Objectives

1. Identify the key features and etiologies of dysphagia
2. Identify the clinical and manometric features of achalasia and other motility disorders
3. Identify the clinical features and approach to GERD
4. Define Barrett’s esophagus and cancer risk
5. Know the follow up approach to Barrett’s esophagus
6. Identify the clinical features and treatment of EoE
7. Compare the clinical features of esophageal adenocarcinoma and SqCCa
8. Compare clinical features of infectious esophagitis

Dysphagia

- **Dysphagia**: difficulty swallowing
  - **Oropharyngeal**
    - Transfer from mouth to esophagus
    - Presents with choking, cough with swallowing
    - Esophageal
    - Transfer through esophagus to stomach
    - Sensation that food is stuck in chest or throat
- **Odynophagia**: pain during swallowing
- **Globus sensation**: feeling of a lump/ ball in throat

Case 1

A 65-year-old woman presents with trouble swallowing. Her main complaint is coughing during swallowing. Denies food being stuck in the chest. Which of the following is the next best test?

- A. EGD
- B. Video fluoroscopic swallow study
- C. 24-hour pH monitoring.
- D. Manometry
- E. Barium esophagogram

Oropharyngeal Dysphagia

<table>
<thead>
<tr>
<th>Etiologies</th>
<th>Diseases of the cerebral cortex and cranial nerves:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural lesions</td>
<td>Benign or malignant tumors</td>
</tr>
<tr>
<td></td>
<td>Cerebral palsy, bulbar and pseudobulbar palsy</td>
</tr>
<tr>
<td></td>
<td>CNS tumors (benign or malignant)</td>
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<tr>
<td></td>
<td>Multiple sclerosis</td>
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<td>Metabolic encephalopathy</td>
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<td></td>
<td>Parkinson’s disease</td>
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<td></td>
<td>Amyotrophic lateral sclerosis</td>
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<tr>
<td>Neuromuscular lesions</td>
<td>Myositis (polymyositis, dermatomyositis)</td>
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<tr>
<td></td>
<td>Myasthenia gravis</td>
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<tr>
<td></td>
<td>Primary myopathies (myotonic dystrophy, oculopharyngeal myopathy)</td>
</tr>
</tbody>
</table>
Esophageal Dysphagia

Category | Etiology
--- | ---
Mechanical obstruction | Intrinsic narrowing: 
  - Benign strictures: gastroesophageal reflux, caustic ingestion, medications, post-surgical, radiation therapy 
  - Esophagitis: infectious, eosinophilic, pill-induced, gastroesophageal reflux disease 
  - Esophageal rings and webs 
  - Esophageal diverticula 
  Tumors: benign or malignant 
  Extrinsic compression: 
  - Anterior mediastinal mass 

Esophageal motility disorders | Achalasia 
  - Diffuse esophageal spasm 
  - Hypertensive peristalsis: nutcracker esophagus 
  - Hypotensive peristalsis: scleroderma

Clues to underlying etiology
• Progressive dysphagia to solids, weight loss, cachexia: malignancy
• Dysphagia for both solids and liquids: Dysmotility
• Raynaud’s, tight skin, telangiectasia: Scleroderma
• HIV, odynophagia, dysphagia: Candida, HSV, CMV, Idiopathic esophageal ulcers
• Hx of stroke: oropharyngeal dysphagia

Long standing reflux disease:
• Gradual onset: peptic stricture, erosive esophagitis
• Rapid, progressive: malignancy
• Young patient, food impaction, normal esophagus: Eosinophilic esophagitis
• Acne, antibiotics: Pill induced esophagitis
• Intermittent, non progressive dysphagia to solids: Schatzki’s ring

Esophageal dysphagia

Clues to underlying etiology
• Endoscopy is diagnostic (biopsy in all cases) and could be therapeutic (dilation, stents)
• Barium swallow (special cases)
• Manometry to check for dysmotility
• Oropharyngeal dysphagia
• Modified barium swallow
• Video fluoroscopy
• Speech/swallow evaluation

EGD Findings
Ring | Stricture | Tumor
--- | --- | ---
Candida | Erosive Esophagitis

Workup
Case 2

- A 40-year-old woman presents with a 2-year history of difficulty swallowing solids and liquids. Symptoms worse over the past 4 months. She lost 30 pounds. Barium shows dilated esophagus and narrowing at the GE junction. EGD shows a dilated esophagus and tight LES. Which of the following is most likely seen on esophageal manometry?
  A. High pressure peristalsis and failure of LES relaxation
  B. Normal peristalsis and high resting LES pressure
  C. Aperistalsis and failure of LES relaxation
  D. Weak peristalsis and low LES pressure
  E. Weak peristalsis and high resting LES pressure

Achalasia

- Presentation
  - Chronic dysphagia to solids and liquids
  - GERD unresponsive to PPI
  - Incomplete or absent LES relaxation + aperistalsis
  - Selective loss of post-ganglionic inhibitory neurons containing nitric oxide and substance P → continuous cholinergic stimulation and high LES pressure
  - Trypanosoma Cruzi (Chagas' disease)

Achalasia

- Barium swallow (bird's beak appearance)
- EGD: Rule out obstructive masses
- Pseudoachalasia (tumor, paraneoplastic)
  - Rapid weight loss and dysphagia < 6 months
  - Manometry:
    - Esophageal aperistalsis
    - Incomplete/absent LES relax
      • residual pressure >8mmHg
      • Resting pressure >45mmHg
      • Can be normal

Achalasia

- Treatment
  - Surgery (Heller's myotomy)
  - Botulinum toxin injection (50% relapse)
  - Endoscopic Balloon dilation
  - Per-oral Endoscopic Myotomy (new)
Other motility disorders

<table>
<thead>
<tr>
<th>Diffuse esophageal spasm (Corkscrew esophagus)</th>
<th>Nutcracker esophagus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysphagia and chest pain</td>
<td>Normal LES relaxation</td>
</tr>
<tr>
<td>High pressure Non-peristaltic contractions</td>
<td>High pressure peristaltic contractions</td>
</tr>
<tr>
<td>TCA, calcium channel blockers, nitrates</td>
<td></td>
</tr>
</tbody>
</table>

Scleroderma esophagus

- Esophageal symptoms develop in more than 50% of patients with scleroderma.
- Dysphagia, severe GERD-heartburn / regurgitation
- EGD: esophagitis, stricture, or normal mucosa
- Manometry: Low LES pressure, weak or absent peristalsis
- Treatment:
  - PPI
  - Modified fundoplication
  - Modified gastric bypass

Case 3

A 58 year-old man with presents to the clinic for evaluation of chest pain for the past 3 months. He describes the chest pain as squeezing or burning sub-sternal sensation that radiates to the neck and sometimes to his jaw and arms. Currently he takes antacids as needed for heartburn, and lisinopril for HTN. He is otherwise healthy. His vitals are within normal limits. Physical exam is unremarkable. What is the best next step in evaluation of his chest pain?

A. Perform EGD
B. CT scan of the abdomen
C. Refer for cardiac evaluation
D. PPI treatment
E. Esophageal manometry

Gastroesophageal reflux disease

- Heartburn and/or regurgitation, chest pain
- Other: laryngitis, chronic cough, asthma
- Less established: sinusitis, otitis, pharyngitis
- Main mechanisms: weak lower esophageal sphincter (LES) and increased frequency of transient lower esophageal sphincter relaxations (TLESR)
- Risk factors: obesity, hiatal hernia, medications (Alpha antagonists, Beta agonists, morphine, Calcium channel blockers, dopamine), food (fat, chocolate, peppermint)

GERD - Complications

- Erosive esophagitis
- Peptic strictures
- Barrett’s
- Cancer

GERD – Indications for endoscopy

- Chronic GERD, >5 years with other risk factors for esophageal adenocarcinoma (Male, white, age>50, smokers, Fhx esophageal cancer, hiatal hernia)
- Atypical manifestations
- Alarming symptoms: dysphagia, odynophagia, wt loss, bleeding or anemia.
- Family history of GI cancer
- GERD with incomplete or no response to acid suppression
**GERD - Treatment**
- Lifestyle modifications (avoid triggering foods, avoid late meals, head of bed elevation, weight loss if BMI>25, avoid tight clothes)
- H2 blockers for mild/infrequent GERD
- PPI
- Not used: Sucralfate, prokinetics
- Fundoplication
- Magnetic LES augmentation
- Endoscopic therapies

**GERD – Clinical pearls**
- No need for endoscopy in typical cases
- Refractory GERD: optimize PPI therapy, EGD (r/o complications), then pH monitoring
- Most have normal EGD (non-erosive GERD)
- Atypical (non cardiac) chest pain: exclude cardiac disease in high risk patients, empiric PPI
- Most patients have normal manometry.
  - No need for manometry except pre-operative
- Extraesophageal GERD: treat with empiric PPI, then pH monitoring to prove/disprove GERD.

**Case 4**
A 50 year-old obese man with longstanding GERD presents for an upper endoscopy. Endoscopy reveals salmon colored mucosa extending 5 cm above the gastroesophageal junction. Which of the following will most likely be seen on biopsies?
A. Active esophagitis with mucosal disruption
B. Dense infiltrate of lymphocytes
C. Eosinophilic infiltration
D. Columnar metaplasia with goblet cells
E. Squamous hyperplasia

**Barrett’s esophagus**
- Definition: Replacement of normal squamous epithelium to intestinal type epithelium
- BE is a significant risk factor for esophageal adenocarcinoma

**Barrett’s esophagus**
- The risk of adenocarcinoma in non dysplastic Barrett’s is 0.3% / year
  - Risk is higher in long segment BE (> 3 cm), low grade (~0.7%) and high grade dysplasia (~7%).
  - Other risk factors
    - Male, white, age > 50, smokers, Fxh esophageal cancer, hiatal hernia
    - Potentially protective: NSAIDS, ASA
  - Most of the mortality in BE is not due to malignancy
  - All patients should receive PPI

**BE surveillance**

<table>
<thead>
<tr>
<th>Dysplasia</th>
<th>Diagnosis</th>
<th>Management options</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>One EGD with adequate sampling with biopsy q 2 cm</td>
<td>EGD every 3 -5 years</td>
</tr>
<tr>
<td>Low grade dysplasia*</td>
<td>Confirm with another EGD and biopsy within 6 month</td>
<td>Surveillance EGD every 1 year until no dysplasia on 2 exams or endoscopic ablation (preferred)</td>
</tr>
<tr>
<td>High grade dysplasia*</td>
<td>Confirm with another EGD and biopsy within 3 months</td>
<td>EMR if nodular dysplasia or endoscopic ablation or esophagectomy not recommended</td>
</tr>
</tbody>
</table>

* Confirm with two expert pathologists
Endoscopic therapy for BE

- Cryotherapy
- RFA
- EMR

http://www.massgeneral.org/
http://www.cancernetwork.com/

Eosinophilic esophagitis

- Dysphagia and food impaction (with or without esophageal strictures)
- M>F. Common in 4th decade.
- Eosinophilic infiltrate (>15 eosinophils per HPF)
  - Persists with PPI treatment
  - Esophageal rings, longitudinal furrows, white patches or specks, esophageal strictures, narrowed esophagus
- Normal EGD in 15% of cases
- Treatment: swallowed fluticasone, budesonide, oral steroids, elimination diets, endoscopic dilation

Esophageal tumors

- Adenocarcinoma (most common)
  - White>Blacks
  - Males>Females
  - Distal esophagus
  - Barrett’s esophagus*, GERD*, smoking, obesity
- Squamous cell carcinoma
  - Blacks>whites
  - Males=Females
  - Mid esophagus
  - Esophageal caustic injury, smoking, alcohol, achalasia, radiation esophagitis, vitamin C deficiency, Plummer-Vinson syndrome

*95% of cases do not have prior diagnosis of Barrett’s

Case 5

- A 31-year-old man presents to the ER with dysphagia that started during dinner earlier that evening. He was having a steak dinner and now he cannot swallow solids or liquids. He takes doxycycline for acne. An EGD is performed, and a food bolus is extracted from the mid esophagus. Multiple mucosal rings were noted. What is the most likely diagnosis?
  A. Gastroesophageal reflux disease
  B. Schatzki’s ring
  C. Pill induced esophagitis
  D. Eosinophilic esophagitis
  E. Peptic esophagitis

Eosinophilic esophagitis

- Longitudinal furrows
- White specks
- Esophageal rings

Esophagitis in immunocompromised

<table>
<thead>
<tr>
<th>Hx</th>
<th>CMV</th>
<th>HSV*</th>
<th>Idiopathic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysphagia, odynophagia, Thrush</td>
<td>Odynophagia, Dysphagia, chest pain</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>White mucosal plaques</td>
<td>Large deep ulcers</td>
<td>Ulcers&lt;2cm</td>
<td>Large deep ulcers</td>
</tr>
<tr>
<td>Branching hyphae</td>
<td>large cells, eosinophilic, intranuclear inclusions</td>
<td>Multinucleated giant cells, nuclear moulding, margination, chromatin Cowdry type A</td>
<td>Negative</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>Ganciclovir</td>
<td>acyclovir, famciclovir, valacyclovir</td>
<td>IV/PO steroids, Thalidomide</td>
</tr>
</tbody>
</table>

*HSV can occur in immunocompromised patients

*40% of cases have no GERD symptoms
Pill induced esophagitis

- Tetracycline, NSAIDS, Bisphosphonates, KCL, Ferrous Sulfate, vitamin C
- Most common site of injury is mid esophagus
- Prevention
  - At least 4 oz of fluid with pills
  - Avoid supine position for 30 min post pill ingestion

Thank you

Answer key
1-B  2-C  3-C  4-D  5-D