Computer battery cell in the cricopharynx of a toddler

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INTRODUCTION

Accidental ingestion of foreign bodies like coins, fish bones, plastic toy parts, batteries and needles are common in toddlers and pre-school children. Mostly, perforation and obstruction are likely complications. Esophageal foreign bodies should be urgently removed because of their potential to cause complications. The battery cells are potentially hazardous as they cause chemical mucositis and because of their capability to generate electric current. The mucosal damage starts early and may lead to life-threatening complications in long-standing cases. Therefore, removal of these should be accorded highest priority to prevent complications. Flexible endoscopy is the therapeutic modality of choice for most patients.\(^{[1-5]}\)

CASE REPORT

A male child aged 1 year and 9 months was brought to our center by the caregivers with history suggestive of accidentally swallowing a computer battery cell at home 4 h before. The parents provided the history of living in a one-roomed dwelling of a slum, which also served both as a computer hardware assembling and repairing workshop of the father and, usually, was cluttered with computer accessories. History suggested that the child had ingested a battery cell while playing in the vicinity of the dismantled spares of computer sets and started retching, vomiting, coughing and choking and turned pale soon after swallowing something. The caregivers had an unsuccessful attempt at retrieving the object. The father had brought along with him a sample of the battery cell to support the suspicion, which resembled a five rupees coin with smooth edges.

A high-risk informed consent was taken after counseling the caregivers for the procedure, explaining in detail the risks with the advantages and disadvantages involved in anesthesia and the course of actions of further interventions. In the preliminary history and clinical
examination, the child had dehydration and mild stridor, but showed no batter marks on the body to exclude a case of child abuse. X-ray PA view of the chest and neck was performed immediately in the emergency room, which confirmed the impaction of the foreign body [Figure 1].

The toddler was rushed to the observation room of the emergency services at our center. A fluid line was promptly started with Ringer lactate and a bolus dose of hydrocortisone and ceftriaxone was administered with adequate precautions, while the preparation was pursued to shift the child to the emergency operation theater. A pediatrician was called without delay to assess the clinical status, including hemodynamic stability of the child.

The pre-operative logistics was in favor of general anesthesia on the anticipation of use of rigid endoscope if flexible endoscopy fails and a tracheostomy in case of respiratory distress. The child was intubated orally by the anesthesiologist and the pediatric flexible esophagoscope was negotiated. The battery cell was noticed to be impacted in the cricopharynx, which is the most common site of impaction for foreign bodies.

Because of limited edematous and congested space, instrumentation was difficult and the single battery slipped repeatedly due to smooth surface, but was removed safely without trauma to the surrounding structures. An infant feeding tube was inserted immediately under direct supervision. On inspection, the foreign body was found to be discolored, with corrosion of one surface, as we could remove it before it could cause severe reaction to the tissues [Figures 2 and 3].

The child was kept in the pediatric intensive care unit to observe for immediate complications like dysphagia, odynophagia, mucositis causing stridor and aspiration in cases of delayed intervention. A nasogastric tube feeding was initiated 4 h after this non-invasive procedure. The post-operative period was uneventful. Antibiotics, steroids and anti-inflammatory drugs were given as a 5-day course and a nasogastric tube was left in situ for a week, after which the patient could swallow well before discharge. The toddler recovered uneventfully in the immediate post-operative period. The child was followed-up for the last 1 year and was free of long-term complications. Institutional ethics committee approved the publication of this report.

Foreign bodies in the esophagus are a routine emergency dealt by the otolaryngologist in daily practice. More the delay in extraction of the leaking battery cells, greater is the damage due to liquefaction necrosis of mucosa and the chance of stricture and pressure necrosis. A Taiwan study noted that 21.6% of the children accidentally ingested button batteries. There were no major complications after endoscopic removal. In the Turkish retrospective study on the ingested foreign bodies in children having endoscopic removal, the relative risk was >1 for button batteries. In the Taipei Veterans General Hospital Poison Control
Center, of 25 patients with button battery ingestion, it was noted that impacted cell needed immediate esophagoscopic removal.[7] At the department of Radiology, Klinikum Rudolf Virchow, Charlottenburg, FRG, button-type batteries ingested were removed from the esophagus and the upper gastrointestinal tract of 13 children by means of  the FE-EX "OGTM-technique." In all cases, the button cells were easily detected and retracted under fluoroscopic control with the magnet without post-operative setback.[8] Litovitz in his review of 56 cases advocated immediate removal of  cells to prevent further complications and use of nasogastric tube to prevent strictures.[9] Still, the researchers are of  the opinion that the management of ingested foreign bodies in children is not standardized.[10]

In the present case, the accidental battery cell impaction was referred to a teaching hospital emergency within 4 h. The kid was examined and diagnosis was confirmed promptly. The narrow inlet of  cricopharynx was the site of  impaction for this type of  larger foreign bodies. Primary outcome measure was immediate endoscopic removal with non-invasive technique as the utmost priority to prevent known secondary complications by the prompt extraction.

The strength of  the study is that the case of  foreign body impaction had undergone optimum management within the resource constraint set up of  eastern Indian tertiary care hospitals. Further, the case has been reported with precise details, including the follow-up. To the horizon of  our knowledge, no previous study had been reported of  children with computer battery cell in the cricopharynx of  a toddler in eastern India. We had the limitation of  reporting the case little later than expected.

Foreign bodies are dealt with by different authors differently, but the basic method is prompt endoscopy and atraumatic removal. Early removal prevents complications. Long-term follow-up is mandatory to see for late sequel.

History should be taken in detail to rule out battered baby syndrome. Further, controversies move around the logistics of  general anesthesia, use flexible or rigid endoscope and a tracheostomy in case of  respiratory distress.

Future research directions should move around research collaboration in this part of  the country for the underlying mechanisms of foreign body ingestions by socioclinical research. The caregivers need to be educated on the art of rearing of children by continuing parent education to prevent all the domestic and peridomestic accidental occurrences. They should be taught on the early identification of ingested foreign bodies, and the optimum intervention is by prompt endoscopic removal of foreign bodies under general anesthesia as the safe and effective method in children to prevent erosion and perforation of the gastrointestinal tract. Longer the duration of impaction, more are the chances of delayed complications. Training of  the primary health care staff  with clinical audit are needed for handling such emergencies without referring them to other centers, which can save morbidities with long-term complications.

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