Surgery for IBD: “State of the Art”

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Professor of Surgery
University of Minnesota

team GI
surgeons + gastroenterologists
• we all want the best for our patients
• we all recognize the recent advances in IBD therapy
• we all know surgery is sometimes necessary
IBD “state of the art”

*surgical principles*

- *primum non nocere*
  - is this trip *really* necessary?
- preserve bowel
- preserve function

If at first you don’t succeed, try, try and try again. Then give up. There’s no use being a damned fool about it.

W.C. Fields

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IBD “state of the art”

*surgical principles*

- make it **safe**
- make it **easy**
- make it **elective**

IBD “state of the art”

*surgical principles*

- fix the fixable
  - resuscitate
  - transfuse
  - utilize your interventional radiologist
  - optimize nutrition
- do the operation appropriate for the patient’s medical status
ulcerative colitis

discoveries for surgery

• unsalvageable toxic or fulminant colitis
• medically refractory disease
• avoidance of cancer risk

dysplasia-associated cancer risk

• colectomy performed for: cancer risk
  – DALM 43%
  – HGD 42%
  – LGD 19%
  – indeterminate dysplasia 5-10%

• 30% of patients with LGD who were observed progressed to DALM, HGD, or cancer

cancer stage at colectomy for dysplasia

<table>
<thead>
<tr>
<th>Author</th>
<th>Dysplasia</th>
<th>Cancer</th>
<th>Stage A</th>
<th>Stage B</th>
<th>Stage C/D</th>
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<td>Lennard-Jones</td>
<td>16</td>
<td>7</td>
<td>6</td>
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<tr>
<td>Nugent</td>
<td>20</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>4</td>
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<td>Runenstok</td>
<td>22</td>
<td>7</td>
<td>1</td>
<td>3</td>
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<td>Blackstone</td>
<td>15</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>2</td>
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<td>Jones</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>5</td>
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</table>
Crohn’s colitis

is ileoanal reservoir justifiable?

37 patients
- initial path: 22 UC, 5 indeterminate, 8 Crohn’s
  • 11 complex fistulae (skin, vagina, bladder)
  • 20 Crohn’s recurrence in pouch
  • 14 Crohn’s recurrence in anal canal
  • 10 pouches excised
  • 7 patients diverted

Sagar 1996

Crohn’s colitis

ileoanal reservoir

41 patients
- No anal or small bowel disease
- 26 diagnosed pre-op, 15 post-op on pathology or post-op complications
- 11 Crohn’s related complications
  – 7 pouch-perineal fistula
  – 3 pouch excision

Regimbeau 2001

personal view:

no thanks
ileoanal reservoir
**technical issues**
- configuration – S, J, or W?
- pouch size
- mucosectomy or double-staple?
- how many stages?

ileoanal reservoir
**emerging consensus!**
- near universal adoption of J-pouch
  - easy to make
  - function comparable
  - conversion to S provides additional 2-3 cm in length
- limb length dictated by longest vessel at apex – usually 10-15 cm/limb

ileoanal reservoir
**emerging consensus!**
- near universal use of double-stapled anastomosis
  - easier
  - requires less mesenteric length
  - symptomatic cuffitis uncommon
  - all mucosa visible – no occult residual islands

ileoanal reservoir
**how many stages?**
3 stage:
- abdominal colectomy / ileostomy / Hartmann
- proctectomy, IPAA, ileostomy
- ileostomy closure
2 stage:
- proctocolectomy, IPAA, ileostomy
- ileostomy closure
1 stage:
- proctocolectomy, IPAA
who needs 3 stages?

- toxic/fulminant colitis
- severe malnutrition
- unstable patient
- technical difficulties
- large BMI

why divert?

- ileostomy
  - yes
  - ↓ risk of pelvic septic complications
  - ↓ risk of poor pouch function
  - omit one operation
  - avoid ileostomy complications

<table>
<thead>
<tr>
<th>IPAA omission of ileostomy</th>
<th>ileostomy</th>
<th>no ileostomy</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>age (yr)</td>
<td>38 ± 13</td>
<td>34 ± 13</td>
<td>&lt;0.001</td>
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<tr>
<td>M:F</td>
<td>2.1</td>
<td>0.8</td>
<td>&lt;0.001</td>
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<td>BSA (m²)</td>
<td>1.87</td>
<td>1.80</td>
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<td>FAP diagnosis (%)</td>
<td>6</td>
<td>18</td>
<td>&lt;0.001</td>
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<tr>
<td>previous colectomy (%)</td>
<td>34</td>
<td>48</td>
<td>&lt;0.001</td>
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<tr>
<td>prednisone ≥ 20 mg qd (%)</td>
<td>22</td>
<td>5</td>
<td>0.007</td>
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<tr>
<td>periop transfusion (%)</td>
<td>20</td>
<td>11</td>
<td>&lt;0.001</td>
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</tbody>
</table>

Remzi 2006

<table>
<thead>
<tr>
<th>IPAA omission of ileostomy</th>
<th>ileostomy</th>
<th>no ileostomy</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>pelvic sepsis (%)</td>
<td>6.5</td>
<td>5.4</td>
<td>0.51</td>
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<tr>
<td>anastomotic leak (%)</td>
<td>5.5</td>
<td>4.3</td>
<td>0.57</td>
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<tr>
<td>pouch-vaginal fistula (%)</td>
<td>7.3</td>
<td>2.6</td>
<td>0.049</td>
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<tr>
<td>postop ileus (%)</td>
<td>11.3</td>
<td>20.2</td>
<td>&lt;0.001</td>
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<tr>
<td>sbo (%)</td>
<td>18.8</td>
<td>16.1</td>
<td>0.012</td>
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<tr>
<td>stricture (%)</td>
<td>20.4</td>
<td>9.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>pouch failure (%)</td>
<td>4.5</td>
<td>1.8</td>
<td>0.022</td>
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</table>

Remzi 2006
selection!

criteria for omission of ileostomy

patient status
- non-toxic
- adequate nutrition
- no prolonged steroid use

technical factors
- smooth operation
- stapled anastomosis
- no tension
- no air leak
- intact doughnuts

laparoscopic surgery potential advantages
- comparable operation
- smaller incision
- decreased reduction of immune function
- more rapid resolution of ileus
- decreased narcotics requirement
- decreased length of stay
- decreased cost
- more rapid return to normal function
- ? decreased risk of post-op adhesions
laparoscopic surgery
potential disadvantages

- technically more difficult
- learning curve / risk of complications
- not always feasible
  - time and expense of conversion
- increased OR time and expense
  - disposable instruments
- lack of randomized, controlled data

laparoscopy for UC
concerns

- friable, inflamed colon
- assessment of small bowel
  - loss of tactile sensation
- long OR times

laparoscopic-assisted IPAA
technical steps

- laparoscopic
  - total abdominal colectomy
- open via Pfannenstiel incision
  - rectal mobilization
  - rectal transection
  - pouch construction and anastomosis

laparoscopic IPAA

<table>
<thead>
<tr>
<th></th>
<th>lap (n=20)</th>
<th>open (n=20)</th>
<th>p</th>
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<tbody>
<tr>
<td>OR time (min)</td>
<td>330</td>
<td>230</td>
<td>&lt;0.001</td>
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<tr>
<td>stoma (%)</td>
<td>60</td>
<td>65</td>
<td>NS</td>
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<tr>
<td>conversion</td>
<td>0</td>
<td>—</td>
<td>—</td>
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<tr>
<td>complications (%)</td>
<td>20</td>
<td>25</td>
<td>NS</td>
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<tr>
<td>bowel function (days)</td>
<td>2</td>
<td>4</td>
<td>0.03</td>
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<tr>
<td>LOS (days)</td>
<td>6</td>
<td>8</td>
<td>0.01</td>
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Rivadeneira 2004

Marcello 2000
open vs. laparoscopic IPAA
1998-2004, case matched study

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<td>Op time (min)</td>
<td>333</td>
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<td>&lt;0.001</td>
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<td>Tol. diet (days)</td>
<td>3</td>
<td>5</td>
<td>&lt;0.05</td>
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<tr>
<td>LOS (days)</td>
<td>4</td>
<td>7</td>
<td>&lt;0.05</td>
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<tr>
<td>Complications</td>
<td>37%</td>
<td>33%</td>
<td>NS</td>
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</table>

Larson 2006

hand-assisted laparoscopy

advantages
- easier to learn
- quicker than conventional laparoscopy

disadvantages
- open surgery in sheep’s clothing?
  • “why not just put in two hands?”
- does it share the advantages of conventional laparoscopic surgery?

laparoscopic IPAA
hand-assisted vs. conventional

<table>
<thead>
<tr>
<th></th>
<th>conventional n=13</th>
<th>hand-assisted n=10</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>incision size (cm)</td>
<td>8</td>
<td>8</td>
<td>NS</td>
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<tr>
<td>OR time (min)</td>
<td>300</td>
<td>247</td>
<td>0.01</td>
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<tr>
<td>conversion</td>
<td>0</td>
<td>1</td>
<td>NS</td>
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<tr>
<td>bowel function (days)</td>
<td>3</td>
<td>2</td>
<td>0.02</td>
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<tr>
<td>complications (%)</td>
<td>31</td>
<td>40</td>
<td>NS</td>
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<tr>
<td>LOS (days)</td>
<td>6</td>
<td>4</td>
<td>NS</td>
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</table>

Rivadeneira 2004
surgical for Crohn’s disease  

* conventional wisdom  

- 33-82% of patients will require further surgical intervention after their first operation  
  Tay 2003  
- yearly surgical recurrence rate  
  8%-10%  
  Farmer 1985  
- average 4-5 resections are performed in a patient’s life  
  Yamamoto 1999  

Be conservative?  

measure twice, cut once  

Crohn’s disease surgery  

- save bowel length  
- save function
perianal Crohn’s disease

- fissure
  - often large, off the midline
- fistula
  - often multiple and complex
- stricture
- skin tags

Crohn’s fistula surgery

‘more incontinence is caused by overzealous surgeons than by overaggressive disease’

John Alexander-Williams

Crohn’s fistula surgery

- spare the muscle
- lay open the external tracks
- place setons
Crohn’s anal fistula
surgical options

• fistulotomy
• seton
• advancement flap
• fibrin glue
• collagen plug

Crohn’s disease
anal fissure

• asymptomatic fissures require no therapy
• in cases of very painful fissures suspect abscess
• control diarrhea
• pharmacologic sphincter relaxants
  – diltiazem, GTN
  – botulin toxin
• persistent severe symptoms in continent patients probably require surgical intervention as last resort
reoperative Crohn’s surgery

dirty little secret: we don’t want to be there either!

control sepsis
optimize patient's general medical condition
optimal perioperative care
- ureteral catheters?
  - mark stoma site
  - nutrition!
plan, but be prepared to rethink

emergency surgery?

yes:
- diffuse peritonitis
- impending perforation

no:
- almost everything else

strictureplasty for Crohn’s

- first described by Lee in 1982
- principle is to correct obstructive stricture without sacrificing length of small bowel.
- up to 15% of Crohn’s patients who require surgery are candidates
**strictureplasty technique**

- stricture evaluation
  - prestenotic dilation
  - pinch between 2 fingers
  - balloon catheters, dilators, marbles
  - inflate Foley or Baker tube to 2 cm

- no limit to the number of strictureplasties that can be performed at one operation

**strictureplasty indications**

- diffuse jejunoileitis with single or multiple, short, fibrotic, strictures
- multiple long strictures in segments of small bowel
- patients with previous resections to preserve bowel length
- recurrent anastomotic stricture
- selected duodenal strictures

**strictureplasty technique**

- full thickness antimesenteric incision
- biopsy intraluminal ulceration
- reconstruction dependent on stricture length
**Strictureplasty results**

- Post-op complications occur in 3-49% of patients after resection.
  - Alexander-Williams 1987
  - Hulten 1988
- Post-op complications occur in 5-14% of patients after strictureplasty.
  - Fazio 1993
  - Spencer 1994
  - Alexander-Williams

**Meta-analysis**

  - Nonrandomized, retrospective
  - n=506; 1,825 strictureplasties (44% with recurrent bowel resection)
  - 74 post-op complications in 66 patients; overall morbidity rate 13%
  - Tichansky 2000

---

**Strictureplasty recurrence**

<table>
<thead>
<tr>
<th></th>
<th>n patients</th>
<th>n strictureplasty</th>
<th>strictureplasty / patient</th>
<th>f/u (months)</th>
<th>recurrence (%) per patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horst</td>
<td>57</td>
<td>109</td>
<td>1.9</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>Ozuner</td>
<td>162</td>
<td>698</td>
<td>4.3</td>
<td>42</td>
<td>22</td>
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</table>

**Laparoscopy for Crohn’s**

- Diversion procedures
- Resection
  - Ileocolic resection
  - Colectomy
  - ? Small bowel resection
  - ? Gastrojejunostomy
  - ? Proctectomy
laparoscopy for Crohn’s concerns

- inflamed bowel
- thick mesentery
  - vascular control
- loss of tactile sensation
  - assessment of small bowel

laparoscopy for Crohn’s contraindications

- large intraabdominal abscess
- complex fistula with ill-defined anatomy
- inability to identify major structures (e.g., ureter)
- dense adhesions
- free perforation

laparoscopic ileocolic resection

- meta-analysis/ 16 studies
  - only 1 prospective!
- longer OR time – 26 minutes
- shorter duration ileus – 0.8 days
- shorter LOS – 2.6 days
- slightly fewer recurrences and bowel obstruction

Rosman 2005
laparoscopic ileocolic resection for Crohn’s

prospective randomized trial

<table>
<thead>
<tr>
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<th>lap (n=30)</th>
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<tbody>
<tr>
<td>OR time (min)</td>
<td>115</td>
<td>90</td>
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<tr>
<td>complications (%)</td>
<td>10</td>
<td>30</td>
<td>0.028</td>
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<td>LOS (days)</td>
<td>5</td>
<td>7</td>
<td>0.008</td>
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<tr>
<td>cost (Euros)</td>
<td>6412</td>
<td>8196</td>
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<td>SF-36</td>
<td>NS</td>
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<tr>
<td>GIQOL</td>
<td>NS</td>
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</tr>
</tbody>
</table>

Maartense 2006

No good physician quavers incantations when the malady he’s treating needs the knife

Sophocles, 4th century BC

IBD “state of the art”

conclusions

• medical and surgical care for IBD both continue to evolve
• surgeons and gastroenterologists must work cooperatively in order to ensure optimal outcomes for their patients
• combined improvements should lead to the felicitous combination of less and better surgery