A Comparison of J and W Pouch Reconstruction after Total Proctocolectomy in Ulcerative Colitis

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Nothing to Disclose
Ulcerative Colitis

- A diffuse inflammatory disease of the colon which manifests with bloody mucoid diarrhea
- The indications for total proctocolectomy in Ulcerative Colitis include
  - Medically refractory pancolitis
  - Colonic dysplasia or malignancy
  - Toxic Megacolon
History of the Surgical Treatment of Ulcerative Colitis

- Total Proctocolectomy with Permanent Ileostomy
- Early Alternatives
  - Kock pouch
    - Continent ileostomy
    - Operation fraught with a high complication rate and a high rate of revision
  - Straight ileoanal anastomosis
    - Perineal Ileostomy
    - Severe incontinence, intolerable stool frequency rates, perianal irritation.

Image: Caltech.edu/~pls/kock/
Current surgical treatment of UC

- Total proctocolectomy with ileal pouch construction; with or without protective proximal ileostomy
- When appropriate, ileostomy takedown two months later
- Laparoscopic techniques presently being deployed
Pouch Design

- Early studies exploring various pouch designs described several variations including: the triple loop “S”, double loop “J” or quadruple loop “W”.

Reservoir designs. a, triple; b, double; c, quadruple

“S” Pouch

- The “S” pouch
  - Low stool frequency rate
  - Difficulty with emptying, requiring catheterization
  - Currently infrequently performed

Johnston, Gut. 1996
Image: uwhealth.org/surgery/ileal-pouch-types
“J” Pouch

- The J pouch:
  - Requires the shortest mesenteric length
  - Pouch creation
    - Made from the terminal 30 to 40 cm of small bowel
    - The small bowel is folded into two limbs of 15 to 20 cm that are often stapled in a side to side fashion
    - The apex of the reservoir is anastomosed side to end to the intact anal mucosa using a circular stapler

Image: uwhealth.org/surgery/ileal-pouch-types
“W” Pouch

- The W pouch was first described as a pouch with similar evacuation characteristics to the J pouch but with a large capacity.

- Pouch Creation:
  - For the W pouch the terminal small bowel is folded into four loops, each 10 to 12 cm long, forming a W shaped configuration.

Image: uwhealth.org/surgery/ileal-pouch-types
The reservoir is hand sewn with three posterior suture lines and a long anterior suture line to form the pouch.

The rectal mucosa is excised to the dentate line.

A end to end anastomosis is then created in between the ileal pouch and the anal canal.
This study sought to objectively examine whether the quadruple loop W reservoir provides superior functional outcomes to the double loop J pouch design.
A comparison of J and W pouch reconstruction after total proctocolectomy in ulcerative colitis

- Retrospective review at Sacred Heart Medical Center
  - Charts review from 1996 to 2011
  - Patients with ulcerative colitis
  - Ileoanal anastomosis with J or W pouch reconstruction
  - With 6 to 36 months of follow-up
Data Collection

- Demographic, operative, postoperative, and follow-up data was collected.
- Additionally, a survey to assess the stool frequency and rates of incontinence was distributed.
Results

- There were 70 patients reviewed; 61 had W pouches and 9 had J pouch reconstruction.
- Most of the patients (56 of 70) underwent a two stage procedure with total proctocolectomy and pouch creation being done along with a proximal diverting loop ileostomy; this was followed by ileostomy takedown 8 weeks later.
- 8 of the patients (4 Js and 4 Ws) had a three stage procedure in which a total abdominal colectomy was done initially with end ileostomy; the patients were subsequently weaned from their steroids and returned later for their pouch procedure.
Results

- 6 of the patient were done in 1 stage without a proximal diverting loop ileostomy.
## Demographics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>J pouch (n =9)</th>
<th>W pouch (n = 61)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at surgery, mean, years (range)</td>
<td>50.9 (22-69)</td>
<td>39.7 (19-71)</td>
<td>0.20</td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>3 (33)</td>
<td>29 (47)</td>
<td>0.815</td>
</tr>
<tr>
<td>Time from surgery to follow-up, mean, days (range)</td>
<td>416.4 (218-743)</td>
<td>613.5 (222-1063)</td>
<td>0.035</td>
</tr>
<tr>
<td>Time from surgery to study, mean, years</td>
<td>3.6 (2-5)</td>
<td>6.8 (1.5- 10.5)</td>
<td>0.008</td>
</tr>
</tbody>
</table>
Perioperative Data

- No significant difference between the two groups:
  - Length of stay
  - Hemorrhage
  - Pelvic infection
  - Anastomotic stricture
  - Pouch excision

<table>
<thead>
<tr>
<th>Variable</th>
<th>J pouch (n = 9)</th>
<th>W pouch (n = 61)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvic Infection/Pelvic Abscess</td>
<td>1 (11.1%)</td>
<td>2 (3.2%)</td>
<td>0.85</td>
</tr>
<tr>
<td>Anastomotic Stricture</td>
<td>3 (33.3%)</td>
<td>3 (4.9%)</td>
<td>0.08</td>
</tr>
<tr>
<td>Pouch Failure</td>
<td>0 (0%)</td>
<td>1 (1.5%)</td>
<td>0.52</td>
</tr>
<tr>
<td>Length of Stay, mean, days (range)</td>
<td>6.75(3-10)</td>
<td>7.17(3-13)</td>
<td>0.39</td>
</tr>
</tbody>
</table>

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<th>W pouch (n = 61)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Pelvic Infection/Pelvic Abscess</td>
<td>1 (11.1%)</td>
<td>2 (3.2%)</td>
<td>0.26</td>
</tr>
<tr>
<td>Anastomotic Stricture</td>
<td>3 (33.3%)</td>
<td>5 (8.1%)</td>
<td>0.39</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>0 (0%)</td>
<td>2 (5%)</td>
<td>0.52</td>
</tr>
<tr>
<td>Length of Stay, mean, days (range)</td>
<td>2.8(2-3)</td>
<td>4(2-14)</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Outcomes

- Patient responses on follow-up in clinic or to survey questions

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</thead>
<tbody>
<tr>
<td>BM per day, mean (range)</td>
<td>7.43 (5-13.5)</td>
<td>4.81 (2.5-12.5)</td>
<td>0.0085</td>
</tr>
<tr>
<td>Patients reporting any</td>
<td>2 (22%)</td>
<td>4 (6.5%)</td>
<td>0.82</td>
</tr>
</tbody>
</table>
Outcomes

- W-pouch patients had an improvement in stool frequency rates and in fecal continence rates as compared to the J-pouch patients.
- W-pouch patients had excellent continence both during the day and at night.
Outcomes

- There were no cases of sexual dysfunction reported.
- No W- pouch patients reported incontinence to a degree where they wore a pad.
- 15% of patients reported 1 or more bouts of pouchitis; all of which were fairly easily managed.
- 2 patients have had their pouch removed late; one for recurrent pelvic sepsis; the other for the development of Crohn’s disease in the pouch.
- All patients report an improvement in their quality of life.
In patients over 65

- There were 9 older patients included in this study (65 – 72 y.o.)
  - There were 2 Js and 7 Ws in this age group
  - There was an anastomotic stricture in one of the older J–pouch patients; no significant complications occurred in the older W–pouch patients.
  - All older W–pouch patients report excellent continence and good stool frequency rates.
  - The operation was very well tolerated by these patients in this cohort without major morbidity.
W–Ileal Pouch Creation – Surgical Technique
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W–Ileal Pouch Creation– Surgical Technique
W–Ileal Pouch Procedure
Restorative Proctocolectomy

- Restorative proctocolectomy was first described in the 1980s.
- Shown to have a functional advantage to straight ileoanal anastomosis.
- The W pouch was first described by Parks and Nicholls in 1980s
  - The evacuation characteristics of the J with a larger capacity, reducing the daily frequency of defecation.
- The J pouch was largely popularized by large case series from the Cleveland Clinic and the Mayo Clinic
  - Acceptable complication rates and adequate long term functional results with the J pouch especially compared to the straight ileoanal anastomosis.

Although the J pouch is most frequently performed, several studies have indicated superior outcomes in patients with W pouch constructions.

One prospective study showed equivocal findings in the J versus the W in regards to stool frequency and continence.

However other trials and a metanalysis in 2007 have shown better stool frequency rates with the W.

Johnston, Gut. 1996

Results

- This study showed excellent patient outcomes in the W ileal pouch group characterized by a low frequency of daily bowel movements and low rates of fecal incontinence.
- The procedure had a low incidence of major post-operative complications including hemorrhage, pelvic infection, anastomotic stricture, bowel obstruction, or ultimate need for pouch excision.
In patients over 65

- Ileal pouch–anal anastomosis procedures for UC have been discouraged in elderly patients traditionally because of poor functional results; nine patients in this series were over 65 years of age.
  - The only complication was an anastomotic stricture in one of the J–pouch patients and excellent functional results were achieved.
- Based on these results, the W–ileal pouch procedure offers an alternative to permanent ileostomy in the older patient.
The limitations of this study

- Retrospective design
- Selection of the pouch design by the surgeon
- J pouches performed when there was insufficient mesenteric length for a W pouch
Mobility of the small bowel mesentery is a critical factor in determining the feasibility of any of these operations. The W pouch design requires the greatest mobilization especially when a hand-sewn anastomosis to the dentate line is formed. In this series the mesenteric vessels were not divided for further mobilization; rather, a J pouch was constructed instead.
The J pouch ileoanal anastomosis was performed different than that the W.

- A circular stapler was utilized for the J pouch ileoanal anastomosis
- The W was hand anastomosed following a distal rectal mucosectomy
- The distal mucosectomy may infer an advantage
  - Removing all diseased rectal mucosa at risk for continued inflammatory bowel disease and malignant transformation.
Conclusion

- This study showed:
  - Similar outcomes in regards to complication and incontinence rates between the two pouch designs
  - Lower stool frequency with the W pouch design.
  - The W pouch, while more tedious to construct, may offer improved functional results.
  - *In the appropriate patient the W pouch may be advantageous after total proctocolectomy for ulcerative colitis.*
Toilet Paper

- 15 sheets of 2 ply toilet paper per BM
  - 15 sheets x 2 bowel movements per day = 30 sheets/day
  - 30 x 365 = 10,950 sheets of 2 ply toilet paper in a year
  - 10,950/ 500 sheets per roll of toilet paper = 21.9 rolls/ year
  - 21.9 rolls of toilet paper x 30 years = 657 rolls of toilet paper

http://encyclopedia.toiletpaperworld.com/toilet-paper-facts