Advances in Surgery for Inflammatory Bowel Disease

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Disclosures

• Course Instructor – Applied Medical
Learning Objectives

• Identify indications for surgery in patients with IBD
• Understand options for surgery and anticipated outcomes in patients with IBD
• Understand the impact of biologic therapy on the timing and outcomes of surgery for IBD
UC – Indications for Surgery

- Medical intractability/Steroid dependency
- Life threatening complications
  - Toxic/fulminant colitis
  - Perforation
  - Hemorrhage
- Toxicity/side effects of medical therapy
- Disabling extracolonic manifestations
- Growth retardation
- Dysplasia/Cancer/Cancer prophylaxis
Crohn’s – Indications for Surgery

- Stricture/Obstruction
- Intra-abdominal phlegmon, abscess, fistula
- Perforation
- Failure of medical therapy
- Hemorrhage
- Toxic/fulminant colitis, toxic megacolon
- Neoplasia/Dysplasia
- Growth Retardation
Ulcerative Colitis

- Mucosal inflammatory process
- Starts in rectum, extends proximally
- Bloody diarrhea, tenesmus, urgency
- Complete remission $\rightarrow$ fulminant disease
- Approx 20-30% will require surgery
  - Role of surgery - curative
- Procedure of choice – IPAA
  - 1200/yr in US
CUC – Elective Surgery

- Proctocolectomy with Brooke ileostomy
- Proctocolectomy with continent ileostomy (Koch pouch)
  - BCIR – Barnett continent ileal reservoir
- Total abdominal colectomy with ileorectal anastomosis
- Proctocolectomy with ileal-pouch anal anastomosis (IPAA)
  – “Restorative proctocolectomy”
Proctocolectomy with Brooke ileostomy

- “Gold standard” for many years
- **Advantages**
  - Completely eliminates diseased mucosa & cancer risk
  - Avoids potential leak, pouch failure, pouchitis
- **Disadvantages**
  - Permanent stoma – physical & psychological sequelae
- **Indications:**
  - Elderly
  - Distal rectal cancer
  - Fecal incontinence
  - Patient choice after education
Proctocolectomy with Continent Ileostomy (Koch pouch)

S-pouch with distal portion intussuscepted into pouch & fixed to pouch wall, creates one-way valve, requires 45-60 cm of terminal ileum

Figure 1. Construction of Kock pouch reservoir.

Proctocolectomy with Continent Ileostomy (Koch pouch)

- Eliminates need for stoma appliance
- High patient satisfaction in the right patient with the right surgeon
- Success depends on experience & technique
- Problems:
  - Dietary restrictions
  - Incontinence
  - Valve slippage – 30%
  - Pouchitis – 25%
  - Fistula – 10%
  - SBO – 5%

References:
- Litle VR. Gastrointest Surg 1999;
Total Abdominal Colectomy with Ileorectal Anastomosis (TAC/IRA)

- **Use in CUC limited:**
  - Relative rectal sparing
  - Elderly patient with long-standing disease and proximal cancer/dysplasia
  - Indeterminate colitis
Total Abdominal Colectomy with Ileorectal Anastomosis (TAC/IRA)

• **Advantages:**
  – Avoid complications of pelvic dissection
  – Continence
  – Well-accepted by patient

• **Disadvantages:**
  – Does not totally eliminate colorectal mucosa
  – High re-operation rate (>50%)
  – Less than 50% have satisfactory long-term functional results
Proctocolectomy with IPAA

• “New” Gold Standard

• Advantages:
  – Near-complete removal of colorectal mucosa
  – Avoids permanent stoma
  – Preserves normal route of defecation
  – Usually maintains continence

• Disadvantages:
  – BM frequency (6-8x/day)
  – Sexual dysfunction
  – Decreased fecundity
  – SBO
  – Pouch-related complications
  – Misdiagnosed Crohn’s disease

Parks AG. BMJ 1978.
Proctocolectomy with IPAA

- Operative Approaches
  - Technique
    - Open
    - Laparoscopic
    - Hand-assisted laparoscopic
  - Staging
    - Single stage – (almost) never
    - Two-stage
    - Three-stage – increasing frequency
Surgery for UC – Complications

- Frequency/urgency/tenesmus
- Incontinence/nocturnal leakage
- Pouchitis/cuffitis
- SBO
- Sexual dysfunction
- Reduced fecundity
- Pouch failure – 5-10%
Crohn’s Disease

- Chronic transmural inflammatory condition
- All portions of GI tract
- Variable symptoms, disease course, and severity
- Surgery reserved for failure of medical management – goal is to relieve symptoms
Crohn’s Disease

• 70-90% will require surgery
  – 1 year from diagnosis – 17%
  – 3 years from diagnosis – 33%
  – 5 years from diagnosis – 47%

• High surgical recurrence rate
  – 5-year risk of 2nd surgery -- 25%
  – 10-year risk of 2nd surgery – 35%
  – 5-18% eventually require TPN for intestinal failure

Toh WT. World J Gastroenterol 2016
Bednarz W. Hepatogastroenterology 2008
Frolkis AD. Gastroenterology 2013
Frolkis AD. Am J Gastroenterol 2014
Crohn’s – Surgical Options

• Ileocolic disease
  – Ileocolic resection – lap or open
    • Pre-biologic era – 87% eventually require resection
    • 80% without clinical recurrence 2 years post-op
    • 37% relapse and 30% ultimately develop stricture/recurrence
      – Balloon dilation
      – Re-resection
      – Strictureplasty

Bernell O.  Ann Surg 2000
Salem A.  J Gastroenterol Hepatol 2013
Fazi M.  JAMA Surg 2016
Crohn’s – Surgical Options

• Ileal disease
  – Resection vs Strictureplasty
Crohn’s – Surgical Options

• Colonic disease
  – In absence of significant anorectal disease –
    • Segmental resection vs total colectomy with anastomosis +/- temporary diversion
  – With anorectal disease –
    • Segmental resection vs total colectomy with end ileostomy/colostomy leaving rectum in situ
    • Proctocolectomy with permanent ostomy
Biologic Therapy in IBD: The Gastroenterologist’s View vs The Surgeon’s View

• Goals of medical therapy – induce & maintain clinical remission
• Goals of surgery – cure of disease, withdraw from medical, avoid risk of cancer
• Surgery is more commonly being delayed – at surgery patients more malnourished, overall “sicker”
Biologic Therapy in IBD: The Gastroenterologist’s View vs The Surgeon’s View

- In patients with UC who fail therapy with corticosteroids, advantage of prolonged medical therapy vs surgery is controversial
  - Approx 1/3 undergo colectomy within 1 yr
  - Approx 70-80% undergo colectomy within 10 yr
- 20% → steroid dependency
- Role for early surgery vs 2\textsuperscript{nd} line medical treatment?
Biologics & Surgery for Crohn’s

- Nasir et al. J Gastrointest Surg 2010
  - Retrospective, 119 patients undergoing surgery for Crohn’s with anastomosis, who received anti-TNF therapy 8 weeks to 30 days pre-op vs 251 controls
  - 50% fulminant disease in anti-TNF group (compared with 18% in controls, p<0.001)
  - No increase in overall complications (27.9% vs 30.1%, p=0.63) or intra-abdominal infectious complications (5% vs 7.2%, p=0.44)
  - Factors associated with increased intra-abdominal infections = age, penetrating disease
Kasparak et al. Inflamm Bowel Dis 2012

- Retrospective, 48 patients undergoing surgery for Crohn’s who received infliximab within 3 months of surgery vs 48 controls
- Wound infection – 19% vs 15%
- Anastomotic leak – 4% vs 13%
- Abscess – 6% vs 10%
- ECF – 4% vs 0%
- Reoperation – 11 vs 10
- Hospital stay – 13 vs 12 days

P>0.05 for all
Biologics & Surgery for Crohn’s

  - Retrospective, 150 patients undergoing surgery for Crohn’s who received anti-TNF therapy <8 weeks prior to surgery vs 175 controls
  - Overall infections – 36% vs 25% (p=0.05)
  - Surgical site complications – 36% vs 25% (p=0.10)
  - Multivariate analysis – anti-TNF therapy predicted:
    - Overall infectious complications [OR 2.43 (CI 1.18-5.03)]
    - Surgical site complications [OR 1.96 (CI 1/02-3.77)]
Biologics & Surgery for Crohn’s


  – Systematic review, 14 studies, 679 patients receiving anti-TNF agents pre-op vs 2363 controls
  – Anastomotic complications – 7.6% vs 8.2% (RR 0.91)
  – Sub-group analysis – studies with lower risk of bias had higher risk of anastomotic complications in anti-TNF group (RR 1.63)
  – Anti-TNF group - increased risk of non-anastomotic surgical complications, major medical complications, minor medical complications
Selvaggi et al. Inflamm Bowel Dis 2015.  
  - Systematic review, 7 studies, 162 patients receiving infliximab pre-IPAA surgery vs 468 controls  
  - Infliximab group – more likely to develop early (p<0.001) and post-ileostomy closure (p=0.005) complications  
  - 3+ infliximab infusions – increased risk of early complications (p=0.0002)
Biologics & Surgery for UC

- Selvaggi et al. Inflamm Bowel Dis 2015.
  - Meta-analysis, 14 studies, all surgeries for UC
  - Infliximab group – trend towards increased total & infectious complications (p>0.05)
  - Biologics associated with lower SSI rate (OR 0.67, p = 0.04)
  - Avoiding primary pouch formation “could be a prudent approach.”
Biologics & Surgery for UC

- Zittan E. Inflamm Bowel Dis 2016.
  - Retrospective, 196 patients with anti-TNF therapy prior to IPAA, 562 controls
  - Anastomotic leak – 13.2 % vs 11.7% (p=0.44)
  - Leak rate for 2-stage surgery based on last anti-TNF dose:
    - <15 days – 10%
    - 15-30 days – 5.9%  P=0.43
    - 31-180 days – 14.8%
Biologics & Surgery for IBD

  - Retrospective case control study, 195 patients exposed to biologics with 180 days of surgery vs 278 controls
  - No difference in LOS, readmission, reoperation, mortality
  - Biologics associated with more wound infections (19% vs 11%, p=0.008) on univariate analysis but not multivariate
  - Timing of last dose (<15, 15-30, 31-108 days) – similar outcomes
Biologics & Surgery for IBD

  – Retrospective, 73 patients with pre-op anti-TNF therapy < 8 weeks pre-op vs 209 controls
  – No difference in 30-day complications:
    • Leak
    • Abscess
    • Wound infection or extra-abdominal infection
    • Readmission
    • Mortality
Biologics & Laparoscopic Surgery for IBD

  – Retrospective, 142 patients receiving infliximab pre-op vs 376 controls
  – Infliximab group – more aggressive pre-op medical therapy (corticosteroids, immunosuppressors)
  – No differences:
    • OR time, blood loss, conversion to laparotomy, mortality, leak, abscess, thrombotic complications
  – Subgroup analysis of CD vs UC – no differences
Vedolizumab and Surgery for IBD

  - Retrospective, vedolizumab within 12 weeks of surgery
  - Vedolizumab group – higher rates of any post-op infection (53% vs 28%, p<0.001) and SSI (37% vs 10%, p<0.001)
  - Univariate & Multivariate analysis – vedolizumab exposure = independent predictor of post-op SSI (p<0.001)
Biologics and IBD Surgery

• Small retrospective/cohort studies & systematic reviews/meta-analyses
• Heterogeneous patient population
• Variations in dosing regimens and timing of therapy in relation to surgery
• No consensus
Biologics and IBD Surgery

- UC
  - 3-stage IPAA

- Crohn’s
  - Schedule surgery at end of dosing schedule
  - Earlier surgery to minimize time to resumption of biologic therapy
  - Early resumption of biologic therapy post-op (4 weeks → 2 weeks)