#### Esophageal Dysphagia: Culinary Critic or Digestive Disease?

Shahan Fernando, MD Pediatric Gastroenterology Phoenix Children's

#### Disclosures

• None

#### Objectives

- Recognize the symptoms of esophageal dysphagia
- Identify the common etiologies of esophageal dysphagia based on age
- Describe the best diagnostic tests to evaluate the esophagus

#### **Deglutition (swallowing)**

- Complex and highly coordinated movement
- Reflexive and voluntary activation of over 30 nerves and muscles
- Oral phase

Preparatory Propulsive

- Pharyngeal phase
- Esophageal phase

#### What is Dysphagia?

- Subjective sensation of difficulty swallowing
  - Not to be confused with Odynophagia pain with swallowing
- Oropharyngeal Dysphagia
- Esophageal Dysphagia

# **Oropharyngeal Dysphagia**

- Difficulty initiating a swallow
- Inability to transfer substances from the oral cavity to the pharynx and esophagus
- Symptoms: sensation of an obstruction in the mouth or neck, choking, coughing, nasal regurgitation, food spillage, changes in voice/speech

#### **Esophageal Dysphagia**

- Difficulty in moving a bolus down the esophagus
- Any problems swallowing?

#### Asking the Right Questions

- Selective eating habits?
  - Avoidance of certain textures Liquids vs solids
- Excessive chewing?
- Need to modify food?
  - Cut into smaller pieces
  - Need to lubricate bites of food?
- Slowest eater at the dinner table? Not related to distractions

#### **Diagnostic Challenges**

- Infants
- ADHD

- Autism
- Sensory processing disorder
- Developmental delays
- Overlap with Oropharyngeal Dysphagia symptoms

#### **Barium Esophagram**

- Pros
  - Widely available Good anatomic evaluation Basic motility assessment
- Cons
  - Radiation exposure Requires patient cooperation Aspiration risk

#### **Chest Radiograph**

- Pros
  - Widely available Radio-opaque foreign bodies Mediastinal changes
- Cons
   Radiation exposure
  - Limited use

# Chest CT/MRI

- Pros
  - Structural abnormalities Extrinsic esophageal compression Vascular anomalies
- Cons

Radiation exposure (CT only) May require sedation

# Esophagogastroduodenoscopy (EGD)

Pros

Direct visualization of esophageal lumen/mucosa Obtain mucosal biopsies Therapeutic interventions Foreign body removal Balloon dilation

Cons

Requires sedation Unable to evaluate motility disorders Rare complications

# **Esophageal Function Tests**

- pH-multichannel intraluminal impedance (pH-MII) Optimal evaluation of GER
- High-resolution esophageal manometry (HREM) Identification and characterization of motility disorders
- Cons
   Requires patient cooperation

No anatomic or mucosal evaluation

#### **Broad Differential**

- Mucosal disorders
- Motility disorders
- Structural disorders
- Luminal obstruction
- Extrinsic compression

#### **Gastroesophageal Reflux**

- Retrograde passage of gastric contents into the esophagus
- Can be associated with regurgitation or vomiting
- Normal physiologic process
- Common in infancy
- Prevalence up to 8.2%
  - Children 3 to 17 years old

# **Gastroesophageal Reflux Disease**

- GER + complications or severe symptoms
- Respiratory complications
  - Prematurity, pulmonary disease, neurodevelopmental delays, Down Syndrome
  - Other complications/symptoms
    - Pain Feeding difficulties Poor weight gain Dysphagia → referral to Gastroenterology

# Management

- Lifestyle changes
  - Milder symptoms, unclear efficacy
  - Weight management, dietary modification, positioning
  - Evaluate and treat constipation
- Pharmacotherapy
  - Moderate to severe symptoms
  - H2RA, PPI, antacids, surface agents, prokinetics
- Surgery
  - Gastrostomy tube placement Fundoplication

# **Eosinophilic Esophagitis**

- Increasing incidence
- Diagnostic challenge
  - Wide range of symptoms
    - Overlap with other GI conditions, especially GERD
  - Often delayed diagnosis
- Symptoms
  - Dysphagia Reflux, regurgitation, vomiting Feeding difficulties Food impaction

# **Remember to Ask the Right Questions**

- Any trouble swallowing? Answer depends on age of patient Not very specific
- Have to modify their food?
- Aversion to harder food textures?
- Have to lubricate bites of food with liquid?
- Take a long time to eat (not related to distractions)?

# Management

- Dietary Elimination
  - Cow's milk, wheat, eggs, soy, peanuts/tree nuts, fish/shellfish
  - ? Grains, legumes, meats
- ChallengingPharmacologic
  - High-dose PPI therapy
  - Topical glucocorticoids: Budesonide, Fluticasone, Ciclesonide
  - Dupilumab (Dupixent): FDA-approved over 1 year of age
- Esophageal dilation

# **Caustic Ingestion**

- 2022: approximately 2 million human exposures
- million (56%) pediatric cases
- 830,000 involved children <5 yrs old
- Household cleaning products
  - Over 98,000 pediatric cases

Household bleach, oven and drain cleaners, laundry and dishwasher detergents, hair relaxers (some with lye), toilet bowl cleaners

• Alkaline agents > Acidic agents

# Alkali Ingestion

- High pH, 11.5-12.5
- Liquefaction necrosis
  - Disintegration of mucosal wall, deep penetration, high risk of perforation
- Injury depends on concentration and time of exposure
   10% Sodium Hydroxide: up to 1 min to cause deep burn
   30% Sodium Hydroxide: less than 1 sec to cause transmural necrosis

# **Acid Ingestion**

- Low pH, less than 2
- Coagulation necrosis
  - Coagulum forms on mucosal surface More attenuated, less risk of perforation

# **Clinical Features**

- Symptoms can vary and do not always correlate with extent of injury
- Acute onset dysphagia
  - Most common symptom
  - Can persist with severe injuries due to dysmotility, fibrosis, or strictures
- Drooling, oral injury
- Retrosternal or abdominal pain
- Hematemesis
- Upper airway symptoms

# Management

- What to do
  - Refer to closest Emergency Room
  - Determine the caustic agent (type, brand, formulation, amount) Can call Poison Control @ 1-800-222-1222 (Banner)
- What not to do
  - Induce vomiting repeat esophageal injury Give neutralizing agents – thermal injury from chemical reaction Give diluting agents – lack of efficacy, safety risk Give charcoal – do not work, obstruct endoscopic view

# Achalasia

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- Progressive degeneration of esophageal ganglion cells Failure of LES relaxation Loss of peristalsis
  - Incidence 1.6/100,000
- Prevalence 10/100,000
- Occur at any age, but less common in children
- Primary/Idiopathic Achalasia etiology unknown
- Secondary Achalasia

# **Clinical Features**

- Insidious onset
- Trouble with solids + liquids
- Often lead to delay in diagnosis Mistaken for other GI disorders
- Case series of 87 adult patients Mean duration of symptoms 4.7 yrs

# Diagnosis: Barium Esophagram

- Widely available and well tolerated
- Not very sensitive Normal in up to 1/3 patients
- Esophageal dilation
  - Angulated and tortuous in later stages of disease
- "Bird-beak" appearance Narrow GE junction
- Aperistalsis and delayed emptying

# **Diagnosis: Esophageal Manometry**

- High-resolution manometry Gold-standard for diagnosis Impaired LES relaxation Absence of normal peristalsis
- Differentiate between 3 sub-types
  - Rule out other diagnoses GERD Pseudoachalasia due to malignancy Other esophageal motility disorders

#### Management

- Goal is to reduce LES resting pressures
- Pneumatic dilation
- Surgical myotomy with partial fundoplication
- Peroral endoscopic myotomy (POEM) Preferred for Type III
- Botulinum toxin injection and pharmacologic therapy
- Common post-treatment complication: GER

# **Esophageal Atresia**

- Commonly associated with tracheoesophageal fistula (TEF)
- Incidence about 1/4000
- 4 types of EA
- 1 type of TEF without EA
  - Associated anomalies
    - VACTERL
    - CHARGE
    - Cardiac
    - GU

# **Clinical Features**

- Polyhydramnios
  - Not always picked up prenatally
- Immediately symptomatic at birth
  - Drooling, choking, inability to feed, resp distress
- Diagnosed via inability to pass NG catheter
- Esophagram with water-soluble contrast

# Management

- Surgical repair with primary anastomosis of EA
- Long-gap EA
  - Delayed anastomosis
  - Esophageal lengthening
  - Jejunal or colonic interposition
  - Post-operative complications
    - GERD
    - Dysphagia
    - Anastomotic strictures (up to 80% of cases)

# **Endoscopic Therapy**

# **Foreign Body Ingestion**

- Majority occur between 6 months and 3 years Many are unwitnessed
- Often asymptomatic or only have transient symptoms
- Symptoms depend on location and type of FB
   Dysphagia, refusal to eat, drooling
   Respiratory symptoms
   Retrosternal chest pain or sensation of something stuck
- Extremely low mortality rate

# **Evaluation and Management**

• Careful history and physical exam

- Imaging
  - 2-view radiographs
  - СТ
  - Esophagram with water-soluble contrast
  - US
- Endoscopic removal

# **Button Battery Ingestion**

#### **Button Battery or Coin?**

- Rising incidence
  - At least 1.5 cases per 10,000 children each year 1985-2022: 66,220 cases in children ≤6 years old
- Serious sequelae in 2.7% of ingestions Esophageal burn, perforation, fistula
- Concerning clinical features
  - Battery size (≥20 mm) Patient age (<5 yrs) Duration of ingestion (≥2 hours) Clinical symptoms

# Management

- Poison Control Center
- National Battery Ingestion Hotline (1-800-498-8666)
- Do not induce vomiting and send to ER
- Give Honey!
  - Asymptomatic children, ≥12 months old Ingestion within 12hrs 10mL every 10 minutes up to 6 doses
  - Can use Carafate in ER

# Summary

- Recognize symptoms of esophageal dysphagia Ask the right questions
- Etiologies vary based on age
  - Mucosal
  - Motility
  - Structural
  - Luminal
  - Extrinsic
- Diagnostic tests to evaluate the esophagus Barium Esophagram Chest Radiograph Chest CT/MRI EGD
  - **Esophageal Function Tests**