Approach to Pediatric Foreign Bodies:
Foreign body removal
Foreign body ingestions

Shannon Baumer-Mouradian, MD
Sarah Thill, MD
We have no relevant financial relationships to disclose.
Objectives

1) Discuss foreign body removal techniques
2) Discuss the management of foreign body ingestions
3) Practice the removal of nasal and ear foreign bodies
Tips for Foreign Body Removal

• Viscous lidocaine (2%) for pain relief, killing live bugs
• Afrin for nasal foreign bodies
• The metal ear curette (with the loop)
• Alligator forceps for soft objects
• Avoid irrigation if object is unknown
Tips for Foreign Body Removal

• Angel’s Kiss or Parent’s Kiss
• Small, smooth spherical objects
• May at least become more visible
Tips for Foreign Body Removal

• Katz extractor
• Magnet bar
• Homemade snare
• When to wave the white flag...
Foreign Body Aspiration Case 1

• 3yo F was watching TV and eating popcorn she had sudden coughing fit. Mom reports patient has continued to cough for the last day and wanted the child evaluated.

• Vitals signs are normal. Exam notable for intermittent dry cough.
University of Chicago
Pediatric Clerkship, Foreign body aspiration
https://pedclerk.bsd.uchicago.edu/page/foreign-body-aspiration
Foreign Body Aspiration

- Occurs in infants and children 1-4yr old
- Often food or toys
- Frequently right main stem bronchus
- May present with coughing, choking, stridor, or wheeze
- But need a high index of suspicion

Imaging for Foreign Body Aspiration

- Radiographs visualize only 10-20% of cases
- Consider inspiratory/expiratory films for children > 3yr and lateral decubitus films in younger children
- Normal imaging does not rule out foreign body aspiration!
- Treatment is bronchoscopy

Foreign Body Ingestion Case 1

• 2yo playing with Mom’s purse 1 hour ago. Purse contains paper bills and coins. Mom is concerned that he swallowed something because he is whining, has a small amount of drooling, and is not wanting to drink anything.

• Vitals are normal and examination only significant for small amount of drool from mouth and fussiness.
Foreign Body Ingestion Case 1

- 2yo playing Mom's clutch. Paper bills and coins are in the clutch; Mom is concerned he swallowed something because he is whining, drooling, and not wanting to drink anything.
- Vitals are normal and examination only significant for drooling and fussiness.
Foreign Body Ingestion Case 1

• Disposition?

• Esophageal coins should be removed within 24 hours to reduce the risk of esophageal injury or erosion into neighboring structures (i.e. aorta).
Foreign Body Ingestion Case 2

• 20 month old, playing in bathroom while Mom & Dad are getting ready for work
• Scale in bathroom powered by 2, 20mm diameter batteries
• Parents notice she abruptly starts coughing, drooling, and crying
• 1 of the batteries is missing from scale
Foreign Body Ingestion Case 2

- 20 month old, playing in bathroom while Mom & Dad getting ready for work
- Scale in bathroom powered by 2, 20mm diameter batteries
- Parents notice she abruptly starts coughing, drooling, and crying
- 1 of the batteries is missing from scale
Foreign Body Ingestion Case 2

• Disposition?

• Immediate endoscopic removal
  – If bleeding or unstable, surgery/CV surgery should also be involved
Foreign Body Ingestion Case 2

Witnessed or suspected BB ingestion

Esophageal

Otherwise stable: immediate endoscopic removal

Active bleeding or clinically unstable: Endoscopic removal in OR with surgery/GV surgery present

If evidence of any esophageal injury: Admission, NPO, IV anbx

Consider CT Angiography to exclude aortic injury. Consider MRI of chest to determine proximity of injury to aorta

No significant injury to surrounding tissue or proximity to aorta

Esophagram to exclude leak before advancing diet as tolerated

Demonstration of injury close to aorta

Continue NPO and Anbx and serial MRI q 5–7 days until injury seen to recede from aorta

If presence of hematemesis or UGI bleeding within 21 days of removal, assume aortobronchial fistula and emergently prepare for thoracotomy with CV surgery

Gastric or beyond

<5 years of age AND BB ≥20 mm

Consider assessment of any esophageal injury and endoscopic removal, if possible, within 24–48 hours

≥5 years of age AND/OR BB <20 mm

May consider outpatient observation only

Repeat x-ray in 48 hours for BB ≥20 mm, repeat at 10–14 days for BB <20 mm if failure to pass in stool

Endoscopic removal if develops GI symptoms or not passed stomach by time of x-ray at time described above

Foreign Body Ingestion Case 2

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Courtesy:
http://www.hawaii.edu/medicine/pediatrics/pemxray/v2c09.html
Foreign Body Ingestion Case 3

- 16yo helping his Dad at a construction job
- Holding nails in mouth, lost his balance, and fell 4 feet (landed on his feet). In the process of falling he swallowed a nail.
- Asymptomatic; the accident occurred 2 days ago (he was embarrassed to tell his Dad)
Case 3

- 16yo helping his Dad at a construction job
- Holding nails in mouth, lost his balance, and fell 2 feet
- Swallowed a nail
- Asymptomatic; the accident occurred 2 days ago (He was embarrassed to tell his Dad)
Foreign Body Ingestion Case 3

Known or suspected ingestion of sharp object

Radio-opaque

Radio-opaque

Radio-opaque

Esophageal: Urgent endoscopic removal

Gastric

Consider endoscopic removal unless short object with heavier blunt end

Small bowel (distal to ligament of Treitz)

Symptomatic

Enteroscopy or surgical removal

Asymptomatic

Follow clinically with serial x-ray

Enteroscopy or surgical removal considered if develops symptoms or >3 days without passage

Symptomatic self-reported or witnessed ingestion: Urgent endoscopic evaluation and removal

Asymptomatic: Consider CT, ultrasound, MRI, or esophagram for further assessment

Evidence of FB: Endoscopic removal

Evidence of FB: Endoscopic removal

No evidence of FB: Clinical observation, close follow-up, reassess if develops symptoms

Foreign Body Ingestion Case 4

• 10yo M “annoyed” with his 6yo sister who was decorating the refrigerator with art work.

• Sister was using strong, small magnets to hang art

• 6yo tells Mom that “he swallowed all my magnets! I hate him!” while pointing at the defiant 10yo.
10yo M "annoyed" with his 6yo sister who was decorating refrigerator with artwork.

Sister was using strong, small magnets to hang art.

6yo tells Mom that "he swallowed all my magnets! I hate him!" while pointing at the deviant 10yo.
Foreign Body Ingestion Case 4

• How do you proceed?
Case 4

- How

Initial presentation
- Obtain history
  - Known magnet ingestion
  - Unexplained GI symptoms with rare earth magnets in environment
- Obtain an abdominal x-ray. If magnets are present on flat plate, obtain lateral x-ray
- Determine single versus multiple magnet ingestion

Single magnet

Within the stomach or esophagus
- Option 1: Consult Pediatric GI if available
- Consider removal if patient at increased risk for further ingestion
- Option 2: Follow serial x-rays as outpatient and educate parents*

Beyond the stomach
- Consult Pediatric GI if available
- Consider removal if possible
- Follow with serial x-rays as outpatient
- Educate parents*
- Confirm passage with serial x-ray
- If delayed progression, may use PEG 3350 or other laxative to aid passage

Multiple magnet (or single magnet and metallic object)

All within the stomach or esophagus
- If pediatric GI available, notify for removal, especially if ≤12 hours
- If not available, transfer to referral center
- If >12 hours until time of procedure, then consult pediatric surgery prior to endoscopic removal

Successful removal
- Discharge home with follow-up and education

Unsuccessful removal
- Refer to surgery for removal

Symptomatic
- Refer to pediatric surgery

Asymptomatic
- If no obstruction or perforation on x-ray, may remove by enteroscopy or colonoscopy if available or follow with serial x-ray
- May do serial x-ray in ED to check for progression every 4–6 hours

Successful endoscopic removal
- Discharge after feeding tolerance, with appropriate follow-up and education

No progression on serial x-rays
- Admit for further monitoring and serial x-rays or surgical removal
- May use PEG 3350 or other laxative to aid in passage and to help prepare for colonoscopy
- Continue serial x-ray every 8–12 hours. If no symptoms, then proceed with surgical removal or endoscopic removal with surgical backup

Progression of magnets on serial x-rays
- Educate parents on precautions* and discharge with close follow-up
- Confirm passage with serial x-ray
- If at any time magnets do not progress or patient becomes symptomatic, admit to hospital for removal of magnets

*Parental education:
  - Remove any magnetic objects nearby
  - Avoid clothes with metallic buttons or belts with buckles
  - Ensure no other metal objects or magnets are in the child environment for accidental ingestion


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Foreign Body Ingestion Case 5

• 17yo, significant psychiatric history along with biliary atresia s/p kasai presents after yet another FB ingestion

• Doesn’t remember what he swallowed because he was “encephalopathic”
Foreign Body Ingestion Case 5

• 17yo, significant psychiatric history along with biliary atresia s/p Kasai presents after yet another FB ingestion
• Doesn’t remember what he swallowed because he was “encephalopathic”
Foreign Body Ingestion Case 5

• 3 blunt objects: nail clippers and 2 other unidentifiable objects
Foreign Body Ingestion Case 5

- Dimensions of blunt object that are unlikely to pass:
  - Diameter > 25mm, especially in young child (unable to pass through pylorus)
  - Long objects (> 6cm) are unlikely to clear duodenal sweep OR ileocecal valve
  - Large or long objects, even if blunt, should be removed from stomach
Contact Information

Sarah Thill MD
sthill@mcw.edu

Shannon Baumer-Mouradian MD
sbaumer@mcw.edu

Physician Referral and Consultation: (800) 266-0366