



CASE REPORT

Sequelae of dawdled presentation of accidental button battery ingestion – A case report on emerging hazard

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Abstract

Aim: To present a case report of button battery ingestion in a 1-year-old child brought after 16 h of ingestion.

Methodology: The child was brought with complaints of button battery ingestion. X-ray of the chest with abdomen was done to confirm position. An immediate rigid esophagoscopy was done and deformed leaking battery was removed from cricopharynx, leaving circumferential blackish slough with ulcer from 12 to 15 cm.

Results: The child was under constant observation for monitoring complications. On day 5, feeding gastrostomy was done. On follow-up day 25, barium swallow showed no leakage or stricture formation. Day 45 follow-up upper gastrointestinal scopy revealed short segment stricture and was dilated with endoscopic and fluoroscopic guided balloon. The child is thriving well and is under regular follow-up to track expected complications earlier.

Conclusion: The increased marketing and use of lithium cells is responsible for the rise in incidence of button battery ingestion. Button batteries are characterized by damage progression and a wide spectrum of complications. Clinicians must do their best in early removal, avoiding and expecting delayed complications, and treat as they arise. Afterall, prevention needs to be the prime goal.

Keywords: button battery, complications, emergency, foreign bodies, otorhinolaryngology, pediatrics

Introduction

Emergency care is an integral part of any discipline of clinical medicine. Foreign bodies (FB) in ear, nose, and throat (ENT) are emergencies usually seen by otorhinolaryngologists, pediatricians, primary care setting, emergency department physicians (1). Foreign bodies account for ~ 11% of the cases of ENT emergency services (2–4). If not appropriately managed, they have a high potential for morbidity and mortality (5, 6).

The presentation and management of foreign bodies vary not only in different populations but also among different age groups (7–9). Generally, ENT FBs are more common in young children. Successful removal depends on a variety of parameters, including the location of the FB, its composition, the technology available, and patient participation (10).

In recent years, with the increasing accessibility of electronic toys and devices to youngsters, ingestion of miniature-sized button batteries has risen. These represent a particular group of pediatric swallowed foreign bodies due to the danger of potentially catastrophic complications if not removed early. Injury can occur through four mechanisms: (1) pressure necrosis; (2) alkali created from external currents; (3) mercury toxicity, and (4) electrolyte leakage from batteries. A case report of button battery ingestion is presented in this paper.

Methods

A one-year-old child was brought, with accidental ingestion of button battery 16 h before, after two removal attempts





FIGURE 1 | Xray of neck with chest and abdomen (AP) and lateral.



FIGURE 2 | Xray of neck with chest and abdomen (AP) and lateral.

elsewhere with flexible endoscopy. The child was brought with complaints of noisy breathing and refusal of feeds. X-ray of the chest with abdomen (**Figures 1, 2**) showed a one-rupee-coin-sized battery with “double ring” or “halo” sign at the level of the cricopharynx.

An immediate rigid esophagoscopy was done and deformed leaking battery was seen adherent to the cricopharyngeal wall (**Figure 3**).

After removal, there was circumferential blackish slough with ulcer from 12 to 15 cm level of the esophagus (**Figures 4, 5**).

Under flexible esophagoscopy, Ryle’s tube was secured. The child was started on broad-spectrum IV antibiotics and Ryle’s tube feed. The child had persistent low-grade fever. CT chest with abdomen (**Figure 6**) was done to rule out mediastinitis, which revealed normal study, with inflammatory enhancement in posterior pharyngeal wall, at the level of the pyriform fossa and cricopharynx.

On day 5, Stamm’s Feeding gastrostomy was done by the pediatric surgery team. Recovery was uneventful.

On follow-up day 25, barium swallow showed no leakage or stricture formation (**Figure 7**).

Day 45 follow-up upper gastrointestinal scopy revealed short segment stricture formation ~3 mm. Endoscopic and fluoroscopic guided balloon dilatation was done, using 8 mm balloon by the medical gastroenterology team.



FIGURE 3 | Button battery after removal.

Results and discussion

The child is thriving well and is being regularly followed up.

The button battery, which is commonly used in the manufacture of calculators, hearing aids, watches, and other portable electronic devices, can cause a wide range of complications if not removed at the earliest. Symptoms



FIGURE 4 | Severe esophageal injury at the site of battery impaction.

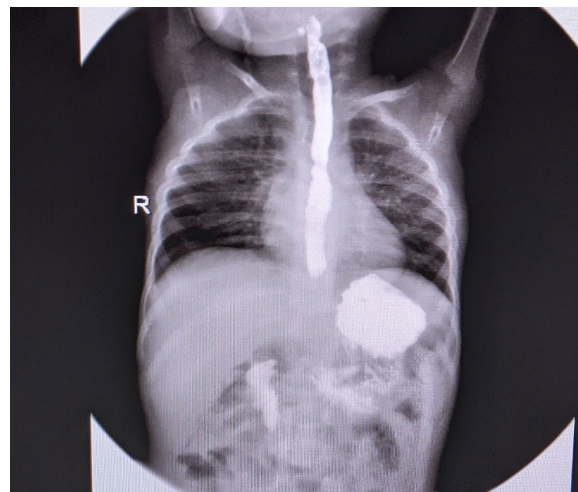


FIGURE 7 | Barium swallow.



FIGURE 5 | Severe esophageal injury at the site of battery impaction.

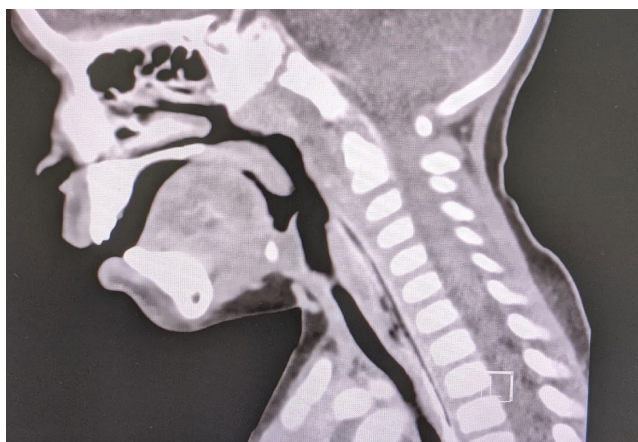


FIGURE 6 | CT Chest with abdomen (black arrow - inflammatory enhancement).

caused by button battery consumption are vague and are also observed in common disorders such as viral infections (11). If the button battery is stuck in the aerodigestive tract, as in this case, urgent removal is mandatory, regardless

of diameter, and the presence of symptoms (12–14). After removal, the state of esophageal mucosa in contact must be assessed for complications. Removal is tough due to irritation, necrosis, and adherence with its surrounding tissues. Button batteries can cause serious mucosal injuries within 2 h of ingestion (15). Following removal, follow-up radiography must be conducted at regular intervals to avoid the development of late problems, which may be silent initially (16). A case of a 2-year-old child who died due to massive bleeding from an esophageal-aortal fistula 18 days after button battery removal has been reported (17).

Conclusion

Increased marketing and use of lithium cells have contributed to an increase in occurrences of button battery ingestion. The progression of harm is the hallmark of button battery impaction. Complications include tracheal and esophageal stenosis, spondylodiscitis, perforations, empyema, vocal cord paralysis, tracheo-esophageal fistula, aorto-esophageal fistula, mucosal burns, stricture & death (18–21). Clinicians must do their utmost in early removal, be mindful of delayed problems, and treat them when they arise. Afterall, prevention needs to be the prime goal.

The purpose of this paper is to raise awareness about the serious consequences caused by button battery impaction in youngsters. We recommend that national standards include the course of action after button battery ingestion.

Data availability statement

Any data that support the findings of this study are included within the article.

Ethics statement

Ethical committee clearance has been obtained from the author's institution.

Author contributions

KK: conceptualization; data curation; methodology; writing, reviewing, and editing. AD: formal analysis and project administration. SP: project administration and supervision. MS: data curation; writing the original draft, reviewing, and editing.

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Conflict of interest

The authors have no conflict of interest to report.

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