Chapter 254

Foreign Bodies

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The emergency department (ED) management of foreign bodies can be simple and rewarding. The three basic management plans are attempted removal, reassurance, and consultation. The plan will depend on the body cavity, the nature of the foreign body, and the clinical presentation. This chapter discusses foreign bodies of the ear, nose, airway, and gastrointestinal tract. Management of pediatric vaginal foreign bodies is discussed in Chapter 255.

Ear Foreign Bodies

Clinical Presentation

Children of all ages have been described with foreign bodies in the ear canal (median age 6 years) (6,18). Presenting complaints may include pain, discomfort, decreased hearing, and bleeding (6). Ear foreign bodies have included insects, paper, beads, seeds, eraser tips, earring parts, toy parts, and disk or button batteries (3,6,18).

Differential Diagnosis

It is usually easy to identify foreign bodies in the ear canal. Impacted wax and rare ear canal masses may be mistaken for foreign bodies. Chemicals released from disk or button batteries can cause an intense localized inflammation that can mimic otitis externa (3).

ED Evaluation and Management

The ED evaluation of a suspected ear foreign body is almost always straightforward and involves visual inspection of the ear canal with an otoscope. If a button battery is suspected, radiography can easily identify this metallic foreign body.

Most ear canal foreign bodies can be removed by emergency physicians in the ED (6,18). The most commonly described techniques involve grasping the object with forceps, using a hook, loop, or curette to drag the object out of the ear canal and irrigation to wash the object out (5,6). A loop may be fashioned from a paperclip when more specialized tools are not available (10). Irrigation should only be undertaken if the tympanic membrane is intact (14). Procedural sedation improves the chances of successful removal in the ED (6). Urgent removal of a button battery is indicated to avoid continued tissue destruction (3).

Essentially all ear foreign bodies can be managed in the ED with or without sedation (6). In the event that a foreign body other than a button battery cannot be removed in the ED, outpatient referral to an ear, nose, and throat (ENT) surgeon is appropriate.

Nasal Foreign Bodies
Clinical Presentation
Nasal foreign bodies tend to present in young children (median age of 2 to 3 years) (6,13). These children are asymptomatic about 50% of the time (6,13). Less common complaints include a foul odor, persistent nasal discharge, pain or discomfort, and bleeding. In about 10% of cases, unilateral nasal discharge is the sole presenting complaint (6,13). The most commonly encountered nasal foreign bodies include beads, plastic toy parts, corn kernels, and beans (13). Bilateral nasal magnets adherent across the nasal septum have also been described (7,24).

Differential Diagnosis
Young children with unilateral nasal discharge should be treated as if they have a nasal foreign body until proven otherwise (5). Nasal polyps may be mistaken for foreign bodies. Children who have a foul odor emanating from the mouth or nose may have halitosis, purulent pharyngitis, sinusitis, or a dental infection.

ED Evaluation and Management
A nasal foreign body can be identified by visually inspecting the nasal passages. Good lighting and a pediatric nasal speculum may be helpful.

The vast majority of nasal foreign bodies can be managed in the ED by emergency physicians (6,13). Sedation may be helpful in uncooperative children with large or adherent foreign bodies (6). The techniques for removal include grasping the object with forceps, using a hook, loop, or curette to drag the object forward, and suction applied directly to the foreign body (5). A positive pressure technique may be used whereby the parent applies pressure to the contralateral nostril and then blows into the mouth to expel the foreign body (2). Positive pressure has also been applied to the contralateral, unaffected nostril via wall oxygen at 10 to 15 L and oxygen tubing connected to a male-male adapter to generate pressure behind the object and expel it (19). Another technique is to insert a balloon catheter (such as a 6-French silicon Foley catheter or Fogarty vascular catheter) past the foreign body, inflate the balloon, and then withdraw the catheter with the balloon inflated. This is a good choice for large round smooth objects that are difficult to grasp and friable, fragmented materials such as clay and paper that fall apart when grasped. Bilateral nasal magnets adherent across the nasal septum may be removed by placing the metal handle of a pair of forceps or a household magnet in each nostril to break the magnetic attraction and individually remove the magnets (7,24).

Essentially all children with nasal foreign bodies are discharged home (6). If a foreign body cannot be removed in the ED, outpatient referral to an ENT surgeon is appropriate in all cases except button batteries and magnets adherent across the nasal septum, which require urgent removal to avoid tissue necrosis.

Airway Foreign Bodies

Clinical Presentation
Although aspirated foreign bodies are uncommon (5), they are most commonly seen in toddlers (4). The most common symptoms include choking or coughing (5). Other signs and symptoms include dyspnea, fever, and wheezing. Stridor, hemoptysis, and the absence of symptoms are uncommon. The most commonly reported aspirated objects are foods, with peanuts seen in about one third of cases (5).

Differential Diagnosis
The symptoms associated with aspirated foreign bodies are nonspecific. The differential diagnosis includes viral upper respiratory tract infections, bronchiolitis, croup, asthma, pneumonia, and hydrocarbon aspiration.

ED Evaluation and Management
Definitively determining whether a child has aspirated a foreign body can be difficult. Radiography and the physical exam are insensitive (9). If the object is radiopaque, a two-view chest x-ray can clearly reveal the location of the foreign body in the trachea or a bronchus. Unfortunately, about 85% of aspirated foreign bodies are radiolucent. If the radiology technologist can time it properly, inspiratory and expiratory chest x-rays may reveal a relatively normal and symmetric inspiratory radiograph, but hyperinflation on the side with the foreign body on the expiratory radiograph. Bilateral lateral decubitus films may reveal a failure of the mediastinum to shift downward on the affected side. However, this technique is insensitive (1). Bronchoscopy can be both diagnostic and therapeutic (4).

Once an aspirated foreign body has been identified or is strongly suspected, consultation for bronchoscopy is indicated. A variety of pediatric specialists perform this procedure, including pulmonologists, intensivists, otolaryngologists, and surgeons.

Aspirated foreign bodies and children with a clinical picture suspicious for aspirated foreign bodies should undergo urgent bronchoscopy.

### Gastrointestinal Foreign Bodies

#### Clinical Presentation

Swallowed foreign bodies are common (15). Most children with subdiaphragmatic foreign bodies are asymptomatic, including those who ingest batteries (5,17). Developmentally delayed children may ingest large or sharp foreign bodies, present in an atypical fashion, or provide a limited history as a result of communication difficulties (8). The ingestion of multiple magnets may cause pressure necrosis as the wall of the intestines is trapped between magnets. The child may present with abdominal pain without fever, or symptoms of obstruction, volvulus, or perforation (11). The most widely studied esophageal foreign bodies are coins (5). More than 90% of children with esophageal coins are symptomatic before or at the time of presentation to the ED (5). Symptoms of esophageal foreign bodies include drooling, substernal pain, and a foreign body sensation.

#### Differential Diagnosis

Although usually asymptomatic, subdiaphragmatic foreign bodies may present with abdominal pain or rectal bleeding (21). Conditions such as appendicitis, intussusception, Meckel diverticulum, intestinal polyps, or other rare causes of abdominal pain are included in the differential diagnosis.

#### ED Evaluation and Management

A traditional approach to evaluating a child with an ingested foreign body is to obtain x-rays from the nasopharynx to the bottom of the pelvis, looking for radiopaque foreign bodies. If a foreign body is identified, the critical question is whether the foreign body is esophageal, as these typically require treatment. If a child is asymptomatic, can eat and drink without apparent pain or difficulty, and has a negative set of x-rays, a subdiaphragmatic radiolucent foreign body is assumed. If the child has persistent foreign body sensation or pain in the substernal area or neck and the x-rays are unrevealing, the child may need to undergo esophagoscopy to evaluate for esophageal abrasions or a radiolucent esophageal foreign body. The use of handheld metal detectors has also been described in the evaluation of ingested coins. When used by emergency physicians, they are highly sensitive and specific for coin presence and highly accurate for coin localization (16). When the coin is localized to the stomach or beyond, children have been discharged without adverse events (22). This approach may save time and radiation exposure.

Subdiaphragmatic foreign bodies are expected to pass spontaneously the vast majority of the time in a child with normal anatomy, even if the object is sharp or an intact battery (8,20). Subsequently, most subdiaphragmatic foreign bodies require only reassurance. Exceptions include very large or very long and pointed objects (typically ingested by developmentally delayed older school-aged children), children with abnormal gastrointestinal anatomy (e.g., an ileostomy), children with multiple magnets in the intestines (11), children with intestinal batteries that appear to be fragmenting on x-ray (17), and symptomatic children.
Esophageal foreign bodies, especially button batteries, tend to need removal to avoid esophageal erosion (5) (Fig. 254.1).

Figure 254.1. Radiograph of a large, flat disk battery in the distal esophagus of a young child. Note the faint circular area of relative radiolucency near the periphery of the object shadow. This characteristic target appearance distinguishes this object from the more homogeneous appearance of an ingested coin. (Photograph by Lance Brown, MD, MPH.)

The vast majority of ingested foreign bodies, especially those that have been confirmed to be subdiaphragmatic, can be managed expectantly at home without further intervention unless symptoms such as vomiting, bloody stools, or abdominal pain develop. Although it has been historically recommended that parents sift through stools until the foreign body is identified as having been passed, this process does little more than punish the parents. Children who have ingested multiple magnets typically require a laparotomy for magnet removal (11). Children with esophageal foreign bodies may require admission for removal (5) or removal may be attempted in the ED (12). In general, coins above the thoracic inlet should be urgently removed by an otolaryngologist, pediatric gastroenterologist, pediatric surgeon, or emergency physician because of the low rate of spontaneous passage and the risk of complications including airway obstruction. Children with acutely ingested esophageal coins below the thoracic inlet may be observed for up to 16 hours because spontaneous passage may occur in up to 40% of cases.

**Critical Interventions**
- Urgent removal of button batteries in the ears, nose, or esophagus
- Use of sedation to remove ear foreign bodies if not accomplished easily on first attempt
- Urgent removal of bilateral nasal magnets adherent across the nasal septum
- Surgical consultation for the ingestion of multiple magnets

**Common Pitfalls**
- Delaying management of a disk battery or multiple magnet ingestion
Failure to use procedural sedation and appropriate equipment to manage ear foreign bodies
Failure to consider foreign body as the cause of unilateral nasal discharge
Relying on radiography to rule out an aspirated foreign body

Web References


