

# Galvanic Esophageal Injury

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## Abstract

Foreign body ingestion is a common clinical problem met in paediatric practice. Though an expectant line of management is indicated in most instances, ingested button batteries warrant emergency endoscopy and retrieval. When impacted, they can result in mucosal damage as a consequence of mechanical, chemical and electrical injury as well as systemic heavy-metal toxicity. Here we report the case of a three-year-old child who presented with features suggestive of impacted oesophageal foreign body. X ray neck revealed the characteristic features, confirming the diagnosis of an impacted button battery. The battery was successfully retrieved endoscopically with fluoroscopic assistance.

## Key words

Button battery, esophageal injury, gastrointestinal foreign body, impaction

## Introduction

Accidental foreign body ingestion is a common clinical problem encountered in pediatric practice. Although most foreign bodies pass off spontaneously through naturalis, without any adverse outcomes, a few warrant urgent endoscopic intervention. The necessity for endoscopic retrieval depends on the physical characteristics of the foreign body which may indicate the likelihood of impaction, and the chemical nature of the foreign body which predicts the possibility of mucosal injury. Here, we report the case of a 3-year-old child who presented with an impacted button battery in the esophagus which necessitated emergency endoscopic retrieval.

## Case Report

A 3-year-old child was brought with the history of throat pain, incessant cry, drooling of saliva, and refusal to feed over the


past 8 h. The local examination of the oral cavity and neck was unremarkable. Accidental foreign body ingestion and esophageal impaction were suspected. X-rays of the neck and chest were taken, which revealed a circular radio-opaque disc with a thin rim of peripheral radiolucency [Figure 1] lodged at the level of the cervical esophagus. The diagnosis of an impacted button battery was thus made based on this characteristic finding at imaging.

On diagnosis, emergent endoscopy was done which revealed a button battery impacted at the level of the cricopharynx. The admission to endoscopy time was approximately 1 h. Extensive edema and ulceration at the site of impaction hindered optimal endoscopic visualization and extraction, necessitating fluoroscopic assistance [Figure 2]. The foreign body, a 3V Lithium-ion battery measuring 2 cm in diameter [Figure 3], was removed successfully. Postremoval, endoscopy revealed a short segment of ulcerated area covered by black eschar - Zargar Grade 3a [Figure 4], at the site of impaction. Considering the possible sequelae of a stricture, a nasogastric tube was placed. Oral sucralfate at a dose of 1 g qid was started on the 3<sup>rd</sup> day onward after the throat pain subsided, and continued for the next 2 weeks. The

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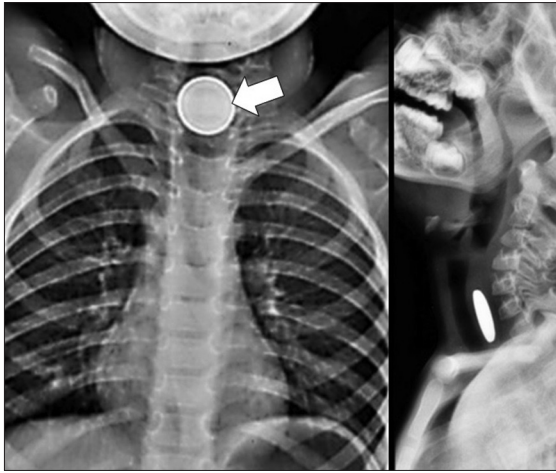
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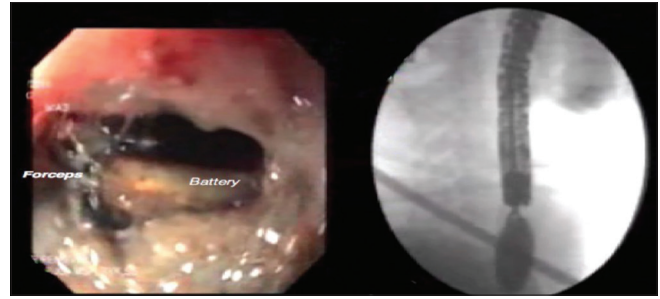
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**Figure 1:** X-ray chest showing radio-opaque disc-shaped shadow with a distinct outer radiolucent rim seen lodged at the level of the cervical esophagus



**Figure 2:** Battery extracted endoscopically using rat-tooth forceps under fluoroscopic guidance

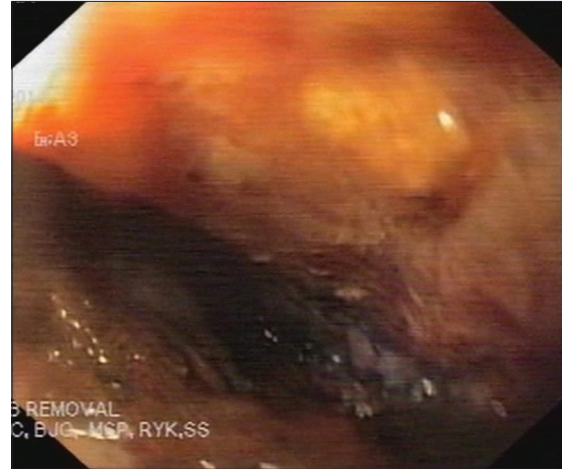


**Figure 3:** The extracted foreign body: A 2 cm sized corroded 3V Lithium-ion battery

child recovered without any sequelae. Relook endoscopy done after 6 weeks showed a linear scar surrounded by mild erythema without any stricture at the site of previous impaction [Figure 5].

## Discussion

Foreign body ingestion is a common gastrointestinal emergency in pediatric practice. Toddlers are orally curious and tend to sample objects through the mouth. Not surprisingly, the incidence of foreign body ingestion is highest between the age group of 6 months and 3 years.<sup>[1]</sup> With the increasing usage of button batteries in toys and household appliances, the incidence of accidental button battery ingestion is on the rise.<sup>[2]</sup> Esophageal impaction of a button battery differs considerably from that of a similar sized inert object in that, in addition to the mechanical injury by pressure necrosis, injury also occurs as a consequence of alkali leakage,

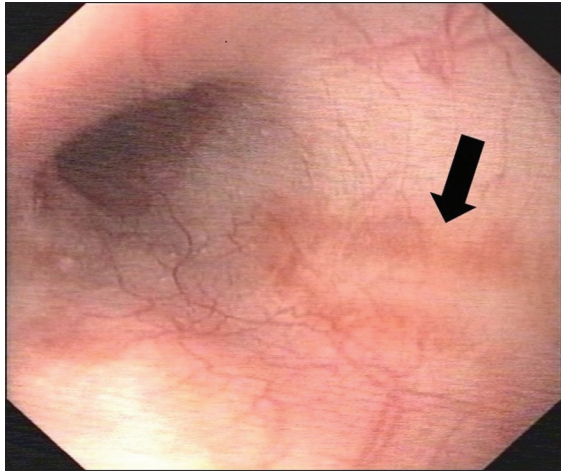


**Figure 4:** Site of impaction showing focal ulceration with black eschar

electrical injury, and heavy-metal toxicity.<sup>[3]</sup> The factors influencing outcome, therefore, include the residual electrical charge, chemical composition and diameter of the battery, and most importantly the ingestion-to-intervention time. Button battery impaction is an endoscopic emergency, wherein mucosal injury can occur as early as 1 h and potentially fatal complications such as esophageal perforation, mediastinitis, tracheoesophageal fistula, esophago-aortic fistula and death, within 4–6 h.<sup>[4,5]</sup> When history is obscure, as often is the case with children, an X-ray showing a circular radio-opaque disc with an outer rim of radiolucency clinches the diagnosis of an impacted button battery and warrants emergency endoscopic removal.

## Learning points

- Retching and drooling in children should arouse the suspicion of impacted esophageal foreign body
- Esophageal impaction of button battery carries high morbidity and is potentially fatal, mandating emergency endoscopic removal
- Button battery impaction, in addition to pressure necrosis due to its physical dimensions, also causes considerable injury secondary to alkali leakage, electrical injury, and heavy-metal toxicity
- Tell-tale circular radio-opaque shadow with radiolucent



**Figure 5:** Follow-up endoscopy after 6 weeks showing a faint linear scar with surrounding erythema (arrow) at site of impaction

rim on X-ray clinches the diagnosis of impacted button battery and differentiates it from an impacted coin

- Follow-up is required in view of the risk of delayed sequelae such as stricture.

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#### **Conflicts of interest**

There are no conflicts of interest.

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