Corrosive injury of esophagus

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Background

- Relatively rare
- Dire emergency for UGI
- Corrosive:
  - Substance that causes destruction of or damage to living tissue on contact
- Prevalence
  - Varies geographically
  - Local domestic and industrial customs
  - Availability of substance
Type of caustic related to injury

• Acid
  – Generally less severe injury
  – Coagulative necrosis
  – Coagulum lessen tissue penetration

• Alkaline
  – Liquefactive necrosis
  – Sodium hydroxide (哥士的)
  – Very hazardous
  – 30% causes full thickness necrosis in animal model for a second exposure
Early management
Resuscitation

• Upper airway
  – Assessment of severity of damage
  – Secure the airway
    • Fiberoptic intubation
    • Tracheostomy

• ? Dilution
  – May induce vomiting – more extensive injury
  – Rapid action of caustics – probably useless
Early management
Pathogenesis

• Animal studies
  – Corrosive enter to stomach -> reflex pyloric spasm
  – Limit passage of corrosive to duodenum
  – Regurgitation of corrosive against a closed cricopharyngeus -> damage to esophagus and stomach
  – 3-5 mins -> gastric atonia -> opening of pylorus

Goldman et al Am J Gastro 1984
Early management
Assessment of extent of injury

- CXR – any pneumomediastinum
- Endoscopy
  - < 12 hrs & not later than 24 hrs

<table>
<thead>
<tr>
<th>Zargar’s grading of mucosal injury caused by corrosive ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 0</td>
</tr>
<tr>
<td>Grade 1</td>
</tr>
<tr>
<td>Grade 2a</td>
</tr>
<tr>
<td>Grade 2b</td>
</tr>
<tr>
<td>Grade 3a</td>
</tr>
<tr>
<td>Grade 3b</td>
</tr>
</tbody>
</table>

Zargar et al GIE 1991; Orringer 1993
Endoscopic assessment
Endoscopic classification Implications

• Grade 1 – 2
  – Conservative management
  – Insertion of feeding tube

• Grade 3b
  – Immediate Surgical Resection

• Problems
  – Difficult to differentiate between 2b and 3
Conservative management

Use of Steroid?

• AIM
  – Reduction of stricture formation
  – 80% of grade 3 injuries developed stricture
  – 67% of grade 2 injuries developed pyloric sternosis

• RCT
  – 18 yr prospective study in 60 children
  – 10 / 31 steroid group developed stricture vs 11 / 29 non-steroid group
  – No use in preventing stricture

Anderson et al. NEJM 1990
Conservative management

• ICU care
• IV antibiotics
• IV PPI
• Nutritional support
• Close monitoring
Operative treatment

• Indications
  – Full thickness injury of esophagus, stomach or duodenum
  – Clinical deterioration with ↑ sepsis

• Early Radical Surgery
  – 10 / 22 patients underwent esophagogastrectomy
  – 4 of 10 patients died (40%)
  – 7 of 12 conservative had stricture
  – Authors advocate early surgery

Olah et al Orv Hetil 1992
Approach to emergency resection

• Laparotomy + Transhiatal + Cervical
  – Laparotomy first to assess the extent of disease in abdomen
  – Transhiatal
    • Avoid opening the thorax
    • Risk of bleeding

• Laparotomy + Transthoracic + Cervical
  – Transthoracic
    • Need to open thorax
    • Extent of injury within thorax can be assessed
## Emergency Esophagectomy

<table>
<thead>
<tr>
<th>Author</th>
<th>Journal / yr</th>
<th>Number</th>
<th>Method</th>
<th>Survival</th>
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<tbody>
<tr>
<td>Gossot</td>
<td>J Thorac Cardiovasc Surg 1987</td>
<td>29</td>
<td>Transhiatal Stripping</td>
<td>62%</td>
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<tr>
<td>Brun</td>
<td>BJS 1984</td>
<td>17</td>
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<td>76.5%</td>
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<tr>
<td>Hendrickx</td>
<td>Acta Chir Belg 1990</td>
<td>1</td>
<td>Transhiatal Stripping</td>
<td>100%</td>
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<tr>
<td>Sarfati E</td>
<td>BJS 1987</td>
<td>44</td>
<td>Transhiatal</td>
<td>45.5%</td>
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<tr>
<td>Pruvot</td>
<td>Ann Chir 2003</td>
<td>28</td>
<td>Transhiatal Stripping / exclusion</td>
<td>82%</td>
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<tr>
<td>Dapril</td>
<td>Surg Endosc 2007</td>
<td>1</td>
<td>Lap Transhiatal</td>
<td>100%</td>
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</tbody>
</table>
Next Step... Reconstruction

- Colonic interposition
  - Left colon basing on left colic artery
  - Right colon
    - Blood supply
    - Distal ileum can be used to connect to esophagus
  - Isoperistaltic

- Route
  - Presternal
  - Retrosternal