Foreign Body Management

NYSGE Fellows Summer Course

Susana Gonzalez, MD
Assistant Professor of Medicine
Objectives

- Timing of endoscopy  
- Anatomic location  
- High risk objects  
- Choosing accessories  
- Airway protection

When?  
Where?  
What?  
Which?  
Who?
Foreign Bodies in the GI Tract

- 1500 people die annually
- High risk:
  - Pediatric age group (80%)
  - Edentulous adults
  - Eosinophilic esophagitis
  - Alcoholics
  - Prisoners
  - Psychiatric patients
Ingested Foreign Bodies

Outcomes:
- Pass spontaneously 80-90%
- Endoscopy 10-20%
- Surgery ~1%

Complications:
- Perforation <1%
- Mediastinitis
- Lung abscess
- Fistula
- Aspiration

*Always consider the possibility of more than one foreign body*
Commonly Ingested Objects

**Children**
- Coins
- Toys/ Magnets
- Crayons
- Ball point pen caps
- Batteries

**Adults**
- Food impaction*
  - Meat
  - Bones
  - Fibrous husks
  - Fish and chicken bones
- Dentures
- Sharp Objects
Patient Presentation

• Symptoms
  – 92% Dysphagia: location of object
  – 60% Neck tenderness
  – Odynophagia:
    impaction, esophageal tear, spasm
  – Hypersalivation/inability to tolerate oral secretions
  – Regurgitation
  – Abdominal pain

• History
  – Objects swallowed
  – Timing of object swallowed
Patient Presentation

- Physical examination:
  - Mental Status
  - Respiratory status
    - Airway compromise
  - Subcutaneous emphysema
    - Esophageal perforation
  - Drooling
    - Complete esophageal obstruction
  - Peritoneal signs
    - Gastrointestinal perforation
Patient Presentation

- Radiologic imaging
  - Location of object
  - Subcutaneous air
  - Pneumomediastinum
  - Pleural effusion
  - Free air under diaphragm
Radiologic Studies

• AP/lateral x-ray
  - Location, size, shape, number
• Most true foreign objects are radiopaque and can be identified on plain films of the neck, chest or abdomen
• Objects such as fish, chicken bones, wood, plastic, most glass and thin metal objects are not seen
• Avoid contrast studies as they may interfere with endoscopy and are contraindicated in obstruction due to risk of aspiration
• Gastrograffin contraindicated in obstructed esophagus
  - Hypertonic $\rightarrow$ pulmonary edema/severe chemical pneumonitis if aspirated
• Chest X-ray and/or chest CT for suspected perforation
Foreign Body Impaction: Anatomy

- Foreign bodies impact at physiologic narrowings and sites of acute angulation
- Esophagus
  - Cricopharyngeus (15-17 cm)
  - Aortic arch (23 cm)
  - Left main stem bronchus (27 cm)
  - Distal esophagus (36-40 cm)
- Pylorus
- IC valve
- Objects >2 cm in diameter and longer than 5 cm have difficulty passing pylorus, bulb and sweep
- Objects longer than 10 cm will not pass duodenal sweep
Anatomical Landmarks
Foreign Body Impaction: *Pathology*

Foreign bodies impact at sites of pathologic narrowing

- **Structures**
- **Rings, webs**
- **Anastomoses**
- **Neoplasms**
- **Eosinophilic esophagitis**
Airway Precautions

- Children, mentally ill patients, uncooperative patients
  - Anesthesia with an ET tube: Ideal

- Most cooperative adults: Moderate sedation is safe
  - Assess risk for airway compromise
  - Patient co-morbidities
  - Mallampati score
Timing of Endoscopy

• Esophageal foreign bodies should be removed **within 12-24 hours** to prevent complications
  – Airway compromise
  – Perforation
  – Aortic or pulmonary fistula

• Foreign bodies leading with sharp/pointed end

![Sharp metal wire in the stomach]
Timing of Endoscopy

• Under no circumstances should a foreign object or food bolus impaction be allowed to remain in the esophagus beyond 24 hours from presentation
Indications for Urgent Endoscopy

• Respiratory distress/compromise
• Unable to handle secretions = high grade obstruction
• Risk of aspiration and perforation
• Sharp objects below the UES
  – If above UES = ENT
• PA & Lateral to determine location in esophagus rather than trachea
Esophageal Food Bolus Impaction

- Disimpaction should not be delayed beyond 12-24 hours
  - Bypass obstruction with endoscope if possible
  - Assess cause of obstruction and angle at GE junction
  - Avoid blindly pushing down into the stomach - there may be underlying pathology
  - Beware bone spicule within bolus = perforation risk
- Extract food through mouth
  - Overtube to protect airway
  - Grasping forceps

Forceful pushing can lead to perforation!
Esophageal Food Bolus Impaction

• Glucagon is controversial
  – May promote spontaneous passage of impacted food bolus
  – Decreases LES pressure
  – No effect on rings or strictures
  – Success rate (30%-50%)

• Follow-up EGD to assess/treat strictures
  – Biopsy suspicious lesions
Sharp and Pointed Foreign Bodies

- Toothpicks
- Nails
- Needles
- Razor blades
- Pens
- Safety pins
- Dental appliances

“Advancing points puncture, trailing do not”
Sharp and Pointed Foreign Bodies

• Remove sharp and pointed foreign bodies **before** they pass through stomach
  - Consider overtube
  - 15-35% will perforate intestine, usually near IC valve

• If endoscopic retrieval unsuccessful consider surgery if:
  - No movement in 3 days by daily x-ray
  - Object advancing with pointed end
Tools of Trade

• Grasping forceps
• Polypectomy snare
• Roth retrieval net: round objects like coins, button batteries
• Stone retrieval basket
• Hood: sharp objects
• Overtube
Foreign Body Hood Protector
Tools and tips

Overtube:
- Allows repeated passage of the scope with less trauma
- Prevents accidental aspiration of objects

Removal of pointed objects
- Point should trail
- Attempt to protect mucosa
Long Pointed Objects

• Examples: Toothbrushes, Pens, cutlery
• May not pass through duodenal sweep
• May be difficult to remove retrograde through LES and UES
• Grasp with basket or end of snare
  – REMOVE IN A STRAIGHT VERTICAL PLANE
• Avoid grasping the center of the object
• Consider pulling into overtube that extends into the stomach
• Fluoroscopy may be helpful
Sharp and Pointed Foreign Bodies
Retrieval of sharp object
Button Batteries

- Hearing aids, calculators, cameras, computers
- Larger batteries (>21 mm in diameter) and lithium batteries lead to most necrosis
- Rapid injury via direct corrosion, low-voltage burns or pressure necrosis
- Liquefaction necrosis
  - Leakage of alkaline KOH or NaOH in 26-45%
Button Batteries in Esophagus

- *Endoscopic emergency with high potential for esophago-tracheal or esophago-aortic fistulas*
- Airway protection
- Removal
  - Retrieval baskets and nets devices of choice
- Avoid graspers or forceps which could puncture
- Overtube prevents loss of object into trachea
Button Battery in Stomach and Intestine

• Most pass once in stomach
  – 85% within 72 hours
  – Consider retrieval in stomach with basket or net
• Follow progress with daily x-rays
• No role for ipecac, H\textsubscript{2}RAs or laxatives
• Surgery
  – Abdominal pain
  – Failure to evacuate within 72 hours
# Button Batteries: Management

**Goal:** Early detection of fistulas and other mucosal injuries

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Procedure Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hrs</td>
<td>Repeat endoscopy to evaluate for mucosal injury</td>
</tr>
<tr>
<td>36 hrs</td>
<td>Dilute barium swallow to exclude fistulas</td>
</tr>
<tr>
<td>10-14 days</td>
<td>Repeat endoscopy or barium swallow to exclude late appearing strictures or fistulas</td>
</tr>
</tbody>
</table>
Magnets

- Multiple magnets stick together
- Severe GI injury and death
- Trapping bowel wall
  - Necrosis, fistula formation, perforation, obstruction, peritonitis
- 50-60% require endoscopy
- 30% require surgery
- Consumer health issue
  - Banned by Consumer Product Safety Commission (CPSC) in July 2012
“Body packing” Mules

• Endoscopy **contraindicated**
  – Condoms contain 3-5 g cocaine
  – Ingestion of 1-3 g cocaine is a lethal dose

• Hospital confinement

• Follow progression with daily KUB, avoid rectal exams
  – Risk of rupture of packet

• Immediate surgery for halted progress
Cocaine Body Packet
Summary

- Plan your strategy before endoscopy
  - Timing, Airway
- Be familiar with available equipment
  - Overtubes, nets, graspers, snare, baskets
- Protect the airway
  - Careful choice of sedation vs anesthesia
Summary

• Recognize indications for urgent endoscopy
  – Complete esophageal obstruction, sharp objects in esophagus, button batteries, patient distress

• Recognize contraindications for endoscopic retrieval
  – Cocaine
  – Perforation

• Recognize Eosinophilic esophagitis
  – Common, risk for complications