CANADIAN ASSOCIATION of
PAEDIATRIC SURGEONS

29th

Annual Meeting

BANFF

October 4-6, 1997
Twenty-Ninth Annual Meeting

CANADIAN ASSOCIATION of
PAEDIATRIC SURGEONS

October 4-6, 1997

Banff Park Lodge
222 Lynx Street
Banff (Alberta) CANADA
T0L 0C0

(403) 762-4433
SCIENTIFIC AND SOCIAL PROGRAM

Friday, October 3, 1997

09:00 - 17:00     Meeting of CAPS Council (Executive)
17:00              Registration
19:00 - 22:00     Welcoming Reception - Glacier Lounge

Saturday, October 4, 1997

07:00 - 13:00     Registration
07:00 - 07:55     Continental Breakfast
07:30 - 13:00     Exhibits
07:55 - 08:00     Welcome and Opening Ceremony
08:00 - 10:00     Scientific Session ONE
10:00 - 10:20     Refreshment Break
10:20 - 11:50     Scientific Session TWO
12:00 - 13:00     Fred MacLeod Lecture

Sunday, October 5, 1997

07:00 - 12:30     Registration
07:00 - 08:00     Continental Breakfast
07:30 - 13:00     Exhibits
08:00 - 09:00     "2 minutes/2 slides"
09:00 - 10:30     Scientific Session THREE
10:30 - 10:45     Refreshment Break
10:45 - 12:30     Scientific Session FOUR
12:30             CAPS Members Business Meeting
19:00             Presidential Reception
19:30             Presidential Banquet - Brewster Cowboy Barbecue and Dance

Monday, October 6, 1997

07:00 - 12:00     Registration
07:00 - 08:00     Continental Breakfast
07:00 - 13:00     Exhibits
08:00 - 09:50     Scientific Session FIVE
09:50 - 10:20     Refreshment Break
10:20 - 12:35     Scientific Session SIX
12:35             Annual Meeting Adjourns
PRESIDENT'S WELCOME

Welcome to Banff!

The 29th Annual Meeting is sure to be a great success.

This is indeed a time to exchange clinical and scientific information at both formal and informal gatherings but also to renew friendship, make new ones, welcome new members and guests, socializing and enjoying the social program.

I wish to thank Salam Yazbeck, our secretary, Arlene Ein, our meeting coordinator; Maureen and Andrew Wong, the local hosts of Banff; and Geoff Blair, the program chairman, for their wonderful work in providing us with an excellent scientific and social program.

I invite you all to participate and join in the fun of this unique gathering where you will learn as well as enjoy yourself.

Jean G. Desjardins, M.D.
President
Canadian Association of Paediatric Surgeons
ABOUT THE
CANADIAN ASSOCIATION OF PAEDIATRIC SURGEONS

The Canadian Association of Paediatric Surgeons was granted its charter in 1967. Its main aim is to improve the surgical care of infants and children in Canada.

There are three main areas, diagnosis, treatment and research, which are of special concern to the members.

Infants Born with Congenital Abnormalities

Even though the majority of newborn infants who have severe congenital abnormalities can be treated successfully by a surgical operation, often the condition is either not recognized, or if it is diagnosed, the local physician may be unaware of the possibilities for surgical cure. In this situation most of these babies die, or some survive to live a life crippled by their deformity.

Malignancy in Childhood

Cancer is the second most common cause of death in childhood. Surgical removal of the tumor, combined with X-radiation and chemotherapy provided by an aggressive team utilizing new techniques can achieve a cure in over 50% of these patients.

Trauma

Finally, the number one killer of children in North America is accidents. Here again, with modern methods of first aid, transportation, resuscitation, intensive care, and specialized surgical team effort, many of these seriously injured children can be saved.

Education Program

To accomplish an improvement in surgical care for babies and children, the Canadian Association of Paediatric Surgeons has launched an educational program for doctors, nurses and others working in the paediatric health field. To support this program, an educational fund has been established.
The Education Fund underwrites the visit of a distinguished paediatric surgeon each year to visit and teach at medical centers in Canada, provides a speaker on Paediatric Surgery at the Annual Meeting of the Canadian Paediatric Society, enables the Association to sponsor a session of scientific papers at the Meeting of the Royal College of Physicians and Surgeons of Canada and supports the Annual Scientific Meeting of the Association. Financing for the Education Fund has been obtained from individuals and groups, both medical and non-medical, interested in the surgical care of children, and from foundations. It is the intent of the Association to increase the capital funding to a level where the annual interest will fully support the Education Program.

The Education Fund of the Canadian Association of Paediatric Surgeons is registered with the Federal Government and all contributions are fully tax deductible. The Fund is audited annually.

Donations may be sent to:

Salam Yazbeck, M.D.
CAPS Secretary-Treasurer
Hôpital Sainte-Justine
3175 Côte Ste. Catherine
Montreal (Quebec) CANADA
H3T 1C5

Telephone  (514) 345-4688
Fax    (514) 345-4964
E-mail Secretary@caps.ca
## PRESIDENTS

<table>
<thead>
<tr>
<th>Years</th>
<th>Name</th>
<th>City</th>
</tr>
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<tbody>
<tr>
<td>1967-73</td>
<td>Harvey Beardmore</td>
<td>Montreal</td>
</tr>
<tr>
<td>1973-75</td>
<td>Colin Ferguson*</td>
<td>Winnipeg</td>
</tr>
<tr>
<td>1975-77</td>
<td>Jim Simpson*</td>
<td>Toronto</td>
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<tr>
<td>1977-79</td>
<td>Sam Kling</td>
<td>Edmonton</td>
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<tr>
<td>1979-81</td>
<td>Pierre-Paul Collin</td>
<td>Montreal</td>
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<tr>
<td>1981-83</td>
<td>Barry Shandling</td>
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<tr>
<td>1983-85</td>
<td>Gordon Cameron</td>
<td>Hamilton</td>
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<tr>
<td>1985-87</td>
<td>Stanley Mercer</td>
<td>Ottawa</td>
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<tr>
<td>1987-89</td>
<td>Alex Gillis</td>
<td>Halifax</td>
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<tr>
<td>1989-91</td>
<td>Jacques C. Ducharme</td>
<td>Montreal</td>
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<tr>
<td>1991-93</td>
<td>Sigmund H. Ein</td>
<td>Toronto</td>
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<tr>
<td>1993-95</td>
<td>Angus Juckes</td>
<td>Regina</td>
</tr>
<tr>
<td>1995-97</td>
<td>Jean G. Desjardins</td>
<td>Montreal</td>
</tr>
</tbody>
</table>

* indicates deceased

## SECRETARY-TREASURERS

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<td>1978-83</td>
<td>Frank M. Guttman</td>
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<td>1983-89</td>
<td>David Girvan</td>
<td>London</td>
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<td>1989-95</td>
<td>Ray Postuma</td>
<td>Winnipeg</td>
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<tr>
<td>1995-</td>
<td>Salam Yazbeck</td>
<td>Montreal</td>
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FOUNDING MEMBERS

ALLEN Michael
ASHMORE Phillip
BEARDMORE Harvey
CAMERON Gordon
COLLIN Pierre-Paul
DESJARDINS Jean G.
DUCHARME Jacques C.
DUVAL Frederick
FALLIS James
FERGUSON* Colin
GILLIS Alex
GUTTMAN Frank M.
JUCKES Angus
KARN* Gordon
KENNEDY Richard
KLIMAN Murray
KLING Samuel
MARSHALL Donald
MARSHALL Russell
MERCER Stanley
MURPHY David
OWEN* Herbert
SHANDLING Barry
SHRAGOVITCH* Israël
SIMPSON* James
STEPHENS* Clinton
TURCOT* Jacques

* indicates deceased

1st ANNUAL MEETING was held January 22, 1969 in VANCOUVER
THE COATS OF ARMS
OF THE
CANADIAN ASSOCIATION OF PAEDIATRIC SURGEONS

Heraldic Blazon

Per pale gules and purpure, dexter a scalpel erect entwined by a serpent, sinister a child standing, all argent.

Crest: On the three maple leaves slipped gules and blacked purpure, the date 1967.

Motto: "Je le pensay, Dieu le guarit".

Description

The red and purple of the arms are also the colours of the Royal College of Physicians and Surgeons of Canada and represent the blood met in surgery - arterial and venous. The scalpel with the healing serpent of AEsculapius, and the figure of a well child combine to symbolize the practice of Paediatric Surgery.

The crest is the Canadian maple leaf and the founding date of the Association (1967).

The Motto is a quotation from Ambroise Pare, a father of modern surgery. The sixteenth-century French translates, "I treated him, God cured him".
FUTURE C.A.P.S. MEETING

30th Annual Meeting
September 25-28, 1998
TORONTO*

31th Annual Meeting
September 24-26, 1999
MONTREAL*

32th Annual Meeting
September 22-24, 2000
OTTAWA*

* dates and locations are those of the Royal College Annual Meeting
CAPS dates and location to be confirmed
RESIDENT PAPERS

The papers presented by Surgical Residents are adjudicated by a panel of members from the Publication Committee. There are two award categories: the best Clinical paper and the best Experimental paper. Selection will be made only from the Original Papers Category. Each award is $500. The Program Committee normally tries to schedule the Residents papers during the first two days of the meeting to enable the awarding of the Residents Prizes during the Presidential Dinner.

WINNERS OF THE 1996 RESIDENT BEST PAPER AWARDS

BEST CLINICAL PAPER

Dr. Christian MÉNARD

"Anal reeducation for postoperative fecal incontinence in congenital diseases of the rectum and anus."
C. Ménard, C. Trudel, R. Cloutier
Le Centre Hospitalier de l'Université Laval, Sainte-Foy (Quebec) CANADA

BEST EXPERIMENTAL PAPER

Dr. Wadi BIN SADDIQ

"The effects of tracheal occlusion on type II pneumocytes in fetal lambs"
W. Bin Saddiq, P. Piedboeuf, J.M. Laberge, M. Gamache, P. Petrov,
E. Hashim, G. Ghitulescu, A. Manika, M.F. Chen
Montreal Children's Hospital, Montreal (Quebec) CANADA
Le Centre Hospitalier Universitaire Laval, Sainte-Foy (Quebec) CANADA

CONGRATULATIONS DR. MÉNARD AND DR. BIN SADDIQ!
<table>
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<th>CAPS COUNCIL 1996-1997</th>
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**EXECUTIVE**

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<th>Position</th>
<th>Name</th>
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<tr>
<td>President</td>
<td>J.G. Desjardins</td>
<td>3rd</td>
<td>J.C. Donald</td>
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<tr>
<td>Past-President</td>
<td>A. Juckes</td>
<td>2nd</td>
<td>N.E. Wiseman</td>
</tr>
<tr>
<td>Secretary-Treasurer</td>
<td>S. Yazbeck</td>
<td>1st</td>
<td>N. Grace</td>
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**COMMITTEES**

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<thead>
<tr>
<th>Ethic, Moral and Legal Issues</th>
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<tr>
<td>A.L. Bengoussan</td>
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<td>T.J. Bocci</td>
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<td>D. Dalman</td>
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<td>A. Grace</td>
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<tr>
<td>R. Gattiman</td>
<td>S. Yezbeck</td>
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<tr>
<td>R. Coutier</td>
<td>H. Blanchard</td>
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<td>R. Eccles</td>
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<td>A. Quinet</td>
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<tr>
<td>N. Wiseman</td>
<td>R. Supina</td>
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<td>C. Charrand</td>
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<td>D. Price</td>
<td>R. Filler</td>
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<td>H. Lau</td>
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<td>L.T. Nguyen</td>
<td>B.J. Hancock</td>
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<td>P. Wolfson</td>
<td>M. Hoffman</td>
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<td>R. Sonino</td>
<td>D. St-Vil</td>
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<tr>
<td>D. Poenaru</td>
<td>D. Wesson</td>
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**Underline indicates chair of committee.**

Please contact the President or Secretary-Treasurer if you are able to serve on any of the above committees or if corrections are necessary in the above information.
PRINTING OF THE PROGRAM BOOKLET
AND PART OF THE SOCIAL PROGRAM
WERE MADE POSSIBLE WITH THE FINANCIAL SUPPORT
OF THE FOLLOWING COMPANIES

American Pseudo-Obstruction and Hirschsprung’s Disease Society, Inc. (APHS)
Bowers Medical Supply
Canada Microsurgical Ltd.
Harcourt Brace Canada
Immuno (Canada) Ltd.
Johnson & Johnson Medical Products
Karl Storz Endoscopy Canada Ltd.
Sherwood-Davis & Geck
Sofamor Danek Canada Inc.
Valleylab Division, Hospital Products Group, Pfizer Canada Inc.
Zeneca Pharma
3M Canada Company - sponsoring the Executive Business Lunch
ABBREVIATIONS

O  original 10 minute paper
R  resident paper
C  5 minute case/technique report
FRIDAY, OCTOBER 3, 1997

BANFF PARK LODGE

09:00 - 17:00  Meeting of CAPS Council (Executive)
               Aspen Room

17:00          Registration
               Front Lobby

19:00 - 22:00  Welcoming Reception
               Glacier Lounge
SATURDAY, OCTOBER 4, 1997

BANFF PARK LODGE

07:00 - 13:00  Registration
              Alpine Meadows

07:00 - 07:55  Continental Breakfast
              Castle Room

07:30 - 13:00  Exhibits
              Assiniboine Room

07:55 - 08:00  Welcome and Opening Ceremony
              President, Dr. Jean G. Desjardins

08:00 - 10:00  Scientific Session ONE
              Summit Room

10:00 - 10:20  Refreshment Break
              Castle Room

10:20 - 11:50  Scientific Session TWO
              Summit Room

12:00 - 13:00  Fred MacLeod Lecture
### SATURDAY, OCTOBER 4, 1997

#### SCIENTIFIC SESSION ONE
- Banff Park Lodge
- Summit Room

**07:55**  WELCOME AND OPENING CEREMONY

Dr. Jean G. Desjardins

#### CO-CHAIRMEN

- Dr. D. Poenaru
- Dr. M. Di Lorenzo

<table>
<thead>
<tr>
<th>1</th>
<th>O R</th>
<th>08:00 - 08:10</th>
<th>MANAGEMENT OF GASTROSchISIS WITH CONCOMITANT SMALL BOWEL ATRESIA</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>The Hospital for Sick Children, Division of General Surgery</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Toronto (Ontario) CANADA</td>
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**08:10**  5 MINUTE DISCUSSION

<table>
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<tr>
<th>2</th>
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<th>08:15 - 08:25</th>
<th>RISK FACTORS ASSOCIATED WITH THE DEVELOPMENT OF PAN-NECROSIS</th>
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<td>J.Y. Tsai, C. Lee, D.E. Wesson, S.F. Redo, N.A. Spigland</td>
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<td></td>
<td>The New York Hospital-Cornell Medical Centre</td>
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<td></td>
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<td>New York, NY USA</td>
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**08:25**  5 MINUTE DISCUSSION

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<tr>
<th>3</th>
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<th>08:30 - 08:40</th>
<th>REDUCED GLIAL CELL-LINE DERIVED NEUROTROPHIC FACTOR LEVEL IN</th>
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<tr>
<td></td>
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<td></td>
<td>AGANGLIONIC BOWEL IN HIRSCHSPRUNG'S DISEASE</td>
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<td>K. Ohshiro, P. Puri</td>
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<td>Children’s Research Centre, Our Lady’s Hospital for Sick</td>
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<td>Children Crumlin, Dublin 12, IRELAND</td>
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**08:40**  5 MINUTE DISCUSSION
|   | 08:45 - 08:55 | ENTEROCOLITIS AFTER TREATMENT FOR HIRSCHSPRUNG'S DISEASE: FINANCIAL IMPACT AND EVALUATION OF RISK FACTORS  
D. Hackam, R. Filler, R. Pearl  
The Hospital for Sick Children, University of Toronto, Division of General Surgery  
Toronto (Ontario) CANADA |
|---|---|---|
| 5 | 09:00 - 09:10 | A COMPARISON OF LAPAROSCOPIC AND OPEN SPLENECTOMY USING A SINGLE INSTITUTION REVIEW AND METAANALYSIS  
Baylor College of Medicine, Texas Children's Hospital  
Houston, TX USA |
| 6 | 09:10 - 09:20 | ELECTIVE PARTIAL SPLENECTOMY IN CHILDHOOD  
C. Kimber, L. Spitz, D. Drake, E. Kiley, S. Westaby, F. Cozzi, A. Pierro  
Institute of Child Health and Great Ormond Street Hospital for Children  
London, UNITED KINGDOM |
| 7 | 09:25 - 09:30 | INTRAOPERATIVE DIAGNOSTIC PNEUMOPERITONEUM: A SAFE, ACCURATE AND COST-EFFECTIVE ALTERNATIVE TO CONTRALATERAL GROIN EXPLORATION  
D.A. Bambini, P. Kapur, M.S. Irish, M.G. Cay, R.A. Azizkhan, P.L. Glick  
The Children's Hospital of Buffalo, State University of New York at Buffalo School of Medicine and Biomedical Sciences  
Buffalo, NY USA |
| 8 | 09:30 - 09:40 | LAPAROSCOPIC EVALUATION OF PEDIATRIC INGUINAL HERNIAS  
D.M. Millenburg, J.G. Nuchtern, T. Jasik, C. Kozinetz, M.L. Brandt  
Baylor College of Medicine  
Houston, TX USA |
|   | 09:40 | 5 MINUTE DISCUSSION |
9  O R  09:45 - 09:55  ALLOGENEIC FETAL INTESTINAL (AFI) TRANSPLANT WITH FK506 IMMUNO-SUPPRESSION  W. McBride, K. Sartorelli, D.W. Vane  University of Vermont, Burlington, VT USA

09:55  5 MINUTE DISCUSSION

10:00  REFRESHERMENT BREAK
SATURDAY, OCTOBER 4, 1997

SCIENTIFIC SESSION TWO
Banff Park Lodge
Summit Room

CO-CHAIRMEN
Dr. A. Winthrop  Dr. N. Wiseman

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Location</th>
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<tbody>
<tr>
<td>10:20</td>
<td>AIRBAG AND CHILDREN: A SPECTRUM OF C-SPINE INJURIES</td>
<td>Hospital Sainte-Justine, Montreal (Quebec)</td>
</tr>
<tr>
<td></td>
<td>L.E. Giguère, D. St-Vil, M. Di Lorenzo, A. Levy, S. Manseau, C. Mercier</td>
<td>CANADA</td>
</tr>
<tr>
<td>11:00</td>
<td>10 YEAR REVIEW OF NON-OPERATIVE MANAGEMENT FOR BLUNT SPLENIC TRAUMA IN CHILDREN - PREDICTORS OF OUTCOME</td>
<td>British Columbia's Children's Hospital, Vancouver (British Columbia) CANADA</td>
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<tr>
<td>10:40</td>
<td>5 MINUTE DISCUSSION</td>
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<tr>
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<th>Location</th>
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<tr>
<td>10:45</td>
<td>ALTERED IGF-I mRNA EXPRESSION IN HUMAN HYPOPLASTIC LUNG IN CONGENITAL DIAPHRAGMATIC HERNIA</td>
<td>Cramlin, Dublin 12, IRELAND</td>
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<tr>
<td></td>
<td>E. Miyazaki, K. Oshiro, Y. Taira, T. Yamazaki, P. Puri</td>
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<tr>
<td>11:05</td>
<td>COMPARISON OR PULMONARY VASCULATURE IN CONGENITAL DIAPHRAGMATIC HERNIA IN NEWBORNS AND STILLBORNS</td>
<td>Cramlin, Dublin 12, IRELAND</td>
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<td>Y. Taira, T. Yamazaki, E.Miyazaki, K. Oshiro, P. Puri</td>
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<td>Children's Research Centre, Our Lady's Hospital for Sick Children</td>
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<td>11:05</td>
<td>5 MINUTE DISCUSSION</td>
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| 11:10 - 11:20 | MASSES MOSTLY MISDIAGNOSED - THYMIC CYSTS  
M. Hendrickson, K. Azarow, B. Shandling, P. Thorner, S.H. Ein  
The Hospital for Sick Children  
Toronto (Ontario) CANADA |
| 11:20 | 5 MINUTE DISCUSSION |
| 11:25 - 11:35 | RESULTS OF PORTO-SYSTEMIC SHUNT IN CHILDREN WITH PORTAL HYPERTENSION  
S.K. Mayer, F. Alvarez, M. Giroux, K. Chou, D. St-Vil, T. Yandza  
M.A. Rasquin, A.L. Bensoussan,  
Hôpital Sainte-Justine  
Montreal (Quebec) CANADA |
| 11:35 - 11:45 | PORTAL VENOUS DECOMPRESSION WITH H-TYPE MesoCaval SHUNT USING AUTOLOGOUS VEIN GRAFT; A NORTH AMERICAN EXPERIENCE  
S.K. Mayer, H. Blanchard, D. Sigalé  
Hôpital Sainte-Justine, Montreal (Quebec) CANADA  
The Children’s Mercy Hospital, Kansas City, MO USA |
| 11:45 | 5 MINUTE DISCUSSION |
| 12:00 | FRED MACLEOD LECTURE |
SUNDAY, OCTOBER 5, 1997

BANFF PARK LODGE

07:00 - 12:30  Registration
               Alpine Meadows

07:00 - 08:00  Continental Breakfast
               Castle Room

07:30 - 13:00  Exhibits
               Assiniboine Room

08:00 - 09:00  "2 minutes/2 slides
               Summit Room

09:00 - 10:30  Scientific Session THREE
               Summit Room

10:30 - 10:45  Refreshment Break
               Castle Room

10:45 - 12:30  Scientific Session FOUR
               Summit Room

12:30          CAPS Members Business Meeting
               Castle Room

19:00          Presidential Reception

19:30          Presidential Banquet
               Brewster Cowboy Barbecue and Dance
               Lake Louise
**SUNDAY, OCTOBER 5, 1997**

08:00 - 09:00  **2 MINUTES / 2 SLIDES**  
Chairman: Dr. G.K. Blair

**SCIENTIFIC SESSION THREE**  
Banff Park Lodge  
Summit Room

**CO-CHAIRMEN**  
Dr. S. Yazbeck  
Dr. A. Juckes

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<td><strong>17</strong></td>
<td><strong>C</strong></td>
<td>09:00 - 09:05</td>
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<td></td>
<td><strong>NOVEL SURGICAL TECHNIQUES IN THE REPAIR OF LARGE NEONATAL CONGENITAL DIAPHRAGMATIC HERNIA</strong></td>
</tr>
</tbody>
</table>
|   |   | University of California, Fetal Treatment Center  
|   |   | San Francisco, CA USA |
| **18** | **C** | 09:05 - 09:10 |
|   |   | **CERVICAL ECMO CANNULA PLACEMENT IN CHILDREN: RECOMMENDATIONS FOR ASSESSMENT OF ADEQUATE POSITIONING AND FUNCTION** |
|   |   | M.S. Irish, P. Kapur, D.A. Bambini, R.G. Azizkhan, J.E. Allen, M.G. Caty,  
|   |   | J.C. Gilbert, R.H. Steinhorn, P.L. Glick  
|   |   | The Children's Hospital of Buffalo  
|   |   | The State University of New York at Buffalo School of Medicine and Biomedical Sciences  
|   |   | Buffalo, NY USA |

09:10  **5 MINUTE DISCUSSION**

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<tr>
<td><strong>19</strong></td>
<td><strong>C</strong></td>
<td>09:15 - 09:20</td>
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<tr>
<td></td>
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<td><strong>VIDEO-ASSISTED THORACOSCOPIC RESECTION OF PULMONARY NODULES: PREOPERATIVE LOCALIZATION WITH INDIA INK</strong></td>
</tr>
</tbody>
</table>
|   |   | A.J. Winthrop, J.C. Langer, M. Hicks, S. Don  
|   |   | Washington University  
|   |   | St. Louis, MO USA |
| **20** | **C** | 09:20 - 09:25 |
|   |   | **SINGLE-PORT TRACHEOSCOPIC SURGERY IN THE FETAL LAMB** |
|   |   | Brown University, Providence, RI USA  
|   |   | Catholic University of Leuven, BELGIUM |

09:25  **5 MINUTE DISCUSSION**
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<th>Authors</th>
<th>Institution</th>
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<tbody>
<tr>
<td>21</td>
<td>09:30</td>
<td>09:35</td>
<td>SUCCESSFUL TREATMENT OF A SPONTANEOUS INTRAOPERATIVE LIVER HEMORRHAGE IN A PREMATURE INFANT WITH NECROTIZING ENTEROCOLITIS</td>
<td>C. Stier, J.L. Graf, M.R. Harrison, R.W. Jennings</td>
<td>University of California, The Fetal Treatment Center, San Francisco, CA, USA</td>
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<td>09:35</td>
<td>09:40</td>
<td>DELAYED COMPLICATIONS IN BLUNT „SPLIT LIVER“ INJURY INITIALLY MANAGED NON-OPERATIVELY</td>
<td>A.L. Winthrop, J.C. Langer</td>
<td>Washington University, St. Louis, MO, USA</td>
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<td>09:40</td>
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<td>5 MINUTE DISCUSSION</td>
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<td>23</td>
<td>09:45</td>
<td>09:50</td>
<td>PEDIATRIC PAPILLARY CYSTIC NEOPLASM OF THE PANCREAS: A REPORT OF 3 CASES</td>
<td>K.S. Wang, C. Allunese, F. Dada, E. Skarsgard</td>
<td>Lucille Salter Packard Children's Hospital, Stanford University Medical Center, Stanford, CA, USA</td>
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<tr>
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<td>09:50</td>
<td>09:55</td>
<td>A MUCOEPIDERMOID CARCINOMA OF THE PAROTID GLAND: A RARE PRESENTATION IN A YOUNG CHILD</td>
<td>R. Khadaroo, M. Walton, S. Archibald, J. Ramsay, J. Hicks</td>
<td>Children's Hospital and St. Joseph Hospital, Hamilton (Ontario), Canada, Texas Children's Hospital, University of Texas, Houston, TX, USA</td>
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<td>5 MINUTE DISCUSSION</td>
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<td>25</td>
<td>10:00</td>
<td>10:05</td>
<td>DOPPLER FLOW ASSISTED LAPAROSCOPIC VARICOCELECTOMY IN ADOLESCENTS</td>
<td>R.C. Cohen</td>
<td>New Children's Hospital, Department of Surgery, Westmead 2145, Australia</td>
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<td>10:05</td>
<td>10:10</td>
<td>COUGAR ATTACK ON CHILDREN: A REPORT OF THREE CASES AND A REVIEW OF THE LITERATURE</td>
<td>K. Kadesky, C. Maurey, M Murphy HI, C. Verchere, G.K. Blair, K. Adkinson</td>
<td>British Columbia's Children's Hospital, Vancouver (British Columbia), Canada</td>
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<td>5 MINUTE DISCUSSION</td>
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<td>CONTRACTILE PROPERTIES OF INTRALOBAR PULMONARY ARTERIES AND VEINS IN CONGENITAL DIAPHRAGMATIC HERNIA: AN INITIAL LOOK AT THE NITRIC OXIDE-cGMP PATHWAY OF VASODILATION</td>
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<td>M.S. Irish, P. Kapur, D.A. Bambini, J. Russell, B.A. Holm, R.H. Steinhorn, P.L. Glick</td>
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<td>The Buffalo Institute of Fetal Therapy of the Children's Hospital of Buffalo</td>
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<td>The State University of New York at Buffalo School of Medicine and Biomedical Sciences</td>
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<td>Buffalo, NY USA</td>
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10:25  5 MINUTE DISCUSSION

10:30  REFRESHMENT BREAK
# SUNDAY, OCTOBER 5, 1997

**SCIENTIFIC SESSION FOUR**
Banff Park Lodge
Summit Room

| CO-CHAIRMEN | Dr. R. Pearl | Dr. J.M. Laberge |

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>10:45</td>
<td>28</td>
<td>SENSITIVITY AND COST EFFECTIVENESS OF RADIOLOGY VS OLIVE PALPATION FOR THE DIAGNOSIS OF HYPERTROPHIC PYLORIC STENOSIS (HPS)</td>
<td>M.C. White, J.C. Langer, S. Don, M.R. Debonn Washington University, Department of Surgery, Radiology and Pediatrics St. Louis, MO USA</td>
</tr>
<tr>
<td>10:55</td>
<td>29</td>
<td>TOPICAL STEROID THERAPY IN THE TREATMENT OF CHILDHOOD PHIMOSIS: AN ALTERNATIVE TO CIRCUMCISION</td>
<td>S.K. Mayer, S. Carrier, T. Yauda, J. Lacroix, S. Yazbeck, H. Blanchard Hôpital Sainte-Justine Montreal (Quebec) Canada</td>
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11:05 5 MINUTE DISCUSSION

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<tr>
<td>11:10</td>
<td>30</td>
<td>PROPHYLACTIC THYROIDECTOMY FOR MEDULLARY THYROID CARCINOMA IN GENE CARRIER OR MEN II SYNDROME</td>
<td>M. Lafleur, D. St-Vil, M. Giroux, C. Huot, L. Oligny, J.G. Desjardins Hôpital Sainte-Justine Montreal (Quebec) Canada</td>
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<tr>
<td>11:20</td>
<td>31</td>
<td>CYSTIC THYROID LESIONS IN CHILDREN</td>
<td>A. Yoskevitch, J.M. Laberge, C. Roed, D. Gaskin Montreal Children's Hospital, McGill University Montreal (Quebec) Canada</td>
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11:30 5 MINUTE DISCUSSION
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<tr>
<td>5:00</td>
<td>5 MINUTE DISCUSSION</td>
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<tr>
<td>11:50</td>
<td>ADHESIVE SMALL BOWEL OBSTRUCTION IN CHILDREN: PREDICTORS OF OUTCOME (P.M. Wan, J.J. Murphy, R. Jansen, K. Gow) British Columbia’s Children’s Hospital, Vancouver (British Columbia), Canada</td>
</tr>
<tr>
<td>12:10</td>
<td>5 MINUTE DISCUSSION</td>
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<tr>
<td>12:15</td>
<td>A FIVE YEAR REVIEW OF APPENDECTOMY: A TRANSITION FROM OPEN TO LAPAROSCOPIC APPROACH (C. Chin, M. Walton, J. Wong, P. Fitzgerald) Children’s Hospital, Hamilton (Ontario), Canada</td>
</tr>
<tr>
<td>12:25</td>
<td>5 MINUTE DISCUSSION</td>
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<tr>
<td>12:30</td>
<td>ANNUAL BUSINESS MEETING LUNCHEON</td>
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MONDAY, OCTOBER 6, 1997

BANFF PARK LODGE

07:00 - 12:00  Registration
               Alpine Meadows

07:00 - 08:00  Continental Breakfast
               Castle Room

07:00 - 13:00  Exhibits
               Assiniboine Room

08:00 - 09:50  Scientific Session FIVE
               Summit Room

09:50 - 10:20  Refreshment Break
               Castle Room

10:20 - 12:35  Scientific Session SIX
               Summit Room

12:35          Annual Meeting Adjourns
### MONDAY, OCTOBER 6, 1997

**SCIENTIFIC SESSION FIVE**
Banff Park Lodge  
Summit Room

**CO-CHAIRMEN**  
Dr. D. St-Vil  
Dr. D. Girvan

<table>
<thead>
<tr>
<th>Time</th>
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<th>Speaker(s)</th>
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<tbody>
<tr>
<td>36</td>
<td>UNDERGRADUATE PEDIATRIC SURGERY OBJECTIVES: GOAL AND REALITY</td>
<td>M. Woo, D. Poenaru</td>
<td>Queen's University, Department of Surgery, Faculty of Medicine</td>
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<td>36</td>
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<td></td>
<td>Kingston (Ontario) CANADA</td>
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<td>37</td>
<td>PEDIATRIC SURGERY AS A SUBSPECIALTY CLERKSHIP ROTATION: FACILITATING ACTIVE LEARNING</td>
<td>D. Poenaru</td>
<td>Queen's University, Department of Surgery, Faculty of Medicine</td>
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<td>37</td>
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<td>Kingston (Ontario) CANADA</td>
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<td>38</td>
<td>SURGICAL TUTELAGE OF PEDIATRIC RESIDENTS</td>
<td>S. Murphy, P. Wolfson, T. Bauer</td>
<td>The Dupont Hospital for Children and Jefferson Medical College</td>
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<td>Wilmington, DE USA</td>
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<td>08:30 15 MINUTE DISCUSSION</td>
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<td>39</td>
<td>RESULTS OF TRANSPLANTATION FOR ACUTE AND CHRONIC HEPATIC ALLOGRAFT REJECTION</td>
<td>L.A. Nicolette, W. Reichard, K. Falkenstein, A. Pierson, S.P. Dunn</td>
<td>St. Christopher's Hospital for Children, Temple University School of Medicine</td>
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<td>39</td>
<td>08:55 5 MINUTE DISCUSSION</td>
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<td>40</td>
<td>O 09:00-09:10</td>
<td>INTRAVENOUS L-ARGININE AS PROPHYLAXIS FOR NECROTIZING ENTEROCOLITIS (NEC): THERAPEUTIC AND TOXICOLOGICAL EVALUATION IN A PREMATURE PIGLET MODEL</td>
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<td>M. Di Lorenzo, A. Krantis</td>
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<td>Hôpital Sainte-Justine, University of Montreal, Montreal (Quebec) CANADA</td>
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<td>University of Ottawa, Department of Physiology, Ottawa (Ontario) CANADA</td>
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<td>41</td>
<td>O 09:10-09:20</td>
<td>ALTERATIONS IN RESPIRATORY STATUS: EARLY SIGNS OF SEVERE NECROTIZING ENTEROCOLITIS</td>
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<td>S.E. Dolgin, E. Slasko, M.A. Levitt, A.R. Hong, S. Brillhart, M. Rynkowski, I. Holzman</td>
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<td>Mount Sinai Medical Center, New York, NY USA</td>
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09:30  5 MINUTE DISCUSSION

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<tr>
<th>42</th>
<th>O 09:25-09:35</th>
<th>THE LIVER IN CHEMICALLY INDUCED DIAPHRAGMATIC HERNIA IN RATS</th>
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<tbody>
<tr>
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<td>D. Khaliq, M. Adamian, J. Pollock, W. Lambrecht</td>
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<td>University Hospital Hamburg, Department of Pediatric Surgery</td>
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<th>43</th>
<th>O 09:35 09:45</th>
<th>BOLUS INTRAVENOUS INFUSION DOES NOT STIMULATE GALLBLADDER CONTRACTION IN NEONATES ON TPN</th>
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<tr>
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<td>S. Phelps, E. Dykes, A. Pierro</td>
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<td>The Children's Hospital Lewisham and the Institute of Child Health</td>
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<td>and Great Ormond Street Hospital for Children</td>
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09:45  5 MINUTE DISCUSSION

09:50  REFRESHMENT BREAK
# MONDAY, OCTOBER 6, 1997

**SCIENTIFIC SESSION SIX**  
Banff Park Lodge  
Summit Room

<table>
<thead>
<tr>
<th>CO-CHAIRMEN</th>
<th>Dr. S.H. Ein</th>
<th>Dr. P. Soucy</th>
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<tr>
<th>Time</th>
<th>Session</th>
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<th>Authors/Institutions</th>
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</table>
| 10:20  | C       | APPLICATION OF INTERNET TECHNOLOGY IN ADVANCED LAPAROSCOPIC SURGERY TRAINING | P. Fitzgerald, M. Walton, M. Ramella, M. Mindorff  
Children's Hospital  
Hamilton (Ontario) CANADA |
| 10:25  | C       | DIGITAL TECHNOLOGY IN PEDIATRIC SURGERY                               | R. Postuma  
Winnipeg Children's Hospital  
Winnipeg (Manitoba) CANADA |
| 10:30  | O       | USE OF TELEMEDICINE SYSTEM IN A TERTIARY CARE CHILDREN'S HOSPITAL: A FUTURE MODE OF MEDICAL CONSULTATION | D.H. Teitelbaum, D. Roloff, M. Lee  
C.S. Mott Children's Hospital, University of Michigan  
Queen's University  
Ann Arbor, MI USA |
| 10:40  |         | 15 MINUTE DISCUSSION                                                 |                                                                                      |

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<th>Authors/Institutions</th>
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</table>
| 10:55  | O       | MECHANISMS UNDERLYING INTESTINAL ADAPTATION FOLLOWING MASSIVE INTESTINAL RESECTION | D.L. Siglet, G.R. Martin  
The Children's Mercy Hospital, Kansas City, MO USA |
| 11:05  | O       | MULTIPLE BOWEL ATRESIAS FOLLOWING FETAL SMALL BOWEL TRANSPLANTATION IN RATS | A. Yamazaki, G. Lane, Y. Kato, E. Miyazaki, H. Kohayashi, T. Miyano  
Jutendo University School of Medicine, Department of Pediatric Surgery  
Tokyo, JAPAN |
<p>| 11:15  |         | 5 MINUTE DISCUSSION                                                 |                                                                                      |</p>
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Hôpital Sainte-Justine  
Montreal (Quebec) CANADA |
and other members of CAPS  
Montreal Children's Hospital, Hôpital Sainte-Justine, B.C.'s Children's Hospital  
and other participating Canadian Hospitals |
|      |       | **11:40** 5 MINUTE DISCUSSION                                                               |                                                                                       |
| 51   | 11:45 | LIPID UPTAKE BY SILICONE ENTERAL ACCESS FEEDING DEVICES                                       | J. Trudel, M.W.L. Gauderer, M. Laberge  
Children's Hospital, Greenville Hospital System, Greenville, SC USA  
Clemson University, Clemson, SC USA |
|      |       | **11:55** 5 MINUTE DISCUSSION                                                               |                                                                                       |
| 52   | 12:00 | ESOPHAGEAL FUNCTION IN ACHALASIA BEFORE AND AFTER MYOTOMY                                     | J.A. Tovar, G. Prieto, M. Molina, J. Arana  
Hospital Infantil 'La Paz', Madrid, SPAIN  
Hospital Aranzazu, San Sebastian, SPAIN |
| 53   | 12:10 | CONGENITAL ESOPHAGEAL DIVERTICULUM                                                             | N. Wijman, R. Postuma  
Children's Hospital  
Winnipeg (Manitoba) CANADA |
<p>|      |       | <strong>12:15</strong> 5 MINUTE DISCUSSION                                                               |                                                                                       |</p>
<table>
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<tr>
<th>Time</th>
<th>Session</th>
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</thead>
</table>
| 12:20 | IMPACT OF MAGNETIC RESONANCE IMAGING ON THE SURGICAL MANAGEMENT OF HYGROMAS  
K. Fung, D. Poenaru, D.A.A. Soboleski, I.M. Kamal  
Queen’s University  
Kingston (Ontario) CANADA |
| 12:25 | CHRONIC INTESTINAL PSEUDO-OBSTRUCTION AND C-Kit:  
ABNORMAL DISTRIBUTION OF INTESTINAL PACEMAKER CELLS  
Tokyo Medical University, Tokyo  
and Dokkyo University School of Medicine, Tochigi, JAPAN |
| 12:30 | 5 MINUTE DISCUSSION |
| 12:35 | ANNUAL MEETING ADJOURNS |
ABSTRACTS

RÉSUMÉS

ABBREVIATIONS

O  original 10 minute paper
R  resident paper
C  5 minute case/technique report
1. **Session One**  Saturday  08:00-08:10  O R

**MANAGEMENT OF GASTROSchISIS WITH CONCOMITANT SMALL BOWEL ATRESIA**

J.C. Hoehner, S.H. Ein, M.L. Saxton, P.C.W. Kim  
The Hospital for Sick Children, Toronto (Ontario) CANADA

**Purpose:** In an attempt to identify the optimal form of treatment for infants with gastroschisis and coexisting intestinal atresia, patient characteristics at presentation, surgical therapy, and complications at extended follow-up were reviewed.

**Methods:** Thirteen infants with co-existing gastroschisis and small bowel atresia were treated at our institution over the past 16 years.

**Results:** The majority of the patients were preterm (mean gestational age 35.2 ± 2.0 weeks) and of low birth weight (2.1 ± .4 kg). Intestinal atresia types II, IIIa, IIIb, and IV were identified at the initial surgical procedure in 1, 8, 1, and 3 patients respectively; however, one small bowel atresia and one colonic atresia went unrecognized. Atresia associated with gangrenous and/or perforated bowel was treated by primary anastomosis in 3 / 6 patients, the remaining 3 by enterostomy. Overall, a primary anastomosis was fashioned in 8/13 patients, the creation of which did not influence length of hospitalization, length of parenteral nutrition (TPN) requirement, complication rate, or survival; however, reoperation was required in 3/8 patients to mediate anastomotic complications. Primary abdominal wall closure was possible in 10/13 patients, a Silon pouch required in 3. All 9 survivors displayed protracted small bowel dysfunction requiring TPN (mean TPN duration of 3.6 ± 3.0 months, range 1-11). Mortality in 4 patients was a consequence of severe prematurity, Silon pouch wound sepsis, or TPN induced cirrhosis.

**Conclusions:** When technically feasible, restoration of intestinal continuity by primary anastomosis is a reasonable treatment option in patients with co-existing gastroschisis and intestinal atresia. Favorable outcome is as much a function of proper supportive care and parenteral nutrition as the type of surgical repair performed for either the intestinal or the abdominal wall defect.

Dr. Sigmund H. Ein  
The Hospital for Sick Children  
555 University Avenue  
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RISK FACTORS ASSOCIATED WITH THE DEVELOPMENT OF PAN-NECROSIS IN NEONATAL NEC

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Aim: To evaluate the pre-operative risk factors and clinical findings which correlate with the development of pan-necrosis vs segmental necrosis in neonatal necrotizing enterocolitis (NEC).

Methods: 55 infants underwent surgical intervention for NEC between 1988-1997. There were 27 males and 28 females with a mean birthweight of 1344 grams and a mean gestational age of 30 weeks. The patients were divided into two risk groups - I (segmental necrosis - 42 patients) and II (pan-necrosis - 13 patients) based upon findings at operation. Results between the two were compared.

Results: Significant differences occurred with respect to a history of umbilical cord prolapse which was present in 1/42 (2.4%) of Group I vs 2/13 (15%) of Group II patients. A history of Abruptio Placenta and Placenta Previa was present in 2/42 (5%) of Group I patients vs 4/13 (31%) of Group II patients. A history of PDA and PFO occurred in 19/42 (45%) of patients in Group I vs 9/13 (69%) of patients in Group II. Portal venous gas was present in 6/42 (14%) of Group I patients vs 7/13 (54%) of Group II patients. There were 9/42 deaths (21%) in Group I compared with 11/13 (85%) in Group II.

Conclusion: Although segmental NEC and pan-necrosis are similar in etiology, ante-natal ischemic events (cord prolapse, Abruptio Placenta and Placenta Previa) are associated with a more severe form of the disease. Additionally the presence of acidosis, positive pre-operative blood cultures and portal venous gas suggest pan-necrosis and a poor outcome.

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REDUCED GLIAL CELL-LINE DERIVED NEUROTROPHIC FACTOR LEVEL IN AGANGLIONIC BOWEL IN HIRSCHSPRUNG’S DISEASE

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Aim: Glial cell-line derived neurotrophic factor (GDNF) is reported to be essential for the development of kidneys and the enteric nervous system. Recently, GDNF has been identified to be a ligand for RET. Moreover, GDNF mutant mice display congenital intestinal aganglionosis. The aim of this study was to investigate GDNF protein expression in human aganglionic (AG) bowel in Hirschsprung’s disease (HD).

Methods: Colonic specimens were obtained from 8 patients with HD (age range, 7 days-14 months) at the time of definite pull-through operation. Immunofluorescence was performed using anti-GDNF polyclonal antibody and FITC-conjugated second antibody on the formalin-fixed and paraffin embedded specimens. For enzyme-linked immunosorbent assay (ELISA) analysis, specimens were homogenized by adding 10 volumes of 10 mmol/L PBS containing proteinase inhibitors. Centrifuged supernatant was used for the quantitative analysis using sandwich-type ELISA for human GDNF.

Results: Using ELISA, the level of GDNF was reduced significantly in AG bowel compared to NG bowel (mean ± S.D. AG/NG: 860.2 ± 309.8 / 1777.5 ± 271.4 pg/g wet tissue, p<0.001). The mucosal epithelium, submucosal and myenteric plexuses and hypertrophic nerve trunks displayed strong GDNF immunoreactivity. GDNF immunoreactivity in the mucosal epithelium was significantly reduced in AG bowel compared to NG bowel. No GDNF immunoreactivity was demonstrated in the smooth muscle layers.

Conclusion: Since GDNF plays an important role in the development of enteric nervous system, decreased GDNF levels in the aganglionic bowel may suggest maldevelopment of neural crest derived cells in Hirschsprung’s disease.

1. Chicago - what type of cells stain
2. mucosa layer in crypt likely neuroendocrine
3. in Neuronal Intestinal Epithelium?
4. No measurements done in H. I. - like condition
ENTEROCOLITIS AFTER TREATMENT FOR HIRSCHSPRUNG’S DISEASE: FINANCIAL IMPACT AND EVALUATION OF RISK FACTORS

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Purpose: To identify risk factors associated with enterocolitis (EC) after treatment of Hirschsprung’s disease (HD), in order to design preventative strategies and decrease costs. Methods: The occurrence of EC requiring hospital admission at a single tertiary care centre between 1991-1996 was determined in 105 consecutive patients who had definitive operation (Soave in 63, Duhamel in 17, Swenson in 25) for less than total colonic HD. The admitting diagnosis of EC was accepted for this study if the child had abdominal pain, fever, distention, diarrhea and no other definable cause. Ten risk factors were evaluated in 2 groups: those with EC (n=33), and a control group without EC (n=72). Comparisons were by the Student t-test or Fischer exact test where appropriate, and significance was accepted at p<0.05. Results: 62 cases of EC occurred in 33 patients at a mean duration from definitive surgery of 8 ± 3 months, a mean age of 18 ± 3 months, with a mean followup of 2.1 ± 0.3 years. Patients with EC had a significantly longer hospitalizations than controls 31 ± 3 days vs. controls 23 ± 1, p<0.5), had more total admissions (EC: 5 ± 0.5 vs. controls 3 ± 1, p<0.5), and a higher associated treatment cost of (EC $10075 vs. $8050, p<0.5). There was no mortality. Significant risk factors were: stricture or leak at the colo-anal anastomosis (EC group: 10/33, control group 0/72, p<0.005). Non significant risk factors were: location of transition zone, type of surgical repair, surgical strategy (single vs. multiple stage repair), the presence of pre-operative EC, gender, age at diagnosis, age and weight at pull through. Conclusion: Post operative EC significantly increases the financial impact of treating HD. Colo-anal anastomotic leak or stricture and bowel obstruction requiring adhesionolysis are the most significant risk factors for EC. Age, weight and the performance of a primary pull through do not increase the risk of EC and supports this mode of therapy. These data support the strategy of minimization of intestinal trauma and early and frequent anal dilatation after definitive surgery to decrease costs.

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A COMPARISON OF LAPAROSCOPIC AND OPEN SPLENECTOMY USING A SINGLE INSTITUTION REVIEW AND METAANALYSIS

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Objective: There remains a controversy as to whether laparoscopic (lap) splenectomy should replace open splenectomy as the standard of care in children. The purpose of our study was twofold: 1) to compare results of open and lap splenectomies at our center, and 2) to apply the identical comparison to data pooled by metaanalysis.

Methods: We retrospectively reviewed the consecutive charts of children who had splenectomies at our center from 5/95 - 12/96. The parameters reviewed were as follows: Operative time, estimated blood loss, patient age, patient weight, spleen weight, number of accessory spleens, length of postoperative hospital stay, time to a regular diet, amount of analgesia use postoperatively, number of complications, and actual hospital costs.

Results: The statistically significant results (*P<0.05) were as follows (mean ± SE):

1) Our center:

<table>
<thead>
<tr>
<th></th>
<th>Operative Time (min)</th>
<th>Postop Hosp. Stay (days)</th>
<th>Time to Reg. Diet (days)</th>
<th>Hosp. Cost. ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open (n=11)</td>
<td>99.5 ± 14.6</td>
<td>4.5 ± 0.3</td>
<td>3.1 ± 0.3</td>
<td>4,935 ± 358</td>
</tr>
<tr>
<td>Lap (n=14)</td>
<td>186.4 ± 13.3*</td>
<td>3.0 ± 0.4*</td>
<td>1.6 ± 0.2*</td>
<td>10,477 ± 957*</td>
</tr>
</tbody>
</table>

2) Metaanalysis (n=34 Lap, n=42 Open) performed on data pooled from three centers, including our own, demonstrated statistically significant (P<0.05) effect sizes (d) for, operative time (d=3.01), postop hospital stay (d=-1.10), and time to regular diet (d=-1.75).

Conclusions: At our center, laparoscopic surgery resulted in a significantly shorter hospital stay, shorter time to regular diet, longer operative time and higher hospital costs. With metaanalysis (hospital costs not available), the same statistically significant differences remained, thus, demonstrating a uniform advantage of laparoscopic surgery in terms of hospital stay and time to regular diet. However, in order to make this technique more widely accepted, O.R. time and hospital cost must be reduced.

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ELECTIVE PARTIAL SPLENECTOMY IN CHILDHOOD

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Objective: To determine: 1) the indications for elective partial splenectomy (EPS), 2) the extent of splenic resection and 3) the complications of EPS.

Material and methods: All infants and children who required elective partial splenectomy in our institution in the last 10 years were studied. We reviewed the clinical presentation, the extent of splenic resection, the type of operative procedure, and the complications. Postoperative adjuvant enzyme treatment was given to all children with hypersplenism related to Gaucher’s disease.

Results: Twelve children had partial splenectomy attempted for various conditions (Table). None of the children required intraoperative transfusion for bleeding. Viability of the splenic remnant assessed by ultrasound was confirmed in the 11 successful cases. There were no postoperative complications or deaths. One procedure was converted to total splenectomy due to recurrent hypersplenism or significant splenic regrowth in the 4 children with metabolic disorders.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No.</th>
<th>Age</th>
<th>Pre-op vaccine</th>
<th>% Resection</th>
<th>Conversion to total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giant cyst</td>
<td>6</td>
<td>8-16y</td>
<td>1</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>Gaucher</td>
<td>3</td>
<td>1-2y</td>
<td>3</td>
<td>95</td>
<td>0</td>
</tr>
<tr>
<td>Niemann-Pick</td>
<td>1</td>
<td>3y</td>
<td>1</td>
<td>95</td>
<td>0</td>
</tr>
<tr>
<td>Pseudotumor</td>
<td>1</td>
<td>3y</td>
<td>1</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Endocarditis &amp; splenic abscess</td>
<td>1</td>
<td>8y</td>
<td>1</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

Conclusions: EPS can be performed for benign splenic conditions without major blood loss. Preoperative vaccination is advisable. Up to 95% of the spleen can be safely removed, even in massive splenomegaly, basing the blood supply on peripheral polar vessels.

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Q1. Given a cyst can be de nuded
A. - residual epithelium is concern
Q2. Australia 95% retained??
Q3. ?? - midline S.S. = mil in 11
A. - Saunzer is
Q4. Wiseman - splenic dangling - attach upper pole
- flow viability = duplex US
INTRAOPERATIVE DIAGNOSTIC PNEUMOPERITONEUM: A SAFE, ACCURATE AND COST-EFFECTIVE ALTERNATIVE TO CONTRALATERAL GROIN EXPLORATION

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Aim of Study: The management of the contralateral groin in children with an inguinal hernia remains controversial. We present the results of our experience with intraoperative diagnostic pneumoperitoneum (Goldstein test) in children with unilateral inguinal hernias.

Methods: Between August 1994 and October 1996, 68 patients with unilateral inguinal hernia or hydrocele were selected for unilateral hernia repair with intraoperative Goldstein test for evaluation of the contralateral groin. The peritoneal cavity was insufflated with CO2 via a 12 Fr. catheter passed through the ipsilateral herniotomy. Patients with crepitance in the contralateral groin (positive test) underwent contralateral exploration. Patients with a negative Goldstein test underwent unilateral herniorrhaphy only.

Results: Sixty-one of the 68 patients (89.7%) were under 2 years of age (mean 15 months). The Goldstein test was performed successfully in 59 of 69 patients (86.8%) without complication. Five patients had a positive test and exploration of the contralateral groin in each revealed a hernia. In 8 patients, the insufflation could not be performed. Surgical exploration of the contralateral groin in 2 of these patients revealed a hernia. The remaining 6 patients remain asymptomatic at follow-up. Of patients with a negative Goldstein test, (n=55), 3 (5.5%) have developed clinical symptoms of a hernia in the unexplored groin resulting in operation.

Conclusions: Intraoperative diagnostic pneumoperitoneum is a safe, accurate, and cost-effective alternative to routine contralateral exploration, and the additional cost of expensive techniques to determine the status of the contralateral groin, i.e. laparoscopy.

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LAPAROSCOPIC EVALUATION OF PEDIATRIC INGUINAL HERNIAS

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Objectives: The issue of how to manage the contralateral groin in children who present with a unilateral inguinal hernia has been debated for 40 years. In 1992 laparoscopy was introduced into the debate. Using meta-analysis, this paper attempted to determine the efficacy of intraoperative laparoscopy in diagnosing a contralateral hernia (including patent processus vaginalis) in children undergoing unilateral inguinal herniorrhaphy.

Materials and Methods: All available studies were reanalyzed. Sensitivity and specificity of laparoscopy was determined using open exploration or development of a metachronous hernia as the gold standard.

Results: 964 patients were suitable analysis. Hernia was seen on laparoscopy in 376 patients. All of these cases then had contralateral exploration. 373 patent processus vaginalis were found. Overall sensitivity for laparoscopy was 99.4% (95% CI 97.87-99.91). 588 patients had negative laparoscopy. 62 patients then had open contralateral exploration and in 61 cases the laparoscopic findings were confirmed. In one case a patient processus was found. In the remaining 526 laparoscopy-negative patients, follow-up (< 3 years) was used to see if a contralateral hernia developed. This occurred in one case. Overall specificity was 99.49% (95% CI 98.39-99.87). Laparoscopy added 6 minutes to the operative time and was accurate regardless of the technique used. There were two minor complications.

Conclusions: Laparoscopy may well be the ideal tool to diagnose a contralateral patent processus vaginalis. However, the presence of a patent processus does not imply that the patient will go on to develop a hernia, and although the development of a metachronous hernia was used as the gold standard in 89% of the laparoscope-negative patients, follow-up was short. Further studies are needed to characterize the efficacy of laparoscopy more precisely.
ALLOGENIC FETAL INTESTINAL (AFI) TRANSPLANT WITH FK506 IMMUNO-SUPPRESSION

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Purpose: Small intestinal transplantation remains a significant clinical problem. Allogenic fetal intestinal (AFI) transplantation shows promise, particularly regarding procurement, however, no studies to date evaluate the potential success of true allogeneic loci implantation. We hypothesized that isolated segments of AFI could be heterotopically transplanted but would require immunosuppression to survive.

Methods: Donor tissue was obtained from late gestation Brown Norway fetuses with a hist-locus RTN and Fischer fetuses with a histo-locus RT1L. The recipients were adolescent male Fischer rats with a histo-locus RT1L. A 1.2-cm segment of fetal small bowel was implanted in the omentum of the recipient rat and allowed to mature for 5 weeks. Animals were then separated into 5 groups. Group A served as controls with and syngeneic fetal intestinal (SFI) transplant. Group B received AFI with no immunosuppression. Group C, AFI transplant with 5 days of FK506, Group D, AFI with 10 days of FK506 and Group E, AFI with daily FK506 for the entire 5 week maturation period. Animals were sacrificed on day 35.

Results: All animals gained weight over the maturation period. Groups B, C, and D had no viable transplant segments at day 35. Groups A and E all had well-developed viable segments confirmed by gross and histological evaluation.

Conclusions: FK506 allows for normal intestinal development for use in allogenic fetal bowel transplantation. With this observation, the use of fetal intestine transplanted into the portal circulation emerges as a potentially viable alternative to present intestinal transplant needs.

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10. Session Two       Saturday       10:20-10:30       O R

AIRBAGS AND CHILDREN: A SPECTRUM OF C-SPINE INJURIES

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Over 30 improperly restrained children or in rear facing safety seats have been reported killed in MVA’s involving airbags. We report 3 cases of major injuries in properly restrained children in the front passenger seat.

Case 1: A 10 year-old seatbelted boy was involved in an MVA (70 km/hr) with deployment of both airbags. Physical examination revealed right hyphema with corneal abrasion, right cheek abrasion and minimal cervical tenderness. C-spine X-ray was normal. He was treated for whiplash and facial burns resulting from contact with hot gas released by the airbags and discharged.

Case 2: A 3 year-old boy in a forward facing safety seat was in an MVA (60 km/hr) with air bag deployment. The patient was fully awake. C-spine X-rays were normal. Due to fluctuating level of consciousness, he underwent head CT which demonstrated a subarachnoid hemorrhage and a hematoma inferior to the posterior odontoid, suggesting a ligamentous tear. He remained asymptomatic and was discharged on day 6. A head CT scan at one month revealed a periosteal reaction in the area of the alar ligament suggestive of partial ligamentous avulsion, this injury being the forerunner of atlanto-occipital dislocation.

Case 3: A 4 year-old boy wearing a lapbelt was in an MVA (20 km/hr) with airbag deployment. On arrival his Glasgow coma scale was 3 and he was haemodynamically unstable. Secondary survey after stabilization revealed left neck abrasions and ecchymoses, priapism and absent rectal tone. C-spine X-ray revealed atlanto-occipital dislocation with possible complete spinal cord transection at C1. Aggressive maneuvres were withheld and the patient pronounced dead. Autopsy findings confirmed the clinical diagnosis.

Airbags deploy by releasing a hot effluent at 300 km/hr. Mechanisms of injury include direct contact or hot gas with facial skin and force transmitted directly from the airbag system to the child’s head and neck. These cases illustrate a spectrum of airbag injuries and support the recommendation that the safest place for children under 12 years of age in a car equipped with dual airbags is the back seat.

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11. Session Two  Saturday 10:30-10:40  OR

CT grade > 3 = nb

10 YEAR REVIEW OF NON-OPERATIVE MANAGEMENT FOR BLUNT SPLENIC TRAUMA IN CHILDREN - PREDICTORS OF OUTCOME

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Objective: Non-operative management of splenic injuries is beneficial in the pediatric population. Although there is a wide range in severity of splenic injury, most patients are managed with the same nonoperative protocol. The duration of hospitalization was derived empirically, and a prospective trial is required to objectively define nonoperative management. This retrospective review attempted to identify factors that predict good outcome, and thus a subgroup of low-risk patients who may be managed with a shorter period of bedrest.

Methods: Review of all 70 patients admitted with blunt splenic trauma over a 10 year period. There were 48 males and 22 females aged 4.6 months to 16 years. Two required immediate surgery and 68 had non-operative management. The 68 nonoperative patients were analyzed to identify good prognostic indicators. Poor outcome was defined as delayed abdominal surgery or splenic complications. CT scans were graded (Pranikoff) by a radiologist blinded to the clinical data.

Results: Two patients had immediate surgery: one splenectomy and one splenorrhaphy. There were 8 poor outcomes in 7/68 patients managed nonoperatively. Four had delayed abdominal surgery (no splenectomies) and 4 developed splenic complications: one pseudoaneurysm, one infarcted spleen, and two prolonged splenic hematomas. The total splenic salvage was 66/70 (97%). There were no deaths. Outcome was not predicted by Pediatric Trauma Score, transfusion requirements, or mechanism of injury (although “fall from a height” approached significance (P=0.06)). CT grade of injury was significant in predicting outcome (P=0.03). All patients with a poor outcome had a CT grade >3.

Conclusions: Although 98.5% (67/68) of spleens managed nonoperatively were salvaged, we identified 7/68 (10%) who had poor outcome. The only significant predictor of outcome was a CT grade of injury <3. Therefore, patients with a CT grade <3 may be a subgroup who could be managed on a “low risk” protocol.
ALTERED IGF-I mRNA EXPRESSION IN HUMAN HYPOPLASTIC LUNG IN CONGENITAL DIAPHRAGMATIC HERNIA

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Aim: High mortality in congenital diaphragmatic hernia (CDH) has been attributed to pulmonary hypoplasia. Insulin-like growth factor-I (IGF-I) is a peptide growth factor that is synthesized in many organs during human development. In the lung, IGF-I is mainly synthesized in type II pneumocytes and alveolar macrophages. Recent studies have shown that IGF-I mRNA expression in the lung is predominant during the fetal life and decreases prior to birth and barely detectable in the neonatal lung. The aim of this study was to investigate IGF-I mRNA expression in CDH lung in order to understand the basis of pulmonary hypoplasia in newborns with CDH.

Methods: Lung tissue samples were obtained at autopsy from 13 newborns (mean age 2.6 days) with CDH. Normal lung tissue from 8 sudden infant death syndrome (SIDS) (mean age: 15.3 days) acted as controls. The tissues were fixed in 4% paraformaldehyde solution for 24 hours and snap frozen in liquid nitrogen embedded in OCT compound. In situ hybridization was performed using IGF-I specific and digoxigenin labeled oligonucleotide probe.

Results: Strong IGF-I mRNA expression was observed in both type II pneumocytes and alveolar macrophages in CDH hypoplastic lung compared to control lung (Table)

<table>
<thead>
<tr>
<th>IGF-I mRNA Expression in Lung Tissue</th>
<th>Control</th>
<th>CDH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II Pneumocyte</td>
<td>~ ±</td>
<td>++</td>
</tr>
<tr>
<td>Alveolar Macrophage</td>
<td>~ ±</td>
<td>++</td>
</tr>
</tbody>
</table>

(-) absent, (+) weak, (+) moderate, (++) strong

Conclusion: Our findings of strong IGF-I mRNA expression in the hypoplastic lung suggest that lung hypoplasia in CDH is a persistence of fetal stage of lung development.
COMPARISON OR PULMONARY VASCULATURE IN CONGENITAL DIAPHRAGMATIC HERNIA IN NEWBORNS AND STILLBORNS

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Aim: The high mortality in patients with congenital diaphragmatic hernia (CDH) has been shown to be a result of pulmonary hypoplasia and associated persistent pulmonary hypertension (PPH). The most striking changes in pulmonary arterial wall in patients who have PPH include increase in medial and adventitial thickness and area. Recently, structural changes in pulmonary veins in addition to arteries have been reported in CDH complicated by PPH. The aim of this study was to compare structural changes in pulmonary vasculature in newborns and stillborns with CDH. Materials and Methods: Victorian blue van Gieson (VVG) staining and immunostaining with anti-alpha smooth muscle actin (ASMA) were performed on lung tissues obtained at autopsy from 23 newborns with CDH complicated by PPH, 4 stillborns with CDH and 11 age matched controls of sudden infant death syndrome patients (SIDS). The degree of adventitial and medial thickness and degree of adventitial and medial area were measured in pulmonary arteries with an external diameter (ED) of <75μm, 75-100μm, 100-150 μm, 150-200 μm, 200-250 μm, and >500 μm by IPS-4.01 image analyzer and compared statistically. Each of the above values were also measured in pulmonary veins with an external diameter (ED) of <100 μm, 100-200μm, and >200 μm. In order to determine whether the characteristic structural changes were size related, each was related to external diameter. Results: There was significant increase in adventitial thickness and area in arteries of all sizes in both newborns and stillborns with CDH compared to SIDS patients (p<0.01). The degree of medial thickness in newborns and stillborns with CDH were significantly increased when compared with SIDS patients (p<0.01). There was a significant increase in adventitial thickness and area in veins of all sizes in newborns with CDH compared to stillborns with CDH and SIDS (p<0.01). The degree of adventitial thickness and area of pulmonary veins were similar between CDH and SIDS. There was no significant differences in medial thickness of veins between three groups. Conclusion: The absence of structural changes in pulmonary veins in stillborns with CDH suggests that the pulmonary venous changes observed in newborns with CDH complicated by PPH occur after birth as a result of increase in transvascular pressure or as a response to release of peptide growth factors.

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MASSES MOSTLY MISDIAGNOSED - THYMIC CYSTS

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Objective: Thymic cysts are rare lesions of the neck and mediastinum that are
difficult to diagnose, often considered inconsequential, but which may become life
threatening by compromising the airway. We reviewed a 10 year series of these
cysts.

Material and Methods: From 1984-1993 we encountered 12 patients with this
lesion. Excluded was any patient that had a thymic cyst in conjunction with a
thymoma. Ages ranged from 2 weeks to 16 years. Six children were symptomatic:
wheezing, upper respiratory infection, cough, and fever being the most common
clinical features. All but two patients were incorrectly diagnosed before surgery.
Incorrect diagnosis included bronchogenic cyst, cystic hygroma, teratoma, and
lymphoma. Investigations used included chest radiograph, contrast esophagogram,
sonography, and computerized tomography. Six patients had cervical masses, five
had mediastinal masses, and one had both sites involved. Seven patients had
displacement of normal mediastinal or neck structures.

Results: All patients underwent uneventful excision of their lesions. All had
benign thymic cysts ranging from 2-22 cm in diameter.

Conclusions: Thymic cysts are rare benign lesions that should be considered in
the differential diagnosis of cervical and mediastinal masses in children.

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RESULTS OF PORTO-SYSTEMIC SHUNT IN CHILDREN WITH PORTAL HYPERTENSION

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Porto-systemic shunt (PSS) remains the best option for children with extra-hepatic portal hypertension and an acceptable one for those with intra-hepatic block and satisfactory liver function. From 1971 to 1996, 34 children (M 18, F 16) have been treated. Mean age at the first hemorrhage was 3.5 years (4 months - 10 years). Etiologic distribution: 13 American Indian cirrhosis, 17 extra-hepatic portal vein obstruction (PVO), and 4 congenital hepatic fibrosis.

Preoperative endoscopic evaluation: 32/34 had esophageal and 17/34 had gastric varices. Mean age at PSS was 7 years 9 months: 11 < 5 years, 13 between 6-10 years, 7 between 11-15 years and 3 > 15 years. Types of shunt: 13 (9 H-Type, 4 others) meso-caval, 11 porto-caval, 7 spleno-renal, 2 iliocavo-mesenteric and 1 spleno-caval. Occasionally, in the young patients, no change was observed. Two patients died (6%) in the immediate post-op period: one from sepsis due to gastrostomy leakage and the second from massive pulmonary embolism.

Our long-term success rate was 76%. Eight of 34 children (24%) were considered failures: 4 patients had gastro-esophageal re-bleeding and 4 had documented thrombosis with their shunt. In conclusion: PSS should be performed in children of any age presenting with major or recurrent bleeding secondary to portal hypertension. This is definitive and adequate treatment for children with extra-hepatic portal hypertension. Furthermore, in children with ongoing cirrhosis, this palliative treatment can delay liver transplantation.

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PORTAL VENOUS DECOMPRESSION WITH H-TYPE MESOCAVAL SHUNT USING AUTOLOGOUS VEIN GRAFT: A NORTH AMERICAN EXPERIENCE

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Purpose: Upper GI bleeding in children is unique because it is often the result of portal vein obstruction with normal liver function. This reports details a North American experience with the H-type mesocaval shunt.

Methods: Patient charts from two children’s hospital from 1980-1996 were reviewed. 13 patients underwent H-type mesocaval shunting for the following diagnosis: cavernous transformation of the portal vein (9) Amerindian cirrhosis (4) congenital hepatic fibrosis (1) hepatic fibrosis/polycystic kidney disease (1). Patients had been followed 3 years +/- 2.8 years prior to surgery (average +/- SD), received 3.8 +/- 3.5 units of blood, and had 5 +/- 3 sessions of sclerotherapy. Age at operation was 6.5 +/- 4.5 years, and weight 26 +/- 17 kg. Patients underwent direct superior mesenteric to inferior vena cava shunting using interposed autologous jugular vein.

Results: Patients did well; the one death occurred at 2 weeks post-op from unrelated G-tube complications. Other malfunction requiring revision (1) transient encephalopathy, (1) and esophageal stenosis due to multiple previous sclerotherapy procedures (3). All shunts are open at minimum follow-up of 1 year; with average follow-up of 3 years; no patients have required transplantation.

Conclusion: These favorable long-term results demonstrate the utility of this procedure and support its use in this population.

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NOVEL SURGICAL TECHNIQUES IN THE REPAIR OF LARGE NEONATAL CONGENITAL DIAPHRAGMATIC HERNIA

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Introduction: A major limitation to primary patch closure of a large neonatal congenital diaphragmatic hernia (CDH) has been the rapid growth of the infant relative to the patch resulting in patch separation and re-herniation. Furthermore, posterior patch fixation is technically demanding when there is no posterior diaphragmatic rim. We have developed novel surgical techniques to address these limitations for the surgical treatment of CDH.

Techniques: A Gortex™ patch is used to prevent extensive adhesions to the upper abdominal viscera. The limitation of a non-expanding diaphragmatic patch has been addressed by placing a redundant Gortex™ patch that is parachuted into the hemithorax and pleated with several Maxon 3.0 sutures. The sutures forming the pleat gradually resorb allowing “functional” expansion of the patch in order to accommodate the growing child. The incidence of re-herniation and requirement for a second patch is thus reduced in these infants.

The difficulty of securing the posterior portion of the diaphragm in infants with no posterior rim of diaphragm has been overcome with the use of a Auto Suture™ multifire Versa Tack 4.0 mm laparoscopic stapling device. After the anterior portion of the patch is sutured to the diaphragmatic rim, the posterior portion is quickly and easily secured to the posterior chest wall with the stapling device.

Conclusion: Until an improved source of diaphragmatic replacement, either synthetic or autologous is available, these techniques may reduce the incidence of patch separation and re-herniation.

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11/2 patients

Discussion

Technical discussion

Stapler surgery fee
CERVICAL ECMO CANNULA PLACEMENT IN CHILDREN: RECOMMENDATIONS FOR ASSESSMENT OF ADEQUATE POSITIONING AND FUNCTION

M.S. Irish, P. Kapur, D.A. Bambini, R.G. Azizkhan, J.F. Allen, M.G. Caty, J.C. Gilbert, R.H. Steinhorn, P.L. Glick,
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Introduction: ECMO cannulae malposition often requires a second operation to rectify the problem. Re-operation places the patient at risk for infection, bleeding or death. This study analyzes indications for cannulae repositioning and to suggest an alternative standard for intra-operative evaluation of catheter function as it relates to position.

Methods: We reviewed charts of 73 patients placed on arterio-venous ECMO through cervical vascular access. Criteria for repositioning of either cannula, after the initial operation, was recorded as was timing of repositioning with respect to initial cannulation.

Results: Of 73 patients, 16 (21.9%) required either arterial cannulae (11) or venous cannulae (7) repositioning. Of the venous cannulae, 3 were advanced on the basis of suboptimal venous flow on the ECMO circuit after wound closure. Three venous cannulae were repositioned based on inadequate positioning, determined on chest x-ray, prior to wound closure. One venous cannula was retracted based on malposition determined by postoperative ECHO. Five patients had intraoperative, arterial cannula repositioning based on cannula position on chest x-ray. Six underwent re-exploration for cannulae repositioning. 4 based on x-ray interpretation of inadequate positioning, 1 because of poor flow, and 1 based on malposition noted on ECHO.

Conclusion: 21.9% of ECMO patients underwent cannulae repositioning. Repositioning required second cervical exploration in 62.5%. The use of 2D-ECHO prior to wound closure, may be a superior, more cost effective means of assessing cannulae placement and function than x-ray. Confirmation of cannulae position and function, prior to wound closure, would reduce the risks involved with cervical re-exploration.

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VIDEO-ASSISTED THORACOSCOPIC RESECTION OF PULMONARY NODULES: PREOPERATIVE LOCALIZATION WITH INDIA INK

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Purpose: Preoperative needle localization has been used to facilitate thoracoscopic resection of small peripheral lung nodules. The disadvantage of this approach is the need to transfer the patient directly from radiology to the operating room, and the risk of dislodgement of the needle. We describe a technique of thoracoscopic biopsy of a small pulmonary nodule with preoperative localization by CT-guided india ink injection.

Methods: A 14 year old child, status post completion of therapy for a right thoracic Askin tumour, presented with 2 small pulmonary nodules in the left lung base. The more peripheral nodule was 9 mm and located 1.5 cm subpleural. With intravenous sedation and local anesthesia, a 22-gauge needle was advanced under Ct guidance to the margin of the nodule, and sterilized india ink was injected. A small pneumothorax was noted on follow up chest X-ray. The child had transient coughing and complained of pain at the site of injection, resolving in several hours.

Results: Thoracoscopic biopsy was performed 24 hours after the localization procedure. India ink staining was easily visualized on the parietal and visceral pleural surfaces, corresponding to the size and site of injection. There was no diffusion of the ink into surrounding pleura or lung parenchyma. The pulmonary nodule was not visible. The endo stapler was used to perform a 3 by 1 cm wedge resection. Pathology demonstrated a small metastatic focus of tumour within the specimen. The child was discharge home 36 hours postoperatively.

Conclusions: India ink can be used for preoperative localization of small, peripheral lung nodules that would otherwise be non-palpable and non-visible at thoracoscopy. The ink appears to be non-diffusible in the lung and pleura, and therefore provide accurate localization, allowing for limited parenchymal wedge resection. Further studies are planned in an animal model, to evaluate dyes with respect to diffusion properties and tissue reaction.

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SINGLE-PORT TRACHEOSCOPIC SURGERY IN THE FETAL LAMB

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Background: Endoscopic fetal surgery could avoid many of the problems associated with open fetal surgery, but the use of multiple ports has proven to be too traumatic to the membranes. We describe a single-port technique of tracheoscopic surgery in the fetus.

Methods: Time-dated pregnant ewes (95-105 d, term = 3D 145d) underwent midline laparotomy under general halothane anesthesia. A 5 mm balloon-tipped cannula was introduced in the uterus by Seldinger technique. A 1.2 mm semi-rigid mini-endoscope (Karl Storz), fitted inside a 9 Fr, 20-B0-curved sheath, was introduced under continuous, low pressure irrigation, inside the fetus’s mouth, and advanced into the trachea. Endotracheal procedures were performed by introducing a 1 mm diameter instrument alongside the telescope. They included temporary balloon occlusion for distal tracheal fluid aspiration or instillation (n=3D 11), placement of a detachable balloon for therapeutic tracheal occlusion (n=3D 21), retrieval of endotracheal device (n=3D 12).

Results: Single-port fetal tracheoscopy was successfully performed in 46 of the 47 fetuses. The rigidity of the telescope allowed controlled access to the pharynx; its curve allowed full tracheobronchial endoscopy with the fetus in utero. There were no operative deaths.

Conclusions: The use of a semi-rigid, curved mini-endoscope has allowed us to safely and reproducibly perform various tracheoscopic procedures in the mid-gestational fetal lamb through a single endoscopic port. The present technique marries the control and optical quality of a rigid endoscope with the physiologic curve only a flexible instrument could until now offer. The types of procedures performed with this technique illustrate its potential as a research tool; the size (1.2 mm), shape and optical qualities of the device should make clinical applications possible.

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SUCCESSFUL TREATMENT OF A SPONTANEOUS INTRAOPERATIVE LIVER HEMORRHAGE IN A PREMATURE INFANT WITH NECROTIZING ENTEROCOLITIS

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Purpose: Spontaneous liver hemorrhage is a rare, but lethal intraoperative complication in infants with necrotizing enterocolitis (NEC). We report successful treatment of a massive liver hemorrhage using intraparenchymal injection of thrombin and fibrin glue.

Case Report: A 1500 gram, 86 day old premature neonate developed abdominal distention and persistently dilated loops of bowel on Xray. His condition quickly deteriorated despite maximal medical therapy and he was taken to the operating room for exploration. At operation, necrotic colon from the cecum to distal sigmoid was resected. He required 175 cc/kg of blood products and colloid to maintain his mean arterial pressure greater than 30 mm Hg. His liver became increasingly engorged and spontaneously fractured in 2 locations. We injected the profusely bleeding liver with thrombin causing a transient blanching, followed by a diminution of bleeding. Pressure was applied for 20 minutes, then fibrin glue was injected, with complete cessation of bleeding.

Discussion: Spontaneous liver hemorrhage during operation for NEC is usually lethal. Techniques to control bleeding including surgical repair, coagulation, topical avitene, and topical fibrin glue, are largely unsuccessful. We believe that intraparenchymal injection of potent clotting factors followed by direct pressure promoted clotting in the disrupted hepatic vessels. Also, injection into the liver itself may have provided direct tissue tamponade. Based on this case, the injection of thrombin and fibrin directly into liver fractures offers another treatment option for the desperate situation of spontaneous intraoperative liver hemorrhage in infants with NEC.

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DELAYED COMPLICATIONS IN BLUNT “SPLIT LIVER” INJURY INITIALLY MANAGED NON-OPERATIVELY

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Purpose: Blunt liver injury is usually managed non-operatively in the stable child. We report three cases of “split liver” injury (an entire lobe or segment devascularized along anatomic planes) that developed delayed complications after initial non-operative management.

Patient Management and Outcome: Three children sustained blunt abdominal trauma from impact or crush injury, and were resuscitated with IV fluids; 2 required blood (10 cc/kg). Injuries were imaged by contrast CT scan. After monitoring in the ICU, they were managed with bedrest on the surgical ward. Case 1 was an 11 year old with devascularization of the right posterior segment, who was discharged home 10 days post-injury on limited activities. He presented on week later with respiratory distress, fever, and a right pleural effusion. Thoracoscopy revealed a diaphragmatic injury with necrotic liver and clot through the defect. At thoracotomy, necrotic liver was debrided and the diaphragm repaired. Follow-up imaging studies showed complete resolution of injury. Case 2 was a 4 year old with complete avulsion of the left lateral segment, which on CT scan 10 days post injury was necrotic. Persistent abdominal pain and fever led to operative exploration and left lateral segmentectomy. The remaining liver was normal on imaging 6 weeks post injury. Case 3 was a 4.5 year old with a laceration through the interlobar fissure and devascularization of the right lobe. The child had persistent abdominal pain, fever, and poor oral intake. CT scan 14 post injury showed a portal fluid collection, with duodenal and IVC compression, which was drained percutaneously with resolution of symptoms. The drain was removed 18 days later, and follow-up CT scan at 2 months showed near complete involution of the right lobe.

Conclusions: Children with “split liver” injury may be initially managed non-operatively after stabilization, but should be followed closely for the development of complications that may require operative intervention.

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PEDIATRIC PAPILLARY CYSTIC NEOPLASM OF THE PANCREAS:
A REPORT OF 3 CASES

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Background: Papillary cystic neoplasms (PCN) are rare pancreatic tumors that typically present in women in the third decade of life. Few cases have been reported in the pediatric literature.

Methods: We retrospectively review three pediatric cases in our experience.

Results: A 10 year old East Indian girl presented with a six month history of abdominal pain and right upper quadrant mass. Computed tomography (CT) revealed an 8 cm partially cystic mass in the pancreatic head. Pancreaticoduodenectomy was performed.

A 14 year old Caucasian girl presented with an epigastric mass. CT demonstrated a 7.5 cm mass in the head of the pancreas. Pancreaticoduodenectomy was performed.

An 11 year old Caucasian boy presented with generalized abdominal pain after blunt trauma. CT revealed a 5 cm solid/cystic mass in the tail of the pancreas, with lesser sac and intraperitoneal free fluid. Laparotomy and splenectomy were performed.

Histologic findings for all tumor specimens were consistent with PCN. All regional lymph nodes were negative for tumor. Each patient is currently well without evidence of recurrence at twelve, forty-eight, and eight months, respectively.

Conclusions: In over fifty years, fewer than 300 cases total of PCN have been reported. Our male patient is only the twenty-ninth male documented with PCN, and he is the second youngest male ever reported. PCNs arise commonly in the pancreatic body or tail. Depending on location, extensive pancreatic resection is often required. Long term prognosis is excellent.

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A MUCOEPIDERMOID CARCINOMA OF THE PAROTID GLAND:  
A RARE PRESENTATION IN A YOUNG CHILD

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Mucopidermoid carcinoma (MEC) of the parotid gland is rare. We define an  
unusual presentation of MEC of the parotid gland, in one of the youngest ever  
documented patients.

A 6-year-old girl had an asymptomatic palpable neck mass for 5 months. Clinical  
examination revealed a 1.5 cm firm but mobile, smooth non-tender mass located  
inferior to the angle of the mandible (left jugulodigastric lymph node region)  
clinically separated from the parotid gland. Ultrasound revealed a vascular mass,  
with a cystic component, possibly within the tail of the parotid gland. An  
excisional biopsy was performed. Pathology showed the MEC was encapsulated  
with solid and cystic areas and one resection margin involved with tumour. MEC  
was not seen in the superficial lobe of the parotid gland. Subsequently a left upper  
modified radical neck dissection and repeat left partial parotidectomy were  
performed. There was no residual disease histologically.

Although MEC is the most common malignant neoplasm of the salivary glands in  
childhood and adolescence, it is rarely found under the age of ten. Review at the  
Rare Tumor Registry in Texas found this was the youngest case of MEC  
documented at their centre in over 20 years. This rare and unusual case does  
suggest that more widespread use of fine needle aspiration may allow for better  
preparation preoperatively.

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similar 7 7/10.
DOPPLER FLOW ASSISTED LAPAROSCOPIC VARICOCELECTOMY IN ADOLESCENTS

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Most varicoceles appear between 10-14 years of age and male subfertility is present in 19-41% of cases. However, following correction of a varicocele in adult life normal fertility is attained in only 20-50% of cases. Between June 1993 and June 1996 laparoscopic varicocelectomy was performed on 20 boys aged 9-16 years (median 12 years). The testicular artery was identified and preserved with the aid of a Doppler flow vascular access device, *Smart Needle*. The operative time was a mean of 1 hour and 3 ports were utilised. Four patients underwent the laparoscopic procedure following recurrence after initial open varicocelectomy. All varicoceles were left sided and easily visible (stage 3). Preoperative assessment clinically and on ultrasound demonstrated the left testis was 20-30% smaller than the right in 16 patients, 50% smaller in 3 and both testes were equal in 1.

Follow-up at a median of 16 months (6-35 months) demonstrated complete correction of the varicocele in 17. Two patients developed a mild hydrocele. In 3 patients with large varicoceles there was significant reduction in size of the varicoceles. Open repair performed on these 3 patients confirmed dilated cremasteric veins connecting to the inferior epigastric vein. Subsequently, 4 recent patients also underwent laparoscopic clip ligation of the epigastric veins with 1 recurrence of varicocele. The majority of patients went home within 6 hours of surgery.

The laparoscopic technique with preservation of the testicular artery is an acceptable alternative to open surgical treatment of varicoceles in adolescents.

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COUGAR ATTACKS ON CHILDREN:
A REPORT OF THREE CASES AND A REVIEW OF THE LITERATURE

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Objectives: Recently, three children have been treated at our institution after
being attacked by cougars. A review of attacks on children was performed to
determine method of attack and injury patterns so that treatment and preventative
measures could be determined.
Materials: A review of all reported attacks on children (ages 0-18) was
performed.
Methods: Situation, adult supervision, patient age, injuries, survival, and mode of
attack, if known, were reviewed.
Results: The cougar has been responsible for 63 nonfatal and 18 fatal attacks in
the last 106 years. 58.9% of all attacks and 69% of all fatal attacks were on
children. There were a total of 49 attacks on children with a 25% fatality rate. The
average age was 8 years. Boys outnumbered girls as victims 4:1. Most children
were not alone when attacked (92%). In many instances adult supervision was
present. Cougars most often attacked the victim from behind. Severe head and
neck lacerations and puncture wounds were the most common injury followed by
extremity injuries. Examples of cervical injuries include a nonfatal vertebral
artery injury, phrenic nerve injury, a fatal internal carotid artery injury and a fatal
cervical spine injury. The cougar was rabid in two cases resulting in one death
secondary to rabies. Pasteurella resulted in late infections in two patients.
Conclusions: We recommend aggressive evaluation for occult cervical injuries
and operative debridement. Antibiotics should cover oropharyngeal flora
including Pasteurella multocida. Rabies prophylaxis is indicated until the rabies
status of the cougar is known. Close adult supervision in wilderness areas is not
necessarily protective.

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CONTRACTILE PROPERTIES OF INTRALOBAR PULMONARY ARTERIES AND VEINS IN CONGENITAL DIAPHRAGMATIC HERNIA: AN INITIAL LOOK AT THE NITRIC OXIDE-CGMP PATHWAY OF VASODILATION

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Introduction: In congenital diaphragmatic hernia (CDH), hyperplasia of the acinar arteries, and sensitivity of pulmonary vessels to stimuli of vasoconstriction suggests that vascular mediators may be involved in the persistent pulmonary hypertension often observed. We hypothesize that there may be an alteration in the nitric oxide (NO) pathway of vasodilation as part of the pathophysiology of CDH.

Methods: 3rd-4th generation pulmonary arteries and veins were dissected from both right and left lungs of 139-day gestational lambs with surgically created CDH. Vessels were studied with standard techniques of isolated tissue baths. All vessels were pre-treated with indomethacin to prevent the formation of vasoactive prostaglandins and propranolol to block Beta-receptors. Concentration-response curves to pharmacologic agents were recorded.

Results: Experiments examined basal release of NO in endothelium-intact PV’s and PA’s of both right and left lungs by measuring the contractile force of vessels with and without the nitric oxide synthase inhibitor N-nitro-L-arginine (L-NA), then constricted the norepinephrine (NE). PA’s of right and left lungs, constrict similarly to NE, and there constriction did not enhance with L-NA pretreatment. Further, we found differences comparing right and left pulmonary veins using the same protocol. L-NA pretreatment enhanced constriction to NE in right PV’s, while left PV’s showed no enhancement. Both right and left PV’s responded with normal relaxation to the calcium ionophore A23187.

Conclusion: These preliminary results suggest there may be a difference in nitric oxide synthase activity between right and left lungs in the CDH model. However, relaxation to A23187 indicates NOS activity can be stimulated.

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SENSITIVITY AND COST EFFECTIVENESS OF RADIOLOGY VS. OLIVE PALPATION FOR THE DIAGNOSIS OF HYPERTROPHIC PYLORIC STENOSIS (HPS)

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Purpose: Two strategies are commonly used for the initial diagnosis of HPS: 1) physical examination, and 2) barium swallow or ultrasound. We wished to determine the sensitivity and relative cost of each strategy.

Methods: 234 patients had a history suggestive of HPS. Mean diagnostic costs (MDC) and mean total costs (MTC) were calculated according to two theoretical models. Model A: all patients examined by a surgeon, proceeding to surgery if an olive is palpable, or to radiology if not. Model B: all patients to radiology first, and to surgery if positive.

Results: 150 patients had HPS (64%); olives were palpated in 111 of these (sensitivity of 74%). There was one false olive (0.7%). Ultrasound and barium were equally accurate (0.5% false positive, 3% indeterminate, sensitivity of 100%). The following equations estimated each model’s MDC and MTC for our patient population:

Model A:
- MDC=$507 - $221 \text{ *(palpation sensitivity)}
- MTC=$2543 - $240 \text{ *(palpation sensitivity)}

Model B:
- MDC=$449 \text{ (independent of palpation sensitivity)}
- MTC=$2454 \text{ (independent of palpation sensitivity)}

Model A yielded a lower MDC than Model B if palpation sensitivity was at least 26%, and a lower MTC if palpation sensitivity was at least 37%. Savings maximized by setting palpation sensitivity at 100% (36% and 6% reduction over Model B for MDC and MTC, respectively).

Conclusions: Although highly sensitive, imaging is superfluous if an olive is palpable. We conclude that: 1) children suspected of having HPS should have a surgical consultation before a radiology study as long as the surgeon’s sensitivity for olive palpation is at least 37%, and 2) improved palpation skills will result in maximum cost savings.

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TOPICAL STEROID THERAPY IN THE TREATMENT OF CHILDHOOD PHIMOSIS: AN ALTERNATIVE TO CIRCUMCISION

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Background: Phimosis is a common problem affecting approximately 5-10% of school-age males. The ideal treatment still remains controversial, especially for disease of moderate severity. Recently, some have begun using topical steroids in the treatment of phimosis.

Objectives: The principal objective of our study is to assess the short and long term efficacy of topical steroids in phimosis and evaluate any complications.

Methods: All patients were treated, by a single investigator, with 0.1% Triamcinolone Acetonide (Kenalog) applied topically to the prepuce TID for 1 month. Follow-up was ascertained by return visits or phone contact. We used a grading system for disease severity proposed by Kikloos et al.: grade 0 - no phimosis, grade 1 - full preputial retraction but constricted behind the glans, grade 2 - partial glans exposure, grade 3 - only meatus visible, grade 4 - some preputial retraction but meatus not visible, grade 5 - no preputial retraction at all.

Results: Thirty boys with an average of 4.7 years completed treatment. Fourteen had an initial disease severity of grade 3 or more, 12 had grade 2 disease, while only four had mild disease (grade 1). After the treatment period of 1 month, 27 (90%) of the children showed improvement, with 23 (85%) being completely cured, grade 0. Twenty three boys, thus far, have follow-up of 2 or more month (average 4.5 months). Twenty of the 23 have had no change from their initial response after completion of treatment. The 3 who recurred did not regularly retract the foreskin. There were no complications associated with this therapy.

Conclusions: Topical steroid therapy cures the vast majority of moderate and severe phimosis. The benefits appear to be permanent, as long as patients routinely retract the prepuce as part of normal hygiene. We believe all children should be treated with topical steroids before undergoing circumcision for phimosis.

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PROPHYLACTIC THYROIDECTOMY FOR MEDULLARY THYROID CARCINOMA IN GENE CARRIER OR MEN II SYNDROME

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Although medullary thyroid carcinoma (MTC) can occur sporadically, it is most often associated with multiple endocrine neoplasia syndrome (MEN type II). Classic screening was based on evaluation of basal and stimulated serum calcitonin levels. The recent identification of the MEN IIa gene on the Ret proto-oncogene of chromosome 10 now allows for testing of gene carrier status in individual at risk. It is opening the option for prophylactic treatment. The present study was undertaken to determine the appropriate age for safe total prophylactic thyroidectomy and central neck dissection without parathyroid autotransplantation. Four patients (30%) were previously treated for Hirschsprung’s disease. In 7 patients (mean age of 11.8) diagnosed with the basic screening, multifocal MTC and C cell hyperplasia (CCH) were found in all the pathologic specimen. Of 6 patients with genetic screening (mean age of 9.1), two had elevated stimulated calcitonin levels, one (age 14) had evidence of MTC and one (age 6) had CCH. Four with normal levels had no evidence of MTC (age 6,8,10) but one occurrence of CCH (age 11). No episode of post-op hypoparathyroidism or recurrent laryngeal nerve damage occurred in this series. With a mean follow-up of 4 years (range 1 to 14 years), the overall disease free survival is 100%. From this study we conclude that total thyroidectomy can safely be performed in children and should be the treatment of choice in gene carrier even if the serum basal or stimulated calcitonin level is normal. Total thyroidectomy should be done as early as 5 years of age before the occurrence of CCH or MTC.

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31. **Session Four**       Sunday       11:20-11:30       OR

**CYSTIC THYROID LESIONS IN CHILDREN**

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**Purpose:** To study both the presentation and management of cystic thyroid lesions in the pediatric and adolescent population.

**Methods:** A retrospective review of all thyroid masses found to be purely or partially cystic on ultrasound examination between 1978 and 1996 was conducted, looking at presentation, family history, laboratory values, ultrasound and radionucleotide imaging, pathologic and cytologic evaluation.

**Results:** 28 patients (19 female, 9 male) aged 6-18 were diagnosed with cystic lesions of the thyroid. Of these, 26 presented with painless neck masses. 24 were clinically euthyroid, only 1 had a single abnormal thyroid function test, only 3 had mildly positive antithyroid antibody tests and nearly 30% had a positive family history of family disease. On ultrasound, 13 patients had pure cysts and 15 mixed solid cystic. On scintiscan, 6 lesions were hot, 15 were cold, 5 were normal and 2 were mixed. Treatment included either observation, aspiration, cyst sclerosis, surgery, or combinations thereof. Pathologic and cytologic results included cystic degeneration (7), follicular adenoma (9), multinodular goiter (4), branchial cleft cyst (1), thyroglossal duct cyst (1), carcinoma (5) and undetermined (2).

**Conclusions:** Thyroid cysts are often thought to represent benign degenerative disease. Our study, which is the first of its kind in the literature to specifically address thyroid cysts in children, shows that ultrasound is useful in evaluating thyroid masses, while laboratory and radionucleotide are of less value, and that single lesions of mixed echogeneity are likely to represent neoplasms, a high percentage of which are malignant.

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LOCAL DRAINAGE AND LAPAROTOMY FOR PERFORATED NECROTIZING ENTEROCOLITIS IN THE VERY LOW BIRTH WEIGHT NEONATES

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The management of the very low birth weight (vLBW, <1500g) babies with perforated necrotizing enterocolitis (NEC) provides a complex therapeutic challenge. Laparotomy with exteriorization, primary anastomosis, or bedside drainage under local anesthesia (either as definitive or temporizing therapy) are advocated for the treatment of perforated NEC in vLBW neonates. The purpose of this study is evaluate the clinical effectiveness of local drainage and laparotomy in vLBW infants with perforated NEC.

This cohort, retrospective study from an urban children’s hospital, reviewed the records of vLBW infants surgically treated for NEC in a level three NICU from 1991-1997. The infants were stratified by birth weight and physiologic parameters. The physiologic conditions were categorized as related to NEC or to coexistent disorders. Statistically evaluations were performed using the students t test and analysis of variance.

80 neonates under 1500g were identified to be in the study group. 58 infants presented with perforated NEC, and were treated initially by either local drainage (N=12) or exploratory laparotomy (N=46). Infants treated initially by local drainage weighed <1000g, and had an average of 4.1 comorbid factors present at perforation. Survival in this group was 50%, with 4 requiring drainage only and 2 had subsequent laparotomies for stricture. Survival for infants <1000g treated by initial laparotomy was 84% and those between 1000-1500g was 75%. Both laparotomy groups had statistically fewer comorbid (2.8) factors than the local drainage group (p<0.05). However, survival, adjusted for number of comorbidities demonstrated no statistical difference between groups. Mortality from perforated NEC in the vLBW neonate continues to be significant, however, it appears more related to severity of illness than mode of surgical therapy. A prospective study of local drainage and laparotomy is justified.

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ADHESIVE SMALL BOWEL OBSTRUCTION IN CHILDREN
PREDICTORS OF OUTCOME

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Objective: To review our experience with adhesive small bowel obstruction to find predictors of outcome.

Materials and Methods: Retrospective review of all admissions for ASBO over 5 yr period. 111 admissions in 99 patients were analyzed to document demographics, presenting signs and symptoms, investigations, initial management, operative findings, complications and previous surgery.

Results: 111 cases (81 male, 30 female) in 99 patients between 2 weeks to 17 years of age. 20 patients required immediate surgery for signs of acute SBO, while 91 patients had initial conservative therapy. 73 patients eventually had surgery for unresolving obstruction, but 18 had successful nonoperative management. Classic predictors of bowel ischemia (fever, tachycardia, localized tenderness, leukocytosis) did not independently predict the need for surgery, but the presence of 2 or more of these factors was predictive (P=0.0004). The volume of NGT drainage, plain X-ray findings, number of previous surgeries and time since last surgery were also not predictive factors. SBFT was performed in 24% of patients and affected management in 82%. 20% of obstructions were caused by adhesions to the previous incision. 78% of patients managed nonoperatively resolved within 60 hours. Conservative therapy did not cause significant increase in complications.

Conclusions: 1) 84% of patients with ASBO required surgery, which varies sharply with the adult population, where 40-80% are managed nonoperatively. 2) Physical findings and investigations are not reliable predictors, but presence of >2 of the classic four does predict the need for surgery. 3) The early use of SBFT may help guide management. 4) Since 20% of obstructions were due to abdominal wall adhesions, and many pediatric patients require staged procedures, the use of an absorbable biomembrane at the time of initial surgery may attenuate this problem.
A Five Year Review of Appendectomy:  
A Transition From Open to Laparoscopic Approach

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Objectives: Laparoscopic procedures have many perceived benefits over traditional surgical approaches. As part of our minimal access program we started appendectomies performing in our institution.

Methods: A five year (1992-1997) retrospective chart review was performed looking at the clinical presentation, management, operating room times, and length of stay (LOS) and outcomes. Appendectomies were performed or directly supervised by pediatric surgeons.

Results: Two hundred and two charts were reviewed. Appendectomies were performed by open technique (OA; n=87), laparoscopic (LA; n=105), and laparoscopic converted to open (n=10). Of the 202 patients, 191 patients (male:female=83:108) had pathologically proven appendicitis and were the basis of this study. Converted cases were analyzed separately.

<table>
<thead>
<tr>
<th></th>
<th>ACUTE(*)</th>
<th>PERFORATED(**)</th>
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<tbody>
<tr>
<td></td>
<td>Mean ± s.e.</td>
<td>Open n=55</td>
</tr>
<tr>
<td>Anaes Time (min)</td>
<td>63.3 ±1.7</td>
<td>79.7 ± 2.1</td>
</tr>
<tr>
<td>Surgery Time (min)</td>
<td>41.4 ± 1.5</td>
<td>56.1 ± 2.0</td>
</tr>
<tr>
<td>Soft Diet (POD#)</td>
<td>2.2 ± 0.1</td>
<td>1.7 ± 0.1</td>
</tr>
<tr>
<td>Analgesia (unit/kg)</td>
<td>6.9 ± 1.1</td>
<td>3.3 ± 0.2</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>3.0 ± 0.2</td>
<td>2.2 ± 0.1</td>
</tr>
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</table>

* there was significant difference (sd) between OA and LA for acute appendicitis in all parameters.

** there was no sd between OA and LA for perforated appendicitis.

Conclusions: Operating room times were significantly longer for LA than OA. LA for acute appendicitis allows for more rapid resumption of regular diet, requires less analgesic and has a shorter LOS. LA for perforated appendicitis shows a trend to earlier resumption of regular diet, less analgesia and shorter LOS but does not reach significance.

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[Handwritten note: "Clinical Pathway" handwritten.
PEDIATRIC FARM INJURIES

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Farm accidents are preventable, in that children do not need to be in the areas where the accidents most commonly happen: around farm machinery, farm vehicles or in locations where falls occur.

We reviewed farm injuries referred to a tertiary pediatric centre from 1988 to 1996. There were 44 cases, with 31 (70.5%) male patients and 16 female (29.5%). Of these, 25 (56.8%) had an ISS greater than 12. There were no deaths in the cases with ISS less than 12. Overall mortality was 15.9% with an average ISS score of 44.

The mechanism of injury included farm machinery 34.1% (15), farm vehicles 31.8% (14), falls 13.6% (6), farm animals 11.4% (5) and accidents in barns 9.1% (4). The site of injuries was thoracic (36.4%), closed head injuries (31.8%), extremity fractures (29.5%), soft tissue injuries (29.5%) and abdominal injuries (20.45%). Operative intervention was required in 43.2% of cases (19) and 68.4% required multiple operations. After recovery, 19% (7) had evidence of residual neurologic deficits, 19% (7) had a decreased level of functioning and 8.1% (3) had required amputation of a digit or limb.

This review demonstrates that farm accidents commonly result in severe accidents with a high mortality rate. There is a preponderance of males injured and killed. The diverse types of injuries incurred reflect how farm implements can inflict multiple, severe injuries. Of the children that survived their injuries, more than one quarter had ongoing deficits.

Considering the high associated morbidity and mortality demonstrated from this review, preventing these accidents is essential.

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UNDERGRADUATE PEDIATRIC SURGERY OBJECTIVES: 
GOAL AND REALITY

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Educational objectives can be used both in the standardization of curricula and in their evaluation. Surveys of subspecialty objectives can clarify educational priorities and identify areas of proficiency and deficiency.

Fifty-one 3rd year and 56 4th year medical students were surveyed on their perceived mastery level of 64 pediatric surgery cognitive objectives. The same objectives were also used to survey 34 pediatric surgeons and 126 practicing family physicians. Expected perceived competency was scored from 0 (not required / unaware of condition) to 3 (confident with diagnosis and management of condition). Data were analyzed using one-way ANOVAs and 2-sample t-tests, and were compared to existing objectives listings in the subspecialty.

Overall competency scores increased significantly from 3rd year to 4th year (p=<0.05), and approximated in 4th year the expected proficiency levels. Family physicians’ and pediatric surgeon’s expected competency ratings were remarkably similar. Eleven items were identified by both physician groups as not required (mean score <=1.5) while 25 were perceived as essential (score >2.0). The 4th year students’ perceived knowledge of all but one of these 25 objectives was adequate. Comparison of the data with previous objectives listings showed similar expected competencies.

The current study has allowed a revision of undergraduate objectives in a subspecialty based on broad stakeholder input. It has also clarified both the expected and the perceived student mastery of these objectives, and identified areas of specific stress required. The data can be used in all undergraduate settings to guide and focus specialty teaching efforts.

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PEDiatric SURGERY AS A SUBSPECIALTY CLERkSHIP ROTATION: 
FACILITATING ACTIVE LEARNING

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Short pediatric surgery rotations are often offered either as part of the Surgery or Pediatrics clerkships. The challenge lies in providing during the span of 3-4 weeks both exposure to the spectrum of pediatric surgery and appropriate primary care competencies related to the specialty. We have attempted to meet this challenge through the application of adult learning principles and the use of several educational tools.

1. identification of critical, important and desirable behavioral learning objectives;
2. student directed program planning through direct input in the rotation objectives;
3. individual mentoring of each student by faculty;
4. a “learning encounter log” of daily valuable experiences which are summarized at the end of the rotation and used for two-way feedback;
5. a “Surgical Objectives Self-Assessment Tool” (SOSAT) that identifies students’ perceived competency pre- and post-rotation in relevant clinical objectives;
6. formative and summative evaluation based on aspired performance levels identified by the student.

Initial results after one year have shown these tools to be well accepted and appreciated by students. The methods increased the students’ ownership of the curriculum and its evaluation, and facilitated significantly the formative and summative feedback process. The application of adult learning principles and specific educational tools can facilitate learning in short pediatric surgery clerkship rotations.

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Surgical Tutelage of Pediatric Residents

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Pediatricians are often the frontline encounter for a child with a serious surgical problem. In spite of this, organized exposure to surgical problems of infancy and childhood comprises a minimal component of a pediatric resident’s training. Many pediatric residences do not provide systematic instruction in pediatric surgery. This incongruity prompted us to advocate strongly for mandatory pediatric surgery rotations for pediatric residents at our institution. We have prospectively evaluated the progress of the pediatric residents for the past two years by compiling a goal-directed syllabus and testing residents before and after their rotation.

The syllabus is an 87 page outline of surgical objectives we consider essential for a pediatrician to have mastered before starting practice. Such directed learning is vital as the surgical rotation lasts for only three weeks. A pre-test is given to each resident before starting on their rotation. A post-test, specifically designed to assay clinical acumen, is administered on the last day of rotation. Pediatric residents are also expected to round with the surgical team in the morning and afternoon, view cases in the Operating Room, attend all surgical clinics and conferences and to participate in the care of all surgical inpatients.

To date, 30 residents have completed the rotation. The average test score on the pre-test was 70.9. The average score on the post-test was 90.4. All residents demonstrated test score improvement after rotating on the pediatric surgery service. Most importantly, residents were retested one year after completion of the rotation and retained their surgical knowledge, averaging 86.4%.

We feel the syllabus is a valuable adjunct to the education of pediatric residents exposed to our specialty and directs their learning. This is imperative for such truncated rotations. The consistent improvement between the pre and post rotation testing highlights the necessity for continued, organized surgical enrichment of pediatric residents.

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RESULTS OF TRANSPLANTATION FOR ACUTE AND CHRONIC HEPATIC ALLOGRAFT REJECTION

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Transplantation for rejection is a requirement in liver transplant recipients when allograft failure is imminent. We evaluate the outcome of these children and their allografts. The medical records of 129 children who received a liver transplant were retrospectively reviewed. Twelve children required transplantation for biopsy proven rejection; twelve chronic and one acute. Overall patient and graft survival were compared to children receiving primary liver transplants. The current allograft function of the transplanted patients were also reviewed. Statistical significance was determined by Fisher’s exact test. Twelve children received at least one transplant for biopsy proven rejection. Graft survival at one year is 58% (vs 79% for primary transplants) and patient survival is 83% (vs 89%). Two allografts were lost due to primary allograft non-function. Three additional allografts were lost; two to recurrent rejection and one to hepatic artery thrombosis. Two patients who lost a second transplant to rejection required a total of seven transplants to treat rejection. Two children died, one due to primary nonfunction and one to adenovirus pneumonia. All 10 surviving patients now have excellent graft function (total bilirubin = .74 ± .38, aspartate aminotransferase = 40 ± 22).

This data suggests that transplantation for rejection can be safely accomplished with a patient survival rate comparable to primary liver transplantation. However, graft loss is excessive and underscores the need for better immunosuppression.

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INTRAVENTOUS L-ARGININE AS PROPHYLAXIS FOR NECROTIZING ENTEROCOLITIS (NEC): THERAPEUTIC AND TOXICOLOGICAL EVALUATION IN A PREMATURE PIGLET MODEL

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Intestinal dysmotility in the premature infant and mucosal damage by intraluminal substrate are key risk factors for NEC. Because NO is involved in control of gut motility and mucosal protection, we investigated the effects of manipulation of the NO system in a premature piglet model of NEC (Study A) and the potential of toxicity associated with longterm administration of L-arginine (NO synthase substrate) in premature piglets (Study B). Methods: Study A: 1) Piglets (5 days premature) were laparotomized and closed loops created from terminal ileum to proximal colon were injected with either acidified casein or saline. 2) At NEC induction, an i.v. infusion of L-arginine, 20-600 mg/kg/hr (n=3D 6), D or L-NAME (NO synthase inhibitor) 20 mg/kg/hr (n=3D 6) or sodium nitroprusside (SNP) an = NO donor, 3-10 mg/kg/min (n=36 6) was given over a 3 hour period. 3) These drugs were also tested given 3 hr prior to or 3 hr after NEC induction (L-arginine n=3D 16, L-NAME n=3d 6, SNP n=3D 8). Loops were then excised and processed for histological assessment. Study B: 5-day premature enterally fed neonatal piglets were infused with L-arginine 500 mg/kg/day i.v. for 4 days (n=3D 9). Venous blood gas, liver, kidney and pancreatic function were biochemically assessed daily. Results: L-arginine (20-500 mg/kg/hr i.v.) significantly reduced intestinal injury without significant hemodynamic effects. SNP (titrated at 3-10 mg/kg/min) was equipotent in the distal ileum and the colon. L-NAME (20 mg/kg/hr i.v.) caused hemorrhagic congestion of the gut wall. D-arginine and D-NAME had no effect. Prophylactic administration 3 hr post induction. Venous blood gases, liver, kidney and pancreatic function based on daily biochemical analysis were within normal limits. Conclusions: In this model of NEC, continuous i.v. infusion of L-arginine or NO donor markedly attenuates intestinal injury. The efficacy of treatment is likely based on NO availability. The effectiveness of prophylactic administration of a clinically relevant dose of L-arginine strongly suggests that chronic i.v. administration of L-arginine may be effective prophylaxis for NEC.

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ALTERATIONS IN RESPIRATORY STATUS: 
EARLY SIGNS OF SEvere NECROTIZING ENTEROCOLITIS

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Objective: We set out to confirm the observation that when neonates develop severe necrotizing enterocolitis (NEC), signs of deteriorating respiratory function often precede abdominal signs.

Materials and Methods: We prospectively collected detailed information on 10 consecutive babies who were ultimately explored for NEC (ave. BW: 1144 gms., ave. gestational age: 28 wks). Nine of these were the produces of premature gestations. Eight had been intubated for respiratory distress syndrome (RDS) on the first day of life. Respiratory status had improved in each of these. All 10 patients had been fed.

Results: Seven of the 8 patients with a history of RDS manifested signs of deteriorating respiratory function prior to any direct sign of intestinal inflammation (such as abdominal distention, tenderness, bilious vomiting, bloody stool). The premonitory respiratory signs were as follows: increased pCO₂ (n=5) preceded by initial decreased pCO₂ in 3, decreased O₂ saturation (n=7), increased respiratory rate (n=5). The respiratory set back was so severe in two that they were reintubated and placed on ventilators just prior to developing any abdominal findings. The indications for the operations were progression of disease despite medical management (n=6) or presence of free air on abdominal films (n=4).

Conclusions: Our observation of respiratory signs preceding the direct evidence of intestinal inflammation in babies with severe NEC revisits the concept of high output respiratory failure (ref: Burke, JF, Pontoppidan H, Welch CE: High output respiratory failure: An important cause of death ascribed to peritonitis or ileus. Annals of Surgery 158:581-595, 1963). Originally, the term “high output respiratory failure” was introduced to describe respiratory failure from intra-abdominal sepsis in adults. A sequence was described in some patients of initial hypocarbia followed by hypoxia and hypercarbia. These babies, like some of the adult patients in the original report, have limited pulmonary reserve. When they develop severe NEC with increased oxygen demand and intra-abdominal inflammation, they often manifest respiratory compromise. Impaired respiratory status may be an early sign of severe NEC. This observation may aid in the early recognition of severe NEC.

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THE LIVER IN CHEMICALLY INDUCED DIAPHRAGMATIC HERNIA IN RATS

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Introduction: Nitrofen is an embryotoxic substance that can induce congenital diaphragmatic hernias (CDH) in newborn rats and mice. In the past, this model has been used to characterize morphological and functional changes of the lungs in CDH. In this study we focused mainly on the characteristics of the liver in chemically induced CDH because this organ is always present in the thoracic cavity and thus may be used as a marker for future therapeutic attempts.

Methods: A total of 266 newborns (30 litters) were exposed to nitrofen on day eleven of pregnancy. Three litters (28 newborn rats) served as controls. After spontaneous delivery at term (22 days), all newborns were microdissected. Using a computerized morphometrical device, the total area of the diaphragmatic defect, if present, was measured. The lungs as well as the intra- and extrathoracic portion of the liver were weighed.

Results: After nitrofen exposure, 160 newborns presented with CDH (60.2%). They were grouped into 5 groups according to the intrathoracic content of intraabdominal organs. The statistical analysis gave the following results: (1) We observed a significant increase of the total liver weight in the severely affected groups (ANOVA statistics). (2) A significant correlation between the size of the defect and the weight of the intrathoracic part of the liver could be demonstrated. (3) Nitrofen alone had no effect on the liver weight.

Conclusions: Our results indicate that this model can be used to measure the benefits of new therapeutic approaches. All treatment that is aimed to create "better" and bigger lungs (i.e. PLUG) must result in a reduced size of the intrathoracic liver and thus in a changed correlation between liver weight and the size of the defect. The effect of this treatment can be calculated now indirectly by using our observed correlation as the base line.

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BOLUS INTRAVENOUS INFUSION DOES NOT STIMULATE GALLBLADDER CONTRACTION IN NEONATES ON TPN

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Stimulation of gallbladder (GB) contraction in patients receiving total parenteral nutrition (TPN) may be beneficial in preventing cholestatic jaundice associated with TPN. Bolus intravenous administration of either amino acids (AA) or fat promotes GB contraction in normal adult volunteers after a period of starvation. This phenomenon has not been investigated in patients receiving continuous TPN.

Aim: To test the hypothesis that bolus intravenous infusion of AA or fat produces GB contraction in neonates receiving TPN.

Method: 24 studies of GB contraction were performed in 15 neonates receiving continuous TPN (weight 2.66 ± 0.15 Kg; age 11.4 ± 3.68 days; mean ± SEM). Two types of experiments were performed: 1) bolus intravenous infusion of AA (13 studies) or fat (3 studies) for 60 minutes at twice the normal infusion rate; 2) bolus intravenous infusion of AA (3 studies) or fat (5 studies) for 15 minutes at 4 times the normal infusion rate. GB volume was measured by real-time ultrasonography by a single investigator. Measurements were made before starting the bolus infusion (time 0) and every 15 minutes for 1 hour.

Results: Data are expressed as mean ± SEM.

Conclusion: Contrary to their effects in adults, bolus infusions of AA or fat did not induce GB contraction in neonates on TPN. This may have been due to lack of starvation in the neonates and/or to the effect of continuous glucose infusion.

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APPLICATION OF INTERNET TECHNOLOGY IN ADVANCED LAPAROSCOPIC SURGERY TRAINING

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Development of basic laparoscopic surgical skills includes participation in structured courses, use of animal models and practical instruction by experienced laparoscopic surgeons. However, learning advanced laparoscopic procedures often involves viewing or participating in a single case and then applying this knowledge under the supervision of an experienced surgeon. We describe our initial experience with an interactive teaching method using Internet technology that can supplement and potentially replace the onsite supervision when teaching advanced laparoscopic procedures.

A laparoscopic Swenson pullthrough was monitored by 4 individuals at a distant site via a network link. At each site a Pentium 133 MHz computer running Enhanced CU-SeeMe interactive software was used for transmission and reception of video images from the operating suite (VideumCam) and the laparoscope (Stryker Camera 594T). The bandwidth varied from 325 kilobytes/second to 600 kilobytes/second at 7 frames/second. Two-way audio communication was by speaker phone.

Feedback from those observing the procedure was positive and all felt the educational value was excellent. The video quality was good and allowed for detailed demonstration of anatomic structures and technical aspects of the procedure.

Application of this Internet technology has the potential to provide many components of advanced laparoscopic surgical training without the time commitment and cost associated with personal travel. In addition, this technology allows surgeons at multiple sites to interactively view relatively rare pediatric laparoscopic surgical cases.

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DIGITAL TECHNOLOGY IN PEDIATRIC SURGERY

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Widespread use of digital technology began with the introduction of the personal computer twenty years ago. Digital technology now plays an important role in the care of Pediatric Surgery patients.

Objective: To review the use of computer technology in my pediatric surgery practice and teaching.

Materials and Methods: The use of microcomputer and digital technology in my pediatric surgical practice was reviewed from 1980-1997.

Results: All of my Pediatric Surgery activities, including educational responsibilities now involve the use of microcomputers and digital technology. Beginning in 1980 with simple word processing and data base software to manage my pediatric practice, the experience now extends to “do-it yourself” computerized multimedia productions for education purposes, telemedicine, and the internet. The multimedia materials are digitized from my catalogued videos (1009 segments, 628 patients, October 1990 to April 1997) and 35 mm slide collection. Students and residents are eager to learn these new skills and incorporate them with increasing frequency into their electronic presentations. The educational materials can also be made accessible through the world wide web.

Conclusion: Digital technology is playing an important role in my Pediatric Surgery practice. The use of this tool increases our effectiveness as pediatric surgeons and teachers. It's also a lot of fun!

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USE OF TELEMEDICINE SYSTEM IN A TERTIARY CARE CHILDREN’S HOSPITAL:
A FUTURE MODE OF MEDICAL CONSULTATION

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Purpose: Changes in medicine and geographic distance may lead to significant restrictions in pediatric referrals to tertiary level children’s hospitals. To address these problems a telemedicine system was established at our hospital.

Methods: A V-TEL telemedicine system (V-TEL incorp) was utilized with a capacity of 1/2 T1 speed (real-time motion). This allowed access to two major regional telemedicine communication facilities in the state. Our facility was used to allow community physicians to obtain pediatric or pediatric surgical consultations, and for our physicians to continue to follow discharged patients. Efficacy of the system was graded (1 to 5, worst to best, respectively) as follows: Clarity of the transmission; impact the consultation had on the care and diagnosis; and overall utility.

Results: Over the past 8 months, 12 telemedicine connections were performed on 9 children. There were 9 pediatric general surgical consultations on 6 patients and the diagnoses consisted of (N): neonatal bowel obstruction (1); evaluation of pneumonia and respiratory status in post-operative patients (2); post-operative wound evaluations (2); and evaluation of dysfunctional jejunostomy (1). Other uses included (N): multi-channel apnea studies (2); and a dermatologic consult (1). Clarity of the transmission was graded a mean of 3.7 (range 2-5); the one consult with a score of 2 was done in a single ISDN line (e.g. lowest range of performance) which has since been upgraded. Mean impact on the care and diagnosis was 3.8 (range 3-5). Mean overall utility of the system was 3.7 (2-5).

Conclusions: Quality of the telemedicine session was directly dependent on the quality of the image which was transferred. Further evaluation of this system is necessary before it can be determined to have both true medical and economic value.

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MECHANISMS UNDERLYING INTESTINAL ADAPTATION FOLLOWING MASSIVE INTESTINAL RESECTION

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Purpose: The regulatory events which control the adaptive response following massive intestinal resection are poorly understood. This study tests the hypothesis that massive intestinal resection increases nutrient transport by upregulation of mRNA for the sodium glucose cotransporter (SGLT1).

Methods: Male Lewis rats (225-250 g) were studied. Control animals (Con) underwent ileal transection 15 cm proximal to the caecum; resected animals (Res) had resection of all bowel proximal to the terminal 15 cm of ileum. Animals were followed for 14 days; pair-fed and weighed daily. At sacrifice the terminal ileum was studied quantifying; SGLT1 mRNA utilizing reverse transcriptase-polymerase chain reaction (RT-PCR) normalized to β-actin, in vitro glucose transport in Ussing Chambers, and histology.

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<th>Group</th>
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<th>Densitometry</th>
<th>Jms</th>
<th>Jmr</th>
<th>Jst</th>
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<td>Con (n=6)</td>
<td>943.54 ± 95</td>
<td>4.13 ± 2.24</td>
<td>0.05 ± 0.04</td>
<td>0.06 ± 0.06</td>
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<tr>
<td>Res (n=6)</td>
<td>871.36 ± 68</td>
<td>4.01 ± 0.73</td>
<td>0.55 ± 0.44</td>
<td>0.06 ± 0.02</td>
<td>0.12 ± 0.03</td>
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Results: All animals survived; transected animals regained pre-op weight by day 10, resected by day 14. Significant adaptation occurred with an increases in Villus height, increase in Jms, paralleling an increase in mRNA expression for SGLT1.

Conclusions: Adaptation following massive intestinal resection involves upregulation of mRNA for SGLT1, which may be useful both as a marker of adaptation, and possibly as a target of therapy following clinical resection.

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MULTIPLE BOWEL ATRESIAS FOLLOWING FETAL SMALL BOWEL TRANSPLANTATION IN RATS

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Purpose: The etiopathogenesis of multiple atresia has not been satisfactorily explained. The aim of this study is to assess atresia formation following fetal small bowel transplantation (SBTx), especially with respect to multiple bowel atresia.

Materials and Methods: A 30mm segment of small bowel was excised from each of 70 Lewis rat fetuses (gestational age: 18-19 days) obtained by uterotomy. Each graft was confirmed for patency then transplanted into the space between the peritoneum and the rectus abdominis in adult Lewis rats, to expose them to ischemic stress (syngeneic fetal SBTx; n=70).

Results: 63/70 grafts (90.0%) were successfully transplanted. Grafts were harvested 10 days post-transplantation. Two were atresia-free; 127 atretic segments were found in the remaining 61. Twenty four grafts (39.3%) had a single atresia comprised of membranous stenosis (MS) in 2, membranous atresia (MA) in 10, and blind ends (BEs) in 12. Thirty seven grafts (60.7%) had multiple atresias, comprised of MS, MA, or both in 6, BEs in 7, and a combination of BEs and MS and/or MA in 24. None showed signs of infection histologically.

Conclusions: Our model is the first to experimentally induce membranous stenosis and a high incidence of multiple atresias, strongly suggesting that bowel ischemia is responsible for multiple bowel atresia formation.

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THE NATURAL HISTORY OF SACROCOCCYGEAL TERATOMAS DIAGNOSED ON ROUTINE OBSTETRICAL SONOGRAM: A SINGLE INSTITUTIONAL EXPERIENCE

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The availability of fetal sonography has facilitated the antenatal diagnosis of sacroccocygeal teratomas (SCT). There are 2 major groups of presentation of prenatal SCT: those with obstetrical indications for antenatal sonogram and those detected on routine sonogram. The first group has a reported 70% mortality. The second group has an over 90% survival in small series. The purpose of this abstract is 1) to describe our experience with the course and outcome of SCT with incidental prenatal sonographic diagnoses and 2) to identify the in utero and perinatal mortality factors.
We retrospectively reviewed the 22 cases of SCT found on routine antenatal sonograms between 1980 and 1996 at our institution. We collected information on patient, tumor characteristics, sonographic features and correlated the findings with pre and perinatal outcome. The Chi Square test was used for statistical comparisons. There were 4 in utero deaths, 3 elective abortions, and 3 perinatal deaths from tumor hemorrhage (an overall pre and perinatal mortality rate of 37%). Diagnoses were made between 16 and 31 weeks gestation. 80% of the patients were delivered by C-section. The incidence of premature labor was 45%, 40% of which were preceded by the appearance of polyhydramnios. The following criteria were examined: new onset polyhydramnios; hydronephrosis; bladder compression; tumor size/rate of growth; solid tumor; hypervascular tumor; and gestational age at time of diagnosis. None of the criteria was found to reach statistical significance in predicting poor outcome except for the sonographic finding of solid tumor (66% in utero death vs 13%; p=0.04)
We have reserved optimism for the outcome of SCT diagnosed on routine obstetrical sonogram. The presence of a solid tumor is found to be a poor prognostic factor. Close antenatal follow-up, with particular attention to the development of polyhydramnios is recommended to identify 40% of patients at risks for premature labor. Further prospective studies are needed to evaluate the clinical significance of our observations.

CAPS Sponsor: Dr. Hervé Blanchard
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FETAL DIAGNOSIS OF CONGENITAL ADENOMATOID MALFORMATION OF THE LUNG: THE CANADIAN EXPERIENCE

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Montreal Children’s Hospital and Hôpital Ste-Justine, Montreal (Quebec)
B.C.’s Children’s Hospital (Vancouver) CANADA
and other participating Canadian Hospitals

Congenital adenomatoid malformation of the lung (CAM) is diagnosed by prenatal ultrasonography with an increasing frequency but controversy persists as to its prognosis and prenatal management.

**Method:** Review of local cases of CAM diagnosed antenatally identified by ultrasonographers and by a review of hospital charts. A questionnaire was mailed to a pediatric surgeon in each Canadian Centre to conduct a similar review.

**Results:** We obtained 26 cases locally, 16 from another center and 6 from three more centers. The incidence of voluntary abortions was 15% (7/48), of spontaneous abortions 2.4% (1/41) and of postnatal death 10% (4/40). One of the postnatal deaths was from trisomy 18. Of the 7 aborted fetuses, 2 had multiple malformations and 1 had severe hydrops and oligohydramnios; the other 4 had a large mass with mediastinal displacement but without hydrops. When pregnancy was allowed to continue, 56% of the lesions regressed spontaneously, even though 1/3 of these had initial progression. In 17 cases (41.5%) the mediastinal shift corrected itself, sometimes by simple growth of the fetus but most often by decrease in the size of the lung mass. In 1 fetus, repeated needle decompressions followed by double-pigtail catheter drainage of large cysts allowed regression of hydrops but resulted in neonatal death with pulmonary hypoplasia.

**Conclusion:** CAM can lead to fetal or neonatal demise from hydrops, lung hypoplasia or prematurity, or from severe associated malformations, but has a good prognosis in the majority of the cases. Fetal intervention is indicated in some well-defined cases. An elective resection is always indicated after birth in all cases of confirmed CAM.

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LIPI D UPTAKE BY SILICONE ENTERAL ACCESS FEEDING DEVICES

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University, Clemson, SC USA

Purpose: Gastric access device deterioration remains a significant patient care and financial problem. Since it is known that lipids, particularly medium-chain triglyceride (MCT) oil can soften and break certain types of polymeric materials, we evaluated the effect of liquid enteral feeding formulas containing different amounts of MCT oil on silicon feeding tubes.

Method: Silicone catheters were sectioned in 5-cm-long samples, cleaned and weighed. Five groups of 5 pieces were immersed for 4 weeks in pure MCT oil, and in 4 commercial formulas having similar protein, carbohydrate, and fat sources. These were chosen because of similar percentages of fat (37-45%), while containing different amounts of MCT oil. Sodium azide 0.05% was added as a bactericide. Samples were maintained at 37°C. After intubation specimens were rinsed, dried and weighed. Selected samples were extracted with chloroform: methanol (2:1). Super-critical fluid chromatography (SFC) and infra-red (IR) spectroscopy were performed. Force-elongation curves were generated for the remaining samples. A statistical analysis (ANOVA, α=0.05) was conducted to compare data from test groups with results from 20 samples of reference silicone material.

Results: demonstrate that silicone is significantly affected by liquid formulas and pure MCT oil. SFC and RI indicated that fractions of MCT oil and corn oil were absorbed by the material. The most dramatic weight gain was observed for specimens immersed in pure MCT oil (7.1 ± 0.4%). An average increase (8.2%) of silicone compliance was measured along with oil migration in the tubing.

Conclusion: Lipid uptake contributes significantly to silicone deterioration, leading to device failure. Surface damage in the form of crevices can create a potential nidus for microorganisms. Lipid type and rate of administration should be taken into consideration when long-term enteral feedings are given.

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Dr. Michael W. L. Gauderer
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ESOPHAGEAL FUNCTION IN ACHALASIA
BEFORE AND AFTER MYOTOMY

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**Aim:** To compare sphincteric function and esophageal motility before and after successful myotomy in children and achalasia.

**Patients and Methods:** In the last 30 years we treated 18 patients aged 8.9 ± 4.3 years (mean ± SD). Stationary and pulltrough manometry were performed preoperatively in 13 and postoperatively in 12 of them. Twenty four-hour ambulatory manometry was possible before myotomy in 4 children and in 8 after an average of 5.4 years (range 0.5 to 17). For ethical reasons we used for comparison a group of 19 refluxing youngsters aged 9.7 ± 5.3 years.

**Results:** Lower sphincter pressure dropped after myotomy from 33.5 ± 18.9 to 8.64 ± 4.7 mmHg (p<0.05) and both the lack of relaxation and the aperistalsis found constantly before operation remained unchanged after it. Investigation with ambulatory manometry revealed that esophageal motility was seriously damaged before and after myotomy in comparison with that of refluxing youngsters in terms of # of sequences/minute (0.4 ± 0.5 and 0.24 ± 0.20 vs 1 ± 0.37 respectively, p<0.05), percentages of peristaltic (16.2 ± 21 and 32.8 ± 28.4 vs 70.2 ± 16.3, p<0.05) and ineffective waves (94.9 ± 7.1 and 90.4 ± 18.3 vs 58.4 ± 19.1, p<0.05) and proximal wave amplitude in mmHg (33.1 ± 5.5 and 29.9 ± 6.1 vs 45.2 ± 17.1, p<0.05).

**Conclusion:** Only minimal recovery of esophageal motor function can be expected in children with achalasia after successful myotomy and this failure of peristaltic pump is a serious threat to the mucosa unless a fundoplication is interposed.

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CONGENITAL ESOPHAGEAL DIVERTICULUM

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Diverticulum of the esophagus is an uncommon diagnosis in the pediatric age group and when of congenital origin is extremely rare. Over a 13 year period three patients have been encountered with congenital diverticulum of the esophagus presenting within the first two years of life. Patient #1 presented with coughing and regurgitation at age 20 months. Barium esophagogram and esophagoscopy confirmed the presence of a pouch-like diverticulum arising from the left lateral wall of the esophagus at the level of T1. The diverticulum was resected via the cervical approach and proved to have mucosa which resembled gastric fundus. The patient was noted to have associated gastroesophageal reflux which was treated conservatively. At age 15 years she is swallowing normally. Patient #2 presented at 2 years of age with inability to swallow solids. Esophagoscopy and barium esophagogram revealed a fusiform diverticulum of the cervical esophagus. A biopsy confirmed normal esophageal mucosa. A transcervical resection of the diverticulum was carried out over a Maloney stent. Postoperatively the patient is swallowing solids and has required two follow-up esophageal dilatations. The wall of this diverticulum was noted to contain mucosa with absence of muscularis. Patient #3 presented with neonatal dysphagia as part of congenital cutis laxa. A large fusiform diverticulum was demonstrated by esophagoscopy and esophagogram. No definitive treatment of the diverticulum has been undertaken and feedings are via gastrostomy.

Dysphagia, rumination, coughing, and choking are all symptoms of esophageal diverticulum. The embryogenesis of this lesion includes primary dysplasia of the developing esophageal wall with absence of muscularis and also appears to include esophageal duplication with luminal continuity. Definitive treatment of esophageal diverticulum consists of resection of the diverticulum with care to preserve adequate lumen diameter and thus avoid stenosis.

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The surgical management of cystic hygromas can be challenging, and accurate anatomic localization is essential. The literature on the use of magnetic resonance imaging (MRI) in pediatric cystic hygromas is sparse, and mostly limited to radiological descriptions. We present five cases of cystic hygromas in children ranging in age from 1 to 13 years. The pre-operative MRI scans and patient charts were reviewed with attention to the clinical, radiological, operative and histologic findings. MRI produced highly detailed multiplanar renderings of the cystic hygromas that were both diagnostic and predictive of the subsequent intraoperative findings. This modality helped specifically in some cases to identify lesion extensions that required specific surgical attention. There were no recurrences or complications at a mean follow-up time of 18 months.

We conclude that the use of MRI in the pre-operative planning of cystic hygromas can lead to accurate operative strategies and may help reduce the risk of local recurrence.

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CHRONIC INTESTINAL PSEUDO-OBSTRUCTION AND C-KIT: ABNORMAL DISTRIBUTION OF INTESTINAL PACEMAKER CELLS

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Dokkyo University School of Medicine, Tochigi, JAPAN

Purpose: Chronic intestinal pseudo-obstruction (CIPO) is a rare syndrome with an obscure pathogenesis. The proto-oncogene c-kit encodes a transmembrane tyrosine kinase receptor (c-KIT). c-KIT positive (c-KIT+) cells are responsible for intestinal pacemaker activity. We examined the distribution of c-KIT+ cells in the intestinal muscle layers of an infant with CIPO.

Case Report: A term female infant developed signs of ileus on day 3 of life. Failure of conservative management led to a laparotomy on day 9 of life, and creation of a cecostomy, proximal to a narrow segment of right colon associated with immature ganglia on biopsy. Lack of improvement resulted in a second laparotomy and creation of an ileostomy at the age of 37 days. Multiple bowel biopsies at this time were histologically normal. Postoperatively, enteral feeding was again prevented by adynamic bowel activity, consistent with CIPO, necessitating the continuation of total parenteral nutrition (TPN). At age 16 months, a Ziegler myectomy-myotomy was performed from the duodenojejunal junction to the ileostomy stoma. However, the child subsequently died at age 20 months from hepatic failure induced by prolonged TPN use. The presence of c-KIT+ cells in bowel specimens from this case and 5 age-matched controls was assessed using antihuman c-KIT serum.

Results: In the controls, c-KIT+ cells were located distinctly between the circular and longitudinal muscle layers of the small bowel, and dispersed evenly throughout the muscle layers of the colon. Myenteric plexuses were clearly demarcated by c-KIT+ cells. In contrast, in the CIPO case, the distribution of c-KIT+ cells between the large and small bowels was the same, with c-KIT+ cells lying on either side of the border between the two muscle layers and unevenly throughout both muscle layers. Myenteric plexuses were not demarcated by c-KIT+ cells.

Conclusion: For the first time this case demonstrates there is abnormal distribution of c-KIT+ intestinal pacemaker cells in chronic intestinal pseudo-obstruction and provides new evidence that abnormal c-kit gene expression may be responsible for autonomic gut dysmotility.

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ASSOCIATION CANADIENNE de CHIRURGIE PÉDIATRIQUE

29ième

Réunion Annuelle

BANFF

4-6 Octobre 1997
VINGT-NEUVIÈME Congrès Annuel

ASSOCIATION CANADIENNE de CHIRURGIE PÉDIATRIQUE

4-6 Octobre 1997

Banff Park Lodge
222 Lynx Street
Banff (Alberta) CANADA
TO L 0C0
(403) 762-4433
PROGRAMME SCIENTIFIQUE ET SOCIAL

Vendredi, le 3 octobre 1997

09:00 - 17:00 Réunion du Conseil de l’ACCP
17:00 Inscription
19:00 - 22:00 Réception de Bienvenue - Glacier Lounge

Samedi, le 4 octobre 1997

07:00 - 13:00 Inscription
07:00 - 07:55 Petit Déjeuner
07:30 - 13:00 Exposition
07:55 - 08:00 Mot de Bienvenue et Ouverture du Congrès
08:00 - 10:00 Première Session scientifique
10:00 - 10:20 Pause-Santé
10:20 - 11:50 Deuxième Session scientifique
12:00 - 13:00 Fred MacLeod Lecture

Dimanche, le 5 octobre 1997

07:00 - 12:30 Inscription
07:00 - 08:00 Petit Déjeuner
07:30 - 13:00 Exposition
08:00 - 09:00 «2 minutes / 2 diapos»
09:00 - 10:30 Troisième Session Scientifique
10:30 - 10:45 Pause-Santé
10:45 - 12:30 Quatrième Session Scientifique
12:30 Déjeuner d’Affaire des Membres
19:00 Réception du Président
19:30 Banquet du Président - Brewster Cowboy Barbecue and Dance

Lundi, le 6 octobre 1997

07:00 - 12:00 Inscription
07:00 - 08:00 Petit Déjeuner
07:00 - 13:00 Exposition
08:00 - 09:50 Cinquième Session Scientifique
09:50 - 10:20 Pause-Santé
10:20 - 12:35 Sixième Session Scientifique
12:35 Ajournement
MOT DE BIENVENUE DU PRÉSIDENT

Bienvenue à Banff !

Le succès de notre 29e réunion annuelle est déjà assuré.

C'est toujours avec plaisir que nous nous retrouvons chaque année pour échanger nos diverses expériences cliniques et scientifiques tout en nous donnant l'occasion de souhaiter la bienvenue à nos nouveaux membres et à nos invités. C'est également un moment privilégié dans l'année où nous nous retrouvons pour renouer nos bonne amitiés et en faire de nouvelles.

J'aimerais remercier notre secrétaire-trésorier Salam Yazbeck, notre coordonnatrice Arlene Ein, Maureen et Andrew Wong, nos hôtes de Banff, ainsi que Goeff Blair, le président du comité de programme, pour leur bon travail d'organisation.

Je vous invite tous à participer ensemble à cette nouvelle assemblée où vous êtes assuré d'apprendre et de vous amuser en même temps.

Jean G. Desjardins, M.D.
Président
Association Canadienne de Chirurgie Pédiatrique
À PROPOS DE
L'ASSOCIATION CANADIENNE DE CHIRURGIE PÉDIATRIQUE

L'Association Canadienne de Chirurgie Pédiatrique fut fondée en 1967. Son principal but est d'améliorer la qualité des soins chirurgicaux offerts aux enfants au Canada.

Il existe trois secteurs d'intérêt principaux pour les membres. Ce sont les méthodes diagnostiques, les traitements ainsi que la recherche.

Les Nouveau-Nés Porteurs de Malformations Congénitales

Bien que la majorité des nouveau-nés porteurs de malformations congénitales graves puissent être opérés avec succès, il arrive souvent que la malformation ne soit pas reconnue ou, si elle est diagnostiquée, que le médecin de première ligne ne soit pas au courant des possibilités chirurgicales. Dans ces conditions, la plupart de ces enfants meurent ou, s'ils survivent, la qualité de leur vie est fortement diminuée par leur malformation.

Les Néoplasies de l'Enfant

Le cancer constitue la deuxième cause de mortalité chez les enfants. Actuellement, l'exérèse chirurgicale des tumeurs associée à la chimiothérapie et la radiothérapie permet de guérir la majorité de ces enfants.

Les Traumatismes

Les traumatismes représentent la première cause de mortalité infantile en Amérique du Nord. Grâce aux méthodes modernes de premiers soins, de transport, de réanimation et de soins intensifs, ainsi qu'à la disponibilité des équipes chirurgicales spécialisées, il est devenu possible de sauver un grand nombre de ces enfants.

Programme d'Éducation Médicale Continue

Afin de réussir à améliorer la qualité des soins chirurgicaux pédiatrique, l'Association Canadienne de Chirurgie Pédiatrique a lancé un programme d'éducation médicale continue pour les médecins, le personnel infirmier ainsi que pour les autres travailleurs du domaine de la santé de l'enfant. Un fonds d'éducation fut créé afin de pouvoir soutenir ce programme.
Le Fonds d'Éducation couvre, tous les ans, les frais de visites de chirurgiens pédiatriques reconnus venant donner des conférences et enseigner dans différents centres médicaux canadiens. Il fournit un chirurgien pédiatrique conférencier à la réunion annuelle de la Société Canadienne de Pédiatrie. Le Fonds d'Éducation permet aussi à l'Association de commander tous les ans une session scientifique au congrès du Collège Royal des Médecins et Chirurgiens du Canada. Il soutient enfin le congrès annuel de notre association. Le financement du Fonds d'Éducation provient d'individus et de groupes aussi bien médicaux que non médicaux intéressés à la chirurgie de l'enfant. Il provient également de certaines fondations charitables. Il est de l'intention de l'Association d'augmenter le capital jusqu'à un niveau suffisant pour que les intérêts puissent soutenir le Programme d'Éducation Médicale Continue.

Le Fonds d'Éducation de l'Association Canadienne de Chirurgie Pédiatrique est inscrit auprès du gouvernement fédéral et tous les dons qu'il reçoit sont entièrement déductibles d'impôt. Une vérification comptable est faite tous les ans.

Les dons peuvent être adressés à:

Salam Yazbeck, M.D.
Secrétaires-Trésorier de l'ACCP
Hôpital Sainte-Justine
3175, Côte Ste-Catherine
Montréal (Québec) CANADA
H3T 1C5

Téléphone  (514) 345-4688
Fax       (514) 345-4964
E-mail    Secretary@caps.ca
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1991-1993  Sigmund H. Ein  Toronto
1993-1995  Angus Juckes  Regina
1995-  Jean G. Desjardins  Montréal

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Le premier CONGRÈS ANNUEL eut lieu le 22 janvier, 1969 à VANCOUVER
LES ARMOIRIES
DE
L'ASSOCIATION CANADIENNE DE CHIRURGIE PÉDIATRIQUE

Le Blason

Au gauche, un bistouri droit entouré d’un serpent alors qu’à droite se tient un enfant, tout argent.

Au sommet se trouvent trois feuilles d’érable ainsi que la date 1967.

Devise: "Je le pensay, Dieu le guarit".

Description

Le rouge et le violet des armes sont les couleurs du Collège Royal des Médecins et Chirurgiens du Canada et représentent le sang artériel et veineux vu au cours de la chirurgie. L’association du bistouri avec le serpent guérisseur d’Esculape ainsi qu’avec l’image d’un enfant en bonne santé symbolise la pratique de la chirurgie pédiatrique.

La couronne du blason est la feuille d’érable du Canada et la date de fondation de notre association (1967).

La devise est une citation d’Ambroise Paré, père de la chirurgie moderne.
PROCHAINS CONGRÈS DE L'ACCP

30e Congrès Annuel
25-27 Septembre 1998
TORONTO*

31e Congrès Annuel
24-26 Septembre 1999
MONTRÉAL*

32e Congrès Annuel
22-24 Septembre 2000
OTTAWA*

* dates et lieux sont ceux des congrès du Collège Royal
COMMUNICATION DES RÉSIDENTS

Les présentations faites par les résidents en chirurgie sont jugées par un panel constitué de membres du Comité de Publication. Il y a deux catégories: celui du meilleur travail clinique et ceux du meilleur travail expérimental. Chaque prix est de 500$. Le comité du Programme essaie normalement de placer ces communications durant les deux premiers jours du programme afin que la remise des prix puisse avoir lieu au cours du Banquet de Président.

PRIX POUR LES MEILLEURES COMMUNICATIONS DES RÉSIDENTS 1995

MEILLEUR TRAVAIL CLINIQUE

Dr. Christian MÉNARD

"Anal reeducation for postoperative fecal incontinence in congenital diseases of the rectum and anus."
C. Ménard, C. Trudel, R. Cloutier
Le Centre Hospitalier de l'Université Laval, Sainte-Foy (Québec) CANADA

MEILLEUR TRAVAIL EXPÉRIMENTAL

Dr. Wadi BIN SADDIQ

"The effects of tracheal occlusion on type II pneumocytes in fetal lambs"
W. Bin Saddiq, P. Piedboeuf, J.M. Laberge, M. Gamache, P. Petrov,
E. Hashim, G. Ghitulescu, A. Manika, M.F. Chen
Montreal Children’s Hospital, Montreal (Québec) CANADA
Le Centre Hospitalier Universitaire Laval, Sainte-Foy (Québec) CANADA

FÉLICITATIONS AUX DOCTEURS MÉNARD ET BIN SADDIQ !