Management of Difficult Perforated Peptic Ulcers

Marilyn Ng, MD

Dept. of Surgery M&M Conference
Downstate Medical Center
April 11, 2013
Case Presentation

- 58 yo F with PMHx of HTN
- SHx: C – section & SocHx: negative
- 9-mo hx abd distention & pain
- Non - bilious emesis several days
- BIBEMS for altered mental status
ED Physical Exam

- BP 221/123  HR 110  RR 25  Sat 99% RA
- Gen: AAO x 2
- Abd: soft, abd distention, diffuse tenderness, lower midline scar
ED Lab Results

- **CBC:** 7.6 > 15.1 / 43.6 < 293 N 80%
- **BMP:** 141 / 3.2 / 92 / 34 / 0.16 < 120
- **Coag:** normal
- **VBG:** 7.48 / 30 / 44 / 32 / 58% / +8
A Long Prelude to the OR

- HD#1: Admitted for GOO
  - IVF resuscitation
  - PPI drip & broad-spectrum abx
  - Refused NGT & central line placement

- HD#2: Tachycardic, normal BP, worsening abd pain & WBC 13.9
Three Days Later . . .

- HD#3: Tachycardia, 7 L IVF
- Portable CXR: no free air
- Bandemia 58%, Cr 2.3, Lactate 2.3
- ABG: 7.37/28/100/16/17/97%/-7.7
- Repeat CT abd/pelvis
Exploratory Laparotomy

- Drainage 3 L gastric fluid
- Perforated giant pre-pyloric ulcer (4 cm)
- Distal gastrectomy, truncal vagotomy, gastrojejunostomy, tube duodenostomy, repair of esophageal injury, wide drainage
Post – Operative Course

- POD#0: ICU; intubated, IVF, PPI, Abx
- POD#3: Extubated
- POD#4: Normalized Cr; ICU transfer
- POD#11: Gastrografin swallow negative for leak or stricture ➔ clear liquids
Post – Operative Course

- POD#12: Full liquids; Blake drain D/C’ed
- POD#15: Duodenostomy tube clamped
- POD#16: JP drains removed
- POD#19: Post – gastrectomy diet
- POD#24: Discharged home
Pathology

- Both vagus nerves transected
- Negative for malignancy
- Chronic gastric mucosal inflammation
- *H. pylori* negative
Management of Difficult Perforated Peptic Ulcers

- Epidemiology
- Etiology
- Immediate Concerns
- Operative Principles
- Difficult Perforated Peptic Ulcers (PPU)
Epidemiology

- 300,000 new PUD cases per year
- 2% U.S. prevalence
- 10% lifetime cumulative prevalence
- 50% world population has *H. pylori*
- Only 10-15% will develop PUD
Etiology

- Focal mucosal defects that extend into submucosa or deeper
- *H. pylori* in 70-90% DU & 30-60% GU
Complication: Perforation

- Acute perforations in 2 - 10% of PUD
- Surgery almost always indicated
- 6 - 30% risk of mortality
- Conservative treatment with contained perforation

Immediate Concern: Sepsis

- Large bore IV
- IV fluid resuscitation
- Broad-spectrum antibiotics & PPI
- Invasive monitoring
- Monitor urine output
## Clinical Stages of PPU

<table>
<thead>
<tr>
<th>Stage</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Abrupt onset abd pain, epigastric generalized</td>
</tr>
<tr>
<td>&lt; 2 hrs</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>Rigidity, RLQ tenderness from drainage of succus</td>
</tr>
<tr>
<td>2-12 hrs</td>
<td></td>
</tr>
<tr>
<td>Third</td>
<td>Abd distention, fever, hypovoleemia, abdominal distension</td>
</tr>
<tr>
<td>&gt; 12 hrs</td>
<td></td>
</tr>
</tbody>
</table>

Operative Principle

Do only what is necessary in an unstable pt in an emergency

<table>
<thead>
<tr>
<th>Indication</th>
<th>Duodenal</th>
<th>Gastric</th>
</tr>
</thead>
</table>
| Bleeding                | 1. Oversew\(^a\)  
2. Oversew, V+D | 1. Oversew and biopsy\(^a\)  
2. Oversew, biopsy, V+D  
3. Distal gastrectomy\(^b\) |
| Perforation             | 1. Patch\(^a\)  
2. Patch, HSV\(^b\)  
3. Patch, V+D | 1. Biopsy and patch\(^a\)  
2. Wedge excision, V+D  
3. Distal gastrectomy\(^b\) |
| Obstruction             | 1. HSV + GJ  
2. V+A | 1. Biopsy; HSV + GJ  
2. Distal gastrectomy\(^b\) |
| Intractability/nonhealing| 1. HSV\(^b\)  
2. V+D  
3. V+A | 1. HSV and wedge excision  
2. Distal gastrectomy |

\(^a\)Unless the patient is in shock or moribund, a definitive procedure should be considered.

\(^b\)Operation of choice in low-risk patient.

GJ = gastrojejunostomy; HSV = highly selective vagotomy; V+A = vagotomy and antrectomy; V+D = vagotomy and drainage.
Modified Johnson Classification

Billroth I

Billroth II
Type IV PPU

Pauchet's procedure  Csendes procedure (esophagogastrojejunostomy)

Newman NA, et al. Cameron’s Current Surgical Therapy, 10th Ed.
Types of Vagotomy

Truncal

Selective

Parietal cell

Source: Gerard M. Doherty: CURRENT Diagnosis & Treatment: Surgery, 13th Edition:
http://www.accessmedicine.com

Copyright © The McGraw-Hill Companies, Inc. All rights reserved.
### Table 26-11 Clinical Results of Surgery for Duodenal Ulcer

<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>10</td>
<td>10–15</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>
</tr>
<tr>
<td>Severe</td>
<td>0</td>
<td>2</td>
<td>1–2</td>
</tr>
</tbody>
</table>

Source: Modified from Mulholland et al, 68 with permission. Copyright Elsevier.
PPI Shifting the Paradigm

- 1980s: elective PU cases dropped >70%
- 80% of cases were emergent surgeries

FIGURE 2 Percentage of patients hospitalized in the United States during 1993 and 2006 with peptic ulcer treated with endoscopic control of bleeding (ECB), surgery, oversew/patch, resection, and vagotomy.

Difficult PPU: What to Do?
Thal Serosal Patch

Fig 1. Steps of jejunal serosal patch for large prepyloric gastric perforation.

Pyloroplasty

- Full-thickness incision 2 cm proximal & distal to pyloric ring
- Incision closed vertically
Jaboulay Pyloroplasty

- Parallel incisions
- Drainage bypassing the pyloric channel ulcer
Finney Pyloroplasty

- Inverted U-shaped incision
- Indicated for “scarred down” duodenum
Nissen’s Procedure

- Posterior DU perforation
- Scar tissue
- Chronic inflammation

Maher JW and Chikunguwo SM. *Fischer’s Mastery of Surgery*, 2012
Fig. 2 a. Tube duodenostomy through the duodenal stump. b. The duodenal stump with Pezzer drain in it has been protected by surrounding omentum.
Summary

- Up to 10% PUD perforate
- Do ONLY what is necessary to manage
- Often Graham patch repair
- Giant ulcers may require Thal patch
- Pyloric exclusion & drainage procedure
- Tube duodenostomy for the difficult duodenum
Which type of gastric ulcer corresponds with the correct anatomic location:

A. Type I – prepyloric region

B. Type II – lesser curvature of the stomach near the GE junction

C. Type III – body of the stomach along the lesser curvature

D. Type IV – lesser curvature of the stomach near the GE junction

E. Type IV – prepyloric region
A 75-yo man taking NSAIDS for arthritis has an acute abdomen and free air. His symptoms are 6 hrs old and his vital signs are stable after 1 L of NS. A perforated duodenal ulcer is identified, which is the best required operation:

A. Suture closure of the perforation
B. Omental patch of the perforation
C. Repair of the perforation and HSV
D. Repair of the perforation and truncal vagotomy
E. Repair of the perforation and gastric resection
Which operation for duodenal ulcer is least likely to produce undesirable postoperative symptoms:

A. Subtotal gastrectomy
B. Truncal vagotomy and pyloroplasty
C. Truncal vagotomy and antrectomy
D. Selective vagotony
E. Highly selective vagotony
References