Dysphagia: 101

Todd D Levine, MD

Phoenix Neurological Associates
University of Arizona
Symptoms of Dysphagia

- Coughing/ Choking
  - Can occur with solids or liquids.
  - More severe if symptoms are present with liquids.
  - Can also occur spontaneously associated with one’s own saliva.

- Frequent Throat Clearing

- Wet Vocal Quality
Symptoms of Dysphagia

- Drooling
- Eating meals more slowly
- Weight loss. Considered excess weight loss if:
  - >2% of body weight in 1 week
  - > 5% in 1 month
  - >7.5% in 3 months
  - >10% in 6 months
Causes of Dysphagia

- Head and Neck Surgery 36%
- Stroke 29%
- Closed Head Injury 7%
- Spinal Cord Injury 6%
- Neuromuscular Disease 6%
  - As many as 30% of myositis pts develop dysphagia
- Vocal Cord Problem 4%
- Zenker’s Diverticulum 2%
- Anxiety 2-5%
Dysphagia and Myositis

- Can occur in all forms of myositis but most common in IBM and childhood DM.
- Can be the presenting symptom for some patients as well.
- In PM and DM response to therapy is not always the same for dysphagia as it is for other muscles.
Evaluation of Dysphagia

- If someone has a known diagnosis of myositis then the neurologist or rheumatologist should screen for the symptoms and will initiate evaluation.
- If dysphagia is the presenting symptom then often seen by Primary Care or GI before Neuro or Rheum.
- Easy at home evaluation is to drink a glass of water and then speak. If it sounds wet then this should be evaluated.
Anatomy of Dysphagia: Oropharynx

- Swallowing is one of the most complex automatic behaviors we do. So it is expected that many diseases can affect the swallow mechanism.

- Oropharynx
  - Teeth
  - Salivary glands
  - Tongue
Physiology of Swallowing

- Oral Phase
- Pharyngeal Phase
- Esophageal Phase
Physiology of Swallowing:

Oral Phase

Pharyngeal Phase
Physiology of Swallowing

Pharyngeal and Esophageal Phase:

Figure 4 A-E. Pharyngeal phase of swallowing.
Oral Phase

- Begins with oral preparation of bolus
  - Liquid:
    - Lips sealed -> held briefly between hard palate and tongue -> one or more complete swallows
  - Soft Foods:
    - held between hard palate and tongue
    - lateralized for mastication if needed
    - if falls apart, acts like liquid
    - if thick precise tongue control for compression into the hypopharynx.
Begins with oral preparation of bolus

Solid Foods:
- require mastication:
- temperature, pressure, texture => 5th cranial n.
- reflexive relaxation of masseter and temporalis
- stretch reflex => rebound closure => repeat cycle.

Salivation
- Necessary to have moist mouth. Certain diseases like Sjogren’s syndrome can cause dysphagia because of lack of saliva
Oral Phase

- Tongue elevates
- Propels food toward oropharynx
- Palatopharyngeal folds contract forming medial slit at base of tongue,
- Nasopharyngeal port blocked by levator and tensor palatine muscles.
Pharyngeal Phase

- Medullary reticular formation in the brain controls this phase (swallowing center)
- Complex series of motor events propelling bolus through pharynx, away from airway into esophagus
Pharyngeal Phase

- Posterior tongue movement and a pharyngeal constricting wave
- Laryngeal elevation and tilting with epiglottis turning under and vocal cords closing
- Relaxation of cricopharyngeal muscle (upper esophageal sphincter)
- Food enters into esophagus
Pharyngeal Phase

- Pharyngeal constricting wave continues throughout esophagus as primary peristaltic wave.
- Secondary peristaltic wave arise locally to propel bolus through Lower esophageal sphincter.
Anatomy of Dysphagia: Esophagus

- Pharyngeal constrictors
  - Propel food downward
- Cricopharyngeal sphincter
- Body of esophagus
  - upper 1/2 skeletal muscle
  - lower 1/2 smooth muscle
- Lower esophageal sphincter
Figure 11. Esophageal stricture showing obstruction of food bolus with corresponding barium swallow.
Esophageal Webs and Rings

Figure 19. Schatzki's ring (A) with corresponding barium swallow x-ray (B) and endoscopic view (C)
Lateral view of MBS
Stasis in Pyriform sinus
Cricopharyngeal hypertrophy
Views of the GE Junction
Anatomy of Dysphagia: Stomach

- Reservoir
- Initiates digestion
  - pepsin
  - HCl
  - intrinsic factor
  - mucous
- Peristalsis
Gastroesophageal Reflux Disease

Figure 20. Normal esophagus (A) compared with erosive esophagitis (B) with corresponding endoscopic views (A', B').
Evaluation of Swallowing

- **Bedside Evaluation**
  - Easy, detects significant problems
  - Wet voice test with drinks of water

- **FEES**
  - Defines anatomy, looks for aspiration

- **MBS**
  - Detects aspiration, defines anatomy, also defines how bad, and the etiology.
Aspiration Pneumonia Risk Factors

Host Factors

- **Neurologic**
  - Advance age
  - Laryngeal n. damage
  - Acute stroke
  - Neuromuscular Diseases
  - Parkinson’s Dz
  - General anesthesia
  - Alcoholism

- **Mechanical**
  - Obesity
  - Head & neck surgery
  - Bowel obstruction
  - Abdominal surgery
  - Pregnancy
  - Endotrachial intubation
  - Tracheostomy
Dysphagia and Aspiration

- Aspiration pneumonia
  - frequently life threatening
  - common in hospitalized patients
  - bacteremia, sepsis, respiratory arrest & death
  - associated with swallowing dysfunction, upper GI d/o due to central and peripheral neurologic dz, mechanical and obstructive diseases.
Dysphagia and Aspiration

- Spectrum of aspiration
  - Laryngeal penetration to frank aspiration pneumonia progressing to end organ hypoxia
  - Not all aspiration leads to pneumonia:
    - Half of normal subjects aspirate during sleep
## Diagnosis and Treatment of Dysphagia

<table>
<thead>
<tr>
<th>Type</th>
<th>Signs</th>
<th>Causes</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Prep</td>
<td>Leakage</td>
<td>Sensory Loss</td>
<td>Place food posteriorly</td>
</tr>
<tr>
<td>Oral</td>
<td>Buccal Pocketing</td>
<td>Facial weakness</td>
<td>Exercises</td>
</tr>
<tr>
<td>Oral</td>
<td>Chewing labored</td>
<td>Dentition, Cognition</td>
<td>Modify food texture</td>
</tr>
<tr>
<td>Oral</td>
<td>Leakage</td>
<td>Lingual weakness</td>
<td>Chin tuck, Food texture</td>
</tr>
<tr>
<td>Pharyngeal</td>
<td>Delayed swallow</td>
<td>Vagus nerve</td>
<td>Thermal stim</td>
</tr>
<tr>
<td>Pharyngeal</td>
<td>Multiple swallow</td>
<td>Weak muscles</td>
<td>Alternate liquids and solids</td>
</tr>
<tr>
<td>Pharyngeal</td>
<td>Cough/clear</td>
<td>Aspiration</td>
<td>Food texture</td>
</tr>
<tr>
<td>Pharyngeal</td>
<td>Change in voice</td>
<td>Penetration to vocal cords</td>
<td>NPO</td>
</tr>
<tr>
<td>Esophageal</td>
<td>Delayed aspiration</td>
<td>Reflex, stricture</td>
<td>Meds GI Doc</td>
</tr>
</tbody>
</table>
Aspiration
Aspiration
Aspiration
Aspiration before swallowing
Aspiration during swallowing
Aspiration from the Pyriform Sinuses
Non-Surgical Methods to Treat Aspiration

- Exercises
- Head position
  - Chin tuck, head lift, rotation of head
- Postural Compensation
  - Sitting upright, lying on side
- Swallow Retraining
- Diet Modifications
Surgical Treatments

- Cricopharyngeal myotomy
  - Useful if muscles are so weak the bolus cannot be propelled past cricopharyngeal sphincter
  - Useful if there is not complete relaxation of upper esophageal sphincter
  - Useful for abnormal increased muscular contractions during relaxation period
Surgical Treatments

- Percutaneous Gastrstomy Tube
  - Still allows patients to eat orally what they can eat safely
  - Can be removed if symptoms resolve
Neuromuscular Electrical Stimulation

- VitalStim approved by the FDA to treat dysphagia in 2002
- Small electrical impulses applied to skin overlying throat muscles
- Speech therapists determine the proper placement and then give the patient exercises to do during stimulation
  - So difficult to separate out treatment effect from therapy effect
Neuromuscular Electrical Stimulation

- Treatments are very safe
- Best studied in stroke patients.
  - Limits outcome assessments because stroke patients have spontaneous recovery
  - Placebo controlled studies have been small and failed to show a benefit
  - However one study of chronic dysphagia in stroke patients showed a very early improvement in swallowing with electrodes on
Neuromuscular Electrical Stimulation in Myositis

- Literature cited by VitalStim references only their FDA data for myositis
  - 8/892 patients in data filed with FDA had myopathy.
  - So no conclusive evidence it works in myositis
  - Therapy is clearly helpful
Conclusions

- Dysphagia is a common complication of myositis
  - Other causes as well that may be treatable as well
- Evaluation and therapy can help prevent significant morbidities
  - Weight loss
  - Aspiration
  - Malnutrition