



Pathology/Biology Section - 2015

H45 Fatal Aorto-esophageal Fistulae Due to Foreign Body Ingestion in Young Children: Presentation of Two Cases

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After attending this presentation, attendees will understand how an aorto-esophageal fistula may develop, the potential subtleties of clinical presentation, and will be aware of the hazards of ingesting coin batteries.

This presentation will impact the forensic science communities by increasing knowledge of the pathology of aorto-esophageal fistulae and factors leading to their development. This knowledge may lead to greater public health awareness and prevention of deaths due to ingested objects, including coin batteries.

Foreign body ingestion is common in young children, with close to 80,000 cases reported to the American Association of Poison Control Centers' National Poison Data System in 2011. In the majority of cases, foreign body ingestion will not have an adverse outcome; however, it can lead to more serious consequences, including respiratory complications, esophageal erosions, or even an Aorto-esophageal Fistula (AEF). In 2011, two deaths due to disc battery ingestion were reported in children under the age of five years.

At the Tarrant County Medical Examiner's Office in 2013 and 2014, two children less than two years of age with sudden onset of upper gastrointestinal hemorrhage and death were autopsied. Case 1 was a 14-month-old female in a store shopping cart who developed seizure-like activity and copious bleeding from the mouth prior to becoming unresponsive. At autopsy, two opposing round mid-esophageal ulcerations were present, with formation of an AEF. Blood was in the stomach and small bowel almost to the cecum. A foreign object was not identified. The child was evaluated by a pediatrician two weeks prior for vomiting and crying and was treated for bilateral otitis media. When she returned home, she was unable to swallow solid foods, though she could take liquids. This resolved within one week.

Case 2 was a 19-month-old male brought to an emergency room by a babysitter for blood coming from his mouth. A radiograph showed a foreign object in the stomach. The child died prior to transport to a tertiary care center. At autopsy, an esophageal ulceration with an AEF and a bronchoesophageal fistula were present, with blood and a large lithium coin battery present in the stomach. Three days prior to death, he was seen in an emergency room for a "barking" cough and was diagnosed with croup.

Esophageal foreign bodies as a group require early intervention because of their potential to cause complications, including erosion, periesophageal abscess, and fistula formation between the aorta and/or the tracheobronchial tree. Button or coin batteries are particularly hazardous due to their size and shape as they are easily swallowed and become lodged in the esophagus or airway. These batteries are used in many household items including flashlights, toys, watches, hearing aids, and remote controls. Lithium batteries generate current flow through saliva which hydrolyzes water, creating alkaline hydroxides that result in caustic tissue damage and rapid perforation. If untreated, AEF can lead to massive gastrointestinal hemorrhage with exsanguination, shock, and death as seen in both presented cases. A coin battery was found in the stomach in case 2. While no foreign object was found in case 1, the ulceration had characteristics similar to a round object. In retrospect, both children had prior symptoms of foreign body ingestion with partial obstruction that led to their evaluation by a physician; however, the diagnosis was not made. As evidenced by these cases, the presenting symptoms may be vague and easily confused with other common childhood illnesses. It is important for pediatric practitioners to be aware of the dangers of foreign body ingestion and the potential for formation of aorto-esophageal fistulae, especially with the increased use of lithium coin batteries in household items.

Aorto-esophageal Fistula, Foreign Body Ingestion, Coin Battery