

Near-Fatal Aorto-esophageal Fistula Following Button Battery Ingestion - A Case Report

The incidence of button battery ingestion (BBI) has been rising in recent years. While most batteries pass through the gastrointestinal tract uneventfully, a minority can result in complications, particularly in children < 5 years and battery size > 20 mm [1]. Aorto-esophageal fistula (AEF) is a severe vascular complication of button battery ingestion with high fatality [2,3]. We report a successful outcome of a delayed presentation of BBI with AEF despite two incidents of near-fatal hemorrhage.

A 5-year-old boy presented to the emergency with two episodes of hematemesis in the preceding 5-6 hours. The parents informed that the child had been having vague abdominal discomfort for the past 5 days for which he received symptomatic treatment from a local practitioner. On examination, the child had severe pallor and shock with normal systemic examination. Shock was corrected with a fluid bolus and he was shifted to the Pediatric Intensive Care Unit (PICU) with the plan for endoscopy after packed red blood cell transfusion (PRBC). Blood investigations and ultrasound abdomen were normal except for anemia and elevated urea. After admission to the PICU, he had episodes of massive hematemesis following which he developed hypotension. He was resuscitated with intravenous fluids, PRBC, inotropes and was put on mechanical ventilation. Chest radiograph revealed a coin-shaped foreign body with a double ring or halo sign in the mid-thorax (**Fig. 1**). Emergency bedside endoscopy retrieved an impacted esophageal button battery (about 20 mm). CT aortogram showed an upper lateral esophageal tear and possible aortic injury. Meanwhile, his shock was progressive with unrecordable blood pressure and he was taken up for emergency surgery. A 4 mm rent in the medial wall of the aorta and a corresponding opening in the esophagus were repaired. His shock improved post-repair and his inotropes were stopped in 24 hrs. However, due to multiorgan failure including acute kidney injury, he was started on peritoneal dialysis. Endoscopic nasojejunal (NJ) tube was inserted on day 5 and NJ feeds were started. He was extubated on day 6 as he was recovering well. However, on day 12 he had a sudden episode of massive hematemesis and developed

hypotension following which he was taken up for thoracotomy which revealed necrosis of the esophageal wall and the adjoining aortic wall. The esophagus was repaired and after resecting the visible necrotic area of the aorta, end-to-end anastomosis of the aorta was done. Following surgery, inotropes were tapered and he was extubated after 24 hours and NJ feeds were restarted. Esophagogram done on day 21 showed no tear/leak. He was discharged after 40 days of hospital stay. At 1-year-follow-up, he is doing well with no evidence of esophageal strictures.

A systematic review by Akinkugbe et al reported that out of 361 cases with severe complications after BBI in children between 1977-2022, 69 died (19%). 61% of these children who had a fatal outcome had vascular complications and 40% were attributed to AEF. Also, of the cases with severe complications of BBI, 14% involved vascular injuries, and 81% of vascular injuries were fatal [2,4]. Most common symptoms in children who developed AEF were abdominal pain, vomiting and hematemesis. In our case, the child had been shown in a local hospital with vague abdominal pain of five-days duration and he was treated as gastritis. Since most cases of ingestion are unwitnessed, considering BBI in the differential diagnosis of unremitting abdominal symptoms may be important in making an early diagnosis. A radiograph of the chest and abdomen may help in early identification and the classical double halo sign can help distinguish it from a coin. Rebleeding following fistula repair has been reported up to 25 days post successful button battery removal [5]. In our

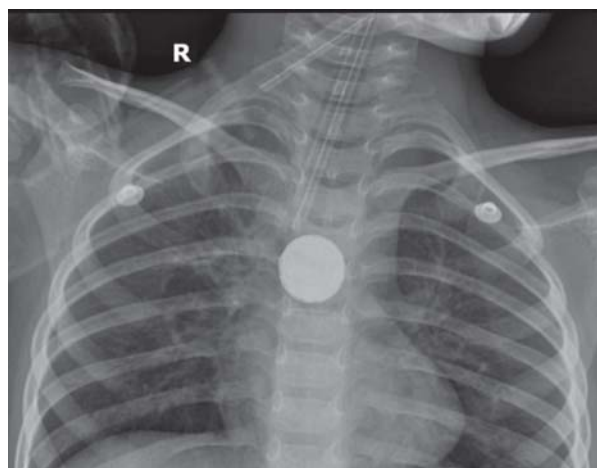


Fig. 1 Chest radiograph showing a coin-shaped opacity in mid-thorax with double ring or halo sign

case also, the child developed late massive hematemesis after 12 days of battery removal and fistula repair.

Button battery ingestions are increasingly recognized as a cause of gastrointestinal bleeding and perforation. As most of these ingestions are not witnessed by caregivers, diagnosis can be challenging. This underscores the importance of ensuring public awareness initiatives and safety mechanisms in toys to prevent ingestion. A thorough history and a simple investigation like a radiograph can clinch the diagnosis. This case also highlights the risk of ongoing injury and near-fatal complications for prolonged periods (up to 2-3 weeks) after successful battery removal and the need for continued vigilant monitoring. This also stresses the importance of availability and coordinated efforts of a multidisciplinary team in the successful survival of a potentially fatal complication of button battery ingestion.

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REFERENCES

1. Lerner DG, Brumbaugh D, Lightdale JR, et al. Mitigating risks of swallowed button batteries: new strategies before and after removal. *J Pediatr Gastroenterol Nutr.* 2020;70:542-6.
2. Akinkugbe O, James AL, Ostrow O et al. Vascular complications in children following button battery ingestions: A systematic review. *Pediatrics.* 2022; 150:e2022057477.
3. Lanzafame LRM, Blandino A, Cicero G, et al. Diagnosis and management of button battery ingestion complicated by tracheo-esophageal and aorto-esophageal fistulas. *Diagnostics.* 2022;12:2369.
4. Mubarak A, Benninga MA, Broekaert I, et al. Diagnosis, management, and prevention of button battery ingestion in childhood: a european society for paediatric gastroenterology hepatology and nutrition position paper. *J Pediatr Gastroenterol Nutr.* 2021;73:129-36.
5. Sinclair EM, Stevens JP, McElhanon B et al. Development and repair of aorto-esophageal fistula following esophageal button battery impaction: A case report. *J Pediatr Surg Case Rep.* 2021;66:101782.