

CLINICAL VIGNETTE

A Curious Case of Button Battery Ingestion

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Introduction

Approximately 3,500 individuals ingest button batteries annually in the United States.¹ While most batteries can safely pass through the gastrointestinal tract without causing harm, if lodged in the esophagus, life threatening injury can occur. Though the majority of button battery ingestions occur in children less than age 6, adults age 50 and over make up the second most common group.² Physicians should be well-versed in the management and evaluation of patients with potential battery ingestions, as well as aware of resources available to help guide management.

Case

A 72-year-old female patient contacted her primary care physician after she inadvertently ingested a button battery at home. She had awoken in the middle of night, as was her regular routine, to take her nighttime medications, which she kept on her nightstand. In the morning, she noticed one of her hearing aid batteries was missing, and moreover, one of her nighttime pills was still sitting on her nightstand.

She called her primary care physician for advice, approximately 7 hours after she had ingested the battery. The patient denied any chest pain, shortness of breath, cough, choking sensation, nausea, vomiting, diarrhea, fevers, or abdominal pain. She was overall feeling well and had been eating and drinking normally. She had a normal bowel movement approximately 1 hour earlier. She was unsure of the exact size of the battery but thought it was less than a centimeter in diameter.

Upon review of her medical history, she was noted to have a history of coronary artery disease requiring percutaneous coronary intervention, mitral regurgitation requiring mitral valve replacement, subsequent endocarditis requiring second valve replacement, hypertension, cerebrovascular accidents, hypothyroidism, and chronic anticoagulation with warfarin. She had no history of esophageal surgery or anomaly. The patient was advised to go to the Emergency Department (ED) for urgent radiographs and evaluation. She was also advised to bring her other button battery to the ED, so the imprint on the battery would be available when contacting the National Battery Ingestion Hotline (NBHI).

In the ED, the patient continued to be asymptomatic. Vital signs were normal. As per report, there was no evidence of stridor, her chest was clear, and abdominal exam was

unremarkable. Radiographs of the nasopharynx, chest, abdomen, and pelvis were obtained. A battery was not visualized. Given that she had a bowel movement approximately 6 hours after ingestion of the battery, it was presumed that it had passed. The patient was discharged home with strict return precautions. On follow-up evaluation with her primary care physician, she continued to feel well and noted she no longer stored her hearing aid batteries near her pills.

Discussion

Hearing aids are the most common source of ingested button batteries (greater than 80%). Moreover, the victim of the ingestion is most commonly the owner of the hearing aid. As in the case of our patient, a significant amount of inadvertent ingestions occur when the hearing aid battery is mistaken for the patient's medication.

The NBHI, which is a subdivision of the National Capital Poison Center, is available 24 hours a day for consultation and advice to patients and physicians in cases of battery ingestion. Battery identification number from an identical battery or packaging can be used to determine a treatment plan. The size of the battery in addition to the battery charge state, type of battery, and magnet co-ingestion is of particular importance. The time of ingestion and patient's history of any esophageal anomalies are also important to management.

Most button batteries, particularly those less than 15mm in diameter, pass through the gastrointestinal tract without any adverse effect.² However if a button battery becomes lodged in the esophagus, serious injury can occur. Causes of injury have been attributed to pressure necrosis, leakage of corrosive battery contents, absorption of heavy metals, and generation of external current causing electrolysis of tissue.¹ These complications can occur within just 2 hours of ingestion, reinforcing the need for emergent evaluation.

Significant complications can include esophageal stricture, stenosis, or perforation; tracheoesophageal fistulas; vocal cord paralysis from damage to the recurrent laryngeal nerve; aspiration pneumonia; tracheal stenosis; or tracheomalacia.

Patients can present with chest pain, cough, nausea, vomiting, abdominal pain, or choking sensation. Many symptoms are due to the battery becoming lodged in the esophagus.

However, most patients are asymptomatic. Initial management involves stabilization, and in most cases, radiographs should be obtained to visualize the nasopharynx to the anus to confirm battery location. The patient should also be asked about magnet coingestion, which can cause bowel perforation and is of particular concern in young children. The patient should not eat or drink until the battery has been verified to have passed through the esophagus on radiographs.

If the battery is visualized in the esophagus, the patient should undergo emergent endoscopy for retrieval. If underlying mucosa appears normal upon retrieval, most patients can be discharged home post-procedure. However if there is evidence of esophageal injury, hospitalization is usually recommended, and the patient will need to undergo another endoscopy or barium swallow 3-4 weeks after the initial ingestion to evaluate for stricture.

Retrieval is also recommended, if the battery is seen in the stomach and the patient displays symptoms of tissue injury such as fevers, hematemesis, melena, or abdominal pain. If the battery is initially visualized in the intestines, then no further intervention is usually required. Most smaller batteries will be eliminated within one week while batteries larger than 15mm usually require retrieval.

In some cases radiographs can be deferred if the patient is older than 12 years of age, the battery measures less than 12 millimeters, and a magnet has not also been ingested.¹ The patient should be advised to seek immediate attention should symptoms arise. Stools should be monitored by the patient until passage.

In all cases, if the battery is not seen within 14 days, the patient should undergo radiographs to ensure passage of the battery, and the patient should undergo endoscopic retrieval if the battery is still in the stomach.

Conclusion

In our case, the patient did not suffer any long-term consequence after ingesting her hearing aid battery. However given the frequency of this scenario, users of hearing aids should be warned of this danger and given precautions in case of accidental battery ingestion. Physicians should evaluate for cardiopulmonary compromise and obtain emergent radiographs. The NBHI is available for consultation and assistance in management.³

REFERENCES

1. **Litovitz T, Whitaker N, Clark L, White NC, Marsolek M.** Emerging battery-ingestion hazard: clinical implications. *Pediatrics*. 2010 Jun;125(6):1168-77. doi: 10.1542/peds.2009-3037. Epub 2010 May 24. PubMed PMID:20498173.
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