Avoiding and managing GI injury

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General surgery

Objectives

• Discuss avoidance, recognition and management of post-operative GI and GU complications
7 Cases of Injured Bowel

1 Woman dies from bowel injury

During a slings procedure for vaginal prolapse, a 50-year-old woman required a transfusion. The next day, she was nauseated and constipated. A day later, she went to the ED with shortness of breath and chest and abdominal pain. Her symptoms persisted for 6 days before an injury to her transverse colon was found during exploratory surgery. She suffered massive organ failure caused by sepsis and was taken to the OR. An exploratory laparotomy was performed 3 days after surgery. Bowel and ureter injuries were repaired and a permanent colostomy was created. The patient developed septic shock with multiple organ failure, and was placed in a chemically induced coma for 3 weeks, after which she had to relearn to walk, talk, and care for herself.

- Patient's claim: The ObGyn was negligent in performing the surgery. He failed to obtain consent for the resident's participation. The associate failed to respond to her declining postoperative condition.
- General surgeon repaired the injury with a loop ileostomy, which was successfully reversed 3 months later. The patient continues to have constipation, with occasional bleeding, pain, and burning.

- Patient's claim: The risks of robotic surgery were never fully explained to her. Failure to properly visualize her internal organs led to the injury; the extent of damage exceeded what is considered "acceptable risk" of the procedure. The physicians had little experience and training in robotic surgery.

- Llarena et al O&G, 2015

GI Injury during laparoscopic surgery

- .13% overall
- .03% for sterilization
- .39% for hysterectomy
- Small intestine 47%
- 55% at initial entry with Veress needle.
- Intra-aoperative repair: no deaths.
- Mortality .8% due to delayed recognition.
- Diagnostic delay: 41%, 3 days.
- Mortality 3.2% if delayed diagnosis.
  - Llarena et al O&G. 2015
Intestinal injury

- 5,000/year in the United States.
- .16 - 1.5% of all cases, or 2.1% of laparoscopic hysterectomies
- Primary trocar injury.
- Use Palmer’s point or open entry when midline incision.
- Watch all secondary trocar insertions.
  » Jo et al JMI G 2013

Avoiding bowel injury

- We bowel prep many: endometriosis, cancer:
  - Halflytely, MoviePrep, pills and 1/2 gal PO as directed.
  - OsmoPrep, #32 tabs PO
  - Golytely, Colyte: drink one gallon.
- Gentle retraction of bowel.
- Be responsible for assistant’s instrument.
- Sharp scissors for bowel adhesions - no heat.
Bowel injuries

- **Direct** - disruption of partial or full intestinal thickness by dull scissors, poor technique of adhesiolysis, rough retraction. Sick in <3 days.

- **Thermal injury** - ultrasonic shears or monopolar device contacts bowel: blanching. Oversew these, as can be full thickness, and necrose within 9-11 days, weeks.

- **Indirect** - injury to mesenteric vascular supply to bowel. Indolent course.

  » Clarke Pearson et al AJOG 2013

Test for sigmoid injury

- Direct inspection, with General Surgeon.
- Betadine prep in 1Liter NS infused through mushroom catheter, compressing proximal sigmoid. (Favor)
- Bubble test with Asepto in puddle of irrigation fluid - look for bubbles.
Repair colon injury

• Run first layer with Vicryl 3-0 SH-1.
• Imbricate first layer with interrupted 3-0 silk or vicryl.
• Test closure: Inflate colon with betadine/NS or air.
• Standard antibiotic prophylaxis for 24 hours.
• If gross soilage:
  – Suction all fecal material first, then irrigate locally, (don’t get irrigant all over abdomen) copiously.
  – Flagyl + Levaquin until normal WBC
  – JP drain (pull in through a trochar site) until normal WBC
  – No colostomy.
  – No NG Tube.
  – Feed after flatus.
  » Jo et al JMIG

Blake drain connects to bulb - not hurt upon removal
Repair small bowel injury
(means we all must learn to suture and tie intracorporeally)

- If blanch or burn bowel, treat as hole and suture imbricate.
- Repair holes with interrupted 3-0 silk or vicryl, SH needle. Pull in through 5mm trocar.
- Second layer to imbricate if insecure of closure.
  - Standard antibiotic prophylaxis for 24 hours.
  - If soilage: aspirate and irrigate.
  - No ostomy for simple injury.
  - NG Tube unnecessary.
  - Feed regular diet when appetite and flatus return to normal.

Laparoscopic repair of enterotomy or colotomy
Should be performed similarly to open standards.

Identify your local laparoscopic General Surgeon.
Laparoscopic patients should feel better every day.

When they don’t……. start to suspect.

Symptom: SBO after your procedure

- If belching, ileus, or SBO four days after surgery...
  Differential:
  - Trochar site hernia, even if 5mm trochars.
  - Small bowel adhesions to vaginal apex.
  - Urological injury.
  - Ileus from narcotic use.
  - GI injury: small or large bowel puncture or breakdown.

- If you thought you had a GI injury you would have already fixed it. Think GI injury!
- Better to suspect the worst always and test for it!!!
  - Abdominal pain.
  - Fever.
  - Nausea, vomiting, diarrhea, bloating.
Diagnostic delay

- Suspect only ileus?
  (But laparoscopic patients improve quickly)
- Fooled by intraperitoneal gas.
- r/o PE
- Diverticulitis.
- C. Difficile.
- Enterotomy, fistula

Develop a presumptive diagnosis:

Q: In a worst case scenario, what do you need to do?

A: Rule out bowel perforation.
Signs and Symptoms of GI injury

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Sign</th>
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</thead>
<tbody>
<tr>
<td>Abdominal pain</td>
<td>Direct and rebound tenderness</td>
</tr>
<tr>
<td>Bloating</td>
<td>Abdominal distension</td>
</tr>
<tr>
<td>Nausea, emesis</td>
<td>Diminished bowel sounds</td>
</tr>
<tr>
<td>★ Diarrhea</td>
<td>Hypermotility</td>
</tr>
<tr>
<td>Fever, chills</td>
<td>Elevated or lower temperature</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>Tachypnea, tachycardia</td>
</tr>
<tr>
<td>Weakness</td>
<td>Palor, hypotension, lethargy</td>
</tr>
</tbody>
</table>

Signs of GI Sepsis

<table>
<thead>
<tr>
<th>Sign:</th>
<th>Colon</th>
<th>Small Bowel</th>
</tr>
</thead>
<tbody>
<tr>
<td>N or low Temp</td>
<td>61</td>
<td>51</td>
</tr>
<tr>
<td>Fever</td>
<td>39</td>
<td>49</td>
</tr>
<tr>
<td>Tachycardia</td>
<td>63</td>
<td>54</td>
</tr>
<tr>
<td>Tachypnea</td>
<td>61</td>
<td>49</td>
</tr>
<tr>
<td>Hypotension</td>
<td>43</td>
<td>19</td>
</tr>
<tr>
<td>Anemia</td>
<td>76</td>
<td>63</td>
</tr>
<tr>
<td>Low WBC</td>
<td>41</td>
<td>22</td>
</tr>
<tr>
<td>High WBC</td>
<td>49</td>
<td>40</td>
</tr>
<tr>
<td>Bandemia</td>
<td>51</td>
<td>37</td>
</tr>
<tr>
<td>Creat/BUN up</td>
<td>24</td>
<td>6</td>
</tr>
</tbody>
</table>

Baggish, J Gynecol Surg, 2007
Case: SBO, bloating

• 62 yo s/p BSO and lysis of dense adhesions, went home same day, but returns on POD 4, c/o bloating, discomfort, nausea, no flatus or stool.
• WBC=5.0.
• CT shows........

Too much gas for POD#4.
Open
Free air, free fluid, air fluid levels, abscess
Treatment of suspected GI injury

• Admit immediately and hydrate.
• Review and consult with colleague for objectivity (Gyn oncologist or General Surgeon).
• Confirm with:
  – CBC with Bands. Bands are your earliest warning.
  – BMP - r/o urologic injury, acidotic?
  – Lactate level - r/o infarcted bowel.
  – CT abdomen and pelvis, IV and oral contrast.
    • Communicate suspicions with radiologist before scan.
    • Review films with radiologist yourself.
    • How much free air after laparoscopy is okay?

This is normal gas for post op day 2
Too much air for day 4

Too much air for day 4
Treatment of Colon Injury

- Immediate laparotomy with general surgeon.
- Culture peritoneal fluid.
- Lavage with 6-10 liters saline.
- Drains
- Triple antibiotics: Cipro, Flagyl, Ampicillin
- Plan repeat lavages every 3 days if diffuse colonic soilage and peritonitis.

Other GI complications

- Hernia
- Torsion
- Adhesions
5mm trocar site

Trocar site hernia

For best patient care:

• Cultivate a good working relationship with your local laparoscopic general surgeon.

• We want to help you and your patients!

• We should all work together.