

## Case Report



# Conservative Management of Cylindrical Battery Ingestion in a Pediatric Case: A Report from Saudi Arabia

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## Abstract

**Presentation:** A child presented to the emergency department with a one-day history of accidental ingestion of a cylindrical battery. **Diagnostic Method:** An abdominal radiograph confirmed the presence of the foreign body in the abdomen. **Management:** The patient was managed conservatively with oral clear fluids, laxatives to aid in the passage of the cylindrical battery, and serial plain abdominal radiographs to monitor its movement from the stomach to the descending colon until it was expelled through the rectum. **Discussion:** Daily clinical examinations, serial abdominal radiographs, and conservative management with oral clear fluids and laxatives can facilitate the passage of an intact cylindrical battery through the rectum in children without causing corrosive effects or complications. However, if the battery casing is compromised, it can cause caustic damage to the airways or gastrointestinal tract.

**Keywords:** *Abdominal X-ray, Cylindrical Battery, Foreign Body Ingestion, Management.*

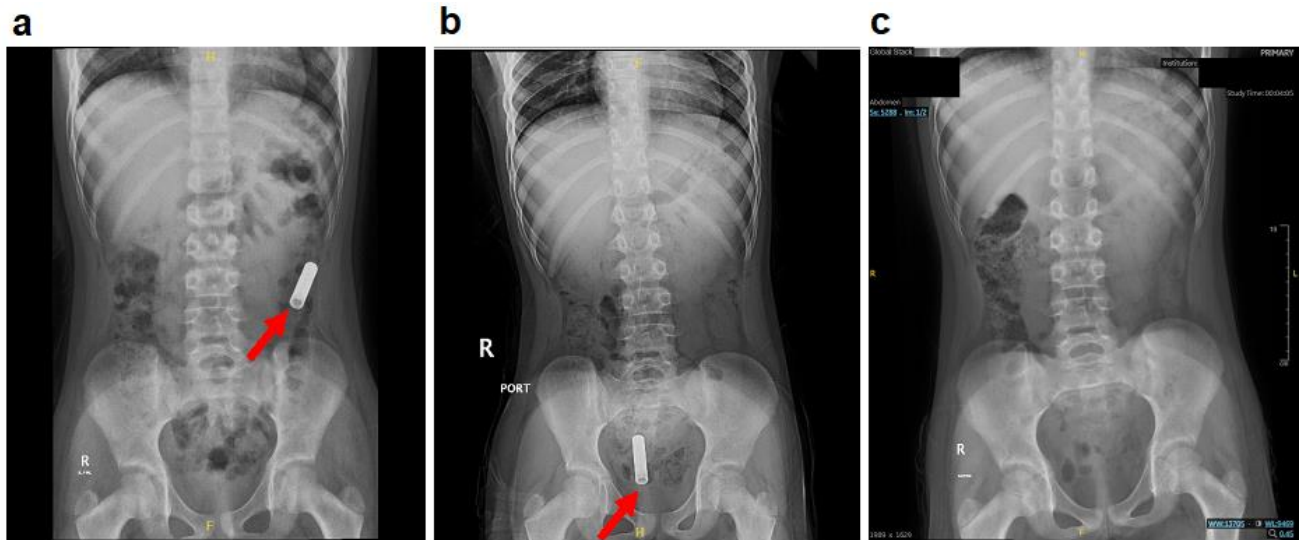
## Introduction

Foreign body ingestion is common among the pediatric population, with button battery ingestion being more frequently reported in the literature than cylindrical battery ingestion [1,2]. While guidelines exist for managing button battery ingestion [3,4], there are no clear guidelines for cylindrical battery ingestion, despite their larger size. Cylindrical battery ingestion can lead to serious complications, including intestinal obstruction, hemorrhage, bowel perforation, peritonitis, and even death [5]. Management strategies for ingested cylindrical batteries include conservative management, endoscopic retrieval, or surgical retrieval. The choice of management depends on various factors, including the type, number, and location of the ingested batteries, as well as the structural integrity of the battery casing and the overall clinical presentation [5-7]. This case report discusses the presentation and management of a pediatric patient who accidentally ingested a cylindrical battery.

## Case Report

A 7-year-old female presented with a one-day history of foreign body ingestion, having accidentally ingested a remote-control battery while playing. She arrived at the emergency room awake, alert, and vitally stable, with no pain, nausea, vomiting, or abdominal discomfort. Her physical examination was unremarkable, revealing a soft, non-distended abdomen with normal bowel sounds. Laboratory studies showed no abnormalities. An initial abdominal X-ray revealed a cylindrical battery (size AAA) in the stomach.

She was admitted for surgical and gastroenterology assessment and monitoring, with plans for endoscopic or surgical intervention if the battery did not pass through the gastrointestinal tract or if symptoms developed. The following day, an abdominal X-ray showed the battery had moved to the descending colon. The patient was managed with clear oral fluids, intravenous fluids, and oral laxative polyethylene glycol (Movicol). Additionally, a single dose of rectal laxative (Fleet enema) was administered. Although she passed stool, the battery remained in the colon. On the third day, the battery was spontaneously expelled via the rectum, and a subsequent abdominal radiograph confirmed the absence of any foreign body in the abdomen. The representation of the case is shown in Figure 1.



**Figure 1:** a) Radiopaque cylindrical foreign body, suggestive of an ingested battery, visible in the stomach. b) Radiopaque cylindrical foreign body, suggestive of an ingested battery, visible in the mid portion of the descending colon. Fecal loading is noted. c) Compared to previous imaging, the foreign body is no longer visible in the descending colon, indicating elimination via the rectum. Fecal loading is noted.

## Discussion

Foreign body ingestion is common among the pediatric population, particularly in children aged six months to three years. However, battery ingestion can also occur in older children, adolescents, and even adults [5-7]. Individuals with mental health conditions are at a higher risk for foreign body ingestion. The literature more frequently documents button battery ingestion compared to cylindrical battery ingestion.

A retrospective analysis, published in 2021, reviewed cases from a tertiary care center involving 124 children under 18 months who ingested batteries between January 1, 2014, and March 31, 2019. The study found that 23 (18.5%) children ingested cylindrical batteries, while 101 (81.5%) ingested button batteries [1]. Similarly, a 7-year study conducted by the National Capital Poison Center (NCPC) in Washington, DC, and published in 1992, reported that button battery ingestion was significantly more common than cylindrical battery ingestion (2,320 cases vs. 62 cases, or 97.4% vs. 2.6%) [2].

In pediatric patients, the ingestion of cylindrical batteries poses a risk of physical obstruction in the airways or esophagus due to their small size. If the battery casing is damaged, it can cause caustic injury to the airways, esophagus, and gastrointestinal tract, leading to severe complications such as perforation, which may necessitate emergency endoscopic or surgical intervention [6-8]. However, if the ingested cylindrical battery has an intact casing and moves to the stomach, it can be managed conservatively. Daily clinical examinations, serial abdominal radiographs, and the administration of oral clear fluids and laxatives can facilitate the battery's passage to the rectum without causing corrosive effects or complications [5,9].

A 2019 case report described an incarcerated adult who ingested two AA batteries.

One battery was retrieved endoscopically, while the second moved to the distal small bowel beyond the reach of endoscopy and was subsequently passed spontaneously via the rectum after laxative administration and supportive care. The authors conducted a literature review in PubMed, Scopus, and the Cochrane Library, identifying 15 reported cases of cylindrical battery ingestion. Most cases involved asymptomatic patients. When symptoms occurred, they were typically upper gastrointestinal complaints or abdominal pain, with unusual presentations including ST segment abnormalities on electrocardiogram and grand mal seizures. All but one patient with a history of prior abdominal surgery required

surgical or endoscopic intervention for battery retrieval, likely due to adhesions or dysmotility preventing the batteries' passage. Several patients spontaneously passed the cylindrical batteries via the rectum [10].

## Conclusion

Given the absence of established guidelines for cylindrical battery ingestion, multiple reported cases, including our own, have demonstrated that close observation with serial X-rays can be an effective management strategy for intact cylindrical batteries. However, if a damaged cylindrical battery is ingested or if the patient exhibits clinical symptoms, endoscopic retrieval or surgical consultation should be pursued. Therefore, we advocate for the development of specific guidelines for the management of cylindrical battery ingestion.

## Abbreviations

Cylindrical Battery: The type of battery discussed in the case report  
 ED: Emergency Department  
 GI: Gastrointestinal  
 HMG: Dr. Sulaiman Al-Habib Medical Group  
 IV: Intravenous  
 Movicol: Laxative used in management  
 NCPC: National Capital Poison Center  
 NSAIDs: Nonsteroidal Anti-Inflammatory Drugs  
 PEG: Polyethylene Glycol  
 XR: X-ray

## Declarations

## Conflicts of Interest

There are no competing interests to declare.

## Patient Consent

Informed consent was obtained from the parents for the publication of the child's details and Figure 1 in this report.

## Funding Statement

None

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