Surgical Treatment of GERD

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Objectives

Review Work-up of GERD
   History, Differential Diagnosis, Investigations
   Discuss Important Criteria of Investigations
Discuss Indications/Contraindications for Surgery
   Traditional Indications for Surgery
   Unusual Indications for Surgery
Understand Barrett’s Esophagus – Implications for Surgery
Discuss Surgical Treatment
   Results
   Complications
Faculty/Presenter Disclosure

Faculty: Dr. Cliff Sample

Relationships with commercial interests:
  • Not applicable
Disclosure of Commercial Support

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Potential for conflict(s) of interest:

• Not applicable
Mitigating Potential Bias

• Not applicable
Mechanisms of GERD

LES dysfunction
  low LES pressure
  Transient Inappropriate Relaxation of LES
Impaired Esophageal Clearance
  scleroderma, achalasia
Delayed Gastric Emptying
  Diabetic Gastroparesis
Obesity
GERD

History

1. pyrosis (burning pain arising at epigastrum and radiating to throat or neck)
2. Exacerbating factors
   - meals
   - recumbency
   - acidic drinks
   - leaning over
   - alcohol
3. Relieving factors
   - antacids
4. Waterbrash
5. Regurgitation
6. Chest Pain (esophageal spasm)
History

Odynophagia (esophagitis)
Respiratory symptoms
  Cough
  Choking
  Voice changes
Alarm symptoms
  Dysphagia
  Weight loss
  Hematemesis or melena
Differential Diagnosis

Biliary disease
Peptic Ulcer Disease
Cardiac
DES
Gastritis
Neoplastic disease of upper GI
Chronic pancreatitis
Diagnostic Investigations

Esophagoduodenoscopy (Biopsy)
Esophageal Manometry
24H pH
Barium UGI series
Ultrasound abdomen
Gastric Emptying study
Esophageal Impedance Studies
EGD

Mandatory to perform before consideration of surgery
Indicated in work-up of alarm symptoms
Indicated in chronic reflux
  1. May support diagnosis
     findings of esophagitis, changes on biopsy
  2. Evaluation of anatomy
  3. Evaluation for complications of GERD
     Barrett’s, stricture, ulceration
  4. Rule out some other causes of upper abdominal pain
Manometry

Two important areas to evaluate in GERD

1. Esophageal Body Function
   important in assessing risk for dysphagia
   may influence decision on surgery/type of wrap
   other diseases (scleroderma, DES)

2. LES function
   resting pressure (6-8mm, but depends on lab and
   probe)
   residual pressure
   duration of relaxation (rule out achalasia)

<table>
<thead>
<tr>
<th>Lower Esophageal Sphincter</th>
<th>Esophageal Body:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(normal values in brackets)</td>
<td>(normal values in brackets)</td>
</tr>
<tr>
<td>Resting Pressure: 7 mmHg (16-30)</td>
<td>Peristaltic contractions: 100 % (&gt;80%)</td>
</tr>
<tr>
<td>Relaxation duration: 8.8 seconds (&gt;2)</td>
<td>Simultaneous contractions: 0 % (&lt;20%)</td>
</tr>
<tr>
<td>%Relaxation: 97 % (80-100%)</td>
<td>Mean contraction amplitude: 120 mmHg (30-180)</td>
</tr>
<tr>
<td>Residual Pressure: 0 mmHg (&lt;8)</td>
<td>Mean contraction duration: 3.1 seconds (&lt;5.8)</td>
</tr>
</tbody>
</table>

Low amplitude contractions: 0 % (<30%)
Spontaneous activity between swallows: none

duration of relaxation (rule out achalasia)
Manometry

Original probes had a single side-hole sensor and measured pressures using a pull through technique.
Later probes had multiple sensors.
Currently high resolution 3D manometry is available with increased accuracy versus earlier probe systems.
  Allows calculation of trans-sphincteric pressure gradient.
  Calculation of intrabolus pressure.
Probe placed in esophagus, 5cm and 15cm from GEJ as well as a probe in the stomach
Readings taken every 4-6 seconds
Event markers for symptoms and position changes
look for correlation (Symptom Index)
pH <4, should be less than 4% of the time

### Procedure Summary

<table>
<thead>
<tr>
<th>Distal Channel</th>
<th>Upright %</th>
<th>Recumbent %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent time pH&lt;4.0</td>
<td>0.2% (6.3%)</td>
<td>0.0% (1.2%)</td>
<td>0.1% (4.2%)</td>
</tr>
<tr>
<td>Total time pH&lt;4.0 (min)</td>
<td>2</td>
<td>2</td>
<td>1 min at 20:49</td>
</tr>
<tr>
<td>Reflux episodes</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Episodes &gt;5 min</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Longest episode</td>
<td>1 min</td>
<td>0 min</td>
<td>1 min</td>
</tr>
</tbody>
</table>

### Composite Score Analyses (Johnson/DeMeester)

<table>
<thead>
<tr>
<th>Dist Channel</th>
<th>Normal</th>
<th>Patient</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upright time in reflux</td>
<td>&lt;6.3%</td>
<td>8.6%</td>
<td>5.2</td>
</tr>
<tr>
<td>Recumbent time in reflux</td>
<td>&lt;1.2%</td>
<td>2.7%</td>
<td>7.2</td>
</tr>
<tr>
<td>Total time in reflux</td>
<td>&lt;4.2%</td>
<td>8.2%</td>
<td>6.8</td>
</tr>
<tr>
<td>Episodes over 5 min.</td>
<td>&lt;3</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>Longest Episode</td>
<td>&lt;9.2 min</td>
<td>5.8 min</td>
<td>2.7</td>
</tr>
<tr>
<td>Total Episodes</td>
<td>&lt;50</td>
<td>248</td>
<td>17.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Johnson/DeMeester</th>
<th>Normal</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dist Channel Composite Score</td>
<td>&lt;22.0</td>
<td>41.8</td>
</tr>
</tbody>
</table>
Other

Barium UGI
   Optional in pt with small or no HH
   used to assess anatomy, length of esophagus
US abdomen
   useful to R/O biliary disease
Gastric Emptying
   if symptoms suggestive of delayed gastric emptying
Esophageal Impedance Studies
   measures electrical impedance, liquid decreases,
   gas increases
   measures direction
   acid and non-acid fluid - combine with pH
Bravo probe
   tubeless – implantable – 48H
Indications for Surgery

Failure of medical management
Intolerance/Non-compliance with medical therapy in young patient
Persistant regurgitation/aspiration
Asthma/bronchiectasis with reflux contribution
Complications of GERD/Barrett’s
Indications - Atypical

GERD laryngitis
Chronic cough
Dental caries
Contraindications

To Surgery:
- Failure to confirm diagnosis
- Aperistalsis of esophagus
- Medical contraindication to surgery

To Laparoscopic Surgery
- Uncorrectable Coagulopathy
- Severe COPD
- Pregnancy
- Previous Upper GI Surgery (relative)
- Shortened Esophagus (relative)
Goals of Surgery

Complete Dissection of Esophageal Hiatus and both crura
Re-establish Intra-abdominal Esophagus (3cm)
Closure of Esophageal Hiatus
Adequate mobilization of the gastric fundus (+/- division of short gastrics)
Creation of 1.5-2.5 cm tension free wrap (+/- Bougie)
Anchoring of wrap to esophagus
## Complications of Surgery

**Table 42-2 -- Complications in 400 Laparoscopic Antireflux Procedures**

<table>
<thead>
<tr>
<th>COMPLICATION</th>
<th>NO. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postoperative ileus</td>
<td>28 (7)</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>13 (3)</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>9 (2)</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>9 (2)</td>
</tr>
<tr>
<td>Other minor complications</td>
<td>8 (2)</td>
</tr>
<tr>
<td>Liver trauma</td>
<td>2 (0.5)</td>
</tr>
<tr>
<td>Acute herniation</td>
<td>1 (0.25)</td>
</tr>
<tr>
<td>Perforated viscus</td>
<td>1 (0.25)</td>
</tr>
<tr>
<td>Death</td>
<td>1 (0.25)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>72 (17.25)</strong></td>
</tr>
</tbody>
</table>
Complications of Surgery

Postoperative

Dysphagia
  up to 50% first 3 weeks
  3-15% longterm

Gas Bloat
  30% early
  <5% after 2 mo - most can be managed medically

Nausea and Wretching
  very common – can lead to early complications

Chest Pain

Early Re-herniation (<1%)
Post-operative Care

Diet
- Balanced fluid Diet 1-2 weeks
- Soft diet additional 2-4 weeks
- Dietician
- Avoidance of carbonation, bread

Contrast Study
- Selective – revisional

Anti-emetics
- some use routinely

Withdrawal of PPI
- weaning

H2B
CONTROL OF ACID REFLUX

% Acid Reflux in 24 hours

* p < 0.01 of preop

Pre-op 6 months 2 years 5 years
SYMPTOM CONTROL

GERD Symptom Severity Score

* p<0.05

Pre-op 6 months 2 years 5 years
Recurrence

At 2 years, recurrence is 5%
At five years, 12% recurrence
Patient satisfaction at 5 years is 86%
9/21(4%) had abnormal 24 hr pH study
3% have undergone re-operative surgery for reflux
Results - Literature

Numerous large case series encompassing thousands of patients
93% are symptom free at one year
3% require medications to control symptoms
Other series as above with up to 10y f/u (Kelly, Dallemagne), similar results

RCT
Lundel et al, improved symptom control in surgical
Mehta et al, further improvement in symptom scores in surgical crossover group

Non-randomized Comparative Studies
VA study (5054 pt treated for esophagitis)
   improved healing and symptom control in surgery group
Results - Literature

Long term results – In favor of medical
  In some cases less convincing
  Spechler (1992), 62% in surgical group taking anti-secretory medications at 10 y
    16% re-operation rate
  same symptom control – esophagitis healing
  many limitations…
Barrett’s Esophagus

Implications for Surgery
- Still require long term monitoring for dysplasia
- Should have stable mucosa before OR (1 year)
- Otherwise same goals for Surgery

Advantage of Surgery over medication for Barrett’s

Regression of Barrett’s
- No convincing evidence (Ortiz, DeMeester)
- Newer studies with some suggestion (Rossi, Sharma)

Prevention of Dysplasia
- Risk of adenocarcinoma drops with time
  (MacDonald)
References


