Esophageal Perforation and Tension Pneumothorax Secondary to Button Battery Ingestion in a 10 Year Old

Ghofran Habib M.D., Victoria Vo M.D.  Department of Anesthesiology, Tufts Medical Center, Boston, MA

INTRODUCTION
We describe a case of 10 year old 70kg 160cm female with mild developmental delay who accidentally ingested a button battery. The retrieval was complicated by esophageal perforations with mediastinal injury resulting in the rare complication of a tension pneumothorax. Her postoperative course was complicated by respiratory failure requiring prolonged mechanical ventilation, septic shock, acute renal injury, and a prolonged ICU stay.

OUR CASE
Our patient presented to us four hours after the original ingestion. The patient was not in any distress during the initial evaluation. Preoperative imaging studies demonstrated that the battery was in the thoracic esophagus. Retrieval was attempted first by the ENT surgeons with a rigid esophagoscope which was not long enough to reach the distal esophagus as this patient was bigger than an average 10 year old. Subsequent attempts were made with a longer scope, however the battery could not be visualized. Intraoperative chest x-ray showed that the battery had migrated in the stomach now with no evidence of pneumomediastinum or a pneumothorax. Consequently, pediatric GI was contacted and after 4 hours was able to successfully retrieve the battery with a flexible endoscope. The patient was extubated without event and transferred to the PICU in stable condition.

One hour later the patient developed chest pain and respiratory distress as evident by hypoxemia and tachypnea; chest x-ray at this time showed a frank tension pneumothorax with mediastinal shift. A chest tube was placed with improvement of her symptoms.

Endoscopy was performed and revealed two distal esophageal perforations (1.5 cm and 1 cm) at the distal esophagus which were repair via an open thoracotomy in the morning. Post operatively the patient developed mediastinitis and went into septic shock, requiring fluid resuscitation, vasoactive medications, and mechanical ventilation. She also developed a pleural effusion due to inadequate chest tube drainage that required a third procedure for a pigtail insertion by interventional radiology. The patient remained intubated for a week and she was started on total parenteral nutrition. After two weeks, the patient was transferred to regular floor and left the hospital on post-operative day 18.

DISCUSSION
To date, button battery ingestion complicated by a tension pneumothorax has only been reported once. This case is particularly noteworthy in that the patient became profoundly septic and required a prolonged hospital stay. In addition, it forces us to reevaluate the question of which subspecialty is best suited for retrieval of foreign bodies when the object is below the clavicles. These complications could have been potentially avoided or minimized if care had not been delayed, appropriate equipment had been made available, or potentially if a standard protocol had been in place.

References:
2. Yardeni D1, Yardeni H, Coran AG, Golladay ES. Severe esophageal damage due to button battery ingestion: can it be prevented? Pediatric Surg Int. 2004 Jul;20(7):496-501