Ileal Pouch Anal Anastomosis: The Preferred Method of Reconstruction after Proctocolectomy in Children

Stephanie Jones, D.O.
Surgical Fellow
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Ulcerative Colitis

- Spectrum of inflammatory bowel disease in children
  - Ulcerative colitis (UC), indeterminate colitis, Crohn’s disease
- Incidence of UC 1: 100,000
- 20% of all patients with UC will develop symptoms before age 20 years
Ulcerative Colitis

- 1 in 100,000 children
- Cyclic- flares and remission
- Medical treatment aminosalicylates and corticosteroids
  - Second line: Immune modulation azathioprine, mercaptopurine, and cyclosporine
  - TNF inhibitors infliximab, adalimumab
- Up to 65% of pt younger 8 y/o with IBD will present with pancolitis
Indications for Operation

- Children commonly present with acute-onset, unremitting, fulminant colitis
  - Urgent colectomy and ileostomy, pouch reconstruction later

- Goal: to restore a more normal life
  - Quality of life correlates with bowel functional outcomes
Indications for Operation

- **Refractory disease**
  - treatment resistance or the inability to wean from corticosteroids

- **Long-term corticosteroid therapy:**
  - growth and development, bone mineralization and the risk of fracture

- **Other indications:** medication toxicity, growth retardation, and carcinoma prophylaxis
Procedure of Choice

1. Laparoscopic-assisted total proctocolectomy
2. Ileoanal J-pouch anastomosis
3. Diverting loop ileostomy
Construction of the Pouch

A

B

C

Staged Reconstruction

- Useful if inflammation obscures planes in rectum
  - Preservation of transitional epithelium
- Allows wean off steroids/medication
- Protects pouch
  - Concern for leak
METHODS: retrospective review- 20 years

- 100 consecutively referred children (<18 years old)
- Reconstruction with a J-pouch of ileum, preservation of the transitional anorectal epithelium
- Same two-surgeon team
- Temporary diverting ileostomy

Outcome measures: daytime and nocturnal fecal continence, bowel movements per day, and complications including pouchitis, ileoanal stricture, or postoperative small-bowel obstruction
Results after J Pouch

- 35/75 children with UC (47%) had at least one episode of pouchitis
- SBO- 20% required reoperation
- Another postop complication was IPAA stricture requiring operative dilatation and/or anoplasty (N= 18)
- No pelvic abscesses, need to redo IPAA
Retrospective analysis of 250 children after proctocolectomy with either SIAA or JPAA

First 3 years after pull-through

A functional stooling score developed
Outcomes

- Daytime and nighttime stooling frequencies were significantly higher for SIAA patients at 1 to 24 months after pull-through.

- Symptomatic pouchitis higher in JPAA
  - Frequency of pouchitis declined with time
  - Most easily managed with antibiotics

- There was no significant difference in surgical complications.

- Incontinence rates were higher in SIAA group
  - 10% vs 2% JPAA \((P=0.025)\) daytime
  - 29% vs 20% JPAA \((P=0.075)\) nighttime
Complications and Stool Frequency

Table 3  Complications

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

a Or enteritis for the JPAA group.
Stool Frequency after Surgery

![Graphs showing the mean stool frequency (daytime and nighttime) over time post-pullthrough (months). The graphs compare different types of anastomosis, including straight pull-through and J-pouch, with error bars showing ±1.00 SE.](image)
Frequency of Pouchitis after Surgery

[Graph showing the frequency of pouchitis over time post-pullthrough. The graph indicates a decrease in the frequency of pouchitis with time.]

Type of Anastomosis
- Straight Pull-through
- J pouch

Error bars: +/- 1.00 SE

Time Post-Pullthrough (Months)
- 12
- 24
- 36

Mean Frequency of Pouchitis
### Functional Outcomes after Surgery

#### Table 4: Functional outcomes

<table>
<thead>
<tr>
<th></th>
<th>SIAA</th>
<th>JPAA</th>
<th>$P^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stool frequency at 24 mo</strong></td>
<td>$8.4 \pm 3.9/d$</td>
<td>$6.2 \pm 2.8/d$</td>
<td>.003</td>
</tr>
<tr>
<td><strong>Pouchitis/enteritis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 mo</td>
<td>8%</td>
<td>39%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>24 mo</td>
<td>8%</td>
<td>24%</td>
<td>.013</td>
</tr>
<tr>
<td>36 mo</td>
<td>5.3%</td>
<td>20%</td>
<td>.005</td>
</tr>
<tr>
<td><strong>Medications for stool control at 24 mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>83%</td>
<td>61%</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Stooling scores at 24 mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>57%</td>
<td>62%</td>
<td>.161</td>
</tr>
<tr>
<td>Fair</td>
<td>43%</td>
<td>28%</td>
<td>.161</td>
</tr>
<tr>
<td><strong>Incontinence rate at 24 mo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daytime incontinence</td>
<td>10%</td>
<td>2%</td>
<td>.025</td>
</tr>
<tr>
<td>Nighttime incontinence</td>
<td>29%</td>
<td>20%</td>
<td>.074</td>
</tr>
</tbody>
</table>

Stooling score: Normal 12, good 9-11, fair 5-8, poor 0-4
Methods: Studies comparing outcomes from ileal pouch-anal anastomosis (IPAA) and straight ileoanal anastomosis (SIAA) were identified by searching Medline, Ovid, and Embase.

- data extracted for meta-analysis

- All were retrospective reviews

- Primary outcome- pouch failure- likely in SIAA
Results: 13 studies identified by literature search, 5 satisfied the inclusion criteria

- Total of 306 patients, 86 of whom (28.1%) underwent SIAA, and the remainder, IPAA
- Pouch failure, abdominal salvage procedures more common in SIAA group
- Short-term adverse events were similar between the 2 groups
  - exception of perianal sepsis, higher in SIAA
- Bowel frequency was lower in the IPAA patients
### Table 3
Results of meta-analysis comparing straight vs pouch reconstruction for children and young adults undergoing panproctocolectomy

<table>
<thead>
<tr>
<th>Outcome of interest</th>
<th>No. of studies</th>
<th>No. of patients</th>
<th>OR/WMDa</th>
<th>95% CI</th>
<th>P</th>
<th>HG $\chi^2$</th>
<th>HG P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-term adverse outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perianal sepsis</td>
<td>3</td>
<td>284</td>
<td>2.36</td>
<td>1.01-5.53</td>
<td>.05</td>
<td>0.34</td>
<td>.84</td>
</tr>
<tr>
<td>Enterovaginal fistula</td>
<td>4</td>
<td>306</td>
<td>2.52</td>
<td>0.75-8.52</td>
<td>.14</td>
<td>0.85</td>
<td>.84</td>
</tr>
<tr>
<td>Anastomotic leak</td>
<td>3</td>
<td>240</td>
<td>1.22</td>
<td>0.37-4.08</td>
<td>.75</td>
<td>0.41</td>
<td>.82</td>
</tr>
<tr>
<td>Small bowel obstruction</td>
<td>4</td>
<td>306</td>
<td>1.01</td>
<td>0.51-2.38</td>
<td>.80</td>
<td>0.25</td>
<td>.97</td>
</tr>
<tr>
<td><strong>Long-term adverse outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>4</td>
<td>306</td>
<td>3.21</td>
<td>1.24-8.34</td>
<td>.02</td>
<td>1.25</td>
<td>.74</td>
</tr>
<tr>
<td>Abdominal salvage</td>
<td>3</td>
<td>284</td>
<td>9.50</td>
<td>3.14-28.77</td>
<td>&lt;.0001</td>
<td>1.84</td>
<td>.40</td>
</tr>
<tr>
<td>Anastomotic stricture</td>
<td>4</td>
<td>233</td>
<td>0.38</td>
<td>0.07-1.90</td>
<td>.24</td>
<td>6.40</td>
<td>.09</td>
</tr>
<tr>
<td>Inflammation of neorectum/Pouch</td>
<td>4</td>
<td>306</td>
<td>0.52</td>
<td>0.08-3.36</td>
<td>.49</td>
<td>6.83</td>
<td>.08</td>
</tr>
<tr>
<td><strong>Functional outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowel Frequency per 24 h</td>
<td>2</td>
<td>35</td>
<td>2.63</td>
<td>1.34-3.92</td>
<td>&lt;.001</td>
<td>0.02</td>
<td>.88</td>
</tr>
<tr>
<td>Defecation at night</td>
<td>1</td>
<td>22</td>
<td>87.40</td>
<td>3.72-2051.06</td>
<td>.005</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Seepage at night</td>
<td>1</td>
<td>13</td>
<td>0.22</td>
<td>0.02-2.45</td>
<td>.22</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
Conclusion

- Pediatric ulcerative colitis is effectively treated with surgery
- Complications can occur
  - Infection, pouchitis, stricture
  - Easier to manage with pouch
- Quality of life and good outcomes are best maintained with the ileal pouch anal anastomosis