Annual Meeting
Réunion Annuelle

Victoria, BC
September 13-15, 1993

Canadian Association of Paediatric Surgeons
l'Association Canadienne de Chirurgie Infantile
<table>
<thead>
<tr>
<th>PROGRAM INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Index</td>
</tr>
<tr>
<td>President's Welcome</td>
</tr>
<tr>
<td>Local Organizing Committee Welcome</td>
</tr>
<tr>
<td>Delegates Program</td>
</tr>
<tr>
<td>Accompanying Person Program</td>
</tr>
<tr>
<td>About Victoria and the Island</td>
</tr>
<tr>
<td>Victoria Map</td>
</tr>
<tr>
<td>Eating out in Victoria</td>
</tr>
<tr>
<td>About CAPS</td>
</tr>
<tr>
<td>Education fund</td>
</tr>
<tr>
<td>Officers and Committees</td>
</tr>
<tr>
<td>Presidents and Secretary Treasurers</td>
</tr>
<tr>
<td>Founding Members</td>
</tr>
<tr>
<td>Future CAPS meetings</td>
</tr>
<tr>
<td>Publication Committee Instructions</td>
</tr>
<tr>
<td>Guest Lecturer, Dr. Keith W. Ashcraft</td>
</tr>
<tr>
<td>Resident Papers and Award</td>
</tr>
<tr>
<td>CAPS Coat of Arms</td>
</tr>
<tr>
<td>Program Details</td>
</tr>
<tr>
<td>Monday, Session 1</td>
</tr>
<tr>
<td>Monday, Session 2</td>
</tr>
<tr>
<td>Tuesday, Session 3</td>
</tr>
<tr>
<td>Tuesday, Session 4</td>
</tr>
<tr>
<td>Wednesday, Session 5</td>
</tr>
<tr>
<td>Wednesday, Session 6</td>
</tr>
<tr>
<td>Abstracts 1-58</td>
</tr>
</tbody>
</table>
Twenty-fifth Annual Meeting
CANADIAN ASSOCIATION of
PAEDIATRIC SURGEONS
L'ASSOCIATION CANADIENNE de
CHIRURGIE INFANTILE

Monday-Wednesday, September 13-15, 1993
The EMPRESS
Crystal Ballroom
VICTORIA
CANADA

please bring this program to the meeting
Welcome to all CAPS members and guests. Welcome especially to our new members and those first-time guests; we hope you all enjoy yourselves to the limit. Nate Wiseman and his committee have arranged excellent sessions of academia (thanks to all your abstracts), and Jim Donald and his co-hosts have planned an entertaining social programme which can only be enhanced by the beauty of Victoria. We have come of age now! We should now move on to other more important things in our pediatric surgical lives, that is learning and laughing in an enjoyable combination. I can't help but borrow Sean Corkery's BAPS presidential message from two months ago: "There will be some delegates for whom this is their first (CAPS). Welcome! Enjoy every moment of it and be assured you will never forget it. Others will be 'old hands' who, like me, look upon this as a great opportunity to recharge the scientific batteries, to reinforce old friendships and to forge new ones. To those, perhaps the majority, who still have not got the balance between the scientific and the social programme quite right I say "Just keep an eye on the guy with the medal around his neck". All are most welcome, but especially the 'accompanying persons'."

Boy! Has Sean ever got it right"

Sigmund H. Ein
President, CAPS
We are delighted to welcome you to Western Canada and particularly to Victoria for our Annual Meeting. We hope that you will enjoy your visit here. For some this will be your first visit and we hope you will like what you see.

The program committee has produced a stimulating educational session. The local arrangements committee has tried to compliment this with a program which we feel will give you an introduction to our rather more relaxed way of living so that you can enjoy the gardens, the food and the scenery of Vancouver Island.

If there is any way we can be of help, please let us know.

Jim Donald         Allen Hayashi
DELEGATES’ PROGRAM

Sunday, 12th September
13.00-16.00  Meeting of CAPS Council; Buckingham Room
15.00  Registration for Meeting, Upper Level Pavilion
Social Program 17.00-20.00  Welcoming Reception, Palm Court, Crystal Ballroom

Monday, 13th September
07.00-  Registration, Palm Court
07.00-08.00  Continental Breakfast, Palm Court
07.45  Welcome and Opening ceremony Crystal Ballroom
08.00-10.00  Scientific Session One
10.00-10.30  Coffee
10.30-12.15  Scientific Session Two
12.15-13.15  Fred MacLeod Lecture
13.15  Lunch (own arrangements; see page xii for listing)
Social Program
15.30  Buses depart from The Empress for Butchart Garden Tour and Dinner
21.00  Buses return to The Empress following Butchart Garden Tour under the Lights

Tuesday, 14th September
07.00  Continental Breakfast, Palm Court
08.00-10.15  Scientific Session Three
10.15-10.45  Coffee
10.45-13.00  Scientific Session Four
13.00-14.30  CAPS Members’ Annual Business Meeting, Empress Room
Social Program
19.00  Presidential Reception, Palm Court
19.30  Presidential Dinner, Crystal Ballroom

Wednesday, 15th September
07.00  Continental Breakfast, Palm Court
08.00-10.15  Scientific Session Five
10.15-10.45  Coffee
10.45-12.00  Scientific Session Six
12.00  Meeting Adjourns

ACCOMPANYING PERSONS’ ACTIVITIES
Information will be available at the Registration Desk and the CAPS Hospitality Suite
ACCOMPANYING PERSONS’ PROGRAM

Sunday, 12th September
See Delegates’ Program

Monday, 13th September, 10.00 a.m.
Walking tour of old Victoria with Pub Lunch
Leaves from the Registration Desk at 10.00 a.m.
Cost: $20.00 (includes lunch and drink)

Monday, 13th September, 15.30
See Delegates Program

Tuesday, 14th September, 10.00 a.m.
Tour of Government House and Gardens
Leaves from Registration Desk at 10.00 a.m.
Cost: $10.00 (includes transport and coffee)

Tuesday, 14th September, after lunch
Tour of Royal British Columbia Museum
The Museum is directly across from the Empress on the south side and it is suggested that you go there at your convenience. Allow at least two hours. The West Coast Indian section should not be missed!!
Cost: $5.00, payable on admission.

Tuesday, 14th September, evening
See Delegates Program

Wednesday, 15th September, 10.00 a.m.
“Diamonds and Pearls”
An illustrated talk by Myra Waller of Waller’s Antiques.
Coffee provided.
Meet in the Hospitality Suite, the Empress
Cost: $10.00

Victoria is famous for its collection of antique stores. These are mainly on Fort Street in the eight hundred to the eleven hundred block within walking distance from the hotel.

If you require further information, the people at the registration desk or in the hospitality room will be glad to help. Should you be interested in travelling further afield, the Victoria Visitors Bureau across from the Empress on Government Road (harbour side) is always pleased to be of service.

Please register for the above events at the Registration Desk.
ABOUT VICTORIA and “THE ISLAND”

Victoria, the capitol city of British Columbia, is situated on the southern tip of Vancouver Island. This is a city with character and vitality—an intimate, manageable city shaped by the pervasive influence of the sea.

Metropolitan Victoria has a population of just under 275,000. Tourism is a major industry and the city hosts more than 2 million visitors a year. It is a city with a distinctive character and offers a wide variety of international restaurants, night clubs and theatres. The unsurpassed recreational environment offers superb fishing, year round golfing, tennis, soccer, baseball, and cricket.

Shopping in Victoria offers an interesting diversion to visitors. The many small, independent stores have an outstanding collection of china, woolen, fine linen, antiques, confections, imports from the Orient and native Indian work.

Victoria has the highest ratio of park land of any city in North America and the sheltered waters around the city are used by hundreds in pleasure boats that range from canoes to majestic sail and power cruises.

The city’s heritage and personality is reflected in it’s beautiful gardens, immaculate lawns and rich architecture of public buildings and fine homes.

Why not take a few days to enjoy the scenic wonders that Vancouver Island has to offer. From Victoria enjoy an exciting day trip over high trestles and through tunnels on the E&N Railway, or if you want to take a bus or car, drive over the Malahat and from its eleven hundred foot summit get an eagle eye view of sparkling inlets and islands. There’s a railway museum at Cowichan. Chemainus, an almost derelict town only a few years ago, has won awards for its famous murals on downtown buildings. At thriving Nanaimo many old buildings have been restored and at Qualicum and Parksville there are quiet beaches to explore.

Head on to Campbell River for salmon fishing. Beyond it lie many fishing resorts and historic fishing villages. At the top of the island, welcome the ferry from Prince Rupert as it arrives in Port Hardy.

Or from Parksville you may wish to cut across the island, through Cathedral Grove, a virgin forest, to Pacific Rim National Park on the open ocean where thundering waves wash the mile of sand know a Long Beach. Watch for eagles, osprey, deer, elk, sea otters, sea lions and the mammoth gray whales.
EATING OUT IN VICTORIA

Victoria has many fine restaurants to choose from. Those mentioned below were selected for their proximity to the Empress and consistently good value. Several have spectacular views or are in old character buildings.

We have classified them as to the type of food they serve and whether they are recommended for lunch (L) or dinner (D).

CHINESE
(1) Panda Szechuan Restaurant, 818 Douglas, 338-0080; L, D
(2) Don Mee, 538 Fisgard (in Chinatown), 383-1032; D
(3) Lin Hueng, 626 Fisgard (in Chinatown), 385-1632; D
(4) Peking House, 1706 Government, 386-3633; D

FRENCH
(5) La Ville D'Is, 26 Bastion Square, 388-9414; L, D
Specializes in Seafood
(6) French Connection Restaurant, 521 Simcoe, 385-7014; D
(7) La Petite Colombe, 604 Broughton, 383-3234; D

MEDITERRANEAN
(8) Millos, 716 Burdett, 382-5544; D
(9) Eugenes, 1280 Broad, 381-5456; L, Greek Snack Bar
(10) Il Terrazzo, 555 Johnson (enter off Wellington Alley) 361-0028; L., D

JAPANESE
(11) Tomoe Japanese Restaurant, 726 Johnson, 381-0223; L, D
(12) Kaz, 100-1619 Store St., 386-9121, L, D

WEST COAST
(13) Victorian Restaurant, Ocean Pointe Resort, 45 Songhees, 360-5800; D
(14) Herald Street Cafe, 546 Herald, 381-14 41; L, D
(15) Harvest Moon Cafe, 1218 Wharf, 381-3338; L, D; Serves only B.C. produce and wines.

VEGETARIAN
(16) Re bar, 50 Bastion Square 361-9223; L.

The Empress Hotel has a couple of restaurants worthy of consideration. The Dining Room serves excellent West Coast Dinners and the Bengal Room is a popular spot for curry lunch.
ABOUT THE
CANADIAN ASSOCIATION OF PAEDIATRIC SURGEONS

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

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

Infants Born With Congenital Abnormalities

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

Malignancy in Childhood

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

Trauma

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

Education Program

To accomplish an improvement in surgical care for babies and children, the Canadian Association of Paediatric Surgeons has launched an educational program for doctors, nurses and others working in the paediatric health field. To support this program, an educational fund has been established.
The Education Fund underwrites the visit of a distinguished paediatric surgeon each year to visit and teach at medical centres in Canada, provides a speaker on Paediatric Surgery at the Annual Meeting of the Canadian Paediatric Society, enables the Association to sponsor a session of scientific papers at the Meeting of the Royal College of Physicians and Surgeons of Canada and supports the Annual Scientific Meeting of the Association. Financing for the Education Fund has been 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 fully support the Education Program.

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

Donations may be sent to:
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:        |  1-204-787-4618
CAPS COUNCIL 1992-93

EXECUTIVE

President: S. Ein
Past-President: J-C Ducharme
President-Elect: A. Juckes
Secretary/Treas.: R. Postuma

Director (3rd year): H. Blanchard
Director (2nd year): D. Girvan
Director (1st year): A. Bensoussan

COMMITTEES as of 92.11.23; revised 93.03.29

1 Archivist:
   D. Girvan
   R. Kennedy

2 Bilingual
   B. Shandling
   P. Soucy
   R. Cloutier
   A. Juckes
   S. Mercer
   S. Yazbeck

3 Congenital Anomalies:
   G. Blair
   N. Wiseman
   M. Di Lorenzo
   P. Soucy

4 Constitution and
   Bylaws:
   D. Girvan
   G. Fraser
   P. Soucy

5 Education:
   M. Giacomantonio
   M. Evans
   J-M Laberge
   A. Winthrop
   A. Wong

6 Ethics and Moral
   Issues:
   B. Shandling
   C. Bagwell
   J. Desjardins
   R. Sonnino

7 Finance:
   A. Gillis
   M. Allen
   D. Girvan
   S. Mercer

Treasurer (R. Postuma)

8 Future Meetings
   President (S. Ein)
   Secretary (R. Postuma)
   Local arrangements:
   J. Donald 1993
   A. Hayashi
   S. Ein 1994
   B. Shandling
   S. Yazbeck 1995

   Members at large:
   A. Gillis

9 Liaison with American
   College:
   B. Shandling

10 Liaison with Trauma
    Assoc. of Canada:
    G. Blair

11 Liaison with World
    Federation:
    Secretary-Treasurer

12 Membership and
    Credentials:
    J. Desjardins
    Secretary
    G. Blair
    S. Rubin
    B. Shandling

13 Nominating:
   J. Ducharme (Past President)
   D. Girvan (Director)
   3 Members-at-large:
   M. Di Lorenzo
   P. Soucy
   N. Wiseman

14 Program:
   N. Wiseman
   D. Girvan
   A. Hayashi
   K. Heiss
   J-M. Laberge
   R. Pearl

15 Publication:
   S. Yazbeck
   A. Bensoussan
   E. Grisoni
   I. Krasna
   P. Soucy
   N. Wiseman

16 Research:
   R. Cloutier
   J. Langer
   R. Superina

17 Specialty Committee
   for Pediatric General
   Surgery of the Royal

18 Standards:
   R. Postuma
   B. Shandling
   P. Soucy

19 Training and Human
   Resources Committee
   previously "Health &
   Manpower" and
   "Residency";
   G. Fraser
   A. Bensoussan
   M. Giacomantonio
   A. Gillis (chair Specialty
   comm.)

   F. Gutman
   A. Juckes
   P. Soucy
   D. Wesson

Laparoscopy Sub-
Committee:
   S. Rubin
   G. Blair
   M. Di Lorenzo
   A. Wong

20 Trauma:
   G. Blair
   M. Giacomantonio
   D. Wesson
   A. Winthrop
   A. Wong

underline indicates chair of committee

Please contact the President or Secretary-treasurer if you are able to serve
on any of the above committees or if corrections are necessary in the
above information (Secretary: tel.(204)787-4203 or fax: 787-4618)
<table>
<thead>
<tr>
<th>Years</th>
<th>President</th>
<th>City</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>1975-1976</td>
<td>Jim Simpson*</td>
<td>Toronto</td>
</tr>
<tr>
<td>1977-1978</td>
<td>Sam Kling</td>
<td>Edmonton</td>
</tr>
<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>1991-1993</td>
<td>Sigmund Ein</td>
<td>Toronto</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years</th>
<th>Secretary-Treasurer</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-1973</td>
<td>Barry Shandling</td>
<td>Toronto</td>
</tr>
<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>1989-1995</td>
<td>Ray Postuma</td>
<td>Winnipeg</td>
</tr>
</tbody>
</table>

* 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 was held January 22, 1969 in VANCOUVER
FUTURE C.A.P.S MEETINGS:

26th ANNUAL MEETING:
Monday, SEPT. 19-21, 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*

* dates and locations are tentative*
IMPORTANT ANNOUNCEMENT
FROM THE PUBLICATION COMMITTEE

RE: 1994 PAPERS
26th Annual Meeting in
TORONTO
September 19-21, 1994

Papers presented at the 1994 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 THREE WEEKS before presentation to:

Dr SALAM YAZBECK
Chairman, Publication Committee
Canadian Association of Paediatric Surgeons
Hopital Ste. Justine
3175 Cote Ste. Catherine
Montreal, PQ, H3T 1C5

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.
Dr. Ashcraft is a true mid-westerner, having lived virtually all of his life in the Central Time Zone. He was born, raised and educated in Kansas, graduated from the University of Kansas School of Medicine in 1963 and received his General and Pediatric Surgical training there. Upon completion of a Thoracic Surgical Residency at Great Ormond Street, Dr. Ashcraft returned to the 94 th meridian when he was appointed Assistant Professor of Surgery and Pediatrics at the University of Texas in Galveston in 1971. Two years later he returned to the Mid-West as Clinical Professor of Surgery at the University of Missouri-Kansas City School of Medicine.
where he was appointed full professor of Surgery in 1992. Dr. Ashcraft is Chief of Urology at the Children's Mercy Hospital in Kansas City, Missouri. He is also president-elect of the Medical Staff of his hospital.

Dr. Ashcraft has published extensively in the pediatric surgical literature. A significant proportion of his 93 published articles were co-authored with his senior associate Dr. Tom Holder. He has published in all areas in our specialty and on both sides of the diaphragm, indicative of Dr. Ashcraft's general pediatric surgical interest. Dr. Ashcraft has published three textbooks: Pediatric Surgery (two editions), Pediatric Esophageal Surgery and Pediatric Urology. He is also an associate editor of the Journal of Pediatric Surgery.

Dr. Ashcraft has been active in numerous medical organizations. For example, he is the past-president of the World Federation of Associations of Pediatric Surgeons, and past-chairman of the Surgical Section of the A.A.P. and the Publication Committee of APSA. Presently, Dr. Ashcraft is the secretary of APSA.

Dr. Ashcraft has been a Visiting Professor and Invited Lecturer around the world. In fact, just prior to the CAPS meeting he will have been a visiting professor in Hong Kong and Taiwan. Nevertheless, Dr. Ashcraft will take time from his busy schedule to visit the pediatric surgical centers of Edmonton, Regina, Calgary before the CAPS meeting and Vancouver following the meeting. CAPS is very pleased that Mrs. Connie Ashcraft will also attend our meeting. Upon returning home they will host the retirement ceremonies in honour of Dr. Tom Holder, their long time colleague. Please join us in welcoming the Ashcrafts.
The papers presented by Surgical Residents are adjudicated by a panel of members from the Publication and/or Program Committees. There are two award categories: the best Clinical paper and the best Experimental paper. Selection will be made only from the Original Papers Category. Each award is $250. The Program Committee normally tries to schedule the Resident papers during the first two days of the meeting to enable the awarding of the Resident Prizes during the Presidential Dinner. Since some of this year's Resident papers have to be presented on the final day, the Resident Prizes will be awarded after the annual meeting and announced in the next issue of CAPSULE.

WINNER OF THE 1992 RESIDENT BEST PAPER AWARD:
Dr. R. BILIK

for his paper:
"MALIGNANT BENIGN NEONATAL SACROCOCCYGEAL TERATOMA"
R. Bilik, M. Pope, B. Shandling, S. Weitzman, S.H. Ein
The Hospital for Sick Children, Toronto

Congratulation Dr Bilik !!!
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 (1967).

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

VICTORIA

September 13-15, 1993
<table>
<thead>
<tr>
<th>#</th>
<th>Cl.</th>
<th>TIME</th>
<th>TITLES/AUTHORS/CENTRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>O</td>
<td>0800-0815</td>
<td>THE SPECTRUM OF PEDIATRIC TRAUMA RECEIVED BY THE UNIVERSITY OF ALBERTA HOSPITALS: FACTORS AFFECTING THE MORBIDITY OF RURAL COMPARED TO URBAN TRAUMA</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>0815-0830</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>University of Alberta Hospitals, Edmonton, AB</td>
</tr>
<tr>
<td>2</td>
<td>O</td>
<td>0815-0830</td>
<td>SUCCESS WITH THE MODIFIED RAVITCH REPAIR OF PECTUS EXCAVATUM USING A DACRON VASCULAR GRAFT SUBSTERNAL STRUT</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Mon., Sep 13</td>
<td>Mark Lane-Smith, DA Gillis, PD Roy, Izaak Walton Killam Hospital for Children, Halifax</td>
</tr>
<tr>
<td>3</td>
<td>O</td>
<td>0830-0845</td>
<td>PRIMARY SPONTANEOUS PNEUMOTHORAX IN CHILDREN</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Mon., Sep 13</td>
<td>D. Poenaru, S. Murphy, S. Yazbeck</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hôpital Sainte-Justine, Montreal, Quebec</td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td>0845-0850</td>
<td>MASSIVE CHYLOTHORAX ASSOCIATED WITH LYMPHANGIOMATOSIS OF THE BONE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>K. Canel, P. Fitzgerald, G. Lau</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Hospital at Chedoke - McMaster Hamilton, Ontario</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>0850-0855</td>
<td>THE USE OF HUMAN DURA MATER IN PEDIATRIC CHEST WALL RECONSTRUCTION FOLLOWING TUMOR RESECTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>M. Walton, J. Bass, E. Sambeay, S. Rubin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Hospital of Eastern Ontario, Ottawa</td>
</tr>
<tr>
<td>6</td>
<td>O</td>
<td>0900-0915</td>
<td>LYMPHOPROLIFERATIVE DISEASE FOLLOWING PAEDIATRIC LIVER TRANSPLANTATION,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>Glyn Morgan, Riccardo Superina</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>University of Toronto and The Hospital for Sick Children, Toronto, Ontario, Canada.</td>
</tr>
<tr>
<td>7</td>
<td>C</td>
<td>0915-0920</td>
<td>PEDIATRIC MALIGNANT PHEOCHROMOCYTOMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospital for Sick Children, Toronto; Alberta Children's Hospital, Calgary.</td>
</tr>
<tr>
<td>8</td>
<td>C</td>
<td>0920-0925</td>
<td>REPORT OF THREE GASTRIC TUMOURS IN CHILDREN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>S. Murphy, K.S. Shaw, H. Blanchard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hôpital Sainte-Justine, Montreal, Quebec</td>
</tr>
<tr>
<td>9</td>
<td>O</td>
<td>0930-0945</td>
<td>SPLENECTOMY, BEFORE OR AFTER TUMOR INDUCTION, DOES NOT AFFECT TUMOR GROWTH IN C-1300 MOUSE NEUROBLASTOMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>Irwin H. Krasna, Richard Lee</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UMDNJ-Rober Wood Johnson Medical School, New Brunswick, New Jersey</td>
</tr>
<tr>
<td>10</td>
<td>C</td>
<td>0945-0950</td>
<td>OMENTAL-MESENTERIC PLASMA CELL GRANULOMA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The Izaak Walton Killam Hospital, Halifax, Nova Scotia</td>
</tr>
<tr>
<td>11</td>
<td>C</td>
<td>0950-0955</td>
<td>CYSTIC MEOSETHELIOMA OF THE PERITONEUM: A RARE CAUSE OF 'ASCITES' IN CHILDREN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon., Sep 13</td>
<td>E. Dykes, M. McCullagh, A. Khan, C. Keene</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Hospital Lewisham, London, UK</td>
</tr>
</tbody>
</table>

**COFFEE**
<table>
<thead>
<tr>
<th>#</th>
<th>CL</th>
<th>TIME</th>
<th>TITLES/AUTHORS/CENTRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>C</td>
<td>1030-1035</td>
<td>BRONCHO-BILIARY FISTULA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>James D. Fischer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Health Centre, Univ. of Alberta Hospital, Edmonton, AB</td>
</tr>
<tr>
<td>13</td>
<td>C</td>
<td>1035-1040</td>
<td>CERVICAL APPROACH FOR THE REPAIR OF ESOPHAGEAL ATRESIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>H.Kemmotsu, K.Joe, H.Nakamura, M. Yamashita</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ibaraki Children's Hospital, Mito, JAPAN</td>
</tr>
<tr>
<td>14</td>
<td>O</td>
<td>1045-1100</td>
<td>PURE ESOPHAGEAL ATRESIA: A 50 YEAR REVIEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>Sigmund H. Ein, Barry Shandling</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospital for Sick Children, Toronto, Ontario, Canada</td>
</tr>
<tr>
<td>15</td>
<td>C</td>
<td>1100-1105</td>
<td>AORTO ESOPHAGEAL FISTULA: CONGENITAL AND ACQUIRED CAUSES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Montreal Children's Hospital, and Hospital Ste Justine*, Montreal, Quebec</td>
</tr>
<tr>
<td>16</td>
<td>C</td>
<td>1105-1110</td>
<td>ESOPHAGO-TRACHEAL FISTULA SECONDARY TO FOREIGN BODY IMPACTION IN FOUR CHILDREN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>Borghol M, Al-Rabeeah A, Jawad A, Al-Sammarral AY, and Al-Mubarek K,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>King Faisal Specialist Hospital &amp; Research Centre and King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>GE REFLUX SYMPOSIUM</strong></td>
</tr>
<tr>
<td>17</td>
<td>O</td>
<td>1115-1125</td>
<td>RESULTS AND COMPLICATIONS OF TOUPE T ANTIREFLUX SURGERY - 10 YEAR EXPERIENCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>S. Leclerc, S. Yazebeck, A L. Bensoussan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hôpital Sainte-Justine, Montreal (Quebec)</td>
</tr>
<tr>
<td>18</td>
<td>O</td>
<td>1125-1135</td>
<td>RESPIRATORY COMPLICATIONS FOLLOWING SUCCESSFUL NISSEN FUNDOPICATION IN NEUROLOGICALLY IMPAIRED CHILDREN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>Molloy M., Galapon DB, Hale DA, Robie DK, Latimer JS, Peer RH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Walter Reed Army Medical Center, Washington, D.C.</td>
</tr>
<tr>
<td>19</td>
<td>O</td>
<td>1135-1145</td>
<td>CILIARY FUNCTION TESTS - CAN WE DETECT RECURRENT ASPIRATION IN CHILDREN WITH GASTROESOPHAGEAL REFLUX?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>W. A. McCallion, A. Li Wan Po, S.R. Potts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Royal Belfast Hospital For Sick Children</td>
</tr>
<tr>
<td>20</td>
<td>O</td>
<td>1145-1155</td>
<td>COMPLICATION RATES OF TOUPE T AND NISSEN FUNDOPICATIONS IN NEUROLOGICALLY IMPAIRED CHILDREN.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospital for Sick Children, University of Toronto, Toronto</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>GE REFLUX ROUND TABLE DISCUSSION</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>1155-1215</strong></td>
</tr>
<tr>
<td>21</td>
<td>O</td>
<td>1215-1315</td>
<td>FRED MacLEOD LECTURE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mon. Sep 13</td>
<td>&quot;MANAGEMENT of the DIFFICULT ESOPHAGUS&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dr. Keith W. Ashcraft</td>
</tr>
<tr>
<td>#</td>
<td>CL</td>
<td>TIME</td>
<td>TITLES/AUTHORS/CENTRE</td>
</tr>
<tr>
<td>---</td>
<td>----</td>
<td>----------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>21</td>
<td>O</td>
<td>0800-0815</td>
<td>THROMBOTIC COMPLICATIONS OF SAPHENOUS CENTRAL LINES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>K. Pippus, E. P. Rees, D. A. Gillis, J. M. Giacomantonio</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The Izaak Walton Killam Children's Hospital, Halifax, Nova Scotia</td>
</tr>
<tr>
<td>22</td>
<td>O</td>
<td>0815-0830</td>
<td>SUBCUTANEOUS INFUSION PORTS IN THE PEDIATRIC HEMOPHILIA PATIENT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>D.P. gravel, L.L. deVeber, M.J. Inwood, E. Clegg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Hospital of Western Ontario and Southwestern Ontario Regional Hamophilia Program, London, Ontario</td>
</tr>
<tr>
<td>23</td>
<td>O</td>
<td>0830-0845</td>
<td>NERVE GROWTH FACTOR RECEPTOR (NGFR) STAINING OF SUCTION BIOPSIES IN THE DIAGNOSIS OF HIRSCHSPRUNG'S DISEASE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>Hiroyuki Kobayashi, D. Sean O'Brien and Prem Puri</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Research Centre, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12</td>
</tr>
<tr>
<td>24</td>
<td>O</td>
<td>0845-0900</td>
<td>INITIAL EXPERIENCE WITH ONE STAGE ENDORECTAL PULLTHROUGH PROCEDURES FOR HIRSCHSPRUNG'S DISEASE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>Erik D Skarsgard, Riccardo A Superina, Barry Shandling, and David E Wesson</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospital for Sick Children, Toronto</td>
</tr>
<tr>
<td>25</td>
<td>O</td>
<td>0900-0915</td>
<td>EXPRESSION OF NERVE GROWTH FACTOR RECEPTOR (NGF-R) ON THE PERINEURUM OF HYPERTROPHIC NERVE TRUNKS IN HIRSCHSPRUNG'S DISEASE (HD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>Prem Puri, Hiroyuki Kobayashi, D. Sean O'Brien</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Research Centre, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12, Ireland</td>
</tr>
<tr>
<td>26</td>
<td>O</td>
<td>0915-0930</td>
<td>A NEW LOOK AT AN OLD OPERATION FOR AGANGLIONOSIS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>Sigmund H. Fin. Barry Shandling, Henry So</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hospital for Sick Children, Toronto and New Hyde Park, New York</td>
</tr>
<tr>
<td>27</td>
<td>C</td>
<td>0930-0935</td>
<td>A NEW METHOD OF INTESTINAL SALVAGE IN SEVERE SMALL BOWEL ISCHAEMIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>M. McCullagh, D. Garvie, E. H. Dykes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Hospital, Lewisham, London, U.K.</td>
</tr>
<tr>
<td>28</td>
<td>C</td>
<td>0935-0940</td>
<td>SPINAL ANESTHESIA FOR PRIMARY REPAIR OF GASTROCHISIS: A NEW AND SAFE TECHNIQUE IN SELECTED PATIENTS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>Dennis W. Vane, Christopher A. Abajian, Andrew R. Hong</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>University of Vermont, Col. of Medicine, Burlington, VT</td>
</tr>
<tr>
<td>29</td>
<td>C</td>
<td>0945-0950</td>
<td>MINIMALLY CONJOINED OMPHALOPLAGI: A CONSISTENT SPECTRUM OF ANOMALIES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>D. Poenaru, J. Uroz-Tristan, S. Leclerc, S. Murphy, D. St-Vil, S. Youssef, H. Blanchard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hôpital Sainte-Justine, Montreal (Quebec)</td>
</tr>
<tr>
<td>30</td>
<td>O</td>
<td>0955-1010</td>
<td>IS IT NECESSARY TO GET EARLY FASCIAL CLOSURE IN OMPHALOCELE AND GASTROCHISIS?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td>Irwin H. Krasna</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>UMDNJ-Robert Wood Johnson Medical School, New Brunswick, New Jersey</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>CL</td>
<td>TIME</td>
<td>TITLES/AUTHORS/CENTRE</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1100-Tue.</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>O</td>
<td>1100-1115</td>
<td>MANAGEMENT OF CHOLEDOCHAL CYSTS IN THE NEWBORN &lt;br&gt;Cathy A. Burnweit, Gary A. Birkin, and Kurt F. Heiss, &lt;br&gt;Miami Children's Hospital, Miami, FL; Hollywood Memorial Hospital, Hollywood, FL; Emory Clinic, Atlanta, GA.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>C</td>
<td>1115-1120</td>
<td>CONGENITAL ABSENCE OF THE PORTAL VEIN: TWO CASES AND A PROPOSED CLASSIFICATION SYSTEM FOR CONGENITAL PORTOSYSTEMIC SHUNTS. University of Toronto and The Hospital for Sick Children, Toronto, &lt;br&gt;Glyn Morgan, Riccardo Superna</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>C</td>
<td>1120-1125</td>
<td>TOTAL ANOMALOUS PULMONARY VENOUS RETURN COMPLICATING PORTENTEROSTOMY FOR BILIARY ATRESIA &lt;br&gt;M. Lafort, D. St-Vil, S. Vobecky and A. Oulmet &lt;br&gt;Hôpital Sainte-Justine, Montreal (Quebec)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>O</td>
<td>1130-1145</td>
<td>LONG TERM EFFECT OF CYCLOSPORINE ON RENAL FUNCTION IN CHILDREN AFTER LIVER TRANSPLANTATION &lt;br&gt;R. Billik, R.A. Superna &lt;br&gt;The Hospital for Sick Children, Toronto.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>O</td>
<td>1145-1200</td>
<td>DEFECTIVE CHOLINERGIC INNERVATION IN PYLORIC MUSCLE OF PATIENTS WITH HYPERTROPHIC PYLORIC STENOSIS &lt;br&gt;Hiroiuki Kobayashi, D. Sean O'Brien and Prem Puri &lt;br&gt;Children's Research Centre, Our Lady's Hospital for Sick Children Crumlin, Dublin 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1200-Tue.</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>O</td>
<td>1200-1215</td>
<td>INTUSSUSCEPTION IN THE 90S: HAS 25 YEARS MADE A DIFFERENCE? Hospital for Sick Children, Toronto, Ontario &lt;br&gt;Sigmund H. Ein, Douglas Alton, Steven B. Palder, Barry Shandling, &lt;br&gt;David A. Stringer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>C</td>
<td>1215-1220</td>
<td>CECAL VOLVULUS IN THE CORNELiae de LANGE SYNDROME &lt;br&gt;K. Husain, P. Fitzgerald, G. Lau &lt;br&gt;Children's Hospital at Chedoke-McMaster Hamilton, Ontario</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>C</td>
<td>1220-1225</td>
<td>GASTROINTESTINAL MUCORMYCOSIS CAUSING AN ACUTE ABDOMEN IN THE IMMUNOCOMPROMISED PEDIATRIC PATIENT: THREE CASES &lt;br&gt;C. Vadeboncor, J.M. Walton, J. Raisen, P. Soucy, H. Lau, S. Rubin &lt;br&gt;Children's Hospital of Eastern Ontario, Ottawa, and IWK Hospital, Halifax</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1225-Tue.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>O</td>
<td>1230-1245</td>
<td>THE MANAGEMENT OF THE ACUTE ABDOMEN IN THE PAEDIATRIC PATIENT WITH VENTRICULAR PERITONEAL SHUNT &lt;br&gt;Dr. H. Leishram, Dr. R. Kennedy, Dr. D. Price, Dr. F. Maroun, &lt;br&gt;Dr. J. C. Jacob, &lt;br&gt;The Dr. Charles A. Janeway Child Health Centre, St. John's</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tue. Sep 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1300-Tue.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sep 14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MEMBERS' BUSINESS MEETING AND LUNCH</td>
</tr>
<tr>
<td>#</td>
<td>CL.</td>
<td>TIME</td>
<td>TITLES/AUTHORS/CENTRE</td>
</tr>
<tr>
<td>----</td>
<td>-----</td>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>42</td>
<td>O</td>
<td>0800-0815</td>
<td>SMALL INTESTINAL ATRESIA: EFFECT ON FETAL NUTRITION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Oct 15</td>
<td>H. Surana, P. Puri</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Research Centre, Our Lady's Hospital for Sick Children,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Crumlin, Dublin 12, Ireland</td>
</tr>
<tr>
<td>43</td>
<td>O</td>
<td>0815-0830</td>
<td>HOW ACCURATE IS PRENATAL SONOGRAPHY FOR THE DIAGNOSIS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>OF FETAL COLOANAL OBSTRUCTION?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B. Balin, J.E. Corvallie, J.C. Langer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Washington University, St. Louis, MO</td>
</tr>
<tr>
<td>44</td>
<td>C</td>
<td>0830-0835</td>
<td>SUCCESSFUL NON-OPERATIVE MANAGEMENT OF NECROTIZING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>ENTEROCOLITIS (NEC) IN AN INFANT FOLLOWING ORTHOTOPIC LIVER</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TRANSPLANTATION (OLT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kurt F. Heiss, &amp; Thomas Dodson</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Egleston Children's Hospital, Pediatric Surgery and Transplant Services,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Atlanta, Georgia</td>
</tr>
<tr>
<td>45</td>
<td>C</td>
<td>0835-0840</td>
<td>EXTREME SHORT-BOWEL SYNDROME:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>a ten-year follow-up case report</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ray Postuma, Stanley P. Moroz and Frank Friesen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Winnipeg Children's Hospital, Winnipeg, Canada</td>
</tr>
<tr>
<td>46</td>
<td>O</td>
<td>0845-0900</td>
<td>DIAMOND-FLAP ANOPLASTY IN INFANTS &amp; CHILDREN WITH INTRACTABLE ANAL STRUTURE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Hospital Los Angeles, and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's National Medical Center, Washington, D.C.,</td>
</tr>
<tr>
<td>47</td>
<td>O</td>
<td>0900-0915</td>
<td>MUCOSAL PERMEABILITY AFTER ISCHEMIA-REPERFUSION INJURY (IRI): AN EXPLORATION OF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>POSSIBLE MECHANISMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>JC Langer, SS Sohal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>McMaster University, Hamilton, Ontario</td>
</tr>
<tr>
<td>48</td>
<td>O</td>
<td>0915-0930</td>
<td>THE ISOLATED BOWEL SEGMENT: THE EFFECT OF NITRIC OXIDE SYNTHASE INHIBITOR ON BOWEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>MOTILITY.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Isao Shihara, Hisashi Ohita and Ken Kimura</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The University of Iowa College of Medicine</td>
</tr>
<tr>
<td>49</td>
<td>O</td>
<td>0930-0945</td>
<td>PLASMA ENDOThELIN LEVELS IN CONGENITAL DIAPHRAGMATIC HERNIA (CDH)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>Hiroyuki Kobayashi &amp; Prem Puri</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children's Research Centre, Our Lady's Hospital for Sick Children,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Crumlin, Dublin 12, Ireland</td>
</tr>
<tr>
<td>50</td>
<td>C</td>
<td>0945-0950</td>
<td>GASTROESOPHAGEAL REFLUX ASSOCIATED WITH LARGE DIAPHRAGMATIC HERNIAS.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>Sigaret DL, Hong AR, Adolph V, Laberge J-M, Nguyen LT, Guttman FM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Montreal Children's Hospital, Montreal, Quebec</td>
</tr>
<tr>
<td>51</td>
<td>C</td>
<td>0950-0955</td>
<td>FRYNS SYNDROME: A RARE FAMILIAL CAUSE OF CONGENITAL DIAPHRAGMATIC HERNIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>JC Langer, AL Winthrop, D Whelan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>McMaster University, Hamilton, Ontario</td>
</tr>
<tr>
<td>52</td>
<td>O</td>
<td>1000-1015</td>
<td>IMPROVED SURVIVAL OF CONGENITAL DIAPHRAGMATIC HERNIA BASED ON PRENATAL ULTRASOUND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wed. Sep 15</td>
<td>DIAGNOSIS AND REFERRAL TO A COMBINED OBSTETRICAL-PEDIATRIC SURGICAL CENTER</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>K.S. Shaw, D. Filiatrault, S. Yazbeck and D. St-Vil</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hôpital Sainte-Justine, Montreal (Quebec)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>1015-1045</td>
<td>COFFEE</td>
</tr>
<tr>
<td>#</td>
<td>CL.</td>
<td>TIME</td>
<td>TITLES/AUTHORS/CENTRE</td>
</tr>
<tr>
<td>----</td>
<td>-----</td>
<td>------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 53 | O   | 1045-1100  | ACCURACY OF DOPPLER SONOGRAPHY IN THE EVALUATION OF ACUTE CONDITIONS OF THE SCROTUM IN CHILDREN  
S. Yazbeck and H. Patriquin  
Hôpital Sainte-Justine, Montreal (Quebec) |
|    |     | Wed. Sep 15|                                                                       |
| 54 | O   | 1100-1115  | URETHRAL PROLAPSE IN GIRLS - THE JAMAICAN EXPERIENCE  
S. Venugopal, N.D. Duncan; R.A. Carpenter  
University of the West Indies |
|    |     | Wed. Sep 15|                                                                       |
| 55 | O   | 1115-1130  | PYLOROMYOTOMY - COMPARISON BETWEEN LAPAROSCOPIC AND OPEN SURGICAL TECHNIQUES  
Ronald J. Scorpio, Hock L Tan & John M Hutton  
The Royal Children's Hospital, Melbourne AUSTRALIA |
|    |     | Wed. Sep 15|                                                                       |
| 56 | C   | 1130-1135  | THE FEASIBILITY OF LAPAROSCOPIC SWENSON PULLTHROUGH  
Thomas J. Curran and John G. Raffensperger  
The Children's Memorial Hospital, Chicago, Ill. |
|    |     | Wed. Sep 15|                                                                       |
| 57 | C   | 1135-1140  | ANTERIOR SAGITTAL ANORECTOPLASTY FOR LOW IMPERFORATE ANUS  
K. Pippus, H. Lau, P. Fitzgerald  
Izaak Walton Killam Children's Hospital, Halifax, Nova Scotia |
|    |     | Wed. Sep 15|                                                                       |
| 58 | O   | 1145-1200  | A STUDY OF INTRA-ABDOMINAL CO2 INSUFFLATION IN THE PIGLET.  
A. Graham, D. Jirsch, K. Barrington, A. Hayashi  
Surgical Medical Research Institute, University of Alberta, Edmonton. |
|    |   R| 1200       |                                                                       |
|    |     | Wed. Sep 15|                                                                       |

CLOSING REMARKS AND ADJOURNMENT

legend:

O-Original, 10 minute paper, followed by 5 minute discussion  
R-Resident paper presentation, eligible for Resident Paper Prize Competition  
C-Case presentation, Special technique or Methods; 5 minute presentation followed by 5 minute discussion after the second Case Presentation; not eligible for Resident Paper Prize Competition

Underlined name indicates the Presenter

Authors are reminded to submit SIX copies of their paper THREE weeks before the meeting to the chairperson of the Publication Committee,

Dr. Salam Yazbeck  
Chair, CAPS Publication Committee  
Hôpital Ste. Justine  
3175 Cote Ste. Catherine  
Montreal, PQ, H3T 1C5
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
1. Monday, 0800-0815; O, R

THE SPECTRUM OF PEDIATRIC TRAUMA RECEIVED BY THE UNIVERSITY OF ALBERTA HOSPITALS: FACTORS AFFECTING THE MORBIDITY OF RURAL COMPARED TO URBAN TRAUMA

Natalie L. Yanchar, J.D. Fischer

University of Alberta Hospital, Edmonton, AB

The University of Alberta Hospitals (UAH) receives trauma from the city of Edmonton as well as being the referral center for northern Alberta and parts of the Northwest Territories. We wished to examine the spectrum of pediatric trauma received at the UAH and examine factors that affect the morbidity of these cases, specifically focusing on rural as compared to urban trauma.

The records of 367 children, aged 0 to 16 years, were reviewed for the period of July 1, 1990 to June 20, 1991. 326 of these children were admitted to the UAH with a diagnosis of trauma while 41 died prior to reaching hospital. There were 105 cases from the urban population and 262 from the rural areas. The overall male:female ratio was 2.5:1.0 and the peak age was 16 years, with another small peak at 1 year. Almost one half of the cases occurred in the teen years, while 20% were aged 3 years or younger. The peak time of the year was the summer months (May, June and July) and the month of September. 69% of cases occurred during the daytime hours and approximately one third occurred at the child's home.

Blunt trauma accounted for two thirds of cases; falls and sports resulted in the majority of injuries while MVA and pedestrian accidents accounted for the most deaths. Burns made up 13% of injuries. 17% had a revised trauma score (RTS) of <12 and 13% had a pediatric trauma score (PTS) of <9; both being indicative of potentially major trauma. Musculoskeletal injuries occurred in 60% of cases and 17% sustained head injuries. 14% of patients sustained injuries to 2 or more body regions. 15% had an Injury Severity Score (ISS) of ≥10, indicative of major trauma. The mean length of stay was 8 days, with 70% of children staying less than that. 17% required special care units (PICU, neuro-ICU or the Burn Unit).

Because, unlike the urban group, many of the less serious rural cases do not come to the UAH, a direct comparison of the total number of urban and rural cases may not be valid. However, when only severe injuries are considered from both groups, certain trends could be seen. The male:female ratio was twice as high in the rural population and the mean age was higher. The rural population tended to have a higher proportion of MVA's, all-terrain vehicle (ATV) and large machinery accidents, and gasoline-involved fires or explosions. Bicycle and sport-related injuries were more prominent in the urban group. All firearm-related incidents occurred in the rural setting. The mean trauma and injury severity scores were worse in the rural population. The average length of stay was 13.4 days amongst the rural group compared to 11.4 for the urban cases, with a higher proportion of rural cases requiring special care units. Three children died while in hospital; all were injured in the rural setting. This data suggests that pediatric trauma received by the UAH from the rural setting may be associated with a slightly higher morbidity compared to the immediate urban population.

Dr. J. D. Fischer, 602, 8215-112 St.,
Edmonton, AB T6G 2C8;
Tel. 403-433-3107
Fax. 403 433-0289
SUCCESS WITH THE MODIFIED RAVITCH REPAIR OF PECTUS
EXCAVATUM USING A DACRON VASCULAR GRAFT SUBSTERNAL STRUT

Mark Lane-Smith, DA Gillis, PD Roy,
Izaak Walton Killam Hospital for Children, Halifax

Long-term follow-up was obtained for 161 patients who underwent a
modified Ravitch repair of pectus excavatum. In all cases, the substernal
strut was fashioned from a Dacron vascular graft. Follow-up was by
telephone (most cases) and also by office visit (63 cases). Follow-up time
was from 12 months to 23 years.

There were 11 pulmonary complications and 7 wound complications,
all minor. Four patients needed blood transfusion. There were no wound
infections.

One hundred and thirty-three patients (83%) had satisfactory chest
contour, while 17 had a fair result and a further 11 had frank recurrence. Risk
factors for poor contour were an asymmetric defect, increasing severity of
the defect, associated congenital anomalies, and increasing age and weight.
Of three patients with Marfan's Syndrome, all developed recurrence.

One hundred thirty (81%) had a satisfactory scar, while 31 had
hypertrophic scars. Risk factors for hypertrophic scar formation were
increasing age and weight, an asymmetric defect, and a "rib overlay" tripod
fixation technique used early in the series.

Factors not contributing to clinical outcomes include the sex of the
patient, the presence of a family history, thoracic or cardiac symptoms,
perioperative complications, the year of surgery, the type of incision, or the
surgeon.

The use of a Dacron strut is relatively easy and complication free. It
can be left permanently in situ. Long-term results are excellent, except in
patients with Marfan's syndrome, extensive or asymmetric deformity, and
possibly in older patients.

Dr. D. A. Gillis,
Department of Surgery, I.W.K. Hospital,
6850 University Avenue
Halifax, Nova Scotia B3J 3G9
Tel 902-428-8113
Fax 902-429-4026
PRIMARY SPONTANEOUS PNEUMOTHORAX IN CHILDREN

D. Poenaru, S. Murphy, S. Yazbeck
Hôpital Sainte-Justine, Montreal (Quebec)

In the absence of pediatric data, spontaneous pneumothorax is managed according to adult guidelines. Fifty-eight patients with primary spontaneous pneumothorax (PNO) were treated in our center over the last 20 years. Median age was 16.7 years with a male preponderance of 1.9 to 1.0. A total of 102 PNO were treated; 63% were left-sided. The risk of recurrence was 51% after one PNO and 56% after two. There were 4 metachronous bilateral PNO. Nonoperative management included tube drainage in 57% of cases (mean extent of PNO-53%). Forty percent of patients were treated by supplemental oxygen and observation without drainage (mean extent of PNO-23%). Eleven patients were treated as outpatients with Heimlich valves (mean extent of PNO-64%). Twenty-eight percent of patients required surgery (mean extent PNO-56%). Fourteen patients underwent bullectomy +/- pleurodesis. Thirteen of surgically treated patients had experienced at least two episodes of PNO. Primary spontaneous PNO in children occurs with a male predominance. Risk of recurrence after one episode is greater than in adults. Operative management by bullectomy +/- pleurodesis carries little morbidity, a high success rate and is recommended after the first recurrence. It is safe to manage younger children with observation as the size of PNO is usually smaller; thoracotomy was not necessary in children less than age 9.

Dr. Salam Yazbeck
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montreal (Quebec) H3T 1C5
Tel. (514) 345-4688
Fax. (514) 345-4964
4. Monday, 0845-0850; C (five minute paper, with discussion after the next short paper)

MASSIVE CHYLOTHORAX ASSOCIATED WITH LYMPHANGIOMATOSIS OF THE BONE

K. Canil, P. Fitzgerald, G. Lau
Children’s Hospital at Chedoke - McMaster Hamilton, Ontario

Chylothorax in the absence of trauma or tumor is rare. Congenital lymphangiomatosis of the bone although extremely rare, has been associated with chylothorax. The skeletal lymphangiomas can be localized to one anatomic region or be diffuse, and can occur with or without soft tissue or visceral involvement.

We describe the case of a 12 year old male who presented with a symptomatic left chylothorax associated with lymphangiomatosis of the ribs, clavicles and pleura. Massive fluid losses (chyle) occurred despite tube thoracostomies and initiation of bowel rest and TPN. The patient developed a mild hypoproteinemia and a severe lymphopenia. Control of the chylothorax was achieved by an extensive pleurectomy and application of fibrin glue (Tisseel).

A review of the available literature has revealed a small number of cases of chylothorax secondary to lymphangiomatosis of the bone, reinforcing this as a diagnostic consideration in patients with chylothorax. Diagnostic approach, treatment options and prognosis in this rare and serious condition are reviewed.

Dr. George Lau

Dr. Peter Fitzgerald
Department of Surgery, McMaster University
1200 Main Street West,
Hamilton, ON, L8N 3Z5
Tel. 416-521-2100
Fax. 416-521-9992
5. Monday, 0850-0855; C (five minute paper, followed by a five minute discussion of this and the previous short paper)

THE USE OF HUMAN DURA MATER IN PEDIATRIC CHEST WALL RECONSTRUCTION FOLLOWING TUMOR RESECTION

M. Walton, J. Bass, E. Sambey, S. Rubin
Children's Hospital of Eastern Ontario, Ottawa

The most difficult aspect of the surgical treatment of chest wall tumors is the reconstruction of the large residual defect. Materials that have been used include: Marlex, Gore-Tex, bone, metal, and fascia. Our recent successful experience with dehydrated human dura (Tutoplast®) for moderate size chest wall defects is described.

A six year old female underwent left anterior chest wall resection of three ribs for an epidermoid sarcoma. Human dura plus with myocutaneous flap were used for reconstruction with good functional and cosmetic results at 15 months follow-up. A large Askin's tumor in a thirteen year old boy required resection of the right posterior aspect of the ninth to eleventh ribs and the transverse process of D9-D11. The 12 x 12 centimetre thoracic defect was closed with dura. Partial soft tissue coverage was obtained with latissimus dorsi muscle. Although a scoliosis secondary to paraspinal muscle resection has developed, the chest wall is stable without evidence of flail at 16 months follow up.

Dura is simple to use, has a low antigenicity, and in experimental studies appears to be incorporated into the tissues acting as a collagen matrix. For moderate size chest wall defects it appears to offer an excellent alternative to synthetic prosthesis.

Juan Bass, M.D., FRCS(C)
Department of Surgery, CHEO, 401 Smyth Road, Ottawa, Ontario, K1H 8L1
Tel. 613-737-2799
Fax. 613-738-4840
LYMPHOPROLIFERATIVE DISEASE FOLLOWING PAEDIATRIC LIVER TRANSPLANTATION.

Glyn Morgan, Riccardo Superina
University of Toronto and The Hospital for Sick Children, Toronto, Ontario, Canada.

Post-transplant lymphoproliferative disease (LPD) is a serious complication associated with considerable morbidity and mortality. The purpose of this study is to report our experience with LPD in a series of paediatric liver recipients from 1986 to 1993. A total of 95 transplants were performed in 78 patients. Only the 66 patients who survived at least 30 days were included in the analysis. There were 7 cases of LPD for an incidence of 10.6%. Seven of 43 patients who received OKT3 developed LPD whereas none of the 23 patients who didn't receive OKT3 developed LPD (p<0.05). The total cumulative dose of OKT3 correlated with the occurrence of LPD, but not the dose per kilogram.

<table>
<thead>
<tr>
<th></th>
<th>OKT3 with LPD</th>
<th>OKT3 with no LPD</th>
<th>p value b</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>7</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>OKT3 (mg/patient)a</td>
<td>92.5±24.6</td>
<td>44.5±5.6</td>
<td>0.0055</td>
</tr>
<tr>
<td>OKT3 (mg/kg/patient)a</td>
<td>4.5±1.3</td>
<td>3.2±0.5</td>
<td>0.3251</td>
</tr>
</tbody>
</table>

a mean SEM  b unpaired two tail t-test

Five of 15 patients who received ≥50 mg OKT3 developed LPD whereas 2 of 28 patients who received <50 mg OKT3 developed LPD (p<0.05). The median time from transplant to diagnosis was 90 days. All cases were immunoblastic B cell lymphomas and positive for Epstein-Barr virus (EBV). Three patients never treated for LPD died since it was discovered incidentally at autopsy in 2 and during re-transplant in a third. The other 4 were treated with decreased immunosuppression, acyclovir, gamma globulin, and alpha interferon. Two of the 4 patients survived. LPD may be interpreted as a symptom of a chronically over-immunosuppressed state associated with a high mortality from a variety of causes. LPD should be suspected in any patient whose clinical condition is deteriorating with no clear evidence of rejection, and should lead to a decrease in the amount of immunosuppression.

Riccardo Superina M.D., F.R.C.S.C.
Suite 1526 The Hospital for Sick Children
555 University Ave. Toronto, Ontario. M5G IX8
Tel. (416) 813-6357
Fax. (416) 813-6846
7. Monday, 0915-0920; C (five minute paper, with discussion after the next short paper)

PEDIATRIC MALIGNANT PHEOCHROMOCYTOMA

Hospital for Sick Children, Toronto;
Alberta Childrens Hospital, Calgary.

Pediatric malignant pheochromocytomas are very rare tumors and no institution sees more than one or two of these problem cases. We report two children with such tumors over a nine year period from two hospitals. In 1984, DM (14 years) presented with symptoms and signs of an extradural metastasis from a right adrenal primary; he also had lung and bone metastases. After spinal decompression and biopsy he was given chemotherapy for almost four years and remains well and in remission six years there-after. In 1987, GR (13 years) presented with a large right adrenal malignant pheochromocytoma invading surrounding structures; he also had a liver metastasis. Preoperative chemotherapy did not shrink the tumor much and it was grossly resected with many postoperative problems. In 1990 he developed bone metastases for which he received radiotherapy and chemotherapy. Three years later, his metastases have not disappeared, he remains on chemotherapy, and his liver function is borderline. From our small experience as well as a literature review, it appears that: surgical excision remains the treatment of choice for the pediatric malignant pheochromocytoma; unresectable tumors may be rendered resectable by intensive chemotherapy (similar to that utilized for neuroblastoma); adjuvant chemotherapy should be used for residual disease after surgery and for metastatic disease.

Sigmund H. Ein M.D.
250 Lawrence Ave, W., #315
Toronto, On M5M 1B2
Tel. 416-781-1411
Fax. 416-444-1809
REPORT OF THREE GASTRIC TUMOURS IN CHILDREN

S. Murphy, K.S. Shaw, H. Blanchard
Hôpital Sainte-Justine, Montreal (Québec)

The literature concerning gastric tumours in children is mainly limited to case studies. We reviewed 1,403 histology reports of pediatric gastric pathology covering a 10-year period at our center. There were three gastric tumors of benign histology and no malignant tumours.

The first case is a 15-month-old girl who presented with a short period of vomiting. Upper GI series revealed gastric outlet obstruction. She underwent laparotomy and was found to have intussusception of a gastric polyp into the proximal jejunum and an associated malrotation. Ladd's procedure, gastroduodenostomy with reduction of intussusception and excision of gastric polyp were performed. Histology of tumor was hamartoma.

The second case is a 9½ year-old male who presented with several months of symptomatic, pH confirmed gastro-esophageal reflux. He underwent a Toupet antireflux valve. At laparotomy, a submucous mass was discovered incidentally on the greater curvature of the stomach. Mass was excised. Pathology revealed ectopic pancreas.

The third case is a 6-year-old boy who presented with a microcytic anemia. Endoscopy revealed several friable bleeding gastric masses. The patient underwent laparotomy with partial gastrectomy and pyloroplasty. Histologic section showed the tumour to be plasma cell granuloma.

We confirm that gastric tumours in children are exceedingly rare. While tumour histology may be benign, excision of the tumour may require major operative resection.

Dr. Hervé Blanchard
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montréal (Québec) H3T IC5
Tel. 514-345-4688
Fax. 514-345-4964
SPLENECTOMY, BEFORE OR AFTER TUMOR INDUCTION, DOES NOT AFFECT TUMOR GROWTH IN C-1300 MOUSE NEUROBLASTOMA

Irwin H. Krasna, Richard Lee
UMDNJ-Robert Wood Johnson Medical School,
New Brunswick, New Jersey

Many experimental tumor systems are affected by splenectomy. Some existing tumors grow more rapidly and widespread after splenectomy, and in other systems splenectomy increases survival and reduces tumor growth and mortality. Splenectomy prior to tumor induction increases resistance to tumor growth in many systems and suppresses natural immunity and increases tumor growth and mortality in others. C-1300 mouse neuroblastoma is an experimental tumor system resembling human neuroblastoma as regards growth characteristics, metastases, catecholamine products, and immunogenicity. It is therefore to be expected that splenectomy in this system should affect tumor growth, and the following experiments were performed to study the effects of splenectomy on tumor growth.

Animals were divided into two groups; 1) Sham (laparotomy alone), and 2) Splenectomy. There were 15 animals in each group. Two groups were studied; A) Splenectomy or sham first, followed by tumor induction six weeks later, B) Tumor induction first, followed by splenectomy or sham five days later. The tumors were measured every three to four days beginning on day 13-14 when a visible and palpable tumor was present.

We also studied autotransplantation of the spleen in the same groups (splenectomy first, tumor induction first) A) autotransplantation to the free abdominal cavity, B) to the omentum, C) to a subcutaneous pouch.

Result - There was no difference in tumor growth or mortality between the sham or the splenectomized groups or the autotransplanted groups, regardless of when the splenectomy is done (before or after tumor induction). This was a surprising finding since C-1300 neuroblastoma is such a well known immunogenic tumor, and it would be reasonable to assume that splenectomy should affect tumor growth.

Irwin H. Krasna, M.D.
UMDNJ-Robert Wood Johnson Medical School
One Robert Wood Johnson Place, CN-19
New Brunswick, NJ 08903-0019
Tel. (908) 937-7821
Fax. (908) 418-8013
OMENTAL-MESENTERIC PLASMA CELL GRANULOMA

S.P. Treissman, D.A. Gillis, C. Lee, M. Giacomantonio,
L. Resch and P. Barnes
The Izaak Walton Killam Hospital, Halifax, Nova Scotia

Because extrapulmonic Plasma Cell Granuloma is an uncommon lesion in adults and children, little is known either of its etiology, or clinical characteristics. However, it remains a significant source of morbidity to patients, and confusion to clinicians. The present paper presents case reports of three patients with intra-abdominal Plasma Cell Granuloma who underwent surgery at our center recently. A review of the recent world literature is also presented. Clinical, and laboratory characteristics of omental-mesenteric plasma cell granuloma are reviewed, along with a theoretical discussion as to etiology. The finding of a chromosome translocation between the long arm of chromosome two, and the short arm of chromosome nine is presented ( (2;9) (q1 3; p2 2) ) and may represent a genetic initiator of tumor growth. Omental-mesenteric Plasma Cell Granuloma appears to represent a distinct clinicopathologic entity, as a benign neoplasm, in the pediatric age group.

Key words: Plasma Cell Granuloma, Benign neoplasm, Cytogenetics, Chromosome translocation.

Dr D.A. Gillis
The Izaak Walton Killam Children's Hospital
5850 University Avenue
Halifax, NS B3J 3G9
Tel. (902) 428-8113
Fax. (902) 429-4026
Monday, 0950-0955; C (five minute paper, followed by a five minute discussion of this and the previous short paper)

CYSTIC MESOTHELIOMA OF THE PERITONEUM: A RARE CAUSE OF 'ASCITES' IN CHILDREN

E. Dykes, M. McCullagh, A Khan, C Keene
Children's Hospital Lewisham, London, UK

A 4 year old girl presented with a 3 month history of progressive painless abdominal distension. Clinical examination suggested massive ascites but no other symptoms or signs could be elicited. There was no history of any illness preceding the onset of distension.

Ultrasound and CT Scan showed extensive ascites with multiple thin-walled loculi throughout the abdomen from diaphragm to pelvis. A pre-operative diagnosis of intra-abdominal lymphangiomatosis was made. At laparotomy, multiple transparent cysts were found throughout the peritoneal cavity. There was no evidence of malignancy in any organ and the cysts appeared almost completely avascular. Many were free-floating and contained cholesterol-like crystals.

Histological findings were compatible with a diagnosis of benign cystic mesothelioma of the peritoneum. This is a rare condition which had previously only been reported in adults. It is thought to represent a borderline variant between the better known benign adenomatoid lesion and true malignant mesothelioma. The aetiology is unknown. Experience in adults suggests a potential for recurrence but no progression to malignant disease.

Evelyn H. Dykes
Children's Hospital
Lewisham London SE13 6LH, U.K.
Tel. 44-(0)81-690-4311
Fax. 44-(0)81-690-1963

1000-1030 Coffee Break
12. Monday, 1030-1035; C (five minute paper, with discussion after the next short paper)

**BRONCHOBILIARY FISTULA**

*James D. Fischer,*
Children's Health Centre, University of Alberta Hospital, Edmonton, AB

A newborn female was referred for investigation of gastroesophageal reflux. Upper GI, endoscopy and 24 hour pH monitoring revealed severe reflux. A fundoplication was carried out. In the early postoperative period bile was noticed to be coming from the endotracheal tube. Bronchoscopy revealed an abnormal opening just to the left of the carina. Fistulogram and Hida scan of the liver confirmed a broncho-biliary fistula. A right thoracotomy was used to divide the fistula. The child made an uneventful recovery. Pathology revealed tissue most consistent with esophageal origin.

Broncho-biliary fistula is unusual with fewer than 20 cases in the literature. The author will discuss the investigation and treatment options which this literature review has revealed.

*James D. Fischer*
602, 8215-112 Street
Edmonton, AB T6G 2C8
Tel. 403-433-3107
Fax. 433-0289
CERVICAL APPROACH FOR THE REPAIR OF ESOPHAGEAL ATRESIA

H. Kemmotsu, K. Joe, H. Nakamura, M. Yamashita
Ibaraki Children’s Hospital, Mito, JAPAN

The repair of esophageal atresia and tracheoesophageal fistula (TEF) is usually performed by the thoracic approach. In cases of TEF with high position, however, cervical approach is an alternative. In the literature, we could find only three patients repaired by this approach. We would like to report on three additional cases successfully repaired by the cervical approach.

Case one was a female infant transported to our hospital with the diagnosis of esophageal atresia and TEF. A bronchoscopy confirmed double fistulae located in an unusually high position. Transillumination, with the bronchoscope in place at the fistula, demonstrated the distal fistula at the suprasternal notch. Because of the location of the two fistulae above the clavicle, the cervical approach was chosen. The two fistulae were adequately exposed by a right cervical incision, and the repair was completed successfully.

Case two was a female infant referred to us, because a nasogastric tube could not be inserted. After the diagnosis of esophageal atresia and distal TEF, she underwent bronchoscopy, which revealed the TEF at an unusually high position -- at the suprasternal notch. The repair was carried out by a right cervical approach.

Case three was a premature female infant with esophageal atresia and distal TEF. The light of bronchoscope in place at the TEF was observed dimly at the suprasternal notch, and the light was observed distinctly at the notch when the bronchoscope was moved up to 6 mm from the TEF. Again the repair was carried out by the cervical approach.

sponsor: Dr. C. Geoffrey F. Seagram,

Hisao Kemmotsu, M.D., Ph.D.
Ibaraki Children’s Hospital
3-3-1 Hutabada Mito. 311-41 JAPAN
Tel. 011-81-292-54-1151
Fax. 011-81-292-54-2382
PURE ESOPHAGEAL ATRESIA: A 50 YEAR REVIEW

Sigmund H. Ein, Barry Shandling
Hospital for Sick Children, Toronto, Ontario, Canada

This review encompasses 50 years from 1942 - 1991 inclusive and evaluates 69 newborns (43 boys, 26 girls). Half of these babies were premature (less than 2.5 kg) and about one-third had other anomalies. The following procedures were used in this series: delayed primary anastomosis 17, gastric tube 16, staging (esophagostomy and gastrostomy) 14, gastric pullup 12, early primary anastomosis 3, colon replacement 3. Four neonates received no treatment. The commonest repair in the 1940s and 1950s was the gastric pullup, and the gastric tube was most popular in the 1960s and 1970s. The delayed primary anastomosis has been the operation of choice since the 1980s. Over the last decade, it has become apparent that 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. This repair seems to offer the baby the best functional result unless there is an anastomotic stricture. Prior to the 1970s, the survival rate was below 40% put since the 1980s this has more than doubled to 90% in our series regardless what repair is used.

Sigmund H Ein M.D
250 Lawrence Ave W., #315
Toronto Ontario M5M 1B2
Tel. (416) 781-1411
Fax. (416) 444-1809
15. Monday, 1100-1105; C (five minute paper, with discussion after the next short paper)

AORTO ESOPHAGEAL FISTULA: CONGENITAL AND ACQUIRED CAUSES


Aorto esophageal fistula (AEF) is a rare, but lethal cause of upper gastrointestinal bleeding. To date only 7 cases have been reported in pediatric patients. This report outlines our experience with four cases and the principles of management.

The congenital cause of AEF is vascular rings. Cases I and II occurred in association with double aortic arch (complete vascular ring); Case I after prolonged NG tube intubation. Both children had massive upper GI bleeds, with bright red blood. In Case I, endoscopy in the OR was performed with the surgical team on standby. Unfortunately after thoracotomy with initial control of bleeding the child died. In Case II, endoscopy was performed, the bleeding site was identified, but not recognised as an AEF. The vascular ring was corrected; during the repair the fistula was recognised and controlled. This is the second reported survivor of AEF.

The third and fourth cases were acquired causes; in case three the fistula developed at the site of PDA ligation, and in the fourth at the level of an impacted button battery. Both cases presented with massive bright red upper GI bleeding; after delayed diagnosis, the bleeding could not be controlled operatively, and the children died.

These cases demonstrate that massive upper GI bleeding should suggest AEF. If suspected, management is aggressive operative treatment. In cases of known vascular ring, NG intubation is contraindicated.

David L Sigalet MD
Dept. of General Pediatric Surgery
Montreal Children's Hospital
2300 Tupper Street, Montreal H3H 1P3
Tel. (514) 934-440 ext. 2938
Fax. (514) 934-4341
ESOPHAGO-TRACHEAL FISTULA SECONDARY TO FOREIGN BODY IMPACTION IN FOUR CHILDREN

Borghol, M., Al-Rabeeah A., Jawad A., Al-Sammarrai A.I.Y., and Al-Mubeirek K.,
King Faisal Specialist Hospital & Research Centre and King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia

Four children aged 18 months to 6 years with an esophago-tracheal fistula secondary to foreign body impaction were seen in a six-year period. The foreign body was a pistachio shell in two children and a beverage can ring in two. Clinical presentation included dysphagia, vomiting, episodes of coughing and repeated chest infections. A history of swallowing a foreign body was not available in any patient. Routine chest x-ray film usually showed a soft tissue shadow but failed to identify the foreign body, computerized tomography being necessary. Contrast studies of the esophagus together with endoscopy were usually necessary to clarify the diagnosis. The fistula was repaired at thoracotomy with a satisfactory outcome in all cases.

Foreign bodies are frequently ingested by children and the majority are passed on harmlessly. However, a sharp foreign body may easily get impacted in the upper esophagus causing esophageal erosion leading to a "contained" perforation and eventually, an esophago-tracheal fistula. This complication causes serious morbidity and must be considered life-threatening. Diagnosis depends upon the history together with a high index of suspicion. It must also be appreciated that the foreign body may be radiolucent and not detectable on conventional radiology. Surgical repair of the esophago-tracheal fistula is essential. Public awareness about the risks of allowing children to place foreign objects in their mouth is necessary. Special legislation to stop manufacture of beverage cans with detachable rings should be universally adopted.

sponsor: D.A. Gillis

Dr. Abdallah Al-Rabeeah,
Department of Surgery,
King Faisal Specialist Hospital & Research Centre,
PO Box 3354,
Riyadh 11211, Kingdom of Saudi Arabia
Tel. 966-1-442-7751
Fax. 966-1-442-7772
RESULTS AND COMPLICATIONS OF TOUPET ANTIREFLUX SURGERY-
10 YEAR EXPERIENCE

S. Leclerc, S. Yazbeck, A L. Bensoussan
Hôpital Sainte-Justine, Montreal (Quebec)

Between 1981 and 1991, 112 patients underwent the Toupet antireflux surgical procedure (fixed posterior 270° wrap). The mean age at surgery was 39 months (range 3 weeks to 19 years). Thirty percent of the patients were neurologically impaired. Gastro-esophageal reflux was assessed and confirmed by either barium swallow, 20 hour pH monitoring, nuclear medicine study or endoscopy. The indication for surgery was the failure of medical treatment in patients with predominant respiratory symptoms (53), nutritional problems (37) or esophageal inflammation (22). The posterior (270°) wrap was performed over an esophageal bougie with approximation of the crura as described in the original technique. A gastrostomy was performed in 19 patients (17%) for feeding purposes. One hundred and six patients (95%) had a 31 month mean follow-up. Nine patients (8%) presented with early postoperative complications: intestinal obstructions (3), wound infections (2) or respiratory problems (4). Thirteen patients (12%) presented with late postoperative complications: recurrence of symptoms (4), symptomatic or asymptomatic intrathoracic wrap herniation. Eight patients died for reasons unrelated to surgery or to the initial reflux symptoms. Our results of the Toupet procedure (96% of the patients free of symptoms at the end of the follow-up), compare favorably with the Nissen procedure without the inconvenience of gas-bloat syndrome or inability to belch and/or vomit. In the patients with the longest follow-up the results appear to be stable.

Dr. A.L. Bensoussan
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montreal (Quebec) H3T 1C5
Tel. (514) 345-4688
Fax. (514) 345-4964
RESPIRATORY COMPLICATIONS FOLLOWING SUCCESSFUL NISSEN FUNDOPICATION IN NEUROLOGICALLY IMPAIRED CHILDREN

Molloy M, Galapon DB, Hale DA, Robie DK, Latimer JS, Pearl RH
Walter Reed Army Medical Center, Washington, D.C.

A modification of the Nissen fundoplication was designed to reduce the incidence of wrap failure. This revised procedure was prospectively studied in 51 children between 1988 and 1992. Indications for the procedure were: respiratory disease with reflux, 32 patients (63%); malnutrition, 18 (35%); and esophagitis, one (2%). Forty seven patients (92%) were neurologically impaired.

There were four perioperative deaths (8%). There were eight subsequent deaths (16%), five from respiratory complications (mean survival: 12 months, range: two to 23 months). The 39 surviving patients were followed for a mean of 22 months (range: two to 48 months). Eighteen (38%) required admission for respiratory infections. Fourteen (78%) of these had an UGI series demonstrating an intact fundoplication and no reflux. Two patients (11%) had wrap disruption.

Of the 32 patients undergoing antireflux surgery for respiratory disease with reflux, nine (28%) have died and 12 (38%) have required subsequent admission for treatment of respiratory infections. Three (17%) of the 18 patients operated on for malnutrition died, all from respiratory disease, and five others (28%) have been admitted for respiratory infections. The combined respiratory morbidity and mortality was 49%.

Two (4%) wrap failures occurred in this study. This incidence compares favorably to our previously reported rate of 19% using an unmodified procedure. An anticipated concomitant reduction in respiratory complications was not observed.

We conclude that respiratory infections continue to produce substantial morbidity and mortality in pediatric patients following successful Nissen fundoplication. These results suggest that pathophysiologic mechanisms other than gastro-esophageal reflux contribute to the development of respiratory infections in this population.

Richard H. Pearl, LTC(P) MC
General Surgery Service
Walter Reed Army Medical Center,
Washington, D.C. 20307-5001
Tel (202) 576-2125
Fax (202) 576-0759
CILIARY FUNCTION TESTS - CAN WE DETECT RECURRENT ASPIRATION IN CHILDREN WITH GASTROESOPHAGEAL REFLUX?

W. A. McCallion, A. Li Wan Po, S.R. Potts
Royal Belfast Hospital For Sick Children

Respiratory tract disease associated with gastro-oesophageal reflux may be reflex, vagally mediated or the result of aspiration. However the pathogenesis is unclear in most cases. The aim of this paper is to determine if ciliary motility is impaired by exposure to acid and to explore its potential in the diagnosis of recurrent microaspiration of gastric contents.

Cilia from the inferior turbinates of healthy adult volunteers were obtained by brush cytology. Controls were incubated in growth medium (pH 7.4) at 37C. The remaining ciliated epithelium was either incubated in growth medium at pH 4, 5 or 6, or exposed transiently to pH 2, pH 3, gastric juice (GJ), milk or saliva followed by "rescue" into growth medium (pH7.4) at 37C. Ciliary beat frequency (CBF) was measured using a computerised photometric technique.

Prolonged incubation at pH 6 and pH 5 significantly reduced CBF; incubation at pH 4 was ciliostatic. Repeated transient exposure to milk saliva and pH 3 had no effect on ciliary motility. Two or more transient exposures to pH 2 or GJ significantly impaired CBF (p<0.05).

Transient in vitro exposure of ciliated epithelium to low pH or gastric juice significantly impairs ciliary activity. This suggests that recurrent microaspiration of gastric contents as opposed to oropharyngeal contents has a deleterious effect on ciliary function. An assessment of tracheal CBF may be useful in diagnosing recurrent microaspiration in children with GOR.

sponsor: Professor B O'Donnell

Mr. S. R. Potts,
Consultant Paediatric Surgeon, R.B.H.S.C.
Falls Road
Belfast, Northern Ireland, UK
20. Monday, 1145-1155; O, R

COMPLICATION RATES OF TOUPEET AND NISSEN FUNDOPPLICATIONS IN NEUROLOGICALLY IMPAIRED CHILDREN.

S. Logsetty, D.E. Wesson, X. Hu, J. Zacks, R.M. Filler
Hospital for Sick Children, University of Toronto, Toronto

Although Nissen fundoplication (NFP) has been the standard antireflux procedure at our hospital for some years, we are dissatisfied with the results of this procedure in neurologically impaired (NI) children. Because of this, we have performed the Toupet fundoplication (TFP), on a pilot basis, and have retrospectively reviewed our experience over a 2 1/2 year period, with both the NFP and the TFP in NI children. A total of 39 children, 13 TFP and 26 NFP with follow up ranging from the day of discharge to 30 months post operatively were reviewed. The incidence of the following adverse outcomes related to the operation was compared for each group: paraesophageal hernia (slipped wrap), small bowel obstruction, relaparotomy, 'gas bloat', perioperative mortality, and late deaths due to reflux.

Adverse outcomes in the NFP group consisted of: 'gas bloat' (5) and slipped wraps (5). There was no perioperative mortality in either group. Although there were 4 late deaths in the TFP group [due to congenital heart disease (1), respiratory failure (3)], only one had any evidence of reflux (vomiting) at the time of death. This was the only adverse outcome in the TFP group. The incidence of adverse outcome was 8% (1/13) in the TFP group and 38% (10/26) in the NFP group. The difference in rates is not statistically significant using Fisher's exact test (p=0.06). Because of the small sample size, the power (the probability of detecting a difference if a true difference exists) of the study is only 0.50. Despite this, the striking difference in the pattern of adverse outcomes between the two groups, particularly the absence of 'gas bloat' and slipped wraps in the TFP group, seems to indicate that some complications are specific to the NFP and can be prevented by performing TFP. If substantiated by a prospective randomized trial, this difference could decrease the suffering of these already challenged children.

<table>
<thead>
<tr>
<th></th>
<th>AGE (YRS)</th>
<th>FOLLOW UP</th>
<th>MORTALITY</th>
<th>MORBIDITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOUPEET N=13</td>
<td>3.2±4.1</td>
<td>3.8±3.8 months</td>
<td>Periop:8%(0-37%)†</td>
<td>0%</td>
</tr>
<tr>
<td>NISSEN N=26</td>
<td>4.5±5.1</td>
<td>14.7±9.3 months</td>
<td>Periop:0%</td>
<td>38% (20-59%)†</td>
</tr>
</tbody>
</table>

Dr. D. E. Wesson
Hospital for Sick Children
555 University Avenue,
Toronto, ON M5G 1X8
Tel. (416) 813-6766; Fax. (416) 813-4986
ROUND TABLE DISCUSSION FOLLOWS THIS PAPER
Monday, September 13, 1993
1215-1315

FRED MacLEOD LECTURE

DR. KEITH W. ASHCRAFT

"MANAGEMENT OF THE DIFFICULT ESOPHAGUS"

Dr. Ashcraft's biography appears on page xxii

13:15 LUNCH: PLEASE MAKE YOUR OWN ARRANGEMENT (see listing p xii)
15:30 Buses leave for Butchart Garden
THROMBOTIC COMPLICATIONS OF SAPHENOUS CENTRAL LINES

K. Pippus, E. P. Rees, D. A. Gillis, J. M. Giacomantonio
The Izaak Walton Killam Children's Hospital,
Halifax, Nova Scotia

Recent publications advocate central venous access by saphenous vein cutdown in the thigh. Even relatively inert silastic catheters are recognized to convey a risk of large vein thrombosis when maintained for lengthy periods. Thrombosis of the inferior vena cava and tributaries places the patient at risk for a spectrum of problems not associated with superior vena cava cannulation. We describe 46 NICU patients with central venous cannulation of greater than two weeks. Prospective monitoring by ultrasound revealed a thrombosis rate of 16.6% for SVC cannulation and 28.5% for IVC cannulation. Complete occlusion of the IVC was clinically apparent and confirmed radiographically in three patients. One further patient developed bilateral renal vein thrombosis, contributing to her death. We compare our data for inferior versus superior caval cannulation and question whether the saphenous vein should be a primary route.

Dr. D. A. Gillis
The Izaak Walton Killam Children's Hospital
5850 University Avenue
Halifax NS B3J 3G9
Tel. (902) 428-8113
Fax. (902) 429-4026
SUBCUTANEOUS INFUSION PORTS IN THE PEDIATRIC HEMOPHILIA PATIENT

D.P. Girvan, L.L. deVeber, M.J. Inwood, E. Clegg
Children's Hospital of Western Ontario and Southwestern Ontario Regional Hemophilia Program, London, Ontario

The use of permanent venous access devices have become important tools in the management of pediatric patients with malnutrition, malignancy and infections requiring long term antibiotic treatment. The patient with hemophilia can present a lifetime challenge for venous access and at times can have an urgent and life threatening situation. Since 1986, we have implanted ten subcutaneous infusion ports in eight hemophilia patients. The systems have remained in place for up to seven years without major complication or problems. Two catheters have been replaced after six and four years for skin erosion and blockage respectively. One catheter has been removed after seven years because of blockage following local trauma.

The benefits of this system have been overwhelming enthusiasm by the parents and children and no major complications. A number of the patients are now HIV positive and are able to use their system for ongoing drug therapy.

Our local use of this system will be compared to national use obtained through the Canadian Hemophilia Centre Directors Group. Preparation of the hemophilia patient and peri and post operative management is discussed.

Dr. David P. Girvan
Children's Hospital of Western Ontario,
P.O. Box 5375,
London, ON, N6A 4G5
Tel. (519) 667-6622
Fax. (519) 667-6633
NERVE GROWTH FACTOR RECEPTOR (NGFR) STAINING OF SUCTION
BIOPSIES IN THE DIAGNOSIS OF HIRSCHSPRUNG'S DISEASE

Hiroyuki Kobayashi, D. Sean O'Briain and Prem Puri
Children's Research Centre, Our Lady's Hospital for Sick Children, Crumlin,
Dublin 12

The development of histochemical techniques for the detection of
acetylcholinesterase (AChE) represented a considerable advance in the
investigation of Hirschsprung's disease (HD). However, because occasional
false positive and false negative results occur, alternate diagnostic neuronal
markers have been sought.

Nerve growth factor (NGF) and its receptor (NGFR) are proteins that
have a role in the normal development and survival of neurons in the
peripheral and central nervous system. NGF is necessary for outgrowth of
axons and establishment of synapses, and NGFR is the transmembrane
protein that binds NGF and brings it into the cell.

We studied rectal suction biopsy material in 58 consecutive patients
suspected of having HD (age range 3 days to 12 years). Using AChE
staining, 10 patients had HD, one had neuronal intestinal dysplasia (NID) and
47 were normal. These diagnoses were confirmed by H&E staining of biopsy
material and by examination of surgically resected material in the HD and NID
cases. We stained these 58 cases with a monoclonal antibody to NGFR
using immunohistochemistry on fresh frozen biopsy tissue. In the 47 normal
biopsies, there were a large number of immunoreactive fibres in the lamina
propria and staining of the muscularis mucosae and submucous ganglia. In
contrast, there were no immunoreactive fibres in the lamina propria in
patients with HD and NID. A striking finding was the strong expression of
immunoreactivity on the perineurium of submucosal hypertrophic nerve
trunks in HD.

These results indicate that NGFR immunoreactivity is similar in
specificity and sensitivity to AChE in the diagnosis of HD. As the technique
uses an immunocytochemical rather than a histochemical technique and the
results were easier to interpret, in some cases NGFR may represent an
important additional technique in diagnosing HD.

sponsor: Ray Postuma, M.D.

Mr. Prem Puri
The Children's Research Centre,
Our Lady's Hospital for Sick Children,
Crumlin, Dublin 12, Ireland
Tel. 353-1-558111
Fax. 353-1-551045
INITIAL EXPERIENCE WITH ONE STAGE ENDORECTAL PULLTHROUGH PROCEDURES FOR HIRSCHSPRUNG'S DISEASE

Erik D Skarsgard, Riccardo A Superina, Barry Shandling, and David E Wesson,
Hospital for Sick Children, Toronto,

To evaluate our experience with one-stage endorectal pull-through (ERPT) procedures, (without colostomy) for Hirschsprung's disease, we compared 6 such patients to a cohort of 20, consecutive patients undergoing ERPT following colostomy. Reasons for exclusion from the cohort group included: 1) bowel obstruction requiring operation before 1 month of age, 2) presentation with enterocolitis, intestinal perforation, or massive fecal distension 3) long segment disease or 4) severe associated anomalies. Six patients presented at a median age of 26 days (4 d- 2.5 y), and in 5, surgery was deferred by regular digital dilation or colonic irrigation, with or without breastfeeding for between 1 and 6 months (median=2 months). Single stage ERPT procedures were performed at median age and weight of 4 months (2 months-2.5 years) and 6.4 kg (4.5-13.8 kg), respectively. Patients were hospitalized a median of 9 days, and the only postoperative complication was an anastomotic stricture requiring outpatient dilation. The cohort group (14 M, 6 F), presented at a median of 15 months. All underwent colostomy as a preliminary procedure. Pullthrough was deferred until a median age of 21 months, and the median hospitalization after pullthrough was 10 days (20 days including stay after colostomy). After colostomy construction 3 patients (15%), developed complications requiring reoperation. Complications after ERPT occurred in 3 patients (15%) consisting of Hirschsprung's enterocolitis, anastomotic stricture, and mucosal prolapse requiring anoplasty. Follow-up revealed excellent functional results in both groups. Despite our limited experience, we conclude that if the bowel is adequately prepared, one stage ERPT can be safely performed in infants under 3 months with short segment Hirschsprung's disease. Duration of hospitalization is reduced, and colostomy associated complications are avoided. Functional outcome appears to be comparable between patients treated in 1 or 2 stages.

Riccardo A Superina, MD
555 University Avenue,
Toronto, ON M5G 1X8
Tel. (416) 813-6357
Fax. (416) 813-7477
EXPRESSION OF NERVE GROWTH FACTOR RECEPTOR (NGF-R) ON THE PERINEURIUM OF HYPTERTROPHIC NERVE TRUNKS IN HIRSCHSPRUNG'S DISEASE (HD)

Prem Puri, Hiroyuki Kobayashi, D. Sean O'Briain
Children's Research Centre, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12, Ireland

Histologically HD is characterised by the absence of ganglion cells in the myenteric and submucous plexuses and the presence of hypertrophied nerve trunks in the space normally occupied by the ganglion cells. Although the bowel dysfunction in HD is now known to be produced by abnormalities of the enteric nerves present in the gut, the pathophysiological basis of the disease is not fully understood. There is no explanation for the occurrence of hypertrophied nerve trunks in the myenteric and submucous plexuses. Recent studies have shown that the development and integrity of cholinergic neurons depend on the presence of NGF. The effects of NGF are transmitted via receptors localized within the cholinergic neurons.

We studied the expression of NGF-R in colon from 20 patients with HD and 10 controls using immunohistochemistry. Quantitative assessment of immunoreactivity in nerve fibres within colonic muscle demonstrated a total lack of expression of NGF-R in the fibres in circular and longitudinal muscle of aganglionic colon whereas NGF-R immunoreactive nerve fibres were present in abundance in the muscle of ganglionic colon of HD patients as well as colon from controls. Myenteric and submucous ganglia in the ganglionic bowel and hypertrophic nerve trunks in the aganglionic bowel displayed strong expression of NGF-R. The most striking finding was the localisation of NGF-R immunoreactivity on the perineurium of hypertrophic nerve trunks, seen as a thick ring surrounding the abnormal nerve trunks in both submucous and myenteric plexuses of aganglionic segment of colon. The strong expression of NGF receptor surrounding the hypertrophic nerve trunks suggest that NGF plays an important role in the development of abnormal thick nerve trunks in HD.

sponsor: Ray Postuma M.D.

Mr. Prem Puri,
The Children's Research Centre,
Our Lady's Hospital for Sick Children,
Crumlin, Dublin 12 Ireland
Tel. 353-1-558111, Ext. 2420
Fax. 353-1-551045
A NEW LOOK AT AN OLD OPERATION FOR AGANGLIONOSIS

Sigmund H. Ein, Barry Shandling, Henry So
Hospital for Sick Children, Toronto and
New Hyde Park, New York

Since 1980, we have operated on seven infants with total colon Hirschsprung's disease using the long Duhamel procedure. All infants were given an ileostomy when the diagnosis was made, and the long Duhamel procedure was performed between six and 24 months of age. This operation is the standard Duhamel procedure except that the sigmoid and descending colons form the fecal reservoir (as in the Martin variation of the Duhamel operation). A covering loop ileostomy was also made in all these patients and it was closed within five months; two infants each had one episode of enterocolitis one to nine months after closure. At abstract time, six of seven infants had their ileostomy closed and have been followed from one to 13 years; all are alive and well. The six children are all continent and toilet trained; they have up to six formed stools per day. Two had some soiling at night. Whereas in the past the Duhamel procedure (in which a long anterior rectal pouch was left) often resulted in the formation of a fecal impaction, this does not occur when the material passed through the anus is at best semi-liquid. With no long anastomosis the procedure is simple and complications are few.

Sigmund H. Ein, M.D.
250 Lawrence Ave. W., #315
Toronto, ON M5M 1B2
Tel. (416) 781-1411
Fax. (416) 444-1809
A NEW METHOD OF INTESTINAL SALVAGE IN SEVERE SMALL BOWEL ISCHAEMIA

M. McCullagh, D. Garvie, E. H. Dykes
Children's, Hospital; Lewisham, London, U.K.

Morbidity and mortality in short bowel syndrome is directly related to the length of the remaining small bowel (SB) and the use of total parenteral nutrition (TPN). We describe the successful salvage of an infant with extensive SB infarction using a new technique for preserving all viable mucosal surfaces.

An infant with gastrochisis was delivered and found to have 720 degree volvulus of the extruded bowel and extensive small bowel ischaemia. Initially, a silastic pouch was fashioned to decompress the abdomen and facilitate circulatory return; a second-look laparotomy was undertaken 48 hours later. Then, 23 cm of proximal jejunum/ileum was necrotic over 75% of the antimesenteric border, 10 cm of midileum was infarcted and 13 cm of terminal ileum was viable. The proximal 23cm was trimmed of all dead tissue, leaving a 'gutter' of jejunum. The 'gutter' was divided at its midpoint and the two halves joined 'face-to-face' to give a 'tube' of 12cm. This 'tube' was anastomosed between the duodenum and the last 13cm of ileum (25cm). Full enteral feeds were tolerated from Day 47. The 'tube' was excised on Day 149, having dilated to 6 cm in diameter, with overall remaining length of 30 cm. There were no longterm complications related to TPN and the child remains well at twenty months.

Evelyn H. Dykes
Children's Hospital
Lewisham London SE13 6LH, U.K.
Tel. 44-(0)81-690-4311
Fax. 44-(0)81-690-1963
SPINAL ANESTHESIA FOR PRIMARY REPAIR OF GASTROSchISIS: A NEW AND SAFE TECHNIQUE IN SELECTED PATIENTS

Dennis W. Vane, Christopher A. Abajian, Andrew R. Hong,
University of Vermont, Col. of Medicine, Burlington, VT

Spinal anesthesia has been described for small infants and premature babies undergoing minor operative procedures. The advantages of shortened operating room time, alleviating intubation, and decreasing hospitalization stays have made this the gold standard for premature and other high risk infants for minor procedures. Little is known however, about this technique for major interventions on newborns and preterm infants. Recently two infants born in house with gastroschisis underwent repair under spinal anesthesia. Both had accompanying intestinal atresia (one with a prenatal perforation and pan-hypopituitarism). Gestational ages were 39 and 33 weeks respectively. One had primary closure of the defect with no repair of the atresia, as the bowel was thick and matted with a significant peel and the defect was not identified in the second case, necrosis and perforation of a localized segment of intestine was identified proximal to the intestinal atresia, and was exteriorized with the primary repair.

Both infants came to the OR breathing spontaneously, without intubation, on room air, after appropriate fluid resuscitation. Both underwent spinal anesthesia as the only agent for operation. Operative procedures lasted 45 and 25 minutes respectively (mean=35 min.). Anesthesia duration was 220 and 170 minutes respectively (mean=195 min.). Both infants were returned to the NICU on room air and breathing spontaneously. Neither infant required any respiratory support for their post-operative course.

Spinal anesthesia appears safe and effective for major operative procedures in high risk infants. This mechanism alleviates the need for intubation and the concomitant risks for premature babies undergoing operation who demonstrate no need for assisted ventilation preoperatively. Given the proven efficacy and safety of this technique, modern neonatal care obligates the consideration of spinal anesthesia in major and minor operative procedures in selected patients.

sponsor: Frank Guttman, MD

Dennis W. Vane, MD
Department of Surgery, University of Vermont
Given Bldg. Rm D-319.
Burlington, VT 05405
Tel. 802-656-4274
Fax. 802-656-8837
MINIMALLY CONJOINED OMPHALOPAGI:
A CONSISTENT SPECTRUM OF ANOMALIES

D. Poenaru, J. Uroz-Tristan, S. Leclerc, S. Murphy, D. St-Vil, S. Youssef,
H. Blanchard
Hôpital Sainte-Justine, Montreal (Quebec)

Omphalopagus twins constitute less than a third of all siamese twins. Most of them are attached by a skin bridge often containing hepatic tissue. Only 4 cases of omphalopagus twins attached by an intestinal bridge have been reported. We present two further cases of conjoined twins minimally attached by a small bowel and bladder bridge. In both instances, the spectrum of anomalies included a ruptured omphalocele and imperforate anus with cloacal anomalies. The attachment consisted of a urachal remnant joining the two bladders, and the short small bowel of twin A attached to the terminal ileum of twin B. Separation was uneventful, and in one case part of the proximal colon of twin B was used to lengthen the bowel of twin A. Three of the twins survived, undergoing further procedures for repair of the cloacal anomalies. All 4 previously reported cases of minimally conjoined omphalopagi presented with a remarkably similar spectrum of anomalies. They all had ruptured omphaloceles, imperforate anus with cloacal anomalies, and urachal anomalies. Intestinal connection was consistently at a point corresponding to the Meckel diverticulum site of twin B, with supply to the small bowel of twin A probably via the vitelline artery. The consistent spectrum of anomalies encountered in minimally conjoined omphalopagi allows planning of separation. Caution is required in not missing the patent urachus, and intestinal lengthening procedures based on the vitelline artery become an important consideration.

Dr. Hervé Blanchard
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montreal (Quebec) H3T 1C5
Tel. (514) 345-4688
Fax. (514) 345-4964
IS IT NECESSARY TO GET EARLY FASCIAL CLOSURE IN OMPHALOCELE AND GASTROSCHISIS?

Irwin H. Krasna
UMDNJ-Robert Wood Johnson Medical School,
New Brunswick, New Jersey

Before the introduction of the "silo" for gastroschisis, the main goal of surgery was to cover the defect with skin. Since the "silo" has been used the goal was 1) to cover the defect with silastic and return the extra-abdominal contents to the abdominal cavity by progressive plication of the silo, and 2) eventual closure of the defect by fascia-to-fascia approximation before one month of age. In many series, the early definitive abdominal wall closure resulted in mortality figures of 10-30%, usually due to bowel necrosis and resulting sepsis.

We have adapted a non-aggressive, two-stage approach to these defects, where the goal is early return of contents to the abdominal cavity, and only skin and granulation coverage of the defect without aiming for early fascial closure, or partial fascial closure, with a small central silastic patch. Stage I is reduction of abdominal contents to the abdomen, through plication of the silo, over a 9-14 day period. Stage II is closure of the ventral abdominal wall defect using a patch of silastic to close most of the defect, after approximating fascia in the superior and inferior portions. If skin cannot be closed (usually), the patch usually separates in 14 days, the pellicle remaining becomes completely epithelialized in 1-2 months, and no further surgery has been necessary. If skin can be approximated, the patch is removed in a few months, when fascial closure is easy. Ten cases of omphalocele or gastroschisis were treated by this method and all are doing well, most without definitive fascial closure.

Irwin H. Krasna, M.D.
UMDNJ-Robert Wood Johnson Medical School
One Robert Wood Johnson Place, CN-19
New Brunswick, NJ 08903-0019
Tel. 908-937-7821
Fax. 908-418-8013

1015-1045 Coffee Break
IS PANCREATIC REGENERATION A TRUE PHENOMENON?

R. Bilik E. Cutz, D. Wesson, RM. Ehrlich, RM. Filler
Dept. of General Surgery, The Hospital for Sick Children Toronto.

The capacity of the liver to regenerate is well known. Clinical findings of euglycemia and improving exocrine function after extensive pancreatectomy or Persistent Neonatal Hyperglycemia (PNH) have suggested the potential for the pancreas to regenerate. The availability of pancreatic remnants from children with PNH who required a 2nd pancreatectomy and the introduction of a new histological test which can estimate cell proliferation, gave us a unique opportunity to test a regeneration hypothesis.

Twenty one infants with PNH underwent 85%-95% pancreatectomy between 1981 and 1993. The pathologic diagnosis in all cases was Islet Cell Dysplasia (Nesidioblastosis). Six patients required further resection of the pancreas 10 to 36 months later for recurrent hypoglycemia.

A larger than expected pancreatic remnant was observed by abdominal C-T scan (1), Ultra-Sound (1) or at surgery (3). Pancreatic tissue resected at the 1st and 2nd operations available from 4 cases was studied Immunohistochemically using a monoclonal antibody against Proliferating Cell Nuclear Antigen (PCNA) which identifies cells in S-phase of cell mitotic cycle. Three of 4 remnants showed diffuse staining (2-3+) of both exocrine and endocrine cells, compared to focal or no staining (0-1+) in normal controls and in the pancreas removed at the 1st operation.

These findings lead us to conclude that regeneration of a pancreatic remnant after partial pancreatectomy is a real phenomenon. While regeneration likely prevents pancreatic insufficiency and diabetes after resection for PNH, occasionally may be the cause for recurrent hyperglycemia.

Dr. R. M. Filler
Department of Surgery
The Hospital For Sick Children,
555 University Avenue,
Toronto, Ontario M5G 1X8
Tel. (416) 813-6400
Fax. (416) 813-7477
MANAGEMENT OF CHOLEDOCHAL CYSTS IN THE NEWBORN

Cathy A. Burnweit, Gary A. Birkin, and Kurt F. Heiss,
Miami Children's Hospital, Miami, FL; Hollywood Memorial Hospital,
Hollywood, FL; Emory Clinic, Atlanta, GA.

Choledochal cysts are now being diagnosed before birth on routine maternal sonography. There is no report in the literature outlining the management of newborns with choledochal cysts, many of whom are asymptomatic. Our study details the diagnosis, treatment and outcome of six such children, 4 girls and 2 boys. Five had antenatal ultrasounds revealing cystic abdominal masses. One had upper abdominal fullness palpated on exam and sonogram suggested choledochal cyst. Four of 6 were asymptomatic with normal serum bilirubins; 2 had bilirubin elevations. In five babies, the choledochal cyst was correctly diagnosed from the pre-operative studies In one patient, the pre-operative diagnosis was ovarian cyst. The children underwent operation at an average of 6 weeks of age (range, 5 days to 17 weeks). At exploration, cholangiography showed Alonzo-Lej type 1 cysts in all. Treatment consisted of resection of the cyst with Roux-en-Y choledochojunosotony in 5 and with valved jejunal choledochooduodenal conduit in one. In no case was the dissection of the choledochal cyst off the portal vein and hepatic artery difficult. There were no intra-operative or postoperative complications. Mean hospital stay was 8 days (range, 5 to 9 days). Presently, all six have normal bilirubins at an average length follow-up of 23 months (range, 4 to 60 months) after operation. We conclude that operative treatment of choledochal cysts in early infancy even in asymptomatic children is safe and effective, and may prevent serious complications later in life.

Kurt F. Heiss M.D.

Cathy A. Burnweit, M.D.
3200 S. W. 60th Court, Suite 201
Miami, FL 33155
TEL. (305) 662-8320
FAX. (305) 665-2467
CONGENITAL ABSENCE OF THE PORTAL VEIN: TWO CASES AND A PROPOSED CLASSIFICATION SYSTEM FOR CONGENITAL PORTOSYSTEMIC SHUNTS.

Glyn Morgan, Riccardo Superina
University of Toronto and The Hospital for Sick Children, Toronto,

Congenital absence of the portal vein (CAPV) is a rare condition often associated with other anomalies. Patient A: A 9 week old girl investigated for jaundice was found to have multiple anomalies including CAPV, cardiac anomalies, biliary atresia (BA), polysplenia, and a midgut volvulus. She was deemed unsuitable for a Kasai, but a Ladd procedure was performed. Angiography showed the superior mesenteric and splenic veins joining to enter the IVC directly. During transplant, at 14 months, severe mesenteric venous engorgement and bowel edema ensued, necessitating closure with a Silon pouch. Three days later the abdomen was closed primarily. Forty-eight hours later she deteriorated and laparotomy revealed a segment of necrotic perforated small bowel. Despite resection, the patient died 24 hours later.

Patient B: A girl with CAPV, cardiac anomalies, BA, situs inversus abdominis, and polysplenia had a Kasai at two months of age. Despite revision of the Kasai at 12 months her condition deteriorated. Angiography revealed a patent splenomesenteric confluence with the portal vein entering the right atrium directly. The patient is awaiting transplant. Patient A is the third patient in the literature with CAPV to receive a transplant and the first to receive a reduced size graft. The mesenteric edema encountered at surgery was due to the absence of portal hypertension and collateral vessels in the pretransplant state due to the congenital portosystemic shunt (CPS). The transplant resulted in an increase in portal pressure and consequently venous congestion. Our experience and a review of the literature indicate that CPS can be classified into two groups. Type I shunts, such as CAPV, are those in which there is no portal perfusion of the liver. In Type II shunts the liver is perfused via the portal vein, but a fistula exists between portal and systemic circulations. Type I shunts are less common and reported almost exclusively in young females. There were no cases of hepatic encephalopathy despite high ammonia levels. Cardiac anomalies and liver tumours were the most commonly associated findings. The morbidity associated with CAPV usually results from associated conditions, but if transplantation is necessary careful management of mesenteric congestion is crucial to success.

Riccardo Superina M.D., F.R.C.S.C.
Suite 1526 The Hospital for Sick Children
555 University Ave. Toronto, ON, M5G 1X8
Tel. 416-813-6357
Fax. 416-813-6846
Tuesday, 1120-1125; C (five minute paper, followed by a five minute discussion of this and the previous short paper)

TOTAL ANOMALOUS PULMONARY VENOUS RETURN COMPLICATING PORTOENTEROSTOMY FOR BILIARY ATRESIA

M. Lallier, D. St-Vil, S. Vobecy and A. Ouimet
Hôpital Sainte-Justine, Montreal (Quebec)

Cardiovascular anomalies such as absent inferior vena cava and preduodenal portal vein are reported in biliary atresia and make hepatic portoenterostomy, a technical challenge. We present the case of a severe cardiac anomaly that significantly altered the functional outcome of a Kasai's procedure. Baby M., an 8-week-old boy born with a total anomalous pulmonary venous return (TAPVR), underwent a hepatic portoenterostomy for biliary atresia. Over the next 3 months he remained icteric (table 1), febrile and failed to gain weight. After multiple antibiotic treatments for suspicious cholangitis, he underwent reexploration of the portoenterostomy with no improvement in his overall status. The patient's prognosis was considered dismal because correction of the cardiac anomaly is associated with a high mortality (>90%). The cardiac surgeon agreed to attempt a cure TAPVR providing liver transplantation is contemplated if the patient survived. Within 48 hours post-op, his hepatic function had drastically improved. The patient became afebrile with an improved appetite and weight gain and was finally discharged 202 days after his admission. At the 6-month follow-up visit, he is thriving and remains anicteric. The exact reason for this drastic improvement is not well understood but the right side cardiac failure caused by the TAPVR had a significant effect on the functional outcome of the portoenterostomy.

Table 1

<table>
<thead>
<tr>
<th>Billirubin level Mmol/L</th>
<th>Admission</th>
<th>Post-Kasai</th>
<th>Post-reexploration</th>
<th>Post-Cardiac Surgery</th>
<th>6th Month Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>292</td>
<td>127</td>
<td>135</td>
<td>36</td>
<td>8</td>
</tr>
<tr>
<td>DIRECT</td>
<td>204</td>
<td>92</td>
<td>99</td>
<td>25</td>
<td>3</td>
</tr>
</tbody>
</table>

Dr. Salam Yazbeck

Dr. Alain Ouimet
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montreal (Quebec) H3T 1C5
Tel. 514-345-4688
Fax. 514-345-4964
LONG TERM EFFECT OF CYCLOSPORINE ON RENAL FUNCTION IN CHILDREN AFTER LIVER TRANSPLANTATION

R. Blik R.A. Superina
The Hospital for Sick Children, Toronto.

Long term effects of cyclosporine (CyA) on renal function was studied in 28 children aged 6 months to 17 years who survived longer than 3 months after liver transplantation. Follow-up was 1 to 3 years. Maintenance immunosuppression included CyA, Azathioprine and Prednisone. Patients were grouped in three age categories: 1-5 years (21 patients-A), 6-10 years (3 patients-B) and 11-17 years (4 patients-C). Plasma urea, creatinine levels, calculated GFR (cGFR), daily CyA per Kg, and CyA levels were recorded at 0.3, 0.5, 0.9, 1.0, 1.5, 2.0, 2.5 and 3 years after transplant. Results: Linear regression analysis showed a significant increase in serum creatinine in all 3 age groups which correlated significantly with time elapsed since transplantation (A- $R^2=0.15$, $p<0.0001$; B-$R^2=0.3$, $p<0.0001$; and C-$R^2=0.38$, $p<0.0001$). Concurrently, the cGFR decreased significantly during the first year after transplantation in all 3 groups (A- $R^2=0.13$, $p<0.0001$; B-$R^2=0.28$, $p<0.0001$; C-$R^2=0.34$, $p<0.0001$). The increase in serum creatinine levels and the deterioration in cGFR were significant during the first year post transplant. Group A showed stabilization of the cGFR with no further significant deterioration after the first post transplant year, whereas in Groups B and C it continued to decline. A significant increase in plasma urea levels was observed during the first year post transplant in all groups ($p<0.001$), with no further significant increase then after, although remained significantly higher than normal. CyA trough levels were equivalent in all 3 groups for all times after transplantation. Groups A & B required significant higher dosage of CyA to maintain adequate trough levels (25.2±3.7 and 29.4±7.6mg/kg/day vs 5.4±0.2mg/kg/day respectively, $p<0.05$). CyA trough levels and CyA dosage did not correlate with the observed deterioration of renal function.

We conclude that significant deterioration in renal function after liver transplantation occurs predominantly during the first year following transplantation. Children under the age of 5 seem to be relatively spared from the nephrotoxic side-effects of CyA, particularly after the first post-transplant year as indicated by the relatively stable cGFR in this age group.

Dr. R. Superina
Department of Surgery, The Hospital For Sick Children
555 University Avenue. Toronto, Ontario M5G IX8
Tel. (416) 813-6357
Fax. (416) 813-7477
DEFECTIVE CHOLINERGIC INNERVATION IN PYLORIC MUSCLE OF PATIENTS WITH HYPERTROPHIC PYLORIC STENOSIS

Hiroyuki Kobayashi, D. Sean O'Briain and Prem Puri
Children’s Research Centre, Our Lady’s Hospital for Sick Children Crumlin, Dublin 12

The etiology of hypertrophic pyloric stenosis (HPS) is not known. Many investigators have studied the myenteric plexus and muscle in HPS but there are no reports of cholinergic nerve distribution in this condition. Histochemical technique for the detection of acetylcholinesterase (AChE) has been used to study cholinergic nerve distribution. Recently it has been shown that the development and survival of cholinergic neurons in the peripheral and central nervous system depend on the presence of nerve growth factor (NGF) and its receptor (NGFR).

We examined pyloric muscle from 18 patients with HPS and 10 controls, using monoclonal antibody to NGFR and AChE histochemistry. Myenteric plexus displayed strong NGFR and AChE reactivity. Quantitative assessment of immunoreactivity in nerve fibers within pyloric muscle demonstrated selective absence of NGFR and AChE positive nerve fibers in the circular and longitudinal muscle of HPS whereas these fibers were in abundance in the muscle of controls.

These findings suggest that NGFR is an important neurotrophic factor in maintenance of cholinergic neuronal function and that pyloric stenosis may be a consequence of NGFR deficiency resulting in defective cholinergic innervation of pyloric muscle.

sponsor: Ray Postuma, M.D.

Mr. Prem Puri,
The Children’s Research Centre,
Our Lady’s Hospital for Sick Children,
Crumlin, Dublin 12, Ireland
Tel. 353-1-556111 Ext. 2420
Fax 353-1-551045
INTUSSUSCEPTION IN THE 90s: HAS 25 YEARS MADE A DIFFERENCE?

Sigmund H. Ein, Douglas Alton, Steven B. Palder,
Barry Shandling, David A. Stringer

Hospital for Sick Children, Toronto, Ontario

To evaluate the current management of the infant and child with intussusception, the medical records of 188 consecutive intussusception patients over five years (1985 - 1990) were reviewed and compared to our series from 25 years ago (1959 - 1968). In each series two-thirds of the patients were males, and the age at presentation 16 months. The peak months changed from May and June to January and July. Duration of symptoms and signs prior to diagnosis increased by one-third to 35 hours with a decrease in the incidence of pain, vomiting, mass and rectal blood. Air was the only contrast used for the enema in the present series and was tried in every case with 81% success. This is a major improvement from 45% in the old series. There were three perforations (1.4%) with air enema attempts compared with one perforation (0.2%) 25 years ago. Fifty-five percent of the patients in the older series required operation and 20% needed resection; recently only 19% required operation and 30% needed resection. Ten percent of intussusceptions continue to be found spontaneously reduced at operation. There were many less lead points in the newer series. The recurrences increased from four to seven percent, but their reduction rate increased from 31% with barium to 100% with air. There were no deaths in the last 25 years.

Sigmund H. Ein M.D.
Lawrence Ave.W. #315
Toronto, Ontario M5M 1B2
Tel. (416) 781-1411
Fax. (416) 444-1809
CECAL VOLVULUS IN THE CORNELIA de LANGE SYNDROME

K. Husain, P. Fitzgerald, G. Lau
Children's Hospital at Chedoke-McMaster Hamilton, Ontario

Cornelia de Lange Syndrome is a congenital malformation syndrome characterized by severe growth failure, mental retardation and multiple physical anomalies. Gastrointestinal anomalies that have been described include colonic duplication, duodenal obstruction, malrotation, hiatus hernia and nonfixation of the cecum.

In a 3 month period 2 patients with Cornelia de Lange syndrome presented to our institution with acute distal bowel obstruction. In both cases emergency laparotomy revealed cecal volvulus which resulted in ischemia of the terminal ileum, cecum, and ascending colon. Resection and end ileostomy was performed, and later successfully reversed.

Nonfixation of the cecum has been identified at autopsy in Cornelia de Lange patients. Unfortunately, radiologic examination of the colon may fail to identify nonfixation of the colon.

Parents of children with Cornelia de Lange syndrome should be counselled as to the possibility of bowel obstruction due to cecal volvulus. This awareness may lead to earlier identification and treatment of this potentially lethal gastrointestinal tract anomaly.

Dr. George Lau

Dr. Peter Fitzgerald
Department of Surgery, McMaster University
1200 Main Street West,
Hamilton, ON, L8N 3Z5
Tel. 416-521-2100
Fax. 416-521-9992
GASTROINTESTINAL MUCORMYCOSIS CAUSING AN ACUTE ABDOMEN IN THE IMMUNOCOMPROMISED PEDIATRIC PATIENT- THREE CASES

C Vaideboncoeur, JM Walton, J Raisen, P Soucy, H Lau, S Rubin
Children's Hospital of Eastern Ontario, Ottawa, and IWK Hospital, Halifax

Mucormycosis is an infection caused by an ubiquitous fungus in immunocompromised individuals. It characteristically invades blood vessels producing thrombosis and tissue infarction. This infection spans all pediatric age groups leading to hollow viscus perforation and bowel obstruction.

A thirty month old male diagnosed with large cell anaplastic lymphoma developed a bowel obstruction. Urgent laparotomy diagnosed an ileoileal intussusception requiring resection and anastomosis. Fungi of the Mucorales order were found associated with tissue necrosis in the pathological specimen.

A premature infant on the eighth day of life developed abdominal distension secondary to bowel perforation. Partial gastric resection with multiple intestinal stomas were performed. Death occurred soon after secondary to multiple organ failure. Autopsy and surgical specimens showed widespread mucormycosis.

An adolescent developed meningococcemia induced septic shock. During her recovery she developed haemorrhagic colitis which led to perforation. The subtotal colectomy specimen showed widespread mucormycosis.

The laparotomy findings are typical (black, necrotic tissue involving the bowel) and when seen in the immunocompromised patient should make one suspect gastrointestinal mucormycosis. Aggressive surgical debridement of devitalized tissue augmented by intravenous antifungal medication is the mainstay of treatment.

Dr. Pierre Soucy
Children's Hospital of Eastern Ontario
401 Smyth rd
Ottawa Ontario K1H 8L1
Tel. 613-737-2396
Fax. 613-737-4840
THE MANAGEMENT OF THE ACUTE ABDOMEN IN THE PAEDIATRIC PATIENT WITH VENTRICULAR PERITONEAL SHUNT

H. Laishram, R. Kennedy, D. Price, F. Maroun, J. C. Jacob

The Dr. Charles A. Janeway Child Health Centre, St. John's

Ventricular peritoneal shunt has become the standard operation for hydrocephalus of any etiology. Many children with V.P. shunt develop acute abdominal pain mimicking surgical conditions, forcing the surgeon into a diagnostic quandry. In a retrospective analysis of 244 V.P. shunted patients admitted to our Institution, from 1979-1992, it was found that seventeen were due to acute abdomen. A study of these seventeen patients showed that seven had pseudocyst of C.S.F., six had peritonitis due to shunt infection, two cases had intra-abdominal abscess and two cases had intestinal obstruction. With the aid of ultrasound examination in the initial diagnosis, unnecessary laparotomies were avoided in seven instances in which five were pseudocysts of CSF and two were shunt peritonitis without pseudocyst formation. The CSF from shunt reservoir or peritoneal cavity was cultured in thirteen patients, seven grew staphylococcus epidermidis, two grew gram negative bacteria and four were sterile. Of the two growing gram negative bacteria, one patient's shunt had eroded through the rectum and another patient had an incidental appendectomy during laparotomy for a pseudocyst. This study shows that all V.P. shunted patients who present with acute abdomen should be presumed to have shunt related complications and the use of ultrasound in assessment will often enable correct diagnosis reducing the need for laparotomy. If gram negative organisms are found some contamination from the G.I. tract should be questioned.

Dr. R. Kennedy
The Dr. Charles A. Janeway Child Health Centre
Janeway Place
St. John's, Newfoundland, A1A 1R8
Tel. (709) 778-4300
Fax. (709) 778-4333
MODULATION OF TNF AND IL6 IN A PERITONITIS MODEL USING PENTOXIFYLLINE.


Royal Belfast Hospital for Sick Children & *Dept of Surgery, The Queen’s University of Belfast, N. Ireland.

The aim of this study was to investigate the effect of Pentoxifylline (PTF) on Tumour Necrosis Factor (TNF) and Interleukin 6 (IL6) production in an animal peritonitis model using caecal ligation and puncture (CLP).

Wistar rats were randomly allocated into 3 groups of 8 animals: 1) sham; 2) CLP and 3) PTF 20mg/kg body weight given 1 hour after CLP. A carotid cannula was inserted to measure blood pressure and for blood sampling at times 6, 12, 18 and 24 hours after surgery. TNF and IL6 were determined using bioassays with WEHI clone 13 and B9 cells respectively.

Blood pressure remained stable during the first 18 hours following surgery and significantly decreased at 24 hours in all groups (p<0.05). At 24 hours TNF had increased in all groups compared to basal levels. There was no significant difference between the CLP and sham groups at 24 hours following surgery (p=0.09). However treatment with PTF after CLP significantly reduced TNF concentrations (p<0.05) at 24 hours. IL6 concentrations decreased from basal levels in all groups, through to 18 hours following surgery. At 24 hours there was a significant rise in the CLP group compared to the sham group (p<0.001). In the PTF group there was a rise in IL6 but this was significantly lower than the CLP group (p<0.01).

PTF given after the insult of CLP appears to attenuate systemic cytokine activation and may have a clinical role in established sepsis.

sponsor: Ray Postuma, MD

Ms SE Refsum FRCS, Dept. of Surgery,
Institute of Clinical Science, Royal Victoria Hospital
Belfast BT9 6BJ, N. Ireland
Tel. 0232-240503 Ext. 2660
Fax. 0232-321811

Members’ Luncheon Business Meeting follows this Paper, 13.00-14.30 hrs. in the EMPRESS ROOM
SMALL INTESTINAL ATRESIA: EFFECT ON FETAL NUTRITION

R. Surana, P. Puri
Children's Research Centre, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12, Ireland

The peak velocity for fetal growth occurs in last few weeks of pregnancy. As the fetus matures it swallows and absorbs an increasing amount of amniotic fluid and contributes to its growth. To test this hypothesis, we studied all the patients with intestinal atresia (IA) treated over 9 years. Fifty-nine newborns had IA - 24 jejunal, 35 ileal atresia. Ten patients had associated anomalies. 14 of the 59 patients were below the 10th percentile of birth weight after correction for gestational age, one was born before 36 weeks and the remaining 13 after 36 weeks of gestation. Of the 23 babies with jejunal atresia (one baby born of twin pregnancy is excluded), 10 (43.5%) were born before 36 weeks of gestation in contrast to 5 (14.3%) of 35 patients with ileal atresia. Five (35.8%) of 13 patients with jejunal atresia who were born 36 weeks of gestation as compared to 8 (26.7%) of 30 patients with ileal atresia had intrauterine growth retardation (IUGR). IUGR was not due to other associated anomalies as only two of the ten with other anomalies were underweight. Our data indicates that the absorption of amniotic fluid by the fetal gut contributes to the fetal growth in the last few weeks of gestation and the higher the obstruction in the small intestine, the more marked is the effect on the nutrition of the fetus.

sponsor: Ray Postuma, M.D.

Mr. Prem Puri,
The Children's Research Centre, Our Lady's Hospital for Sick Children, Crumlin, Dublin 12, Ireland
Tel 353-1-558111 Ext. 2420
Fax. 353-1-551045
HOW ACCURATE IS PRENATAL SONOGRAPHY FOR THE DIAGNOSIS OF FETAL COLOANAL OBSTRUCTION?

B Belin, JE Corteville, JC Langer
Washington University, St. Louis, MO

Imperforate anus and Hirschsprung's disease are the commonest causes of coloanal obstruction in the neonate. We prospectively studied 15,092 pregnancies over a one year period to determine the accuracy of prenatal sonography in diagnosing these conditions.

Thirteen fetuses were thought to have colonic dilation on prenatal sonography. Nine of these had dilated bowel located in the pelvis; postnatally 7 were normal and 2 had imperforate anus. Four fetuses were thought to have dilated proximal colon, based on the peripheral location of the bowel loops in the abdomen. All 4 had normal colons but small bowel obstruction postnatally (3 meconium ileus, 1 maldescent).

Neonatal and pathological followup was obtained in all 15,092 pregnancies. Twenty-three infants without dilated colon on sonography had neonatal coloanal obstruction (20 imperforate anus, 3 Hirschsprung's). However, other anomalies had been sonographically evident in 70% of these fetuses (all with imperforate anus).

Overall sensitivity and positive predictive value for sonographically dilated colon in predicting coloanal obstruction were very low in this series (8% and 15% respectively). No cases of Hirschsprungs disease were diagnosed prenatally. Dilated bowel loops outside the pelvis represented small bowel rather than colon, even if they were peripheral in location. These data suggest that prenatal sonography is of limited value for either diagnosing or excluding coloanal obstruction.

Jacob C. Langer, MD
St. Louis Children's Hospital, Room 5W12
One Childrens Place,
St Louis Missouri 63110
Tel. 314-454-6022
Fax. 314-454-2442
SUCCESSFUL NON-OPERATIVE MANAGEMENT OF NECROTIZING ENTEROCOLITIS (NEC) IN AN INFANT FOLLOWING ORTHOTOPIC LIVER TRANSPLANTATION (OLT)

Kurt F. Heiss, and Thomas Dodson
Egleston Children's Hospital, Pediatric Surgery and Transplant Services, Atlanta, Georgia

OLT has been used successfully to treat TPN-induced liver failure due to short gut syndrome from NEC. A 7 month old infant presented with TPN-induced liver failure secondary to neonatal NEC and short gut. The infant underwent OLT with good graft function and progressed to enteral feeding and oral immunosuppression (IS). Four weeks post-transplant, the infant experienced culture-negative diarrhea and was treated with loperamide and continued enteral feeds. Five days later, the patient became febrile with increased liver enzymes, suggestive of graft rejection, followed by vomiting, abdominal distention and bloody stools. Abdominal films showed diffuse pneumatosis intestinalis (PI) and possible free intraperitoneal gas. An isolated blood culture grew M. catarrhalis. The infant was treated with broad spectrum antibiotics covering anaerobes, gram positive & negative bacteria, gut rest and intravenous IS. Five experienced pediatric liver transplant centers were consulted for management suggestions of NEC in an OLT recipient. Finding no consensus, it was elected to pursue a course of observation, gut rest and antibiotics. Within 2 weeks, bloody stools, abdominal distention and PI resolved. The patient was discharged home 2 months later. This appears to be the first report of NEC complicating pediatric OLT. The absence of consensus among experienced transplant centers in treatment of such a rare entity prompts us to report this successful outcome of non-operative management.

Kurt F. Heiss, M.D.
Emory Clinic - Pediatric Surgery
1365 Clifton Road, N.E.
Atlanta, GA 30322
Tel. 404-248-3745
Fax 404-248-5033
45. Wednesday, 0835-0840; C (five minute paper, followed by a five minute discussion of this and the previous short paper)

EXTREME SHORT-BOWEL SYNDROME:  
a ten-year follow-up case report

Ray Postuma, Stanley P. Moroz and Frank Friesen  
Winnipeg Children’s Hospital, Winnipeg, Canada

In 1983 we reported the outcome of massive 90% intestinal resection in a male infant with congenital intestinal volvulus. He was left with only thirteen (13) centimeters of small bowel and an intact duodenum, ileo-cecal valve and colon. During the first two years of life he was maintained on a combination of decreasing amounts of home parenteral nutrition and increasingly larger amounts of specialized oral intake. Parenteral nutrition was discontinued at 21 months of age and at the time of last follow up at age three years he was able to maintain normal growth development on large amounts of oral diet.

This follow up case report describes this patient at age 13 years. He continues to do well, remains healthy and is developing normally. However he still requires a restricted diet and remains extremely allergic to a number of common food items. Hyperoxaluria is managed with a diet low in oxalate. He is also dependent on regular vitamin B12 injections.

This patient is remarkable, since, despite record short bowel length, he has maintained relatively normal growth and development, had remarkably few serious complications, and experienced remarkably few hospitalizations.

Ray Postuma, MD.  
AE 201, 840 Sherbrook St.,  
Winnipeg, MB, R3A 1S1  
Tel. 204-787-4203  
Fax. 204-787-4618
DIAMOND-FLAP ANOPLASTY IN INFANTS AND CHILDREN WITH INTRACTABLE ANAL STRicture

Kathryn D. Anderson, Kurt D. Newman, Neil Sherman,
Children's Hospital Los Angeles, and
Children's National Medical Center, Washington, D.C.,

Following the posterior sagittal anorectoplasty for imperforate anus a prolonged course of anal dilatations is necessary until the scar softens. Although rare, severe stricture following this procedure is difficult to resolve. Y-V plasty is not entirely satisfactory as the pedicle advanced into the anus is on some tension which tends to retract producing recurrent stricture.

We have performed a diamond-shaped island anoplasty in six children with post-operative anal strictures (one following an unsuccessful Y-V plasty) with prompt resolution of the stricture in five. The island flap anoplasty consists of a diamond-shaped flap of skin formed laterally with complete separation of skin and subcutaneous attachments around the periphery of the flap. The skin island is supplied with blood from the deep tissue. An incision is made through the scarred anal ring and into the mucosa, a distance of half the length of the diamond which is then advanced into the mucosal defect. The defect lateral to the advanced flap is sutured closed. The island of skin falls quite naturally into the anus under no tension. The procedure can be performed simultaneously in the 3 o'clock and 9 o'clock positions and can later be repeated anteriorly and posteriorly though we have not found this necessary.

Two of the six children have required no dilatation postoperatively, a distinct advantage in our 4 year old patient. One segment in one child sloughed resulting in repeat stricture which is responding to dilatation. The other 5 children are doing well with their colostomies closed.

Kathryn D. Anderson, M.D.
Mailstop #72, Post Office Box 54700
Los Angeles, CA 90054-0700
Tel. (213) 669-2104
Fax. (213) 663-3466
MUCOSAL PERMEABILITY AFTER ISCHEMIA-REPERFUSION INJURY (IRI): AN EXPLORATION OF POSSIBLE MECHANISMS

JC Langer, SS Sohal
McMaster University, Hamilton, Ontario

Changes in mucosal permeability may be important in the etiology of necrotizing enterocolitis. We have previously shown that subclinical IRI results in increased permeability in the rat, and have partially characterized this phenomenon. In the present study we attempted to determine the mechanism by which these changes occur.

Six-wk old rats underwent 10-minute superior mesenteric artery occlusion (SMAO) or sham, and mucosal permeability to $^{51}$Cr-EDTA was measured after 30 min. Rats were pretreated with saline, inhibitors of oxygen free radicals (OFR) or eicosanoids, the putative cytoprotective agent prostaglandin E2 (PGE2), or the inhibitor of neutrophil OFR production fructose 1,6 diphosphate (FDP). Results of the SMAO groups are shown (counts/cc/std-SD, 5-10 rats/group):

<table>
<thead>
<tr>
<th>Agent</th>
<th>Mechanism</th>
<th>SMAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>saline</td>
<td></td>
<td>3.89±1.9</td>
</tr>
<tr>
<td>SOD+catalase</td>
<td>OFR</td>
<td>3.93±2.1</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>OFR</td>
<td>3.99±1.5</td>
</tr>
<tr>
<td>allopurinol</td>
<td>OFR</td>
<td>2.78±0.8</td>
</tr>
<tr>
<td>N-butyl alphaphenylnitroene</td>
<td>OFR</td>
<td>3.72±1.1</td>
</tr>
<tr>
<td>indomethacin</td>
<td>cyclooxygenase</td>
<td>7.00±3.7</td>
</tr>
<tr>
<td>quinacrine</td>
<td>phospholipase A2</td>
<td>6.61±3.3</td>
</tr>
<tr>
<td>diethylcarbamazine</td>
<td>leukotriene</td>
<td>4.06±2.4</td>
</tr>
<tr>
<td>azaprostanolic acid</td>
<td>thromboxane</td>
<td>3.72±2.0</td>
</tr>
<tr>
<td>PGE2</td>
<td>&quot;cytoprotective&quot;</td>
<td>10.99±7.1</td>
</tr>
<tr>
<td>FDP</td>
<td>neutrophilOFR production</td>
<td>3.54±1.4</td>
</tr>
</tbody>
</table>

To further explore the role of neutrophils, tissue myeloperoxidase (MPO) was measured 30 minutes after IRI (5 rats/group). There was no significant difference in MPO between sham and SMAO animals (0.26±03 vs 0.28±07). These data suggest that the early increase in mucosal permeability after IRI is not mediated by oxygen free radicals, eicosanoids, or neutrophils. Other mechanisms, such as local action of cytokines, must be postulated.

Jacob C. Langer,
St. Louis Children's Hospital, Room 5W12
400 South Kingshighway, St. Louis, Missouri 63110
Tel. 314-454-6022
Fax. 314 454-2442
THE ISOLATED BOWEL SEGMENT: THE EFFECT OF NITRIC OXIDE SYNTHASE INHIBITOR ON BOWEL MOTILITY.

Isao Shirahase, Hisashi Ohta and Ken Kimura.
The University of Iowa College of Medicine

In rats, an 8 cm jejunal segment (IBS) was divided and coapted to the anterior liver margin forming a hepatenteropexy with its both ends forming enterostomies. The remaining jejunum was reconstructed by anastomosis. Six sets of bipolar electrodes were chronically implanted into the IBS (3) and the jejunum (3). The IBS mesentery was severed 5 weeks after the initial operation.

Myoelectrical recordings during fast were performed before and after IBS mesenteric division. At each recording, N-nitro-L-arginine methyl ester (LNAME, 10 mg/kg) was subcutaneously administrated.

In the IBS (n=5), cyclic period of migrating motor complex (cMMC) and frequency of slow wave (FSW) were 13.7 +/- 4.8 min and 31.8 +/- 1.9 cpm (mean +/- SD), respectively. By LNAME administration, the cMMC and FSW decreased significantly (p<0.05). These responses were reversed by following administration of L-arginine (300 mg/kg, s.c.), which was not observed by D-arginine (300 mg/kg, s.c.). IBS mesenteric division provided no change in these responses.

These results indicate that inhibition of nitric oxide synthesis increases bowel contractility unrelated to the extrinsic neurons. This suggests that endogenous nitric oxide in the small intestine may play a role in modulation of bowel motility.

Ken Kimura MD,
Department of Surgery, UIHC
Iowa City, IA 52242, USA
Tel. (319) 356-1884
Fax. (319) 356-8378
PLASMA ENDOTHELIN LEVELS IN CONGENITAL DIAPHRAGMATIC HERNIA (CDH)

Hiroyuki Kobayashi and Prem Puri
Children’s Research Centre, Our Lady’s Hospital for Sick Children, Crumlin, Dublin 12, Ireland

Persistent pulmonary hypertension (PPH) together with pulmonary hypoplasia accounts for high mortality in CDH. Endothelin (ET) is a recently described endothelium-derived vasoconstrictor peptide with a potent and sustained effect. We investigated plasma ET levels in 8 patients with CDH who developed respiratory distress at birth and 15 age matched controls. Plasma ET levels were measured using a highly sensitive and specific enzyme immunometric assay (EIA) preoperatively intraoperatively, 24hr and 48hr postoperatively. The mean preoperative plasma ET level (54 pg/ml) in the patients was significantly (p<0.01) increased compared to controls (mean <10 pg/ml). Two patients who died prior to operation had plasma ET levels of 60 pg/ml and 82 pg/ml respectively. Three patients who developed PPH postoperatively continued to have high ET levels and at 48 hours, the mean plasma ET level in these patients was 33 pg/ml. In contrast in the three patients who survived after repair of CDH, the mean plasma ET level at 48 hours was 1.3 pg/ml. We further examined the lungs of two patients who died prior to operation for the expression of endothelin using immunocytochemistry. Pulmonary endothelial cells expressed strong endothelin staining compared to control tissues. These findings suggest that endothelin may be a pathophysiological mediator of pulmonary hypertension in CDH.

sponsor: Ray Postuma, M. D.

Mr. Prem Puri,
The Children's Research Centre,
Our Lady's Hospital for Sick Children,
Crumlin, Dublin 12, Ireland
Tel 353-1-558111 Ext. 2420
Fax 353-1-551045
GASTROESOPHAGEAL REFLUX ASSOCIATED WITH LARGE DIAPHRAGMATIC HERNIAS.

Sigalet DL, Hong AR, Adolph V, Laberge J-M, Nguyen LT, Guttman FM.
Montreal Children's Hospital, Montreal, Quebec,

Over the past year at our institution we have treated seven children with congenital diaphragmatic hernia requiring ECMO. Five children survived. Four were left sided hernias, and three required a patch to repair; these form the basis of this report.

Repair was done post-decanulation from VA ECMO, and adequate mobilization of the duodenum with lysis of Ladd's bands was undertaken in all cases.

After extubation, these children developed persistent vomiting. Upper GI's were performed in all cases, and showed evidence of abnormal esophageal anatomy, with free GE reflux. One patient was only minimally symptomatic and was treated conservatively, however two children could not tolerate feeds, and had similar radiographic features of gastric outlet obstruction. Both children had had antenatal diagnosis before 20 weeks gestation. Liver and stomach were in the chest, and both had relatively large dilated stomachs. The radiographic features post repair suggested pyloric obstruction, and accordingly they were re-operated upon. No pyloric stenosis was found, but abnormal scarring across the antrum of the stomach was noted. The lysis of adhesions did not relieve the obstruction, anterior fundoplication failed in one patient and eventually a Nissen fundoplication was performed in both cases with good results.

We suggest that large diaphragmatic hernias are associated with abnormal gastric motility, which may predispose to partial gastric outlet obstruction, with secondary reflux. When symptoms warrant operative intervention, adequate mobilization of the antrum and duodenum with fundoplication should be done.

David L Sigalet, MD,
Dept of General Pediatric Surgery
Montreal Children's Hospital, 2300 Tupper Street
Montreal, H3H 1P3
Tel. (514) 934-4400, ext. 2938
Fax. (514) 934-4341
FRYNS SYNDROME: A RARE FAMILIAL CAUSE OF CONGENITAL DIAPHRAGMATIC HERNIA

JC Langer, AL Winthrop, D Whelan
McMaster University, Hamilton, Ontario

Fryns syndrome is characterized by diaphragmatic hernia (CDH), distal limb hypoplasia, coarse facies, and occasional other anomalies. Almost all reported infants have died at birth, and survivors have had severe mental retardation. We describe three cases of Fryns syndrome in one family, one of which survived with only mild neurological dysfunction.

A 32 yo woman had two first trimester miscarriages. Her third pregnancy was complicated by CDH detected at 34 weeks gestation. The infant was born at term, and died at several hours of life despite maximal resuscitation. Autopsy revealed no other anomalies, and karyotype was normal.

In the fourth pregnancy a sonogram at 20 weeks was normal but a scan at 34 weeks showed CDH. The infant was born at term, and underwent repair at 1 day of life. Fryns syndrome was diagnosed based on the presence of CDH, distal limb hypoplasia, typical facies, bilateral cryptorchidism, ASD, and family history. Karyotype was normal. He did well and was discharged home, although he required a fundoplication at 8 months of age because of failure to thrive. At two years of age he is neurologically normal despite mild developmental delay and mild hypotonia.

In a fifth pregnancy CDH was found at 17 weeks gestation. At the parents' request, the pregnancy was terminated, and limited autopsy revealed CDH with no other anatomic abnormalities. Karyotype was not done.

These cases illustrate the spectrum of Fryns syndrome, underscore the importance of a family history in patients with CDH. This is also the first report of survival without severe mental retardation in a patient with Fryns syndrome.

Jacob C. Langer,
St. Louis Children's Hospital, Room 5W12
One Childrens' Place, St. Louis, Missouri 63110
Tel. 314-454-6022
Fax. 314-454-2442
IMPROVED SURVIVAL OF CONGENITAL DIAPHRAGMATIC HERNIA
BASED ON PRENATAL ULTRASOUND DIAGNOSIS AND REFERRAL TO A
COMBINED OBSTETRICAL-PEDIATRIC SURGICAL CENTER

K.S. Shaw, D. Filatrault, S. Yazbeck and D. St-Vil
Hôpital Sainte-Justine, Montreal (Quebec)

Between January 1990 and January 1993, 36 patients with ultrasound
and/or postnatal diagnosis of congenital diaphragmatic hernia (CDH) were
referred to our high-risk obstetrical and pediatric referral hospital. Among the
36, there were four spontaneous abortions (11%), five deaths after live
births (14%), one false positive ultrasound, and 26 patients who underwent
surgery, of whom 23 survived (66% overall, 74% livebirths, 89%
postoperative). Only one survivor required ECMO affiliated. Thirty-five
ultrasound exams were performed in 24 patients with 18 true-positives
(51%), one false-positive (3%), and 16 false-negative (46%). In this series,
there were 25 left CDHs, eight right CDHs, one bilateral, and one central
CDH. Of the four right CDH cases who underwent ultrasonography, only one
was diagnosed prenatally whereas 15 of a possible 17 left CDHs were
correctly diagnosed (88%). All 18 patients diagnosed prenatally were born at
our institution. Patients born in our hospital with CDH tended to be more ill
than patients transferred from elsewhere as reflected by lower one minute
and five minute APGAR scores (3.7 vs 6.9, p < 0.001*, and 5.4 vs 6.9, p <
0.16* respectively), lower gestational age (37.0 vs 39.2 weeks, p < 0.007*),
and lower birth weights (2525 vs 3049 g, p < 0.02*). Nevertheless,
transferred patients had a similar mortality (3/15 patients or 20%) than non-
transferred patients (5/20 patients or 25%). We conclude that: 1) systematic
prenatal ultrasound can diagnose CDH and enable referral to a center
providing high-risk obstetrical and pediatric surgical care, thus providing
optimal postnatal care; 2) contrary to other reports, antenatal diagnosis of
CDH did not presage high mortality at our institution.

* Student's unpaired t-test with statistical significance at p < 0.05.

Dr. Salam Yazbeck

Dr. Dickens St-Vil
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montreal (Quebec) H3T 1C5
Tel. (514) 345-4688
Fax. (514) 345-4964

1015-1045 Coffee Break
ACCURACY OF DOPPLER SONOGRAPHY IN THE EVALUATION OF ACUTE CONDITIONS OF THE SCROTUM IN CHILDREN

S. Yazbeck and H. Patriquin
Hôpital Sainte-Justine, Montreal (Quebec)

During a 12 month period, 65 boys (birth to 18 years) with acute scrotal pain or swelling underwent Doppler sonography of both testes, followed by scintigraphy (15) and/or surgery (34) and a close clinical follow-up for at least 4 months (23). Pulsed Doppler was performed with an ATL UM8 or Quantum II apparatus using 7.5 or 10 MHz transducers. In 25 patients color Doppler was also performed. The testicular artery was deemed patent if Doppler shifts from branches within the parenchyma could be found. (Doppler signals from scrotal or marginal arteries were considered as non diagnostic). Surgery revealed 19 testicular torsions. Seventeen were diagnosed as such with Doppler. Two boys with torsion were called normal both at Doppler and scintigraphy. One boy had a repeat Doppler examination 13 hours later, which showed no flow. The testicle was necrotic at surgery. The second boy had had 8 hours of symptoms and had a viable testis at surgery. This probably represented intermittent torsion. In six cases no signals could be found on either side and these were deemed as technical failures of the test. Doppler sonography was technically successful in 59/65 boys (91%) and yielded a sensitivity of 89% and specificity of 100%. Comparing the normal to the painful side helped to define technical failures. Pulsed Doppler with mechanical sector scanners was more sensitive than color Doppler. Intermittent torsion was missed both with Doppler sonography and scintigraphy. Although ultrasonography cannot replace clinical judgement, it may be very helpful in unclear cases.

Dr. Salam Yazbeck
Hôpital Sainte-Justine
3175 Ste-Catherine Road,
Montreal (Quebec) H3T 1C5
Tel. (514) 345-4688
Fax. (514) 345-4964
URETHRAL PROLAPSE IN GIRLS - THE JAMAICAN EXPERIENCE

S. Venugopal, N.D. Duncan; R.A. Carpenter
University of the West Indies

Urethral prolapse is a benign lesion of the terminal urethra, usually seen in young negroid girls. Twenty seven children with urethral prolapse treated at the University Hospital of the West Indies between January 1982 and December 1991 were prospectively studied.

74% of the children were between ages three years and seven years. Bloody discharge was the most common symptom (74%). Vulval bleeding together with a bruised appearance of urethra resulted in erroneous initial suspicion of sexual abuse in 3 children.

Prolapse was graded from I to IV depending on the extent of prolapse and degree of inflammation. Initial therapy in the 25 prepubertal consisted of sitz baths and topical application of either an antibiotic ointment or 0.5% oestrogen cream, chosen randomly.

There were 15 girls in the antibiotic group compared to 10 in the oestrogen group. Complete resolution of prolapse occurred in only 4 children, 3 of them from oestrogen group. Although oestrogen group showed better response (downgrading of prolapse in 90% as against 60% in antibiotic group), it also caused theliarchy in 2 girls.

Three children, who had only a transient improvement, along with two post-pubertal patients, had surgical excision of the prolapse. Post excision there were no complications or recurrence of prolapse. Three girls who had improvement with non-operative therapy persisted to have Grade II prolapse even after puberty. Initial therapy of urethral prolapse in pre-pubertal girls can be non-surgical. However, when this fails to achieve resolution surgical excision is simple safe and curative.

S. Venugopal
Dept. of Surgery
University of the West Indies.
Mona, Kingston 7, Jamaica
PYLOROMYOTOMY - COMPARISON BETWEEN LAPAROSCOPIC AND OPEN SURGICAL TECHNIQUES

Ronald J Scorpio, Hock L Tan, and John M Hutson
The Royal Children's Hospital, Melbourne AUSTRALIA

Several reports have appeared in the literature recently describing various techniques of performing pyloromyotomy laparoscopically. While there is no doubt that this is now a technical feasibility, there are unanswered questions with regards to its safety, efficacy and potential benefits or otherwise to the patient.

In an attempt to resolve some of these issues, we have compared the results in 37 infants who underwent open pyloromyotomy with 26 who underwent laparoscopic pyloromyotomy. The two groups were similar in terms of sex, age, weight and presenting pH although they could not be randomised. The time from feeding to discharge was less for the laparoscopic group (1.4 days) compared to the open group (1.8 days, p=0.04). Postoperative vomiting was not significantly different between the two groups. The operating time was significantly longer for the laparoscopic group: 40 mins vs 27 mins, p=0.04. There were three complications in the open surgical group and one in the laparoscopic group.

On the criterion measured, our results suggests that laparoscopic pyloromyotomy is at least as good as conventional surgery, and offers the potential benefits of shortened hospital stay, and minimal cosmetic deformity.

sponsor: Dr David E Wesson

Hock L Tan, Paediatric Surgeon
The Royal Children's Hospital
Melbourne AUSTRALIA 3052
Tel. (61-3) 345-6358
Fax. (61-3) 347-6272
THE FEASIBILITY OF LAPAROSCOPIC SWENSON PULLTHROUGH

Thomas J. Curran and John G. Raffensperger
The Children's Memorial Hospital, Chicago, Ill.

Laparoscopic techniques are well suited for pullthrough procedures because they provide excellent lighting and magnification in the pelvis, the resection is performed transanally, and the anastomosis is performed externally. The feasibility of the Swenson pullthrough was tested in thirteen mongrel dogs. Four ports are used as follows. A 10mm port is placed above the umbilicus for the camera, a 10mm in the left lateral abdomen for a bowel grasping forceps, a 12mm port in the right upper abdomen for dissection and use of an endoscopic GIA device, and a 5mm port in the right lower abdomen to provide countertraction. The bowel is divided above the peritoneal reflection using the GIA. Dissection is then performed immediately on the bowel wall down to the anal sphincter. The distal end is then everted through the anus and resected, and the proximal end anastomosed 1-2cm above the dentate line. The first several dogs were used to study optimum trocar placements and techniques, and were sacrificed at the conclusion of the procedure or within a few days. The last five consecutive dogs survived to demonstrate fecal and urinary continence and were autopsied 1-4 weeks later to reveal no surgical complications. Average operating time has been approximately 2 hours. The dogs have been active on the first postoperative day, and eating a solid diet by the second. In conclusion, we have found that the dog is a good model in which to study this procedure, and that laparoscopic techniques are capable of accomplishing the same result as the open procedure while decreasing the morbidity.

John G. Raffensperger, M.D.
2300 Children's Plaza  Box 63
Chicago, Ill 60614
Tel. 312-880-4338
Fax. 312-880-4588
ANTERIOR SAGITTAL ANORECTOPLASTY FOR LOW IMPERFORATE ANUS

K. Pippus, H. Lau, P. Fitzgerald
Izaak Walton Killam Children's Hospital, Halifax, Nova Scotia

Anal transposition and cutback procedures have been widely used in the treatment of low imperforate anus, especially in the female where this condition is the most common anorectal anomaly. For the last decade we have used an anterior sagittal anorectoplasty in this condition. This approach allows better identification and preservation of the associated muscular anatomy, and produces a satisfactory cosmetic result. The use of an intra-fistula catheter balloon has allowed controlled dissection even in the newborn, and protecting colostomy appears unnecessary. Results from eleven patients with follow-up to ten years are presented.

Dr. D. A. Gillis
The Izaak Walton Killam Children's Hospital
5850 University Avenue
Halifax, NS B3J 3G9
Tel. 902-428-8113
Fax. 902-329-4026
A STUDY OF INTRA-ABDOMINAL CO2 INSUFFLATION IN THE PIGLET.

A. Graham, D. Jirsch, K. Barrington, A. Hayashi,
Surgical Medical Research Institute, University of Alberta, Edmonton.

The hemodynamic and metabolic changes associated with intra-abdominal CO2 insufflation (IACI) were studied in 8 young, 4-6kg piglets. Cardiac index (CI), inferior vena cava flow (IVCF), pressure (IVCP), femoral artery flow (Femf), blood pressure (BP), central venous pressure (CVP) were continuously recorded; arterial blood gases (ABG), and minute Ventilation (VE) were recorded at 15 minute intervals. Mean values (±SD) were recorded at baseline (15 min), post- IACI at 15 mmHg for 1 hr, at New Baseline (15 min) following desufflation and hyperventilation for 30 minutes, and post- IACI at 15 mmHg with hyperventilation to control arterial pCO2 for 1 hr (post-IACI+V). Baseline values were compared to values post-IACI; New Baseline values were compared with post-IACI+V. Using the same protocol a second group of six 4-6kg piglets were studied during N2O insufflation. Baseline recordings were compared to those during N2O insufflation. Baseline recordings were compared to those during N2O insufflation with controlled ventilation.

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>post-IACI</th>
<th>New Baseline</th>
<th>post-IACI+V</th>
<th>N2O Baseline</th>
<th>N2O Insufflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI (ml/min/kg)</td>
<td>136±13</td>
<td>158±42*</td>
<td>138±32</td>
<td>138±38</td>
<td>151±22</td>
<td>147±11†</td>
</tr>
<tr>
<td>IVCF (ml/min)</td>
<td>480±157</td>
<td>452±194</td>
<td>503±105</td>
<td>394±105†</td>
<td>403±59</td>
<td>304±66†</td>
</tr>
<tr>
<td>Femf (ml/min)</td>
<td>35±20</td>
<td>31±18</td>
<td>34±14</td>
<td>25±11†</td>
<td>27±8</td>
<td>19±10†</td>
</tr>
<tr>
<td>BP (mmHg)</td>
<td>65±13</td>
<td>76±12*†</td>
<td>73±14</td>
<td>78±14†</td>
<td>75±12</td>
<td>87±11†</td>
</tr>
<tr>
<td>CVP (mmHg)</td>
<td>6.8±2.6</td>
<td>8.8±3.0*†</td>
<td>7±3</td>
<td>11±3†</td>
<td>5.4±1.9</td>
<td>7.3±2.9†</td>
</tr>
<tr>
<td>IVCP (mmHg)</td>
<td>14±3.9</td>
<td>27.7±6.9*†</td>
<td>15±4</td>
<td>25±4†</td>
<td>8.9±2.2</td>
<td>20.3±2.1†</td>
</tr>
<tr>
<td>HR (bpm)</td>
<td>175±32</td>
<td>184±29</td>
<td>193±36</td>
<td>195±30</td>
<td>184±29</td>
<td>198±20</td>
</tr>
<tr>
<td>PaCO2 (mmHg)</td>
<td>36.8±3.29</td>
<td>48.2±4.83</td>
<td>36.4±4.3</td>
<td>37.4±4.1</td>
<td>39.1±3.9</td>
<td>42.1±4.5†</td>
</tr>
<tr>
<td>PaO2 (mmHg)</td>
<td>167±51</td>
<td>141±54*</td>
<td>140±52</td>
<td>125±34</td>
<td>149±43</td>
<td>150±34</td>
</tr>
<tr>
<td>VE (L)</td>
<td>0.75±0.12</td>
<td>0.67±0.12</td>
<td>0.8±0.2</td>
<td>1.1±0.2†</td>
<td>0.9±0.2†</td>
<td>0.8±0.18</td>
</tr>
</tbody>
</table>

IACI in the piglet results in significant changes in CI, BP, CVP, IVCP, PaCO2, and PaO2 (p < 0.05; paired t-test). Hyperventilation with IACI (post-IACI+V) can control PaCO2 and alter the hemodynamic changes associated with IACI but, significant changes in IVCF, Femf, BP, CVP, IVCP persist (p < 0.05; paired t-test). Insufflation with N2O shows similar significant changes in IVCF, Femf, BP, CVP, and IVCP (p < 0.05) suggesting these changes are primarily the result of increased intra-abdominal pressure.

A. Hayashi
D. Jirsch
Royal Alexandra Hospital
10240 Kingsway
Edmonton, Alberta T5H 3V9
TEL. (403) 448-3701; FAX. (403) 425-4179

THIS IS THE FINAL PAPER OF THE 25th ANNUAL CAPS MEETING