"I don't think it's a coin!"

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A seven-year-old healthy female is brought to the emergency department by her mother. The girl had been playing with a friend about an hour earlier, when she accidentally swallowed something that came out of a broken garage door opener. Although she had complained of pain initially, she is now asymptomatic with no stridor, wheezing, or drooling.

On exam, she looks well and her vital signs are normal. Physical exam is otherwise unremarkable. Chest and abdominal films (Figures 1 and 2) show a coin-shaped object in her stomach. You suspect she has swallowed a button battery.

Figure 1. Chest X-ray showing coin-shaped object in the region of the stomach.

Figure 2. Lateral X-ray of the same patient.

Questions:

1. *When should we suspect button battery ingestion?*
2. *How serious is a button battery ingestion?*
3. *What about toxicity/toxins?*
4. *How should this case be managed?*

Answers:

1. When should we suspect button battery ingestion?

Button batteries are the fourth most common foreign bodies ingested after coins, toys, and jewelry. This is especially common in children.

When faced with an X-ray showing an ingested coin-shaped object, magnifying the film may help demonstrate the double density of a button battery when seen from the top, or a step-off with a rounded edge on one side when viewed from the side (Figure 3).

2. How serious is a button battery ingestion?

Button battery ingestion is potentially very serious. The button batteries can cause tissue injury by direct pressure necrosis, caustic injury due to leakage of sodium or potassium hydroxide, or low-voltage burns. Perforation of the gastrointestinal (GI) tract has occurred as rapidly as six hours after esophageal impaction.

Vivid case reports of esophageal perforation, aortic perforation with exsanguination, and tracheoesophageal fistulae initially led to recommendations for aggressive management, including surgical removal. Closer

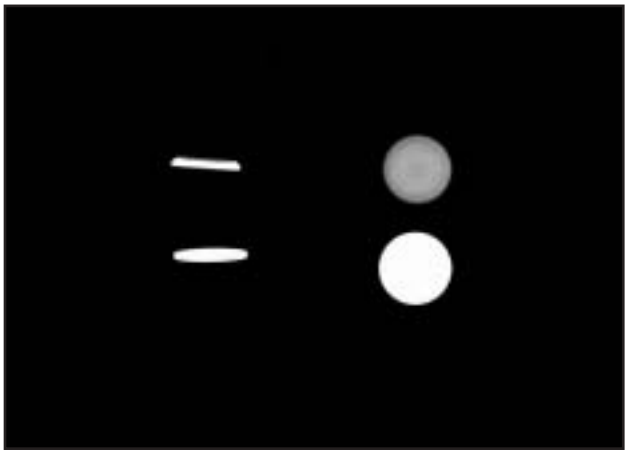

Figure 3. X-ray appearance of a 20-mm button battery (above) shown from the side (left) and from the top (right), compared to a nickel (shown below button battery).

examination of a large series of cases, however, reveals complications are very rare and only occur when larger batteries become lodged in the esophagus.

In a study of over 2,000 button battery ingestions, only about one in 10 patients was symptomatic and only two had severe complications.

Batteries distal to the esophagus almost always pass spontaneously without complications (although there have been rare case reports of batteries leaking or perforating through a Meckel's diverticulum). The danger of sequelae decrease with decreasing battery size.

3. *What about toxicity/toxins?*

Button batteries in the GI tract tend to remain intact for about two weeks, so chemical toxicity from ingestion is not common. Although mercury toxicity has been reported, most button batteries today are mercury-free, and, when it is present, most mercuric oxide from batteries is converted in the gut to insoluble metallic mercury.

Having said that, batteries with mercuric oxide cells are more likely to fragment than batteries of other chemical compositions, so if fragmentation with mercury leakage is suspected, referral for removal is recommended and the patient should be appropriately monitored for mercury toxicity.

4. *How should button battery ingestion be managed?*

Symptomatic cases, or cases where esophageal impaction is suspected, should be referred for urgent endoscopic removal. There is a National Button Battery ingestion hotline (1-202-625-3333) in Washington, D.C. that may assist decisions in difficult cases.

X-rays are indicated to determine the location of the battery and to serve as a baseline, although considering the low incidence of complications, some authorities recommend restricting X-rays to symptomatic patients.

For batteries located beyond the esophagus, conservative management/watchful waiting is appropriate. Almost all pass spontaneously and complications are far fewer than would be expected with aggressive management. Patients should be discharged with instructions to examine each stool to ensure passage of the battery. If passage does not occur within one week, most recommend a repeat X-ray.

Laparotomy is reserved for failure of less invasive techniques or in those cases with known perforation. In adults over 60 years of age, impaction in the small or large intestine is far more common than in children.

Ipecac use is contraindicated. Metoclopramide may speed gastric transit, but no controlled studies exist. Dx

This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to diagnosis@sta.ca.

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