What to Do With Luminal Foreign Bodies

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ACG /ASGE Best Practices Course
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Foreign Bodies in the GI Tract

- 1500 people die annually
- 16 cases/100,000 population
- High risk
  - Pediatric age group (80%)
  - Edentulous adults
  - Inebriated people
  - 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
- Crayons
- Ball point pen caps
- Batteries
- Bottle caps

Adults
- Food impaction
  - Meat
  - Bones
- Dentures
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

Foreign bodies impact at sites of pathologic narrowing

- Strictures
- Rings, webs
- Anastomoses
- Neoplasms
- Eosinophilic esophagitis
Common Foods Associated with Impactions

- Meats
  - Chicken, beef, pork, hot dogs, lamb
  - “Steakhouse syndrome”
- Vegetables
  - Fibrous husks
- Fish and chicken bones
  - Sushi

Patient Presentation

 Symptoms
- Dysphagia (92%)
  - Location of object
- Neck tenderness (60%)
- Odynophagia
  - Impaction, esophageal tear, spasm
- Hypersalivation
  - Inability to tolerate oral secretions
- Regurgitation, abdominal pain
- Children: Sudden refusal to eat

 History
- Objects swallowed
- Timing of object swallowed
**Patient Presentation**

**Physical examination**
- Mental status
- Respiratory status
  - Airway compromise
- Drooling
  - Complete esophageal obstruction
- Subcutaneous emphysema
  - Esophageal perforation
- Peritoneal signs
  - Gastrointestinal perforation

**Evaluation**

**Radiologic imaging**
- Location of object
- Subcutaneous air
- Pneumomediastinum
- Pleural effusion
- Free air under diaphragm
Most ingested foreign bodies are radioopaque
- Exceptions: Chicken and fish bones, wood, plastic, glass

Avoid barium
- Gastrografin contraindicated in obstructed esophagus
  - Extremely hypertonic
  - Can cause pulmonary edema if aspirated

Biplanar radiographs
- Chest X-ray and/or chest CT for suspected perforation

Safety pin in the cervical esophagus
Radiologic Studies

Biplanar plain films may be important

Indications for Endoscopic Removal of Foreign Bodies

- Esophageal foreign bodies should be removed within 12-24 hours to prevent complications
  - Airway compromise
  - Perforation
  - Aortic or pulmonary fistula
- Foreign bodies with sharp or pointed end
- Objects >5 cm and wider than >2 cm do not (usually) pass through pylorus or IC valve

Faigel et al., GI Endosc 1997;45:490
Indications for Urgent Endoscopy

- Respiratory distress/compromise
- Pain
- Complete esophageal obstruction
  - Unable to handle secretions
- Sharp objects below the UES
  - If above UES = ENT
- Lateral image
  - Determine location in esophagus versus trachea
- Button batteries within reach of gastroscope

Endoscopy Contraindicated

- Asymptomatic and no foreign body remaining
- Drug packets
Tools of Trade

- Grasping forceps
- Polypectomy snare
- Roth retrieval net
  - Round objects like coins, button batteries
- Stone retrieval basket
- Hood
  - Sharp objects
- Overtubes

Foreign Body Hood Protector
Esophageal Food Bolus Impaction

- Push bolus into stomach if possible
  - Bypass obstruction with endoscope if possible
  - Assess cause of obstruction and angle at GE junction
- Reposition endoscope
  - Push food bolus from the right
  - Gently advance
  - Beware bone spicule within bolus
    - Perforation risk
- Extract food through mouth
  - Overtube to protect airway
  - Grasping forceps

Esophageal Food Bolus Impaction

- Avoid papain (Meat tenderizer)
  - Enzymatic digestion of meat = Enzymatic digestion of esophagus
  - Two fatalities
- Glucagon (1-3 mg)
  - Decreases LES pressure
  - No effect on rings or strictures
  - Low success rate (30%-50%)
- Follow-up EGD to assess/treat strictures
Sharp and Pointed Foreign Bodies

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

CHEVALIER JACKSON’S AXIOM
“Advancing points puncture, trailing do not”
Sharp and Pointed Objects

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
  - “Mural withdrawal reflex” turns the object
- If endoscopic retrieval unsuccessful consider surgery if:
  - No movement in 3 days by daily x-ray
  - Object advancing with pointed end
Sharp and Pointed Foreign Bodies

Long Pointed Objects

- Long foreign bodies
  - Toothbrushes
  - Pens
  - Cutlery
- May not pass through duodenal sweep
- May be difficult to remove retrograde through LES and EUS
- Grasp with basket or end of snare
  - Remove in straight vertical plane
Long Pointed Objects

Tips

- Avoid grasping center of object
  - Shifts it to horizontal plane
  - Prohibits removal
- Long foreign body
  - May be pulled into overtube
  - Overtube extends into stomach
  - Object, overtube, and endoscope removed in a single maneuver

Surgery May be Required

Courtesy Of Kai Matthes, MD
**Button Batteries**

- Hearing aids, calculators, cameras, computers
- 3 volt, 20 mm (or greater size) lithium batteries lead to most necrosis
- Rapid injury
  - Direct corrosion
  - Low-voltage burns
  - Pressure necrosis
- Liquefaction necrosis
  - Leakage of alkaline KOH or NaOH in 26-45%

**Button Batteries**

- Most damage caused when negative pole (side) is against mucosa
- 3Ns
  - Negative
  - Narrow
  - Necrotic
Button Batteries: Esophagus

- Endoscopic emergency
  - High potential for esophago-tracheal or esophago-aortic fistulas
  - Current guidelines are for removal within 2 hours of ingestion
- Airway protection
- Removal
  - Retrieval baskets
  - Nets
  - Balloon extraction
    - Pass deflated balloon beyond
    - Inflate
    - Withdraw battery as an intact unit
- Avoid graspers or forceps which could puncture

Button Battery: 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, H₂RAs or laxatives
- Surgery
  - Abdominal pain
  - Failure to evacuate within 72 hours
Magnet Ingestions

- May be used to simulate piercings in mouth
  - Accidentally swallowed
- Multiple magnets stick together
  - Pressure necrosis and perforation
- 50-60% require endoscopy
- 30% require surgery
- Consumer health issue
  - Banned by CPSC in July 2012

Marsha Kay, 2012

Wong, Phillips, CJEM 2009;11(5):493-495
Cocaine Body Packets

- Endoscopic retrieval contraindicated
- Condoms contain 3-5 g cocaine
- Ingestion of 1-3 g cocaine is a lethal dose
- DO NOT rupture packets
- Avoid rectal exams
- Remove surgically
Summary

- Recognize indications for urgent endoscopy
  - Complete esophageal obstruction
  - Sharp objects in esophagus
  - Button batteries
  - Patient distress

- Recognize contraindications for endoscopic retrieval
- Be familiar with available equipment
- Protect the airway
- Plan your strategy before endoscopy

That’s All Folks!!
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