

Are strange radiopaque bodies with double contours in the digestive tract always button cell batteries?

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Received: 20/09/18
Accepted: 06/02/19

Abstract

Accidental ingestion of foreign bodies constitutes an emergency for pediatric care services especially since the group most frequently affected consists of children between 6 months and 3 years of age. Ingestion of button cell batteries has high risks for severe early complications such as esophageal perforations and mediastinitis, as well as the long term risk of stenosis. Early identification and extraction are the most important management strategies. A double contour on a frontal cervical, thoracic, or abdominal x-ray is characteristic, but this same radiological sign has been reported for other foreign bodies. We present two cases with these characteristics.

Keywords

Battery, button cell, double contour, radiography.

INTRODUCTION

Accidental ingestion of foreign bodies constitutes an emergency in gastroenterology, pediatrics and pediatric surgery services. While digestive tract issues are usually benign, some of these objects can cause serious injury to the esophagus. (1, 2) Of the total cases, 60% to 80% are reported in the pediatric population, with a maximum incidence between six months and three years of age. (3) The most frequently recorded foreign bodies are coins (50% to 70% of cases); (4-6) sharp objects such as earrings, tacks, pins, needles and bones; (33%) and button cell batteries (15%). (4)

Radiological studies are useful for diagnosis and location of foreign bodies, but only 65% of ingested objects have been reported to be radiopaque. (7, 8) Of these, it is important to differentiate between coins and button cell batteries, given their similar radiological characteristics and the differing therapeutic requirements that they imply. (9)

The double contour sign in a frontal chest x-ray has been said to confirm the presence of a button cell battery impacted

in the esophagus, (10) but we present two cases of pediatric patients who had this radiological characteristic but who had in fact ingested foreign bodies other than batteries.

CASE 1

The patient was a four-year-old boy from the city of Piura. He was admitted to the emergency service of the Hospital Santa Rosa de Piura after ingesting a foreign body the day before. Upon admission, he was experiencing dysphagia and sialorrhea. During the physical examination, he was found to be hemodynamically stable. Laboratory tests were normal, and a round, double-contoured, radiopaque foreign body was shown in the upper esophagus by a chest x-ray (Figure 1A). The patient was evaluated by the surgery service and the object was extracted with a Foley catheter. At the end of the procedure, a metallic trouser button was obtained (Figure 1B). There were no complications after the intervention and the patient was discharged with good oral tolerance.

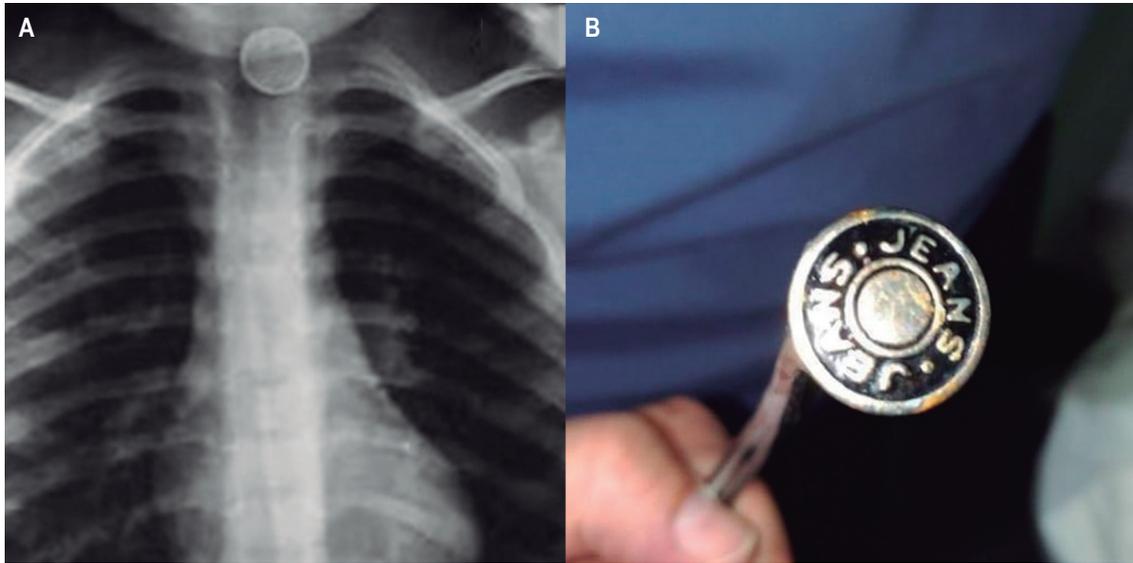


Figure 1. A. Posteroanterior chest x-ray showing a round, double contoured, radiopaque foreign body in the upper third of the esophagus. B. Metallic trouser button removed with a Foley catheter.

CASE 2

The patient was a one year and 10 month old boy from Chiclayo who was admitted to the emergency service of the Lambayeque Regional Hospital in Chiclayo after ingesting an unknown foreign body thirteen hours earlier. The patient's initial respiratory distress resolved spontaneously

but was followed by vomiting and hyporexia. At the time of admission, sialorrhea and dysphagia were evident. During the physical examination, he was found to be hemodynamically stable. Blood and biochemistry tests were normal.

A chest x-ray revealed a rounded, double contoured, radiopaque foreign body in the upper esophagus (Figure 2A). Given the uncertainty about the type of foreign body

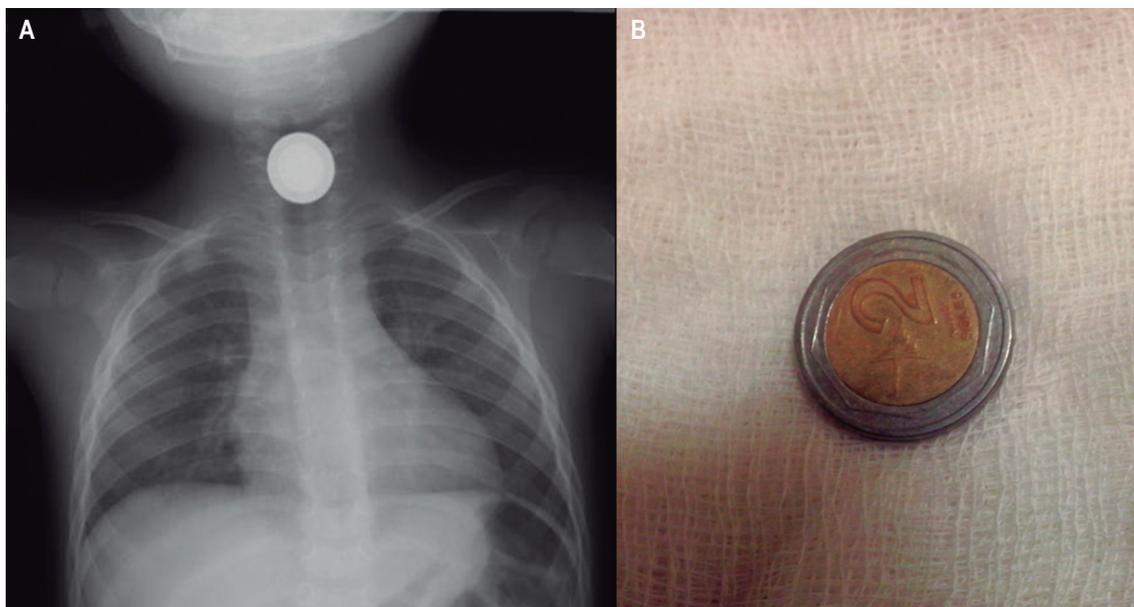


Figure 2. A. Anteroposterior chest x-ray showing a rounded, double contoured, radiopaque foreign body in the upper third of the esophagus. B. A new Peruvian sole coin which contains two alloys which cause a double density on the frontal x-ray were extracted.

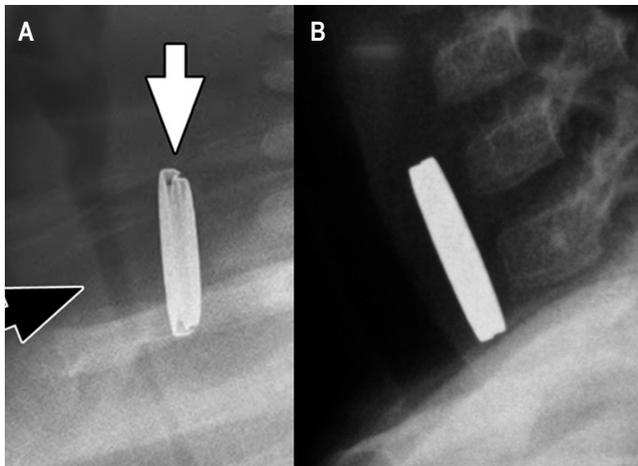


Figure 3. A. Lateral x-ray clearly shows the difference in diameter between the cathode and the anode (white arrow), as well as the different densities of the different alloys found in button cells (black arrow). B) Lateral x-ray of a patient with two coins attached to each other so that they show a uniform lateral border and a single radiological density.

ingested, and given the suspicion of a button cell, he was immediately scheduled for endoscopy under general anesthesia. Finally, a coin was removed (Figure 2B). The patient tolerated the procedure appropriately. After being tested orally, he was discharged.

DISCUSSION

For pediatric patients who have ingested foreign bodies, early diagnosis and immediate removal are essential. Ideally, button cells should be removed within the first two hours as they are related to early and usually severe complications of esophageal perforation, mediastinitis, and tracheoesophageal fistulas. Late complications can include esophageal stenoses. (11, 12)

Although the double contour sign on a frontal x-ray is characteristic of button cells, it is not unique to these foreign bodies. Gan et al. documented a patient who ingested two coins which became impacted together in the esophagus. (13) Our two cases are additional examples.

For this reason, knowledge of the diameters of various coins and the button batteries used in the local environment can be very useful. Similarly, it should be considered that x-rays of coins show a wide outer edge, so that when they contain one or two alloys, they appear to have either a uniform density or two changes in density. This differentiates them from button cells, which show a thin border and usually have three to four density changes. (14)

Consequently, a lateral x-ray should always be taken to visualize the difference in diameter between the cathode and the anode in the case of the button cell which contrasts with the image of a coin which has a uniform edge (Figures 3A and 3B). (4, 15)

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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