CASE REPORT

Chronic button battery ingestion

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Abstract

Abstract: Button battery ingestion is a hazardous condition, which is associated with the increasing technology in household products. Most of these ingestion are unwitnessed so parent`s unawareness of potential lethal outcomes may delay the doctor visit. Most cases of button battery ingestion end uneventfully. However, those batteries that lodge in the esophagus can result in serious complications. Very few case report are available where button battery has been lodged in esophagus without causing major complication. This case presents a child who had a button battery in the esophagus for a substantial duration of 3 months with negligible consequences referred to the Pediatric department of Vivekananda polyclinic and institute of medical sciences, Lucknow

1. Introduction

Battery ingestion in children is an emerging hazard. With the use of button batteries in toys and easy accessibility to these batteries, the incidence of accidental ingestions is increasing. National Capital Poison Center data show a 6.7 fold increase in the percentage of button battery ingestions from 1985 to 2009 [1]. Most children who ingest a disk battery remain asymptomatic and pass the battery in their stool within 2-7 days [5]. Only 10% of patients who ingest disk batteries report symptoms, which are predominantly GI problems. Most common place where disk batteries become lodged, resulting in clinical sequelae, is the esophagus. Esophageal damage can occur in a relatively short period of time (2-2.5 h) when a disk battery is lodged in the esophagus. [1, 3]. Prompt removal of button battery from esophagus is indicated to prevent feared complications of esophageal perforation, tracheoesophageal fistula, perforation, mediastinitis and vocal cord paralysis. Therefore, a rapid and accurate diagnosis is critical. Prolonged lodgment of button battery in esophagus is unlikely to present without any major complication. In this article, a case of neglected button battery lodgment in the esophagus with unusual presentation as gastritis is highlighted.

2. Case report

A 3 year old previously healthy girl child presented with complaint of dull aching abdominal pain, localized to epigastric region for last three months. Pain was not associated with nausea, vomiting or fever. She was evaluated and managed as a case of gastritis in various health center, but symptom did not improve. Then she visited a private nursing home where her CT abdomen was done which showed foreign body in lower third of esophagus. Child was then referred to Paediatric department of Vivekananda polyclinic and institute of medical sciences, Lucknow for further management. On general examination, the patient was well appearing and tolerating her secretions. Her vital signs were: temperature 36.6°C, blood pressure 111/73 mm Hg, pulse 122 beats/min, respiratory rate 24 breaths/min, and pulse oximetry 100% on room air. On head and neck exam, her trachea was midline and there was no subcutaneous emphysema. Lungs were clear to auscultation bilaterally and she demonstrated no difficulty with respirations. The remainder of the physical exam was unremarkable. Her chest X-ray (fig 1) showed an opaque foreign body consistent with button battery in lower esophagus. Patient was taken to operating room and button battery was retrieved endoscopically (fig 2). Circumferential mucosal ulceration was evident at site of impaction, though there was no transmural burn. Patient was discharged without further complication and regular follow up was adviced. On follow up the patient was completely normal, with no complaints of dysphagia or abdominal pain. She was eating foods of all consistencies without aspiration or difficulty. Repeat endoscopy after two months didn't reveal any perforation, fistula or any other major complication (fig 3).

Fig 1 Plain X- ray abdomen showing a round disc battery in lower esophagus

Fig 2 upper GI endoscopy showing impacted button battery a round disc battery in esophagus

Fig 3 follow up upper GI endoscopy showing healthy esophagus

3. Discussion

Foreign body ingestion is a common encounter in pediatric emergency department. It is estimated that 80% of all cases of swallowed foreign bodies occur in children between 6 months and 6 years of age . Most of them, 90%, pass through the gastrointestinal tract without any complication . The frequency of battery ingestion has been increasing in recent years due to greater accessibility from electronic toys and adult devices. Most important predictors of clinically significant outcome were battery diameter greater than 20 mm and a patient age less than 4 years . Lovits and coworkers noticed a 6- to 7-fold increase in the rate of major or fatal outcomes by battery ingestion over three-year period (0.443% in 2007–2009) compared with (0.066% in 1985–1987 [3]. Button battery ingestion can cause injury in three primary ways: leakage of caustic alkaline electrolyte; ischemic necrosis caused by direct pressure; and production of external electrolytic current that hydrolyzes tissue fluids creating hydroxide at the negative pole [3]. The esophagus is susceptible to foreign body retention because of its anatomic areas of narrowing and weak peristalsis [1]. Unfortunately, battery ingestion often goes unwitnessed leading to severe damage by the time of presentation. Foreign body ingestion (including batteries) can be very difficult to diagnose without a radiograph as symptoms of cough, fever, decreased oral intake, difficulty swallowing, sore throat, and vomiting are symptoms of common viral infections .

In the case described above, the patient presented with three months of abdominal pain and was ultimately diagnosed with an ingested button battery lodged in her esophagus. Upon removal, there was surprisingly limited injury despite long-term ingestion of a button battery sized 20 mm in diameter.

Guidelines for management of button battery ingestion[2,8,9,10,11]

- Index of suspicion should be high because many cases are asymptomatic.
- Plain radiography of chest and abdomen not only confirms the diagnosis but also locates the site of the battery. The battery can be distinguished from a coin with the help of a double ring or halo sign seen in a X-ray.
- After diagnosis, endoscopy should be performed as soon as possible to remove the battery and

perform a complete exploration of the esophagus to rule out early complications.

- The battery located within the esophagus should be removed within 2 h of ingestion because of the potential to cause mucosal injury. This is much shorter time period compared to previous reports, as lithium batteries have higher capacitance and voltage.
- Hemorrhage occurs within 12–14 h of ingestion and may be fatal
- Batteries which have passed into the stomach need not to be extracted on emergent basis. Such batteries must be removed if they fail to cross pylorus in 8 h, if patients have GI symptoms or when the size of the battery is large.
- Specific complications like tracheoesophageal fistula and aortoesophageal fistula occur between 9 and 18 days of ingestion, depending upon the location of negative pole.
- Length of observation, duration of esophageal rest, and need for serial imaging and endoscopy/ bronchoscopy are determined based on the location and severity of injury
- Complications include esophageal perforation, tracheoesophageal fistula, mediastinitis, vocal cord paralysis, tracheal stenosis, aspiration pneumonia, empyema, abscess, pneumothorax, spondylodiscitis, and perforation into large vessels

4. Conclusion

We present this atypical case to increase awareness surrounding this diagnosis amongst primary care physicians. Button battery ingestions that remain in the esophagus can result in severe complications and death within hours to days. This case presents a child who had a button battery in the esophagus for 3 months. It is important for physicians to keep ingestion of button batteries in their differential for children presenting with vomiting, coughing or gagging, refusal to eat, and complaints of abdominal or chest pain. Clinical suspicions should be confirmed by a plain radiography followed by an emergency endoscopy if it reveals a round opaque foreign body. The earlier the diagnosis is made, the less serious and devastating complications occur.

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