





NOTES AND RECOMMENDATIONS

¹SUSPECT BUTTON BATTERY (BB) INGESTION

- Patient with abrupt onset of any one of the following: refusal of oral intake, difficulty swallowing, chest pain, drooling, airway obstruction, or wheezing or stridor without typical prodromal symptoms of viral illness.
- Presumed “coin” shape ingestion.
- **For patients presenting to an Urgent Care center with BB ingestion, immediately begin Honey/Carafate and contact Transfer Center for Emergent transfer to ECH or SR.**
- Batteries located in the esophagus may be asymptomatic initially. **Do not wait for symptoms to appear.** Serious burns can occur within 2 hours.
- Do not induce vomiting or give cathartics
- Consult the National Battery Hotline at 800-498-8666 (or 202-625-3333) as needed for assistance in battery identification & patient management

Symptoms of BB ingestion include:

Occult or visible bleeding, persistent or severe abdominal pain, vomiting, signs of acute abdomen and/or fever, and/or profoundly decreased appetite (unless symptoms unrelated to battery ingestion)

²DETERMINE BB SIZE AND LOCATION

- Honey/Carafate is recommended for all known or suspected BB ingestions **within the past 12 hours** (increased risk of esophageal perforation if >12 hours)
- Begin honey/Carafate once BB ingestion suspected. If X-ray shows **esophageal location**, continue until patient reaches the OR. Discontinue if battery located in the stomach.
 - If ≥ 12 mo. give honey 10 ml PO Q10 min, max 6 Doses*
 - If < 12 mo. give Carafate 1g PO Q10 min, max 3 doses*
- **May exceed max doses per MD order*
- 1 honey packet (9.2 ml) is acceptable substitute for 10 ml dose
- Chemical content & diameter of the BB can be determined from imprinted code found on the battery case
- Assume hearing aid batteries are < 12 mm
- Cylindrical batteries pose a lower threat for caustic damage after ingestion than BB, but due to their size may become trapped in the stomach. Any cylindrical battery ingestions warrant prompt x-ray evaluation & urgent endoscopic removal if located in the esophagus.
- Removal of gastric BB < 15 mm at the discretion of consulting provider

³RADIOLOGY

- For all suspected BB ingestions, Foreign Body Series to include: AP x-ray nose to rectum & lateral x-ray neck. If circular metallic foreign body identified in chest, obtain lateral x-ray of chest to evaluate position of negative battery pole.
- Esophagram should be performed as “pull back” esophagram with contrast injected through enteric tube by radiology
- MRI on Day 13-15 post removal for **all** patients with BB removal (not to be done after hours or on weekends without direct permission of radiology attending physician).
- MRI to be limited sequence study (about 20 minutes in length).
- Need for sedation/anesthesia for MRI is at the discretion of clinical team

³RADIOLOGY CONT'D**Potential MRI findings that might trigger additional imaging and/or clinical intervention.**

- Proximal Esophageal injury (above carina T5) + tracheal wall thickening
- Proximal esophageal injury (above carina T5) + edema/enhancement involving $> 50\%$ circumference of Aorta/Great vessels
- Mid-distal esophageal injury (below carina T5) + edema and enhancement involving $> 50\%$ circumference of descending thoracic aorta
- For Complicated cases may request a case review by the Button Battery Guideline Team & Consider repeat MRI on Day 20 post removal

MANAGEMENT AND FOLLOW-UP

⁴INPATIENT MANAGEMENT

- **All NG tubes placed under endoscopy must be non-weighted, MRI compatible, Bridle feeding tubes.**
- If NG tube becomes dislodged, contact provider. Caregiver should not attempt to replace NG at bedside.
- Patients with button battery removal esophageal should be admitted.
- Once PO feedings advanced, patient must remain on soft diet until D/C
- If battery removed from upper esophagus, monitor closely for voice changes, respiratory distress, or stridor due to possible vocal cord paralysis.
- **Antibiotics: Unasyn 50 mg/kg IV Q6H (max dose 2000 mg). If PCN allergy: Clindamycin 10 mg/kg IV Q8H (max dose 900 mg). Length of antibiotics should be determined by extent of injury**
- If severe inflammation, mediastinitis, suspected perforation, and/or s/s of SERS or systemic infection (i.e. fever, \uparrow WBC, \uparrow CRP), antibiotics may be administered for a min. of 7-10 days.
- In other cases, course of antibiotics to be determined by care team

⁵DISCHARGE CRITERIA

- MRI shows stable or improved inflammation around aorta/great vessels
- **Patient tolerating soft diet**
- Patient to follow up with GI 4 weeks after battery removal for a repeat Esophagram to evaluate for persistent mucosal irregularity, stricture, and delayed perforation

⁶OUTPATIENT MANAGEMENT

- Button batteries that have cleared the stomach usually pass the GI tract within 1 week without complications.
- Anticipatory guidance to include close monitoring for bloody emesis, melena, cough, and fever, and/or abdominal pain
- Patients with symptoms of abdominal pain, hematochezia, or fever should seek immediate medical attention for emergent X-rays.
- **Prompt surgical removal is indicated for symptomatic patients with radiographic confirmation of a retained intestinal Button Battery**

POTENTIAL COMPLICATIONS

- After removal, if mucosal injury was present, observe for and anticipate delayed complications: tracheoesophageal fistula, esophageal perforation, mediastinitis, vocal cord paralysis, tracheal stenosis, tracheomalacia, aspiration pneumonia, empyema, lung abscess, pneumothorax, spondylodiscitis, or exsanguination from perforation into a large vessel.
- Complications may be delayed for up to 30 days post ingestion.
- Consider battery proximity to the aorta or major vessels. If less than 3 mm tissue between area of esophageal injury and adjacent vessels on MRI/CTA monitor closely for sentinel bleeds. Involve cardiothoracic and vascular surgery early if possibility of impending esophageal-vascular fistula.