction for giant omphalocele is presented. This technique avoids complex reconstructive techniques, thus minimizing operative time without compromising outcome. Creation of a neumbilicus should be performed routinely during abdominal wall reconstruction.

---

**44-POSTER**  
**Antenatal Double Bubble – Postnatal Double Stomach**

*Authors*  
Monica Langer, Tufts University Medical School

*Background/Purpose*  
Antenatal imaging demonstrating a “double bubble” sign is usually indicative of a duodenal atresia or stenosis but rarely indicates other, non-obstructive, diagnoses.

*Methods*  
The authors present a case report of in a five-month-old female with unusual antenatal presentation of an intestinal duplication cyst.

*Results*  
Our patient had a double bubble sign on antenatal ultrasounds, with normal post-natal feeding tolerance, Xray, and upper GI contrast studies. She re-presented at 5 months of age with two months of hemocult positive stools, one week of melena, and profound anemia (Hemoglobin 4 g/dL). In investigation of the patient’s gastrointestinal bleed an ultrasound revealed a duplication cyst posterior to the stomach. Subsequent diagnostic laparoscopy and laparotomy identified and resected a hemorrhagic tubular esophagogastric duplication in communication with the gastrointestinal tract via the pancreatic duct system, and asplenia. Review of the literature shows a case of colonic duplication presenting similarly, but no other reports of esophagogastric duplication.

*Conclusions*  
In addition to duodenal stenosis or atresia, the differential diagnosis of a prenatal double bubble sign should include gastrointestinal duplications. Parental counselling and post-natal investigations should be directed towards this when duodenal atresia or stenosis is not the cause.

---

**45-POSTER**  
**Current Status and Analysis of Negative Appendectomy: 20 years’ experience in Children’s Hospital**

*Authors*  
Gong CHEN; TZ IV; Shan ZHENG, Children’s Hospital of Fudan University
**46-POSTER**

**A randomized controlled trial of conservative versus operative treatment of normal and short-segment Hirschsprung’s disease for infants**

**Authors**
Tianqi, Zhu; Jiexiong, Feng, Tongji Hospital, Wuhan

**Background/Purpose**
The present study was designed to compare the efficacy of conservative treatment to operative treatment for improvement of constipation symptoms in infants with short or normal-segment Hirschsprung disease.

**Methods**
This randomized controlled trial enrolled 48 pediatric patients who aged below 3 months. They were randomly assigned into conservation group and operation group. Both groups were followed up for 6~12 months after treatment.

**Results**
Totally 39 children completed follow-up, there were no significant differences in stool characteristics, abdominal distension, vomiting, and fever between two groups. The defecation frequency in the conservative group was less than that in the operative group (P < 0.05), and the ability to control defecation of conservative group was also significantly better than the other group (P < 0.05). However, in the long term follow up, operative groups gained better defecation frequency than conservative group (P<0.05).

**Conclusions**
Conservative methods achieved less frequency of stool and better ability to control defecation. However, in the operative groups, patients gained better defecation frequency in the long term.

---

**47-POSTER**

**Small incision around umbilicus for intussusception reduction: an initial report**

**Authors**
Ning Li; Wen Zhang, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China

**Background/Purpose**
This article reports our initial experience in small umbilicus incision for intussusception reduction.

**Methods**
During Jun 2010 and Dec 2013, 57 acute intussusception children underwent reduction surgery. Of which, 49 were accomplished through umbilicus incision. The medical records of these children were reviewed.

**Results**
The intussusceptions were diagnosed by clinical symptoms, ultrasonography, and air enema. The inclusion criteria for transumbilical incision surgery were as follows: The onset time was within 48 hours, the state of the children was stable, and air enema could push the intussusception segment back to the ascending colon or ileocecal junction. Fifty-three children met the criteria, and finally 49 children were successfully reduced through umbilical incision. The other 4 cases needed incision extension by 2-4 cm because of difficulty to reduce. Intestinal necrosis was not found in the 53 cases. All the 53 cases had no complication. After 1 month, the scars were hidden within the fold of navel skin in the 49 children.

**Conclusions**
Most intussusception reduction can be done through umbilical incision, which needs only a small incision, and the scar is hidden. For those who are difficult to achieve reduce, proper extension of the incision can also finish the operation without increasing the risk and difficulty.

---

**48-POSTER**

**Peutz-Jeghers syndrome in children: need for screening of intestinal polyps from an early age?**

**Authors**
Dayong Wang; Wei Chen; Xiaosong Li, Department of Surgery, Beijing Children’s Hospital, Capital Medical University, Beijing 100045, China

**Background/Purpose**
Peutz-Jeghers syndrome (PJS) is an autosomal dominant syndrome. The purpose of this report was to describe our clinical experience with PJS in children and to determine whether the screening of intestinal polyps should be performed from an early age.

**Methods**
We reviewed the charts of all the children with a diagnosis of PJS at our institution from 1996 to 2012 abstracting demographic data, family history, clinical presentation, and interventions.

**Results**
Of 26 children identified, 13 were boys (male:female = 1:1). Median age at beginning of symptoms was 6.7 years old (rang 2 months - 17 years). Mucocutaneous pigmentation, and/or the complications caused by polyps were the most common factors stimulating evaluation. There were 19 intussusception events in 14 (54%) children treated by laparotomy. Polyps were found in the stomach in 7 (27%), duodenum in 3 (12%), small bowel in 13 (50%), appendix in 1 (4%), and colon in 16 (62%) children. No malignancy was found in all the patients.

**Conclusions**
Children with PJS have a high risk of numerous laparotomies due to polyps’ complication. Therefore, a screening of intestinal polyps by ultrasound or endoscopy is recommended from an early age.

---

**49-POSTER**

**Patent vitellointestinal duct: the emerging role of Telehealth diagnosis in rare paediatric presentations**

**Authors**
Nandini Singh, University of Newcastle, Australia; Rajendra Kumar, John Hunter Children's Hospital, Newcastle, Australia; Peter Michail, University of Newcastle, Australia

**Background/Purpose**
Complete patency of the vitello-intestinal duct represents one of the rarest causes of umbilical discharge in the pediatric population. It warrants specialist pediatric surgical review, for clinical diagnosis, confirmatory investigations and duct excision. We present a case of persistent VID that was further complicated by its remote location. The issue of inaccess to prompt tertiary paediatric services was resolved by telehealth-assisted consultation.

**Methods**
A 6-week-old male infant was consulted via teleconference to a general practitioner in a remote town located 500km north-
west of our tertiary children's hospital. He presented with a pink raised umbilical lesion, with a history of serous discharge since birth. Inspection via video identified a patent VID. A Gastrografin contrast study confirmed this. Exploratory surgery confirmed a persistent VID with a Meckel's diverticulum prolapsing out through the umbilicus. This was excised and a primary repair performed. The resected specimen was found to have a duct-like structure lined by small intestinal mucosa.

Results

Conclusions

Patent VID is a rare yet serious presentation that can pose diagnostic difficulty in the absence of specialist experience. This case elucidates on the vast potential of telehealth. With ever-improving technology, medical care via this medium is becoming more feasible and accepted amongst specialists in tertiary centers.

50-POSTER Outcome Of Long-Gap Oesophageal Atresia Surgeries: 44 Cases Compared To 293 Non Long-Gap Oesophageal Atresia Surgeries In A Single Institute

Authors

Hui Qing Lee; John Hutson; Alisa Hawley; Joe Doak; Michael Nightingale, Department of General Surgery, Royal Children's Hospital, Melbourne, Australia

Background/Purpose

Tackling long-gap oesophageal atresia (LGOA) is more challenging than non long-gap oesophageal atresia (NLGOA). We compared short and long-term outcomes of LGOA compared to NLGOA procedures performed in a single institute over 25 years.

Methods

LGOA occurs when immediate repair is deferred due to long oesophageal gap. Medical records of oesophagia atresia (OA) patients from 1986 to 2010 were extracted from the database with ethics approval. Perioperative and long-term complications of LGOA and NLGOA repairs were compared using student’s t-test, Pearson’s Chi-squared test and multivariate logistic regression.

Results

Over 25 years, 337 OA were repaired; 44 (13%) LGOA and 293 (87%) NLGOA. There were 3 deaths due to surgical complications amongst NLGOA patients. In general, perioperative complications were similar (p>0.32) but LGOA had more oesophageal leaks (43%) compared to NLGOA (12%) (p<0.001) (Table 1). Using multivariate regression, LGOA strongly predicts late complications (OR 17.0, p<0.001), especially oesophageal stricture requiring multiple dilatations (Mean number of dilatations = 9.0, 95%CI 6.5-12.0) compared with mean of 1.6 in NLGOA (95%CI 1.2-1.9). LGOA also had more gastro-oesophageal reflux requiring fundoplication and ongoing gastrointestinal problems.

Conclusions

LGOA patients had more perioperative and long-term morbidity compared to NLGOA, highlighting the need for multi-disciplinary long-term follow-up of these patients.

51-POSTER Malrotation: 11 year review of clinical outcomes with emphasis on atypical presentations

Authors

Aaron WM Seah, Yong Loo Lin School of Medicine, National University of Singapore; Shireen Anne Nah, Department of Paediatric Surgery, KK Women’s and Children’s Hospital; Thida Win, Department of Diagnostic and Interventional Imaging, KK Women’s and Children’s Hospital; Lin Yin Ong, Caroline CP Ong; Yee Low, Narasimhan K Lakshmi, Department of Paediatric Surgery, KK Women’s and Children’s Hospital

Background/Purpose

We review the outcomes of children diagnosed with malrotation, with emphasis on atypical presentations, which may lead to delayed treatment.

Methods

Retrospective record review of patients diagnosed with malrotation in our institution from 2002-2012.

Results

Forty-six consecutive patients were reviewed, excluding 1 with untraceable records. Four (9%) presented non-emergently. 3 were incidentally diagnosed during operations for other pathologies. 1 had cyclic vomiting. Forty-two (91%) were emergency presentations; 38 had vomiting (28 with bilious vomiting), 10 had gastrointestinal bleeding (7 haematochezia, 3 haematemesis), 5 neonates presented with shock, 3 were referred as duodenal atresia. Abdominal signs were seen in 22 (48%) patients. Thirty-six (78%) underwent upper gastrointestinal (UGI) contrast, with 33 suggesting malrotation. Twenty-seven had abnormally sited duodenoejunal (DJ) flexures. All underwent Ladd’s procedure. Twenty-one (46%) had intraoperative volvulus, of whom 4 did not have imaging suggesting volvulus. Ten (22%) required bowel resection. Twenty-five (54%) required parenteral nutrition (PN) for 14 (median, range 2-184) days. Thirteen (28%) had complications (Table). Two (4%) required second look laparotomies. There were 3 (7%) mortalities; 1 with near-total gut gangrene, 2 from unrelated causes.

Conclusions

More than 25% of patients with malrotation do not have bilious vomiting. Abdominal signs are present in only half. When performed, UGI contrast is suggestive in more than 90% but more than 25% do not have the typical abnormally sited DJ flexure. Volvulus may be missed on imaging studies.

52-POSTER A new approach for pyloromyotomy: intraumbilical longitudinal incision

Authors

Keisuke Suzuki; Makoto Komura; Kan Terawaki; Testuro Kodaka; Ryousuke Satake; Akira Satomi, Department of Pediatric Surgery, Saitama Medical University; Tadashi Iwanaka, Department of Pediatric Surgery, The University of Tokyo

Background/Purpose

We have weighed approaches of intraumbilical longitudinal incision and supraumbilical incision for pyloromyotomy. Classically pyloromyotomy for hypertrophic pyloric stenosis was performed through a right upper quadrant transverse approach. Nowadays there are several other approaches including open transumbilical pyloromyotomy or laparoscopic pyloromyotomy. Since 2012 we have adopted intraumbilical longitudinal incision as a new transumbilical approach for pyloromyotomy.

Methods

We reviewed records of patients undergoing transumbilical longitudinal incision since 2008. Operation time, length of stay and complications were compared between supraumbilical incision and intraumbilical longitudinal incision.

Results

Ten patients underwent pyloromyotomy with supraumbilical incision (group I), and 7 with intraumbilical longitudinal incision (group II). Average operation time in group II was longer than in group I (66.4 vs 49.9 minutes), but this difference was not statistically significant. Average length of postoperative stay was 9.2 days in group I and 4.0 days in group II. Although two wound infections and one duodenal perforation occurred in group I, there were no complications seen in group II. On follow-up, cosmetic outcome appeared to be superior in group II.

Conclusions

Intraumbilical longitudinal incision was an equally simple and safe procedure compared with supraumbilical incision. Moreover, this new approach may improve cosmetic outcomes.
Conclusions
AMDCS in children is mainly due to malfixation of duodenum and early surgical release of duodenum is the best option unlike

Methods
Subjects consisted of seven patients with vomiting and/or stridor, aged 1 month to 17 years (median, 6 years), who had the

Conclusions
Both Diagnostic and reduction rate of US-guided method were high. This method seemed to be non-invasive (without X-ray exposure) and feasible for intussusception in children.

53-PAPER
Usefulness of ultrasonography-guided hydrostatic reduction for intussusception in children.

Authors
Keigo Yada; Hiroki Ishibashi; Hiroki Mori; Mitsuo Shimada, Department of Pediatric Surgery, Tokushima University Hospital; Takehi-

Background/Purpose
Ultrasonography (US) is minimal invasive and convenient tool with favorable sensitivity in pediatric area. The purpose of this

Results
At the first visit, only US enabled to diagnose all patients with intussusception in outpatient settings. US-guided hydrostatic re-

Conclusions
Rikkunshito is effective mainly for acid reflux in patients with pathological gastroesophageal reflux.

54-PAPER
Rikkunshito, a traditional Japanese medicine, reduces acid reflux in children with pathological gastroesophageal reflux

Authors
Hisayoshi Kawahara, Hamamatsu University School of Medicine; Yuko Tazuke; Hideki Soh; Akihiro Yoneda; Masahiro Fukuzawa,

Background/Purpose
Rikkunshito is used to treat chronic dyspepsia and was reported to improve delayed gastric emptying. We investigated the
efficacy of rikkunshito for acid and non-acid reflux in patients with pathological gastroesophageal reflux (GER).

Methods
Subjects consisted of seven patients with vomiting and/or stridor, aged 1 month to 17 years (median, 6 years), who had the

Results
In pH analyses, acid clearance time [184(114-296)sec vs.134(66-199)sec, p=.03] and the number of acid reflux episodes

Conclusions
Rikkunshito is effective mainly for acid reflux in patients with pathological GER.

55-PAPER
Modified Duhamel’s Procedure for Hirschsprung’s disease: Further modifications for improved outcome

Authors
K. L. N. Rao, Nitin James Peters; Prema Menon, Postgraduate Institute Of Medical Education And Research, Chandigarh, India

Background/Purpose
To analyze short, long term outcomes and quality of life after two stage modified Duhamel procedure for Hirschsprung’s
disease with our specific modifications to the technique.

Methods
Patients who had undergone this procedure over a 10 year period with at least 2 years follow up were analyzed. Greater
reliance on contrast enema for identifying the level of aganglionosis, temporary stoma above transition zone, excision of most
of the sigmoid reservoir, bowel anastomosis below dentate line were practiced. Bowel function score (adequacy of stools,
soiling, incontinence and stool consistency) and quality of life scores (soiling, incontinence, school absence, anxiety, food
restriction, peer rejection) were assessed.

Results
Of the 152 patients, 69 responded. Mean age at the time of interview was 7.72 Â± 3.04 years with mean follow up of 4.9 years
(2 to 11 years). Contrast enema was positive in 91%. Good fecal continence score was present in 97.1% patients in the long
term. 95.4% had good quality of life scores. There was no mortality in this series.

Conclusions
Although short term outcomes (first 2 months postoperatively) showed altered bowel function, soiling and perineal excoria-

56-PAPER
Arterio-Mesentric Duodenal Compression Syndrome In Children: Is It Different From Adults

Authors
Rajah S, Sabah Women And Children Hospital, Malaysia

Background/Purpose
Arterio-mesentric duodenal compression syndrome (AMDCS) is uncommon in children. This study analyzes the etiopatho-
genesis, clinical presentations, radiological findings and management of AMDCS in children.

Methods
Records of three patients treated in our institution were reviewed retrospectively.

Results
Three male patients aged day one, day 4 and 11 years on admission for billious vomiting, upper abdominal distension and
electrolyte derangement. Duodenal obstruction was diagnosed by antenatal scan in one, and abdominal radiography in
both neonates. CT angiography showed dilated duodenum and transposition of superior mesentric artery in a neonate and
reduction of aortomesentric angle and distance in the older child. Laparotomy revealed abnormal peritoneal bands with
linear compression of third part of duodenum by superior mesentric artery and abnormaly high fixation of duodenum by lig-
amentum Treitz. Duodenal derotaion similar to Ladd’s procedure in a neonate, Duodeno-jejunosotomy in a preterm baby and
release of duodenum by dividing the peritoneal bands in older child were perfomed. Both neonates had uneventful recovery.
The older boy had persistent high aspirate for two weeks which was releived by prone and left lateral nursing.

Conclusions
AMDCS in children is mainly due to malfixation of duodenum and early surgical release of duodenum is the best option unlike
in adults.

54-PAPER
Rikkunshito, a traditional Japanese medicine, reduces acid reflux in children with pathological gastroesophageal reflux

Authors
Hisayoshi Kawahara, Hamamatsu University School of Medicine; Yuko Tazuke; Hideki Soh; Akihiro Yoneda; Masahiro Fukuzawa,

Background/Purpose
Rikkunshito is used to treat chronic dyspepsia and was reported to improve delayed gastric emptying. We investigated the
efficacy of rikkunshito for acid and non-acid reflux in patients with pathological gastroesophageal reflux (GER).

Methods
Subjects consisted of seven patients with vomiting and/or stridor, aged 1 month to 17 years (median, 6 years), who had the

Results
In pH analyses, acid clearance time [184(114-296)sec vs.134(66-199)sec, p=.03] and the number of acid reflux episodes

Conclusions
Rikkunshito is effective mainly for acid reflux in patients with pathological GER.

55-PAPER
Modified Duhamel`s Procedure for Hirschsprung`s disease: Further modifications for improved outcome

Authors
K. L. N. Rao, Nitin James Peters; Prema Menon, Postgraduate Institute Of Medical Education And Research, Chandigarh, India

Background/Purpose
To analyze short, long term outcomes and quality of life after two stage modified Duhamel procedure for Hirschsprung’s
disease with our specific modifications to the technique.

Methods
Patients who had undergone this procedure over a 10 year period with at least 2 years follow up were analyzed. Greater
reliance on contrast enema for identifying the level of aganglionosis, temporary stoma above transition zone, excision of most
of the sigmoid reservoir, bowel anastomosis below dentate line were practiced. Bowel function score (adequacy of stools,
soiling, incontinence and stool consistency) and quality of life scores (soiling, incontinence, school absence, anxiety, food
restriction, peer rejection) were assessed.

Results
Of the 152 patients, 69 responded. Mean age at the time of interview was 7.72 Â± 3.04 years with mean follow up of 4.9 years
(2 to 11 years). Contrast enema was positive in 91%. Good fecal continence score was present in 97.1% patients in the long
term. 95.4% had good quality of life scores. There was no mortality in this series.

Conclusions
Although short term outcomes (first 2 months postoperatively) showed altered bowel function, soiling and perineal excoria-

56-PAPER
Arterio-Mesentric Duodenal Compression Syndrome In Children: Is It Different From Adults

Authors
Rajah S, Sabah Women And Children Hospital, Malaysia

Background/Purpose
Arterio-mesentric duodenal compression syndrome (AMDCS) is uncommon in children. This study analyzes the etiopatho-
genesis, clinical presentations, radiological findings and management of AMDCS in children.

Methods
Records of three patients treated in our institution were reviewed retrospectively.

Results
Three male patients aged day one, day 4 and 11 years on admission for billious vomiting, upper abdominal distension and
electrolyte derangement. Duodenal obstruction was diagnosed by antenatal scan in one, and abdominal radiography in
both neonates. CT angiography showed dilated duodenum and transposition of superior mesentric artery in a neonate and
reduction of aortomesentric angle and distance in the older child. Laparotomy revealed abnormal peritoneal bands with
linear compression of third part of duodenum by superior mesentric artery and abnormaly high fixation of duodenum by lig-
amentum Treitz. Duodenal derotaion similar to Ladd’s procedure in a neonate, Duodeno-jejunosotomy in a preterm baby and
release of duodenum by dividing the peritoneal bands in older child were perfomed. Both neonates had uneventful recovery.
The older boy had persistent high aspirate for two weeks which was releived by prone and left lateral nursing.

Conclusions
AMDCS in children is mainly due to malfixation of duodenum and early surgical release of duodenum is the best option unlike
in adults.
57-POSTER  Surgical Strategy for Older Children with Hirschsprung’s Disease

Authors Kwang Sik Kim, Department of Surgery, College of Medicine, Cheju National University and Cheju National University; Dae Yeon Kim, Jihee Hwang, University of Ulsan College of Medicine, Asan Medical Center; Sohyun Nam, Inje University Haeundae Paik Hospital

Background/Purpose The aim of this study was to evaluate the technical challenges and feasibility of one-stage laparoscopy-assisted transanal endorectal pull-through (TAERPT) for older children.

Methods The medical records of seven children older than 3 years of age who had undergone laparoscopy-assisted TAERPT were retrospectively reviewed.

Results The five males and two females had a median age of 11.0 years (range, 3.5–14 years), median weight of 29.1 kg (range, 14.4–50 kg), and median height of 137.0 cm (range, 91.4–159.2 cm). To decompress the bowel, one patient received a conventional enema, two patients received oral polyethylene glycol, and four patients underwent massive fecal disimpaction under general anesthesia. The median operating time was 132.0 min (range, 190.0–484 min). No child required an intraoperative blood transfusion. The median follow-up period was 19 months (range, 5–38 months). One patient had persistent constipation and three children had intermittent soiling that showed continuous improvement over time. There were no incidences of incontinence.

Conclusions Laparoscopic-assisted one-stage TAERPT can be performed successfully and safely in older children. The procedure permits clinically satisfactory results and avoids stoma-related complications.

58-POSTER  Reappraisal of adhesive strapping for umbilical hernia in infancy by using ultrasonography

Authors Satohiko Yanagisawa, Department of Pediatric Surgery, International University of Health and Welfare Hospital; Takehito Oshio, Department of Pediatric Surgery, Shikoku Central Hospital; Yasuhide Morikawa, Department of Pediatric Surgery, International University of Health and Welfare Hospital

Background/Purpose Spontaneous closure of most umbilical hernias occurs by 3–6 years of age; therefore, repair is considered only in children without closure by that age. Adhesive strapping is not the preferred treatment for umbilical hernia because of lack of sufficient evidence and associated umbilical skin complications. This study aimed at demonstrating the process of closure and optimal timing for umbilical hernia strapping, and redrawing attention to its merits.

Methods From June to December 2013, 26 infants (13 boys, 13 girls) underwent adhesive strapping for umbilical hernia, which was changed once a week. The hernia orifice was measured with ultrasonography fortnightly until closure. The closure speed (CS) was compared with birth weight, gestational age, diameter of the hernia orifice (DHO), patient age at treatment (PAT), and weight gain.

Results Twenty-three infants showed closure within 12 weeks after strapping, regardless of the DHO or PAT. In the 3 without closure, strapping was not completed because of skin complications. CS was high in mature infants with birth weight >2500 g. Weight gain was not correlated with CS.

Conclusions Spontaneous closure of umbilical hernia occurs earlier with adhesive strapping than with observation, regardless of DHO or PAT.

59-POSTER  Total Intestinal Aganglionsis (TIA): Long-Term Follow Up of Extended Myectomy/Myotomy

Authors Roach, Jonathan; Ziegler, Moritz, Children’s Hospital Colorado

Background/Purpose Until 1987, TIA was uniformly fatal in infancy. We described a novel operative procedure—Extended Myectomy/Myotomy (EMM)—designed to relieve intestinal obstruction, permit liver-protecting enteral nutrition, while serving either as a definitive procedure or as a bridge to transplantation. We report the first long-term follow up of these patients.

Methods A registry recorded length of aganglionosis, operation performed, and survival along with proportional parenteral/enteral calorie intake.

Results Patients were divided into two groups: short-term survivors who lived from 2 months to 2 years (n = 17); and long-term survivors, living 2 years to 30 years (n = 15). The male to female ratio for the entire cohort was 1.9/1.0; the mean length of ganglionated bowel in short-term survivors was 16.4 cm from the Ligament of Treitz, while the same length for long-term survivors was 8.3 cm. Ganglionated bowel length did not correlate with survival. Associated with survival was postoperative stomal output, advancing enteral feeds, normal liver function, few central line infections, and prompt therapy of bacterial overgrowth.

Conclusions EMM is an appropriate option to consider when managing TIA; however, there is no evidence that as a stand-alone therapy it results in predictable disease cure. Instead, EMM may be considered as an appropriate bridge to transplantation.

60-POSTER  Clinical Diagnosis Of Acute Appendicitis : Lost Art In Pursuit Of A Ct Diagnosis

Authors Paul CY Chang, Shin Kong Memorial Hospital, Taipei, Taiwan

Background/Purpose Recent literature indicated that there’s increasing reliance on CT scan for children with suspected appendicitis.

Methods All patients who received appendectomies in the respective years of 2004 and 2013 were reviewed and compared.

Results Fifty-two appendectomies in 2004 and 53 appendectomies in 2013 were identified. In 2004, 44% of the appendectomies were performed without either ultrasound or CT scan. This rate of clinical diagnosis decreased to 5.8% in 2013. The rate of pre-operative ultrasound decreased from 42% (n = 23) in 2004, to 24.5% (n = 13) in 2013. The use of CT scan dramatically increased from 7.7% in 2004, to 69% in 2013. Patients in the 2004 group were significantly younger (10.2 vs. 12.2 years) and less heavier (38.2 vs. 49.3 Kg) than the 2013 cohort. However, there was no statistically significant difference in white cell count (16,882 vs. 16,286 /mm3), rate of perforation (32.7 vs. 26.4%), or length of stay (6.0 vs. 5.6 days) between these two groups.

Conclusions Over the past 9 years, in children with suspected appendicitis, emergency physicians seem to depend less on clinical examinations or abdominal ultrasound, and ordered a lot more CT scans. Efforts should be made between pediatric surgeons and ER physicians to improve its over-reliance thus decrease radiation exposure.
61-POSTER  Current status and prognosis of allied disorders of Hirschsprung’s disease in Japan-A report from Japanese Study Group of allied disorders of Hirschsprung’s disease

Authors
Tomoaki TAGUCHI; Satoshi IERI; Kina MIYOSHI; Yoshiro WATANABE; Hiroyuki KOBAYASHI; Mashiro FUKUZAWA; Yoshinori HAMADA; Minoru YAGI; Hiroshi MATSUFUJI; Atsuko NAKAZAWA; Akio KUBOTA; Tadashi IWANAKA; Akira MATSUI, Japanese Study Group, Allied disorders of Hirschsprung’s disease

Background/Purpose
Allied disorders of Hirschsprung’s disease (ADHD) have been the concept of the functional obstruction of the intestine with the presence of ganglion cells in terminal rectum. Some of them show poor prognosis. In order to clarify the current status of ADHD, Japanese study group was established.

Methods
Our study group classified ADHD into 2 categories based on pathology; 1)Abnormal ganglia: immaturity(GG), hypoganglionosis(HG), and intestinal neuronal dysplasia(IND), 2)Normal ganglia: MMHI, segmental dilatation(SD), anal sphincter achalasia(A-SA), and CIIP. The questionnaires were sent and collected.

Results
Replies were obtained from 157 out of 161 institutes (98%), and totally 355 cases were collected for 10 years (2001-2010). They included 28 IG, 130 HG, 18 IND, 33 MMHI, 43 SD, 3 IASA, and 100 CIIP. The 69 institutes out of 95 (72.6%) had their own criteria for ADHD. HG, CIIP, and MMHI showed poor outcome. Survival rate was 69%, 91%, and 53% respectively, and large number of patients were on PN, whereas, most of IG, IND, SD, and IASA were alive and off PN.

Conclusions
Totally 355 cases of ADHD in 10 years were collected. Congenital HG and CIIP were two major. The prognosis of congenital HG, CIIP, and MMHI was poor.

62-POSTER  Segmental dilatation of the intestine - A report from Japanese Study Group of allied disorders of Hirschsprung’s disease

Authors
Tatsuma Sakaguchi; Yoshinori Hamada; Kouji Masumoto; Tomoaki Taguchi, Japanese Study Group, Allied disorders of Hirschsprung’s disease

Background/Purpose
Segmental dilatation of intestine (SDI) is a congenital disease characterized by localized bowel dilation and intestinal obstruction with normal ganglia. SDI was first described by Swenson and Rathbauer in 1959 as a "new entity". To clarify the current status of SDI, Japanese study group was performed.

Methods
Japanese survey of SDI was carried out as one of the allied disorders of Hirschsprung’s disease in 2012. Forty-three cases were collected from 157 institutions of Japanese Society of Pediatric Surgeons between 2001 to 2010, and 28 were ascertained as SDI by the diagnostic criteria of Swenson and Rathbauer.

Results
Nineteen males and 9 females were included. Average gestational weeks were 30.2 and average birth weights were 2,319 gram. Dilated sites were ileum in 14 cases, colon in 10, jejunum in 3 and duodenum in 1. First manifestations were 20 cases of bowel dilation, 13 of vomiting. Seven cases were diagnosed prenatally. Twenty-six cases were treated by surgical resection. Only a case of 9-year-old male with necrotic change of cecum was died by sepsis. Histologically, abnormality of muscle layer was found in 3 cases.

Conclusions
Total 28 cases were collected in 10 years survey. Etiology is still unclear, but diagnostic criteria and clinical manifestations were established.

63-POSTER  Postoperative outcomes underwent TERPT for Hirschsprung’s disease by preoperative conditions and surgical technique

Authors
Soo-Hong Kim; Hae Young Kim; Yong Hun Cho, Pusan National University Children’s Hospital

Background/Purpose
Transanal single-stage endorectal pull-through(TERPT) for Hirschsprung’s disease(HD) is showed good prognosis, however more researches about the impact of specific surgical technique and preoperative conditions to TERPT are needed

Methods
From 2010 to 2013, 22 TERPT were performed to patholgically confirmed HD patients. Preoperative conditions and specific surgical technique were investigated. For check-up about functional status, Krickenbeck assessment was used.

Results
16 boys and 6 girls were included. Mean age at operation was 21 days. 6 patients(27.2%) showed poor outcomes, more than 2 points on any items in Krickenbeck assessment at least once. They didn’t showed statistical differences in length of muscle strip from posterior myectomy(p=0.594) and presence of anal synchronized squeezing movement(p=0.541) didn’t affect.

Conclusions
Cutting direction of proximal colon was only factor affected prognosis. This study has limitation due to small numbers of patients and short follow-up period, so futher studies are needed.

64-POSTER  Acute gastric volvulus in children: experience with 6 cases

Authors
Katsumi Yoshizawa; Shigeru Takamizawa; Tomoko Hatada; Kazuki Yoshizawa, Department of Surgery, Nagano Children’s Hospital

Background/Purpose
In the pediatric age group, Acute gastric volvulus (AGV) is a rare but potentially life-threatening clinical entity due to gastric perforation or necrosis. The aim of this study is to review our cases of AGV

Methods
Between 1993 and 2013, six children with AGV were treated at our institution. The medical records were retrospectively reviewed in terms of age, clinical presentations, diagnostic modalities, concomitant disease, treatment and outcome.

Results
The age at presentation ranged from 1.3 to 12.4 years. All children showed persistent vomiting with abdominal distention. The definitive diagnosis was made by upper gastrointestinal studies in four patients and abdominal computed tomography in two patients which revealed gastric perforation. Concomitant disease included congenital heart disease (3/6), malrotation (2/6), wandering spleen (2/6), and situs inversus (1/6). Four patients underwent emergency operation which consists of reduction of the volvulus and anterior gastropexy with or without fundal gastropexy. Two out of four patients, required repair of ruptured gastric wall. Two patients underwent elective gastropexy because the stomach was successfully decompressed by naso-gastric tube. Splenectomy for wandering spleen was performed in two patients. All patients survived and no one experienced the recurrence.

Conclusions
AGV requires prompt diagnosis and treatment to prevent devastating outcomes.
65-POSTER  Transumbilical Laparoscopically-assisted Interval Appendectomy for Non-perforated appendicitis or Perforated Appendicitis with Abscess

Authors  Minoru Kuroiwa, Yumiko Shibata, Masato Sakai, Dpt. of Pediatric Surgery, Toho University Omori Medical Center

Background/Purpose  Our strategy for appendicitis is conservative therapy (CST) and interval appendectomy (IA) when needed. CST adapts to not only appendiceal abscess but also non-perforated appendicitis. To elucidate validity of the strategy, we reviewed our experience during last 3 years.

Methods  The subjects were 76 patients who underwent CST. Diagnosis of appendicitis was determined by US and/or CT. Over the same period, 16 underwent an emergency appendectomy. IA procedure consists of identifying an appendix using laparoscopy and performing appendectomy extra peritoneally via the umbilicus. Success rate of CST, recurrence of appendicitis and complication were retrospectively reviewed.

Results  All patients were successfully treated by CST (100%). However, recurrence occurred in 15 (19.7%), 12 of whom were operated on. Of remaining 61 patients, 37 (60.7%) underwent an IA according to familial preference. Complication occurred in 2 patients (2.6%), intraabdominal abscess after IA and intestinal obstruction during CST. The abscess was caused by residual appendix tissue, which resulted from peri-appendiceal adhesion.

Conclusions  Success rate of CST was excellent with a few complications. Transumbilical laparoscopically-assisted IA was easily performed with superior cosmetic results. However, in a patient who had an abscess, the transumbilical appendectomy should be converted to conventional 3-ports procedure depending on adhesion around the appendix.

66-POSTER  Swallowing dysfunction in adults with surgically-corrected esophageal atresia/tracheoesophageal fistula: 63 years of follow up

Authors  Waleed O. Gibreel, MBBS; Geoffrey S. Fasen, MD; Michael B. Ishitani, MD; Christopher R. Moir, MD; Abdalla E. Zarroug, MD, Mayo Clinic, Rochester, MN

Background/Purpose  Reports of functional outcomes after correction of congenital esophageal atresia/tracheoesophageal fistula (EA/TEF) infrequently go beyond adolescence, leaving a gap in our knowledge of long-term function

Methods  An IRB-approved swallowing dysfunction questionnaire (SDQ) was developed by our institution to measure swallowing dysfunction and long-term disease specific outcomes in adults with repaired EA/TEF. Higher scores indicate increased difficulty/discomfort. Patients having undergone EA/TEF repair were mailed the SDQ along with the SF-36 to measure quality of life (QOL)

Results  Response rate was 55% (41/75). Mean follow up was 40 years (range 18-63 years). Among the eight subscales of the SF-36, the general health subscale was most affected. The Swallowing Total Score (STS) showed a negative Spearman rank correlation with the eight SF-36 (range -0.07 to -0.39 subscales). The strongest correlation was with the social functioning subscore of the SF-36 (r=-0.39, p=0.015). STS was higher among patients with GERD and esophageal stricture. The physical and mental components of the SF-36 were below normal in patients with GERD but normal in patients with esophageal stricture

Conclusions  SDQ is a valid tool to assess swallowing dysfunction in adults with repaired EA/TEF. GERD has more impact on swallowing and QOL than esophageal stricture

67-POSTER  Endoscopic Clipping For Persistent Gastrocutaneous Fistulae In Children

Authors  Gerald Gollin; Jacob Olson, George Yanni, Loma Linda University School of Medicine and Children's Hospital

Background/Purpose  Following removal of a gastrostomy tube, a gastro-cutaneous fistula (GCF) persists in 15-35% of cases and operative closure is required. We examined the efficacy of endoscopic clipping for persistent GCF.

Methods  The records of all children who underwent endoscopic clipping for a persistent GCF between 2004 and 2013 were reviewed. The median follow-up was 4.5 years. Relative costs were determined.

Results  Thirty-one children (mean age, 7.9 years) underwent endoscopic clipping for a persistent (mean duration, 13 weeks) GCF and 12 (39%) had complete resolution. In 12, cyanoacrylate glue was externally applied in conjunction with endoscopic clipping and in 7 (58%) of these the GCF closed. Closure was achieved in only 5 of 19 (26%) cases in which cyanoacrylate glue was not used (p=0.13). The number of clips placed (1-4) did not correlate with successful closure. The total charges for endoscopic clipping were $5,550 vs $30,533 for operative closure.

Conclusions  Endoscopic clipping is moderately effective in producing long-term closure of GCF. Cyanoacrylate glue may improve outcomes. If endoscopic clipping with cyanoacrylate glue application was used primarily for all persistent GCF and operative closure was subsequently required in 50%, costs for the entire population of children with GCF would be reduced.

68-POSTER  Long-term incidence of adhesive small bowel obstruction following repair of gastrochisis

Authors  Roman Sydorak, MD MPH; Karen Rodriguez, NP; Donald Shaul, MD, Kaiser Los Angeles Medical Center

Background/Purpose  Adhesive small bowel obstruction in patients with gastrochisis can be problematic. We studied the long-term incidence of this complication in a closely followed cohort.

Methods  A twenty year multi-institutional (community and tertiary) retrospective study of patients with gastrochisis. All relevant data were collected and analyzed. IRB number 6079.

Results  There were 249 patients born over a 20 year period. Average birth weight was 2.42 kilograms, mode of delivery 60% Caesarean section, and length of stay 49 days. 11% were born with intestinal atresia. 54% were repaired in a staged manner. 13% required additional operations at the initial hospitalization for early small bowel obstruction or for removal of mesh. Long-term 50 patients (23%) were admitted for a small bowel obstruction and 35 patients (14%) required an operation. These patients had significantly more matting of the bowel and/or atresia. Nineteen patients' operations (54%) occurred in the first year after discharge but some (six patients) did not occur until ten or more years later. 6% required multiple operations. Five patients died related to these subsequent operations. Average follow-up was 76 years.

Conclusions  Adhesive small bowel obstruction is a serious complication following the repair of gastrochisis particularly when it occurs in the first year of life.
POSTER SESSION II
Poster Session II

NEONATOLOGY

1-POSTER  Sutureless gastroschisis closure avoids neurotoxicity of general anaesthesia

Authors Andrea Vasquez, Amanda Hall; Angela Schellenberg; Saeed Awan; Grant G. Miller, University of Saskatchewan

Background/Purpose There is mounting concern for the potential neurotoxicity of general anesthesia in treating newborns with gastroschisis. We reviewed our experience to determine if gastroschisis can be adequately treated without general anesthesia.

Methods The heath records of a Level IV nursery were searched for all patients with gastroschisis (2005 â€“ 2012). Data included: basic demographics, use of general anesthesia, days of mechanical ventilation, days of parenteral nutrition, time to complete enteral nutrition, number of hospital days, and surgical site infection.

Results Six out of 111 extremely low birth weight infants (ELBWIs) who were born in our hospital and 14 ELBWIs who were born out of the hospital developed NEC. In order to elucidate whether CAM involved in the occurrence of NEC, we compared specific placental findings of neonates who developed NEC (n=20) and those who did not (n=105).

Conclusions Chorioamnionitis was suggested to be one of risk factors of NEC with early onset.

2-POSTER  Thoracoscopic Aortopericardiosternopexy In Neonates And Infants

Authors Yury Kozlov MD; Vladimir Novozhilov MD, Department of Neonatal Surgery, Municipal Pediatric Hospital, Irkutsk, Russia; Department of Pediatric Surgery, Second Department of Surgery, Wakayama Medical University, School of Medicine

Background/Purpose The aim of this study was the comparison of the open and thoracoscopic methods of treatment of tracheomalacia in children of the first 3 months of life.

Methods Between January 2002 and December 2012 were performed 4 open and 6 thoracoscopic aortopericardiosternopexy. We made the analysis of efficiency of these operations, early and late postoperative outcomes.

Results Results In the open group, the mean number of hospital days per patient was 26 days, and in the thoracoscopic group, it was 8 days. Moderate respiratory compromise remained in 1 patient after thoracotomy and in 2 patients is endoscopic group. One thoracoscopic patient had a recurrence of the symptoms of tracheomalacia.

Conclusions The experience described in this study confirms that aortopericardiosternopexy can be applied for treatment of tracheomalacia in small babies with good functional outcomes. However, we need further accumulation of experience and performing of the comparative studies to make judgment about advantage of endoscopic operations.

3-POSTER  Is chorioamnionitis a risk factor of necrotizing enterocolitis?

Authors Takashi Watanabe; Akio Kubota; Katsunori Takifuji; Yasuyuki Mitani, Second Department of Surgery, Wakayama Medical University, School of Medicine; Jyun Shiraishi, Department of Neonatal Medicine,Osaka Medical Center for Maternal and Child Health; Hiroki Yamaue, Second Department of Surgery, Wakayama Medical University, School of Medicine

Background/Purpose Recently, some relationships between necrotizing enterocolitis (NEC) and chorioamnionitis (CAM) have been reported. On the other hand, it is well-known that the onset of NEC is very early in the neonatal period in some cases, and late in the neonatal period or early infancy in others. We hypothesized that different risk factors, including CAM, involved in the pathogenesis of NEC.

Methods Six out of 111 extremely low birth weight infants (ELBWIs) who were born in our hospital and 14 ELBWIs who were born out of the hospital developed NEC. In order to elucidate whether CAM involved in the occurrence of NEC, we compared specific placental findings of neonates who developed NEC (n=20) and those who did not (n=105).

Results The incidence of CAM was significantly higher in NEC group than in controls (83.4 % vs. 38.1% p=0.039). The serum level of CRP at birth was significantly higher in NEC group than in controls (p=0.0067). The histopathological findings of the placenta was significantly severer in those who developed NEC within 3 weeks after birth than those who developed NEC at 3 weeks of birth or later (P<0.03).

Conclusions Chorioamnionitis was suggested to be one of risk factors of NEC with early onset.

4-POSTER  Negative Pressure Wound Therapy in the Management of Neonatal Complex Abdominal wall defects: Is it effective?

Authors Fletcher Charlton, School of Medicine and Public Health, Newcastle University, Australia; Margaret Allwood; Rajendra Kumar, John Hunter Children’s Hospital, Newcastle, Australia

Background/Purpose Negative pressure wound therapy (NPWT) has been extensively used to manage complex abdominal wounds in adults with proven benefits. There is little information examining the role of NPWT in the management of large abdominal wall defects in neonates. This study aims to explore the role of NPWT in the management of complicated abdominal wall defects.

Methods 71 neonates with abdominal wall defects were seen in our tertiary neonatal unit during the period 2004-2014. This included 51 gastroschisis and 20 exomphalos. Conventional surgical treatment failed to manage two children in this cohort due to the size of the abdominal wall defects. One had giant exomphalos major with rupture of membrane and the other had complex gastrochisis. NPWT in combination with nanocrystalline silver was initiated when it became clear that the bowel was otherwise irreducible.

Results NPWT resulted in reduction of the large dome of bowel tissue into the abdominal cavity and brought the wound edges closer together, minimising the defect and accelerating wound closure. Despite successful wound healing using NPWT and silver, one neonate died from sepsis at five months of age.

Conclusions NPWT is both safe and effective and should be considered in large abdominal wall defects in neonates who fail conventional management.
5-POSTER  Histological findings of intestinal disorders in extremely low birth weight infants. How thin are their intestines?

Authors  Kensuke Ohashi; Tsugumichi Koshinaga; Toshifumi Hosoda; Furuya Takeshi; Kiminobu Sugito; Taro Ikeda; Sumie Ohni, Nihon University School of Medicine; Mayumi Hoshino, Hiroshi Goto, Tokyo Metropolitan Ohtsuka Hospital

Background/Purpose  Intestinal histology in extremely low birth weight infants (ELBWIs) is not elucidated well. The aim is to evaluate histological findings of the intestine in ELBWIs who had developed necrotizing enterocolitis (NEC), spontaneous intestinal perforation (SIP) and meconium obstruction of prematurity (MOP). 30

Methods  A total of 39 specimens of the ileum were surgically removed from the ELBWIs with developed intestinal disorders (SIP, MOP, NEC, 3) from 2005 to 2012 (table 1). We evaluated correlation between patients’ clinical characteristics and histological findings (table 2). We classified each histological finding into four stages from 0 to 3+ and defined 2+ or more as positive findings.

Results  The internal circular muscle (ICM) of SIP and external longitudinal muscle (ELM) of MOP were significantly thinner than those of NEC (p<0.01). More ICM and ELM defects were observed in SIP (p<0.05). Though inflammatory cells infiltration increased in NEC, it did not in SIP or MOP (p<0.05, table 2).

Conclusions  This suggests that SIP and MOP arise from the extreme thinness of the wall on ELBWIs. In addition, the thinness may come from intrauterine growth restriction of the intestine. This is the first report evaluating intestinal wall thickness and the other findings on ELBWIs.

6-POSTER  Williams-Beuren Syndrome With Congenital Lobar Emphysema, Anorectal Malformation And Bilateral Indirect Inguinal Hernias: Is Elastic Deficiency The Culprit?

Authors  Miss Kulanka Premachandra, School of Medicine, University of Newcastle, Australia; Dr Rithvik Reddy; Dr Rajendra Kumar, Department of Paediatric Surgery, John Hunter Children’s Hospital, Newcastle, Australia

Background/Purpose  Williams-Beuren Syndrome (WBS) is a multisystem genetic disorder with an estimated incidence between 1 in 13,700 and 1 in 25,000. It is caused by a heterozygous deletion on chromosome 7q11.23, which includes the entire elastin (ELN) gene in 98% of cases. This is the first reported case of respiratory impairment and congenital lobar emphysema (CLE) in a patient with WBS.

Methods  We present a case where the genetic findings of WBS possibly contributed to the development of CLE and bilateral indirect inguinal hernias.

Results  A term neonate born with an imperforate anus underwent a primary anorectal pull-through procedure on day three of life with an uneventful recovery. She presented a month later with respiratory distress and cyanosis and was diagnosed with CLE for which a left upper lobectomy was performed. Bilateral herniotomy was performed at 7 months of age. She had failure to thrive, which was investigated and revealed WBS with typical facial features and hypercalcaemia.

Conclusions  This is the first reported case of anorectal malformation and CLE in a patient with WBS. What was once merely a biological plausibility is now a reported case. The elastin gene mutation described in WBS is possibly the cause of CLE and hernias in this patient.

7-POSTER  Duplication of the trachea with cystic lung: a case report

Authors  Yuko Bitoh; Yuichi Okata; Tamaki Iwade; Akiko Yokoi; Hiroaki Fukuzawa; Kosaku Maeda, Department of Pediatric Surgery, Kobe Children’s Hospital

Background/Purpose  Duplication of the trachea is an extremely rare congenital anomaly and few cases have been reported.

Methods  We report an infantile case, which had successfully resected duplication of the trachea with cystic lung in the upper mediastinum. This is the first reported case, which had been prenatally suspected, and detected duplication of the trachea radiologically after birth.

Results  A boy was born at 37 gestational weeks. Upper mediastinal mass detected prenatally in MRI. After birth, CT and MRI demonstrated mediastinal cysts and tubular structure along the trachea. He had no symptoms but the mass had been growing. At six months old, excision of the lesion was performed through a right posterolateral thoracotomy and cervical approach. At thoracotomy, polycystic mass at the right upper mediastinum was found and not connected to the normal lung. The lesion extended to the cervix along the right side of trachea which attached to the cricoid with the blind end, and could be completely resected. The pathology revealed that the mediastinal mass consisted of lung tissue and the tubular structure contained tracheal cartilage.

Conclusions  In our case, duplication of the trachea with cystic lung could be suspected by radiological images. These findings were useful for determination of operative approach.

8-POSTER  Balloon Tracheoplasty for Congenital Tracheal Stenosis in Neonates : Six Years’ Experience

Authors  Kosaku Maeda, Shigeru Ono; Katsuhisa Baba; Insu Kawahara; Atsuhisa Fukuta, Pediatric Surgery, Jichi Medical University

Background/Purpose  A congenital tracheal stenosis is an obstructive airway lesion, which often presents as a life-threatening emergency. We had introduced the balloon dilatation as an initial therapeutic option in neonates. This study clarified the initial results of Balloon Tracheoplasty in neonates.

Methods  A retrospective review was conducted of nine patients in whom treated in neonatal periods during 2007 to 2013. The balloon dilatations of the trachea were performed in six cases of them.

Results  In nine, eight patients showed respiratory distress immediately after birth. Tracheal stenosis had been suspected from difficulty with intubation at the endotracheal intubation in six cases. Rigid bronchoscopy and 3-D CT confirmed the diagnosis in all cases. The patient’s lesions were divided between four long segments and five short segments. As associated anomalies, seven of them had severe congenital heart disease and two had right lung agenesis. Four children are alive and doing well without any respiratory problems after balloon tracheoplasty. Two died from tracheal bleeding due to associated cardiac anomalies. Another died from severe BPFM. Other patients are waiting for surgical treatment because of mild respiratory conditions.

Conclusions  The Balloon Tracheoplasty is an efficient and safe technique for the treatment of primary neonatal tracheal stenosis.
10-POSTER

Inadequate Prophylactic Antibiotic Administration: Can’t we just fix it with the checklist?

Authors
Luke R. Putnam; Shauna M. Levy; Nathan B. Rogers; Diana M. Hoor-Dufresne; Maria Matusczak; Ranu Jain; Lillian S. Kao; Kevin P. Lally; Kuo Jen Tsao, University of Texas Health Science Center at Houston

Background/Purpose
Proper administration of prophylactic antibiotics is a known clinical challenge. We hypothesized that checklist modifications with intra-operative process standardization would improve overall adherence.

Methods
A series of 7-week observational periods and 10-month interventions were carried out from 2011-2013. During observational periods, trained assessors documented proper administration based on five criteria: whether or not antibiotics were given/held correctly, correct type, correct weight-based dose (±10%), administration within 10-60 minutes of incision, and re-dose (when applicable). Intervention #1 (2012) entailed pre-incisional checklist modifications to confirm all 5 administration requirements. Intervention #2 (2013) consisted of 1) assigning antibiotic administration responsibility to anesthesiology and 2) attaching antibiotic guidelines to all anesthesia carts.

Results
Antibiotic administration was observed in 473 cases. Overall adherence did not change significantly (51% to 49% to 46%, p=0.49), but poorer performance of giving/withholding antibiotics appropriately (98% to 94% to 92%, p=0.05) and dosing (81% to 75% to 61%, p=0.001) was noted. Re-dosing significantly improved (7% to 26% to 26%, p<0.001, Graph).

Conclusions
Correct administration of prophylactic antibiotics remains elusive despite several targeted interventions. Changes to the intraoperative process of antibiotic administration appear to be inadequate. Adjunctive interventions prior to entering the operating room may be required and are being investigated.

9-POSTER

Lung clearance index (LCI) and Reactance (X5Hz) may be more sensitive in detecting residual lung function abnormalities in children operated for suspected congenital cystic adenomatoid malformation in infancy

Authors
Dr Payal H. Mandaliya, John Hunter Children’s Hospital, Hunter Medical Research Institute, University of Newcastle; Dr Rajendra Kumar, John Hunter Children’s Hospital; Matthew Morton, University of Newcastle, Hunter Medical Research Institute; Robyn Hankin, Hunter Medical Research Institute, Lauren Platt, John Hunter Children’s Hospital; Dr Anirudh Deshpande, John Hunter Children’s Hospital; Dr Alan James, John Hunter Hospital; Dr Paul Robinson, Children’s Hospital at Westmead; Dr Bruce Whitehead, John Hunter Children’s Hospital

Background/Purpose
Lobectomy is the preferred surgical treatment for congenital cystic adenomatoid malformations (CCAM). Our aim was to determine forced expiratory flows and volumes, lung clearance index (LCI) measured by multiple-breath nitrogen washout technique (MBW) and perform impulse oscillometry ( IOS) in children who underwent lobectomy for CCAM in infancy.

Methods
The study involved 10 children (age 5 to 9 years) who had undergone surgery for suspected CCAM in early life. Lung function measurements were compared to values obtained in a cohort of 13 healthy children (age 4 to 6 years).

Results
LCI (mean; SD) was significantly higher in children from the CCAM group (8.11; 0.70) as compared to healthy children (7.17; 0.69; p=0.01). There was no significant difference between FEV1 (p=0.21) and FVC (p=0.74) measured in CCAM and control group. Ratio of residual volume and total lung capacity (RV/TLC) was increased in 4 CCAM patients. Reactance (X5Hz) (mean; SD; n) was significantly higher in children from the CCAM group (166.3; 64.6; 9) as compared to healthy children (101; 34.8; 13; p=0.005).

Conclusions
Children with CCAM and lobectomy in early life have ventilation inhomogeneities at school age, which indicates abnormalities related to CCAM or lobectomy in the non-resected lung.

CRITICAL CARE/TRAUMA

11-POSTER

Surgical closure of the Larynx to intractable aspiration for neurologically impaired patients: surgical technique and clinical results

Authors
Kazuya Ise; Michitoshi Yamashita; Show Ishi; Hirofumi Shimizu; Mitsukazu Gotoh, Department of Pediatric Surgery, Fukushima Medical University

Background/Purpose
Laryngotracheal separation can help to prevent neurologically impaired patients from intractable aspiration, however there are severe complications such as tracheoinnominate artery fistula. We devised a novel technical innovation to the conventional surgical closure of the larynx for large and high position of tracheostoma. We report the results of this novel method.

Methods
The larynx was opened after removing both thyroid and cricoid cartilages to gain a wide operative field. The horizontal incision was made at the level of the bilateral vocal cords, and this was separated to superior and inferior mucosal flaps and sutured at the midline above and below. The sternohyoid muscle flap was inserted into the open space between superior and inferior flaps and sutured with intraoperative process standardization.

Results
Surgical closure of the larynx was performed safely in all patients. None had any intraoperative complication or anastomotic stricture. Both aspiration pneumonia and respiratory disorders were controlled after the operation. The large tracheostoma did not require tracheal cannulas in seven patients (78%). There were no late complications such as tracheoinnominate artery fistula.

Conclusions
We conclude that surgical closure of the larynx is effective for neurologically impaired patients.

12-POSTER

Successful Endovascular Repair of Exsanguinating Penetrating Carotid Artery Injury in Two Pediatric Patients

Authors
Rajeev Prasad, MD; Leah Sieren, MD; Marshall Schwartz, MD, St. Christopher’s Hospital for Children/Orexel University College of Medicine

Background/Purpose
Immediate operative exploration has been considered mandatory for all penetrating injuries to Zone II of the neck and in any patient who is unstable, regardless of the location of the injury. An endovascular approach has been considered an option only for Zone I and Zone III injuries in stable patients. Endovascular repair has been proposed as an alternative to surgical intervention in adults. In children, penetrating neck injuries are relatively rare, and endovascular repair in the pediatric population has not been described.

Methods
We report two cases of penetrating carotid artery injuries (the first in a 3-year-old initially unstable patient with what ultimately proved to be a Zone II injury and the second in an 18-year old initially unstable patient with a Zone III injury) successfully managed endovascularly.
Methods

Five children underwent endoscopic procedures under SPACE. SPACE was performed using an automatic CO2 insufflator.

Conclusions

Endovascular repair of carotid artery injuries can be successfully achieved in children with penetrating neck trauma, both in patients with Zone II injuries and in initially unstable patients. This emerging technology should be considered to be an appropriate management option in children with these life-threatening injuries.

13-POSTER Paediatric trauma: An audit of mortality and morbidity in a Pacific Island country: The Vanuatu experience.

Authors

Basil Leodoro, Vila Central Hospital

Background/Purpose

The Pacific Islands have a young and growing population. This is relevant in Vanuatu, which is a small country in the south west Pacific, where more than a third of the population is under 15 years of age. It is recognized that this proportion has been increasing in the last decade. Trauma statistics for this age group, including morbidity and mortality has never been studied in Vanuatu. Overseas though, such as in the US, pediatric trauma accounted for 59.5% of all mortality for children under 18 in 2000 with injury being the leading cause of death in this age group. In New Zealand, Australia and Hawaii, paediatric trauma in Pacific Island populations have revealed interesting statistics concerning injury patterns and recommended injury prevention interventions. This audit reveals the paediatric injury patterns and mortality. This audit in a small Pacific Island country and aims to establish a foundation for future research and injury prevention strategies in Vanuatu. Like many of the Pacific Island states, Vanuatu is faced with limited resources and the challenge will be to promote cheap and effective injury prevention strategies to tackle pediatric trauma in the Pacific.

Methods

Retrospective qualitative and quantitative audit

Results

Awaiting tabulation

Conclusions

Awaiting final results

14-POSTER Role of bi-directional regulation in skin allograft survival

Authors

Miwa Satomi, Department of Pediatric Surgery, Osaka City University Graduate School of Medicine, Osaka, Japan

Background/Purpose

We previously reported that the pre-transplant immune status of organ donor as well as organ recipient strongly influenced allograft outcome in CAMPATH-1H-treated recipients of a kidney transplant. HLA haploidentical patient-donor pairs with uni-directional or non-regulation status had significantly increased acute rejection and anti-donor HLA antibody response. In contrast, donor-recipient pairs with pre-transplant bidirectional regulation had long term graft survival. To investigate the mechanism of bi-directional regulation, we studied the survival of skin grafts in mice.

Methods

We chose to induce tolerance by MR-1 [antiCD154] and DST in both B6 and CBA mice. We used i.p. injection spleen cells for the DST, either alone or along with 3 injections of MR-1. After analysis of immune regulation status by trans-vivo DTH assay, CBA and B6 skin allografts were placed on the back of each CBA recipient. We scored the skin graft condition every day.

Results

Preliminary experiments using abdominal skin showed an accelerated graft rejection when both donor-B6 and recipient-CBA mice were sensitized to one another. Ear skin graft experiments were still in progress at the time of writing.

Conclusions

Preliminary data still have not addressed the question of the graft survival impact of bidirectional regulation which was observed in heavily T cell-depleted R7x patients.

15-POSTER Efficacy of yokukansan, a traditional Japanese medicine, for postoperative pain relief after tonsillectomy in children

Authors

Ryoko Kawahara; Yutaka Tamai; Kyoko Yamasaki; Satoko Okuno; Rumi Hanada, Department of Anesthesiology Nissay Hospital; Hisayoshi Kawahara, Department of Pediatric Surgery Hamamatsu University School of Medicine

Background/Purpose

Postoperative pain management is an important issue after tonsillectomy in children. Intraoperative administration of opioids has widely been used, which potentially delays the recovery of spontaneous respiration. Yokukansan is a traditional Japanese medicine for infantile irritability and effective for neuropathic pain. It was aimed to investigate the efficacy of intraoperative yokukansan administration for pain relief after tonsillectomy.

Methods

The subjects consisted of 24 children, aged 4 to 9 years (median, 6 years). They were randomized to receive either 0.25g/kg of yokukansan (TJ-54) suppository (Group Y, n=12) or intravenous administration of 5?g/kg of fentanyl (Group F, n=12) after the operation of general anesthesia for tonsillectomy. Primary outcome measures included Behavioral Observational Pain Scale (BOPS; facial expression, verbalization, body position) and Children's Hospital of Eastern Ontario Pain Scale (CHEOPS; cry, facial, verbal, torso, touch, leg) at 0, 2, and 6 hours after surgery. Statistical analyses were conducted with Mann-Whitney U-test. A p-level of <.05 was considered to be significant.

Results

Tonsillectomy was conducted successfully and postoperative course was uneventful in all. There were no significant differences of total and each score of BOPS and CHEOPS between Groups Y and F.

Conclusions

Intraoperative administration of yokukansan suppository provided postoperative pain relief comparable with fentanyl in children undergoing tonsillectomy.

HEPATOMOBILIARY / MIS

16-POSTER Modified Steady Pressure Automatically Controlled Endoscopy in Pediatric Patients

Authors

Katsuji Yamauchi; Takeo Yonekura; Tomohiro Ishii; Masafumi Kamiyama; Yuuji Morishita, Department of Pediatric Surgery, Nara Hospital, Kinki University Faculty of Medicine

Background/Purpose

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 “pinch-cock phenomenon”. We applied modified SPACE to GI endoscopic procedures in children.

Methods

Five children underwent endoscopic procedures under SPACE. SPACE was performed using an automatic CO2 insufflator.
with pressure monitoring system specified for laparoscopic surgery (THEMOFLATOR; Karl Storz endoscopy, Tokyo, Japan), which was connected to working channel on GI endoscopy (XP-240, XP-40; Olympus Medical Systems, Tokyo, Japan) or naso-gastric (NG) tube at a pressure of 6-8 mmHg.

Results
Two newborn infants with duodenal stenosis underwent SPACE: one for balloon dilatation of stenosis, and one for duodenography to reveal two stenotic lesions. One child received a gastrojejunostomy tube through gastric fistula under SPACE. SPACE provided excellent visual fields without abdominal distention in both cases. The 2 infants underwent SPACE while receiving laparoscopic gastrostomy. SPACE prevented intestinal distention and facilitated a large operative field for the laparoscopic procedures.

Conclusions
SPACE is feasible, safe, and clinically effective compared with conventional endoscopy for pediatric patients.

17-POSTER
Laparoscopic Surgery for Perforated Peptic Ulcer in Children: Report of 5 Cases

Authors
Yu-wei Fu; Nien-lu Wang; Jin-cherng Sheu; Yi-cherng Duh; Chin-hung Wei, Mackay Memorial Hospital

Background/Purpose
Peritonitis following perforated peptic ulcer in children is rare. The aim of this study was to report our experience of PPU in pediatric laparoscopic surgery.

Methods
From June 2007 to December 2013, we retrospectively reviewed the charts of children diagnosed with PPU at our hospital. Data were obtained and demonstrated with demographics, clinical features, perforation sites, operative details, postoperative course, and outcome.

Results
There were 5 children presented with peritonitis following PPU and operated laparoscopically. They are all male aged from 14 to 19 years-old. One patient had gastric ulcer and the other four had pyloric ulcer. We performed ulcerectomy and simple closure for gastric ulcer, while pyloroplasty with mental patch for pyloric ulcer. All had uneventful recovery except one patient had complication of anastomatic leakage and received laparoscopic re-operation. All remained asymptomatic on follow-up.

Conclusions
PPU has a high morbidity and mortality in children. In adolescents presenting acute abdominal pain with peritoneal signs, PPU should be impressed. Laparoscopic repair for PPU in children is effective and safe and has a more favorable outcome than adults.

18-POSTER
Usefulness of preoperative ultrasonography in the evaluation of contralateral patent processus vaginalis: Comparison with intraoperative findings of laparoscopic hernia repair

Authors
Jung-Tak Oh, Department of Pediatric Surgery, Severance Children's Hospital, Yonsei University, Seoul, Korea; Mi Jung Lee; Myung Joon Kim, Department of Radiology, Severance Children's Hospital; Yonsei University; Seoul, Korea

Background/Purpose
Preoperative ultrasonography of groins has become popular as an ancillary diagnostic method of inguinal hernia in children. However, its usefulness of detecting the contralateral potential hernia is still under debate. The aim of this study was to evaluate the diagnostic value of ultrasonography for contralateral patent processus vaginalis (CPPV) by comparing the intraoperative findings of laparoscopic approach.

Methods
From September 2012 to December 2013, 138 pediatric patients underwent the laparoscopic hernia repair under the diagnosis of the unilateral inguinal hernia. These patients preoperatively received groin ultrasonography for detecting CPPV. The ultrasonographic findings were compared with the intraoperative findings of laparoscopic hernia repair.

Results
Laparoscopy showed that 58 cases were only unilateral inguinal hernia without CPPVs, but 80 cases had CPPVs. Among the patients without CPPVs, preoperative ultrasonographic findings were correct in 55, but 3 cases were diagnosed as having CPPVs. In contrast, only 18 of 80 CPPV cases were correctly diagnosed preoperatively. Sixty-two patients could not detect CPPVs by ultrasonography. The specificity, sensitivity and accuracy of preoperative ultrasonography for detecting CPPV were 94.8%, 22.5% and 52.9%, respectively.

Conclusions
Ultrasonography is not satisfying diagnostic tool for diagnosing CPPV because of its lower sensitivity. However, contralateral exploration could be performed when ultrasonography showed CPPV.

19-POSTER
The combination of double balloon enteroscopy with laparoscopic surgery for the gastrointestinal bleeding with negative Tc-99m Meckel's diverticulum scanning in children

Authors
Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children's Hospital, Shanghai Jiao Tong University

Background/Purpose
To review the experience on the combination of double balloon enteroscopy (DBE) with laparoscopic surgery for gastrointestinal bleeding with negative Tc-99m Meckel's diverticulum scanning in children.

Methods
From Dec 2006 to October 2013, 13 cases with gastrointestinal bleeding and hypoalbuminemia were underwent DBE and laparoscopic surgery in the department of pediatric surgery, Shanghai Children's Hospital, Shanghai Jiao Tong University and Children's Hospital of Fudan University. All the patients got Tc-99m Meckel's diverticulum scanning but failed to find positive spot. With the aid of a specially designed DBE, the enteroscope was advanced into small intestine under total anesthesia. If Meckel's diverticulum or other surgical disease was found, the laparoscopic surgery such as ileoileostomy was followed at the same time.

Results
8 patients were Meckel's diverticulum, and duplication of intestine was 4 cases and hemagiomas in 1. No complications such as aspiration pneumonia, perforation or hemorrhage occurred, and all the patients well tolerated. No recurrence of bleeding was noted during a median follow-up period of 21 months (range, 3-60 months).

Conclusions
DBE is a useful and feasible procedure for children, especially for the gastrointestinal bleeding with negative Tc-99m Meckel's diverticulum scanning, and combination with laparoscopic surgery at the same time could make good results.

20-POSTER
Choledochal cyst masquerading as a duplication of the duodenum

Authors
Linlin Zhu; Shanghai Children's Hospital

Background/Purpose
To present the rare case of a 6-year-old girl with choledochocoele (type 3b), who was treated with surgery and had a positive recovery, and discuss the differences between choledochoele and duodenal duplication.

Methods
Clinical and imagery review of a 6-year-old girl presented with intermittent abdominal pain, without jaundice and damage of liver function. Clinical examination and preoperative imaging suggested the diagnosis of a duplication of the duodenum.
Patient: A 2-year-old boy was admitted to our hospital, because he was in a bad mood and defecated whitish stool. His blood

Methods

Introduction: We report a case of dilatation of the common bile duct (CBD) with intestinal malrotation.

Background/Purpose

Authors

24-POSTER

Children with congenital biliary dilatation had the high expression of HDAC and K-ras in the biliary epithelium on the pathway

Conclusions

Intrahepatic portal blood flow was restored by PDV closure, even in patients with extremely hypoplastic intrahepatic PVs

Results

Since 2000, we have encountered 5 patients with a hypoPV associated with a PDV. Of these patients, 3 underwent closure of

Conclusions

Laparoscopy is a useful tool in modern pediatric surgical hospital; it allowed to avoid open surgery in 5.21% of cases.

22-POSTER

A hypoplastic portal vein associated with a patent ductus venosus: Is this an irreversible condition?

Authors

Masakatsu Kaneshiro; Hiromi Miyake; Naoto Urushihara; Keichi Morita; Masaya Yamoto; Hiroshi Nousu; Go Miyano; Kouji

Fukumoto, Shizuoka Children's Hospital

Background/Purpose

A hypoplastic portal vein (hypoPV) associated with a patent ductus venosus (PDV) is a rare condition. Here, we report our experience in the management of this condition.

Methods

Since 2000, we have encountered 5 patients with a hypoPV associated with a PDV. Of these patients, 3 underwent closure of

Results

All 3 patients were male, and their age at treatment ranged from 1 to 4 years. Preoperative measurement of the intrahepatic

Conclusions

Intrahepatic portal blood flow was restored by PDV closure, even in patients with extremely hypoplastic intrahepatic PVs preoperatively. Preventive PDV closure was useful in acquiring sufficient PV flow and preventing complications.

23-POSTER

Risk of carcinogenesis in the biliary epithelium in children with pancreaticobiliary maljunction through the epigenetic regulation.

Authors

Hiroki Ishibashi; Hiroki Mori; Keigo Yada; Mitsuo Shimada, Department of Pediatric Surgery, Tokushima University Hospital; Takehi

totic regulation.

Results

In the gallbladder epithelium, Ki67 labeling index, HDAC and K-ras in the dilatation group significantly increased compared

Conclusions

The role of laparoscopy in the diagnostics of abdominal pain and trauma

Authors

Shapkina A.N., Pacific State Medical University, Vladivostok

Background/Purpose

The acute abdomen and blunt abdominal trauma are still the main challenge for any surgeon, especially pediatric.

Methods

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Results

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Conclusions

Laparoscopy is a useful tool in modern pediatric surgical hospital; it allowed to avoid open surgery in 5.21% of cases.

21-POSTER

The role of laparoscopy in the diagnostics of abdominal pain and trauma

Authors

Shapkina A.N., Pacific State Medical University, Vladivostok

Background/Purpose

The acute abdomen and blunt abdominal trauma are still the main challenge for any surgeon, especially pediatric.

Methods

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Results

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Conclusions

The role of laparoscopy in the diagnostics of abdominal pain and trauma are still the main challenge for any surgeon, especially pediatric.

Methods

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Results

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Conclusions

The role of laparoscopy in the diagnostics of abdominal pain and trauma are still the main challenge for any surgeon, especially pediatric.

Methods

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Results

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Conclusions

The role of laparoscopy in the diagnostics of abdominal pain and trauma are still the main challenge for any surgeon, especially pediatric.

Methods

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Results

In 2011 year 1179 children came to our emergency department for the reasons of trauma and abdominal pain, 1255 in 2012

Conclusions

The role of laparoscopy in the diagnostics of abdominal pain and trauma are still the main challenge for any surgeon, especially pediatric.
duct and pancreatic duct. Computed tomography (CT) scan and magnetic resonance cholangiopancreatography (MRCP) were suggestive of pancreatico biliary maljunction.

Results
Thus, we diagnosed as CBD and he underwent operation on the 27th day of hospitalization. During the surgery, we confirmed the common bile duct and pancreatic duct forms common channel with a length of about 2cm. We unexpectedly found an intestinal malrotation with nonrotation type. We performed Roux-en-Y hepatojejunostomy with bile duct excision and correction of malrotation. Operation was performed successfully and he was discharged uneventfully.

Conclusions
Conclusion: We report a case of CBD with intestinal malrotation and discuss the problems to be noted during surgery for such a rare condition.

25-POSTER
Diagnostic and prognostic value of extrahepatic biliary cyst in type III biliary atresia

Authors
Zhen Shen, Children’s Hospital, Fudan University, Shanghai, China

Background/Purpose
Whether type III cyst biliary atresia (BA) with extrahepatic biliary cyst (EHBC) presents a unique entity distinct from conventional type III BA and the value of EHBC in diagnosis and prognosis is unknown.

Methods
Eight type III CBA patients operated on from 2008 to 2012 with EHBCs detected in preoperative ultrasonography were enrolled. Sixteen patients with conventional type III BA and 14 patients with type IIIb BA with EHBCs were selected as controls.

Results
Preoperative TB/CB, ALT/AST, GGT, positive rates of serum CMV-IgM/DNA, fibrosis and inflammation scores in biopsy were not significantly different between type III CBA and conventional type III BA. Numbers of residual bile ducts in fibrous tissue of porta hepatis were 3-20 and 2-19/HP, respectively (p<.05). Rate of Jaundice clearance (75.0%), ascending cholangitis (62.5%) and 2-year survival (56%) were not different from conventional type III. One EHBC was localized in common bile duct, 15mm in diameter. The rest 7 were in porta hepatis, <10mm in diameter. All EHBCs in control were > 10mm.

Conclusions
Type III cystic BA seems along the spectrum of BA, without significant differences in prognosis. However, EHBC in porta hepatis, <10mm in diameter, could be utilized as a proepopitive diagnostic ultrasonic feature for type III CBA.

26-POSTER
Severity of intrahepatic duct impairment in intraoperative cholangiography as a prognostic factor for curable biliary atresia

Authors
Zhen Shen, Children’s Hospital, Fudan University, Shanghai, China

Background/Purpose
Type I and II biliary atresia (BA) are considered “curable”, however, their prognosis vary significantly, so as the severity of intrahepatic bile duct (IHB) impairment. Here we aim to determine the impact of severity of IHB impairment on outcomes.

Methods
Patients with Curable BA operated on from August 2008 to December 2012 were classified into 2 groups according to their favorable/unfavorable IHB in intraoperative cholangiography. In favorable group (n=7), whole IHB was visible, through impaired and poorly defined. In unfavorable group (n=7), IHB was blurred, cloud-like or only visible in close proximity to porta hepatis. Follow-up period was 9-50 months.

Results
Size of extrhepatic biliary cyst (EHBC) in favorable group was large than that in unfavorable group (24.9±8.84 vs 7.5±1.1mm in diameter, P<.05). Preoperative ALT, AST and GGT were not significantly different. Unfavorable group had a decreased severity of intrahepatic duct impairment (7.1% vs 100%, P<.05), physical retardation was seen in One long-term survivor with unfavorable IHB but in none of those with favorable IHB.

Conclusions
Prognosis of curable BA is highly correlated with the severity of IHB impairment. Outcomes of patients with unfavorable IBD should be further improved.

27-POSTER
Does pneumoperitoneum adversely affect growth, development, and liver function in postoperative biliary atresia patients? Open versus laparoscopic portoenterostomy.

Authors
Hirotoki Nakamura; Hiroyuki Koga; Go Miyano; Manabu Okawada; Takashi Doi; Geoffrey J Lane; Tadaharu Okazaki; Masahiko Urao; Atsuyuki Yamataka, Department of Pediatric General and Urogenital Surgery, Juntendo University School of Medicine

Background/Purpose
Pneumoperitoneum reportedly decreases hepatocyte proliferation and induces hepatocyte damage in biliary atresia (BA) model mice. High PaCO2 due to pneumoperitoneum could also hinder growth (G) and development (D: gross/fine motor function, communication/social skills). We compared 22 consecutive BA patients treated at a single institution from 2005-2013 between open or laparoscopic portoenterostomy (OPE: n=10, LPE: n=12) to determine whether pneumoperitoneum has adverse effects on G&D and liver function.

Methods
Both OPE and LPE were performed using principles described originally by Kasai. All data were collected prospectively from outpatient and baby health records.

Results
Differences in duration of follow-up (LPE: 34 months; OPE: 38 months), jaundice clearance (LPE: 12/12=100%; OPE: 8/10=80%), survival with the native liver (LPE: 10/12=83%; OPE: 8/10=80%), incidence of cholangitis, and incidence of esophageal varices were not significant. Mean intraoperative PaCO2 was significantly higher in LPE (LPE: 50.1mmHg; OPE: 40.7mmHg, p < .05). Liver function impairment was not statistically different although LPE results were slightly worse. G&D delay in LPE was not significantly different from OPE. In both groups, G&D delay was similar until discharge from hospital then resolved within 6 months.

Conclusions
Pneumoperitoneum would appear to have no adverse effects on G&D and liver function in postoperative BA patients.

28-POSTER
Total bile acid: a valuable surgical indicator in neonates with biliary cystic lesions diagnosed prenatally?

Authors
Qiu-ming HE; Jia-kang YU; Wei ZHONG; Zhe WEN; Xiao-li XIE; Chao HU; Le LI, Department of Pediatric Surgery, Guangzhou Women and Children’s Medical Center, Guangzhou, China

Background/Purpose
More biliary cystic lesions (BCL) are found prenatally with advanced imaging techniques. Early surgical intervention is recommended to rule out potential biliary atresia (BA) and good outcome. The aim of this study was to evaluate the indicator of surgery in neonates with BCL.
Background/Purpose
Cystic lymphangioma arising from falciform ligament is a rare disease in children and there was no any previously reported

Authors
Jiangbin Liu,

32-POSTER
Treatment for Misdiagnosed Cases during Laparoscopic congenital bile duct cysts resection and follow up analysis

Authors
Yingchao Li, Suolin Li, The Second Hospital of Hebei Medical University Shijiazhuang, Hebei, P. R. China

Background/Purpose
Porta hepatitis space-occupying diseases that have similar imaging characteristics found as congenital bile duct cyst can be easily misdiagnosed for some children.

Methods
Among 52 cases of congenital bile duct cysts studied between January 2010 and march 2012, 4 cases were determined as misdiagnosis through laparoscopic exploration, intraoperative biliary imaging, and/or rapid biopsy pathologic examination during Laparoscopic congenital bile duct cysts resection. By revising the surgery process, we obtained good therapeutic effect.

Results
The misdiagnosis rate is 7.7%. For these 4 misdiagnosed cases, 2 cases were exogenous liver cyst. One case was retroperitoneal inflammatory hemangioma. Another case was botryoid rhabdomyosarcoma of common bile duct. Postoperative pathological examinations confirmed the diagnosis during the surgery. After 6 ~45 months follow up visit period for these 4 cases, no serious complications such as bile leakage, intestinal leakage, anastomotic stenosis, and tumor recurrence etc., were found. The patient with retroperitoneal inflammatory hemangioma was re-hospitalized after eight months due to adhesive intestinal obstruction and cured with conservative treatment.

Conclusions
Laparoscopic exploration, Intraoperative biliary imaging and rapid biopsy pathologic examination should be utilized during the surgery to make appropriate surgical decisions. Correct diagnosis and optimized surgical treatment for children suffering from Porta hepatitis space-occupying disease can get good prognosis.

30-POSTER
Thoracoscopic repair of esophageal atresia with tracheoesophageal fistula: overcoming the learning curve

Authors
Sanghoon Lee, Suk-Koo Lee, Jeong-Meen Seo, Deokbi Hwang, Samsung Medical Center

Background/Purpose
We describe our initial experience of thoracoscopic esophageal atresia with distal tracheoesophageal fistula (EA/TEF) repair.

Methods
We describe our initial experience of thoracoscopic esophageal atresia with distal tracheoesophageal fistula (EA/TEF) repair. Among 22 cases of congenital bile duct cysts studied during January 2010 and march 2012, 4 cases were determined as misdiagnosis through laparoscopic exploration, intraoperative biliary imaging, and/or rapid biopsy pathologic examination during Laparoscopic congenital bile duct cysts resection. By revising the surgery process, we obtained good therapeutic effect.

Results
The study period was divided into 2 sections: from 2008 to 2011 (13 cases) and from 2012 to 2013 (9 cases). Patient characteristics did not differ between the two study periods. Mean operation time was significantly shorter in period 2 compared to period 1 had clinically significant esophageal strictures requiring one or more sessions of balloon dilatations. No cases of leakage was seen in 2 cases during period 1, while no cases of leakage were encountered in period 2. Ten out of 13 cases (76.9 %) in period 1 had clinically significant esophageal strictures requiring one or more sessions of balloon dilatations. No cases of esophageal strictures were seen in period 2 (p < 0.01).

Conclusions
When the initial learning curve was endured, surgical outcomes of thoracoscopic repair of EA/TEF were superior to the outcomes of earlier cases, and comparable to past experiences with open thoracotomy.

31-POSTER
Laparoscopic Aspiration for Neonatal Ovarian Cysts: Minimally Invasive Surgery

Authors
Jihoon Kim, Jonghun Lee, Jeong-Meen Seo; Seong Chul Kim, Department Of Trauma & General Surgery, The Catholic University Of Korea, Uijeongbu St.Mary’s Hospital; Dae Yeon Kim, Department of Pediatric Surgery, University of Ulsan College of Medicine & Asan Medical Center, Korea; Min Jong Cho, Department of Surgery, Konkuk University Medical Center, Korea; Seong Chul Kim, Department of Pediatric Surgery, University of Ulsan College of Medicine & Asan Medical Center, Korea

Background/Purpose
To review our experience with laparoscopic aspirations and minimally invasive surgeries for neonatal ovarian cysts (OCs), and report the outcome of their follow-up.

Methods
Twenty-one neonates diagnosed as OCs were retrospectively reviewed at the Asan Medical Center from 2006 through 2013. Out of 21 neonates, 8 showed simple cysts and 13 showed complex cysts in ultrasound. Laparoscopic aspiration was performed for all neonates with simple cysts. Torsion was found in 7 out of 13 neonates with complex cysts. Three neonates underwent detorsion while 2 neonates underwent oophorectomy. Two neonates already showed auto-ligation, showing a cystic mass, which was removed. The remaining 6 neonates with complex cysts underwent only aspiration since no torsion was found. Out of 14 who underwent only aspiration, 11 showed no cyst while 3 neonates, having a cyst with a size <2 cm, are followed up. Out of 3 who underwent detorsion, 1 showed an ovary without cyst, while 2 showed neither cyst nor ovary.

Conclusions
Laparoscopic aspiration is a simple, safe, and effective minimally invasive procedure to perform. It may also avoid torsion of simple OCs and cases with hemorrhagic cysts. Detorsion, unroofing or oophorectomy for OCs with torsion would require further trial studies with long-term follow-up.

32-POSTER
Laparoscopic excision of rare disease: cystic lymphangioma arising from falciform ligament in children.

Authors
Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

Background/Purpose
Cystic lymphangioma arising from falciform ligament is a rare disease in children and there was no any previously reported
cases in Medline/Pub med. Our study is to investigate the feasibility and effectiveness of laparoscopic surgery on this tumor.

Methods
Medical records of 2 patients undergoing laparoscopic excision of cystic lymphangiomata occurred in the falciform ligament from Shanghai Children’s Hospital, Shanghai Jiao Tong University from 2010 to 2012. One was male and another was female, with age of 4.3 and 6.7 years respectively. The most common symptoms were abdominal pain and abdominal distention without vomiting. The cystic size of the two patients was 9.5X5.5 cm, 7.8X3.3 cm by ultrasound examination. And CT, MRI scanning demonstrated a multiple cystic mass.

Results
Cystic mass arising from falciform ligament the falciform ligament of the two patients was successfully removed by laparoscopic resection. No bowel loops or mesentery was involved. The operative time was 51, 39 minutes respectively. The pathologic investigation showed benign cystic lymphangiomata. There were no intra- or postoperative complications during follow-up, no recurrence was seen and the patients remained in good health.

Conclusions
We present the first case report on cystic lymphangioma arising from falciform ligament and laparoscopic resection is safe, feasible treatment of choice.

UROLOGY

33-POSTER Modified Technique for Large Rectovestibular Fistula with Normal Anus

Authors Peng Li, Department of Pediatric Surgery, the Second Affiliated Hospital of Xi’an Jiaotong University, Xi’an

Background/Purpose Rectovestibular fistula with normal anus (RFVNA) is an abnormal communication between the normal rectum and vestibule in girls presenting with fecal leakage through the fistula. In the majority of the reported cases, the vestibular openings were less than 5 mm in diameter. There is no consensus on how to treat RFVNA although various procedures have been performed for this condition. The major complications are fistula recurrence (5%-30%) and wound dehiscence (0%-25%). There has been no report about the operation method and recurrence rate of large RFVNA in literature as yet.

Methods
Out of a total of 218 patients with RFVNA, 8 patients (3.67%) presented with large fistulas which diameters of fistula orifice were more than 1 cm were included in this study. Our modified technique was used.

Results
There was no recurrence of fistula in all patients. Follow-up was obtained from 2 to 8 years (median 5.6 years). All of the patients were continent and had regular bowel movements without recurrence of fistula or rectal stenosis.

Conclusions
The large RFVNA that we encountered were acquired after repeated infection due to insufficient drainage or previous failed operation. Our modified technique for large RFVNA was successful and reasonable to avoid fistula recurrence.

34-POSTER Modified Primary Ano-Rectoplasty For Vestibular Malformations In Female

Authors Rajah S, Paediatric Surgery Department, Sabah Women And Children Hospital

Background/Purpose This retrospective study analyzes the advantages of sub mucosal excision of anterior wall of the fistula in patients with vestibular malformations.

Methods
79 patients age range from 2 days 9 years with vestibular fistulas underwent primary repair in our institution during 1992 to 2013. Patient in lithothomy position two to 5ml of local infiltration was given at 11 and 1’O clock position at the fistula. Semilunar incision at postero-lateral border of fistula and by midline dissection the posterior and lateral wall of the fistula was mobilised. Sub mucosal resition of the anterior wall of the fistula for about 5mm to 10mm facilitated adequate release of bowel. Anoplasty was performed after excising the fistula and anchoring the rectum within the muscle complex identified with electrostimulation. Oral feeding was allowed in 3 to 4 days and discharged on 5th day.

Results
Minimal wound infection occurred in 2 patients. No anterior migration was noted. 62 patients over 3 years were assessed. 48 patients had good continence. 10 patients had constipation relieved with laxatives and 4 had occasional staining.

Conclusions
Local infiltration and submucosal resition of anterior wall of the fistula minimized the bleeding and avoids damage to vagina. It is relatively safe with equally good results.

35-POSTER Polyorchidism with undescended testis: A case report

Authors Yasunari Sasaki, Department of Pediatric Surgery, Kyoto Yamashiro General Medical Center

Background/Purpose Polyorchidism is a rare congenital anomaly, but the indication for the resection of an accessory testis are controversial. We reported on a case of polyorchidism.

Methods
A 12-year-old boy was admitted because of left cryptorchidism since birth. Physical examination revealed healthy, well developed boy. Right testis was normally palpated in the right scrotum; however, the left testis was palpated in the left inguinal canal. A supernumerary testis was not palpated as a scrotal masses on physical examination. Magnetic resonance imaging (MRI) showed the left testis at the left inguinal canal. However, the supernumerary testes were not obviously shown by MRI.

Results
At surgery, two separate testicular masses were found. The caput epididymis was attached to the superior pole of the upper normal-looking tests, but there was no connection with the vas deferens. Only the lower accessory mass in the scrotum was continued into a single vas deferens, however the epididymis was vague. Both of them were replaced in the left scrotum together.

Conclusions
Polyorchidism is a rare congenital anomaly; moreover our case was not classified into any types described in previous literatures. This patient must be followed up with regular clinical and ultrasonic examination in the future.

36-POSTER Soft tissue coverage effectively protects the neo-urethra during hypospadias surgery. A single surgeon’s experience of 225 cases.

Authors Shogo SEO, Takanori OCHI, Yuta YAZAKI, Manabu OKAWADA, Takashi DOI, Go MIYANO, Hiroyuki KOGA, Geoffrey J LANE, Atsuyuki YAMATAKA, Juntendo University School of Medicine

Background/Purpose Soft tissue coverage (STC) reportedly supports the neo-urethra during hypospadias repair (HR) and prevents postoperative urethrococutaneous fistula (PUF).
Conclusions
There were 4 patients in the laparoscopic group and 10 in the open excision group. There was no difference in operative time.

Methods
We performed a retrospective chart review of all patients undergoing open or laparoscopic excision of a presumed urachal remnant from June 2007 to January 2013. We collected demographic data as well as presentation, length of stay, operative time, and total hospital expenses.

Results
There were 61 patients (99 ureters) of whom 47 (77%) were male. The VUR grade in the ureters was one in 3 (3.1%), two in 66 (6.2%), three in 33 (34%), four in 38 (39.2%) and five in 16 (16.5%). Median age at operation was 36 months (range 6-132) and the median follow-up period was 84 months (15-156). There was pre-existing renal scarring in 52 (52.5%) ureters. All VUR except 2 (2.1%) and 3 (3.1%) respectively in the ureters with one scar resolved after surgery (98% success). No patient developed post-operative obstruction. After UR, 14 kidneys (14.1%) deteriorated in function despite absence of post-operative UTI.

Conclusions
STC, especially ESF, is valuable for preventing PUF in HR.

37-POSTER
Ureteral Re-Implantation For Primary Vesico-Ureteral Reflux: Technical Success Does Not Predict Preservation Of Long-Term Renal Function

Authors
Te-Lu Yap; Caroline Ong Choo Phaik, KK Women’s and Children’s Hospital; Shireen Anne Nah HY; Jacobsen Anette S; Yee Low, Women’s and Children’s Hospital

Background/Purpose
The ultimate goal of primary vesico-ureteral reflux (VUR) treatment is preservation of renal function, but the published evidence is limited. We aim to analyze the long-term outcomes of our patients undergoing open ureteral re-implantation (UR).

Methods
We retrospectively reviewed patients who underwent open Cohen UR for primary VUR between 2001 and 2010 and collected data on patient demographics, pre-operative and post-operative imaging and episodes of febrile urinary tract infections (UTI). Post-operative renal function deterioration was defined as 3% reduction in differential renal function on DMSA, with or without any new area of scarbing.

Results
There were 61 patients (99 ureters) of whom 47 (77%) were male. The VUR grade in the ureters was one in 3 (3.1%), two in 66 (6.2%), three in 33 (34%), four in 38 (39.2%) and five in 16 (16.5%). Median age at operation was 36 months (range 6-132) and the median follow-up period was 84 months (15-156). There was pre-existing renal scarring in 52 (52.5%) ureters. All VUR except two resolved after surgery (98% success). No patient developed post-operative obstruction. After UR, 14 kidneys (14.1%) deteriorated in function despite absence of post-operative UTI.

Conclusions
Despite successful anti-reflux effect, UR may not prevent future renal deterioration. Long-term clinical follow-up with functional imaging is advisable.

38-POSTER
Pseudotumoral Cystitis in Children: Clues to Etiology

Authors
Yee Low, Caroline Ong, KK Women’s and Children’s Hospital

Background/Purpose
Proliferative bladder masses arising in benign cystitis is uncommon in children. Although benign in nature, it masquerades as a tumour on imaging. This paper reports our experience to raise awareness of this uncommon condition.

Methods
A report of 3 cases of pseudotumoral cystitis, with review of the relevant literature and discussion on the likely etiopathogenesis.

Results
Two children presented with gross haematuria and dysuria while 1 child presented with anaemia with no urinary symptoms. Ages ranged from 3 to 8 years. Imaging in all 3 children showed irregular bladder masses suggestive of possible rhabdomyosarcoma. Histopathological examination from cystoscopic biopsies from all cases showed inflammatory cystitis. Adenovirus was positive in one while ulcerative colitis developed concurrently in another. All 3 cases ran a self limiting clinical course with resolution of clinical symptoms and imaging abnormalities.

Conclusions
In children with bladder masses, due consideration should be given to the possibility of pseudotumoral cystitis. Etiopathogenesis is uncertain but likely to be diverse, including infective and immunological causes. The clinical course is self limiting. Recognition of this rare condition is important in planning management and appropriate counseling.

39-POSTER
Laparoscopic Versus Open Excision of Urachal Remnants

Authors
Alia Whitehead MD; L. Grier Arthur MD; Rajeev Prasad MD, St. Christopher’s Hospital for Children

Background/Purpose
A urachal remnant forms when the embryologic connection between the bladder and the umbilicus fails to obliterate. Urachal remnants should be excised once discovered. Traditionally, excision has been performed via an open approach. More recently, minimally invasive techniques have been applied. There are no studies in the literature comparing open and laparoscopic excision in children.

Methods
We performed a retrospective chart review of all patients undergoing open or laparoscopic excision of a presumed urachal remnant from June 2007 to January 2013. We collected demographic data as well as presentation, length of stay, operative time, and total hospital expenses.

Results
There were 4 patients in the laparoscopic group and 10 in the open excision group. There was no difference in operative time (laparoscopic: 66.75 min vs open: 57.2 min, p-value 0.50). There was a trend toward increased cost and longer post-operative length of stay in the laparoscopic group ($60594.05 vs $40454.83, 43.25 hours vs 9 hours) but neither was statistically significant (p-values 0.11 and 0.058, respectively). There were no complications in either group.

Conclusions
Laparoscopic excision of urachal remnants is a safe and effective alternative to open excision. The laparoscopic approach allows for excellent visualization of the entire urachal tract.
40-POSTER  Vesico-cutaneous fistula: A simple method for continent urinary diversion
Authors  Wendy Yang; Pei-Yeh Chang, Department of Pediatric Surgery, Chang Gung Children’s Hospital, Chang Gung Memorial Hospital, Linkou, Taiwan
Background/Purpose  Patients with lower urinary tract anomalies or neurogenic disorders often have voiding difficulties. Clean intermittent catheterization (CIC) is effective for bladder drainage. However, transurethral catheterization or a Mitrofanoff conduit have disadvantages, including painful catheterization, difficult surgical techniques, and frequent operative complications.
Methods  Between December 1, 1998 and December 31, 2013, six patients underwent a vesico-cutaneous fistula for CIC. The fistula was created at the bladder dome. A Foley catheter was left in place for at least 2 weeks to prevent stoma stricture. A CIC program was started immediately after catheter removal. Further stenting during the night in the first 6 months was necessary to prevent early closure.
Results  Follow-up ranged from 6 months to 16 years. All patients showed improvements in hydroureteronephrosis. Decreased urinary tract infection frequency was seen in five patients. Renal function was normal in five patients, while the other suffered from chronic renal failure preoperatively. Only one patient had occasional mild urine leakage from the stoma at night, once in 2 weeks. No patient experienced painful or difficult catheterization.
Conclusions  The vesico-cutaneous fistula is a simple, effective, and tolerable method for CIC. It may be a substitute for or a transition to a Mitrofanoff conduit in some patients.

41-POSTER  miR-302 suppresses neuroblastoma proliferation and metastasis via down-regulation of CDK4
Authors  Xu Cao; Jian Wang, Children’s Hospital of Soochow University
Background/Purpose  Previous studies have shown that miR-302 functions as a tumor suppressor in some malignancies. Its role in neuroblastoma remains largely unexplored. We report a functional role of miR-302 in Wilms tumor proliferation and metastasis via CIC4.
Methods  First, we analyzed miR-302 in 14 metastatic and primary Wilms tumor tissues by way of Real-time PCR. To address the functions of miR-302 in Wilms tumors, we transfected miR-302 mimics into neuroblastoma cells. Then we measured cell proliferation by MTT assay and invasive capacity. Finally, we predict the possible target gene of miRNAs, we carried out a computational analysis on Targetscan and confirmed by luciferase reporter activity assay.
Results  MiR-302 was down-regulated in metastatic tumor tissues compared with primary tumor tissues. In vitro studies further showed that forced overexpression of miR-302 mimics substantially suppressed cell proliferation, migration, and invasion of neuroblastoma cells. MiR-302 overexpression could repress expression of CDK4 by directly targetting its 3′-untranslated region. Overexpression of CDK4 partially reversed the tumor suppressive effects of miR-302 in neuroblastoma cells.
Conclusions  Our data suggest that miR-302 may suppress neuroblastoma cell growth and motility, at least in part, by targeting CDK4. MiR-302 and CDK4 may be a potential novel therapeutic target for the treatment of Wilms tumor.

42-POSTER  Hydronephrosis caused by inguinal herniation of uterus
Authors  Taku Noda, Takanao Oyama, Okayama University Hospital; Kiyoshi Sasaki, Kochi Health Sciences Center
Background/Purpose  In infant girls, indirect inguinal hernias containing the ovary and fallopian tube are not uncommon, but inguinal hernias containing the uterus are very unusual. We present a rare case of inguinal hernia containing the uterus that caused hydronephrosis in a female infant.
Methods  Hospital records of the patient with hydronephrosis caused by inguinal herniation of uterus were reviewed.
Results  A 1-month-old female who had detected right multi-cystic dysplastic kidney by prenatal ultrasonography, was pointed out left hydronephrosis by postnatal follow-up examination. MRI and CT revealed the uterus incarcerated into the left inguinal canal compressed the left ureter. She had not noticed the mass region in the left groin. Laparoscopic repair was attempted but was not successful. The operation was converted to the classic inguinal approach because of the treatment for this sliding inguinal hernia of the uterus. After purse-strings’ suture was made around the hernia sac, the hernia sac was inverted and closed. After operation, left hydronephrosis was immediately disappeared.
Conclusions  This is the first report of unique inguinal herniation of the uterus that caused hydronephrosis. The operation through an inguinal approach was better for reduction of the sliding component.

ONCOLOGY

43-POSTER  Children with an adult disease: A case report and literature review of colorectal cancer in childhood.
Authors  Lucy Goddard, Wellington Hospital, Department of Paediatric Surgery; Atikah Razley, Wellington Hospital, Department of Gastroenterology; Professor Kevin Pringle, Wellington Hospital, Department of Paediatric Surgery, University of Otago; Elizabeth Dennett, Wellington Hospital, Department of Colorectal Surgery
Background/Purpose  A 15-year-old boy presented with a 2-month history of abdominal pain and weight-loss. A CT scan showed a likely colon cancer with liver metastases. Colonoscopy confirmed the diagnosis. He underwent an extended right hemicolectomy. Histology revealed T3N2M1 mucinous adenocarcinoma. We conducted a literature review to investigate incidence, treatment and prognosis of childhood colorectal cancer.
Methods  Two authors individually conducted a literature search using Ovid/Embase and Google Scholar databases. The results were combined.
Results  Colorectal cancer is rare in children and adolescents with an incidence of 1 in 10,000,000. We found 441 reported cases of colorectal cancer in patients aged <20 years. Children often present with advanced disease and aggressive histopathology. Unfortunately, prognosis is poor with 5-year survival rates of 2.5-40%. Carcinoembryonic antigen levels were not useful for detecting recurrence or disease progression. Prompt surgery is the mainstay of treatment but adjuvant chemotherapy is important. Oncologists with experience managing adult colorectal carcinoma should be involved early. Genetic testing and screening of family members is essential.
Conclusions  Colorectal cancer is rare in childhood. It is frequently associated with advanced disease and poor outcomes. Treatment should be aggressive and involve both colorectal surgeons and oncologists with colorectal cancer experience.
44-POSTER Perforated appendicitis with carcinoid tumour: Is an ileo-colic resection warranted?

Authors
Nandini Singh, University of Newcastle, Australia; Simon Ghosh, John Hunter Children's Hospital, Newcastle, Australia; Peter Michail, University of Newcastle, Australia; Rajendra Kumar, John Hunter Children's Hospital, Newcastle, Australia

Background/Purpose Carcinoid tumours in association with perforated appendicitis have scarcely been reported in the pediatric literature. Further ileocolic resection is currently recommended in adult literature, based upon criteria such as tumor size >2cm, involvement of the meso-appendix or base of appendix, lymphovascular invasion and high-grade tumor. A case of perforated appendicitis, which required subsequent ileocolic resection, is presented with a review of the literature.

Methods A previously well 11-year-old boy presented to a regional hospital with perforated appendicitis and underwent routine open appendicectomy. Histopathology revealed a carcinoid tumour of 11mm in size in the proximal third of the appendix, with infiltration through the muscular wall to the subserosal plane and a positive meso-appendiceal margin. Further investigation at our institution included a negative 24hr urine for 5-HIAA and gallium scan. An elective limited ileocolic resection was performed in view of tumor size, meso-appendiceal involvement and perforation at its base. The resected specimen revealed no evidence of tumor progression and the child is currently well.

Results -

Conclusions Although carcinoid tumors of the appendix represent low malignant potential, a tumor with perforation has a higher potential for metastatic spread. Further ileo-colic resection may be necessary to assess for residual tumor and lymph node spread.

45-POSTER Clinical Experience with Infantile Hepatic Hemangioendothelioma in Neonates: Retrospective Study of Ten Patients

Authors
Wei ZHONG; Xiao-li XIE; Qiu-ming HE; Jia-kang YU, Department of Pediatric Surgery, Guangzhou Women and Children's Medical Center, Guangzhou, China

Background/Purpose Infantile hepatic hemangioendothelioma (IHHE) is a rare malformation with only a few reports in the literature. This study is to investigate the clinical characteristics and appropriate therapy.

Methods A retrospective analysis of patients with IHHE between 2010 and 2013 was performed.

Results Ten patients (median age 8 days, six diagnosed prenatally) with IHHE were diagnosed and identified by CT after birth. Of these cases, eight were focal lesion, one multifocal and one diffuse. Four symptomatic patients, including one with Kasabach-Merritt syndrome (KMS) and cardiac failure, two with KMS only and one with diffuse mass, underwent medical treatment with corticosteroids and/or propranolol. Tumor size and body weight ratio (SWR) above 1.66 was found in these four symptomatic cases. One was received surgical resection to rule out malignancy. Seven were in regression and two were stable during 1 month to 2.7 years (mean, 9.5 months) followed up.

Conclusions Clinical symptoms might present when the SWR surpass a certain level. In symptomatic patients, drug therapy finally proved to be effective and should be considered primarily.

46-POSTER Successful thoracoscopic resection of large symptomatic mediastinal lymphatic malformations: report of three cases

Authors
Amy W Cheng; Donald B Shaul; Roman M Sydorak, Kaiser Permanente Los Angeles Medical Center

Background/Purpose Lymphatic malformations (LMs) involving the mediastinum are uncommon. Treatment of these lesions can be difficult due to their location.

Methods We report three cases of mediastinal LMs that were successfully resected thoracoscopically.

Results The first patient presented at age 2 with wheezing and fever and was found to have a cystic mass in the left neck extending into the superior mediastinum on imaging. The second patient was a 14-year-old girl with Klippel-Trenaunay-Weber syndrome who was noted to have chest pain. Imaging showed a large mediastinal mass. The third patient had a prenatally diagnosis of a large complex mass in the right side of the neck and extending into the neck and underwent a planned ONFH procedure at birth. The thoracic component of the mass prevented extubation. All three patients underwent successful thoracoscopic resection of their mediastinal LMs with resolution of their symptoms. The first patient developed a left hydrothorax two months post-operatively after an episode of coughing, which was evacuated with tube thoracostomy. The third patient’s post-operative course was complicated by a left chylothorax that also resolved with tube thoracostomy and medical management.

Conclusions Thoracoscopic resection of mediastinal LMs can be safe and effective in relieving patients of their symptoms, and should be considered in the pediatric population.

47-POSTER Prenatally diagnosed cystic adrenal tumors: differential diagnosis and perinatal management

Authors
Shigeru Ono; Kosaku Maeda; Katsuhisa Baba; Yoshiko Usui; Yuki Tsuji; Insu Kawahara; Atsuhisa Fukuta; Sachi Sekine, Pediatric Surgery, Jichi Medical University School of Medicine

Background/Purpose Prenatal diagnosis of intra-abdominal cystic lesions has become more common with advances in ultrasonography; however, prenatally diagnosed cystic adrenal tumors are extremely rare. Therefore, the establishing a precise diagnosis of congenital adrenal cystic tumor is difficult, and postnatal management remains controversial.

Methods The medical records of patients with prenatally diagnosed cystic adrenal tumors were reviewed and analyzed retrospectively.

Results From 2010 to 2013, there were 5 prenatally diagnosed cystic adrenal tumors, consisting of 2 cystic neuroblastomas, 1 adrenal cyst, 1 adrenal hemorrhagic pseudocyst, and 1 adrenal hemangioma. It was difficult to differentiate these entities before surgery. All patients had normal serumNSE and urinary VMA/HVA levels. In all 5 cases, postnatal ultrasound and CT scan revealed no change in the tumor’s internal texture or size. Surgical resection was performed between day 7 and 29 of life. The postoperative course was uneventful. The 2 patients with cystic neuroblastoma did not receive postoperative chemotherapy.

Conclusions Radiological studies and tumor markers (NSE or urinary VMA/HVA) are not useful for differentiating congenital cystic neuroblastoma from other cystic lesions. Therefore, surgical intervention is recommended for final histological diagnosis within 4 weeks after birth.
Conclusions

These results demonstrated that children with cancer had poor HRQOL during treatment. Those with advanced neuroblastoma and advanced neuroblastoma displayed worse HRQOL at all time points as determined by Core Scales. Parent proxy report for the core and cancer modules demonstrated lower HRQOL scores than child self-report, but the two were highly correlated. There were no obvious differences in PedsQL total scores from the initial to the follow-up assessment during treatment between Wilm’s tumor patients and advanced neuroblastoma patients. However, children with advanced neuroblastoma have worse PedsQL scores compared with those with Wilm’s tumor after 6 and 12 months of treatment.

Conclusions

These results demonstrated that children with cancer had poor HRQOL during treatment. Those with advanced neuroblastoma were at higher risk for long-term impaired HRQOL. Intervention and effects aimed at improving HRQOL in these children are required.

49-POSTER

Right middle sleeve lobectomy for inflammatory myofibroblastic tumor in a 4-year-old child

Authors

Masayuki Obatake, Taichiros Kosaka, Yusuke Yamane, Yasuaki Taura, Takeshi Nagayasu, Nagasaki University

Background/Purpose

Inflammatory myofibroblastic tumor (IMT) is a rare benign tumor. It is considered as a low grade malignancy. The lung is the most commonly affected site in children, however, the trachea and the bronchus can also be affected less often. We report a case of a four-year-old child who had an endobronchial IMT arising in the bronchus intermedius.

Methods

A 4-year-old girl was referred to our hospital because of a right middle and lower lobe atelectasis. A computed tomography showed an endobronchial mass on the right bronchus intermedius. The bronchoscopy showed that the tumor had completely obstructed the right bronchus intermedius, and the tumor was cauterized and resected with a semiconductor laser.

Results

Five months after the resection the bronchoscopy revealed the recurrence of the tumor. Thoracotomy was performed 2 months after the recurrence. The tumor was also resected with the right middle sleeve lobectomy. Microscopic examination revealed a proliferation of spindle cells and eosinophils. Immunohistochemical analysis showed positive staining for ALK, vimentin, and S100.

Conclusions

The treatment and a good prognosis of endobronchial IMT rely on complete surgical resection. Sleeve lobectomy is a relevant treatment for the lesion on the main stem bronchus and can preserve respiratory function.

50-POSTER

Adenocarcinoma of the Alimentary Tract in Children

Authors

Kwang Sik Kim, College of Medicine, Cheju National University and Cheju National University Hospital; DaeYeon Kim, SeongChul Kim, Jihee Hwang, University of Ulsan College of Medicine, Asan Medical Center; Sohyun Nam, Inje University Haeundae Paik Hospital

Background/Purpose

We aimed to review clinical characteristics and outcomes of the adenocarcinoma of the alimentary tract (ACAT) in children.

Methods

We retrospectively analyzed medical records of 23 children (?18 years of age) who were treated with ACAT from 1995 to 2013 in Asan medical center.

Results

There were thirteen males and ten females and the median age was 16 years (range 11–18 years). The sites of the tumor were the stomach (n=8) and the small bowel (n=1) and the colon (n=14). Four patients (17.3%) had underlying precancerous disease, the Familial adenomatous polyposis (n=2), the Juvenile polyposis (n=1), the Peutz-Jeghers syndrome (n=1). Familial history of ACAT was found in two children. Twelve patients (12/23, 52.1%) had distant metastasis on initial diagnosis, and the most common site was the peritoneum (n=11, 91.6%). Eleven patients (11/23, 47.8%) underwent curative resection. Median follow-up period was 13 months from the diagnosis (range 1–158 months). The overall 1-year survival was 50.5%, 5-year survival was 32.1%. Among resection group, three patients had recurrence (27.2%). On survival analysis, colon cancer group (p<0.05) had better outcome.

Conclusions

ACAT in children often associate with distant metastasis at initial diagnosis. For early detection, careful surveillance is needed to children with precancerous disease.

51-POSTER

Surgical management of focal nodular hyperplasia in children: experience with 12 cases

Authors

Yi Ji, West China Hospital of Sichuan University; Siyuan Chen, Lin Zhong, Shuguang Jin, Bo Xiang, Hospital of Sichuan University

Background/Purpose

Focal nodular hyperplasia (FNH) is a benign hepatic tumor that is rare in children. Our aim was to investigate the experience in the surgical management of pediatric FNH.

Methods

Following approved by the institutional review board of the West China Hospital of Sichuan University, a review of the medical records of patients with pathological diagnosis of FNH between 2003 and 2013 at West China Hospital was undertaken.

Results

There were 3 males and 9 females whose ages ranged from 23 months to 18 years with a means of 13.2 years. Nine patients were symptomatic at presentation. All patients had aspartate aminotransferase and alanine aminotransferase. One patient had raised ?-fetoprotein level. No patients had a remote history of childhood malignancy. All patients underwent liver resection. The mean size of resected lesions was 6.4 cm (range, 2.4–11.5 cm). There was no operative death or postoperative complications. The children were followed up ranging from 3 to 61 months (mean 26 months) without sequelae.

Conclusions

Pediatric FNH patients who underwent resection because of symptoms, increasing size, or inability to confidently rule out malignancy had good outcomes.
### 52-POSTER  Surgical Treatment for Large Cervical Lymphangioma

**Authors**  Deokbi Hwang; Sanghoon Lee; Suk-Koo Lee; Jeong-Meen Seo, Samsung Medical Center

**Background/Purpose**  Cervical lymphangiomas are rare lymphovascular malformations arising in the neck, which form huge fluid-containing cysts. Treatment of the malformation consists of surgery and sclerotherapy. However, the optimal approach is still controversial. Here, we describe a series of cervical lymphangioma which were treated with surgical approaches.

**Methods**  We retrospectively investigated the medical records of 449 patients who had been diagnosed with cervical lymphangioma from 2001 to 2012 in our center.

**Results**  Sixteen patients underwent surgical excision of cervical lymphangioma. Mean age was 16 years. The indications of surgical treatment were lesions located near vital organs such as the trachea or carotid artery or non-responsiveness after repetitive picibanil injections. The mean size of the lymphangioma was 6.9 cm and on average, the patients were followed over a period of 23 months. Surgical treatments were done in coordination with a plastic surgeon or otorhinolaryngologist in 6 and 7 cases, respectively. Postoperative complications included swallowing difficulty, lip palsy, or dyslalia due to adjacent nerve damage. Four children had tracheostomy due to tracheal or subglottic stenosis after surgery.

**Conclusions**  Surgery for cervical lymphangioma may result in serious complications. A well thought-out surgical plan with a multidisciplinary surgical team approach is crucial for good outcome.

---

### 53-POSTER  The surgical management of Wilms’ tumor with persistent intravascular extension in children: experience from east China

**Authors**  Jiangbin Liu, Department of Pediatric Surgery, Shanghai Children’s Hospital, Shanghai Jiao Tong University

**Background/Purpose**  To review the outcome and experience of surgical management on the Wilms’ tumor with intravascular extension in children from two major children’s hospital in east China

**Methods**  From January 2000 to June 2012, 17 patients underwent treatment for Wilms’ tumor with persistent intracaval or arterial thrombus. Data were collected regarding clinical characteristics, chemotherapy, operative details, tumor and thrombus histology, and long-term outcome. Intravascular involvement type I?5 cases?type II4 cases?type III, 6 cases; and type IV, 2 case respectively. The surgery were: local cavotomy, 7/17, extensive infra-diaphragmatic cavotomy without cardiopulmonary bypass (CPB), 8/17, and excision of cavo-atrial thrombus with CPB and deep hypothermia and circulatory arrest (DHCA), 2/17

**Results**  There were no intraoperative death. The block time on extensive infra-diaphragmatic cavotomy without CPB were 13-25min. CPB on cavotomy and atriotomy was 25min. Tumor histology were following: FH(11/17) and UFH (6/17). The length of thrombus was 2.5-13 cm(mean 6.85.5 cm),16 patients followed up 0.8-9.5 years (mean 3.42.7 years), 15 patients remain disease-free and only 1 the disease recurred and died.

**Conclusions**  Surgical management for Wilms’ tumor with intravascular extension is still technically challenging. The outcome of Wilms’ tumor with persistent intravascular extension in children depends on the complete surgical excision with optimal chemotherapy.

---

### 54-POSTER  Real-time intraoperative identification of hepatoblastoma using a near infrared imaging system with indocyanine green

**Authors**  Yasuyuki Mitani; Akio Kubota; Katsunari Takifuji; Masaki Ueno; Takashi Watanabe; Shinya Hayami; Hiroki Yamaue, Wakayama Medical University, School of Medicine

**Background/Purpose**  Near infrared imaging with indocyanine green (ICG-NIR) is a novel fluorescent imaging system that can detect tiny primary liver cancer or metastatic liver tumors located on the liver surface. We report the pediatric case of hepatoblastoma which was detected by ICG-NIR imaging.

**Methods**  A 32-month-old female suffered from hepatoblastoma. After 4 courses of neoadjuvant chemotherapy, she underwent hepatectomy. Six months after the hepatectomy, the sAFP level increased again. CT and MRI delineated a recurrent tumor about 5mm in diameter on the liver surface, however, the border of tumor was not delineated well. As there was no evidence of distant metastasis, we planned additional hepatectomy for the recurrent tumor. ICG at a 0.5mg/kg dose was injected intravenously two days before the operation for intraoperative identification of the tumor.

**Results**  In operation, the tumor exhibited strong fluorescence in ICG-NIR imaging system, and there was no other fluorescence in the abdominal cavity or liver surface. Tumor resection with a sufficient surgical margin was performed. The histopathological findings revealed that the tumor was a macrotrabecular hepatoblastoma.

**Conclusions**  ICG-NIR can be a novel and reliable imaging tool for diagnosing hepatoblastoma located on the liver surface and facilitate to decide the necessary and sufficient resection border.