Optimal Use of Surgical Expertise in the Care of IBD Patients

Bashar Safar MBBS, MRCS
Assistant professor of Surgery
Ravitch Division

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No disclosure
Objectives

- **Crohns Disease**
  - Timing of surgery
  - Resection
  - Anastomotic technique
  - Strictureplasty
  - Laparoscopic versus open surgery
  - Segmental versus total colectomy
  - Perioperative CD medications

- **Ulcerative Colitis**
  - Surgical Approach and complications
  - Mucosectomy vs Stapled IPAA
  - Crohns Disease in IPAA
  - Laparoscopy
  - Biologics
Crohn's Disease
Crohn's Disease
Location and Extent

- Mouth to Stomach: 6%
- Colitis 32%
- Ileocolitis 45%
- Ileitis 22%
Impact of Therapy

Cosnes J et al. Inflamm Bowel Dis 2002; 8: 244
Crohn’s Disease Surgical Management

- Palliative
- Early surgical consultation
- Good communication with GI and patient essential
- Establish goals and inform patient of expectations
- Optimize nutritional status
- Obtain “roadmap”
  - CT, colonoscopy, SBS
You are here
Surgical decision making

- Timing of surgery
- Resection
- Anastomotic technique
- Strictureplasty
- Laparoscopic versus open surgery
- Segmental versus total colectomy
- Perioperative CD medications
Surgical decision making

• Timing of surgery
• Resection margins
• Anastomotic technique
• Strictureplasty
• Laparoscopic versus open surgery
• Segmental versus total colectomy
• Perioperative CD medications
Timing of Surgery

• 197 patients underwent 231 bowel resections for perforating ileitis

• 1992 – 2009

• The median duration of clinical deterioration leading to surgery was 5 months
  – from the onset of clinical exacerbation unresponsive to any medical treatment to the date of surgery

• If the patient was sick for >5 months:
  • Greater number of structures in the inflammatory mass (3.3 vs 2.8)
  • Higher probability of taking immunosuppressive drugs (26% vs 14%), budesonide (29% vs 14%), and a multiple-drug combination (31% vs 16%) at the time of surgery
  • Higher incidence of post-op septic complications (31% vs 13%)

Iesalnieks et al. Inflamm Bowel Dis 2010
Timing of surgery

• Timing is critical
  – For some patients, waiting leads to worse outcome.
  – On the other hand, delaying surgery is beneficial for many patients and in some cases may avoid surgery altogether.
Surgical decision making

- Indications for and timing of surgery
- Resection
- Strictureplasty
- Segmental versus total colectomy
- Anastomotic technique
- Laparoscopic versus open surgery
- Nutritional status
- Perioperative CD medications
Resection

Intestinal Economy
Effect of resection margins on the recurrence of Crohn’s disease in the small bowel

- 131 patients randomized to 2 cm vs 12 cm margin from grossly involved bowel.
- Median f/u = 55.7 months Recurrence = operation for pre-anastomotic disease
- Recurrence rates
  - Limited resection = 25%
  - Extended resection = 18%
  - p=NS
- Results – no differences in early post-op complications

Fazio el at. Ann Surg 1996
<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Dates</th>
<th>% all cases</th>
<th>Outcome</th>
<th>Follow up</th>
<th>% relapse negative</th>
<th>% relapse positive</th>
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<tbody>
<tr>
<td>Pennington, 1980</td>
<td>103</td>
<td>1958-1977</td>
<td>unknown</td>
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<td>5.4 years</td>
<td>17%</td>
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<td>Karesen, 1981</td>
<td>59</td>
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<td>Clinical recurrence</td>
<td>10 years</td>
<td>14%</td>
<td>66%</td>
<td>S</td>
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<td>Lindhagen, 1983</td>
<td>110</td>
<td>1958-1974</td>
<td>unknown</td>
<td>Clinical recurrence</td>
<td>10 years</td>
<td>40%</td>
<td>73%</td>
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<td>Wolff, 1983</td>
<td>42</td>
<td>1970-1975</td>
<td>unknown</td>
<td>Clinical recurrence</td>
<td>&gt;5 years</td>
<td>*55% overall unit</td>
<td>89%</td>
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<td>Heuman, 1983</td>
<td>81</td>
<td>1972-1978</td>
<td>85%</td>
<td>Clinical recurrence</td>
<td>5.6 years</td>
<td>36%</td>
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<td>Cooper, 1986</td>
<td>142</td>
<td>1968-1982</td>
<td>unknown</td>
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<td>6 years</td>
<td>38%</td>
<td>29%</td>
<td>NS</td>
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<td>Kotanagi, 1991</td>
<td>100</td>
<td>1960-1977</td>
<td>44%</td>
<td>Clinical recurrence</td>
<td>11 years</td>
<td>51%</td>
<td>49%</td>
<td>NS</td>
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<tr>
<td>Heimann, 1993</td>
<td>*28</td>
<td>1976-1989</td>
<td>unknown</td>
<td>Clinical recurrence</td>
<td>3 years</td>
<td>41%</td>
<td>91%</td>
<td>S</td>
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<td>Fazio, 1996</td>
<td>131</td>
<td>1986-1993</td>
<td>100%</td>
<td>Surgical recurrence</td>
<td>4.5 years</td>
<td>20%</td>
<td>30%</td>
<td>NS</td>
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<td>Kurer, 2006</td>
<td>98</td>
<td>1995-2004</td>
<td>61%</td>
<td>Clinical recurrence</td>
<td>3 years</td>
<td>51%</td>
<td>52%</td>
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</table>
Surgical decision making

- Timing of surgery
- Resection margins
- Anastomotic technique
- Strictureplasty
- Laparoscopy
- Segmental versus total colectomy
- Perioperative CD medications
Anastomotic technique

• Stapled versus handsewn
  • 7 trials, 1125 patients (441 stapled, 684 handsewn)
  • Stapled anastomoses associated with significantly fewer leaks than handsewn
  • No difference in other outcomes (stricture, time, bleeding, reoperation, mortality, LOS, abscess, wound infection)

  Cochrane Database Syst Rev. 2011 Sep 7;(9)

• Side to side versus end to end
  • Multicenter, RCT
  • 139 patients, 1 yr followup
  • No difference in endoscopic (40%) or symptomatic (20%) recurrence rate

  McLeod et al. DCR 2009
Surgical decision making

- Timing of surgery
- Resection margins
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- Strictureplasty
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- Segmental versus total colectomy
- Perioperative CD medications
Stricturoplasty

• Indications
  1. Diffuse involvement of the small bowel with multiple strictures
  2. Stricture(s) in a patient who has undergone previous major resection(s) of small bowel (>100 cm)
  3. Rapid recurrence of Crohn’s disease manifested as obstruction
  4. Stricture in a patient with short bowel syndrome
  5. Non-phlegmonous fibrotic stricture

• Contraindications
  1. Free or contained perforation of the small bowel
  2. Phlegmonous inflammation, internal fistula, or external fistula involving the affected site
  3. Multiple strictures within a short segment
  4. Stricture in close proximity to a site chosen for resection
  5. Hypoalbuminemia (<2.0 g/dL)
Strictureplasty

Heineke-Mikulicz Strictureplasty

Finney strictureplasty

Side-to-side isoperistaltic strictureplasty
• Finding intestinal strictures at surgery
Stricturoplasty

• Mata-analysis 23 studies

• 1975-2005

• 1112 patients underwent 3259 Stricturoplasties

• Complication 13%
  – Septic 4%; 44% required laparotomy
  – Bleeding 3%; 6% required laparotomy

• Recurrence rate 28% at 5 years
  – 90% at non-strictureplasty sites

• Cancer in 2 patients

• Deaths 0

Yamamoto et al. DCR 2007; 50:1968-86
Surgical decision making

- Timing of surgery
- Resection margins
- Anastomotic technique
- Strictureplasty
- Laparoscopic versus open surgery
- Segmental versus total colectomy
- Perioperative CD medications
Laparoscopic surgery
Laparoscopy for Crohn's Disease: A Meta-Analysis

- 881 patients
- 14 studies
  - 2 prospective, randomized, controlled trials
  - 2 case-matched studies
  - 10 studies compared patients who had open and laparoscopic surgery in the same institution

Laparoscopy for Crohn's Disease
A Meta-Analysis

- Laparoscopic surgery for Crohn's disease takes longer to perform
- There are significant short-term benefits to the patient.
- The morbidity is lower
- The rate of disease recurrence is similar
- Therefore, laparoscopic surgery for Crohn's disease is both safe and feasible.
Surgical decision making

- Timing of surgery
- Resection margins
- Anastomotic technique
- Strictureplasty
- Laparoscopic versus open surgery
- Segmental versus total colectomy
- Perioperative CD medications
Segmental vs Total colectomy

- Meta-analysis: n=6 (488 patients)
- Operative morbidity rate n=3: 1.4 (0.2-12.7)
- Permanent Stoma rate n=4: 2.75 (0.8-9.7)
- Operative recurrence rate n=5: 1.08 (0.4-3.0)
- Time to operative recurrence n=3: 4.5 years (3.0-5.8)

Tekkis et al. Colorectal disease 2006
Surgical decision making

- Timing of surgery
- Resection margins
- Anastomotic technique
- Strictureplasty
- Laparoscopic versus open surgery
- Segmental versus total colectomy
- Perioperative CD medications
Steroids

Total complications

OR 1.41, 95% CI 1.07-1.87

Septic complications

OR 1.68, 95% CI 1.24-2.28
## Steroids – Dose matters

<table>
<thead>
<tr>
<th>Study Reference</th>
<th>No. on Steroids &lt;20 mg</th>
<th>No. of Complications</th>
<th>No. on Steroids &gt;20 mg</th>
<th>No. of Complications</th>
<th>No. on Steroids &gt;40 mg</th>
<th>No. of Complications</th>
</tr>
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<tbody>
<tr>
<td>Mahadevan^32</td>
<td>89</td>
<td>23</td>
<td>42</td>
<td>8</td>
<td>78</td>
<td>34</td>
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<tr>
<td>Colombel^30</td>
<td>193</td>
<td>42</td>
<td>34</td>
<td>8</td>
<td>43</td>
<td>13</td>
</tr>
<tr>
<td>Bruewer^29</td>
<td>323</td>
<td>37</td>
<td>73</td>
<td>9</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Data on total complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Ziv^36</td>
<td>479</td>
<td>32</td>
<td>192</td>
<td>12</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Aberra^28</td>
<td>2.56 (0.68–9.61)</td>
<td>3.12 (0.93–10.49)</td>
<td>9.16 (1.51–55.42)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombel^30</td>
<td>193</td>
<td>34</td>
<td>34</td>
<td>8</td>
<td>43</td>
<td>10</td>
</tr>
<tr>
<td>Author</td>
<td>Year</td>
<td>Study design</td>
<td>Type of surgery</td>
<td>N</td>
<td>Postoperative complications</td>
<td>Patient treated with anti-TNF</td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----------------------------</td>
<td>-------------------------------</td>
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<tr>
<td>Tay et al.</td>
<td>2003</td>
<td>Retrospective</td>
<td>Segmental resection with primary anastomosis or strictureplasty</td>
<td>100</td>
<td>11%</td>
<td>22%</td>
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<tr>
<td>Marchal et al.</td>
<td>2004</td>
<td>Case-control</td>
<td>Intestinal resection (symptomatic stenosis or refractory fistulas and/or abscesses, or intractable disease)</td>
<td>79</td>
<td>24%</td>
<td>50%</td>
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<tr>
<td>Colombel et al.</td>
<td>2004</td>
<td>Retrospective</td>
<td>Abdominal surgery</td>
<td>270</td>
<td>23%</td>
<td>19%</td>
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<tr>
<td>Appau et al.</td>
<td>2008</td>
<td>Retrospective</td>
<td>Ileocolonic resection</td>
<td>389</td>
<td>ND</td>
<td>15%</td>
</tr>
<tr>
<td>Indar et al.</td>
<td>2009</td>
<td>Retrospective</td>
<td>Intestinal surgery (ileocecal resection and small intestine resection++)</td>
<td>112</td>
<td>33%</td>
<td>15%</td>
</tr>
<tr>
<td>Nasir et al.</td>
<td>2010</td>
<td>Retrospective</td>
<td>Surgery which included a suture or staple line</td>
<td>370</td>
<td>29%</td>
<td>32%</td>
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<tr>
<td>Canedo et al.</td>
<td>2011</td>
<td>Retrospective</td>
<td>Abdominal surgery</td>
<td>225</td>
<td>ND</td>
<td>29%</td>
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<tr>
<td>Kasperek et al.</td>
<td>2011</td>
<td>Case-control</td>
<td>Abdominal surgery</td>
<td>96</td>
<td>59%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Summary

• Surgery for CD is palliative.
• Optimize nutritional status.
• Set clear goals of therapy and communicate with patient and gastroenterologist.
• Conservative intestinal resection is important.
• Laparoscopic approach is preferred.
• Steroids but not biologics influence postoperative outcomes.
Ulcerative Colitis
Ulcerative Colitis
Surgical Management

- 30% rate of colectomy in UC after 20 years
- Elective
  - Disease refractory to medical therapy
  - Cancer risk
  - Complications from medical therapy
- Emergency
  - Toxic megacolon
  - Perforation
  - Bleeding
Ulcerative Colitis
Emergency Surgery

- Subtotal colectomy with end ileostomy
- 3 stage pouch
Ulcerative Colitis
Elective Surgery

1. Proctocolectomy, and ileal pouch-anal canal anastomosis (IPAA)
2. Proctocolectomy with permanent ileostomy (Brooke ileostomy)
3. Abdominal colectomy with ileorectal anastomosis
4. Proctocolectomy with continent ileostomy (Kock pouch)
Ulcerative Colitis

- Surgical Approach and complications
- Mucosectomy vs Stapled IPAA
- Crohns Disease in IPAA
- Laparoscopy
- Biologics
Elective Surgery
TPC with end ileostomy

• Proctocolectomy with permanent ileostomy (Brooke ileostomy)
TPC/end ileostomy

• **Pros**
  - Remove all disease
  - No risk of cancer
  - Relatively low morbidity
  - Absence of functional problems of pouch

• **Cons**
  - Permanent ileostomy
Elective Surgery
TAC with IRA

• Abdominal colectomy with ileorectal anastomosis
TAC with IRA

• Pros
  – Women of childbearing age
  – Indeterminate colitis favoring Crohn’s
  – Advanced cancer in the colon

• Cons
  – Retained rectum at risk of recurrent disease/cancer
  – Results variable in different series
Elective Surgery
TPC with continent pouch

• Proctocolectomy with continent ileostomy (Kock pouch)
• Rarely performed
Elective Surgery
IPAA

• Proctocolectomy, and ileal pouch-anal canal anastomosis (IPAA)
• Two stage vs Three stage
IPAA

• **Pros**
  – Cure of disease
  – Minimization of cancer development
  – Avoidance of a permanent stoma
  – Maintenance of anal continence

• **Cons**
  – Technical complexity of operation
  – Potential for significant complications
UC: IPAA Complications

Cleveland Clinic 1995

Post-op complication rate 27%

Pouch excised in 34 patients

1005 patients

<table>
<thead>
<tr>
<th>Complication</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anastomotic leak</td>
<td>2.9%</td>
</tr>
<tr>
<td>Pelvic abscess</td>
<td>8.2%</td>
</tr>
<tr>
<td>Pouch-cutaneous fistula</td>
<td>5.2%</td>
</tr>
<tr>
<td>Pouch-vaginal fistula</td>
<td>4.2%</td>
</tr>
<tr>
<td>Wound infection</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

| Pouch fistula                | 6    |
| Pelvic sepsis                | 9    |
| Perianal sepsis              | 7    |
| Pouchitis                    | 7    |
| Incontinence                 | 3    |
Long term complications IPAA

- Mortality (<0.5%)\(^1\)
- 3-10 stools/24 hr so bowel pattern not normal\(^1\)
- Impotence (1.5\%)\(^2\)
- Pouchitis (10-60\%)\(^1\)
- Small bowel obstruction (20\%)\(^1\)
- Decrease in female fertility (56-98\%)\(^3\text{-}5\)
- Pouch-vaginal fistula (4\%)\(^1\)

Long term complications IPAA

- Mayo Clinic
- 1885 patients
- 20 year follow up (Mean 11 years)
- Mean age at time of surgery 34
- Pouch success decreases with time but still 92% at 20 years
- Incontinence and night time seepage worsened with time
- QOL remained unchanged and 92% remained in same employment

## Ileal Pouch – Functional Outcome

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>&lt;45</th>
<th>46-55</th>
<th>56-65</th>
<th>&gt;65</th>
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<tbody>
<tr>
<td>10 year postoperative</td>
<td>5.5</td>
<td>5.7</td>
<td>6.2</td>
<td>4.6</td>
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<tr>
<td># of BM / 24 Hours</td>
<td>56</td>
<td>46</td>
<td>42</td>
<td>33</td>
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<tr>
<td>Never Incontinent (%)</td>
<td>39</td>
<td>48</td>
<td>39</td>
<td>60</td>
</tr>
</tbody>
</table>

Overall, 96% of patients were happy to have undergone their surgery, and 98% recommended it to others.
Mucosectomy vs Stapled anastomosis

- Meta-analysis OR
- 21 studies
- 4183 patients
- No difference in post operative outcomes
  - Anastomotic leak
  - Pouch related sepsis
  - Pouch failure
- Nocturnal seepage and pad usage increased in mucosectomy group
- Significant worsening in physiologic measurements in mucosectomy

Crohn’s disease in IPAA

- 204 patients
- Median follow up 7.4 years
- Pouch retention 71% at 10 years
  - Diagnosis made
    - Preoperative (Intentional) n=20 (15%)
    - Pathological (Incidental) n=97 (47%)
    - Delayed (Symptoms) n=87 (43%)

Melton et al. 2008 Ann Surg
Survival of IPAA in patients with CD

Intentional CD (solid thin line), incidental CD pouch (dotted line), delayed diagnosis (solid thick line)

Melton et al. 2008 Ann Surg
Crohn’s disease in IPAA

- Patients with retained IPAA at follow-up had
  - Near-perfect/perfect continence (72%)
  - Rare/no urgency (68%)
  - Median daily bowel movements 7 (range 2–20).
  - Median overall quality of life, quality of health, level of energy, and happiness with surgery were 9, 9, 8, and 10 of 10, respectively.

- Pouchvaginal fistula and postoperative sepsis were associated with higher failure rates

Melton et al. 2008 Ann Surg
Laparoscopic IPAA

- Meta-analysis
- 10 Studies
- 329 Patients
- Conversion rate 1.1%
- Procedure length longer in Lap by 86 min (59-114)
- Blood loss less in Lap by 84 ml
- Length of Stay reduced on in subgroup analysis by 1.1 days (High quality studies and >30 patients) and by 3 days in studies published since 2001.
- Anastomosis leak rate, pouch related sepsis and small bowel obstruction revealed no significant difference
<table>
<thead>
<tr>
<th>Author</th>
<th>Institution</th>
<th>Year</th>
<th>Patients</th>
<th>IFX/ Total</th>
<th>IFX window</th>
<th>Adjusted for disease severity</th>
<th>IFX increased complication</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Schluender</td>
<td>Cedar Sinai</td>
<td>2007</td>
<td>UC</td>
<td>14/151 (11%)</td>
<td>1-12 months</td>
<td>No</td>
<td>No</td>
<td>NO increase unless combined with cyclosporine underpowered</td>
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<td>Selvasekar</td>
<td>Mayo Rochester</td>
<td>2007</td>
<td>UC</td>
<td>47/301 (16%)</td>
<td>6 months</td>
<td>Yes</td>
<td>Yes</td>
<td>increased pouch-related and infectious complications</td>
</tr>
<tr>
<td>Mor</td>
<td>Cleveland Clinic, Ohio</td>
<td>2008</td>
<td>UC</td>
<td>85/523 (16%)</td>
<td>4-37 weeks</td>
<td>Yes</td>
<td>Yes</td>
<td>increased risk for both 2-stage and 3-stage IPAA</td>
</tr>
<tr>
<td>Gainsbury</td>
<td>BU</td>
<td>2011</td>
<td>UC</td>
<td>29/52 (56%)</td>
<td>12 weeks</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Eshuis</td>
<td>Netherlands</td>
<td>2012</td>
<td>UC</td>
<td>72</td>
<td>7 Months</td>
<td>No</td>
<td>No</td>
<td>Increase septic complications in 1 and 2 stage only</td>
</tr>
</tbody>
</table>
2 vs 3 stage in biologic era

CCF data

- 2006-2010
- 407 underwent TAC with EI, 181 TPC with IPAA
- TPC with IPAA (181)
  - Biologic users 25, non users 156
  - Pelvic sepsis 32% vs 16%
  - Preop biologics were an independent factor for pelvic sepsis
- TAC with EI (407)
  - Biologic users 142, non users 265
  - No difference in outcome even when both groups went on to have a pouch later

GU et al. DCR 2013 56:11
2 vs 3 stage in biologic era

MGH data

- 2000-2011
- 144 patients
- 10 Surgeons
- Mean F/U 5 years
- 116 two stage, 28 three stage
- 29% of two stage received preop biologic; 18% in three stage
- Other immunomodulators higher in two stage (48% vs 18%)
- Surgeon experience (≥50) was only factor to predict complications
- Two stage IPAA had lower risk of anal stricture
- No difference in fistula, abscess or pouch failure were identified

Hicks et al. Jama Surgery 2013 148,7
Conclusion

- IPAA is a reliable surgical procedure for patients requiring surgery for UC
- Data on preoperative immunosuppression is conflicting
- Consider three stage pouch in sicker patients