Ingested Foreign Bodies in Children: A Report of Two Cases

Gurjit Singh, Surendra Sharma, Shrikant Khurade, Somnath Gooptu

Department of General Surgery, Padm. Dr. D.Y. Patil Medical College, Pimpri, Pune, Maharashtra, India

Abstract

Introduction: Accidental foreign body ingestion and impaction of food bolus present as an emergency. Pediatric population is the most vulnerable. Since the act may go unnoticed, the child may present late. However, most foreign bodies pass spontaneously in the stools. Case Capsule: Two children were brought with history of battery ingestion. In one case, an emergency gastrointestinal endoscopy had to be done for the foreign body removal which was made up of corroded battery. In the other case, no intervention was undertaken & an uncorroded battery passed per anum along with stools after 15 days of ingestion. Conclusion: Decision regarding immediate intervention or conservative approach will require consideration of the level of lodgement & type of foreign body. Prevention is possible if parents/guardians exercise control on their wards & are aware of implications of such an event.

Keywords: Battery, foreign body, children

Introduction

Foreign body ingestion and impaction of food bolus occur commonly. The majority of foreign body ingestions occur in the pediatric population, with a peak incidence between the ages of 6 months and 6 years.[1] Most foreign bodies pass harmlessly and are eliminated in the stool. We report two cases of ingestion of button battery.

Case Reports

Case 1
A 5-year old male child was brought to hospital 15 h after ingestion of button (disc) battery of toy. The child was asymptomatic. On examination, vitals were stable. Abdomen examination was within normal limit. Radiograph of chest and abdomen erect showed the disc-shaped foreign body in lower one-third of oesophagus [Figure 1].

Emergency upper gastrointestinal endoscopy was done and the foreign body was removed. It was a disc battery of 1.5 m diameter which was corroded and had caused the corrosion of oesophageal mucosa. The child was kept nil orally for 48 h with i.v. fluid supplementation and i.v. antibiotic injection cefotaxim 50 mg/kg was given for 3 days, along with injection pantoprazole 1 mg/kg. On day 3, orally liquids were started followed by soft diet on day 4 and full diet on day 5. Child had no complications and was discharged a day later.

Case 2
A 5-year old male child was brought to hospital 5 h after ingestion of button (disc) battery of toy. The child was asymptomatic. On examination vitals were stable. Abdomen examination was within normal limit. Radiograph of abdomen erect 1 h after ingestion of foreign body had shown a disc shaped foreign body in the stomach at the level of L2 vertebra [Figure 2].

Repeat radiograph of abdomen erect at time of presentation to hospital showed that foreign body had moved to level of ischial spine [Figure 3].

On admission to our hospital no intervention was done and the child was given normal diet. Child passed the disc battery of 1 cm diameter in stool 15 h after ingestion, which was not corroded [Figure 4].

Discussion

Infants are known to put almost everything into their mouths. Patients with foreign bodies in the upper GI tract usually fall into
The majority of foreign body ingestions occur in the pediatric population, accounting for 75–85% of patients with foreign bodies in the upper GI tract but edentulous adults are also at greater risk of ingesting foreign bodies, including an obstructing food bolus or their dental prosthesis. Mortality rates have been extremely low. A compilation of multiple studies including 2 large series report no deaths in 852 adults and 1 death in 2206 children.

The narrowest area within the GI tract is the esophagus, making this the commonest site of foreign body impaction. Within oesophagus foreign body may lodge in the thoracic inlet, the aortic arch area, or the gastroesophageal (GE) junction. The commonest site of impaction is the thoracic inlet followed by the GE junction and then the aortic arch.

Objects larger than 2 cm in diameter are less likely to pass the pylorus, and objects longer than 6 cm may become entrapped at either the pylorus or the duodenal sweep.

Coins are the most common foreign body ingested by children; others include toys, toy parts, magnets, batteries, safety pins, screws, marbles, bones, and food boluses.

The number of ingestion of disc or ‘button’ batteries is increasing substantially. It may cause perforation in oesophagus due to direct pressure necrosis or due to conduction of electricity or due to leakage of caustic material.

Foreign bodies in the esophagus can produce various symptoms, including dysphagia, drooling, and occasionally airway obstruction. Gastrointestinal foreign bodies produce less specific symptoms, including abdominal pain, melena, and hematochezia.

All children with a history of foreign body ingestion should be evaluated with radiographs of the neck, chest, and abdomen.
Radiolucent objects require direct visualization or contrast radiographs.

Button batteries can usually be differentiated from coins on plane films. Biplane radiograph (anterioposterior and lateral) of neck, chest, and entire abdomen is required to locate the object. Disk batteries have a distinctive two-step profile and a double circle appearance as compared to coin. Endoscopy is preferred over barium contrast studies for radiolucent objects as it allows removal of object as well.

Pathophysiological considerations for ingested foreign bodies include the anatomy of the lodgment site, the physical properties of the foreign body (size, shape, and composition), and the body's reaction to the foreign body.

Batteries consist of two metal plates joined by a plastic seal. Internally, they contain an electrolyte solution (usually concentrated sodium or potassium hydroxide) and a heavy metal, such as mercuric oxide, silver oxide, zinc, or lithium. If ingested, these batteries often lodge in the esophagus and cause injury by electrical current, electrolyte leakage, or pressure necrosis. If they break in the GI tract, they can cause heavy metal poisoning. Button batteries lodged in the esophagus must be removed immediately. Removal options include endoscopy, Foley catheter removal, esophageal bougienage, or Magill forceps removal. Intact button batteries in the stomach are safe and can be allowed to pass but must be monitored radiographically to observe for disruption of the battery. Follow-up radiographs are needed in 24–48 h. If the battery is still in the stomach, endoscopic removal is indicated.

Disc battery ingestions have traditionally been feared as they can cause corrosive injury. A disc battery is removed endoscopically on an urgent basis if it is found to be in the esophagus.

Recent studies suggest that once a disc battery moves past the esophagus and into stomach, systemic absorption is rare. No treatment is required. Hence, no intervention was undertaken in our second case.

Urgent intervention is indicated if any of the following warning signs are present:

- When the ingested object is sharp, long (>5 cm), and in the esophagus or stomach
- When the ingested object is a high-powered magnet or magnets
- When a disk battery is in the esophagus (and in some cases in the stomach)
- When the patient shows signs of airway compromise
- When there is evidence of near-complete esophageal obstruction (eg, patient cannot swallow secretions)
- When there are signs or symptoms suggesting inflammation or intestinal obstruction (fever, abdominal pain, or vomiting)

Emergent endoscopy is recommended for patients with button batteries or sharp objects in the esophagus, as was done in our first case.

Nonurgent endoscopy may be undertaken in the following settings:

- Coins in the esophagus may be observed for 12–24 h before endoscopic removal in an asymptomatic patient
- Objects in the stomach with diameter >2.5 cm
- Disk batteries and cylindrical batteries that are in the stomach of patients without signs of GI injury may be observed for as long as 48 h. Batteries remaining in the stomach longer than 48 h should be removed.

Observation is recommended for patients with small, blunt objects below the diaphragm or with asymptomatic objects beyond the reach of an endoscope.

Surgical removal should be considered for blunt objects beyond the stomach that remain in the same location for longer than one week.

Conclusion

Ingestion of disc batteries is on the rise. It is a medical emergency when lodged in oesophagus. However, its smooth passage and spontaneous expulsion can be expected when present in stomach and beyond. Awareness amongst parents and guardians can prevent and help in reducing its incidence.

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