Peptic Ulcer Disease: Management Options for Complications

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Case Presentation

HPI:
37 year old male with inability to tolerate PO diet which has been worsening progressively. + abdominal pain and distension after eating.

PMHx/PSHx:
Perforated duodenal ulcer s/p Graham’s patch in 1998, GERD, s/p ex-lap, LOA for SBO
Case Presentation

**Meds:** Esomeprazole

**All:** NKDA

**SocHx:** + 6 cigarettes/day x 20 years, occasional EtOH, no drugs

**Family Hx:** none
Case Presentation

Physical Exam:
Alert and oriented, thin
Normal heart sounds
Clear chest
Healed midline incision, soft abdomen, nontender, nondistended

Height: 5’8”   Weight: 140lbs   BMI: 21
Case Presentation

Work up:

EGD – deformed pylorus, could not pass pediatric scope

Barium swallow – deformed and fixed narrowing of the duodenal bulb

Lab work – normal
OR Findings:
Very dilated stomach, omental adhesions to the proximal duodenum with single stricture. no other strictures noted

Exploratory laparotomy, partial gastrectomy, truncal vagotomy, Billroth II reconstruction

Path: segment of nerve x 2; distal portion of stomach without pathological changes
Case Presentation

Hospital Course:
- POD #1: NGT discontinued
- POD #4: Liquid diet started
- POD #5: Regular diet
- POD #6: Discharged home
Questions?
Peptic Ulcer Disease
Epidemiology

• Over 4 million people affected by PUD annually.
• Overall incidence of duodenal and gastric ulcers decreased over last 3-4 decades but incidence of complicated PUD is stable.
• Cause of death in 10,000 deaths annually.
• Advances in understanding the causes and pathophysiology of PUD led to change in management
Anatomy

Diagram showing the anatomy of the stomach and its arteries. The diagram includes labels for:
- Short gastric arteries
- Right gastric artery
- Gastroduodenal artery
- Left gastric artery
- Left gastroepiploic artery
- Superior mesenteric artery
- Right gastroepiploic artery

Additional diagrams show the right and left vagus nerves, hepatic division, and celiac division.
Type V gastric ulcer – NSAID
Physiology

Diagram showing the physiology of gastric acid production, including the roles of HCl, secretory canaliculi, tubulovesicles, Ca²⁺, cAMP, histamine, acetylcholine, ECL cell, and gastrin.
Physiology

Goblet Cells and epithelium contribute to bicarbonate-capturing mucus gel barrier.
Acid secretion

Mucosa barrier protection

ULCER
Etiology

- H. pylori infection
- NSAIDs
- Severe physiologic stress
- Hypersecretory states (ZE syndrome, MEN I)
- Blood type O
- Tobacco, alcohol
# Symptoms

<table>
<thead>
<tr>
<th>Uncomplicated Gastric Ulcers</th>
<th>Uncomplicated Duodenal Ulcers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gnawing epigastric pain</td>
<td>Gnawing epigastric pain</td>
</tr>
<tr>
<td>Associated with food intake</td>
<td>Typically occurs 1-3hrs after food</td>
</tr>
<tr>
<td>Anorexia, Weight loss</td>
<td>Pain improves with food</td>
</tr>
</tbody>
</table>
Work-Up

- Thorough history and physical exam
- Upper endoscopy
- Barium study
- Serum gastrin level
- H. pylori testing
# H. Pylori Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serologic antibody test</td>
<td>• Noninvasive</td>
</tr>
<tr>
<td></td>
<td>• Now cost</td>
</tr>
<tr>
<td></td>
<td>• False positive for past infections</td>
</tr>
<tr>
<td>Breath Urease test</td>
<td>• Active infection only</td>
</tr>
<tr>
<td></td>
<td>• False negative if on PPI or bismuth</td>
</tr>
<tr>
<td>Fecal antigen test</td>
<td>• Active infection only</td>
</tr>
<tr>
<td>Rapid urease test</td>
<td>• Requires tissue biopsy</td>
</tr>
<tr>
<td></td>
<td>• Fast</td>
</tr>
<tr>
<td>Histology</td>
<td>• Requires tissue biopsy</td>
</tr>
<tr>
<td></td>
<td>• Time consuming</td>
</tr>
</tbody>
</table>
Treatment

• Non-operative
  – Treatment of underlying H. pylori infection
  – H2 receptor antagonist or proton pump inhibitor
  – Lifestyle modification
  – Removal of physiologic stress
Surgery indicated for bleeding, perforation, obstruction and intractable ulcers.
Complicated PUD

- Perforation
- Bleeding
- Obstruction

- Sharp sudden onset of pain
- Peritoneal signs on exam
- Free air on imaging studies

Omental patch
Complicated PUD

• Perforation
• Bleeding
• Obstruction

• Hematemesis, melena, BRBPR
• Resuscitation
• Upper endoscopy with electrocautery, injection
Complicated PUD

- Perforation
- Bleeding
- Obstruction

- Occurs in <5% of patients
- Can attempt to dilate endoscopically
- Must rule out malignancy
- Bypass or drainage procedure
Pyloroplasty
Gastroenterostomy

Billroth I

Billroth II
Comparison of Vagotomy and Drainage Procedures

<table>
<thead>
<tr>
<th></th>
<th>Parietal Cell Vagotomy</th>
<th>Truncal Vagotomy and Pyloroplasty</th>
<th>Truncal Vagotomy and Antrectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative mortality rate (%)</td>
<td>0</td>
<td>&lt;1</td>
<td>1</td>
</tr>
<tr>
<td>Ulcer recurrence rate (%)</td>
<td>5–15</td>
<td>5–15</td>
<td>&lt;2</td>
</tr>
<tr>
<td>Dumping (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>&lt;5</td>
<td>10</td>
<td>10–15</td>
</tr>
<tr>
<td>Severe</td>
<td>0</td>
<td>1</td>
<td>1–2</td>
</tr>
<tr>
<td>Diarrhea (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>&lt;5</td>
<td>25</td>
<td>20</td>
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<tr>
<td>Severe</td>
<td>0</td>
<td>2</td>
<td>1–2</td>
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</table>
Comparison of short-term outcomes between organ preserving bypass and antrectomy
Is Jaboulay Gastroduodenostomy Effective for Treating Duodenal Stricture due to Duodenal Ulcer in the Early Postoperative Term? Clinical Consideration

<table>
<thead>
<tr>
<th>TABLE 2 Outcomes</th>
<th>J (n=12)</th>
<th>A (n=18)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time (min)</td>
<td>67.1±10.1</td>
<td>122±17.4</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Blood loss (mL)</td>
<td>48.8±16.2</td>
<td>255±99.7</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Duration of N-G (day)</td>
<td>7.1±1.4</td>
<td>4.1±1.1</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Initial diet (day)</td>
<td>7.3±1.5</td>
<td>5.2±0.6</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Solid diet (day)</td>
<td>11.3±1.7</td>
<td>9.4±0.7</td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>DGE</td>
<td>10 (83%)</td>
<td>6 (33%)</td>
<td>&lt; 0.0106*</td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1 (8.3%)</td>
<td>1 (5.6%)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Wound infection</td>
<td>1 (8.3%)</td>
<td>1 (5.6%)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Hospitalization (day)</td>
<td>13.7±1.4</td>
<td>12.1±1.1</td>
<td>&lt; 0.002*</td>
</tr>
</tbody>
</table>
Conclusion

• Management of peptic ulcer disease has been evolving.
• Immediate treatment of PUD is important to prevent future complications.
• Selecting the optimal procedure for individual case of complicated PUD is essential.
• Understand the concept of vagotomy and drainage procedures.
All of the following are true except

1. The right gastric artery is a branch of the common hepatic artery
2. The left gastric artery is a branch off the celiac axis
3. A bleeding ulcer from the posterior 1st portion of the duodenum is likely bleeding from the proper hepatic artery
4. The short gastrics are branches of the splenic artery
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The best test for diagnosis of H. pylori is

1. Rapid urease test from biopsy
2. Breath urease test
3. Histologic exam from biopsy
4. Fecal antigen test
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A 37-year-old man with a three-year history of ulcers is admitted to the hospital with recurrent epigastric pain and heme-positive stools. One year ago he underwent simple closure for a perforated duodenal ulcer. If a plasma gastrin determination of 400 pg/ml is obtained, the single best test to establish the diagnosis of Zollinger-Ellison syndrome is

1. Transhepatic sampling of the splenic vein for gastrin level
2. A secretin stimulation test
3. A calcium stimulation test
4. Overnight measurement of gastric acid and volume secretion
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References

- Lawrence, Essentials of General Surgery. 4th Edition
Questions?

www.downstatesurgery.org