Esophageal Disease: Current Role of the Barium Esophagram

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Role of the Fluoroscopic Barium Esophagram

- Etiology of dysphagia
- Motility disturbances
- Obstructing lesions
- Essential; not fully addressed by MBS
- Evaluation of GERD + complications
  - Hiatal hernia, reflux, strictures, Barrett’s esophagus, carcinoma
- Post-operative evaluations
  - Anti-reflux, Ivor-Lewis, bariatric, etc.

Anatomy of the Pharynx

- Nasopharynx
  - Base of skull to palate (purple)
- Oropharynx
  - Soft palate to hyoid (blue)
- Hypopharynx
  - Hyoid to cricopharyngeus muscle (green)

Cricopharyngeal Muscle

(with spasm or “bar”)
Marks the pharygosophageal junction

Upper Esophagus

Cricopharyngeal Achalasia (and aspiration)
Esophageal Webs
- Thin (< 2 mm) mucosal "shelf"
- Probably acquired, post inflammation
- Usually in proximal esophagus
- Usually arise from anterior-lateral walls

Upper Esophagus
- Zenker diverticulum (small)
- Zenker diverticulum (large)

Zenker Diverticulum
- Pharyngoesophageal diverticulum
- Mucosal herniation through Killian dehiscence
  - Through fibers of cricopharyngeal musculature
  - Starts at C5-C6
- Most patients have hiatal hernia +/- dysmotility

56 year old female referred to MBS for "dysphagia"
- MBS essentially normal. No aspiration or penetration
- Delayed passage of barium
- Need full esophagram

56 year old female referred to MBS for "dysphagia"
- Smooth stricture in upper third of the esophagus
  - History of lung cancer and radiation (and chemotherapy)

56 year old female referred to MBS for "dysphagia"
- Axial CT: soft tissue thickening in the mediastinum and medial lung fibrosis/scarring
  - DIAGNOSIS: Radiation stricture of the esophagus
Esophageal Anatomy

- Muscular tube 20-24 cm long
- Lined by stratified squamous epithelium
- Outer longitudinal + inner circular muscle layers
  - Striated muscle upper 1/3, smooth muscle lower 2/3
- Lower esophageal sphincter
  - High resting tone
  - Between A + B rings

Fluoroscopy: Esophageal Anatomy

- "A" Ring
  - Tubulo-vestibular junction
  - Proximal end of lower esophageal sphincter (LES)
  - Uncommonly demonstrated
- "B" Ring
  - Transverse mucosal fold
  - Marks esophagogastric junction
  - Usually at junction of squamous + columnar mucosa

Schatzki Ring

- Annular, inflammatory, symptomatic narrowing of the lower esophageal (B) ring
  - < 13 mm, always symptomatic
  - 14-20 mm, occas. symptomatic
  - > 20 mm, asymptomatic
- Often detected only with full distention, Valsalva

"Schatzki Ring"

- Should be reserved for a web-like narrowing at the esophagogastric junction

With impacted hot dog
Esophageal Web and Schatzki Ring in the Same Patient

Gastroesophageal Reflux Disease

Reflux Esophagitis
- Mild: may not be detectable on esophagram
- Moderate: mucosal nodularity, ulceration
- Submucosa: thick folds, stricture, shortening of esophagus
  - Longitudinal muscle spas
- Usually associated with hiatal hernia
  - ? Cause or effect

Reflux Esophagitis
- Small hiatal hernia
- Foreshortened esophagus
- Nodular mucosa
- Can be indistinguishable from Barrett's esophagus

Reflux Esophagitis
- Hiatal hernia
- Peptic stricture
- Esophageal ulcerations

Reflux Esophagitis with Stricture
Barrett’s Esophagus

- Metaplasia of esophageal squamous epithelium to columnar epithelium
- Best clue: mid esophageal stricture or ulcer with hiatal hernia + reflux
- Premalignant: adenocarcinoma (30 – 40X over general population)
  - Accounts for nearly all adenocarcinomas

Esophageal Carcinoma

- Squamous cell carcinoma: 50-70%
  - Alcohol, tobacco, achalasia, prior stricture
- Adenocarcinoma: 30-60%
  - Almost all due to reflux + Barrett’s esophagus
- Diagnosis: esophagram, endoscopy
  - Staging: PET-CT, endoscopic sonography

Esophageal Adenocarcinoma

- Polypoid mass
- Large fungating mass
- History of Barrett’s Esophagus
- Acute angles with wall
- Irregular surface
Esophageal Adenocarcinoma
- Bulky intraluminal mass
- Endosonography shows only T1 lesion
- No penetration of muscularis propria

Esophageal Squamous Cell Carcinoma
- Mass
  - Polypoid
  - Eccentric
  - Circumferential

Other Causes of Esophagitis

Caustic Esophagitis
- Corrosive ingestion
  - Alkali (e.g., Drano) or acid
  - Best clue: rigid long stricture with ulcerated mucosa
  - Usually mid + lower esophagus

Caustic Esophagitis
- Acute Lye Ingestion
  - Complete obstruction
  - Stasis
  - Ulceration

Caustic Esophagitis
- Acute Lye Ingestion
  - Massive wall thickening of esophagus + stomach
  - CT gives all essential information in the acute setting
Drug-induced Esophagitis

- Due to injury from ingested medications
  - Tetracycline, KCl, NSAIDs, heart meds
  - Take at bedtime with insufficient water
- Best clue: Ulcer +/- stricture at level of arch or left main bronchus
- Acute odynophagia

Radiation Esophagitis

- Inflammation + scarring of mucosa + wall
- Acute (within days)
  - Luminal narrowing + mucosal ulceration
- Chronic
  - Strictures at site of treatment
  - May cause fistula to bronchi

Motility Disorders

Achalasia

- Primary esophageal motility disorder
  - No primary peristalsis
  - May have tertiary contractions (“vigorous achalasia”)
- Best clue: grossly dilated esophagus with smooth tapering at lower end (“bird beak”)

“Sigmoid esophagus”
- Markedly dilated and elongated
- Standing column of fluid places patient at great risk for aspiration
Achalasia: Differential Diagnosis

- Peptic (reflux) stricture
- Iatrogenic
  - Post fundoplication, variceal sclerosis
- Scleroderma
  - Late, with stricture, aperistalsis, dilation
- Carcinoma
  - Gastric fundus with submucosal extension

Achalasia Mimic: Scleroderma

- Esophageal stricture causing dilation
- Air-fluid level

Achalasia Mimic: Gastric Carcinoma

- Esophagus: aperistaltic
- Fixed distal stricture
- Nodular folds in the stomach

Motility Disorders

“Presbyesophagus”
- Prominent tertiary (nonpropulsive) contractions
- Nonspecific esophageal motility disturbance

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Motility Disorders

- "Corkscrew Esophagus"
- Diffuse esophageal spasm
- Dysmotility

Hiatal Hernia

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>&quot;sliding&quot; HH only cardia in chest</td>
</tr>
<tr>
<td>2–4</td>
<td>Paraesophageal HH (PEHH)</td>
</tr>
<tr>
<td>2</td>
<td>EGJ in abdomen</td>
</tr>
<tr>
<td>3</td>
<td>EGJ in chest (common)</td>
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<tr>
<td>4</td>
<td>Intrathoracic stomach +/- volvulus</td>
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</tbody>
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Type 1 (sliding) hiatal hernia
- "Feline" esophagus (transient contraction of muscularis mucosa)

Type 3 paraesophageal hiatal hernia
- Esophagogastric junction in chest

Type 4 paraesophageal hiatal hernia
- Intrathoracic stomach
- Organo-axial malrotation, but no obstruction
Mimic: Epiphrenic diverticulum

Role of the Fluoroscopic Barium Esophagram

Thank you for your attention!

Summary

- Barium esophagram remains an important though complementary study
- Aids in visualization of strictures
- Great (along with endoscopy) for mucosal or endoluminal lesion (e.g., esophageal cancer)
- Aids in visualization of hiatal hernias and GERD complications
- Best along with MBS for causes of dysphagia (including motility disorders)