Primary Repair of
Giant Paraesophageal Hernia

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Overview

- Clinical Presentation
- Investigations
- Principles of Repair
- Controversies in Management
- Outcomes
- Recurrences
Clinical Presentation
Clinical Presentation

- Postprandial Pain 59%
- Postprandial vomiting 31%
- Dysphagia 30%
- GERD symptoms 16%
- Anemia 21%
- Asymptomatic 5%
- Acute incarceration 3%

Allen JTCVS 1993
Investigations
Investigations

- CXR  
  Mandatory
- Barium Swallow  
  Mandatory
- Endoscopy  
  Mandatory
- Esophageal Manometry  
  Useful
- 24 hour pH testing  
  Optional
- CT or MRI  
  Useful
Upside Down Stomach with Volvulus
Type II Hernia
Type III Hernia
Upside down stomach with volvulus
Cameron’s Ulcer
Surgical Repair
Principles of Repair

- Reduce hernia contents
- Excise hernia sac
- Ensure adequate length of intrabdominal esophagus (3-4cm)
- Anchor stomach in abdomen: fundoplication, gastropexy, or gastrostomy
- Tension free Closure of crura
Surgical Steps in Repair

1. Reduce contents back into abdomen - this may be facilitated by step 2

2. Excise hernia sac: divide it at level of diaphragm circumferentially, then remove it - if not removed mediastinal seroma or worse may result; *meticulous* hemostasis
3. Ensure Adequate Esophageal Length

- Mobilize esophagus at least to level of inferior PV preferably higher- carina
- Remove esophagogastric fat pad
- On table endoscopy to identify GE jxn
- Reduce intrabd pressure to 10 mmHg if laparoscopic
- Measure length of esophagus between GE Jxn and level of diaphragm: need 3-4 cm
Excise Gastroesophageal fat pad
4. Repair of hernia

- Close crura
- Fundoplication
Controversies in Repair

- Repair asymptomatic patient?
- Transthoracic versus Transabdominal?
- Open versus Laparoscopic?
- Esophageal lengthening procedure?
- Fundoplication? Total vs Partial
- Hiatal Closure: simple suture vs mesh?
Patient Selection

• Symptomatic
• Age not a contraindication
• No increase in mortality until >80 yrs
• ↑ Risk for morbidity and Mortality:
  Age >80,
  ASA 3-4
  Gastropexy
  Non elective repair
Operative Approach

**Transthoracic**: lowest recurrence rates, ease of performing Collis gastroplasty
good in obese patients, redos, easy to judge esophageal length, highest morbidity

**Transabdominal**: less morbidity, more difficult in obese patient or redo

**Laparoscopic**: least morbidity, Collis gastroplasty more challenging, harder to judge esophageal length
Esophageal Lengthening

- *Esophageal bougie
- Collis Gastroplasty: linear stapler through thoracotomy
- Collis Gastroplasty: linear stapler through R VATS port or L VATs port
- **Hunter Modification of Collis Gastroplasty: EEA + linear stapler through abdomen
- **Wedge Gastroplasty: linear stapler- most user friendly for laparoscopic use
- ** risk of esophageal pouch
4. Fundoplication

• Use of fundoplication not controversial
• GERD symptoms: 16% preop
• BUT Increased GERD Postop if no fundoplication
• Anchors stomach in abdomen
• Total versus partial: choice based on preop manometry; surgeon preference
• More secure than gastropexy, or gastrostomy
Nissen Fundoplication
Transthoracic Belsey Mark IV Repair
Crural Closure

- Tension Free
- Simple sutures
- Pledgetted sutures
- Mesh  synthetic vs biologic
<table>
<thead>
<tr>
<th>Category</th>
<th>Laparoscopic (%)</th>
<th>Open (%)</th>
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</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>0.5-5.4</td>
<td>0-5.5</td>
</tr>
<tr>
<td>Overall Morbidity</td>
<td>4-28</td>
<td>5-42</td>
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<tr>
<td>Esoph Perforation</td>
<td>1.5-6.5</td>
<td>0</td>
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<tr>
<td>Gastric Perforation</td>
<td>1.5-4.5</td>
<td>0-1.5</td>
</tr>
<tr>
<td>Splenic injury</td>
<td>rare</td>
<td>0-4.5</td>
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<tr>
<td>Immediate failure</td>
<td>2-4.5</td>
<td>0</td>
</tr>
<tr>
<td>Acute postop volvulus</td>
<td>3-8</td>
<td>0</td>
</tr>
<tr>
<td>Delayed leak</td>
<td>3-4.5</td>
<td>0</td>
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### Recurrences

<table>
<thead>
<tr>
<th>Routine Ba Sw</th>
<th>Symptomatic</th>
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</thead>
<tbody>
<tr>
<td>Laparoscopic</td>
<td>14-28%</td>
</tr>
<tr>
<td>Open Thoracic</td>
<td>8%</td>
</tr>
<tr>
<td>Open Abdominal</td>
<td>18%</td>
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<tr>
<td>With gastroplasty</td>
<td></td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>0%</td>
</tr>
<tr>
<td>Thoracic</td>
<td>8%</td>
</tr>
</tbody>
</table>
Patterns of Failure

Type I hernia due to crural failure and failed fundoplication

Slipped Nissen due to short esophagus

Wrapped stomach

Herniation of fundoplication due to crural failure and short esophagus
Slipped Nissen
Slipped Nissen
Recurrence

- Reoperation in hospital: 0.7%
- Early revision (>30d): 3.0%
- Type I hernia: 47%
- Type II hernia: 30%
- Disruption of wrap: 23%
- Not related to “Learning curve”
- Reduced by Gastroplasty p=0.03
Two Compartment Stomach
Recurrence

Major causes of anatomic failure:
- Crural failure
- Shortened esophagus
Slipped Nissen
Summary

• Surgical approach based on surgeon training and experience
• Laparoscopic repairs have higher procedure specific morbidity, anatomic recurrence
• Transthoracic repair have lowest recurrence but highest overall morbidity
Summary

• Esophageal mobilization, removal of fat pad and on table endoscopy are key to assessment of adequate length of intrabdominal esophagus

• Use esophageal lengthening procedure more rather than less

• Fundoplication partial or total, not optional
Summary

• Excise sac
• Secure Crural closure ???mesh– to be answered
• Asymptomatic patients do not require repair, may be safely followed
• Operate if symptomatic
• Increased risk with age>80, ASA 3-4, nonelective repair