Boerhaave’s Syndrome

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SUNY DOWNSTATE MEDICAL CENTER
JUNE 18TH, 2015
Case Presentation

- 82yoM 1 day of LLQ abdominal pain w/bloody BM
- 3 hours of nausea & emesis
- Chest pressure radiating to neck
- SOB
Brief History

- **PMH:** HTN, CVA x2, CAD s/p stent, Prostate ca, diverticulosis, LGIB 2/2 radiation proctitis

- **Meds:** Valsartan, HCTZ, flomax, avadart, nexium (NKDA)

- **PSH:** RIHR, prostate seeding, L hip replacement

- **SH:** ex-smoker (quit 20yrs prior), denies EtOH

- **FH:** non-contributory
Physical Exam

- 97.8 110 126/78 20 96% NC
  - Elderly male in mild distress
  - S1s2 +, ctabl
  - Soft obese abdomen, mildly distended with some epigastric abdominal pain with palpation

8.14>13/39<80

126/3/87/23/24/1.74<201

Lactate 5.1

PT/PTT 12.3/28.7 INR 1

+UA
IMAGING

- CT A/P: Moderate to large L ptx, pneumomediastinum, patchy air space disease in RML/RLL, and L pleural effusion.
  - Diverticulosis, benign appearing renal cysts BL
CT surgery consult

- CT surgery consulted for spontaneous ptx
- Chest tube placed - 700cc black “tarlike” fluid

- Recommend Chest CT/CXR
- Resolution of PTX
- Empiric Antibiotics
- Admitted to medicine with surgery follow-up
Hospital Course

- HD 1: hypotensive on floor with increasing bandemia and sepsis, transferred to MICU, IVF hydration and levophed
- HD 2: swallow reveals esophageal leak into L chest
  - Taken to OR for emergent esophageal repair
  - LABS:
    - 12.6>10/31<64
    - 129/4.8/102/18/32/2.2<113
    - 4.1/2.2/55/24/30/1.0
    - 7.27/40/113/18/-9
Barium Swallow
Operative Intervention

- Bronchoscopy, EGD with PEG placement, L thoracotomy with washout, debridement, partial decortication and primary repair of esophageal perforation with intercostal muscle flap
- Open skin wound, wet to dry dressings
EGD
Intra-operative
Layered Surgical Repair
Hospital Course

- POD1-8: weaned of pressors w/improving acidosis, continued broad spectrum abx & TPN
- POD9: extubated
- POD11: NGT removed, kept NPO
- POD12: recurrent esophageal leak via Chest tubes
- POD13: esophageal stent placed for leak, decortication and drainage, swallow negative
- POD15: CT removed, pt dislodged PEG
- POD17: PEG replaced
- POD 20: Discharged to rehab
Esophageal Stent
Continued Patient Course

- Pt readmitted with worsening left thoracotomy wound healing
- Taken to OR for stent readjustment and wound debridement with wound vac and chest tube placement followed by PEG-J placement
Boerhaave’s Syndrome

- Herman Boerhaave (1668-1738)
- Transmural perforation of the esophagus described in 1724
Esophageal Anatomy
Pathophysiology

- Abrupt increase intraluminal esophageal pressure with absence of superior sphincter relaxation
- Mortality approximately 20%
- Most commonly in left posterolateral wall, 2-3cm above GEJ
Etiology

- Iatrogenic (most common)
- **Spontaneous**
- Foreign body ingestion
- Trauma
- Tumor
- Other
Presentation

- 50-70 years of age
- History of retching with subsequent chest/upper abdominal pain
- Swallowing increases pain or produces cough
- Shortness of breath
- Hematemesis usually NOT associated
Physical Exam

- **Mackler’s Triad**
  - Vomiting, lower thoracic pain, subcutaneous emphysema

- **Non-specific findings**
  - Fever, tachycardia, tachypnea, dyspnea, abdominal rigidity, pleural effusion

- **Pneumomediastinum**
  - Hammans crunch
Differential Diagnosis

- Aortic dissection
- Esophageal perforation
- Pneumothorax
- Mallory Weiss tear
- Myocardial Infarction
- Peptic Ulcer Disease
Workup

- Labs usually reveal leukocytosis w/bandemia
- CXR
- CT scan with po contrast
- Esophagography
- Esophageal endoscopy
Management

- Early diagnosis and surgery are mainstay
- Non-operative vs. Conservative vs. Surgical
- Mortality can approach 20%, delay in treatment can increase mortality to as high as 60%

SIGNS AND SYMPTOMS OF ESOPHAGEAL PERFORATION

Water-Soluble or Barium Contrast Esophagography, Chest X-Ray, Computed Tomography

Contains Perforation

- Broad-Spectrum Antibiotics
- Parenteral Nutrition

Uncontained Perforation

- No Improvement <24 hr
  - Cervical
  - Thoracic
  - Abdominal

DRAINAGE

EVALUATION OF PERFORATION

Surgical Repair Tolerable

- PRIMARY REPAIR

Surgical Repair Intolerable

- CONTROLLED FISTULA
- EXCLUSION AND DIVERSION

Malignancy

RESECTION
Non-operative

- Less than 24hr
- Absence of sepsis
- Contained perforation, absence of extravasation into the pleura
- Non-tumoral perforation
- Possibility of clinical & radiological surveillance

Conservative Management

- Endoscopic
  - Clipping and gluing
- Endoprostheses

Surgical Management Options

- **Primary surgical repair with reinforcement flap**
  - Requires myotomy to healthy mucosa
  - Wide irrigation, debridement, decortication & drainage
  - Reinforcement with flap

- **T-tube drainage**
  - When magnitude of damage too large to repair
  - Attempt to create controlled fistula

Continued Surgical Options

- **Esophageal Exclusion**
  - Poor surgical candidate
  - Debridement & drainage
  - Cervical & cardia stapling

- **Esophagectomy**
  - Usually only after failed conservative treatments or in the setting of perforation of a diseased esophagus

Prognosis

- Time interval between diagnosis & treatment

- Location of perforation
  - Cervical location best
  - Involvement of superior mediastinum increases severity

- Cause of perforation
  - Iatrogenic is best
  - Boerhaave & tumor worst

An Analysis of Esophageal Stent Placement for Persistent Leak After the Operative Repair of Intrathoracic Esophageal Perforations

Richard K. Freeman, MD, MBA, Anthony J. Ascioti, MD, Megan Dake, PA-C, and Raja S. Mahidhara, MD

- Retrospective Review
- Spontaneous perforation of thoracic esophagus
- Persistent leak after primary surgical repair
## Results

### Table 2. Patient Demographics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>29</td>
</tr>
<tr>
<td>Age (mean years)</td>
<td>64 ± 13 (range, 19–83)</td>
</tr>
<tr>
<td>Etiology</td>
<td></td>
</tr>
<tr>
<td>Endoscopy/foreign body removal</td>
<td>7</td>
</tr>
<tr>
<td>Esophageal dilatation</td>
<td>6</td>
</tr>
<tr>
<td>Endoscopy with biopsy</td>
<td>6</td>
</tr>
<tr>
<td>Transesophageal echocardiography</td>
<td>5</td>
</tr>
<tr>
<td>Endoscopic ultrasound</td>
<td>3</td>
</tr>
<tr>
<td>Endoscopic antireflux procedure</td>
<td>2</td>
</tr>
<tr>
<td>Mediastinitis</td>
<td>7 (24%)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>2 (7%)</td>
</tr>
<tr>
<td>Perforation to repair (mean hours)</td>
<td>26 ± 39 (range, 3–111)</td>
</tr>
<tr>
<td>Muscle use initial repair</td>
<td>16 (55%)</td>
</tr>
<tr>
<td>Repair to leak identification</td>
<td>6 ± 5 (range, 3–11)</td>
</tr>
<tr>
<td>Associated procedures with stent</td>
<td>7 (24%)</td>
</tr>
<tr>
<td>Percutaneous endoscopic gastrostomy</td>
<td>3</td>
</tr>
<tr>
<td>Thoracoscopic decortication</td>
<td>3</td>
</tr>
<tr>
<td>Jejunostomy</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 3. Results After Esophageal Stent Placement

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution of leak after stent placement</td>
<td>27 (93%)</td>
</tr>
<tr>
<td>Oral intake within 72 hours</td>
<td>25 (86%)</td>
</tr>
<tr>
<td>Stent migration</td>
<td>5 (19%)</td>
</tr>
<tr>
<td>Hospital length of stay (mean days)</td>
<td>8 ± 11</td>
</tr>
<tr>
<td>Morbidity (30-day)</td>
<td>5 (19%)</td>
</tr>
<tr>
<td>Mortality (30-day)</td>
<td>0</td>
</tr>
<tr>
<td>Stricture during follow-up</td>
<td>0</td>
</tr>
</tbody>
</table>
Most common esophageal perforations are iatrogenic.

Retching with subsequent chest/abdominal pain are most common presenting symptoms of Boerhaave’s.

Initial diagnosis is incorrect up to 50% of the time due to atypical clinical presentation.
TAKE HOME POINTS

- Boerhaave is associated with high morbidity and mortality, early recognition and surgical intervention is key

- Surgical debridement, drainage & primary repair WITH antibiotics are the mainstay of treatment
QUESTIONS???

THANK YOU