CLINICAL IMAGE

Ingested Foreign Body in a 2-Year-Old Boy

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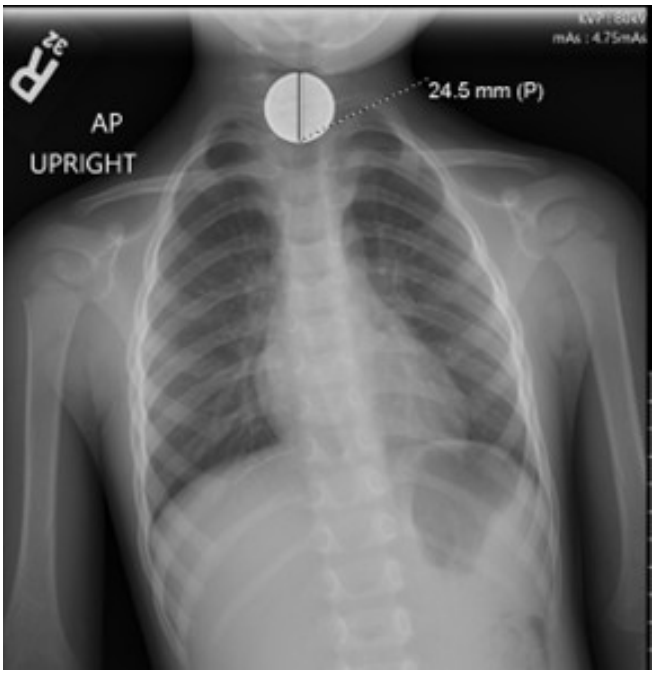
CASE REPORT

A 2-year-old male with history of episodic eczema presented to the emergency department following multiple episodes of emesis throughout the morning. The mother estimated that the patient had 5-10 episodes of nonbloody, nonbilious, mucus-predominant emesis. The mother also endorsed 1 day of rhinorrhea, sinus congestion, decreased appetite and fever (Tmax 101°F). The patient did not have any relief in symptoms or fever reduction with over-the-counter cold and flu medications. He maintained regular stool and urine output since symptoms began. Upon further questioning, it was determined that the child potentially swallowed a coin while playing earlier that morning. Mother was unsure of the size or type of coin he may have ingested.

On exam, the child was alert, active, and nontoxic-appearing. There was no sinus discharge, tympanic membranes were unremarkable, and the posterior pharynx was moist without erythema or exudates. His lungs were clear bilaterally without any stridor or signs of respiratory distress. The abdomen was soft, nondistended, and nontender. The skin was warm, dry, and had good turgor. Vital signs were stable, he was afebrile, not tachycardic, and maintained 100% oxygen saturation on room air. A respiratory panel was obtained, which was negative for SARS-COV-2, respiratory syncytial virus (RSV), influenza A, and influenza B. An anterior/posterior (AP) chest/abdomen/pelvis x-ray was obtained, which revealed a 2.5-cm coin at the level of the cervicothoracic junction visible in the coronal plane (see Figure 1).

FIGURE 1: Anterior Posterior x-ray revealing a coin within the cervical esophagus



QUESTIONS

1. What is the most common ingested foreign body in children?

a. Battery

b. Coin

c. Food

d. Magnet

e. Safety pin

Correct Answer:
b. Coin

Coins are the most commonly ingested foreign body.[1] Although any object can become impacted when swallowed, severity and management varies based on the foreign body characteristics and location.

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The authors have no conflicts of interest or financial disclosures.

2. What is an exam finding that indicates an urgent need for intervention?

a. Abdominal pain

b. Cough

c. Gagging sensation

d. Rash

e. Stridor

Correct Answer:
e. Stridor

Stridor can indicate that an object is lodged within the trachea posing potential for airway obstruction. Other concerning signs include drooling with an inability to manage secretions, which may indicate a complete esophageal occlusion, and crepitus along the neck, which could suggest esophageal perforation. Other symptoms can vary depending on the type of object and its location along the gastrointestinal (GI) tract, and may include a foreign body sensation, gagging, coughing, and abdominal discomfort.[1] Depending on the length of time since ingestion, patients can develop fever and other systemic symptoms due to sensitivity reactions to the object material.[1] It is important to note that even with a witnessed foreign-body ingestion, half of the patients may remain asymptomatic.[1]

3. What is the best definitive management of a confirmed coin within the esophagus?

a. Endoscopic retrieval

b. Induce vomiting

c. Observation at home

d. Surgical intervention

Correct Answer:
a. Endoscopic retrieval

Spontaneous passage is possible dependent on the size of the coin, age of the patient, and position of the coin in the esophagus at time of presentation. Coins lodged within the distal esophagus are more likely to spontaneously pass into the stomach; however, depending on size, intervention may still be needed to avoid entrapment distally.[1] Endoscopic intervention has shown great success with removal of upper GI foreign bodies, avoiding the need for open surgical intervention in most cases.[2] Medical management by inducing vomiting has not been shown to be effective and has potential to increase harm.1 The patient in this clinical scenario was subsequently transferred to a pediatric hospital for endoscopic retrieval.

DISCUSSION

Within the United States, there are more than 100,000 cases of ingested foreign bodies annually.[3] Of these cases, a vast majority occur in children, with the most ingested object being a coin.[1] While some ingestions are witnessed, children may swallow objects without caregivers being aware. More concerning, half of patients who do ingest an object will display nonspecific symptoms or remain asymptomatic.[4] This highlights the need to maintain a broad differential diagnosis when evaluating children with concern for potential ingestion, regardless of presenting symptoms.

On initial assessment, it is important to identify concerning signs and symptoms that would prompt emergent endoscopic intervention including stridor, inability to manage secretions, and crepitus with tenderness along the neck.[4] Stridor is suggestive of the object partially occluding the trachea or within the esophagus but large enough to cause tracheal compression.[2] Drooling may be seen with an ingested foreign body regardless of severity, however the inability to manage secretions is indicative of complete esophageal occlusion.[4] Pain along the neck associated with crepitus raises concern for esophageal perforation.[5]

It is important to promptly identify the ingested object, as not all objects are managed in the same manner. In a well-appearing child without concerning symptoms, it is recommended to proceed with a 2-view x-ray of the neck and chest.[6] Traditionally, it has been thought that ingested coins in the esophagus are seen in the coronal plane versus those in the trachea that are seen in the sagittal plane on radiography. However, there have been several case reports demonstrating variability between anatomic position and imaging findings.[7] Ingestion of multiple small magnets, button batteries, or sharp objects poses significant risk and are managed differently than a common coin ingestion.[8,9] While a singular magnet most likely can pass without intervention, two or more ingested magnets can attract each other, posing risk for severe complications such as obstruction or perforation.[10] Ingested button batteries can induce a current that causes localized hydrolysis of tissues leading to focal caustic burns and potentially perforation of the mucosa.[9,11]

Batteries and coins may be hard to differentiate initially on radiography, therefore it is important to properly identify each due to their variation in clinical management. There are a few key techniques to utilize when reviewing the x-ray if there is concern for a coin ingestion versus a button battery. A button battery will have a “double halo” sign around the edge, as well as a “step off” seen on lateral images due to the segmentation of positive and negative poles. This contrasts with a smooth or ridged edge that may be visible on a coin (see Figure 2).[11] There are few

documented cases of multiple coin ingestions at once resulting in a "stacked" coin orientation, which can falsely give a "double halo" appearance as seen with button batteries.[12]

FIGURE 2: Button batteries front and back with notable "step off" groove

The location of the coin along the GI tract dictates the next step in management. Coins with a diameter >25 mm are unlikely to pass through the pylorus.[13] The American quarter is 24 mm, which poses a threat of entrapment especially in those under the age of 5 years.[9] While coins lodged in the distal esophagus are more likely to pass spontaneously versus those in the proximal and middle esophagus, it is still recommended that asymptomatic esophageal foreign bodies be removed endoscopically within 24 hours.[1,9] Stable patients with a distal esophageal foreign body should be observed for 12 hours with repeat imaging prior to intervention to assess passive migration.[13] Coins located within the stomach do not necessitate immediate intervention. Stool straining for spontaneous passage within 1-2 weeks with a repeat x-ray at 2 weeks as an outpatient is recommended.[14] If passage does not occur, endoscopy may be needed.

If ingestion is suspected with concern for multiple magnets, button batteries, or an irregularly shaped or sharp object, prompt consultation with a pediatric GI or surgical specialist is critical. While awaiting their assessment, provide supportive care and prepare to transport the patient to a tertiary center as indicated.

SUMMARY

Ingested objects are common among pediatrics cases and may present with various nonspecific symptoms, potentially even no symptoms at all. It is imperative to identify patients with an acute obstruction and coordinate urgent removal. Other ingested objects that do not pose an initial threat should be properly identified using radiographic imaging and any known history from the ingestion. Management then varies depending on anatomic location, object material, and size characteristics. The most important takeaway is educating caregivers to identify objects with potential for ingestion and to maintain a safe environment in an effort to reduce the incidence of pediatric ingested foreign bodies.[15]

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