The Difficult Stoma

Jacob Perry M.D.

Administrative Chief Resident
University of KY Medical Center
Department of Surgery
Grand Rounds
February 23  2011
Objectives

• Discuss importance of preoperative planning in Stoma surgery
• Discuss technique of Stoma creation
• Review Technical Complications of Stoma Surgery
• Review Technical tips for dealing with the difficult Stoma intraoperatively
Non-difficult stoma

Perfect Stoma

Imperfect location
Difficult Stoma
What makes a Stoma Difficult?

Poor Planning?

Technical errors?

Difficult Postoperative Maintenance?
Preoperative considerations

LOCATION! LOCATION! LOCATION! LOCATION!

- Does this Person *really* need this stoma?
- Quality of life issues
- Elective vs. Emergent
- Education
- Will this be reversed?
Preoperative Siting

- Randomized trial of Preoperative Evaluation and Teaching:
  - 2 sessions with Enterostomal Therapist
  - Cost effective (savings of $2,100 per patient)
  - Reduces early stoma-related postoperative interventions in the community (0 vs 0.5)
  - Earlier Discharge from hospital (8 vs 10 days)
  - Shorter intervals to stoma proficiency (5.5 vs 9 days)
Cook Co. Experience 1979-1996

- 536 Elective stoma formations
- Preoperative stoma marking by enterostomal Therapist:
  - Decreased early complications (23% vs 32%) \( p < 0.03 \)
  - No change for late complications (9.3% vs 12%) \( p = 0.34 \)
  - Affected site chosen for stoma

<table>
<thead>
<tr>
<th>Complication</th>
<th>Group I No.</th>
<th>Group II No.</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necrosis</td>
<td>22</td>
<td>16</td>
<td>16.4</td>
<td>8.9</td>
</tr>
<tr>
<td>Stenosis</td>
<td>6</td>
<td>8</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td>Retraction</td>
<td>19</td>
<td>22</td>
<td>14.3</td>
<td>12.2</td>
</tr>
<tr>
<td>Prolapse</td>
<td>3</td>
<td>5</td>
<td>2.2</td>
<td>2.8</td>
</tr>
<tr>
<td>Parastomal Infection</td>
<td>17</td>
<td>12</td>
<td>12.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Hernia</td>
<td>7</td>
<td>5</td>
<td>5.3</td>
<td>2.8</td>
</tr>
<tr>
<td>Skin problems</td>
<td>58</td>
<td>108</td>
<td>43.2</td>
<td>60</td>
</tr>
<tr>
<td>Fistula</td>
<td>1</td>
<td>1</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Bleeding</td>
<td>1</td>
<td>3</td>
<td>0.7</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>134</strong></td>
<td><strong>180</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Some patients may have had more than one complication; therefore, the totals on this table may be greater and do not coincide with the total number of patients with complications found between the two groups (Group I = 95 vs. Group II = 131).
How to Properly Site a Stoma*

1. Examine abdomen with patient clothed
2. Examine exposed abdomen with patient supine, standing, sitting, bending over
3. Identify skin creases, folds, skin problems, scars, bony prominences
4. Draw imaginary line where incision will be
5. Choose point 5 cm away from incision with 5-7 cm of flat surface.
6. Identify and mark edge of rectus muscle

*ASCRS/WOCN joint concensus statement
7. Choose an area visible to patient, but below level of belt line

8. Mark site with X
9. Examine mark with patient supine, standing, sitting, bending over.

10. Mark and cover with tegaderm.

Note change in skin fold with sitting!
Ostomy Triangle
No one gets out … without a stoma!
Ostomy Triangle
Special considerations

- Obesity
- Wheelchair
- Ventral hernia
- Multiple Stomatas
- Prior Stoma
- Lifestyle
Special Considerations

- Lifestyle
  - Hobbies
  - Type of employment
    - Carpenter’s Tool belt
    - Utility belt?
Technique of Stoma creation

- **Preoperative planning** is most important
- Must be considered to be an intestinal anastomosis for success.
- Same principles apply
  - Tension free
  - Appropriate section of bowel/orientation
  - Blood supply
  - Delicate tissue handling
Creation of stoma skin aperture
2cm in diameter
5 cm from incision
Create Hole

• Dissect onto rectus sheath
• Open Fascia in cruciate form
• Spread fibers of Rectus to expose posterior sheath
Enter Peritoneum

- Protect intraabdominal contents with your hand or lap. Use Cautery.
- Dilate peritoneal opening to 2 fingerbreadths

Grasp bowel through opening with atraumatic clamp (Babcock)

Push from inside!
Types of intestinal stomas

- End ileostomy (Brooke)
- End colostomy
- Double barrel stoma
- Loop ileostomy
- Loop colostomy
- Others: gastrostomy/jejunostomy, urostomy/ECFs/cecostomy/Pouch
The Brooke Ileostomy

• Eversion technique
• Uses 3 point sutures to evert the ileum to create a spout
• Adopted worldwide after introduction in 1952
• Revolutionized Stoma surgery

Bryan Brooke – My Surgical Idol
Brooke-ing a Stoma

- 3 point technique
- Full thickness of bowel 2-3 mm (must get serosa!)
- Sero-muscular bite of ileum approximately 4 cm from opening of bowel
- Deep dermal
- Absorbable suture
  - Usually 3-0 or 4-0 Vicryl/Polysorb
Loop Ileostomy
Loop Transverse Colostomy
Appropriate lengths for stoma

• Ileostomy
  – Total bowel length above skin = 6-8 cm
  – Loop = 3 cm at mesenteric apex
  – Height of spout after Brooke Ileostomy creation > 20 mm decreases skin/wound issues

• Colostomy
  – Total bowel length above skin 2-4 cm
  – Height of stoma after Colostomy maturation should be > 5mm

Persson E, Colorect Dis 2009
Two Kinds of Difficult Stomas

1. Already created
2. Being Created
Is a Previously Created Stoma Being Difficult?

AKA: Buzz Words on Rounds!

(warning: stoma pictures forthcoming)
“Erythematous skin...”
“Sunken in...”
“Is it supposed to be...long?”
“draining some pus...”
The Dreaded “Dusky Stoma”
Complications

• Technical
  – Surgeon factors
    • Judgment
    • Technique
    • Stoma type
  – Patient factors
    • Indication for Stoma creation
    • Baseline functional status
    • Postoperative care

• Physiological
  – Electrolyte abnormalities
  – Fluid balance
  – Nutritional deficiencies
  – Cholelithiasis
  – Psychosocial issues
Technical Complications

• Early
  – Skin irritation
  – Retraction
  – Vascular compromise
  – Peristomal infection/abscess/fistula
  – Bowel obstruction/acute parastomal herniation
  – Purely technical errors
    • Maturing wrong end

• Late
  – Stomal prolapse
  – Retraction
  – Parastomal hernia
  – Bowel obstruction
  – Stenosis/Stricture
  – Peristomal varices/bleeding
  – Skin infection/inflammation
Overall Morbidity

• Widely varies
  – 21-70% (most 30-50%)
  – Observer dependent
  – Stoma type plays a huge role
  – Likely underestimated by most studies
Important studies
Park, et al. Cook County

- Retrospective analysis of 1616 pts (20 years)
- Data compiled by EST
- 553/1616 complications (448 early/105 late)
- Early complications (28%)
  - Skin irritation 12%
  - Pain/poor location 7%
  - Partial necrosis 5%
<table>
<thead>
<tr>
<th>Early Complications</th>
<th>No. of Complications</th>
<th>Incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin irritation</td>
<td>199</td>
<td>12.31</td>
</tr>
<tr>
<td>Poor location</td>
<td>111</td>
<td>6.87</td>
</tr>
<tr>
<td>Partial necrosis</td>
<td>83</td>
<td>5.14</td>
</tr>
<tr>
<td>Retraction</td>
<td>73</td>
<td>4.52</td>
</tr>
<tr>
<td>Parastomal separation</td>
<td>64</td>
<td>3.96</td>
</tr>
<tr>
<td>Parastomal abscess</td>
<td>35</td>
<td>2.17</td>
</tr>
<tr>
<td>Bleeding</td>
<td>12</td>
<td>0.74</td>
</tr>
<tr>
<td>Complete necrosis</td>
<td>6</td>
<td>0.37</td>
</tr>
<tr>
<td>Evisceration</td>
<td>6</td>
<td>0.37</td>
</tr>
<tr>
<td>Stenosis</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>Pseudoepithelial hyperplasia</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>Protruding sigmoid</td>
<td>2</td>
<td>0.12</td>
</tr>
<tr>
<td>Allergy</td>
<td>1</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>600</strong></td>
<td></td>
</tr>
</tbody>
</table>
Late complications (6%)
- Skin irritation 6%
- Prolapse 2%
- Stenosis 2%
- Parastomal hernia not mentioned

Trauma/colorectal had lowest complication rate

No difference in emergent vs elective
<table>
<thead>
<tr>
<th>Late Complications</th>
<th>No. of Complications</th>
<th>Incidence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin irritation</td>
<td>92</td>
<td>5.69</td>
</tr>
<tr>
<td>Prolapse</td>
<td>28</td>
<td>1.73</td>
</tr>
<tr>
<td>Stenosis</td>
<td>27</td>
<td>1.67</td>
</tr>
<tr>
<td>Parastomal hernia</td>
<td>19</td>
<td>1.18</td>
</tr>
<tr>
<td>Pseudoepithelial hyperplasia</td>
<td>18</td>
<td>1.11</td>
</tr>
<tr>
<td>Retraction</td>
<td>17</td>
<td>1.05</td>
</tr>
<tr>
<td>Allergy</td>
<td>5</td>
<td>0.31</td>
</tr>
<tr>
<td>Perforation</td>
<td>1</td>
<td>0.06</td>
</tr>
</tbody>
</table>
- Highest complication rate loop ileostomy (74%)
- Lowest complication rate transverse end colostomy (5.8%)

### Table 3.
Early, Late, and Total Complications Per Enteric Stoma Type and Configuration

<table>
<thead>
<tr>
<th>Enteric Stoma Type and Configuration</th>
<th>Total Constructed</th>
<th>No. of Early Complications</th>
<th>Early Complications Per Stoma Type (%)</th>
<th>No. of Late Complications</th>
<th>Late Complications Per Stoma Type (%)</th>
<th>Total Complications</th>
<th>Total Complications Per Stoma Type (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ileostomy—end</td>
<td>274</td>
<td>80</td>
<td>29.20</td>
<td>14</td>
<td>5.11</td>
<td>94</td>
<td>34.31</td>
</tr>
<tr>
<td>Ileostomy—loop</td>
<td>154</td>
<td>92</td>
<td>59.74</td>
<td>22</td>
<td>14.29</td>
<td>114</td>
<td>74.03</td>
</tr>
<tr>
<td>Ascending—end</td>
<td>11</td>
<td>3</td>
<td>27.27</td>
<td>1</td>
<td>9.09</td>
<td>4</td>
<td>36.36</td>
</tr>
<tr>
<td>Ascending—loop</td>
<td>26</td>
<td>8</td>
<td>30.77</td>
<td>1</td>
<td>3.85</td>
<td>9</td>
<td>34.62</td>
</tr>
<tr>
<td>Transverse—end</td>
<td>69</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
<td>5.80</td>
<td>4</td>
<td>5.80</td>
</tr>
<tr>
<td>Transverse—loop</td>
<td>423</td>
<td>66</td>
<td>15.60</td>
<td>37</td>
<td>8.75</td>
<td>103</td>
<td>24.35</td>
</tr>
<tr>
<td>Descending—end</td>
<td>20</td>
<td>12</td>
<td>60.00</td>
<td>1</td>
<td>5.00</td>
<td>13</td>
<td>65.00</td>
</tr>
<tr>
<td>Descending—loop</td>
<td>38</td>
<td>4</td>
<td>10.53</td>
<td>1</td>
<td>2.63</td>
<td>5</td>
<td>13.16</td>
</tr>
<tr>
<td>Sigmoid—end</td>
<td>267</td>
<td>58</td>
<td>21.72</td>
<td>21</td>
<td>7.87</td>
<td>79</td>
<td>29.59</td>
</tr>
<tr>
<td>Sigmoid—loop</td>
<td>334</td>
<td>125</td>
<td>37.43</td>
<td>3</td>
<td>0.90</td>
<td>128</td>
<td>38.32</td>
</tr>
</tbody>
</table>

1616  448  105  553
Table 2: Comparison between elective and emergency stoma procedures. The range of percentages of patients who developed the following complications between 10 days and 2 years after their stoma operations is listed below.

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Elective</td>
</tr>
<tr>
<td>Stenosis</td>
<td>2–6</td>
</tr>
<tr>
<td>Retraction</td>
<td>16–23</td>
</tr>
<tr>
<td>Hernia</td>
<td>0–31</td>
</tr>
<tr>
<td>Prolapse</td>
<td>2–6</td>
</tr>
<tr>
<td>Skin excoriation</td>
<td>15–36</td>
</tr>
<tr>
<td>Odour</td>
<td>7–27</td>
</tr>
<tr>
<td>Daytime leakage</td>
<td>14–28</td>
</tr>
<tr>
<td>Night time leakage</td>
<td>6–22</td>
</tr>
<tr>
<td>Daytime soiling</td>
<td>10–23</td>
</tr>
<tr>
<td>Night time soiling</td>
<td>6–22</td>
</tr>
<tr>
<td>Night time emptying</td>
<td>22–40</td>
</tr>
</tbody>
</table>
• Case control study
• 204 patients in 3 years had ostomies created
• Records available for 164
• Complications in 41/164 (25%)
### Table 1. Complications by Stoma Type and Subtype

<table>
<thead>
<tr>
<th>Stoma Type and Subtype</th>
<th>No. of Complications/No. of ostomies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ileostomy</td>
<td>16/45 (35.6%)</td>
</tr>
<tr>
<td></td>
<td>End</td>
</tr>
<tr>
<td></td>
<td>Loop</td>
</tr>
<tr>
<td><strong>Colostomy</strong></td>
<td>26/119 (21.8%)</td>
</tr>
<tr>
<td>Ascending-end</td>
<td>0/1 (0%)</td>
</tr>
<tr>
<td>Ascending-loop</td>
<td>0/1 (0%)</td>
</tr>
<tr>
<td>Transverse-end</td>
<td>3/11 (27.3%)</td>
</tr>
<tr>
<td>Transverse-loop</td>
<td>8/22 (36.4%)</td>
</tr>
<tr>
<td>Descending-end</td>
<td>6/38 (15.8%)</td>
</tr>
<tr>
<td>Descending-loop</td>
<td>2/10 (10.0%)</td>
</tr>
<tr>
<td>Sigmoid-end</td>
<td>4/16 (25.0%)</td>
</tr>
<tr>
<td>Sigmoid-loop</td>
<td>3/20 (15.0%)</td>
</tr>
</tbody>
</table>
Duchesne, et al.

- Risk factors evaluation
- Not relevant:
  - Gender
  - Penetrating/blunt trauma
  - Cancer
  - Diverticulitis
  - Ostomy quadrant
  - Emergent operation

Fig. 3. Frequency of complication type.
Significant Risk factors

Enterostomal nurse affords protective effect

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Crude Odds (95% CI)</th>
<th>Adjusted Odds (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammatory bowel disease</td>
<td>3.90* (1.19–12.79)</td>
<td>4.34* (1.07–17.69)</td>
</tr>
<tr>
<td>Ischemic colitis</td>
<td>3.98* (1.09–14.47)</td>
<td>5.39 (0.31–92.93)</td>
</tr>
<tr>
<td>Obesity</td>
<td>2.28* (1.05–4.96)</td>
<td>2.64* (1.14–6.14)</td>
</tr>
<tr>
<td>Enterostomal nurse</td>
<td>0.20* (0.06–0.71)</td>
<td>0.15* (0.03–0.74)</td>
</tr>
<tr>
<td>Diverticulitis</td>
<td>0.33 (0.0–1.36)</td>
<td>0.52 (0.11–2.45)</td>
</tr>
<tr>
<td>Ileostomy</td>
<td>1.97 (0.94–4.15)</td>
<td>0.90 (0.34–2.36)</td>
</tr>
</tbody>
</table>

*P > 0.05.
Complications of Colostomy*

Sibu Pada Saha, M.D.,† Narasimma Rao, M.D.,‡ Sam E. Stephenson, Jr., M.D.§

From the Department of Surgery, University Hospital of Jacksonville, Jacksonville, Florida

Saha, et al.

- One of the first series of Colostomy complications
- Reviewed experience in 200 Patients with colostomy
- 21/200 with complications (11%)

<table>
<thead>
<tr>
<th>Complication</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolapse</td>
<td>11</td>
</tr>
<tr>
<td>Retraction</td>
<td>1</td>
</tr>
<tr>
<td>Paracolostomy hernia</td>
<td>2</td>
</tr>
<tr>
<td>Pericolic abscess</td>
<td>1</td>
</tr>
<tr>
<td>Stenosis</td>
<td>5</td>
</tr>
<tr>
<td>Obstruction</td>
<td>1</td>
</tr>
<tr>
<td>Necrotizing fascitis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>
Complications
Skin irritation

• Almost entirely due to poor stoma siting
• Occurs in 3-60%
• Result of Chemical dermatitis or frequent appliance changes.
• Fungal irritation by C. Albicans

• May be due to abscess or fistula
  – Fistula common in Crohn’s
  – Fistula from taking too much bowel wall on seromuscular bites of Brook ileostomy
  – Abscess often due to retraction of mucocutaneous border
Skin Irritation

- Seen more commonly in Ileostomies than in Colostomies
- Height of Stoma important. >1cm is minimum
- Patient education plays a key role
- Correct appliance size/shape
Retraction

• Partial retraction causes gaps between stoma and skin – pouching difficulties
• Undue tension of mucocutaneous jxn
• Use of loop or end-loop Stomas with bridge
  – Controversial
  – 1 Prospective randomized control trial shows no benefit
Retraction

• Convex appliances are key to avoid reoperation
• Can be revised locally
  – Re-Brooke-ing
• May require laparotomy and re-siting if severe retraction
Dusky Stoma

- 2-17% of stomas
- Superficial
- Full thickness
  - Suprafascial – can watch
  - Intraperitoneal – needs laparotomy and revision

- Test Tube Test – place lubricated end of red top tube into stoma and shine light through top.
  - Should visualize pink mucosa through side of tube.
Vascular compromise

- Technical Error
- Venous congestion
- Disruption of segmental arterial supply
- Abd wall too tight
- Must retain ascending branch of left colic if ligating IMA
Vascular compromise

May result in late retraction or stenosis, even if stoma has full recovery in acute setting.

• Viability needs to be insured intraoperatively
• Allow bowel to demarcate if viability in question
• Clamp arterial arcades with bulldog clamps prior to division to assess for color change
Late complications

- Stomal prolapse
- Retraction
- Parastomal hernia
- Bowel obstruction
- Stenosis/Stricture
- Skin infection/inflammation
Stomal Prolapse

- Usually a late occurrence
- Approx. 7% of all stomas
- Up to 30% of transverse loop colostomies
- Debatable whether suturing bowel to fascia will prevent this.
Acute Prolapse

- Incarceration can be severely painful
- Manual reduction is first treatment option
- Sugar has been used as a dessicant with anecdotal evidence of efficacy
  - It works. I seen it.
  - Shapiro 2010
  - Fligelstone 1997
Chronic prolapse

• Surgical options include
  – Modified Altmeier or Delorme Procedures
    • Dissect mucocutaneous junction
    • Resect either mucosa (Delorme) or full thickness (Altmeier), and re-Brook stoma to create new mucocutaneous border
  – Relocation of stoma with resection of extra length.
  – Burton Modification of Thiersch Wire technique
Pseudohernia/SubQ prolapse

• Prolapse of hernia into subQ tissue, but not through stomal orifice
• Mimics Parastomal hernia, but has intact fascia
• Presents with obstruction, pain, mass at stoma site.
• Treatment is the same as for regular prolapse
Stenosis/Stricture 2-14%

- Late sequela of vascular compromise
- May present with Bowel obstruction at level of fascia
- Often successfully treated with fingertip dilation
- If unacceptable results, may require revision
- If early on, may be due to Small aperture through fascia.
Parastomal hernia

A Grand Rounds unto itself
“It doesn’t matter if God himself made your ostomy. If you have it long enough, you have a 100% risk of a parastomal hernia.”

J Byron Gathright, 1996
Parastomal hernia

- Incidence is unknown due to underreporting and difficult dx.
- Estimated to be between 20-80%
- More frequent with colostomy than ileostomy

- Cingi et al
  - 23 patients
  - PE detected PSH in 52%
  - CT detected total of 78%
Parastomal Hernia

• Early
  – Presents with acute pain, mass, obstruction
  – < 30 days from stoma
  – Technical failure
  – Too large of an aperture in fascia

• Late
  – Inevitable?
  – Presents with slow growing mass, abnormal contour of tissues around stoma
  – Consequence of increasing intraabdominal tension
  – “There’s already a hole there, Doctor.”

R. Schwartz 2008
PSH risk factors

• Patient
  – Waist circumference over 100cm
  – Smoking
  – Age
  – Malnutrition

• Technical aspects
  – Rectus/oblique?
  – Preop Siting
  – Aperture size > 2-3 fingers (cm?)
  – Emergent?

• Disease processes
  – Obesity
  – Diabetes
  – IBD
  – COPD
  – Intraabdominal hypertension
  – Postop Sepsis
  – Perioperative steroid use
  – Malignancy
Primary Repair

- Just sew the hole around the stoma closed to recreate a new aperture

- High recurrence rate historically 50-100%

- Add mesh?
  - Still doesn’t work 50-88% recurrence
Re-Siting of Stoma

• Traditional boards answer for symptomatic PSH

• Has expected high recurrence rate
  – Baig et al. 4/27 recurrences at 56 months
    • 3/16 with laparotomy
    • 1/11 without laparotomy
  – Historically has rates up to 50-68% (essentially the same as hernia rate for each new stoma)
Laparoscopic techniques

• Lap vs Open
  – McLemore – 49 pt with PSH
    • Laparoscopic vs Open suture repair
      – No significant difference in morbidity or short term outcomes
  – Pastor – 25 pts
    • 4/12 laparoscopic had recurrence
    • 7/13 open had recurrence
Laparoscopic Keyhole vs Sugarbaker

Muysoms, et al.

Keyhole – recurrence 72.7%
Sugarbaker – recurrence 14.2%

Mancini, et al.

Retrospective review of 25 pts with Sugarbaker technique
1 recurrence at 30 months. (4%)
An ounce of prevention is worth 450 pounds of cure
Stomal Reinforcement
Prevention of PSH

• Metaanalysis of 3 randomized trials of mesh vs no mesh
  – 12.3% vs 54.7%
  – No increased morbidity

• Serra-Aracil et al
  – 5 year data
    • Mesh - 14.8% hernia rate
    • No mesh – 40.7% hernia rate

• 5 prospective observational studies
• All show reduction in herniation rate, no change in morbidity
• Long term data forthcoming
• Planned end colostomies/ileostomies
How are we going to get this through that?

AKA: The Difficult Stoma in the Operating Room.
A Difficult Situation

- 65 year old man
- 350 lbs
- Diabetic with CHF
- Perforated diverticulitis
- 5 laparotomies
- Septic with peritonitis

Get the idea?
The Difficult Stoma

- Inflamed, thickened, foreshortened mesentery
  - Prior operations
  - Inflammatory changes
- Obesity
  - Thick abdominal wall
  - Poor tissue quality
- Distended colon
- Epiploic appendages
Obesity and Stoma Creation

• Increased depth of skin creases causes pouching difficulties, even in properly constructed, well located ostomies
• Difficult to identify the rectus muscles preoperatively
• Obese patients cannot see their lower abdomen
• Thicker abdominal wall adipose tissue requires increased amount of length of mobilization
Thick abdominal Wall

Skin

Fascia

9 cm + 2 cm = 11 cm of Sigmoid Colon

9 cm + 6 cm = 15 cm of Terminal ileum

BMI 48.7
Tips for success

- Avoid a Stoma if at all possible
- Excise all inflamed Sigmoid colon
- Segment used for stoma must be free of inflammation
Difficult End Colostomy

- Take down Left lateral peritoneal reflection fully

- Transect medial peritoneal attachments to left mesocolon.
Mobilize Splenic Flexure
Divide IMA/IMV if necessary

Must have good pulse in marginal artery!

Stay proximal to Left colic!
Windows

- Create windows through the peritoneum of the left mesocolon
- Useful for providing extra length
- Careful not to devascularize colostomy!
“Bigger Hole!”

- Expand fascial aperture or skin edges
- Remove subcutaneous tissues

“Smaller Colon!”

- Remove excess fatty tissues – epiplolic appendages
- Trim mesentery – leave 1 cm of mesentery on distal bowel to preserve marginal artery
- Decompress distended bowel
PseudoLoop

- Herbert, et al - maturation of antimesenteric border of colon
- No Brooking, often ends up skin level, or retracted
- Emergencies only, only when no other stoma will reach
“Better to create an ugly stoma in a good location than a pretty stoma in an ugly location.”

--Peter Cataldo
Thinner wall?

• Abdominal wall modification
  – Lipectomy
    • Meguid (1997) described technique of excision of subcutaneous fat to reduce abdominal wall thickness
    • Leave convex contour to abdominal wall – can lead to pouching issues
  – Liposuction
    • Margulies elucidated technique of peristomal suction lipectomy for removal of excess fat during stomal revision
SubQ plane
“Our experience is limited to a single patient because we have not had this clinical presentation again.”

-- Meguid 1997
Thinner Wall?

• Flaps
  – Good for Retraction and pyoderma/skin ulcerations in Obese people.
  – Functionally Better than Lipectomy because of restoration of flat abdominal wall, but have risk of potential flap necrosis
  – Not described for initial placement of ostomy
Decrease the friction

- Stuff bowel into 1 inch Penrose drain and slide through trephine
- Sleeve of Sterile Glove (size 5 ½)
- Alexis wound retractor
Penrose Pass

- Mavroidis (1996)
- Passage of bowel into large penrose drain (1 inch)
- Passage of drain through stoma aperture eased by bowel compression and decreased “catchin’.”
- Difficult to pass bowel into drain
“Glove Cuff” Technique

Alexis Wound retractor method

- Described by Meagher, et al 2009
- Stomal aperture created in usual fashion
- Small (2.5-6cm) Alexis inserted and wound retracted
- Colon passed through wound retractor
- Inner (green) ring divided and plastic sheath cut off
- Plastic slides out, Colon left in perfect position
Alexis Wound Retractor
(Anecdotal) Benefits

- “Noticeably” Smaller size of aperture
- Less tissue damage/bruising
- F/U < 14 months, but no retractions nor parastomal hernia
- Limited by BMI 28-32 in these 8 patients
- Abdominal wall 7-8 cm
Relocate.
Go North Young Man

• In obese patients, supraumbilical placement of stomas is desirable.
• Improved pouching.
• Decreased skin irritation.
• Thinner abdominal wall above umbilicus.
• Patients can see it.
Summary
Stoma Formation

- Is life altering for patients
- Is not a benign procedure
- Is associated with a high rate of early and late technical complications
- May require Operative imagination
Remember

Preoperative planning, operative technique, postoperative education are of vital importance

Make every stoma as though it were going to be permanent
Resources for Ostomates

- United Ostomy Associations of America
  - WWW.OSTOMY.ORG
- ASCRS website
  - www.fascrs.org
- Wound, Ostomy, and Continence Nursing
  - WWW.WOCN.ORG
Thank You.

Now let’s get to the OR on time.
References


