Evaluation and Management of Dysphagia

1. Evaluation of dysphagia
2. Dilation methods: pros and cons
3. Specific disease examples
   1. Schatzki ring
   2. Achalasia
   3. Eosinophilic esophagitis
   4. Refractory strictures

### Esophageal Dysphagia: Motility Disorders
- Achalasia
- Diffuse Esophageal Spasm
- Scleroderma
- Polymyositis

### Esophageal Dysphagia Structural Etiologies
- Schatzki ring
- Eosinophilic esophagitis
- Peptic stricture
- Iatrogenic (radiation, surgery, endoscopic therapy)
- Esophageal neoplasm
- Caustic injury
- Esophageal diverticula
- Esophageal web
- Congenital esophageal stenosis

### Diagnostic Testing for Esophagus
- Upper GI Series/Esophagram/Barium swallow
- Endoscopy
- Esophageal manometry
- Esophageal impedance manometry
- Impedance planimetry
- Endoscopic ultrasonography
Predilation Considerations

Stricture characteristics
1. Proximal vs distal location
2. Long vs short stricture
3. Estimated stricture diameter
4. Active mucosal inflammation/ulceration
5. Concomitant fistula/diverticulum

Patient characteristics
1. Comorbidities. Can patient tolerate complication
2. Anticoagulation (bleeding ~4/1000)
3. Antibiotics (endocarditis prophylaxis if high risk)

Predilation Considerations

High resolution manometry

0 Pharynx
10 Upper esophageal sphincter
15 Esophageal peristalsis
20 Cm
25 Lower esophageal sphincter
30 LES deglutitive relaxation
35 Stomach

A. Pre Procedure Esophagram
   Complex strictures (radiation, surgery)

B. Intraoperative Fluoroscopy
   Tight stricture that scope cannot traverse;
   Angulation
   Pneumatic dilation

C. Choice of Equipment (1 mm=3 Fr)
1. Maloney:
   PRO: Blind, Tactile, Reusable
   CON: Blind passage, Axial + Radial force
Predilation Considerations

2. **Savary:**
   - **PRO:** Wire-guidance, Reliable diameter, Reusable, Some tactile sensation
   - **CON:** Axial+radial force, patient comfort

3. **Hydrostatic Balloon (TTC, TTS, CRE):**
   - **PRO:** Pt tolerance, Axial, +/- wire, variable diameter & length, visualize results of each successive dilation
   - **CON:** cost, long strictures, no tactile sensation

4. **Pneumatic Balloon:** Achalasia, Post fundoplication dysphagia
   - Fixed diameter (3,3.5,4 cm)

D. Steroid injection for refractory stricture

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“Rule of Threes”

No more than 3 consecutive dilations once resistance is encountered

Eminence and not evidence based
Based on passage of Maloney dilators that have best tactile response
Case Presentation

A 62 yo male presents to the ER at 1 am complaining that a piece of meat is trapped in his throat. He states that while eating a late dinner at a local restaurant, a piece of his steak “did not go down” (he points at his mid sternum). He tried to wash down the meat with water but vomited only the water. This same problem has been happening a few times a year for several years.

Schatzki Ring

- Described by Schatzki & Gary and by Ingelfinger & Kramer in 1953
- Localized to esophageal squamocolumnar junction and almost invariably coexist with a hiatal hernia
- Found in 4-15% (mean 10%) of radiographic studies. Autopsy study by Goyal reported a prevalence of 9%

Dysphagia vs Ring Diameter

- 3 mm
- 12 mm
- 20 mm
- 40 mm

Repeated dysphagia

Isolated dysphagia

No dysphagia

Schatzki, AJR 1963

Schatzki's Ring

Schatzki ring
Schatzki’s Ring

- Primary Treatment:
  - Maloney, Savary or balloon dilator.
  - Most commonly 50-51 Fr (17 mm)
- Alternative Tx:
  - Disruption of ring with cold biopsy forceps in 4 quadrants
  - Long-term follow up following dilatation with 46-58Fr dilator (Eckardt DDS 1992)
    - 68% of patients are free of dysphagia at 1 year
    - 35% at 2 years
- PPI Therapy may prevent recurrence
  (Spouss Am J Gastro 2006)
  - Recurrence 47% with omeprazole vs 7% with placebo at 3 years

Case Presentation

57 yo female referred for evaluation of dysphagia.

- Onset of dysphagia 6 months ago.
- Both liquids and solids
- Localizes to his lower sternal region
- Frequent regurgitation of food / saliva
- Nocturnal coughing/aspiration
- 8# weight loss

Achalasia

High Resolution Manometry in Achalasia

Therapy of Achalasia

- Smooth muscle relaxants
- Botulinum toxin
- Pneumatic dilation
- Per oral endoscopic myotomy (POEM)
- Esophageal stent
- Percutaneous gastrostomy tube
- Heller myotomy
Timed barium swallow

Pooled Estimates of Response Rates of Achalasia Treatments

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Total n</th>
<th>Weighted mean response rate±SE %</th>
<th>Follow-up</th>
<th>Weighted mean perforation</th>
</tr>
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<tbody>
<tr>
<td>Botulinum toxin</td>
<td>638</td>
<td>78 ± 33</td>
<td>1 mo</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>412</td>
<td>58 ± 36</td>
<td>6 mo</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>225</td>
<td>49 ± 23</td>
<td>12 mo</td>
<td>NA</td>
</tr>
<tr>
<td>Pneumatic dilation</td>
<td>374</td>
<td>85 ± 30</td>
<td>20 mo</td>
<td>2.6</td>
</tr>
<tr>
<td>(Rigiflex)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heller myotomy</td>
<td>1221</td>
<td>84 ± 20</td>
<td>5 yr</td>
<td>NA</td>
</tr>
<tr>
<td>Thoracotomy</td>
<td>732</td>
<td>85 ± 18</td>
<td>7.6 yr</td>
<td>NA</td>
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<tr>
<td>Laparotomy</td>
<td>365</td>
<td>91 ± 13</td>
<td>1.4 yr</td>
<td>NA</td>
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<tr>
<td>Laparoscopy</td>
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Pneumatic Dilation versus Laparoscopic Heller’s Myotomy for Idiopathic Achalasia

218 Patients were included in study

4 Were excluded owing to predominant achalasia

214 Underwent randomization

106 Were assigned to undergo LHM

108 Were assigned to undergo PD
Effectiveness of pneumatic dilation is comparable to laparoscopic Heller myotomy if allow for repeated dilations and accept risk of esophageal perforation.

Case Presentation

- 42 year old male presents with 12 years of intermittent dysphagia for solids that localizes to his mid sternum. Symptoms have been progressive; now occurring on a daily basis. He has had repeated food impactions after eating meat or bread that last up to 1 hour. He was seen in the ER on 2 occasions for endoscopic disimpaction.
- It takes the patient over an hour to complete his meals. He is embarrassed when he needs to leave the table during meals to vomit up food that he cannot swallow.
- The patient was previously diagnosed with GERD and esophageal spasm.
- PMH includes childhood asthma and allergic rhinitis.

Eosinophilic Esophagitis 2011

EoE is a clinicopathologic disease

- Clinically, EoE is characterized by symptoms related to esophageal dysfunction
- Pathologically, 1 or more biopsy specimens must show eosinophil-dominant inflammation. With few exceptions, 15 eos/hpf is considered a minimum threshold for the diagnosis of EoE
- The disease is isolated to the esophagus, and other causes of esophageal eosinophilia should be excluded

Eosinophilic Esophagitis is increasing over past 2 decades in both children and adults worldwide

Epidemiology of EoE in US

Health insurance database 2009-11 of 11.5 million; Prevalence based on ICD9 (530.13) 57/100,000

Eosinophilic Esophagitis Clinical Features in Adults

- Male predominant ~70%
- Age at diagnosis: 35-40
- Atopy (asthma, allergic rhinitis, atopic dermatitis): ~70%
- Primary symptoms: dysphagia, food impaction
- Secondary symptoms: heartburn, chest pain
- Symptom duration prior to diagnosis: 5 years
Etiology of Dysphagia
Retrospective Study 1371 Adults Undergoing EGD for dysphagia

The 2 am “Wake up” Call!
EoE identified in 11-55% of adults with food impaction

Role of Endoscopy in EoE
Classify and grade severity of characteristic findings of Edema, Rings, Exudates, Furrows, Strictures (EREFS)

Complications of EoE: Narrow caliber esophagus

EoE Endoscopic Reference Score (EREFS)

EoE: A Conceptual Model of Clinical Subtypes Based On Inflammation and Tissue Remodeling
3 D’s of Treatment for EoE
• Drugs
  – Topical steroids
  – Systemic steroids
  – Leukotriene antagonists (montelukast)
  – Mast cell stabilizers (cromolyn sodium)
  – Immunomodulators (CRTH2 antagonist, azathioprine)
  – Biologics (anti IL5, anti IL13, anti TNF, anti IgE)
• Dietary Therapy
  – Empirc elimination diet
  – Allergy testing directed elimination diet
  – Elemental diet
• Dilation (Endoscopic therapy)

Suggested Algorithm for Management Of Eosinophilic Esophagitis

Esophageal Dilation in EoE Prior to 2008
High risk of Esophageal Complications

8 cases; 3 dilations
1 perforation with EGD

Esophageal Dilation in EoE 2012:
Low risk of Esophageal Complications

474 dilations
0 perforations

76 dilations
0 perforations

15 dilations
0 perforations

293 dilations
3 perforations

Esophageal Dilation in EoE: Effectiveness, Safety and Impact on Underlying Inflammation
• Retrospective study of 474 dilations in 207 adults
• 63 patients treated with dilation alone
• 93% of patients reported slight or no dysphagia after dilation
• Esophageal diameter increased from 11 mm pre to 16 mm post dilation
• 3 mm incremental dilation per session; median 2 sessions per patient (range 1-13)
• Median duration symptom improvement: 15 mos
• No perforations

Esophageal Dilation Does Not Affect the Underlying Esophageal Inflammatory Process
Dilation without anti-eosinophil therapy
Esophageal Dilation in EoE: Chest Pain
Retrospective Analysis of 474 dilations in 207 patients

Chest pain noted in 7% of patients based on chart review
Chest pain reported by 74% of patients based on survey

38% of patients experienced moderate to severe post dilation pain lasting less than 4 days in most

Esophageal Dilation in EoE:
Dilation in EoE has a high degree of patient acceptance based on patient survey (n=42)

Case Presentation
• 16 year old man with onset of severe dysphagia for solids of all consistencies following a several week hospitalization for complicated appendicitis.
• Local GI EGD demonstrated a severe 3-4 mm stricture at 20-37 cm. TTS dilation x 4 to 12 mm without benefit

Refractory Esophageal Strictures
• Proposed Definition (Kochman GIE 2005)
  – Refractory: Inability to successfully establish diameter of 14 mm during 5 sessions at 2-week intervals
  – Recurrent: Inability to maintain luminal diameter for 4 weeks once the target of 14 mm achieved
• Most common etiologies:
  – Radiation
  – Caustic ingestion
  – Peptic
  – Surgical anastomosis
  – Narrow caliber esophagus (EoE)

Refractory Esophageal Strictures
Treatment Options
• Repeated dilation
  – Bougie (Maloney, Savary)
  – TTS Balloon
• Intralesional injection (steroid, mitomycin C)
• Strictureplasty
  – Needle-knife
  – Endoscopic scissor
  – Argon Plasma Coagulation (APC)
• Stent therapy
  – Advantages: Long-term, continuous dilation
  – Disadvantages: migration, chest pain, durability
• Self bougienage
• Surgery

Suggested Algorithm for Management Of Refractory Esophageal Strictures

Benign Esophageal Stricture
Esophageal dilation ➔ Symptom relief

“Refractory” Stricture
Rule out esophageal inflammation (LP, EoE, bullous), esophageal dysmotility, oropharyngeal dysphagia

Dilation with intralesional steroid
Strictureplasty ➔ Serial Dilations ➔ Esophageal stent
Refractory Esophageal Strictures

**Intralesional steroid injection**
- First used by Holder in 1969
- Used by dermatology: keloid, burns
- Theoretically reduces collagen and fibrin deposition
- Most commonly triamcinolone 40-80 mg injection

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**Esophageal Stents**

- PC-SEMS: partially-covered metallic
- FC-SEMS: fully-covered metallic
- SEPS: fully-covered plastic

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16 yo M with refractory mid-distal stricture 20-37 cm. Failed 4 dilations OSH and 4 dilations NMH with steroids. Alimaxx

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Refractory Esophageal Strictures

**Esophageal Stents for Benign Stricture**

- Conceptual advantages for benign strictures
  - Temporary (usu 4-12 weeks), continuous, gradual dilation to allow for stricture remodeling
- Practical disadvantages
  - Migration (25-50%)
  - Chest pain
  - Durability of response
  - Bleeding

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**Stents for Benign Esophageal Stricture**

*Pooled analysis of 232 patients with refractory strictures*

<table>
<thead>
<tr>
<th>Stricture etiology</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>Anastomotic</td>
<td>69 (30)</td>
</tr>
<tr>
<td>Peptic</td>
<td>58 (25)</td>
</tr>
<tr>
<td>Radiation</td>
<td>36 (16)</td>
</tr>
<tr>
<td>Caustic</td>
<td>29 (13)</td>
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</table>

<table>
<thead>
<tr>
<th>Technical success</th>
<th>n (%)</th>
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<tr>
<td>Overall</td>
<td>229 (98.7)</td>
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<tr>
<td>Fully covered SEMS</td>
<td>85 (100)</td>
</tr>
<tr>
<td>SEPS</td>
<td>67 (90.7)</td>
</tr>
<tr>
<td>Biodegradable</td>
<td>77 (100)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical success</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>Overall</td>
<td>56 (24.2)</td>
</tr>
<tr>
<td>Fully covered SEMS</td>
<td>12 (14.1)</td>
</tr>
<tr>
<td>SEPS</td>
<td>19 (27.1)</td>
</tr>
<tr>
<td>Biodegradable</td>
<td>25 (32.9)</td>
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*Given risks and uncertain sustained benefits, use of esophageal stenting for benign strictures should be individualized. Randomized trials awaited.*
Management of Esophageal Strictures

- Steroid injection and stents may reduce frequency of dilation for benign stricture
- Esophageal stents are an option for refractory strictures but sustained resolution in < 25%
- Pneumatic dilation is highly effective for treatment of achalasia and equivalent to surgical myotomy IF allow for aggressive dilation protocol
- Esophageal dilation is safe and effective for esophageal strictures in eosinophilic esophagitis