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FOREIGN BODY INGESTION AND ITS MANAGMENT IN CHILDREN - AREVIEW ARTICLE

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ABSTRACT

Children commonly swallow foreign bodies. most children are observed to be between 6 months and 3 years of age. Coins are the most commonly swallowed foreign Most swallowed foreign bodies will harmlessly pass through the GI tract Although endoscopic or surgical removal may be required in a few children, but some will lead to health problems if they become lodged traumatize the mucosa (e.g., sharp or pointed object, like arazor blade or pin), or cause caustic burn injury (e.g., biologically active substances, such as a button battery or a medication patch those presenting with a single or multiple magnets and a metallic FB that have advanced beyond the stomach, symptomatic children need a consultation with a pediatric surgeon for surgery, and asymptomatic children may be followed with serial X-rays to assess progression. Sharp or pointed, and long or large and wide FBs located in the esophagus or stomach require endoscopic removal. The usual presentation is with sudden onset of cough,gagging or strider with or without respiratory distress.

KEYWORDS: Foreign bodies, Child, Endoscopy.

Etiology

Button/disc batteries may cause serious injury if lodged in the esophagus, nose, ear, or another orifice for even a brief period. The highest risk is associated with larger lithium-based batteries. Children with suspected button/disc battery ingestion should be managed urgently; a battery lodgedin the esophagus should be removed without delay. A button/disc battery may be distinguished from a coin when seen on a radiograph by its characteristic two-

layer appearance when seen on-end, or a circle-within-a-circle appearance when seen front-to-back.

Small, powerful magnets, such as those found in some toys and games, may cause serious injury to the intestines, as the strong attraction betweentwo or more magnets may cause them to erode through intervening tissues.[6] A single swallowed magnet in combination with another metallic object, most notably a button/disc battery, may also cause injury.

Preexisting GI tract abnormalities, such as previous surgery, strictures,fistulas, diverticula, or functional abnormalities, increases the risk of a swallowed foreign body becoming lodged at the site of the abnormality.

TYPE OF FOREIGN BODY

Coins

Coins are the most commonly ingested FB in children, children presenting with an ingested coin without complications) can be observed over 12–24 hours before performing an invasive procedure (endoscopic or surgical removal) t coins lodged in the upper and mid esophagus require endoscopic removal, although 60% of coins lodged in Children in whom coin ingestion is observed or suspected need to undergo an X-ray to confirm the presence, size, and location of the coin, am stool should be monitored for the passage of the coin, and serial X-rays should be obtainedevery 1 or 2 weeks until passage of the coin has been confirmed. I

Button batteries

Button batteries resemble coins in size and shape, a careful X-ray examination is important to avoid a delay in diagnosis. Button batteries can cause severe damage secondary to local hydrolysis and the action of hydroxide on the mucosa, caustic injury secondary to a high pH, and minor electrical burns secondary to lithium. Button batteries impacted within the esophagus can cause burns within 4 hours. Usually, small button batteries (diameter ≤20 mm) do not cause serious complications that are observed inassociation with larger button batteries (diameter ≥20 mm).[17]

The NASPGHAN Endoscopy Committee recommends removal ofesophageal button batteries within 2 hours.

MAGNETS

If a single magnet is ingested, it can be expected to be passed spontaneously if the magnet is

not too large. However, if multiple magnets or a single magnet with a metallic FB has been ingested, the contact between these ingested magnets or the magnet and the metallic FB and the mucosal surfaces of different body parts can cause mucosal pressure necrosis, as well as intestinal obstruction, fistula, and/or perforation; therefore, surgical removal is needed in such cases.[19]

Symptomatic children need to consult a pediatric surgeon to plan surgery and asymptomatic children may be closely followed using serial X-rays tomonitor progression of the FBs.

Sharp or pointed foreign bodies

Ingestion of sharp or pointed FBs in children is known to be associated with high morbidity and mortality, and delayed diagnosis and management increases the risk of serious complications. Sharp or pointed FBs such as safety pins, nails, hair-pins, screws, pine needles, thumbtacks, or dental prostheses can cause serious complications such as esophageal ulceration and/or perforation, tracheafistula, and/or abscess formation, peritonitis, an aorto-esophageal fistula, and even death[26] Usually, intestinal FBs are known to cause perforation in.

Fish bones

Fish bones comprise the most common food-related FB ingested by children., Children usually show fish bone impaction in the palatine tonsils, tongue base, vallecula and pyriform sinus because the laryngopharynx is narrower and the tonsils are larger in children than in adults, fish bone impaction is rare in the esophagus below the pharynx. However, fish bones lodged in the esophagus can cause mucosal ulceration or a topical inflammatory reaction leading to esophageal stenosis, perforation, a deep neck abscess,mediastinitis, a lung abscess, or even aortic fistulae. Therefore, prompt andaccurate diagnosis and treatment are required.

SYMPTOMS

- Difficulty swallowing, also known as dysphagia
- Sensation of a lump in the throat, neck or chest, if the object is blunt
- Pain in the throat, neck or chest, if the object is sharp
- Gagging, retching and vomiting
- Wheezing and coughing
- Drooling or spitting due to excess saliva in the mouth
- Blood-stained saliva

- Pain or cramping in the abdomen
- Abdominal swelling or bloating
- Blood in the stool
- Diarrhea or constipation.

PATHOPHYSIOLOGY

The most common complication of foreign body ingestion in children is obstruction of the object in the esophagus, although the foreign body may become lodged anywhere in the gastrointestinal (GI) tract. Once lodged, the object may partially or completely obstruct the GI tract. Furthermore, some foreign bodies may erode through the GI tract, causing complicationsdue to perforation or migration of the object. Certain patients may be at higher risk for retention, obstruction, or perforation. These include younger patients with smaller anatomy, those with prior upper GI tract surgery, history of significant gastroesophageal reflux or eosinophilic esophagitis, neuromuscular disease states, or presence of congenital malformations.[14]

The most common site for obstruction is at the thoracic inlet, which is the area between the clavicles on x-ray. The cricopharyngeus sling located at C6 is also located at this level and known to be a common site for the lodgement of foreign bodies. About 10%-15% of foreign bodies get trapped in the mid esophagus, where the carina and aortic arch overall the esophagus. The rest get entrapped at the lower esophageal junction.

Foreign bodies are likely to get lodged in children with preexisting esophageal abnormalities. Once a foreign body reaches the stomach, it isless likely to be associated with complications. However, some foreign bodies can become trapped at the ileocecal valve.

History and Physical

In cases of suspected foreign body ingestion, the airway (including the oropharynx) and breathing should be evaluated promptly. A foreign body that has become obstructed within or injured the esophagus may cause chest pain or a foreign body sensation. Symptoms may be more notable when swallowing. Younger children may drool, gag, vomit, or refuse food. Hematemesis and cough may be present. A foreign body lodged in the stomach or intestines may cause abdominal pain, vomiting, or bloody stools. If present for a prolonged period, fever or weight loss may develop. A foreign body that has completely obstructed the esophagus will cause more dramatic symptoms.

Importantly, however, there may be no signs or symptoms (or they may besubtle and hard to recognize) in pediatric ingestions. Since many foreign body ingestions by children are unwitnessed, the possibility of non-specificsymptoms being caused by foreign body ingestion should always be considered. In one series, for example, only half of the patients had any symptoms whatsoever despite witnessed ingestion of a foreign body.[15]

Swallowed foreign bodies that contain nickel may cause systemic signs and symptoms, such as rash or pruritus, in patients with nickel sensitivity.

Evaluation

If a complete history and physical examination (including examination of the pharynx) suggest possible foreign body ingestion, the provider must decide whether imaging is indicated. If so, usually plain radiographs sufficeinitially. Healthy children with recent, low-risk ingestions may be simply observed. Metallic swallowed foreign bodies, such as coins and batteries, will show up readily on a plain radiograph. Metal detectors are occasionally used, especially in the setting of known coin ingestion.[16,17] It is not unusual to find an unexpected foreign body on a radiograph obtained for the evaluation of non-specific symptoms, such as a cough, fever, or weight- loss. Most glass fragments are visible on a radiograph. Radiolucent objects, such as a large piece of meat or a plastic toy, may not be apparent on radiographs, although their edges or irregularities may still be noticeable on radiography. Affected patients may require more advanced imaging techniques, such as contrast-enhanced radiography or MRI scanning, but these patients may also be considered for treatment (e.g., endoscopy) without further imaging.[20,21]

Treatment / Management

Most children who have swallowed a foreign body do not require invasive treatment. Asymptomatic, previously healthy children who have swallowed low-risk foreign bodies typically will do well. Patients and caregivers shouldbe instructed on the signs and symptoms of subsequent potential complications.[22]

Foreign bodies that are lodged in the esophagus are most commonly removed endoscopically.[25] Some, especially those lodged in the lower esophagus at the gastroesophageal junction, will pass spontaneously into the stomach after a few hours; this is safe for coins and similar small, inert objects, in children with otherwise normal GI tracts who are at low risk of further complication as the object passes through the remainder of the

GI tract. Some centers will remove small esophageal foreign bodies, especially coins, with a bougie or a balloon catheter; these require substantial experience. Endoscopy is also typically used to remove large, sharp, pointed, or other high-risk objects from the stomach, or in patients for whom continued passage of the object through the GI tract poses a risk.Objects in the lower GI tract should be managed in conjunction with a specialist, who may recommend surgical removal.

Medical management of foreign body ingestion is not recommended. Emetics, muscle relaxants, and meat tenderizers are typically ineffective, and are potentially dangerous, in the treatment of children with esophageal foreign bodies.[26] Laxatives are occasionally used to promote the passage of objects from the intestines, but this practice has not been proven effective.

Differential Diagnosis

The differential for pediatric foreign body ingestion is broad, but the following entities should be considered (or ruled out) in patients presentingwith such complaints:

- Esophagitis
- Pyloric stenosis
- Laryngitis
- Pharyngitis
- Globus sensation
- Esophageal rupture

Prognosis

The outcomes and prognosis in pediatric foreign body ingestion are generally good, with most patients tolerating passage of ingested objects without intervention. Even in scenarios where intervention is needed, mortality and morbidity are low. High-risk ingestions (button batteries, magnets) can be associated with complications, and in rare instances, death.[8]

Systemic reactions associated with zinc allergy have been reported. Esophageal foreign bodies have been known to cause mediastinitis, perforation, and pneumomediastinum. Button batteries cause the highest morbidity, and thus, they need to be removed as soon as the diagnosis ismade. Finally, procedures to remove foreign bodies can also cause complications-either from the anesthesia or the procedure.

Complications

As stated above, esophageal obstruction is the most common complication of foreign body ingestion in children.[27] However, some foreign bodies may erode through the GI tract, causing complications due to perforation or migration of the object. The following complications may be observed in rare cases:

- Esophageal or stomach perforation
- Pneumothorax
- Mucosal erosion
- Aortoenteric fistula
- Pressure necrosis
- Failure to thrive secondary to decreased oral intake

Enhancing Healthcare Team Outcomes

Management of children who have swallowed foreign bodies requires an interprofessional approach. Physicians, nurses, poison control specialists, radiology technologists, child life specialists, ambulance personnel, and others must work together to provide continuous, child-friendly care, both acutely and in follow-up. [Levels 3, 4, and 5] The nurse should educate the parent and caregiver about the dangers of leaving small items around children. In addition, parents should be told never to keep button batteries around children as they are known to cause rapid damage to the GI tract.[28]

Unusual or recurrent foreign body ingestion should prompt consideration of psychosocial concerns and an evaluation by a mental health professional. Foreign body ingestion may be risk-taking or attention-seeking behavior.

Abuse or neglect may be present. Mental illness may lead some children to swallow foreign bodies. This may be inadvertent, such as the patient with bulimia who loses grip on a toothbrush used to induce vomiting and swallows it. Packets of drugs may be swallowed to avoid detection by police.

Prevention of foreign body ingestion in children is a high priority. Caregivers should be educated about preventing small children from contact with small objects that may be harmful if swallowed, especially button/disc batteries, small magnets, and other high-risk objects. This includes items placed into a trash container that may be accessible to children.

Outcomes

The majority of ingested foreign bodies pass through the gastrointestinal tract without any complications. In rare cases, the retained foreign body may cause ulceration, perforation, bleeding, or localized stricture formation. The most dangerous foreign bodies are button batteries, which can rapidly cause mucosal injury. Magnets are also known to cause mucosal injury in the small bowel leading to perforation. In rare cases, complications are alsoknown to occur during removal of the foreign body- usually from the anesthesia.[30]

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