Dysphagia

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Grand Rounds Presentation
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Physiology of Swallowing

• The act of swallowing involves three phases: Oral, Pharyngeal, and Esophageal.
• Swallowing takes about 8-10 seconds
• Before swallowing begins, Oral Preparation of the bolus must occur.
Physiology of Swallowing:

Oral Phase

Pharyngeal Phase
Physiology of Swallowing

Pharyngeal and Esophageal Phase:
Evaluation of Dysphagia

- History
- Review of Systems
- Physical Exam
- Imaging Studies
History

- Duration dietary changes, weight loss
- Odynophagia
- Solids or Liquids
- Level of sensation of dysphagia
- Past surgery to head and neck, trauma, ingestion of caustic substances
- Associated symptoms such as with GERD, voice changes, nasal leakage, otalgia
Review of Systems:

- Ask about common systemic processes associated with dysphagia:
  - Tobacco/Alcohol
  - Medications – antihistamines, anticholinergics, antidepressants, antihypertensives
  - Osteoarthritis
  - Systemic neuromuscular disorders
  - Auto-Immune disorders
  - Psychiatric state
Physical Exam:

- General: body habitus, mental status, drooling, wheezing, dyspnea, voice quality
- Cranial nerves
- Inspection of the tongue and palate for strength/symmetry
- Laryngeal Examination: pooled secretions, vocal fold movement, interaretyoid area
Imaging Studies

• Should be chosen to suit the patient’s symptoms and to confirm a finding.
Plain Film

- **Uses:**
  - Suspected infectious cause of dysphagia with gross displacement of structures.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
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<tbody>
<tr>
<td>cheap</td>
<td>Radiation</td>
</tr>
<tr>
<td>Fast</td>
<td>Poor anatomic detail</td>
</tr>
<tr>
<td></td>
<td>No assessment of swallow</td>
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Plain Film

(Epiglottitis)
Barium Esophagram

- Uses: structural disorders, e.g. dysphagia for solid foods. Can use air contrast.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>Good anatomic detail</td>
<td>Radiation</td>
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<td></td>
<td>Logistics in bedridden pts.</td>
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<td>Cannot detect dynamic disorders.</td>
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Air Contrast Barium Esophagram

Normal

Fungal Plaques
Manometry

- Uses: disorders in which intraluminal pressures must be measured (achalasia, esophageal spasm, etc.)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tr>
<td>It is the only test of pressure wave physiology</td>
<td>Cannot diagnose visible lesions</td>
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<td>Unpleasant for patient</td>
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<td>Technically demanding</td>
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Manometry

Figure 27. Esophageal peristalsis with corresponding manometric tracing.
Bolus Scintigraphy

- Uses: follow improvement in a patient with history of aspiration, patient with achalasia.

<table>
<thead>
<tr>
<th>Advantages:</th>
<th>Disadvantages:</th>
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<tbody>
<tr>
<td>Less radiation</td>
<td>No anatomic details</td>
</tr>
<tr>
<td>Quantitative count of</td>
<td>Single bolus, not</td>
</tr>
<tr>
<td>particles</td>
<td>different consist. used</td>
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Bolus Scintigraphy

Figure 24. Esophageal cornflake study (A) before and after (B) treatment for achalasia.
### Ultrasound

- **Uses:** Portable tool for dynamic studies, especially in children

<table>
<thead>
<tr>
<th>Advantages:</th>
<th>Disadvantages:</th>
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<tbody>
<tr>
<td>No radiation</td>
<td>Not widely available</td>
</tr>
<tr>
<td>Portable</td>
<td>Poor anatomic detail</td>
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<td>Normal Food can be used</td>
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Ultrasound
**Modified Barium Swallow**

- **Uses** – excellent to evaluate dynamic (e.g. neuromuscular, aspiration) swallow disorders.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>Gives good anatomic detail</td>
<td>Radiation</td>
</tr>
<tr>
<td>Evaluates all phases of swallowing</td>
<td>Does not directly test sensitivity</td>
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<td></td>
<td>Logistics</td>
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Modified Barium Swallow

Normal Barium Swallow
http://www.hopkinsmedicine.org/gastroenterology_hepatology/

Neurogenic Dysphagia
http://www.hopkinsmedicine.org/gastroenterology_hepatology/
Fiberoptic Endoscopic Evaluation of Swallowing

- Uses – as a mobile tool that can be used in training patients via biofeedback

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>Portable</td>
<td>Blind spot</td>
</tr>
<tr>
<td>Allows assessment of sensation</td>
<td>Cannot evaluate cricopharyngeus directly</td>
</tr>
<tr>
<td>Cheap</td>
<td>Cannot eval. esophagus</td>
</tr>
<tr>
<td>Can be used for pt teaching</td>
<td></td>
</tr>
<tr>
<td>No radiation</td>
<td></td>
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Fiberoptic Endoscopic Evaluation of Swallowing
Disorders that Cause Dysphagia
Foreign Bodies
Tracheostomy
Cricopharyngeal Achalasia

Figure 16. Radiographic image of cricopharyngeal dysfunction.
Cricopharyngeal Achalasia

Cricopharyngeal Myotomy:
Zenker’s Diverticulum

Figure 17. Zenker’s diverticulum (A) with corresponding barium x-ray (B).
Zenker’s Diverticulum
Cervical Spine Disease
Esophageal Webs and Rings

**Figure 19.** Schatzki’s ring (A) with corresponding barium swallow x-ray (B) and endoscopic view (C).
Strictures / Caustic Ingestion

Figure 11. Esophageal stricture showing obstruction of food bolus with corresponding barium swallow.
Achalasia

Figure 23. Endoscopic (A) and radiographic (B) findings in achalasia.
Figure 22. Barium swallow x-ray showing diffuse esophageal stricture (A) with corresponding manometric tracing (B).
Gastroesophageal Reflux Disease

Figure 20. Normal esophagus (A) compared with erosive esophagitis (B) with corresponding endoscopic views (A’, B’).
Cancer

Figure 21. Esophageal cancer (A) with corresponding barium swallow x-ray (B) and endoscopic view (C).
Systemic Disorders that Cause Dysphagia

- Stroke – present in up to 47%
- Amyotrophic Lateral Sclerosis
- Parkinson’s Disease
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
Autoimmune Disorders

- Systemic Sclerosis
- Systemic Lupus Erythematosi
- Dermatomyositis
- Mixed Connective Tissue Disease
- Mucosal Pemphigoid, Epidermolysis Bulosa
- Sjogren’s Syndrome (xerostomia)
- Rheumatoid Arthritis (cricoarytenoid joint fixation)
Aging

• Dysphagia is present in 2% > 65
• Poor dentition
• Loss of tongue connective tissue
• Increased pharyngeal transit time
Dysphagia in Children

- Nasal obstruction
- Oral lesions – clefts, ranulas, mucoceles
- Laryngomalacia, laryngeal clefts, TE fistula
- Vascular rings, Foregut malformations
- Tumors – hemangiomas, lymphangiomas, papillomas, leiomyomas, neurofibromas
Globus Hystericus

- Imagined dysphagia
- Somatization
Case Review

• 50 year old man presents with 6 month history of progressive dysphagia.
Case Report

• His dysphagia is worse for solid foods.
• Additionally he notes that he hears gurgling noises when he swallows, and occasionally chokes on his food.
• When he chokes, he often ends up “vomitting” his food back up.
• He has lost about 6 lbs over the past 6 months.
• He drinks socially but gave up tobacco x 10yrs
Case Report

- Physical exam reveals a thin white gentleman in no apparent distress.
- Neck exam reveals nothing unusual.
- Indirect Laryngoscopy is difficult because of frothy secretions in his hypopharynx and piriform sinus.
Case Report

Case Report Barium Esophagram

http://www.hopkinsmedicine.org/gastroenterology_hepatology/