1967-1992

24th Annual Meeting
Réunion Annuelle
Ottawa

in conjunction with the
British Association of Paediatric Surgeons and the
Royal College of Physicians and Surgeons of Canada

Canadian Association of Paediatric Surgeons
l’Association Canadienne de Chirurgie Infantile

September 10-13, 1992
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Twenty-fourth Annual Meeting
CANADIAN ASSOCIATION of PAEDIATRIC SURGEONS

Thurs., September 10-Sun September 13, 1992

Le CHATEAU LAURIER
BANQUET ROOM
OTTAWA
CANADA

in conjunction with the
British Association of Paediatric Surgeons
and the
Royal College of Physicians and Surgeons of Canada

please bring this program to the meeting
Note: Meeting registration at the Ottawa Congress Centre
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 in 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. Now 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 selected distinguished paediatric surgeons from overseas each year to visit and to teach at medical centres in Canada, provides a speaker on Paediatric Surgery at the 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 attained 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 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:
Ray Postuma, M.D.
C.A.P.S. Secretary/Treasurer
AE 201-840 Sherbrook St
Winnipeg, MB, R3A 1S1
Canada
Telephone 1-204-787-4203
Fax: 1-204-787-4837
25 Years of CAPS

Canada celebrated its 100th birthday in 1967. That same year a group of paediatric surgeons from major centres from Newfoundland to British Columbia and cities in between assembled to establish an association with a Canadian charter. There was a great deal of enthusiasm for such a group and within four months a constitutional assembly was held and office-bearers elected. Harvey Beardmore of Montreal was the first President and there were 29 founder members. By April of 1968 a Federal Charter was obtained.

The objective of the fledgling Association was to improve the surgical care of infants and children in Canada. Founder Members were Canadian surgeons devoting all or most of their time to paediatric surgery. However, in view of the number of U.S. and overseas residents training in Canada the membership, not wishing to remain exclusive, established a category of associate membership for those who had received most of their training in this country.

A coat of arms, approved by the Royal College of Heraldry, was designed and it was decided to meet annually in conjunction with the Royal College of Surgeons, while at the same time maintaining a close liaison with the Canadian Paediatric Society. On occasion the Association has met other than with the Royal College and this may well be a future trend. Indeed, in 1993 the annual meeting will take place in Victoria, British Columbia, quite apart from the Royal College meeting.

The membership resolved in 1971 that the Canadian Association of Paediatric Surgeons approve in principle the establishment of a Specialty Certificate in Paediatric Surgery. As this was a relatively new concept, much negotiation ensued. Finally the first examination for certification took place in 1976. Since then there have been regular examinations in the language of the
candidate's choice. Membership in the Association has now been limited to those who have, by examination, demonstrated special competence in Paediatric Surgery. As a consequence of direct solicitations by members the Association has at its disposal a large fund which is used for educational purposes. Its prime function is to underwrite the visit of distinguished surgeons from abroad. Such visits coincide with the annual meeting and are preceded or followed by teaching visits to various centres across the country.

The highlight of any collegial association is its annual meeting. The 24th such meeting is taking place in Ottawa this year. Notable for their informality, these gatherings encourage frank and free exchange of ideas. Members are practicing paediatric surgeons and it therefore follows that a clinical subject matter is of the most interest to most people and this is the general direction of the programme.

The Canadian Association of Paediatric Surgeons is a strong, viable and thriving organization. Membership stands at 57 regular members, 26 associate members, 20 honorary members and 10 life members. Early in the final decade of this century the future of CAPS seems assured. There are more Canadian paediatric surgeons in training or recently trained than ever before. We now have six credentialled paediatric surgical training centres across the country.

The Association can thus be said to be fulfilling its stated aim - to improve the surgical care of infants and children in Canada.

Barry Shandling
Archivist
Welcome CAPS and BAPS members and guests. This is our 25th anniversary and we're celebrating it in the Capital of Canada culminating a "capital" idea we have been cultivating for the last several years - a meeting with BAPS! So here it is! May I, (on behalf of the CAPS council, the members of CAPS, and my wife Arlene) welcome all of our overseas guests to our silver anniversary meeting and celebration. The BAPS meeting has always been a premier clinical pediatric surgical meeting in the British Isles and Europe; CAPS is fast becoming its North American equal. Therefore, this promises to be a meeting of champions.

We really hope everyone has a wonderful academic and social good time. However, great events require good planning and hard work, so let me be the first of many to thank those CAPS members who have made all this possible: Ray Postuma (Secretary-Treasurer), Nate Wiseman and his Program Committee, Barry Shandling and his Publication Committee and the Local Arrangements Committee, Pierre Soucy, Steven and Elizabeth Rubin. May our friendship, knowledge, and enjoyment be fostered by and from their hard work.

Sigmund H. Ein
President, CAPS
CAPS COUNCIL 1991-92

EXECUTIVE

President: S. Ein
Past-President: J-C Ducharme
Director (third year): S. Yazbeck
Director (second year): A. Juckes
Director (first year): D. Girvan
Secretary/Treasurer: R. Postuma

COMMITTEES as of 92.08.24

1 Archivist:
   B. Shandling

2 Congenital Anomalies:
   N. Wiseman
   M. DiLorenzo
   P. Soucy

3 Constitution and Bylaws:
   A. Juckes
   D. Girvan
   S. Youssef

4 Education:
   M. Giacomantonio
   J. Bass
   M. DiLorenzo
   G. Lau
   G. Lees
   G. Seagram

5 Ethics and Moral Issues:
   S. Rubin
   C. Bagwell
   S. Chou
   L. Nguyen
   B. Shandling

6 Liaison with American College:
   B. Shandling

7 Liaison with Trauma Assoc. of Canada:
   D. Wesson

8 Liaison with World Federation:
   Secretary-Treasurer: J. Desjardins

9 Local arrangements:
   P. Soucy, S. Rubin

10 Membership and Credentials:
   D. Girvan
   G. Fraser
   B. Rodgers
   R. Superina

11 Nominating:
   J. Ducharme
   M. DiLorenzo
   P. Soucy

12 Program:
   N. Wiseman
   A. Bensoussan
   G. Blair
   R. Filler
   M. Giacomantonio
   R. Kennedy

13 Publication:
   B. Shandling
   R. Cloutier
   S. Ein
   A. Juckes
   S. Rubin
   S. Yazbeck

14 Specialty Committee for Pediatric General Surgery of the Royal College:
   A. Gillis
   A. Bensoussan

15 Training and Human Resources Committee (previously "Health & Manpower" and "Residency"):
   G. Fraser
   A. Bensoussan
   J. Desjardins
   J. Donald
   R. Filler
   M. Giacomantonio
   A. Gillis
   F. Gutman
   J. Langer
   P. Soucy

16 Trauma:
   D. Wesson
   G. Blair
   M. Giacomantonio
   J.M. Laberge
   A. Winthrop
   A. Wong

17 Finance:
   M. Allen
   D. Girvan
   S. Mercer

underline indicates chair of committee

Interest groups

18. Quality Assurance: R. Postuma, B. Shandling, P. Soucy
19. Research: J. Langer

Please contact the President or Secretary-treasurer if you are able to serve on any of the above committees and interest groups or if corrections are necessary in the above information (Secretary: tel.(204)787-4203)
<table>
<thead>
<tr>
<th>Year</th>
<th>President</th>
<th>City</th>
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<tbody>
<tr>
<td>1967-1972</td>
<td>Harvey Beardmore</td>
<td>Montreal</td>
</tr>
<tr>
<td>1973-1974</td>
<td>Colin Ferguson*</td>
<td>Winnipeg</td>
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<tr>
<td>1975-1976</td>
<td>Jim Simpson*</td>
<td>Toronto</td>
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<tr>
<td>1977-1978</td>
<td>Sam Kling</td>
<td>Edmonton</td>
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<tr>
<td>1979-1980</td>
<td>Pierre Paul Collin</td>
<td>Montreal</td>
</tr>
<tr>
<td>1981-1982</td>
<td>Barry Shandling</td>
<td>Toronto</td>
</tr>
<tr>
<td>1983-1984</td>
<td>Gordon Cameron</td>
<td>Hamilton</td>
</tr>
<tr>
<td>1985-1986</td>
<td>Stanley Mercer</td>
<td>Ottawa</td>
</tr>
<tr>
<td>1987-1989</td>
<td>Alex Gillis</td>
<td>Halifax</td>
</tr>
<tr>
<td>1991-</td>
<td>Sigmund Ein</td>
<td>Toronto</td>
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<tr>
<th>Year</th>
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<th>City</th>
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<td>1967-1973</td>
<td>Barry Shandling</td>
<td>Toronto</td>
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<tr>
<td>1974-1978</td>
<td>Gordon Cameron</td>
<td>Hamilton</td>
</tr>
<tr>
<td>1978-1983</td>
<td>Frank Guttman</td>
<td>Montreal</td>
</tr>
<tr>
<td>1989-</td>
<td>Ray Postuma</td>
<td>Winnipeg</td>
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* deceased
FOUNDING MEMBERS

CANADIAN ASSOCIATION OF PAEDIATRIC SURGEONS
L'ASSOCIATION CANADIENNE DE CHIRURGIE INFANTILE

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

*DECEASED

1st ANNUAL MEETING - January 22, 1969 - VANCOUVER
FUTURE C.A.P.S MEETINGS:

25th ANNUAL MEETING:
Monday, SEPT. 13-15, 1993, VICTORIA
(independent meeting)

26th ANNUAL MEETING:
Friday, SEPT. 16-18, 1994, TORONTO*

27th ANNUAL MEETING:
Friday, SEPT. 15-17, 1995, MONTREAL*

28th ANNUAL MEETING:
Friday, SEPT. 27-29, 1996, HALIFAX*

29th ANNUAL MEETING:
Friday, SEPT. 26-28, 1997, VANCOUVER*

30th ANNUAL MEETING:
Friday, SEPT. 25-27, 1998, TORONTO*

31th ANNUAL MEETING:
Friday, SEPT. 24-26, 1999, MONTREAL*

32th ANNUAL MEETING:
Friday, SEPT. 22-24, 2000, OTTAWA*

* in conjunction with the Royal College Meeting; not confirmed
IMPORTANT ANNOUNCEMENT
FROM THE PUBLICATION COMMITTEE

RE: 1993 PAPERS
25th Annual Meeting in
VICTORIA, B.C.
September 13-15, 1993

Papers presented at the 1993 annual CAPS meeting may be selected for publication in the Journal of Pediatric Surgery. The publication committee requires six (6) copies of the manuscript to be submitted FOUR WEEKS before presentation to:

Dr Barry Shandling
Chairman, Publication Committee
Canadian Association of Paediatric Surgeons
Hospital for Sick Children
555 University Avenue
Toronto, ON
M5G 1X8

All manuscripts must adhere strictly to the "Information for Contributors" which appears in the Journal of Pediatric Surgery. Failure to do so will of necessity invalidate consideration of the manuscript for publication.
THE COAT OF ARMS
OF THE
CANADIAN ASSOCIATION OF PAEDIATRIC SURGEONS
L'ASSOCIATION CANADIENNE DE CHIRURGIE INFANTILE

Heraldic Blazon

Per pale gules and purpure, dexter a scalpel erect entwined
by a serpent, sinister a child standing, all argent.
Crest: On three maple leaves slipped gules and backed 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.
The Motto is a quotation from Ambroise Pare, a father of
modern surgery. The sixteenth-century French translates, "I treat him,
God cures him."
programme détaillé
programme schedule

OTTAWA
September 10-13, 1992
OVERVIEW of SCIENTIFIC, BUSINESS, SOCIAL PROGRAM
CANADIAN ASSOCIATION OF PEDIATRIC SURGEONS MEETING
Thursday, September 10-Sunday, September 13,1992
LE CHATEAU LAURIER, OTTAWA
LOCAL HOSTS: DR PIERRE SOUCY, DR STEVEN RUBIN

REGISTRATION: starting 12:00 hrs Thursday, Sept 10 and
7 am daily at the Ottawa Congress Centre

SCIENTIFIC SESSIONS: ALL sessions are in the Banquet Room of
LE CHATEAU LAURIER, 1 Rideau Street

Friday, September 11:
07:00-08:00 CONTINENTAL BREAKFAST - Banquet Room
08:00-11:15 PAPER SESSIONS 1 & 2
11:15-12:15 Fred McLeod Lecture:
Dr A. CORAN, Ann Arbor
13:45-16:45 PAPER SESSIONS 3 & 4

Saturday, September 12
07:00-08:00 CONTINENTAL BREAKFAST - Banquet Room
08:00-12:15 PAPER SESSIONS 5 & 6

Sunday, September 13:
07:00-08:00 CONTINENTAL BREAKFAST - Banquet Room
08:00-12:00 PAPER SESSIONS 7 & 8
12:00-12:15 CLOSING COMMENTS and ANNOUNCEMENTS

BUSINESS MEETINGS:
Thursday, September 10:
10:30-15:00 COUNCIL (EXECUTIVE) MEETING;
Drawing Room, Chateau Laurier

Saturday, September 12
12:15-14:00 ASSOCIATION MEMBERS LUNCHEON
BUSINESS MEETING; Banquet Room

SOCIAL PROGRAM:
Thursday, September 10
18:30-22:00 C.A.P.S. WELCOMING RECEPTION:
Parliament Building,
Centre Block Room 253-D
19:00 Parliament Tour from Reception Room

Friday, September 11
18:30-21:30 ROYAL COLLEGE WELCOMING RECEPTION,
Canadian Museum of Civilization in Hull

Saturday, September 12
19:00-19:30 Presidential Reception - Banquet Room
19:30-22:30 Presidential Banquet - Chateau Laurier

ENJOY

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<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors/Institutions</th>
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<tbody>
<tr>
<td>0800</td>
<td>O,R</td>
<td>MYOCARDIAL OXYGEN CONSUMPTION AND REGIONAL PERFUSION TO THE HEART: EFFECTS OF ALVEOLAR HYPOXIA AND NORMOXIA DURING GRADED INCREMENTS OF EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) SUPPORT IN NEWBORN PIGLETS</td>
<td>W.K.Y. Chan, K.J. Barrington, S. Al-Jadaan, A.H. Hayashi, N.N. Finer Department of Surgery and Neonatology, University of Alberta and the Royal Alexandra Hospital, Edmonton, Alberta</td>
</tr>
<tr>
<td>0815</td>
<td>O</td>
<td>ESTIMATION OF LUNGS' HYPOPLASIA ON POSTOPERATIVE CHEST X-RAYS IN CONGENITAL DIAPHRAGMATIC HERNIA</td>
<td>R. Cloutier, J. Pichette, O. St-Onge Université Laval, (Quebec)</td>
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<tr>
<td>0830</td>
<td>O</td>
<td>THE IMPACT OF ASSOCIATED MALFORMATIONS ON THE SURVIVAL OF NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA</td>
<td>Y. Sweed, P. Puri, Our Lady's Hospital for Sick Children, Crumlin, Dublin, IRELAND</td>
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<tr>
<td>0845</td>
<td>O,R</td>
<td>A NEW METHOD OF TREATMENT FOR PULMONARY HYPERTENSION IN CONGENITAL DIAPHRAGMATIC HERNIA</td>
<td>D. Major, R. Cloutier, L. Fournier, J. Pichette Université Laval, (Quebec)</td>
</tr>
<tr>
<td>0900</td>
<td>O</td>
<td>WITHHOLDING AND WITHDRAWAL OF LIFE SUPPORT FROM SURGICAL NEONATES WITH LIFE-THREATENING CONGENITAL ANOMALIES</td>
<td>F.W.J. Hazebroek, D. Tibboel, M. Mourik, A. P. Bos, J.C. Molenaar Sophia Children's Hospital, Rotterdam</td>
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<tr>
<td>0915</td>
<td>O,R</td>
<td>THE IMPACT OF SPINA BIFIDA ON OUR MEDICAL SERVICES AND COMMUNITY</td>
<td>H. Laishram, D. Price, R. Kennedy, Janeway Child Health Centre, St. John's, Newfoundland</td>
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<tr>
<td>0930</td>
<td>O</td>
<td>SEVERE NON-FATAL INJURIES: IS THE HOME SAFER THAN THE STREET?</td>
<td>G.J. Sherman, M. Giacomantonio Diseases of Infants and Children's Division, NHW, Ottawa</td>
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</table>

0945 - 1015 Coffee Break
FRIDAY, 1015-1115: SESSION 2: original papers and case reports
Co-Chairmen / Les Co- Presidents:
Dr M. Giacomantonio and Dr F. Guttman
(O=original 10 minute paper; R=resident paper; C=5 minute case report)

| 9. | O,R | 1015 | Frid. | BILIARY TRACT COMPlications IN PEDIATRIC ORTHOTOPIC LIVER TRANSPLANTATION
M. Lallier, D. St-Vil, F.I. Luks, J-M. Laberge,
A.L. Bensoussan, F. M. Guttman, H. Blanchard
Hôpital Sainte-Justine, Montreal |
| 10. | O,R | 1030 | Frid. | GALLBLADDER DISEASE IN CHILDREN: CHARACTERISTICS & THE CHANGING FACE OF TREATMENT
S.K. Mayer Jr., A. Hong, J-M. Laberge, D. Sigialet,
H. Sigman, F. M. Guttman
Montreal Children's Hospital, Montreal |
| 11. | O | 1045 | Frid. | RESULTS OF AN INITIAL CONSERVATIVE APPROACH TO LIVER ABSCESS IN CHILDHOOD
S.W. Moore, A.J.W. Millar, S. Cywes
Tygerberg and Red Cross Children's Hospitals, Cape Town |
| 12. | C,R | 1100 | Frid. | IDIOPATHIC ACUTE PORTAL VEIN THROMBOSIS
H. Laishram, R. Kennedy, B. Cramer
Janeway Child Health Centre, St. John's, Newfoundland |
| 13. | C,R | 1105 | Frid. | SPLenic, PORTAL AND MESENTERIC VENOUS THROMBOSIS AFTER SPLENECTOMY FOR HEMATOLOGIC DISEASE
E. Skarsgard, J. Doski, T. Jaksic; D. Wesson,
B. Shandling, S. Ein, P. Babyn, K. Heiss
The Hospital for Sick Children, Toronto |

1115-1215
FRED MCLEOD LECTURE
DR. A. G. CORAN
'THE SURGICAL MANAGEMENT OF ULCERATIVE COLITIS IN CHILDREN''

note: Dr Coran's biography is found on page xxvi

1215-1345 Lunch; please make your own arrangements
FRIDAY, 1345-1500: SESSION 3:  
original papers and case reports

Co-Chairmen / Les Co-Presidents:  
Dr. G. Blair and Dr. D. Wesson

(O=original 10 minute paper; R=resident paper; C=5 minute case report)

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| 14 | O | 1345 Frid. | HISTAMINE DOES NOT MEDIATE MUCOSAL PERMEABILITY AFTER SUBCLINICAL INTESTINAL ISCHEMIA-REPERFUSION INJURY (IRI)  
McMaster University, Hamilton |
| 15 | O,R | 1400 Frid. | COMPARISON OF STAMM WITH PERCUTANEOUS ENDOSCOPIC GASTROTOMY IN NEUROLOGICALLY IMPAIRED CHILDREN  
B.H. Cameron, G.K. Blair, G.C. Fraser, J.J. Murphy  
B.C. Children's Hospital, Vancouver |
| 16 | O | 1415 Frid. | VASOACTIVE INTESTINAL POLYPEPTIDE (VIP) CAUSES RELAXATION OF THE PYLORIC SPHINCTER IN THE RABBIT  
Enrique Grisoni, Juan Deagustin, Satish Kalhan  
MetroHealth Medical Centre, Cleveland, Ohio |
| 17 | O | 1430 Frid. | GLUCOSE UTILIZATION IN THE SURGICAL NEWBORN INFANT RECEIVING TOTAL PARENTERAL NUTRITION (TPN)  
M.O. Jones, A. Pierro, P. Hammond, D.A. Lloyd  
University of Liverpool, Liverpool, England |
| 18 | C,R | 1445 Frid. | INVASIVE NECROTIZING CANDIDA INFECTION OF THE DUODENUM LEADING TO PERFORATION: A CASE REPORT  
M. Neumeister, P. Fitzgerald, E. Mikhail,  
M. Giacomantonio, Izaak Walton Killam Children's Hospital, Halifax, |
| 19 | C,R | 1450 Frid. | CAT-SCRATCH DISEASE: AN UNUSUAL PRESENTATION  
B.J. Hancock, A. Ouimet,  
Hôpital Sainte-Justine, Montreal, Quebec |

1500-1530 COFFEE BREAK
FRIDAY, 1530-1645: SESSION 4:
original papers and case reports

Co-Chairmen / Les Co-Présidents:
Dr. A. Bensoussan, and Dr. S. Rubin

(O=original 10 minute paper; R=resident paper; C=5 minute case report)

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<tr>
<td>20</td>
<td>O.R</td>
<td>1530</td>
<td>THORACOSCOPY IN THE MANAGEMENT OF EMPYEMA IN CHILDREN</td>
<td>John A. Kern, Bradley M. Rodgers \ University of Virginia Health Sciences Centre, Charlottesville, USA</td>
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<tr>
<td>21</td>
<td>O.R</td>
<td>1545</td>
<td>CHILDHOOD PRIMARY PULMONARY NEOPLASMS</td>
<td>B.J. Hancock, M. Di Lorenzo, S. Youssef, S. Yazbeck, J.E. Marcotte \ Hôpital Sainte-Justine, Montreal, Quebec</td>
</tr>
<tr>
<td>22</td>
<td>O.R</td>
<td>1600</td>
<td>STERNOCHONDROPLASTY FOR PECTUS DEFORMITIES</td>
<td>B.J. Hancock, D. St-Vil, M. Di Lorenzo, P.P. Collin \ Hôpital Sainte-Justine, Montreal</td>
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<td>23</td>
<td>O.R</td>
<td>1615</td>
<td>OPTIMAL MANAGEMENT OF PATENT DUCTUS ARTERIOSUS (PDA) IN THE LESS THAN 800 GRAM NEONATE</td>
<td>T. Trus, Andrea L. Winthrop, S. Pipe, J. Shah, J.C. Langer, G.Y.P. Lau \ McMaster University, Hamilton</td>
</tr>
<tr>
<td>25</td>
<td>C</td>
<td>1620</td>
<td>THORACOSCOPIC RESECTION OF APICAL BULLOUS EMPHYSEMA IN A CHILD</td>
<td>M.W.L. Gauderer, T. A. Stellato \ Case Western Reserve University, Cleveland, Ohio</td>
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EVENING: ROYAL COLLEGE WELCOMING RECEPTION
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<td>O</td>
<td>0800</td>
<td>PENTOXIFYLLINE IMPROVES RESTING MEMBRANE POTENTIAL IN SEPSIS</td>
<td>S.E. Refsum, W. Norwood, B.J. Rowlands, V.E. Boston</td>
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<td></td>
<td>Sat.</td>
<td>Queen's University of Belfast and Royal Belfast Hospital for Sick Children, N. IRELAND</td>
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<td>27</td>
<td>O,R</td>
<td>0815</td>
<td>NON-OPERATIVE MANAGEMENT OF POST-APPENDECTOMY INTRA-ABDOMINAL ABScesses</td>
<td>J.M. Walton, P. Gooble, P. Fitzgerald,</td>
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<td>Sat.</td>
<td>J.M. Giacomantonio, D.A. Gillis, P. Soucy</td>
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<td>Children's Hospital of Eastern Ontario, Ottawa and Izaak Walton Killam Hospital for Children,</td>
<td>Halifax</td>
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<td>Sat.</td>
<td>Hôpital Sainte-Justine, Montreal</td>
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<td>29</td>
<td>C,R</td>
<td>0845</td>
<td>ENTERIC SCHISTOSOMIASIS PRESENTING AS PSEUDO-OBSTRUCTION: A CASE REPORT</td>
<td>B. Rudston-Brown, B.H. Cameron, J.J. Murphy,</td>
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<td>Sat.</td>
<td>G.K. Blair, J.E. Dimmick</td>
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<td>B.C. Children's Hospital, Vancouver</td>
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<td>30</td>
<td>C,R</td>
<td>0850</td>
<td>A CASE OF BOWEL OBSTRUCTION IN A PATIENT WITH KAWASAKI'S DISEASE</td>
<td>M.G. Evans, B.G. Gan</td>
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<td>Children's Hospital of Western Ontario, London</td>
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<td>Sat.</td>
<td>Hospital for Sick Children, Toronto</td>
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<td>32</td>
<td>O</td>
<td>0915</td>
<td>ETHICAL DILEMMAS: HOW DO WE DEAL WITH THE ANIMAL RIGHTS ACTIVISTS?</td>
<td>R.E. Sonnino</td>
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<td>Sat.</td>
<td>Case Western Reserve University, Cleveland, Ohio</td>
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<td>33</td>
<td>O</td>
<td>0930</td>
<td>THE ROLE OF A PAIN MANAGEMENT TEAM IN A CHILDREN'S HOSPITAL</td>
<td>Roberta E. Sonnino, Sally A. Lambert</td>
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<td>Sat.</td>
<td>Rainbow Babies and Children's Hospital, Cleveland, Ohio</td>
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<tr>
<td>34</td>
<td>C,R</td>
<td>0945</td>
<td>BILIARY ATRESIA BEGINS BEFORE BIRTH.</td>
<td>E. MacGillivray, N.S. Adzick</td>
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<td>University of California, San Francisco</td>
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<td>Sat.</td>
<td>Children's Hospital of Eastern Ontario, Ottawa</td>
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10:00 - 10:30 - Coffee Break
### SATURDAY, SEPTEMBER 12
#### le CHATEAU LAURIER
#### Banquet Room

**1030-1230: SESSION 6: original papers and case reports**

**Co-Chairmen / Les Co-Presidents:**
Dr. M. Di Lorenzo and Dr. R. Kennedy

(O=original 10 minute paper; R=resident paper; C=5 minute case report)

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<td>36. O</td>
<td>1030 Sat.</td>
<td><strong>INTUSSUSCESSION: TOWARD LESS SURGERY?</strong> S.H. Ein, S. Palder, D.J. Alton, A. Daneman Hospital for Sick Children, Toronto</td>
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<td>38. O,R</td>
<td>1100 Sat.</td>
<td><strong>MALIGNANT BENIGN NEONATAL SACROCCYGEAL TERATOMA</strong> Ron Bilk, M. Pope, B. Shandling, S. H. Ein The Hospital for Sick Children, Toronto</td>
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<td>40. C</td>
<td>1130 Sat.</td>
<td><strong>CYSTIC ADRENAL MASS IN A NEWBORN, WHEN TO OPERATE? A CASE REPORT</strong> S. Leclerc, A. L. Bensoussan Hôpital Sainte-Justine, Montreal</td>
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<tr>
<td>41. C</td>
<td>1135 Sat.</td>
<td><strong>MASSIVE OVARIAN EDEMA IN THE PEDIATRIC PATIENT: A RARE SOLID TUMOR</strong> Kurt F. Heiss, Gerald T. Zwiren, Kevin Winn Egleston Children's Hospital, Atlanta, Georgia</td>
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<td>42. O</td>
<td>1145 Sat.</td>
<td><strong>ANORECTAL FUNCTION AND QUALITY OF LIFE IN ADULT PATIENTS WITH AN OPERATED SACROCCYGEAL TERATOMA</strong> R. Rintala, P. Lahdenne, H. Lindahl, M. Heikinheimo Children's Hospital, University of Helsinki, FINLAND</td>
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Note: The Association annual business meeting follows immediately this session (12:15-14:00). Members are asked to attend; lunch will be served. The remainder of the afternoon is free.

Please remember that the Presidential Banquet is tonight, beginning with cocktails at 7:00 pm in the Banquet Room of le Château Laurier. Please bring your banquet ticket, available at registration desk. The scientific sessions resume tomorrow at 0800 hrs at le Château Laurier.

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<th>No.</th>
<th>Type</th>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>44</td>
<td>O</td>
<td>8:00</td>
<td>Allopurinol Protects the Bowel from Necrosis Caused by Indomethacin and Temporary Intestinal Ischemia in Mice</td>
<td>I.H. Krasna, R. T. Lee; Robert Wood Johnson Medical School, New Brunswick, New Jersey</td>
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<tr>
<td>45</td>
<td>O</td>
<td>8:15</td>
<td>Chronic Esophagitis and Gastric Metaplasia Are Frequent Late Complications of Esophageal Atresia</td>
<td>H. Lindahl, R. Rintala, H. Sariola; Children's Hospital, University of Helsinki, Finland</td>
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<tr>
<td>46</td>
<td>O</td>
<td>8:30</td>
<td>Treatment of Intractable Salivary Aspiration in Children by Laryngotracheal Separation with or Without Proximal Tracheal Diversion</td>
<td>M.A. Hoffman, M.M. Fuerlen, R.H. Pearl, R.F. Wetmore, J.A. O'Neill; Children's Hospital of Philadelphia and Walter Reed Army Medical Centre, Washington, DC</td>
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<tr>
<td>47</td>
<td>C</td>
<td>8:45</td>
<td>Enlargement of the Abdominal Cavity with a Tissue-Expander in the Treatment of Giant Omphalocele</td>
<td>N.M.A. Bax, D.C. van der Zee, A.J. Pullen, Gunne, M.H. Rövekamp; Het Wilhelmina Kinderziekenhuis, Utrecht, Netherlands</td>
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<tr>
<td>48</td>
<td>C</td>
<td>8:50</td>
<td>Sequential Sac Ligation for Giant Omphalocele</td>
<td>A.R. Hong, D.L. Sigalet, D.P. Croitoru, F.M. Gutman, J.M. Laberge; The Montreal Children's Hospital, Montreal</td>
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<td>49</td>
<td>O,R</td>
<td>9:00</td>
<td>Selective Preterm Delivery for Prenatally Diagnosed Gastrochisis: Development of Objective Sonographic Criteria</td>
<td>J. Khanna, J.C. Langer, E.H. Dyke, C. Caco, K.H. Nicolaides; McMaster University, Hamilton and Harris Birthright Research Centre for Fetal Medicine, London, UK</td>
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<td>50</td>
<td>O,R</td>
<td>9:15</td>
<td>Incarceration of Inguinal Hernia in Infants Prior to Elective Repair</td>
<td>S. Stylianos, N.N. Jacir, B.H. Harris; Tufts University School of Medicine and The Floating Hospital, Boston</td>
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<td>52</td>
<td>C</td>
<td>9:45</td>
<td>Neuroblastoma and Lumbar Hernia: A Causal Relationship?</td>
<td>D.J. Lafer; Nemours Children's Clinic, Jacksonville, Florida</td>
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<td>53</td>
<td>C</td>
<td>9:50</td>
<td>Fine Needle Aspiration Cytology: A Simple Exam to Screen Superficial MASSES</td>
<td>P.G. Gambi, L.M. Antoniello, P. Boccato, S. Blandamura, G. Cecchett, P. Dall'Inga, A. Messineo, M. Guglielmi; University of Padua, Hospital of Padua, Italy</td>
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1000 - 1030 Coffee Break
**SUNDAY, SEPTEMBER 13**  
**Le CHATEAU LAURIER**  
Banquet Room  
**10:30-12:00: SESSION 8: original papers and case reports**  
Co-Chairmen / Les Co-Présidents:  
Dr S. Chou and Dr. M. Giacomantonio

(O=original 10 minute paper; R=resident paper;C=5 minute case report)

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| 54. O | 1030 Sun. | MALIGNANT RISK IN JUVENILE POLYPOSIS COLI: INCREASING DOCUMENTATION IN THE PEDIATRIC AGE GROUP  
K.F. Heiss, D. Schaffner, R.R. Ricketts, K. Winn  
Egleston Children’s Hospital & Scottish Rite Children’s Hospital, Atlanta |
| 55. O,R | 1045 Sun. | ANAL FISTULAS IN INFANTS: ETIOLOGY, FEATURES, MANAGEMENT  
D. Poenaru, S. Yazbeck,  
Hôpital Sainte-Justine, Montreal |
| 56. O | 1100 Sun. | SECONDARY EFFECTS OF PROLONGED INTESTINAL OBSTRUCTION ON THE ENTERIC NERVOUS SYSTEM (ENS) OF RATS  
S.F. Moore, D. Laing, J. Melis, S. Cywes  
Tygerberg Hospital and Red Cross Children’s Hospital of Cape Town, SOUTH AFRICA |
| 57. C | 1115 Sun. | HYPOMOTILE BOWEL SYNDROME PRESENTING AS MECONIUM ILEUS: A CASE REPORT  
D. Wilcox, D.S. Borowitz, M.C. Stovroff, P.L. Glick,  
Children’s Hospital of Buffalo, Buffalo, New York |
| 58. C | 1120 Sun. | POSTERIOR SAGITTAL RECTAL MYECTOMY FOR PERSISTENT RECTAL ACHALASIA AFTER THE SOAVE PROCEDURE FOR HIRSCHSPRUNG’S DISEASE  
K. Kimura, Y. Inomata, R. T. Soper  
University of Iowa College of Medicine, Iowa City, Iowa |
| 59. O | 1130 Sun. | SPARSE NEUROMUSCULAR JUNCTIONS IN THE NORMO-GANGLIONIC BOWEL OF HIRSCHSPRUNG’S DISEASE: IS IT A CAUSATIVE FACTOR OF FAILED PULL-THROUGH OPERATION?  
A. Yamatake, T. Miyano, T. Fujimoto, H. Nishiyi  
Juntendo University School of Medicine, Tokyo, JAPAN |
| 60. O,R | 1145 | ROUTINE USE OF THE NITRIC OXIDE STAIN IN THE DIFFERENTIAL DIAGNOSIS OF HIRSCHSPRUNG’S DISEASE  
C. Cuffari, A. Krantis, S. Rubin  
Children’s Hospital of Eastern Ontario and University of Ottawa, Ottawa |

12:00  
CLOSING REMARKS AND ADJOURNMENT
Dr. Coran was born in Boston, Massachusetts and graduated from Harvard College and Harvard Medical School (Cum Laude) in 1963. He completed his internship and surgical residencies in 1969 at the Peter Bent Brigham Hospital and the Children's Hospital Medical Center in Boston. Concurrently during his surgical training he held fellowships from the National Institute of Health,
the American Cancer Society, Neonatal Metabolism and the Cabot Fellowship. Dr. Coran has held academic appointments at Harvard Medical School (1967-1969), the George Washington University School of Medicine (1970-72) and the USC School of Medicine (1972-74). In 1974 the Coran's moved to Ann Arbor, Michigan where he became Professor of Surgery and Head, Section of Pediatric Surgery at the University of Michigan Medical School. He has been the Surgeon-in-Chief at the C.S. Mott Children's Hospital in Ann Arbor, Michigan since 1981 and also is Professor of Pediatrics at his university. Dr. Coran's publication record began in 1965 and to date includes 241 articles in peer reviewed journals, 10 books and 51 textbook chapters. His areas of academic interest include surgical nutrition and gastrointestinal surgery. He has received research grants for research in shock, nutrition, physiological evaluation of endorectal pull-through procedures, constipation, fertility following orchiopexy and ECMO. Dr. Coran is the Editor or Editor Consultant to a number of important surgical journals. He holds many honors and awards. He has honorary membership to numerous medical and non-medical societies and is a much sought after guest lecturer to many centres around the world. His presentations, movies and exhibits total 275. The Coran's have three children. Mrs. Coran (Susan) will accompany him on the tour to the Pediatric Surgical Centres in St. John's, Newfoundland, Halifax, Quebec City, Montreal, London, Ontario, Hamilton and Toronto where he will deliver the Annual James Simpson Lecture. At the CAPS meeting in Ottawa Dr. Coran will give the Fred McLeod Lecture entitled "Surgical Management of Ulcerative Colitis in Children." He will also be the guest speaker following the Presidential Dinner. The CAPS Education Fund and the Royal College of Physicians and Surgeons of Canada are providing financial support for Dr. Coran's visit. We thank them and Dr. Coran for making the visit possible.
Editor Note:

The listing of CAPS members' names and addresses that normally appear in the Annual Program Booklet will be printed in a separate booklet following this annual meeting. The CAPS membership listing will also include the revised Bylaws to be adopted at this year's Annual Business Meeting.

The Editor wishes to thank Dr. Salam Yazbeck for translating this Program Booklet. It is our intention to print in the future the whole program in both official languages.

ACKNOWLEDGMENT

DONATION FROM THE FOLLOWING TOWARDS THE COSTS OF THE SCIENTIFIC PORTION OF THIS ANNUAL MEETING IS GRATFUELY ACKNOWLEDGED:

MERCK FROSST CANADA INC.
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 Paper Category. Each award is $250. The Program Committee normally tries to schedule the Residents' papers during the Friday and Saturday sessions to enable the awarding of the Resident Prizes during the Presidential Dinner on Saturday evening. Since some of this year's Resident papers have to be presented on Sunday morning the Resident's Prizes will be announced in the next issue of CAPSULE.

WINNER OF THE 1991 RESIDENT BEST PAPER AWARD:
Dr. A. Humur

for his paper:
"FIBROMATOSIS IN INFANCY and CHILDHOOD: THE SPECTRUM"
A. Humur, S. Chou, B. Carpenter
Children's Hospital of Eastern Ontario

Congratulations Dr Humur !!!
ABSTRACTS

abbreviations:

O = original 10 minute paper and 5 minute discussion
R = resident paper, same time limits
C = 5 minute case/technique report; discussion follows second Case report paper

XXX
MYOCARDIAL OXYGEN CONSUMPTION AND REGIONAL PERFUSION TO THE HEART: EFFECTS OF ALVEOLAR HYPOXIA AND NORMOXIA DURING GRADED INCREMENTS OF EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) SUPPORT IN NEWBORN PIGLETS

W.K.Y. Chan, K.J. Barrington, S. Al-Jadaan, A.H. Hayashi, N.N. Finer

Department of Surgery and Neonatology, University of Alberta and the Royal Alexandra Hospital, Edmonton, Alberta

Venoarterial ECMO was performed in 7 neonatal piglets (4-10d; wt. 3.2-3.9 kg) to determine changes in carotid and coronary oxygen metabolism and blood flow at varying flow rates. Each flow rate was studied during alveolar normoxia and hypoxia. The right and left carotid flow (CarF) and O2 delivery (CarDO2), coronary artery flow (CorF) and O2 delivery (CorDO2), myocardial O2 consumption (MVO2), percentage coronary filling from the left ventricle (pulmonary venous blood), cardiac index and systemic vascular resistance (SVR) were measured before cannulation, after cannulation before ECMO, and at ECMO flow rates of 40, 80, and 120 ml/kg/min while ventilating with 60% O2. ECMO flows of 120, 80, and 40 ml/kg/min were repeated after ventilating with 100% nitrogen to create alveolar hypoxia. Cannulation and ligation of the right carotid increased left CarF and CarDO2 but decreased total CarF and CarDO2. At all flow rates of ECMO total CarF and CarDO2 was further decreased (p<0.05). Changes in CorF and CorDO2 paralleled MVO2. MVO2 was lowest at ECMO flow of 120 ml/kg/min during ventilation with O2 (p<0.05). MVO2 increased with alveolar hypoxia and further increased with decreasing levels of bypass (p<0.05). MVO2 appeared to be dependent upon heart rate, SVR, and cardiac output. The majority of coronary blood flow was derived from the left ventricle at 40 ml/kg/min but left ventricular contribution decreased as ECMO flow rates increased.

CONCLUSIONS: 1) ECMO decreased total carotid artery blood flow and oxygen delivery at all flow rates, 2) ECMO provides maximal cardiac rest, as determined by myocardial oxygen consumption, at full support.

Dr. Allen H. Hayashi
302-2020 Richmond Ave.,
Victoria, BC
V8R 6R5
Tel. 604 385-2451
Fax 604 592-5020
2. Friday, 08:15-08:30 ; (O)

ESTIMATION OF LUNGS’ HYPOPLASIA ON POSTOPERATIVE CHEST X-RAYS IN CONGENITAL DIAPHRAGMATIC HERNIA

R. Cloutier, J. Pichette, O. St-Onge
Université Laval, (Quebec)

In order to minimize trauma to the lungs in congenital diaphragmatic hernia, we stopped inserting ipsilateral underwater chest drains after reduction of the herniated contents and we now use prosthesis impervious to air in cases of diaphragmatic aplasia. This allows both lungs to expand at their own pace, and makes it possible to estimate their degree of hypoplasia on postoperative chest X-rays.

Thirty-nine consecutive postoperative chest X-rays were examined by an independent reviewer in a blind manner and were classified into three groups: none to mild hypoplasia (group I, 10 cases), moderate to severe (group II, 20 cases) and very severe hypoplasia (group III, 9 cases). These degrees of hypoplasia were then correlated with other data, either clinical (antenatal diagnosis, presence of hydramnios, duration of gestation, weight at birth, APGAR, age at symptoms, needs for assisted ventilation and state of preoperative stabilization), or anatomical (side of their hernia, size of the defect, presence of a sac and site of the stomach).

Our results indicate that early antenatal diagnosis is not reliable to predict the degree of lungs’ hypoplasia at birth. On the other hand, when extra care is taken to prevent trauma, very severe hypoplasia is compatible with extraterine survival (8 survivors in group III).

Raymond Cloutier, MD, FRCS(C)
Département de chirurgie - porte 221
Le Centre hospitalier de l’Université Laval
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Sainte-Foy, PQ, G1V 4G2
Tel. (418) 656-4141
Fax (418) 654-2774
THE IMPACT OF ASSOCIATED MALFORMATIONS ON THE SURVIVAL OF NEONATES WITH CONGENITAL DIAPHRAGMATIC HERNIA

Yechiel Sweed, Prem Puri,
Our Lady's Hospital for Sick Children, Crumlin, Dublin, IRELAND

We examined medical records of 116 consecutive cases of congenital diaphragmatic hernia (CDH) among 368,772 live births at the three maternity hospitals in Dublin, analyzing the incidence of associated malformations and their impact on survival. The patients were divided into two groups - group I included 64 (55%) patients who died during resuscitation and stabilization prior to surgery at a mean age of 11.23 hours and group II included 52 (45%) patients who were operated upon. All patients in group I underwent detailed postmortem examination and 45% patients who died in group II had an autopsy. The mean gestational age for group I patients (36.1 ± 4.5 weeks) was significantly lower (p<0.01) compared to mean gestational age of group II patients (38.98 ± 2.39 weeks). Similarly, mean birth weight of group I patients (2415.8 ± 906g) was significantly lower (p<0.001) than mean birth weight of group II patients (3140.5 ± 563g). Of the newborns who died prior to surgery, 40 (62.5%) patients had 79 associated malformations. The major associated anomalies were: cardiac (n=16), neural tube defects (n=15), skeletal (n=8), chromosomal (n=5), urinary tract (n=6), gastrointestinal (n=3), omphalocele (n=4), craniofacial (n=5), pulmonary (n=2) and syndromes (n=2). Sixteen (40%) of these patients were found to have multiple anomalies. Of the 52 patients who were operated upon, only 4 (7.7%) had associated malformations. Our data shows that associated malformations in neonates with CDH is a major factor influencing outcome in this congenital malformation.

Mr. Prem Puri
Children's Research Centre,
Our Lady's Hospital for Sick Children
Crumlin, Dublin 12, IRELAND
Tel. 353-1-5581111
Fax 353-1-551045
4. Friday, 08:45-08:50 ; (C,R) (five minute paper;discussion following next paper)

A NEW METHOD OF TREATMENT FOR PULMONARY HYPERTENSION IN
CONGENITAL DIAPHRAGMATIC HERNIA

D. Major*, R. Cloutier, L. Fournier, J. Pichette
Université Laval, Quebec

This research proposes a new treatment for perivascular emphysema
suspected to be responsible for pulmonary hypertension leading to "foetal
circulation" in congenital diaphragmatic hernia (CDH). Repeated vibrations
on the thorax could reduce the extrinsic compression on pulmonary vessels,
the so-called "air-block syndrome", by fractioning air around the vessels into
small bubbles, thus increasing their redistribution and reabsorption rate.

In cats, pulmonary lesions similar to those found in CDH were
obtained by continuous insufflation of air at 40 cm H₂O for 2 min. in a lower
lobe of the lung, following the technique described by Macklin. Vibrations on
the thorax were produced with the same apparatus as used by
physiotherapists to eliminate pulmonary secretions. Thirty-three cats were
divided into three groups: lesions without treatment, lesions treated by
vibrations and controls. A catheter was inserted in the pulmonary artery for
PAP and wedge measurements. The carotid was cannulated for arterial and
blood gases monitoring. Morphometric analysis of the lung was also carried
out in all cases.

Results showed a very significant difference in pulmonary
hypertension between treated and untreated groups after only 20 minutes of
treatment by vibrations. Results also confirmed the very strong correlation
between PAP variations and perivascular emphysema.

We can conclude that vibrations is a simple and efficient way to
reduce pulmonary hypertension by diminishing extrinsic compression on the
pulmonary vessels. This should permit an increased survival in cases of
CDH where trauma to the lungs has already occurred.

Raymond Cloutier, MD, FRCS(C)
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Tel. (418) 656-4141
Fax (418) 654-2774
* post graduate student in Experimental Medicine
5. Friday, 08:50-09:00; (C) (five minute paper, followed by five minute discussion of this and previous paper)

HOME ESOPHAGEAL SELF-DILATATION (ESD) IN CHILDREN

J.C. Langer, F. Sherkin-Langer, J. Zupancic,
A.L. Winthrop, R.M. Issenman
McMaster University, Hamilton, Ontario

Long-term esophageal dilatation is necessary for some children with esophageal strictures. In adults, home ESD permits greater independence and more frequent treatments than intermittent hospital procedures. We developed an innovative technique for teaching ESD to preadolescent children, using a form of creative visualization.

The child focused on a 2-minute mental image from his own experience (i.e., a video game, a popular song, swimming a race), while passing a Maloney bougie. A nasal breathing technique was used and active encouragement was provided. Topical lidocaine and oral valium were used initially to assist relaxation, and were stopped when the child gained confidence with ESD.

We used this technique in 3 patients. 1) A 12 year old boy had a persistent stricture following a Sugiura procedure. Daily ESD to a number 38 bougie was taught over 1 week in hospital, continued for 6 months at home, and successfully stopped. 2) A 13 year old boy developed a stricture from reflux esophagitis. A fundoplication was done, and ESD to a number 38 bougie was taught postoperatively. Daily home ESD was successfully stopped 4 months later. 3) A 12 year old girl had a stricture of unknown etiology. ESD to a number 42 bougie was taught over a 1 week period in hospital, and she continues twice weekly ESD 4 months later.

Home esophageal self-dilatation can be successfully taught to children in this difficult age group. The teaching technique is simple and effective, and can be easily applied to other tasks such as pain control, nasogastric tube feeding, and self-injection.

Jacob C. Langer, MD
St. Louis Children’s Hospital, Room 5W12
400 South Kingshighway,
St. Louis, Missouri, 63110
Tel. 314-454-6022
Fax 314-454-2442
WITHHOLDING AND WITHDRAWAL OF LIFE SUPPORT FROM SURGICAL NEONATES WITH LIFE-THREATENING CONGENITAL ANOMALIES

F.W.J. Hazebroek, D. Tibboel, M. Mourik, A. P. Bos, J.C. Molenaar
Sophia Children's Hospital, Rotterdam, THE NETHERLANDS

The availability of advanced medical and surgical life-saving therapies may complicate the process of decision making to withhold or withdraw therapy in newborns with congenital anatomical anomalies (CAA).

We evaluated whether, why and how life support was withheld or withdrawn in surgical neonates. During the study period, January 1988 through December 1991, 529 neonates were admitted, 52 of whom died (10%). Twenty eight deaths were due to the underlying disease.

The other 24 patients died because treatment was withheld or withdrawn. In 15/24 (Group A, mean stay 9.2 ± 9.1 days) treatment was not started (2/15) or initially started but later withdrawn (13/15) because of the severity of CAA alone or CAA associated with chromosomal anomalies. In 9/24 (Group B, mean stay 20.3 ± 17.3) treatment was withdrawn because of serious postoperative complications or hypoxic encephalopathy.

In all cases often lengthy discussions have led the medical and nursing staff together with the parents to choose unanimously for withdrawal of treatment. Mechanical ventilation was the intervention most frequently withdrawn (10/15 Group A, 9/9 Group B). Vaso-active and other drugs were withheld in 5 patients of Group A. Sedatives and algetics were administrated as supportive care permitting the child to die in a humane way, 17 in the arms of a parent and 7 in the arms of a nurse.

We conclude that life-sustaining care is withheld or withdrawn relatively frequently from patients at our ICU. Such decisions are ethical ones, taken in the light of professional and technical expertise. Evaluation of withholding or withdrawal of treatment is difficult but necessary to evolve appropriate decision-making procedures and to formulate humane standards of intensive care.

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THE IMPACT OF SPINA BIFIDA ON OUR MEDICAL SERVICES
AND COMMUNITY

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Our institution receives all live spina bifida patients. The aim of this
study is to determine the outcome of these patients and the impact on the
medical system. On a retrospective chart review, 274 patients were studied
from 1967-1990. An analysis of the statistical variables revealed that the
incidence per 1000 live births have remained stationary in our Province;
there is a slight female predominance; 64% were born to young mothers and
the peak incidence occurred in March, April and May. A total of 179 patients
out of 254, who underwent surgery were alive and underwent rehabilitation
programs. Only 35% are wheelchair bound; the rest are ambulatory. 161 are
of school age or older, 78 are in regular high school (3 dropouts), 36 in
special education, 15 had no neurological deficit, 7 lost in followup, 5 died, 4
are in University, 6 graduated from high school, 9 gross mental retardation
and one is the mother of three normal children. To attain these results these
patients are seen twice a year in a Rehabilitation and Multidisciplinary Clinic.
From this study the utilization of the medical services and impact on the
community is great. However, the majority of these patients appear to attain
a surprisingly high quality of life.

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SEVERE NON-FATAL INJURIES:  
IS THE HOME SAFER THAN THE STREET?

G.J. Sherman, M. Giacomantonio  
Diseases of Infants and Children's Division, NHW, Ottawa

Childhood injuries occurring in areas of transportation (eg., roads,  
parking lots, sidewalks) have been accepted as a serious problem and many  
injury prevention programs have concentrated on motor vehicles and  
bicycles. By contrast, injuries occurring in the home (for example) have  
received less attention, in part because they are often perceived as less  
severe. While it is true that more injury-related deaths occur on the street,  
data from the Canadian Hospitals Injury, Reporting and Prevention Program  
show that a majority of non-fatal, severe injury (i.e., resulting in hospital  
admission) occurs in a residential setting.

This analysis concentrates on the similarities and differences in  
location, gender, age, nature of injury and body part affected in more than  
5400 severely injured children from April 1990 to December 1991.  
The results show that if injury is viewed as a public health (burden of  
ilness) issue and not as a cost per injury issue, children are most at risk  
when most people consider them most safe: at home and at school.

It is concluded that injury prevention priorities should be re-examined  
using data which supply information on the severity of injury and with a  
philosophy that injury is a problem for the society and not just for the  
individual.

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0945 - 1015 - Coffee Break
BILIARY TRACT COMPLICATIONS IN PEDIATRIC ORTHOTOPIC LIVER TRANSPLANTATION

M. Lallier, D. St-Vil, F.I. Luks, J-M. Laberge, A.L. Bensoussan,
F. M. Guttman, and H. Blanchard
Hôpital Sainte-Justine, Montreal

Biliary tract complications are reported to occur in 15 to 20% of orthotopic liver transplantations (OLT). Since 1986, 47 OLTs were done in 42 children with a mean age and weight of 5.3 years and 19.5 kgs respectively. Twenty-two transplantations were with reduced liver grafts (RLG) and 25 were non-reduced grafts (NRG). Choledocho-choledochostomy with a T-tube (CC-T) (mean weight 25.0 kgs) or a choledocho-jejunostomy (RY-CJ) (mean weight 14.5 kgs) were done in 21 and 26 cases respectively. The overall mortality was 20% but none of the deaths were related to biliary problems. Biliary tract complications occurred in 10 cases (21%), 2 within 30 days (early), 5 within 3 months (intermediate) and 3 more than 6 months (late) after OLT. Leakage leading to bile peritonitis (6) required reoperation and occurred after T-tube removal (4) (intermediate), from partial anastomotic dehiscence (1) (early) and from the transection margin (1) of a RLG. Obstruction (1 early, 1 intermediate 2 late) was documented in 4 cases with none associated with arterial thrombosis. Stenosis after CC reconstruction (2) required conversion to RY-CJ; two patients had revision of their RY-CJ because of kinking of the choledochus after a hyper-reduced graft (segment 2 and 3) in one and an anastomotic stricture 46 months after OLT in the other. Neither the type of transplantation (RLG 18% vs NRG 24%) nor the type of biliary reconstruction (RY-CJ 15% vs CC 29%) did significantly influence the rate of biliary complications. RLGs are not associated with an increased risk of biliary leak at the transection margin and the only case in our series improved after correction of a distal obstruction at a CC anastomosis. Biliary tract complications can be decreased by meticulous technique during reconstruction of the biliary tract and selective use T-tube drain during OLT.

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GALLBLADDER DISEASE IN CHILDREN: CHARACTERISTICS & THE CHANGING FACE OF TREATMENT

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Montreal Children's Hospital, Montreal

Laparoscopic cholecystectomy (LAP) is gaining wide acceptance, however some question its value in pediatric patients. This has prompted a retrospective review of patients with gallbladder disease to examine patient population, the risk factors and changing morbidity. All charts of patients with cholelithiasis or cholecystitis seen at our hospital between 1985 and 1992 were reviewed. A total of 68 charts were analyzed. Five were under 2 years, 24 between 2 and 12, and 39 were teenagers, 48 were female. The majority of the patients presented with typical colic but 10 patients were asymptomatic and 6 had atypical symptoms. Cholelithiasis was confirmed by U/S in all cases. Of the 68 patients, only 12 (18%) had hemolytic disease. Obesity was present in 17 (25%) patients and 12 (18%) had a positive family history. Twenty (29%) had no known risk factor. Other previously reported risk factors such as major surgery, sepsis, prolonged TPN, and pregnancy were uncommon.

Fifty-two underwent cholecystectomy. Twelve of these were approached by LAP, all since 1990. Eleven were successfully completed and one was converted to an open procedure due to light source failure. One operative cholangiogram was performed and was normal. Of the 40 patients undergoing open cholecystectomy (OC), 22 had a cholangiogram and 4 required CBD exploration. Intraoperative complications consisted of a minor retroperitoneal laceration in a patient undergoing LAP and a bile duct injury in a OC patient. Ten had postop complications all in the OC group. Four of these were considered major including a bile leak, wound dehiscence, and GI bleed (2). mean and median postop stay for the OC was 7.7 and 4 days respectively as opposed to 1.75 and 1 day for the LAP.

The majority of pediatric patients with gallbladder disease appear to have risk factors similar to those of the adult population. Cholecystectomies remain infrequent in children but laparoscopic techniques have wider applications and definitive advantages and should be part of the armamentarium of the pediatric general surgeon.

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RESULTS OF AN INITIAL CONSERVATIVE APPROACH TO LIVER ABSCESS IN CHILDHOOD

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We reviewed a 16 year experience (124 patients - 1973-1989) of initial conservative management of liver abscess in children under the age of 14 yrs. Surgical drainage was performed for clinical evidence of peritonitis or failure to improve within 48-72 hours of commencing therapy.

Ninety-eight liver abscesses were situated in the right liver, 26 on the left and 31 (25%) were multiple. Seventy-eight (80%) of right sided abscesses and 20 (77%) of the left sided abscesses were primary pyogenic, the remainder being of amoebic origin. Both groups presented with a similar symptom complex but observed differences included the mean age of onset (Pyogenic 4.5 yrs; Amoebic 2.0 yrs) and the ultrasonographic appearance.

Non-operative management was successful in 37% overall and surgical drainage was successful in all cases where performed with low morbidity and zero mortality. Sixty percent of multiple abscesses responded to conservative management but only 12.5% of solitary left liver abscesses responded.

An initial conservative management protocol is successful in 37% of liver abscesses in childhood. Early drainage of the solitary pyogenic left liver abscess should be considered because of poor response to medical therapy and the close proximity to vital structures.

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IDIOPATHIC ACUTE PORTAL VEIN THROMBOSIS

H. Lalshram, R. Kennedy, B. Cramer
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There are few reported cases of acute portal vein thrombosis presenting as an acute abdomen in adolescent age group. Most published series concern chronic extra hepatic portal vein thrombosis. Acute portal vein thrombosis is rare, but can develop into serious complications. Hence, prompt diagnosis and heparinization can prevent the development of lethal complications such as venous gangrene of the bowel and acute portal hypertension. A 17 year old, who had a oesophageal replacement by a stomach tube for a TEF anomaly in the neonatal period was recently treated for an acute ulcer in the stomach tube. He was admitted four weeks later with a three day history of persistent epigastric pain and right, upper quadrant pain and tenderness and this was different except for tenderness in the epigastrium and right upper quadrant. Due to the persistent symptoms an ultrasound examination of the abdomen was performed and this showed a portal vein thrombosis of the left main branch with two smaller thrombi into more peripheral right branches and this was confirmed by CT scan. Anticoagulation therapy was started with relief of symptoms and was stopped when the thrombi disappeared. The symptoms recurred after a short interval with recurrence of the thrombi. He is currently maintained of long-term anticoagulation therapy.

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SPLENIC, PORTAL AND MESENTERIC VENOUS THROMBOSIS AFTER SPLENECTOMY FOR HEMATOLOGIC DISEASE

E. Skarsgard, J. Doski, T. Jaksic, D. Wesson,
B. Shandling, S. Ein, P. Babyn, K. Heiss

The Hospital for Sick Children, Toronto

Splenic, portal or mesenteric venous thrombosis in pediatric patients after splenectomy for hematologic disease is a rare event, but has been associated with significant morbidity and mortality in adult reports. Between 1981 and 1991, 3 patients (13 yo male with hereditary elliptocytosis [HE], 13 yo male with thalassemia intermedia [TI] and an 18 yo female with idiopathic thrombocytopenic purpura [ITP]) presented with abdominal pain and nausea, with or without fever, at 4, 11, and 13 days post splenectomy, respectively. Abdominal imaging by doppler U/S and/or CT scan revealed: 1) an intraluminal filling defect with partial obstruction to flow in the right branch of the portal vein with the remaining vessels patent (HE), 2) splenic vein thrombosis with complete occlusion of the main portal vein and proximal superior mesenteric vein (TI) and 3) complete thrombosis of the splenic vein, proximal SMV, and portal vein (including central radicles), with retrogastric collateralization (ITP). Followup imaging revealed either complete resolution of vascular obstruction on no treatment (1), or portal venous cavernomatous transformation with hepatofugal flow after 6 months of systemic anticoagulation (2,3) and all 3 patients are currently asymptomatic. Postoperative sonographic evaluation of a consecutive series of pediatric splenectomies for hematologic disease (n=16), was performed at a median of 51 days (range 3-543). This revealed one case of asymptomatic left portal venous thrombosis with subsequent recanalization in the absence of treatment. Comparison of patients with thrombosis to those without, with respect to age, sex, diagnosis, previous thrombotic episodes, preoperative steroids, pre/postoperative platelet count and hemoglobin, operative duration and resuscitation, splenic mass and post-operative complications, identified only advanced age and splenic mass as significant predictors of thrombosis. This condition should be considered in the evaluation of every post-splenectomy child with abdominal pain.

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Note: The Fred McLeod Lecture follows this paper
1115-1215 - FRED MCLEOD LECTURE

DR. ARNOLD G. CORAN

'THE SURGICAL MANAGEMENT OF ULCERATIVE COLITIS IN CHILDREN"

Dr Coran's biography is found on page xxvi

1215-1345 - Lunch; please make your own arrangements
HISTAMINE DOES NOT MEDIATE MUCOSAL PERMEABILITY AFTER SUBCLINICAL INTESTINAL ISCHEMIA-REPERFUSION INJURY (IRI)

McMaster University, Hamilton

Mucosal permeability following IRI may be an important mechanism in the etiology of necrotizing enterocolitis. The present studies were designed to assess the role of histamine in mediating these permeability changes.

Six-wk old rats underwent 10-minute superior mesenteric artery occlusion (SMAO) or sham, and mucosal permeability to \(^{51}\)CrEDTA was then measured after 30 min. Rats were pretreated with saline, mepyramine (6mg/kg), or ranitidine (5mg/kg).

Results are shown below (counts/cc/\text{std}±SD, *p<0.05 vs sham):

<table>
<thead>
<tr>
<th>Group</th>
<th>Saline</th>
<th>Mepyramine</th>
<th>Ranitidine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sham (5/grp)</td>
<td>0.91±0.4</td>
<td>0.65±0.2</td>
<td>0.86±0.2</td>
</tr>
<tr>
<td>SMAO (5/grp)</td>
<td>8.44±3.0*</td>
<td>8.31±3.8*</td>
<td>8.02±1.8*</td>
</tr>
</tbody>
</table>

Permeability to \(^{51}\)CrEDTA was then measured in 6-wk old rats during aortic infusion of saline or histamine. There was no significant increase in permeability as a result of histamine infusion (2.02±1.4 vs 1.63±0.5 counts/cc/\text{std}).

Finally, histamine levels were measured in portal vein blood and ileal tissue 30 minutes after 10-min SMAO in 6-wk and 10-day old rats. There was no significant difference between sham and SMAO with respect to portal vein histamine (6-wk - 22.6±9 vs 23.4±16 ng/ml; 10-day - 2.2±0.9 vs 2.8±1.1 ng/ml), or ileal histamine (6-wk - 2.29±1.1 vs 2.57±1.2 ng/mg; 10-day - 19.0±13 vs 14.9±9 ng/mg).

In conclusion: 1) IRI-induced permeability was not blocked by either H1 or H2 blockers, 2) histamine infusion did not increase permeability, and 3) SMAO did not increase portal vein or tissue histamine levels. These data suggest that histamine does not play a role in mediating the increase in permeability after subclinical IRI in this model.

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COMPARISON OF STAMM WITH PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN NEUROLOGICALLY IMPAIRED CHILDREN

B.H. Cameron, G.K. Blair, G.C. Fraser, J.J. Murphy
B.C. Children's Hospital, Vancouver

Gastroesophageal reflux (GER) is common in neurologically impaired (NI) children after gastrostomy insertion. We compared the incidence of GER and complications after Stamm vs. percutaneous endoscopic gastrostomy (PEG).

We reviewed 63 NI children without GER who were referred for gastrostomy. The surgeon determined the choice of procedure; 33 had a Stamm and 30 had a PEG. Contraindications to PEG included: concomitant pyloroplasty or Ladd procedure (5), request for a Button (R)(6), and severe scoliosis (3). The smallest baby having a PEG was 3.8 kg.

Minor complications occurred in 30%. No PEGs had major complications and 43% were done as outpatients. Three major complications followed Stamm gastrostomy: one patient bled from the stomach and 2 died of seizures or pneumonia. Sixty-one patients were followed for an average of 23 months. GER was graded clinically as A (absent or mild) in 39%, B (moderate, requiring medication) in 34%, and C (severe, requiring surgery) in 26%. Antireflux procedure (15) or jejunostomy (1) was required after Stamm in 42% and after PEG in only 10% (p<0.02).

PEG had less major morbidity and a significantly lower incidence of severe GER requiring surgery than did Stamm gastrostomy. PEG may interfere less with the Angle of His and gastric motility than does Stamm. PEG is the procedure of choice for NI children without symptomatic GER who require a feeding gastrostomy.

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VASOACTIVE INTESTINAL POLYPEPTIDE (VIP) CAUSES RELAXATION OF THE PYLORIC SPHINCER IN THE RABBIT

Enrique Grisoni, Juan Deagustin, Satish Kalhan
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The smooth muscle of the pyloric sphincter has a high resting tone when compared with the rest of the gastrointestinal tract. VIP and VIP nerve endings have been found in high concentrations at the pyloric region in many animal species.

VIP (1200 ng/ml) was selectively infused in the rabbit’s gastric artery (six animals) at a rate ranging from 0.01 to 1 ml/min for periods of five minutes. VIP at 0.1 ml/min produced significant decrease in amplitude (55 ± 15%) p<0.001 and duration (29 ± 25%) p<0.001 of the peristaltic waves, measured at the pyloric region by intraluminal balloon pressure device and by electromyographic techniques. The maximal inhibition was obtained with infusion of VIP at a rate of 0.2 ml/min (240 ng) and 0.4 ml/min (480 ng).

The frequency of the pyloric contractions did not decrease significantly in response to VIP infusion. Prostagmine injection (0.25 mg) increased the basal amplitude 8.44 ± 5.5 mm to 38.6 ± 2.1 mm. VIP (0.4 ml/min) significantly decreased this high amplitude to 26 ± 6.1 mm (p<0.001) when infused by the same route.

This study suggests a role of VIP in the relaxation of the pyloric sphincter. The possible role in VIP in the pathophysiology of congenital pyloric stenosis where there is a lack of sphincteric relaxation needs further investigation.

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GLUCOSE UTILIZATION IN THE SURGICAL NEWBORN INFANT RECEIVING TOTAL PARENTERAL NUTRITION (TPN)

M.O. Jones, A. Pierro, P. Hammond, D.A. Lloyd
University of Liverpool, Liverpool, UNITED KINGDOM

Carbohydrate (CHO) is converted to fat when intake exceeds maximum oxidative capacity. The aim of this study was to determine in the stable surgical newborn infant: 1. the maximum oxidative threshold for I.V. glucose; 2. the thermogenic effect of glucose.

Fifteen metabolic studies were performed on 6 infants (weight: 2.4±0.2 kg; mean±SEM) receiving TPN containing constant amounts of amino acids (2g/kg/d) and fat (3g/kg/d) and different amounts of CHO (range: 10-25 g/kg/d). O₂ consumption, CO₂ production (VCO₂) (ml/kg/min), and resting energy expenditure (REE) (kcal/kg/d) were measured by indirect calorimetry. Urinary nitrogen excretion rate was measured and substrate utilization calculated from the nitrogen-free respiratory quotient (nf-RQ).

REE was 53.33±1.16 kcal/kg/d. When CHO intake exceeded 17 g/kg/d the nf-RQ was greater than 1.0 indicating CHO conversion to fat. CHO intake correlated linearly with nf-RQ (r=0.95; y=0.722+0.0157x; p<0.00001), VCO₂ (r=0.85; y=4.359+0.161x; p<0.0001) and REE (r=0.64; y=43.175+0.591x; p<0.01).

From these equations we calculate: 1. Maximum oxidative glucose capacity in infants receiving TPN is 17 g/kg/d. Above this level CHO is converted to fat and VCO₂ increases. 2. The thermogenic effect of I.V. glucose is 0.6 kcal/kg/d per gram of CHO intake.

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INVASIVE NECROTIZING CANDIDA INFECTION OF THE DUODENUM LEADING TO PERFORATION: A CASE REPORT

M. Neumeister, P. Fitzgerald, E. Mikhail, M. Giacomantonio
Izaak Walton Killam Children's Hospital, Halifax, Nova Scotia

Candida infection is a well recognized entity in the immunocompromised patient. Colonization of the GI tract and subsequent mucosal candidiasis is common, but invasion of the bowel wall with resultant transmural necrosis is quite rare.

A case is reported of a 10 year old male with acute lymphocytic leukemia who developed a necrotizing Candida infection of the duodenum which led to perforation. The patient underwent emergency laparotomy for peritonitis. Operative findings consisted of a large duodenal perforation, small isolated areas of jejunal necrosis, and pancolitis.

Pathologic analysis with PAS and GMS stains showed massive fungal proliferation in all layers of the duodenal wall. In addition, there were a large number of blastospheres (yeast cells with pseudohyphae) present in the duodenal wall. Specimens from the jejunum and colon showed minimal proliferation of Candida confined to the mucosa, with the mural injury appearing to be primarily ischemic in origin.

The pathophysiology and management of invasive Candida GI tract infections in the immunocompromised patient are discussed.

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19. Friday, 14:50-15:00; (C,R) (five minute paper, followed by five minute discussion of this and previous paper)

CAT-SCRATCH DISEASE: AN UNUSUAL PRESENTATION

B.J. Hancock, A. Ouimet,
Hopital Sainte-Justine, Montreal, Quebec

A 2 year old boy was referred for investigation of persistent mesenteric lymphadenopathy discovered 2 months earlier during investigation of a fever of unknown origin. He was asymptomatic and physical examination was unremarkable. Stool cultures and viral studies were negative. Abdominal ultrasound and CT scan revealed a mass measuring 6.0 by 5.5 cm composed of multiple adherent mesenteric lymph nodes. A gallium scan showed abnormal and intense uptake of radiotracer in the mesenteric mass. A laparotomy for biopsy was undertaken to eliminate a lymphoma. At surgery, multiple, enlarged mesenteric lymph nodes with central caseating necrosis were excised. Cultures for tuberculosis, atypical mycobacterium, mycoses, toxoplasmosis, mononucleosis and yersinia enterocolitica were negative. Histology showed lymphoid follicles with germinal centres containing granulomas with multinucleated giant cells and central caseating necrosis. Gram, Grocott, PAS and Zhiel-Nelson stains were normal. A Warthin-Starry stain revealed structures resembling cat-scratch bacillus within the necrotic tissue. Cat-scratch disease is a well recognized cause of regional adenopathy in children and usually resolves without treatment. Intraabdominal involvement, consisting of hepatic and splenic lesions has been reported. Isolated mesenteric adenopathy is an unusual presentation of this disease but should be included in the differential diagnosis of intraabdominal lymphadenopathy.

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1500-1530 - Coffee following this paper
THORACOSCOPY IN THE MANAGEMENT OF EMPIEMA IN CHILDREN

John A. Kern, Bradley M. Rodgers
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Many Pediatric Surgeons advocate early open drainage or decortication for children with acute empyema. Unfortunately, such procedures can be associated with significant morbidity. Since 1981, we have employed early thoracoscopic adhesiolysis and pleural debridement as an alternative to open thoracotomy in 9 children with acute empyema. Results: The average age was 7.8 ± 1.8 years (range 2-16). All patients had received broad spectrum antibiotics and 6 had had one or more chest tubes placed preoperatively as an initial attempt at therapy. All procedures were performed under general anesthesia. Following thoracoscopy, 8 of the 9 patients were managed with a single chest tube and the average duration of tube drainage was 8.3 ± 1.4 days. One patient required a second chest tube and ultimately died of underlying leukemia. (Leukemic infiltrates of the lung were diagnosed by thoracoscopic biopsy in this patient.) Of the 8 patients who recovered, all did so quickly with an average postoperative stay of 13.3 ± 3 days. No complications resulted from the thorascopies and there was no need for further surgical intervention in any of the patients. Conclusions: Thoracoscopy allows for minimally invasive, yet effective treatment of acute empyema with loculated collections. Thoracoscopic visualization of the pleural cavity permits efficient debridement, thorough adhesiolysis, and optimal placement of drainage tubes. Since we have begun using early thoracoscopy in the treatment of pediatric empyema, open drainage or decortication has not been required in any of our patients. Thoracoscopy is a useful adjunct in the treatment of empyema in children and its early application can eliminate the need for open decortication.

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CHILDHOOD PRIMARY PULMONARY NEOPLASMS

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Nine children were diagnosed with primary endobronchial or pulmonary parenchymal neoplasms within the past 10 years. Six were male and 3 female. The average age at diagnosis was 9 years and ranged from 1 month to 15 years. The presenting complaints included cough (7), temperature (5), pulmonary infection (3), respiratory distress (3), weight loss (2), pain (2) and hemoptysis (1). Pulmonary x-ray showed persistent atelectasis, pneumonic infiltrates, hyperinflation or mass lesions. CT scan was performed in 7. Bronchoscopy with biopsy was performed in 5 out of 6 endobronchial tumors. Thoracotomy and pulmonary resection were performed in 7 cases and laser resection in 2. The time from the onset of symptoms until surgical resection ranged from 1 month to 1 year. Seven lesions were on the left and 2 on the right. The pathologic diagnosis was bronchial carcinoid (3) bronchial plasma cell granuloma (2), bronchial mucoepidermoid carcinoma (1), plasma cell granuloma of the lung parenchyma (1), fibrosarcoma (1) and rhabdomyosarcoma (1). Postoperative chemotherapy was given only to the patient with pulmonary rhabdomyosarcoma. This child died; 8 children are alive and free of disease at an average follow-up of 2.4 years. Pulmonary neoplasms are unusual in the pediatric age group and represent a wide spectrum of pathology. Early investigation and surgical intervention are essential in children with persistent pulmonary symptoms or x-ray abnormalities. The prognosis is excellent with complete surgical resection even though the majority are malignant.

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STERNOCHONDROPLASTY FOR PECTUS DEFORMITIES

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Eighty-two children underwent sternochondroplasty for pectus carinatum (46) and pectus excavatum (36). 61 were male and 21 female. Eight patients had an associated syndrome: Marfan (4), Poland (1), Curarino-Silverman (1), Prune-belly (1) and neurofibromatosis (1). Symptoms of chest pain or shortness of breath were present in 26%. The average age at presentation was 14 years for carinatum deformities and 8.8 years for excavatum deformities. Patients were evaluated with chest X-ray in 91% and CT scan in 90%. Of those patients who underwent pulmonary function tests, 14% showed a restrictive defect; of those undergoing electrocardiogram, 14.8% had a right bundle branch block. The average age at surgery was 14.6 years and 9.6 years for carinatum and excavatum deformities, respectively. The average number of cartilages removed was 5. Fifty percent of patients underwent sternal osteotomy and 43% had a prostheses or bone graft. Complications occurred in 38% of patients: 41% of complications were local wound and 38.5% pulmonary. Serious complications occurred in 3 patients and included osteomyelitis, necrosis of the skin flaps requiring surgical debridement and displacement of the prosthesis causing hemorrhagic shock. Minor recurrences were documented in 4.9%. The prosthesis was removed at an average of 11.5 months postoperatively. Complications (11.5%) included pneumothorax, wound infection and inability to remove the prosthesis. The average hospital stay for surgery was 7.6 days. Follow-up averaged 4.7 years. Results were recorded as poor in 2.4%, good in 47.6%, very good in 19.5% and excellent in 30.5%. Sternochondroplasty, an operation primarily performed for cosmetic reasons, produces gratifying results in the majority of cases. However, the significant incidence of complications must be considered when evaluating patients for surgery.

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98% = Good to Excellent

CARIN. PRESENT. 3 OZ

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Average 5% of cart

39% dr. and/or

15% recurrence + 3 mo
OPTIMAL MANAGEMENT OF PATENT DUCTUS ARTERIOSUS (PDA) IN THE LESS THAN 800 GRAM NEONATE

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McMaster University, Hamilton

Standard therapy for PDA includes fluid restriction, diuretics, and indomethacin, with surgical ligation reserved for medical failures. Over a three year period, 132 neonates < 800 gms were admitted to our Neonatal ICU. Of the 76 who survived initial resuscitation, 42 had developed a hemodynamically significant PDA (mean ± SD): gest. age 25.3 ± 1.9 wks, B Wt. 650 ± 93 gms. Two infants were referred for primary surgical ligation because of contraindications to indomethacin. Forty infants were initially treated with indomethacin. Seventeen of 40 (43%) were subsequently referred for surgical ligation because of indomethacin failure. Infants requiring surgical duct closure were a lower gestational age (24.6 ± 1.3 vs 25.7 ± 2.0 wks, p = 0.049) and had a greater left atrial-aortic (LA/Ao) ratio on echocardiography (1.71 ± 0.28 vs 1.46 ± 0.26, p = 0.04), compared with those treated successfully with indomethacin.

There were 6 deaths (15%), all of which occurred in infants receiving indomethacin (5 indomethacin alone, 1 indomethacin + ligation). Indomethacin was directly associated with intestinal perforation in 3 patients, and acute renal failure in 1; all 4 died. Surgery was associated with minimal morbidity (intraoperative transfusion in 1, postoperative pneumothorax requiring chest tube in 1).

These data suggest that in the extremely premature neonate with a hemodynamically significant PDA: 1. Indomethacin therapy is associated with a high failure rate and significant complications. 2. PDA associated with a large LA/Ao ratio is unlikely to close with indomethacin therapy. 3. Surgical duct closure is associated with minimal morbidity. We conclude that primary surgical ligation may provide the optimal management for PDA in carefully selected patients.

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GIANT HYDATID LUNG CYSTS IN THE CANADIAN NORTHWEST: OUTCOME OF CONSERVATIVE TREATMENT IN 3 CHILDREN

B.C. Children's Hospital, Vancouver

Hydatid lung disease due to *Echinococcus granulosus* in the Canadian northwest and Alaska is often asymptomatic and usually benign. We reviewed the course and outcome of 3 children with giant hydatid lung cysts seen over a 2 year period.

All were North American Indian children aged 9 to 12 years who presented with cough, fever, and chest pain. One had a rash. There was a history of exposure to domestic dogs who had been fed moose entrails in each case. Chest X-rays showed solitary lung cysts with air-fluid levels, from 6 cm to 12 cm in diameter. Aspiration of each cyst demonstrated *Echinococcus* hooklets and protoscolices. Serology was unhelpful, being negative in 2 cases.

Transient pneumonitis and pneumothorax were seen as complications of needle aspiration. Two cysts gradually resolved over the following 6 months. One child returned after 9 months with a lung abscess due to superimposed infection of the cyst remnant with *H. influenzae*, and eventually required lobectomy.

The existence of an endemic benign variant of *E. granulosus* in Canada is not widely known, and it is important to distinguish it from the more aggressive pastoral form of the disease seen in immigrants from sheep-rearing countries. The native Canadian disease usually resolves spontaneously, does not cause anaphylaxis, and does not implant daughter cysts if spilled. Surgical treatment should be avoided except for complications such as secondary bacterial infection.

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THORACOSCOPIC RESECTION OF
APICAL BULLOUS EMPHYSEMA IN A CHILD

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An 11 year old girl with marfanoid features presented with a recurrent right tension pneumothorax. Although the 1st episode (2 months earlier) responded to tube thoracostomy, there was no decrease in the large air leak following 3 days of suction.

Under general anesthesia, a small incision was made in the 7th intercostal space (ICS), mid axillary line (MAL), 2 interspaces below the previous chest tube placement site. A 5 mm cannula was inserted for the 0 degree telescope. The visualization of the entire right chest cavity was excellent. The apical area containing the bullae was 6 x 3 cm and had a distinct, yellowish-green, irregular appearance. The 2nd incision was made over the 2nd ICS in the MAL. A 10 mm cannula was placed under direct visualization. An endoscopic Babcock was inserted through this cannula and the lower portion of the bullous segment grasped and elevated. The 3rd cannula (12mm) was placed throughout the previous chest tube site. The Endo Gia™ was inserted and the opened prongs easily placed between the pathologic segment and the healthy right upper lobe. Four 30 mm cartridges were applied, completely resecting the diseased segment, and sealing the remaining healthy lung. The operative procedure was completed in less than 30 minutes. The chest tube was removed after 24 hours and she was discharged asymptomatic the day thereafter. Follow-up chest X-ray 1 month later showed a fine staple line conforming to the contour of the right pleural cupola.

This child demonstrates that intracavitary resection of peripheral pulmonary lesions using minimally invasive videoscopic techniques, can be performed safely and effectively.

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PENTOXYFYLLINE IMPROVES RESTING MEMBRANE POTENTIAL IN SEPSIS

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N. IRELAND

Our aims were to establish if Pentoxyfylline (PTF) would improve skeletal muscle resting membrane potential (RMP) during sepsis.

72 female Wistar rats (220-280 grams) were divided into 3 groups. A. Caecal ligation and puncture (CL&P) B. 20 mg/kg body weight PTF given intraperitoneally (ip) 1 hour prior to CL&P. C. 20 mg/kg body weight PTF given ip 1 hour after CL&P. Membrane potential was measured at 6, 12 and 18 hours post CL&P, via a glass ultra microelectrode inserted into the thigh muscle.

RMP in millivolts. Mean (± standard error) Two way test

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<th>A</th>
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<tr>
<td>6 hours</td>
<td>-81.5(0.49)</td>
<td>-82.8(0.28)</td>
<td>-81.60(1.19)</td>
<td>NS</td>
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<tr>
<td>12 hours</td>
<td>-77.8(0.87)</td>
<td>-81.6(1.83)</td>
<td>-80.98(1.88)</td>
<td>NS</td>
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<tr>
<td>18 hours</td>
<td>-76.2(1.12)</td>
<td>-76.7(2.21)</td>
<td>-87.76(2.21)</td>
<td>p&lt;0.001</td>
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With increasing sepsis there is a significant decrease in the RMP in the CL&P group (P<0.01). There was a significant increase in RMP when PTF was given after CL&P (p<0.0003) at 18 hours. There was no significant difference when given prior to CL&P.

Pentoxyfylline normalizes the RMP in sepsis in an animal model. PTF may be of clinical use in established sepsis.

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NON-OPERATIVE MANAGEMENT OF POST-APPENDECTOMY INTRA-ABDOMINAL ABSCESES

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Perforated appendicitis has been associated with a high incidence of infectious complications. Standard post-operative care includes broad spectrum antibiotics and drainage of abscesses. This report reviews a sixteen year experience from two paediatric centres where predominantly non-operative treatment of post-appendectomy intra-abdominal abscesses was utilized.

A retrospective chart review from 1975-1990, inclusive, at the Children's Hospital of Eastern Ontario, Ottawa, Ontario and the Izaak Walton Killam Hospital for Children, Halifax, revealed 1192 children with perforated appendicitis. Eighty-four children developed a total of 90 intra-abdominal abscesses which were pelvic (65), right lower quadrant (8), subhepatic (5), subphrenic (4), left lower quadrant (4), interloop (2), perinephric (1), and right side of the abdomen (1). Seventy abscesses in 67 children were successfully managed non-operatively with 17 draining spontaneously via the rectum (11), wound (4), or vagina (2). Twenty intra-abdominal abscesses in 17 children were either operatively (18) or percutaneously (2) drained. Children with multiple abscesses (3 of 6), and those with subphrenic abscesses (3 of 4) were more likely to undergo a drainage procedure.

Non-operative management of post-appendectomy intra-abdominal abscesses with broad spectrum antibiotics is safe and successful in the majority of cases.

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COLONIC ATRESIA: A RARE CASE OF NEONATAL BOWEL OBSTRUCTION

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Colonic atresias are rare and present in various forms depending on their location. Membranous atresias (type I) are almost exclusively found in the distal colon, while the proximal colon is usually affected by atresias with or without intestinal continuity (types II and III, respectively). We present five additional cases of neonatal bowel obstruction caused by colonic atresias: 3 membranous and 2 type II atresias.

The first patient with an isolated cecal membrane underwent an ileocaecal resection with primary anastomosis and had an uneventful postoperative course. This is to our knowledge the third case of a caecal diaphragm described. The second infant presented with small bowel obstruction and had multiple intestinal webs (1 jejunal, 1 at the splenic flexure and another in the descending colon) and 2 type III small bowel atresias. Treatment involved resection of the small bowel atresias with Bishop-Koop anastomosis, double-barrel descending colostomy and jejunal web excision. The infant had a prolonged ileus but recovered uneventfully, and both stomas were eventually closed. A third patient had a sigmoid membrane initially managed by colostomy, followed by Bishop-Koop anastomosis; recovery was uneventful. The fourth and fifth cases involved type II atresias of the sigmoid and the transverse colon. One was associated with a small bowel atresia and presented as small bowel obstruction after repair of gastrochisis. Both patients underwent resection with Bishop-Koop anastomosis, and had uncomplicated postoperative courses.

Colonic atresias can be managed by staged or primary resection with anastomosis. We believe that the Bishop-Koop type anastomosis is the most appropriate staged procedure for distal colonic lesions. A thorough search for associated atresias is essential.

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ENTERIC SCHISTOSOMIASIS PRESENTING AS PSEUDO-OBSTRUCTION: 
A CASE REPORT

R. Rudston-Brown, B.H. Cameron, J.J. Murphy, G.K. Blair, J.E. Dimmick 
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An 11 year old boy born in Malawi presented with subacute severe 
intestinal obstruction simulating chronic Hirschsprung’s Disease. 
Schistosomiasis was diagnosed on rectal mucosal biopsy. The colon was 
decompressed and irrigated at laparotomy, with a temporary cecostomy left 
postoperatively. After 4 months he remains on a laxative regimen because 
of ongoing dysmotility. The megacolon is resolving.

Intestinal schistosomiasis causes chronic submucosal fibrosis. It 
can present with pseudoobstruction, stricture, polyps, or appendicitis. 
Disease may involve multiple organs including the urinary system and liver. 
Treatment with praziquantel will eliminate the adult worms. Surgical 
intervention is rarely indicated but may be necessary for stricture or 
secondary malignancy.

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A CASE OF BOWEL OBSTRUCTION IN A PATIENT WITH KAWASAKI'S DISEASE

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Kawasaki's disease is a syndrome characterized by multiple organ system inflammation and a diffuse arteritis. Abdominal complications most commonly involve the gallbladder, although necrosis of the liver, duodenum, and jejunum have been described. Prolonged ileus is also being well described in association with the acute phase of Kawasaki's disease but acute bowel obstruction has rarely been reported. We describe the case of a one year old girl who presented with a febrile illness which was diagnosed as Kawasaki's disease. Coronary artery dilatation was demonstrated by echocardiography. She was initially treated with gamma globulin and aspirin and had a prompt resolution of her acute illness. Four weeks later she was readmitted to hospital because of persistent vomiting and an upper GI performed at that time demonstrated an incomplete obstruction of the jejunum. She was initially treated with nasogastric drainage and hyperalimentation and at the end of one week her contrast study was repeated and this demonstrated a nearly complete obstruction of her jejunum. A laparotomy was performed and she was found to be completely obstructed at the level of the jejunum due to an isolated segmental stricture. A segmental resection and jejuno-jejunoanastomosis was performed. Her subsequent postoperative course was uncomplicated and she was discharged seven days following surgery. Pathological examination of the resected specimen confirmed complete luminal obstruction with a proliferation of granulation tissue, findings compatible with ischemic enteritis. Previous reports have suggested that functional obstruction of the small intestine secondary to paralytic ileus is common in Kawasaki's disease, but that true luminal obstruction is rare. We were able to find only one previous report of a true luminal bowel obstruction occurring in a patient with Kawasaki's disease. In summary we present the case of a one year old girl with Kawasaki's disease who developed an acute mechanical small bowel obstruction. Ischemic injury to the intestine causing bowel obstruction should be considered an important and potentially serious complication of Kawasaki's disease.

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PURE ESOPHAGEAL ATRESIA: OUTLOOK IN THE 1990’s

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Eleven newborns with pure esophageal atresia (EA) were treated between 1980 and 1989 inclusive; there were six girls and five boys. Their gestational age ranged from 31 to 40 weeks (average 37) and weight from 1.1 to 3.0 kg (average 2.2). The only associated anomalies were Down’s Syndrome and RDS. All babies received an immediate gastrostomy. After a wait of one to seven months (average 3 1/2) a primary anastomosis was attempted. The weight of the babies at least doubled during this time. Several radiologic studies were done to see if the distance between the two esophageal pouches was decreasing. Dilatations of the upper pouch were carried out in one patient. Eight neonates had a primary repair (one was aided by a circular myotomy). Two had a staged gastric tube constructed and one of the babies had a gastric pullup procedure. Three of the infants with a primary anastomosis required a subsequent antireflux operation, and one needed her anastomosis resected 15 months later. Ten of these 11 newborns are alive and well; one of the gastric tube children died from an adhesive small bowel obstruction at age four years. We concluded that (1) newborns who have a pure esophageal atresia occur at a ratio of one to every 15 neonates with the common type of esophageal atresia and distal tracheo-esophageal fistula; (2) there are few associated congenital defects; (3) primary repair is successful in three quarters of such infants if the wait is past three months and/or the newborn weight is at least doubled; (4) one third of the primary repair babies will require antireflux surgery within three months of the primary anastomosis; (5) survival rate is over 90%.

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ETHICAL DILEMMAS:
HOW DO WE DEAL WITH THE ANIMAL RIGHTS ACTIVISTS?

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The aggressive militancy of many animal rights groups is causing great concern among biomedical researchers. Pediatric surgeons are greatly affected, since many life-saving procedures for congenital anomalies have been developed in animal models that cannot be replaced by other means. Investigators have been physically threatened, laboratories vandalized and valuable data destroyed. The proliferation of animal rights groups such as the "Animal Liberation Front - ALF" and "People for the Ethical Treatment of Animal - PETA" have prompted the birth of pro-research organizations such as the "Foundation for Biomedical Research" and the "Incurably ill For Animal Research - iIFAR". PETA has stated that "animals are the moral equivalent of human beings and any differentiation between people and animals is species-ism, as unethical as racism". This situation has created many dilemmas for the pediatric surgeon involved in basic animal research: is it worth taking personal risks to develop new techniques? Is it ethical to allow these fears to hinder progress in surgery? Should we do away with animal research entirely and test new techniques directly on children? Would that be ethical? The result of all this activity is an extraordinary amount of time and expense devoted to cover the cost of new regulations and laboratory security (estimated at US $ 1.5 billion for 1990). These resources must come from research budgets. These issues, the current status of organizations both for and against animal research will be discussed and opinions from the audience will be actively sought in this presentation.

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THE ROLE OF A PAIN MANAGEMENT TEAM IN A CHILDREN'S HOSPITAL

Roberta E. Sonnino, Sally A. Lambert
Rainbow Babies and Children's Hospital, Cleveland, Ohio

The management of pain in the hospital and outpatient setting has become the subject of much debate, prompting federal guidelines in the USA to mandate improved methods of pain control.

Our children's hospital has formed a multidisciplinary team to meet the needs of children in pain. The "pain management team" is comprised of surgeons, anesthesiologists, pediatricians, psychologists, nurses, clinical pharmacologists, physical and occupational therapists and child life specialists. A member of each service represented in the team is available for consultation at all times. A team chairperson responds to all consults and begins assessment of the patient. The team then confers and suggests a treatment plan involving appropriate team members according to his or her specific area of expertise. In the first 3 months of activity, our team has received 20 consults. In all cases, a multidisciplinary assessment was made and a treatment plan initiated. All children had satisfactory pain control, as assessed either by the patients or their caregivers. The consults included oncology and post-surgical patients, children undergoing painful procedures and children with chronic pain.

We conclude from our early experience that a multidisciplinary pain management team is an effective tool to assist clinicians in providing pain control for their patients in a children's hospital and to educate hospital staff on the needs of children in pain. We strongly encourage other facilities to form similar teams in response to the specific needs of their local population.

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BILIARY ATRESIA BEGINS BEFORE BIRTH

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Although the specific etiology of biliary atresia is unknown, evidence is accumulating that biliary atresia is a dynamic disease process that begins before birth. The diagnosis of biliary atresia in the first week of life is unusual. Affected children usually present with jaundice after a preceding anicteric period. We present a term female infant who had jaundice after a preceding anicteric period. We present a term female infant who had jaundice and acholic stools at birth. Her direct/total bilirubin values peaked at 12.2/14.9. Ultrasonography and PIPIDA scan were consistent with biliary atresia, and liver biopsy performed on day 5 of life revealed perportal fibrosis and bile duct proliferation. Prompt surgical exploration revealed the classic findings of biliary atresia which were confirmed by pathologic analysis. A modified Kasai procedure using a biliary appendicoduodenostomy was performed, and the serum bilirubin returned to normal by three weeks of life.

Analysis of fetal gastrointestinal enzymes in amniotic fluid provides further insight into the temporal onset of biliary atresia. G-glutamyl transpeptidase (GGTP) is an enzyme synthesized in the liver and excreted into the bile. GGTP and other fetal intestinal enzymes are passed from the GI tract into amniotic fluid in high levels between weeks 14 and 24 of gestation due to normal fetal defecation prior to 24 weeks gestation. Muller has analyzed amniocentesis fluid in 10,000 cases and has shown that only three fetuses had very low GGTP values (first percentile) at 18-20 weeks gestation, consistent with in utero biliary obstruction. All three babies were found to have biliary atresia after birth. These findings coupled with our case report suggest that biliary atresia involves gradual biliary occlusion that begins weeks before birth.

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FETAL TUMORS: THE ROLE OF THE PEDIATRIC SURGEON

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Fetal tumors are being diagnosed with increasing frequency and accuracy by ultrasonography. High output cardiac failure and hydrops indicate fetal distress. Management may be limited by the gestational age of the fetus. Our experience with three fetal tumors demonstrates the dilemma with respect to timing of delivery and prognosis. Following the diagnosis of a large sacrococcygeal teratoma, a 22-week gestation fetus became hydropic and died. A rapidly growing posterolateral chest wall mass necessitated a Cesarian section delivery at 29 weeks gestation. Post-natal course was complicated by pulmonary hypoplasia, tumor hemorrhage and death. The third fetus had an enlarging tumor in the right lobe of the liver. Poor biophysical profile and mild hydrops necessitated Cesarian section delivery at 34 weeks. Right hepatic lobotomy was performed and the infant was subsequently discharged home at 1 month of age. These three pregnancies demonstrate the wide spectrum of fetal tumors that present at various gestational ages and the different decisions for the perinatal team. The deleterious effect of the fetal tumor and the need for its removal have to be carefully weighed against the agility of the fetus to survive post-natally.

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1000-1030 Coffee follows this paper

- Hydrops + placental edema
  - Lung maturity = key to early delivery
  - If ↑↑ almost as fetus surgery
INTUSSUSCEPTION: TOWARD LESS SURGERY?

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Hospital for Sick Children, Toronto

By the 1950's, several large centers had adopted hydrostatic reduction with barium under fluoroscopic control as the treatment method of choice and adopted rigid criteria for management. One criterion was that if free reflux of barium into the terminal ileum did not occur, the ileocolic intussusception had not been reduced and the infant or child was taken straight to the operating room for laparotomy and surgical treatment. However, 10% of such intussusceptions were found to have spontaneously reduced. Needless to say, non-operative management reduces morbidity and shortens hospitalization. From October 1985 to March 1991 inclusive, 503 air contrast colon studies for suspected intussusception were performed on infants and children aged two days to 13 years (average 16.8 months): 262 (52%) were normal, 241 had an intussusception of which 196 (81%) were reduced and 45 were not reduced; the latter were operated on. In three patients (four months to two years) the air enema reduced the intussusception from the colon without terminal ileal filling but they all became immediately asymptomatic. For this reason they were not operated on, were admitted to hospital and observed for 24-48 hours. Two of these three had recurrence of their abdominal pain the next morning, but repeat air enemas were all normal. This experience suggests that surgery can possibly be avoided in infants and children whose ileocolic intussusception is reduced from the colon without terminal ileum filling but who experience immediate relief of their symptoms. Diligent clinical observation is mandatory.

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INDICATIONS FOR LAPAROTOMY AFTER HYDROSTATIC REDUCTION FOR INTUSSUSCEPTION

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A criterion for successful hydrostatic reduction of intussusception is reflux into the terminal ileum (TI). In our hospital absence of reflux into the TI in the presence of "oedema of the ileo-cecal valve" (OICV) is not an indication for laparotomy. The aim of this study is to validate our approach.

We reviewed the case notes of patients with intussusception (n=84; age 12.8±1.9 months; mean ± SEM) treated from 1987 to 1991. Nine required laparotomy for peritonitis. Seventy-five patients who had a contrast enema were studied. OICV was defined as persistent filling defect in the caecum after hydrostatic reduction.

In 45 patients hydrostatic reduction was successful: 35 (78%) had reflux of contrast into the TI (Group A), 10 (22%) had OICV and no reflux into the TI (Group B). All recovered after the enema without further treatment. In 30 patients hydrostatic reduction was unsuccessful and operation was required for manual reduction or bowel resection (Group C). No differences were observed between the 3 groups for age, duration of symptoms or recurrence rate.

We conclude that: 1. OICV and absence of reflux into the TI is not an indication for laparotomy if the clinical condition of the child improves after hydrostatic reduction. 2. This approach does not increase morbidity and mortality from intussusception and avoids an unnecessary laparotomy in 13% of children.

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MALIGNANT BENIGN NEONATAL SACROCCOCGYEAL TERATOMA

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Twenty-eight patients with benign neonatal sacrococcygeal teratoma (SCT) were treated in our medical center from 1972 to 1990. Mean gestational age was 38.6±3.3 weeks, with a mean birth weight of 3484.5 ± 938.5 gm. Twenty-five patients (89%) were females. The majority of the tumours (75%) contained cystic components and 96% were Altman classification I and II. The initial surgical removal of the SCT (including the coccyx) was carried out during the first seven days of life. Six patients (23%) developed recurrence of the tumour. Three were benign and reappeared locally after 12±3 months and were re-excised. The mean serum alphafetoprotein level in this group was 13±1 g/L. The malignant recurrences (all originally reported as being histologically benign) appeared at 20.3±1.5 months and had markedly elevated serum alphafetoprotein levels (7320±4630 g/L). All the patients in this group had multimodal therapy including complete excision of the recurrences.

We conclude that SCT, although histologically benign, has an alarming potential to recur either as a benign or malignant tumor during the first two years of life. Close follow-up for at least three years (frequent examination, serum alphafetoprotein and diagnostic imaging) is recommended for all patients who had undergone excision of SCT in the newborn period.

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MEDIASTINAL TERATOMAS - REVIEW OF 15 PAEDIATRIC CASES

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153 children with a teratoma presented at one hospital between 1970 and March 1992; and of these, 15 had a mediastinal tumour. There were 6 boys and 9 girls. Six were newborn and 9 aged from infancy to 13 years. Thirteen patients presented with respiratory symptoms or distress, and 15 had a mass on chest radiograph, only 1 demonstrating calcification. Ultrasound, echocardiogram, barium swallow and CT scan were other modalities of investigation. Six tumours were in the anterior mediastinum, 6 in the right chest, 1 left chest, 1 pericardial and 1 intra-cardiac (left ventricle). A definitive diagnosis of a teratoma was not made pre-operatively in any of these patients. At operation, a median sternotomy was used to approach the 7 anterior tumours, and a lateral thoracotomy performed in the other 8 patients. Histologically, 2 tumours were mature, 10 had immature elements and 3 were malignant teratomas. All 3 of the patients with malignant teratomas received chemotherapy, but died within 6 months of diagnosis.

The 6 neonates all had immature teratomas. Raised serum alpha protein levels proved useful markers in 2 patients with recurrent tumors.

Three conclusions are drawn: (i) mediastinal teratomas are rare in children and frequently not diagnosed before operation. (ii) in neonates these tumours may be immature. (iii) a median sternotomy gives excellent exposure for anterior mediastinal tumours.

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CYSTIC ADRENAL MASS IN A NEWBORN, WHEN TO OPERATE?
A CASE REPORT

S. Leclerc, A. L. Bensoussan
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Adrenal hemorrhage is not an uncommon diagnosis in the neonatal period and conservative management is advocated. Surgery is indicated only for patients with uncontrollable hemorrhage. Adrenal neuroblastoma is not often found in the neonatal period and most of the time presents as a solid or mixed (solid-cystic) mass. Rarely the adrenal neuroblastoma is presenting as a cystic mass in the left flank. We report the case of a female newborn referred at 4 days of age for a cystic mass in the left flank. The 3.7 kg baby was born at 41 weeks of gestation by vaginal delivery without complication. A diagnosis of adrenal hemorrhage was made and the patient was followed for 6 weeks with CT-scan and repeated abdominal ultrasound. A laparotomy was done at 8 weeks of age because of persistence of the mass during the follow-up period. A left adrenalectomy was done and a diagnosis of ganglioneuroblastoma was made. Bone marrow biopsy revealed the presence of metastatic cells in the aspirate. This case is brought for discussion of the management of a cystic adrenal mass found in the neonatal period.

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MASSIVE OVARIAN EDEMA IN THE PEDIATRIC PATIENT:
A RARE SOLID TUMOR

Kurt F. Heiss, Gerald T. Zwirn, Kevin Winn
Egleston Children's Hospital, Atlanta, Georgia

Solid ovarian masses in children are considered malignant until proven otherwise, with presentation at a younger age carrying increased risk of malignancy. We report 2 cases of an unusual, benign, solid ovarian tumor found on ultrasound for evaluation of acute abdominal pain. Both patients were found to have a torsed, non-viable ovary at the time of laparotomy. Patient #1 was a virilized, menarchal 11 year old, whose tumor had acquired massive proportions (10 x 7 x 16 cm). Pre-operative testing of HCG, Alpha-fetoprotein, FSH, and LH were normal and testosterone was mildly elevated. After salpingo-oophorectomy, ovarian tumor staging was done, including peritoneal washings, and biopsy of the contralateral ovary and the omentum, which were all normal. Patient #2 was a premenarchal 10 year old who had undergone a lengthy evaluation for intermittent chronic abdominal pain, diagnosed as constipation. Ultrasound showed a 9 x 5 ovarian mass, which was removed by oophorectomy. Final pathology for both was massive ovarian edema, a rare, stromal, virilizing tumor caused by chronic venous and lymphatic obstruction. Contralateral oophoropexy is a controversial treatment for the remaining ovary. A review of the literature regarding this uncommon tumor is given.

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ANORECTAL FUNCTION AND QUALITY OF LIFE IN ADULT PATIENTS WITH AN OPERATED SACROCOCCYGEAL TERATOMA

R. Rintala, P. Lahdenne, H. Lindahl, M. Heikinheimo
Children's Hospital, University of Helsinki, FINLAND

Fecal continence and quality of life were evaluated by a questionnaire in 26 adult patients (mean age 30 years; 6 males, 20 females) who underwent surgery for a benign sacrococcygeal teratoma between 1947 and 1973. Twenty-two patients were operated neonatally and 4 later during the first year of life. The fecal continence was assessed by a score described by Holschneider. Twenty-six healthy people with a similar age and sex distribution were used as controls.

All controls had good fecal continence, 77% with completely normal bowel habits. The aberrations in anorectal function of the 23% of the controls were minor, such as constipation or fecal urgency. Good fecal continence was reported by 88% of the patients, however, only 27% had completely normal bowel habits. Frank fecal soiling was present in 27% of the patients. No correlation between the severity of aberrations in anorectal functions and the type of the tumor (degree of intrapelvic extension) was found in the present series.

Social problems related to deficient anorectal function were reported by 27% of the patients. Other health problems including urinary incontinence (19%) were reported by 50% of the patients. None of the controls had social problems related to bowel function, 4% of them reported other health problems. The present study shows that at the adult age, a significant proportion of patients who have undergone surgery for sacrococcygeal teratoma suffer from deficient anorectal function and a diminished quality of life.

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NEUROBLASTOMA: PRENATAL ULTRASOUND DIAGNOSIS AND NATURAL HISTORY

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University of California, San Francisco

Neuroblastoma is a devastating childhood tumor, and early detection is critical to improve outcome. We present five fetal neuroblastomas detected by routine prenatal sonography. All were adrenal tumors (Evans stages I or II) diagnosed between 26 and 39 weeks gestation. All tumors were completely resected postnatally and the patients have remained disease free.

We also found 16 other cases of fetal neuroblastoma detected by sonography between 29 and 38 weeks gestation. These cases included 1 cervical, 1 thoracic, and 14 adrenal tumors. Thirteen neonates had Evans stage I or II disease, and three had advanced disease. Eleven mothers had pregnancies without hypertension or preeclampsia, and all of these had neonates with stage I or II disease. Four mothers had hypertension or preeclampsia. Three of these neonates had stage IV or IVs disease with liver metastases, and all three had fetal hydrops.

Review of the congenital neuroblastoma literature revealed 47 cases diagnosed soon after birth. There were 11 stillbirths and 31 neonatal deaths, with two additional deaths at 19 and 21 months - all had widely disseminated disease. Three neonates survived - two had stage IV disease and one had a localized superior mediastinum tumor. Eight of the tumors metastasized to the placenta, and 1 metastasized to the umbilical cord with subsequent fetal demise.

Prenatal sonography can diagnose fetal neuroblastoma, although accurate staging is difficult. Mothers with no hypertension or preeclampsia have a small chance of widely disseminated disease. Fetal hydrops may reliably indicate advanced disease. The sonographic detection of fetal neuroblastoma may allow for carefully planned delivery to maximize survival.

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1215 - 2:30 BUSINESS MEETING/LUNCHEON for CAPS members follows this paper.
ALLOPURINOL PROTECTS THE BOWEL FROM NECROSIS CAUSED BY INDOMETHACIN AND TEMPORARY INTESTINAL ISCHEMIA IN MICE

I. H. Krasna, R. T. Lee
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The present study was undertaken to evaluate if allopurinol administration protects mice from bowel necrosis caused by temporary intestinal ischemia followed by indomethacin (INDO). We have previously reported that ischemia (15 minute occlusion of superior mesenteric vessels) followed by IV INDO caused significant bowel necrosis in CD-1 mice. Ischemia or INDO alone did not cause necrosis. To investigate protective measures against necrosis, we used CD-1 mice, 25-30 gm. Forty-four animals were gavage fed 1 cc water for 7 days and 32 animals were gavage fed 10 mg/Kg allopurinol for 7 days. On the seventh day all animals were anesthetized and the superior mesenteric vessels occluded for 15-20 minutes, followed by IV INDO (0.5 mg/Kg) once daily for 3 days. Animals who died were examined for bowel necrosis and all animals were sacrificed 7 days after surgery and necropsied. Of the 44 saline-fed animals, 12 developed bowel necrosis (27%). Of the 32 allopurinol-fed animals, 1 developed necrosis (3%). The result of Fisher’s Exact Two-Tailed Test was p = .006.

Pretreatment with oral allopurinol significantly protects the mice from developing bowel necrosis when the mesenteric vessels are temporarily occluded and INDO is administered. Allopurinol may prevent reperfusion injury by inhibiting formation of xanthine oxidase generated, oxygen-derived free radicals and may be valuable in pretreating premature infants with PDA who have had an ischemic episode in who INDO use is contemplated.

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CHRONIC ESOPHAGITIS AND GASTRIC METAPLASIA ARE FREQUENT LATE COMPLICATIONS OF ESOPHAGEAL ATRESIA

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During 1981 - 1985, 55 patients with esophageal atresia underwent esophageal anastomosis. Early and late mortality accounted for 12 patients, all belonging to Waterston's risk group C, which left 43 patients for long-term follow-up. Long-term follow-up examination with esophagogastrroduodenoscopy was performed on 38 patients 2 - 11, (mean 7.4) years after the anastomotic operation. Nine of these patients had undergone fundoplication for gastroesophageal reflux. The subjective results at the last follow-up were as follows: Excellent in 24, good in 10 and fair in 4 patients. The endoscopic findings were normal in 16 patients. Endoscopy of the remaining 22 patients showed esophagitis in 16, hiatal hernia in 10, and Barrett's esophagus in 5 patients. The fundoplication was totally or partially disrupted in 3 patients. Esophageal biopsies were obtained from 36 patients. The histological findings were as follows: esophagitis in 21, gastric metaplasia in 3, and normal esophageal mucosa in 12 patients. The endoscopic and histological findings correlated poorly with the subjective results. Fourteen of the 24 patients with excellent subjective results had esophagitis, and one had gastric metaplasia.

In conclusion, both endoscopical and histological pathological findings, some of which are potentially premalignant, are common in patients with operated esophageal atresia. Therefore, regardless of symptoms, long-term endoscopic follow-up is warranted in all esophageal atresia patients.

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TREATMENT OF INTRACTABLE SALIVARY ASPIRATION IN CHILDREN BY LARYNGOTRACHEAL SEPARATION WITH OR WITHOUT PROXIMAL TRACHEAL DIVERSION

Children's Hospital of Philadelphia and Walter Reed Army Medical Centre, Washington, DC

Chronic salivary aspiration in children is encountered in the setting of disordered swallowing mechanisms or impaired airway protective reflexes. While enteric tube feeding, correction of gastroesophageal reflux, and tracheostomy are usually ameliorative, a small percentage of children require more radical surgical intervention when salivary aspiration is intractable and life-threatening. Over a 13 year period, we have employed laryngotraceal separation in 19 patients with intractable salivary aspiration and pulmonary deterioration who failed more conventional medical and surgical therapies.

<table>
<thead>
<tr>
<th>PATIENT DIAGNOSIS</th>
<th>11</th>
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<tbody>
<tr>
<td>hypoxic encephalopathy</td>
<td>1</td>
</tr>
<tr>
<td>congenital myopathy</td>
<td>2</td>
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<tr>
<td>brainstem glioma</td>
<td>1</td>
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<tr>
<td>VATER syndrome</td>
<td>1</td>
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<tr>
<td>CNS vascular malformation</td>
<td>1</td>
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<tr>
<td>complicated esophageal atresia*</td>
<td>1</td>
</tr>
<tr>
<td>congenital cardiac disease</td>
<td>1</td>
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<tr>
<td>caustic ingestion*</td>
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In 4 patients, proximal tracheal diversion was also performed: 2 into the esophagus and 2 (*) into colonic esophageal replacement interposition grafts. The remaining patients had the stump of the proximal trachea oversewn. There were no major complications. All patients experienced stabilization or improvement of pulmonary function, and 5 of 9 ventilator dependent children were successfully weaned from mechanical support. This technique is safe, highly effective, and potentially reversible. This series represents the largest reported pediatric experience with this procedure.

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ENLARGEMENT OF THE ABDOMINAL CAVITY WITH A TISSUE-EXPANDER IN THE TREATMENT OF GIANT OMPHALOCELE

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A baby was born with a giant omphalocele without associated anomalies. It was clear that operative closure would be impossible but the baby remained ventilator dependent. It was thought that reduction of the omphalocele and closure of the defect would decrease the need for long-term ventilation but enlargement of the small abdominal cavity would be imperative. After informed consent and approval by the ethical committee a tissue expander was implanted into the lower abdomen at 21 days of age. The initial filling volume of 70 ml was daily increased with 10 to 20 ml up to the maximal filling volume of 250 ml which was achieved in 12 days. Decreasing diuresis and dilatation of the urinary tracts required partial emptying of the expander. Nineteen days after implantation, the omphalocele was reduced and the defect closed with skin. Weaning from the ventilator was completed in 4 days. Treatment in omphalocele should be tailored to the individual needs. Enlargement of the abdominal cavity with a tissue expander extends the therapeutic possibilities.

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SEQUENTIAL SAC LIGATION FOR GIANT OMPhALOCELE

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The Montreal Children's Hospital, Montreal

The management of the patient with a giant omphalocoele can be a difficult problem. We report our experience with 3 patients in which sequential sac ligation was used to achieve delayed primary repair.

Methods: After cleansing with dilute chlorhexidine, the sac was gently kneaded to release any adherent intestine or liver. Traction on the cord was applied and the contents were gently reduced. The sac was then twisted and ligated with sterile umbilical ties. The procedure was repeated every 24-48 hours until complete reduction was obtained. Desiccation between reductions was prevented with a moist gauze and occlusive dressing. Additional support for the sac was provided by suspending it. Infants were sedated with IV morphine prior to each reduction.

Results: Three patients have been treated in this fashion; two (2.6 & 3.1 kg) to complete closure and one (premature, 1.8 kg) currently being reduced. Primary fascial closure was achieved in the first two patients. Time between birth and closure for the first two was 7 days and 3 days. The third is not yet completely reduced after an interval of 16 days. The sac remained intact in all three cases and did not become infected. Two of the three patients required ventilatory support during the reduction process. Complications included one case of line sepsis and one patient who developed transient venous congestion after a vigorous reduction step. No injury to the intraabdominal contents occurred. There were no postoperative complications.

Our experience with this technique demonstrates that the sac is strong and allows aggressive reduction of the contents similar to that achieved with a silo. Dehiscence or rupture has not occurred. By allowing the membrane to remain intact, the risk of infection may actually be less. Sequential sac ligation should be considered in those patients in whom immediate closure is not possible.

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Selective Preterm Delivery for Prenatally Diagnosed Gastrochisis: Development of Objective Sonographic Criteria

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Preterm delivery has been recommended to prevent ongoing bowel damage in fetuses with gastrochisis. This study was designed to identify sonographic findings predictive for intestinal damage, and to develop objective parameters for selecting appropriate patients for preterm delivery.

Twenty four consecutive fetuses at two centers were assessed retrospectively or prospectively. Sonographic parameters were recorded and correlated with postnatal outcome. Stomach diameter, luminal or amniotic fluid debris, and bowel wall echogenicity were unrelated to outcome. Bowel thickness ≥ 4 mm was associated with longer time to oral feeds (34.9 ± 7 vs 25.4 ± 5 days) and higher bowel resection rate (40% vs 14%), but the differences were not statistically significant.

Bowel diameter ≥ 18 mm was associated with a significantly longer time to oral feeds (36.3 ± 6 vs 22.3 ± 5 days, p=0.04), and with greater need for resection (42% vs 8%, p=0.03). When gestational age was plotted against bowel diameter, a threshold line was generated above which 100% had prolonged hypoperistalsis and below which only 30% had prolonged hypoperistalsis (p<0.001).

Bowel dilatation is a useful prognostic indicator for prenatal bowel damage in fetuses with gastrochisis, especially late during fetal life, and may permit selection of appropriate fetuses for preterm delivery. A prospective study is necessary to validate and refine these parameters.

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INCARCERATION OF INGUINAL HERNIA IN INFANTS PRIOR TO ELECTIVE REPAIR

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The low morbidity and good results of elective herniorrhaphy in children are adversely affected by incarceration prior to hernia repair. Since this is a potentially avoidable complication, we reviewed 908 consecutive cases to determine the incidence and consequences of incarceration in children awaiting elective operation for an inguinal hernia.

Eighty-five of the 908 children (9%) presented with an incarcerated hernia. Thirty of these 85 patients (35%) were known to have an inguinal hernia prior to incarceration, and 10 of the 21 were awaiting elective hernia repair. The median time from surgical office visit to planned operation was 22 days, and the mean interval from office visit to incarceration was 8 days. Eighty-five percent of the children with incarcerated hernias were infants under one year of age.

Seventy-one of the 85 patients with an incarcerated hernia had successful manual reduction (84%). They were all admitted and had a mean hospital stay of 2.5 days. Emergency operation after unsuccessful attempts at reduction was required in the other 14 children, increasing the average length of stay to a mean of 4.0 days. Significant complications including infarction of the testis or ovary, bowel obstruction, intestinal necrosis, wound infection, and recurrent hernia occurred in 26 of the 85 children (31%).

We conclude that prompt hernia repair should be carried out soon after the diagnosis is made. Infants are the highest priority group, since 35% of children less than 12 months of age experienced incarceration after diagnosis and while awaiting elective repair. Timely operation can be expected to avoid the complications and prolonged hospitalization associated with incarcerated inguinal hernia.

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ROUTINE INGUINAL HERNIA REPAIR IN THE PEDIATRIC POPULATION:
IS OFFICE FOLLOW-UP NECESSARY?

J. Koulack, P. Fitzgerald, D. A. Gillis, M. Giacomantonio
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Inguinal hernia repair in the pediatric population has a very low complication rate. As a result, few complications are identified at follow-up. Given the current limitation of health care resources, the value of the traditional routine postoperative visit requires review.

Hospital and office charts of patients who had inguinal hernia repair in 1991 by one of two pediatric surgeons sharing an office facility were reviewed. Age, sex, procedure, complications, and postoperative follow-up information were recorded. To determine the perceived necessity for the follow-up visit, parents were contacted and a short questionnaire administered.

One hundred and seventy-five patients were eligible for the survey. Questionnaires were completed on 145 patients. Of these 145 patients 77 were seen in follow-up by the pediatric surgeon only, 43 by the family doctor only, and 12 were seen by both. Thirteen patients had no physician follow-up. The sole complication was a stitch abscess, for a complication rate of 0.7%. Results of the questionnaire showed that 90% of parents felt the follow-up visit was "helpful", 80% felt it was "necessary" and 35% would have been satisfied with telephone follow-up.

The main purpose of the postoperative visit appears to be parental reassurance as opposed to being medically necessary. Careful postoperative instruction and reassurance may be sufficient in a significant number of cases.

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NEUROBLASTOMA AND LUMBAR HERNIA: A CAUSAL RELATIONSHIP?

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Lumbar hernia is a rare occurrence in infants and children. Congenital variations have been described, frequently associated with musculofascial and skeletal abnormalities, specifically the "lumbocostovertebral syndrome" (LCV) and/or meningomyelocele. In the "LCV" syndrome, lumbar herniation results from a single somatic defect occurring during the third to fifth week of embryonal development. Meningomyelocele may predispose to lumbar herniation secondary to abnormalities in muscular innervation related to nerve entrapment in the spinal dysraphism. Acquired lumbar hernia can generally be attributed to surgery, infection, or trauma. Localized neuropraxis, temporary or permanent, may be the underlying factor common to all of these defects.

Two children with lumbar hernia in association with intrathoracic neuroblastoma are presented: A four month old with a lumbar hernia and a large intrathoracic neuroblastoma, whose hernia "resolved" within four months of excision of the paravertebral tumor. The second patient, a fifteen month old, developed a lumbar hernia following excision of a thoracic ganglioneuroblastoma. This resolved within one year without specific therapy. Lumbar hernia in these cases appears to be the result of neuropraxis secondary to intrathoracic paravertebral tumor and its management. In both cases, this deficiency was temporary and resolved without specific therapy.

This association of lumbar hernia in intrathoracic neuroblastoma has not previously been reported and suggests the advisability of a screening chest x-ray in children presenting with this diagnosis. Similarly, these cases suggest a role for conservative treatment for the hernia itself when the neural impairment resulting in the defect is of a temporary nature.

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FINE NEEDLE ASPIRATION CYTOLOGY: A SIMPLE EXAM TO SCREEN SUPERFICIAL MASSES

P.G. Gamba, L.M. Antoniello, P. Boccato, S. Blandamura, G. Cecchetto, P. Dall'Inga, A Messineo, M. Guglielmi
University of Padua, Hospital of Padua, ITALY

Fine needle aspiration cytology (FNAC) is already considered a useful tool in the evaluation of adult patients with mass lesions. We reviewed the experience with FNAC in our Paediatric Surgical Department.

One hundred and eleven FNAC were performed in children with a superficial mass and no sure diagnosis. All the exams were done by the same physician using a fine needle and no anesthesia. We routinely used May Grunwald Giemsa and Papanicolaou stainings. Patients age ranged from 20 days to 17 years with a mean age of 6.5 years.

A clinically benign pathology was confirmed in 90 cases (80.3%). All children did well at follow-up. Malignancy was diagnosed in 8 cases (7.2%) and in all confirmed with a surgical biopsy. In 9 children (8.1%) the specimen was considered insufficient to make a sure diagnosis. In 4 cases (3.6%) the pathologist diagnosed a malignancy that was excluded at surgical biopsy. The sensitivity was 100%, the specificity was 96% and the positive predictive value was 66%.

Our experience confirms that FNAC is a fast, cheap, simple and accurate diagnostic method and should be used for screening in all children with doubtful superficial mass.

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1000 - 1030 Coffee Break follows this paper
MALIGNANT RISK IN JUVENILE POLYPOSIS COLI: INCREASING DOCUMENTATION IN THE PEDIATRIC AGE GROUP

K.F. Heiss, D. Schaffner, R.R. Ricketts, K. Winn
Egleston Children's Hospital & Scottish Rite Children's Hospital, Atlanta

The presence of juvenile polyps with resulting bleeding, which is usually painless, has traditionally been considered to be a benign, self-limited process that resolves with age. The dictum that these polyps are usually solitary, are found predominantly in the rectosigmoid area, and are without malignant potential has been reconsidered in recent years with the increased use of colonoscopy. Several case reports in both adults and children have documented the presence of adenomatous changes in the polyps of patients with this syndrome. We report three children, ages 3, 11 and 11 years, who were evaluated for rectal bleeding and were found to have adenomatous polyps in the presence of juvenile polyposis coli. All three were treated definitively with an endorectal pull-through procedure. Two of these patients had atypia on histologic evaluation, one of which was severe, consistent with carcinoma in situ. We recommend a more aggressive approach to patients found to have multiple juvenile polyps on barium enema. This includes colonoscopic biopsies at several sites to determine the presence of adenomatous changes, with colectomy and endorectal pull-through should these changes be found.

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ANAL FISTULAS IN INFANTS: ETIOLOGY, FEATURES, MANAGEMENT

D. Poenaru, S. Yazbeck,
Hôpital Sainte-Justine, Montreal

Anal fistulas in infants are poorly understood. A high incidence of recurrence has been attributed to a congenital abnormality of the anal crypts. In order to verify this hypothesis, we reviewed all anal fistulas without other anorectal anomalies in children less than 2 years old treated between 1980 and 1991. All patients were males with a mean age of 9.5 months, and only 3 had other illnesses. 92% have had previous anorectal abscesses.

The fistulas were single in 31 patients and double in 5. They originated in crypts in 14 cases. When anoscopy was routinely performed, deep thick-walled crypts were found in 47% of the cases. In most instances only one crypt was abnormal.

The operative management included fistulotomy in 17 patients and fistulectomy in 9. Cryptotomies in addition to fistula excision were performed in 9 cases, and concurrent abscess drainage in 6. Follow-up was available in 31 patients for a mean length of 20 months.

There were 4 complications (11%): one abscess requiring drainage, one wound infection treated conservatively, one granuloma and one postoperative laryngitis. None of the patients had fistula-related complaints at the last visit. Unlike previous studies, no recurrences were observed.

Anal fistulas in the infant therefore are encountered exclusively in males, follow perianal abscesses, and are often related to abnormal crypts. They can be treated by either fistulotomy or fistulectomy. Neither cryptotomy nor antibiotic prophylaxis seem to be necessary. A good final result can be expected, with little chance of recurrence.

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SECONDARY EFFECTS OF PROLONGED INTESTINAL OBSTRUCTION
ON THE ENTERIC NERVOUS SYSTEM (ENS) OF RATS

S.E. Moore, D. Laing, J. Melis, S. Cywes
Tygerberg Hospital and
Red Cross Children's Hospital of Cape Town, SOUTH AFRICA

Motility disturbances following prolonged intestinal obstruction have
been attributed to secondary effects. This study aimed to demonstrate the
effects of incomplete obstruction on the ENS of an animal model.

Ethical permission was obtained. Surgical placement of a non-
strangulating ligature encircling the distal bowel was performed in 42 freshly
weaned rats. Study design included normal controls, sham procedures, a
group with intestinal obstruction consisting of intestinal obstruction, plus an
additional pre and post intestinal obstruction biopsy subgroup. Anaesthetic
protocol included Ketamine, Ether or Xylazine (an alpha-2-adrenergic
agonist). Histologic evaluation was by ganglion cell morphology,
histochemical staining for acetylcholinesterase (AChE) and tyrosine
hydroxylase (TOS) immunocytochemistry. A visual analog score (0-3)
assessed AChE activity.

41 freshly weaned LE rats (median survival 27 days) were divided into
controls (8) sham procedures (8), intestinal obstruction (16) and matched
pairs (9). Histologic changes included elongation of ganglion cells and a
decrease in the number per 5mm slide in obstructed animals. No further
obstruction specific differences were detected. A significant (p<0.01)
increase in AChE in the submucous plexus was recorded in Xylazine
anaesthetized animals.

No obstruction specific effects could be demonstrated in the ENS but
pharmacological stimulation of the alpha-2-adrenergic receptor resulted in
an increase in AChE. This may help to explain the role of the adrenergic
system in Hirschsprung's Disease.

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HYPOMOTILE BOWEL SYNDROME PRESENTING AS MECONIUM ILEUS: A CASE REPORT

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The majority of patients with meconium ileus (MI) have cystic fibrosis (CF), although familial pancreatic insufficiency has been noted to present as MI without CF. We report the first case of hypomotile bowel syndrome presenting in the neonatal period as MI.

A full-term white male infant began bilious vomiting and failed to pass meconium by 24 hours. On examination he had a soft, distended abdomen and a patent anus. Radiographs showed right lower quadrant pellet-like calcifications and distal small bowel obstruction. A barium enema revealed a distal microcolon with failure of the barium column to pass beyond the transverse colon. At surgery, the findings were typical of MI; no mechanical obstruction was noted. The meconium was removed with 4% N-acetylcysteine. Three sweat tests have excluded CF (mean volume=0.28g; mean C1=18 meq), duodenal aspirates have excluded pancreatic insufficiency (lipase=6u/l, amylase=90u/l), and rectal biopsies have ruled out Hirschsprung's disease. Post operatively he continues to have bilious gastric aspirates and only passes stools following enemas. Radiographs show small bowel obstruction, despite reoperation confirming the absence of mechanical obstruction. He does not tolerate enteral feeds, but is gaining weight adequately on TPN.

Hypomotile bowel syndrome is still a diagnosis of exclusion, but should be considered when MI is associated with a normal sweat test and pancreatic sufficiency. The prognosis for these patients is guarded.
POSTERIOR SAGITTAL RECTAL MYECTOMY FOR PERSISTENT RECTAL ACHALASIA AFTER THE SOAVE PROCEDURE FOR HIRSCHSPRUNG'S DISEASE

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Persistent rectal achalasia is not an uncommon complication after the Soave endorectal pull through procedure. For the management of this complication, we employed posterior sagittal myectomy of the remaining aganglionic rectal muscular cuff and have had satisfactory outcome.

Technique: Via a posterior sagittal skin incision, the levator sling is divided in the midline to reach the posterior aspect of the aganglionic rectal muscle. With the striated muscular complex retracted downward, the level of the dentate line is identified on the posterior wall of the rectum by the aid of the surgeon's finger inserted in the anorectum. Two longitudinal incisions are made on the aganglionic rectal muscle to create a muscular strip which is elevated and excised at the level of the dentate line including the internal sphincter muscle.

Patients: During the last four years, this procedures has been performed in 5 patients. Satisfactory outcome was observed in all patients.

The advantage in this procedure: 1) includes less technical difficulty, 2) avoids colostomy, 3) corrects anatomical orientation, and 4) has a promising result.

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SPARSE NEUROMUSCULAR JUNCTIONS IN THE NORMO-GANGLIONIC BOWEL OF HIRSCHSPRUNG'S DISEASE: IS IT A CAUSATIVE FACTOR OF FAILED PULL-THROUGH OPERATION?

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The cause of failed pull-through operation of Hirschsprung's disease (HD) remains a dilemma. It may be related to the abnormal innervation of ganglionic bowel pulled-through during procedure. This prompted the authors to study the distribution of neuromuscular junctions in the muscle layers of the pulled-through ganglionic bowel.

Pulled-through normo-ganglionic bowels of seven patients with HD, which were either biopsied or resected at operations, and normal bowel specimens from six age-matched controls were investigated by immunohistochemical technique using monoclonal antibody 171B5 against synaptic vesicle-specific 38,000 dalton protein which is widely distributed in nerve terminals.

In all specimens of the control group and also bowels of six patients of the HD group, many neuromuscular junctions were demonstrated in the muscle layers and dense clusters of synapses in the myenteric plexuses. However, in the bowel of one patient of the HD group, very sparse neuromuscular junctions were seen despite the presence of dense clusters of synapses in the myenteric plexuses.

These findings suggest that there appear to be a small number of HD patients who have poorly innervated muscle layers in the normo-ganglionic bowels, which in turn may be related to the failed pull-through.

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ROUTINE USE OF THE NITRIC OXIDE STAIN IN THE DIFFERENTIAL DIAGNOSIS OF HIRSCHSPRUNG'S DISEASE

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Hirschsprung's Disease (HD) is defined as a congenital absence of ganglion cells in the distal bowel. Functionally, there is a loss of enteric neuromuscular inhibition. Inhibitory intestinal innervation includes extrinsic adrenergic and intrinsic non-adrenergic non-cholinergic (NANC) nerves. Nitric oxide (NO) is proposed to be a NANC neurotransmitter. Signs of NO synthesis can be localized using a NO dependent NADPH diaphorase histochemical assay. We present a study of the distribution of NO neural elements in patients with HD.

Method: Routine hematoxalin eosin (HE) histology as well as histochemical localization of NO synthase activity was carried out on fixed laminae and sectioned tissue of infant colon.

Results: NO synthase positive nerve cells and fibres were found throughout the wall of the proximal ganglionated colon. In the myenteric plexus disposition of these nerves parallels the known NANC innervation. "Aganglionic" distal colon displayed disrupted ganglia and increased nerve fibres. Selective preservation of NO synthesizing neurons was also seen. Punctate labeling of an apparently non-neuronal origin was also noted on the surface of arterioles.

Conclusions: NO stain simplifies the pathological diagnosis of HD. The presence of NO positive nerve cells in HD suggests that aganglionosis is a misnomer. The lack of characteristic HE findings in other forms of neuronal intestinal dysplasia indicates the need for routine simple, more sensitive neural staining of colonic biopsies in selected infants with constipation.

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