What is Better for Ulcerative Colitis? Straight Pull-through vs. Ileo-anal Pouch

John Lilly, M.D. Memorial Lectureship

Jacob Langer, M.D.
Professor of Surgery
Division Head General and Thoracic Surgery
The Hospital for Sick Children
The University of Toronto

Jonathan P. Roach, M.D.
Resident in Pediatric Surgery

March 21st, 2011

Outline

- Ulcerative colitis in children
- Operative therapy
- Straight versus Pouch: the data
- Conclusions

Ulcerative Colitis

- Inflammatory bowel disease
  - Crohn's Disease

	Ulcerative Colitis	Crohn's Disease
Thickened wall and fat wrapping	0	+++
Transmural and granulomas	0	+++
Bleeding and Diarrhea	+++	++
Anal Disease	0	+++
Bowel involvement	Rectal/continuous	Discontinuous

Sabiston Textbook of Surgery, 18th Ed, 2007

UC – Extraintestinal Manifestations

- Arthritis
- Ankylosing spondylitis
- Erythema nodosum
- Pyoderma gangrenosum
- Primary sclerosing cholangitis
  - Colectomy has no effect of course of PSC

Sabiston Textbook of Surgery, 18th Ed, 2007

UC – Medical Therapy

- Aminosalicylates
  - 5-ASA
- Corticosteroids
- Immunomodulatory drugs

Sabiston Textbook of Surgery, 18th Ed, 2007

Indications for Surgery

- Intractability
- Dysplasia or carcinoma
- Colonic bleeding
- Toxic megacolon

Sabiston Textbook of Surgery, 18th Ed, 2007

Goals of Operative Therapy

- Reduce or eliminate symptoms
- Optimize nutritional status
- Promote normal growth and development
- Prevent complications
- Minimize the psychological effects of chronic illness

Coran AG, Ped Surg Int 2004;20:565-

Is UC in Children Worse?

- Higher rate of pancolitis
  - 29% in children
  - 16% in adults
- Long term consequences of treatment

Coran AG, Ped Surg Int 2004;20:565-

Historic Operation

- Proctocolectomy with end ileostomy 1944
- 3-stage procedure 1948
  - End ileostomy
  - Subtotal colectomy, sigmoid colostomy
  - Abdominoperineal resection
- Colectomy with ileoproctostomy 1966
- Variety of ileoanal anastomoses
  - Straight, J- S-, W-pouches

Pediatric Surgery, Grosfeld JL, *et al, eds. 2006*

The Straight Pull-through

- Proctocolectomy
- Mucosectomy starting just distal to the peritoneal reflection
- 4-5 cm muscular cuff
- Ileoanal anastomosis

Coran AG, Ann Surg 1990;212:242-248

Initial Study

- July 1977 – October 1989
- 100 Children and adults (age 1-48)
  - Ulcerative colitis 79
  - Familial adenomatous polyposis 19
  - Total colonic Hirschsprung's disease 10
- Only those with ileostomies closed included
- Follow-up 3 months – 15 years

Coran AG, Ann Surg 1990;212:242-248

Post-operative Complications

Stool frequencies were compared at various time intervals and between age groups and diagnosis using the paired Student's t test.

Results

Coran AG, Ann Surg 1990;212:242-248

Initial Study

- No anastomotic leaks
- No pouchitis
  - 14 – 24% in pouch reconstruction
- Mean stool frequency at 3 years
  - 7.7 episdoes in 24 hours
  - 7 episodes in pouch reconstruction
- Daytime continence = 100% at one year
- Nocturnal soiling 11.1% at 1 year
  - Absent by 3 years

Coran AG, Ann Surg 1990;212:242-248

The Romans

- 28 children with UC requiring surgery
  - 25 with straight pull through
  - 3 with S-pouch
  - 11 males
  - 17 females
- Protective ileostomies in all but one
- All ileostomies closed by 4 months post op
- Telephone interview
  - Median follow-up 6 years

Ceriati E, *et al,* Ped Surg Int 2004;20:573-578

Complications

Table 2 Complications

ERPT ($n = 21$)	
Local recurrence (residual mucosa)	4
Anastomotic leak	2
Fistula	1
Intractable diarrhea	1
Wound infection	2
Total	10 (47%)

Ceriati E, *et al,* Ped Surg Int 2004;20:573-578

Frequency of Stooling

Table 3 Results of stooling patterns

Parameter	Number of patients
Frequency of defecation	
Normal (1–2/day)	2
Often (3–5/day)	9
> 6/day	10
Stool consistency	
Normal	14
Loose	5
Liquid	2
Urgency period	
Normal (min)	14
Short (s)	4
Absent	3

Ceriati E, *et al,* Ped Surg Int 2004;20:573-578

Quality of Life

Table 6 Evaluation of quality of life

	Normal		Compromised	
	Number of patients	%	Number of patients	%
School/work activity	15	72	6	28
Physical activity	14	66	7	33
Emotional status	15	72	6	28
Social life	14	66	7	33

Ceriati E, *et al,* Ped Surg Int 2004;20:573-578

Pouchitis

- No pouchitis in straight pull-through
- 2 of 3 S-pouches excised because of pouchitis

Michigan Study

- Pediatric patients (<18 years old)
- Ulcerative colitis or familial adenomatous polyposis
- Three institutions
  - University of Michigan (May 1977 – Oct 2005)
  - University of Chicago (Feb 2002 – Oct 2004)
  - University of Helsinki (May 1985 – Dec 2004)

Seetharamaiah R, *et al,* J Ped Surg 2009;44:1410-1417

Michigan Study

- 250 patients (203 included in analysis)
- Continence scoring system 0-12 (12 = best possible outcome)
- Three year outcome
- Pouchitis measured at 12, 24, and 36 months
- Stooling freq measured at 1, 3, 6, 12, and 24 months
  - After closure of protective ileosotmy

Seetharamaiah R, *et al,* J Ped Surg 2009;44:1410-1417

Table 1 Clinical evaluation of continence at 24 months (modified Holschneider) [9]

Parameter	Scoring
Frequency of defecation	
Normal (1-2/d)	2
Often (3-5/d)	1
≥6/d	0
Stool consistency	
Normal	2
Loose	1
Liquid	0
Daytime soiling	
No	2
Soiling by stress/diarrhea	1
Permanent soiling	0
Nighttime soiling	
No	2
Often (every 2-3 d)	1
Very often (everyday)	0
Urgency period	
Normal (min)	2
Short (s)	1
Absent	0
Need of therapy for stool control	
No	2
Occasionally	1
Continuously	0

Total scores are computed by summing the scores of each of the 6 parameters. Normal bowel habits, 12 points; good (social continence, none or little limitations in social life), 9-11 points; fair (marked limitation in social life), 5-8 points; poor (total incontinence), 0-4 points.

Table 2 Sample size distribution of patients

Location	SIAA (n = 112)	JPAA (n = 91)
University of Michigan C S Mott Children's Hospital	104	43
University of Helsinki Hospital for Children and Adolescents	8	40
University of Chicago Comer Children's Hospital	0	8

Seetharamaiah R, *et al,* J Ped Surg 2009;44:1410-1417

Table 3 Complications

	SIAA (n = 112)	JPAA (n = 91)	*P*
Wound infection	9%	5%	.272
Anastomotic leak	3%	5%	.470
Intraabdominal abscess	6%	2%	.142
Anastomotic stenosis	5%	14%	.050 [a]
Intestinal obstruction	23%	28%	.511
Incisional hernia	1%	1%	-
Fistula	13%	5%	.050 [a]
Pouchitis [a] (during first 3 y of f/u)	24%	49%	.006 [a]

[a] Or enteritis for the JPAA group.

Seetharamaiah R, *et al,* J Ped Surg 2009;44:1410-1417

Table 4 Functional outcomes

	SIAA	JPAA	P [a]
Stool frequency at 24 mo	8.4 ± 3.9/d	6.2 ± 2.8/d	.003
Pouchitis/enteritis			
12 mo	8%	39%	<.001
24 mo	8%	24%	.013
36 mo	5.3%	20%	.005
Medications for stool control at 24 mo	83%	61%	.001
Stooling scores at 24 mo [b]			
Good	57%	62%	.161
Fair	43%	28%	.161
Incontinence rate at 24 mo			
Daytime incontinence	10%	2%	.025
Nighttime incontinence	29%	20%	.074

[a] A χ^2 test was performed for categorical comparisons and a t test for continuous comparisons.

[b] This did not include patients in the normal and poor score groups as this comprised 8% of patients and would not permit a sufficient number for adequate statistical analysis.

Seetharamaiah R, *et al,* J Ped Surg 2009;44:1410-1417

London Study

- Meta analysis of all comparative studies
  - Straight pull-through and pouch reconstruction
  - 1980 – 2005
  - Only studies with pediatric patients
  - Data not previously reported
  - Total 5 retrospective studies included

Tilney HS, *et al,* J Ped Surg 2006;41:1799-1808

London Study

- 306 total patients
- 86 (28.1%) underwent straight pull-through
- 220 (71.9%) underwent pouch
  - 74 (34.1%) J-pouches
  - 18 (8.2%) S-pouches
  - 127 (57.7%) lateral pouches

Tilney HS, *et al,* J Ped Surg 2006;41:1799-1808

London Study

- Primary outcome – pouch failure
  - 15.1% straight
  - 7.7% pouch
- Secondary outcomes – short-term
  - Perianal sepsis – no difference in studies with high quality data
  - Rectovaginal fistula – no difference
  - Bowel obstruction – no difference

Tilney HS, *et al,* J Ped Surg 2006;41:1799-1808

London Study

- Secondary outcomes – long term
  - Anastomotic stricture – overall no difference
    - High quality studies
    - Significantly fewer strictures
    - 1.8% vs. 30.3%

Tilney HS, *et al,* J Ped Surg 2006;41:1799-1808

London Study

- Functional outcomes
  - Greater frequency in straight
  - Slightly more noctural soiling

Tilney HS, *et al,* J Ped Surg 2006;41:1799-1808

London Study

- "The low number and overall quality of the studies analyzed means that caution should be exercised in the interpretation and generalization of the results of this meta-analysis."

Tilney HS, *et al,* J Ped Surg 2006;41:1799-1808

Conclusions

- Both straight and pouch procedures can be performed safely in children
- Both effectively cure UC
- There are fewer episodes of pouchitis in straight pull through
- Long term continence and stool frequency in straight pull through is similar to pouch reconstruction