INFLAMMATORY BOWEL DISEASE

• CROHN’S DISEASE

• ULCERATIVE COLITIS

• INDETERMINATE COLITIS
SURGERY FOR ULCERATIVE COLITIS

CURATIVE!
SURGERY FOR CROHN’S DISEASE

PALLIATIVE!
IBD SURGERY

• CROHN’S DISEASE

• ULCERATIVE COLITIS

• INDETERMINATE COLITIS
CROHN’S DISEASE

• It can affect any part of the GI tract.
• Up to 71% of patients require surgery.
• For small bowel Crohn’s disease, a bowel sparing approach is used to prevent short bowel syndrome.
• For Crohn’s colitis, the extent of surgical resection is debated.

What are the symptoms of CD?

- Abdominal pain and tenderness -- often in the lower, right section of the abdomen
- Bloody stools
- Chronic (long-term) diarrhea
- Delayed development and stunted growth in children
- Feeling of fullness in the abdomen, particularly in the lower, right section
- Fever
- Weight loss
How is CD treated?

• When Crohn's disease is active, treatment has three objectives:
  1) Relieve symptoms
  2) Control inflammation
  3) Help with getting proper nutrition

• Medications are generally the first step in treating CD.
  – Anti-inflammatories
  – Antibiotics
  – Antidiarrheals
  – Immune-suppressors, including:
    • Anti-TNF blockers
    • Corticosteroids

• For patients with poor nutrition, supplements are often prescribed
Surgeries performed to treat CD?

- Surgery to treat Crohn's disease depends on several factors:
- Where the disease is located in the intestine
- How severe the disease is
- The purpose of the surgery -- which complication it will treat
- It's important to note that surgery, like medications, does not cure Crohn's disease. After the diseased part of the bowel is removed, Crohn's can reappear in some other part of the intestine or elsewhere.
- Many people are wary of having surgery to treat Crohn's disease. Each part of the intestines serves a particular purpose and removing part of the bowels may impair bowel function, leading to short bowel syndrome.
INDICATIONS FOR SURGERY

• Failure of Medical Management
• Intestinal Obstruction
  – Partial
  – Complete
• Intestinal Fistulas
  – Symptomatic Entero-entero Fistulae
  – Enterocutaneous Fistulae
  – Enterovesical Fistulae
  – Enterovaginal Fistulae
INDICATIONS FOR SURGERY

• Intra-Abdominal Abscess / Mass
• Hemorrhage
• Perforation
• Perineal Disease
  – Abscess
  – Superficial FIA unresponsive to ABX
  – Complex Fistulas unresponsive to aggressive Medical RX
Considerations

• Risk of side effects of medications versus quality of life

• Potential loss of absorptive surface following resection

• Radical surgery is not a cure
SURGICAL CHALLENGES IN CD

- Extent of disease
- Age / Attitude
- Avoid Stoma
- SBS
- Recurrence
- Disease location
Surgical Strategies

• Minimize Loss of Functional bowel
• Minimize Blood Loss
• Minimize Disfigurement
• Keep Natural History in Mind
• Avoid Unorthodox Procedures
Surgical Procedures

• Resection and Anastomosis
• Resection and Stoma
• Strictureplasty
• Intestinal Bypass
• Perineal Procedures
• Others
  – Closure of Fistulas
  – Drainage of Abscess
Surgeries performed to treat CD

- **Strictureplasty.** Crohn's disease in the small intestine often shows up in alternating areas of the bowel. As a result, a diseased portion of the bowel is connected to a disease-free portion. Strictureplasty is a surgical procedure to widen the narrow area of the small intestine in a portion that is affected by the disease. No part of the intestine is removed.

- **Resection.** Resection is a surgical procedure in which part of the intestine is removed. This surgery may be necessary when the stricture is very long. It may also be necessary when there are many strictures located near each other. The remaining healthy bowel sections are sewn together to create what's called an anastomosis. The removal of the diseased portion of the bowel may provide the patient with relief from symptoms for many years. But the disease can come back at or near the point where the two sections of bowel are sewn together.
Surgeries performed to treat CD

- **Colectomy.** Colectomy is the removal of part or the entire colon. This surgery might be done if the disease is severe and extensive enough. It may be possible to connect the rectum to the small intestine -- ileum -- if the rectum is not affected by Crohn's disease.

- **Proctocolectomy.** If both the rectum and colon are affected, both are removed with a surgery called a proctocolectomy. A proctocolectomy is performed along with an ileostomy. The latter surgery brings the end of the small intestine through a hole in the lower abdomen so that waste can exit the body. The hole is called a stoma. When this procedure is necessary, the waste drains into an external bag that has to be emptied throughout the day. The bag or pouch is concealed by clothing and is not noticeable.
CD Surgery - Ileocolic Resection
CD Small Intestine
Surgery: Strictureplasty
Long-Term Follow-Up of Strictureplasty in Crohn’s Disease

Victor W. Fazio, M.D., Joe J. Tjandra, M.D., Ian C. Lavery, M.D., James M. Church, M.D., Jeffrey W. Milsom, M.D., John R. Oakley, M.D.

Table 7.
Outcome After Strictureplasty

<table>
<thead>
<tr>
<th></th>
<th>Present Series</th>
<th>Others*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>116</td>
<td>115</td>
</tr>
<tr>
<td>Median follow-up</td>
<td>6 months–7 yr</td>
<td>6–40</td>
</tr>
<tr>
<td></td>
<td>(median, 3 yr)</td>
<td>months</td>
</tr>
<tr>
<td>Symptomatic recurrence</td>
<td>28 (24%)</td>
<td>41 (36%)</td>
</tr>
<tr>
<td>Reoperative</td>
<td>17 (15%)</td>
<td>17 (15%)</td>
</tr>
<tr>
<td>Medical/nonoperative</td>
<td>11 (9%)</td>
<td>25 (22%)</td>
</tr>
<tr>
<td>Symptomatic restructure of</td>
<td>2.8%</td>
<td>?5%†</td>
</tr>
<tr>
<td>strictureplasty site</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
of recurrence at the level of a previous anastomosis. On the other hand, the SSIS surgical recurrence rate of 23% appears favorable when compared with the total cumulative rates of surgical recurrence 5 years after Heineke-Mikulicz and Finney strictureplasties ranging between 28% and 41% [17–20].
Crohn’s Disease: Large Bowel

- Medical failure
- Perianal disease
- Proctocolectomy
- Subtotal colectomy
Crohn’s Disease of the Colon: Surgery Issues

• Risk of malignancy with Crohn’s colitis

• Strictures on sections of the bowel at highest risk

• Annual colonoscopies with biopsy
Long-Term Outcome of Surgically Treated Crohn’s Colitis: A Prospective Study

Alessandro Fichera, M.D., Richard McCormack, B.A., Michelle A. Rubin, R.N., M.S., Roger D. Hurst, M.D., Fabrizio Michelassi, M.D.
Conclusions
Small bowel clinical recurrence occurs in about 28% of patients after total colectomy with permanent ileostomy for colonic Crohn’s disease. Disease recurrence risk is 3.2 times higher in patients with history of ileal disease, and continued medical therapy may be advisable in this population. In patients without ileal inflammation at surgery, continued endoscopic surveillance may identify asymptomatic disease recurrence to guide therapy.
LAPAROSCOPY FOR CD
Laparoscopic Surgical Approach

- Minimally invasive surgery
- Issues
  - Less abdominal trauma
  - Less pain
  - Faster return of bowel function
  - Cosmetically acceptable
Laparoscopic Ileocolic Resection

Meta Analysis

Difference in operative time (min)

-40 -20 0 20 40 60 80 100 120 140

Alabaz [11]
Bemelman [13]
Benoist [14]
Huilgol [18]
Kishi [19]
Luan [20]
Milson [21]
Msika [22]
Tabet [24]
Pooled

Laparoscopic Ileocolic Resection Meta Analysis

Time difference to first flatus (Days)

Benoist [14]
Huilogol [18]
Kishi [19]
Msika [22]
Pooled

Laparoscopic Ileocele Resection Meta Analysis

Laparoscopic Ileocolic Resection Meta Analysis

Laparoscopic Ileocolic Resection Meta Analysis

Time difference to solid diet (Days)

-6 -5 -4 -3 -2 -1 0 1 2

Bemelman
Benoist
Diamond
Huilgol
Tabet
Pooled

Laparoscopic Ileocolic Resection Meta Analysis

Difference in hospital stay (Days)

Alabaz [11]
Bemelman [13]
Benoist [14]
Diamond [16]
Huilgol [18]
Msika [22]
Tabet [24]
Pooled

Surgical Management of Fistulizing Perianal Crohn’s Disease

- EUA
- Sepsis control
- I&D, Drains, Setons
- Definitive surgical treatment
- Fistulotomy, Glue, Plug, Setons, Advancement Flap
- Proctectomy / Total Proctocolectomy

Resolution → Failure
Resolution → Failure
PRE- AND POST-OPERATIVE ISSUES

• Preoperative Patients Education

• Postoperative Management of Sequelae and Complications
PRE-OPERATIVE ISSUES

- Stabilize the patient
- Optimize nutrition
- Bowel Prep
- Stoma Marking

- Correction of electrolyte imbalance, anemia, hypoproteinemia
- Use of nasogastric suction if necessary
- Dietary restriction of solids and use of modified elemental liquid diet to prepare bowel
- Administration of antibiotics / TPN
- Stoma marking if necessary
STOMAS

- Preop Marking
- Pre & Postop Education
- Postop Complications
- Long-Term Management
INDICATIONS FOR INTESTINAL STOMA

• Poor Perfusion
• Infection / Inflammation / Contamination
  – Peritonitis
  – Stool
• Distal Obstruction
• Tension
• Protection
• Loss of Rectum
STOMAS

• 34% of Surgical Crohn’s Patients
  – 11% Temporary
  – 23% Permanent
POST-OPERATIVE ISSUES

- Anastomotic Failure
- Incisional Hernias
- Recurrent Disease
- Short Bowel Syndrome

- Less than 5%
- Grossly underestimated
- 1/3 of patients will require further surgery
- Bowel sparing procedures.
EXTENSIVE RESECTIONS

- Short Bowel Syndrome
  - TPN Dependency
- Malabsorption
  - Micronutrients
  - Fluids / Electrolytes
- Functional Disturbances
  - Diarrhea / Incontinence
  - High Output Stomas
Wide-Lumen Stapled Anastomosis vs.
Conventional End-to-End Anastomosis
in the Treatment of Crohn’s Disease

Manuel Muñoz-Juárez, M.D.,* Takayuki Yamamoto, M.D.,† Bruce G. Wolff, M.D.,*
Michael R. B. Keighley, F.R.C.S.†

Cumulative Symptom-Free Rate

Cumulative Reoperation-Free Rate

\[ p = 0.0041 \]

\[ p = 0.017 \]
A New Antimesenteric Functional End-to-End Handsewn Anastomosis: Surgical Prevention of Anastomotic Recurrence in Crohn’s Disease

Toru Kono, M.D., Ph.D. ¹ • Toshifumi Ashida, M.D., Ph.D. ²

The nearby mesentery of the intestinal loop which is to be excised

Supporting column

resection stumps

mesentery

A New Antimesenteric Functional End-to-End Handsewn Anastomosis: Surgical Prevention of Anastomotic Recurrence in Crohn’s Disease

Toru Kono, M.D., Ph.D. • Toshifumi Ashida, M.D., Ph.D.
Division of the Mesentery

Minimizing disruption of the vascular supply and innervation
Creation of the Supporting Column

Maintaining the shape of the anastomosis and preventing distortion in the event of an anastomotic recurrence.
Diseased segment of intestine is transected such that mesentery is in the center of the stump.
Creation of the supporting column to prevent distortion due to anastomotic recurrence.
Construction of Wide Anastomosis

Anastomosis created on the antimesenteric side ensuring a large lumen.
Longitudinal enterotomies created along the antimesenteric aspect 1cm from the supporting column to allow a transverse length of 7cm
Two layer handsewn anastomosis created.
Completed Kono-S Anastomosis
Endoscopic evaluation of Kono-S anastomoses

Courtesy of Dr. S. Hanauer
Our Current Experience

- May 2010 – May 2014

- All procedures performed by 2 colorectal surgeons

- Resection with primary Kono-S anastomosis was performed in all patients

- 99 patients with CD; 104 anastomoses
<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Total 99 Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (n)</td>
<td>33.9 (17.2 – 63.2)</td>
</tr>
<tr>
<td>Sex</td>
<td>48 F, 51 M</td>
</tr>
<tr>
<td>Age at Diagnosis (n)</td>
<td>23.1 (5.0 – 65.2)</td>
</tr>
<tr>
<td>Emergent/Urgent Operation</td>
<td>22.2%</td>
</tr>
<tr>
<td>Previous Bowel Surgery</td>
<td>46.5%</td>
</tr>
<tr>
<td>Preoperative IBD Medications</td>
<td>83.8%</td>
</tr>
<tr>
<td>Actively Smoking</td>
<td>15.2%</td>
</tr>
<tr>
<td>Multiple Kono –S Anastomoses</td>
<td>5.1%</td>
</tr>
<tr>
<td>Site of Anastomosis</td>
<td></td>
</tr>
<tr>
<td>Enterocolonic</td>
<td>93.9%</td>
</tr>
<tr>
<td>Enteroenteric</td>
<td>10.1%</td>
</tr>
<tr>
<td>Colocolonic</td>
<td>1.0%</td>
</tr>
<tr>
<td>Combined Surgeries</td>
<td>34</td>
</tr>
<tr>
<td>Type of Surgery</td>
<td>Number of Patients</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Treatment of Perianal Disease</td>
<td>11</td>
</tr>
<tr>
<td>Fistula Closure</td>
<td>9</td>
</tr>
<tr>
<td>Stricturoplasty</td>
<td>7</td>
</tr>
<tr>
<td>Sigmoid/Rectal Resection</td>
<td>7</td>
</tr>
<tr>
<td>Perioperative Complications</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Morbidity (%)</td>
<td>13.1%</td>
</tr>
<tr>
<td>Surgical Site Infection (%)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Prolonged Ileus (%)</td>
<td>5.1%</td>
</tr>
<tr>
<td>Incisional Hernia (%)</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Anastomotic Leak * (%)</strong></td>
<td>1.0%</td>
</tr>
<tr>
<td>30 Day Reoperation (%)</td>
<td>0%</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td>0%</td>
</tr>
<tr>
<td>Postoperative Outcomes</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Follow-Up Beyond Post-op Visit</td>
<td>79.0% (78/99)</td>
</tr>
<tr>
<td>Mean Duration of Follow-Up (Months)</td>
<td>23.34</td>
</tr>
<tr>
<td>Endoscopic Surveillance</td>
<td>62.6% (62/99)</td>
</tr>
<tr>
<td>Endoscopic Recurrence</td>
<td>32.3%</td>
</tr>
<tr>
<td>Surgical Recurrence</td>
<td>0%</td>
</tr>
</tbody>
</table>
# Kono-S Anastomosis for Surgical Prophylaxis of Anastomotic Recurrence in Crohn’s Disease: an International Multicenter Study

Toru Kono¹ · Alessandro Fichera² · Koutarou Maeda³ · Yoshiharu Sakai⁴ · Hiroki Ohge⁵ · Mukta Krane² · Hidetoshi Katsuno³ · Mikihiro Fujiya⁶

<table>
<thead>
<tr>
<th></th>
<th>Group J</th>
<th>Group US</th>
<th>p value</th>
<th>Cumulative experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>144</td>
<td>43</td>
<td></td>
<td>187</td>
</tr>
<tr>
<td>Male/female ratio</td>
<td>110/34 (3:1)</td>
<td>21/22 (1:1)</td>
<td>p = 0.0006</td>
<td>131/56 (2:1)</td>
</tr>
<tr>
<td>Median age at operation (months), (range)</td>
<td>31 (19–62)</td>
<td>32 (17–58)</td>
<td>NS</td>
<td>31 (17–62)</td>
</tr>
<tr>
<td>Site of anastomosis (n), (%)</td>
<td>171</td>
<td>45</td>
<td>p = 0.005</td>
<td>216</td>
</tr>
<tr>
<td>Ileocolic</td>
<td>93 (54 %)</td>
<td>38 (84 %)</td>
<td></td>
<td>131 (61 %)</td>
</tr>
<tr>
<td>Ileal/jejunal</td>
<td>65 (38 %)</td>
<td>5 (11 %)</td>
<td></td>
<td>70 (32 %)</td>
</tr>
<tr>
<td>Colonic</td>
<td>8 (5 %)</td>
<td>1 (2 %)</td>
<td></td>
<td>9 (4 %)</td>
</tr>
<tr>
<td>Ileorectal</td>
<td>5 (3 %)</td>
<td>1 (2 %)</td>
<td></td>
<td>6 (3 %)</td>
</tr>
<tr>
<td>Number of Kono-S anastomosis/patient (n), (%)</td>
<td>113 (78 %)</td>
<td>41 (95 %)</td>
<td></td>
<td>154 (82 %)</td>
</tr>
<tr>
<td>1</td>
<td>113 (78 %)</td>
<td>41 (95 %)</td>
<td></td>
<td>154 (82 %)</td>
</tr>
<tr>
<td>2</td>
<td>27 (19 %)</td>
<td>2 (5 %)</td>
<td></td>
<td>29 (16 %)</td>
</tr>
<tr>
<td>3</td>
<td>3 (2 %)</td>
<td>0 (0 %)</td>
<td></td>
<td>3 (2 %)</td>
</tr>
<tr>
<td>4</td>
<td>1 (1 %)</td>
<td>0 (0 %)</td>
<td></td>
<td>1 (1 %)</td>
</tr>
</tbody>
</table>
# Kono-S Anastomosis for Surgical Prophylaxis of Anastomotic Recurrence in Crohn’s Disease: an International Multicenter Study

Toru Kono¹ · Alessandro Fichera² · Koutarou Maeda³ · Yoshiharu Sakai⁴ · Hiroki Ohge⁵ · Mukta Krane² · Hidetoshi Katsuno³ · Mikihiro Fujiya⁶

## Factors influencing postoperative recurrence

<table>
<thead>
<tr>
<th>Factor</th>
<th>Control (n=135)</th>
<th>Case (n=36)</th>
<th>p-value</th>
<th>Reference Population (n=171)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active smoking (ratio), (%)</td>
<td>35/135 (26 %)</td>
<td>12/36 (33 %)</td>
<td>NS</td>
<td>47/171 (27 %)</td>
</tr>
<tr>
<td>Previous bowel operation (n), (%)</td>
<td>64 (43 %)</td>
<td>22 (51 %)</td>
<td>NS</td>
<td>86 (46 %)</td>
</tr>
<tr>
<td>Perforation type (n), (%)</td>
<td>66 (45 %)</td>
<td>18 (45 %)</td>
<td>NS</td>
<td>84 (45 %)</td>
</tr>
<tr>
<td>Postoperative medication (n), (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-TNFα antibody</td>
<td>55 (37 %)</td>
<td>12 (28 %)</td>
<td>NS</td>
<td>67 (36 %)</td>
</tr>
</tbody>
</table>

## Short-term complications (<30 days)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Control (n=135)</th>
<th>Case (n=36)</th>
<th>p-value</th>
<th>Reference Population (n=171)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anastomatic leakage, (n) (%)</td>
<td>1 (0.7 %)</td>
<td>1 (2.3 %)</td>
<td>NS</td>
<td>2 (1.1 %)</td>
</tr>
<tr>
<td>Surgical site infection, (n) (%)</td>
<td>8 (5.6 %)</td>
<td>2 (4.7 %)</td>
<td>NS</td>
<td>10 (5.3 %)</td>
</tr>
<tr>
<td>Abdominal abscess, (n) (%)</td>
<td>4 (2.8 %)</td>
<td>1 (2.3 %)</td>
<td>NS</td>
<td>5 (2.7 %)</td>
</tr>
<tr>
<td>Bowel obstruction, (n) (%)</td>
<td>3 (2.1 %)</td>
<td>1 (2.3 %)</td>
<td>NS</td>
<td>4 (2.1 %)</td>
</tr>
<tr>
<td>Other, (n) (%)</td>
<td>3 (2.1 %)</td>
<td>0 (0 %)</td>
<td>NS</td>
<td>3 (1.6 %)</td>
</tr>
<tr>
<td>Mortality</td>
<td>0</td>
<td>0</td>
<td>NS</td>
<td>0</td>
</tr>
</tbody>
</table>
Kono-S Anastomosis for Surgical Prophylaxis of Anastomotic Recurrence in Crohn’s Disease: an International Multicenter Study

Toru Kono¹ · Alessandro Fichera² · Koutarou Maeda³ · Yoshiharu Sakai⁴ · Hiroki Ohge⁵ · Mukta Krane² · Hidetoshi Katsuno³ · Mikihiro Fujiya⁶

Table 2  Anastomotic recurrence after Kono-S anastomosis in Japan (Group J) or the USA (group US)

<table>
<thead>
<tr>
<th></th>
<th>Group J (n = 144)</th>
<th>Group US (n = 29)</th>
<th>p value</th>
<th>Cumulative Experience (n = 173)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median follow-up (months), (range)</td>
<td>65 (43–138)</td>
<td>32 (12–44)</td>
<td>p = 0.003</td>
<td>60 (12–138)</td>
</tr>
<tr>
<td>Endoscopic recurrence</td>
<td>i3.0 (i1–i4)</td>
<td></td>
<td></td>
<td>i3.0 (i1–i4)</td>
</tr>
<tr>
<td>Rutgeert’s score, median (range) at 5 years, (n)</td>
<td>(30)</td>
<td>NA</td>
<td></td>
<td>(30)</td>
</tr>
<tr>
<td>Number of surgical recurrence</td>
<td>2</td>
<td>0</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>5 years cumulative surgical recurrence, (95 % CI)</td>
<td>1.8 % (0.0–4.3 %)</td>
<td>NA</td>
<td></td>
<td>1.7 % (0.0–4.2 %)</td>
</tr>
<tr>
<td>10 years cumulative surgical recurrence, (95 % CI)</td>
<td>1.8 % (0.0–4.3 %)</td>
<td>NA</td>
<td></td>
<td>1.7 % (0.0–4.2 %)</td>
</tr>
</tbody>
</table>
Recurrence After ICR for Crohn’s Disease

Prospective follow-up of all patients who underwent ileal (ileocolonic) resection for at least 5 years with ileocolonoscopies at 6-12 months and at 3 years.

Survival without surgery
Survival without laboratory recurrence
Survival without symptoms
Survival without endoscopic lesions

Cumulative Probability of Surgery in Crohn’s Disease

*Kaplan-Meier analysis.
Early Postoperative Colonoscopy

- Avoidance of unnecessary and costly treatment for patients with very low risk of symptomatic recurrence.

- Prediction of high probability of early symptomatic recurrence.
Factors Associated With Increased Recurrence Risk

- Smoking
- Perforating phenotype
- Small bowel disease
- Ileocolonic disease
- Perianal fistulas
- Duration of disease
- Age
- ? Clear margins
- ? Length of resection

Risk of Post-Op Recurrence

- **Very Low**
  - No Meds
  - Colonoscopy 6-12 months post-op
  - No Recurrence
    - Colonoscopy every 1-3 yrs
  - Recurrence
    - Immunomodulator or anti-TNF

- **Moderate**
  - 6MP or AZA ± metronidazole
  - Colonoscopy 6-12 months post-op
  - No Recurrence
    - Colonoscopy every 1-3 yrs
  - Recurrence
    - Immunomodulator or anti-TNF

- **High**
  - Anti-TNF
  - Colonoscopy 6-12 months post-op
  - No Recurrence
    - Colonoscopy every 1-3 yrs
  - Recurrence
    - ↑ Anti-TNF or Δ biologics

Approach to Post-op Crohn’s Prevention

• Identify risk of recurrence based on clinical risk factors
• Encourage smoking cessation!
• Assess presence of endoscopic recurrence as predictor of clinical recurrence
• Choose therapy or switch therapy based on endoscopic findings