

Swallowed foreign bodies

What is a swallowed foreign body?

Virtually any object small enough to pass through the pharynx may be swallowed. The objects most frequently ingested by children are coins, but may also be small toys, pencils, pens and their tops, batteries, safety pins, needles and hairpins – they are mainly radio-opaque. Food-related items, such as chicken and fish bones, are more often ingested by older children and adults and tend to be radiolucent. In adults, dentures or parts from dentures can be swallowed accidentally.

Trichobezoar is a rare condition where hair ingestion leads to formation of a hair ball in the stomach.

The majority of ingested foreign bodies will pass spontaneously. Although at least 80% of foreign objects pass without the need for intervention, some will cause damage to the gastrointestinal (GI) tract and/or become lodged^[1]. Patients swallowing foreign bodies are usually asymptomatic but symptoms can result. It may even lead to life-threatening obstruction of the upper GI and respiratory tracts.

Epidemiology

- The ingestion of foreign bodies is most commonly a problem in young children aged 6 months to 5 years. The most common age is between 1-2 years. However, it can affect children of all ages (those younger than 6 months can occasionally ingest materials with the aid of older siblings during play)^[1].
- Coins are the foreign body most commonly ingested in infants and children^[2].
- It occurs much less frequently in older children and adults but does affect these groups rarely. It usually occurs accidentally but can result from deliberate ingestion.

- Patients with psychiatric illness, or intellectual disability, or those who are prisoners or are 'drug-mules'/'body-packers' (involved in the smuggling of illicit drugs concealed in the GI tract) are prone to problems caused by purposeful ingestion of foreign bodies.

Ingested foreign body symptoms

- This is highly variable and depends on whether it is a child or an adult. In children the event may have been witnessed, or reported by the child, or be suspected/discovered subsequently when a child becomes ill.
- Any symptoms or signs are also largely dependent on where any lodged object is impacted.
- About 75% of children who have an impacted foreign body (FB) will have it at the level of the upper oesophageal sphincter, with roughly 70% of affected adults having impaction at the level of the lower oesophageal sphincter.
- In a 2019 review of 194 episodes of paediatric FB ingestion, 53.6% were by males and 46.4% by females with a median age of 43.5 months^[3]. Presentation was divided into asymptomatic (44.3%) and symptomatic (55.7%). The most common symptom was vomiting (23.2%). In the majority of cases, foreign bodies were located in the oesophagus (37%).
- Young children, mentally impaired adults and those with psychiatric illness^[4] may thus present with choking, refusal to eat, vomiting, drooling, wheezing, bloodstained saliva, or respiratory distress^[1].

Oropharyngeal foreign bodies

- The majority of foreign bodies become trapped at this level (commonly at, or just below, the level of the cricopharyngeus muscle).
- Patients usually have a clear sensation of something being trapped that is relatively well localised.
- Small linear items such as bones and toothpicks are often trapped at this level, from the tonsils/posterior tongue to the vallecula and upper oesophagus.

- There is usually discomfort ranging from mild to quite severe.
- Drooling and an inability to swallow may be present.
- Airway compromise may occur if large objects are trapped.
- A delayed presentation with infection or perforation may occur with foreign objects that become stuck at this level.

Oesophageal foreign bodies

- In adults, there is usually an acute presentation following ingestion of an object or food item that becomes stuck.
- There tends to be a vague sensation of something being stuck in the centre of the chest or epigastric region, indicating that the object is probably at the level of the aortic cross-over or the lower oesophageal sphincter.
- There may be dysphagia for the remainder of the meal, prompting presentation or salivary pooling/drooling if there is complete oesophageal obstruction.
- Children with oesophageal impaction tend to have a less clear-cut presentation, although there may have been a witnessed swallowing event.
- Gagging, vomiting, retching, neck and/or throat pain are more common presentations in children with oesophageal foreign bodies.
- Children with partial oesophageal obstruction may present with a chronic course featuring inability to feed, **faltering growth**, fever, recurrent **aspiration** pneumonitis/pneumonia or respiratory embarrassment/stridor (due to tracheal impingement).

Sub-oesophageal foreign bodies

- These may present with a range of symptoms, depending on the degree of progression of the foreign body through the gut.
- Vague symptoms, such as abdominal distension and discomfort, fever, recurrent vomiting, passing rectal blood/melaena and/or other symptoms of acute or subacute intestinal obstruction, may be present.

Symptoms due to GI perforation

- Sometimes even a piece of bone within a meal can lead to perforation of the oesophagus and even injure the pericardium and myocardium^[5] .
- If an object perforates the oesophagus, it tends to cause acute mediastinitis with chest pain, dyspnoea and severe odynophagia (pain associated with swallowing), along with signs of pneumonitis/pleural effusion.
- Perforation below the level of the oesophagus will cause symptoms and signs of acute/subacute peritonitis.

Examination of the patient with definite or suspected foreign body ingestion/entrapment

This is often unhelpful; however, careful examination should be carried out for acute clinical and medicolegal reasons.

- Assess the airway and respiratory function to exclude/highlight any compromise.
- Check vital signs to exclude impending catastrophic presentation due to airway obstruction or acute GI perforation, or fever in case of delayed presentation.
- Open the mouth and observe the oropharynx with a bright light.
- Consider indirect laryngoscopy and/or fibre-optic examination of the pharynx if you have appropriate equipment and a sufficiently experienced practitioner available.
- Gently palpate the neck and assess tracheal position/compression.
- Formally examine the chest and listen to the lungs.
- Perform a cardiovascular examination.
- Carefully examine the abdomen.

Differential diagnosis^[6]

- This clinical scenario is unlikely to be confused with another illness, with the possible exception of space-occupying oesophageal pathology - eg, [oesophageal carcinoma](#) causing obstruction of a normal food bolus.
- Always consider the possibility that a foreign body has been inhaled, particularly if a patient presents acutely with respiratory compromise or with chronic chest symptoms.
- An acute presentation of mediastinitis may be due to perforation by a swallowed foreign body, or the primary form of the disease.
- [Retropharyngeal abscess](#) can cause similar symptoms to impacted objects in the upper oesophageal area.
- Pneumomediastinum can present similarly, where there is a [pneumothorax](#) into the mediastinal portion of pleura.

Investigating ingested foreign bodies

Blood tests are usually unhelpful, with the exception of chronic presentations or febrile patients where FBC/ESR may provide useful clues as to the cause of symptoms.

Plain X-rays

Important information

Where there is a history of a swallowed radio-opaque object that may be located within the upper GI tract, plain X-ray should be carried out to confirm or refute the possibility of oesophageal entrapment. If there is a suspicion of swallowing a button battery then X-rays and further treatment should be performed urgently^[7].

- Where the ingested foreign object is not radio-opaque, X-ray investigations are unlikely to help and will probably only delay more relevant investigations such as upper GI endoscopy.
- X-rays can identify most true foreign objects, steak bones and free mediastinal or peritoneal air.

- Radiographs can confirm the location, size, shape and number of ingested foreign bodies and help exclude aspirated objects. However, fish or chicken bones, wood, plastic, glass, and thin metal objects are not easily seen.

CT scans

- CT scanning of the thorax/abdomen can be very useful for locating entrapped foreign objects of various types and is often undertaken instead of plain X-ray imaging.
- CT scans can be more useful than conventional X-rays in localising swallowed dentures^[8] .

Endoscopy

- Urgent endoscopy is mandatory in cases where there is airway obstruction or evidence of other severe complications.
- Where there is a clear history of swallowing foreign objects, such as toothpicks and/or aluminium bottle caps/can rings, endoscopy is the investigation/procedure of choice, as there is a high rate of complications with these objects.
- Endoscopy is also indicated for gastric or proximal-duodenal foreign bodies that have a diameter of >2 cm, a length of >5-7 cm or are eccentrically-shaped and prone to enlodgement/perforation, such as open safety pins.
- Although flexible endoscopy under local anesthesia is a less time-consuming procedure for adults, rigid endoscopy under general anaesthesia may be preferable for children^[9] .

Other tests

- CT should be considered as the first-choice technique for the diagnosis of oesophageal fish bone foreign body or if the history of ingestion of objects is not clear-cut^[10] .
- Handheld metal detectors can also be used to localise metallic objects^[11] .

Foreign body ingestion treatment and management

Studies have shown that removal of foreign bodies by experienced hands, at well-equipped endoscopy units and under conscious sedation, in most cases leads to high success rates, with complications (if they do occur) tending to be minor^[12] .

Emergency management

- Act quickly to locate and remove any foreign object that may be causing acute upper airway obstruction.
- Where airway obstruction is life-threatening and a foreign object cannot be removed then obtain urgent senior A&E/anaesthetic/ENT advice and/or consider cricothyroidotomy as a life-saving procedure.
- Children with upper GI obstruction and/or airway compromise should be allowed to stay in their parent's arms whilst being transferred to, or assessed in, hospital, to reduce anxiety and worsening airway embarrassment^[6] .
- Indications of instability or a need for urgent transfer to hospital include:
 - Airway compromise.
 - Drooling.
 - Inability to swallow fluids.
 - Sepsis.
 - Suspicion of intestinal perforation.
 - Evidence of active bleeding.
 - Clear history of ingestion of a button battery.

Conservative management

- Stable patients who have swallowed small, smooth objects, who have no evidence of oesophageal entrapment, otherwise negative imaging and no evidence of damage, can often be managed conservatively with follow-up at 24 hours or so to check that they remain well; passage of objects in stool may take days to weeks and parents should observe for their presence. In a paediatric review spontaneous passing of the FB occurred in 60.3%^[3] .
- Patients with stomach or small-intestine foreign bodies of width <2 cm or length <6 cm can be discharged home with instructions on symptoms that should prompt their re-attendance; patients with larger or sharp objects in these areas should be referred to a gastroenterologist who may carry out serial X-rays.

Interventional management

Those with foreign objects lodged in the oesophagus will usually require some form of intervention to prevent ulceration and/or other complications; options include endoscopy, removal with a Foley® catheter, bougienage (use of a stiff rod to push objects such as coins past the lower oesophageal sphincter), oesophagotomy^[13] and medical therapy to dilate the lower oesophageal sphincter.

- Both flexible and rigid endoscopy remove oesophageal foreign bodies successfully^[9]
- Endoscopic removal of foreign bodies generally has a low probability of complications, including impaction, perforation and obstruction^[14] .
- Adult patients with oesophageal entrapment of food bolus or other food-related objects should be considered for referral to a gastroenterologist, as there is a significant incidence of oesophageal lesions such as carcinoma in these patients.
- Patients with signs of small bowel obstruction or peritonitis should have surgery - endoscopy should not delay surgery.

Drug trafficking

- Narcotic 'body packers'/'drug mules' should be followed up and monitored as inpatients due to the risk of drug toxicity^[15]. They may need bowel irrigation and/or surgical intervention if there is any evidence of systemic effects of leaking narcotics (endoscopy is not recommended, as it tends to release drugs from the packages)^[16]^[17].

Ingested foreign body complications

A 2019 retrospective review noted complications in 9% of cases^[3].

Oropharyngeal foreign bodies

- Scratches and lacerations of oropharyngeal mucosa.
- Perforation.
- Retropharyngeal abscess.
- Soft-tissue infection or abscess.

Oesophageal foreign bodies

- Scratches, lacerations or abrasions of mucosa.
- Oesophageal necrosis (beware swallowed button batteries in children).
- [Retropharyngeal abscess.](#)
- [Oesophageal stricture.](#)
- Oesophageal perforation and subsequent para-oesophageal abscess.
- [Mediastinitis.](#)
- [Pneumothorax](#) and/or pneumomediastinum.
- [Pericarditis/cardiac tamponade.](#)
- Tracheo-oesophageal fistula (especially swallowed button batteries in children).
- Aorto-oesophageal fistulae or other mediastinal vascular injury.

Gastric/small-intestine foreign bodies

- Entrapment of an object within a [Meckel's diverticulum](#).
- Perforation leading to peritonitis and advanced sepsis.
- Acute or subacute small-intestinal obstruction.
- [Metal poisoning](#) (coins).

Prognosis

- On the whole, prognosis is good, especially with appropriate investigation, management and follow-up.
- Complications are more likely in those cases of longer than 12 hours since foreign body ingestion or sharp-pointed object ingestion ^[14] .
- Most patients with ingested foreign bodies will suffer no significant sequelae. However, a minority of people will have complications.

Medicolegal tips and pitfalls

- Ingested toothpicks have a high rate of complications and should be treated by endoscopic removal.
- Children who have swallowed button batteries are at high risk of oesophageal necrosis and should be referred urgently for removal of the object.
- Radiolucent, small, light objects such as bottle caps and can rings are often trapped in the oesophagus and do not show up on X-rays; they should be looked for with CT and/or endoscopy, depending on how clear the history of ingestion of the object is.
- Failing to evaluate a child adequately, who may have an oesophageal foreign body, is a recipe for disaster; it is the 'norm' for them to be relatively asymptomatic and well at presentation.
- Failure to consider occult foreign body ingestion in children with GI symptoms, such as poor feeding, fever, irritability and/or respiratory symptoms.
- Failure to scan the neck with imaging and missing an object trapped in the upper oesophagus.

- Carrying out Foley® catheter removal of oesophageal objects in children, without sufficient expertise or emergency airway-resuscitation equipment to hand.
- Failing to consider neglect or chaotic home circumstances in children who present repeatedly with ingested foreign bodies.
- Failing to consider underlying psychological causes in older children/adults who present with non-food-related foreign body ingestion.

Preventing swallowing of foreign bodies

- It is difficult to prevent toddlers from examining things with their mouths. However, basic home-safety measures, such as cupboard catches and vigilance about not leaving objects within children's reach, are helpful.
- Discussion with the parents of children who have swallowed foreign bodies is recommended to prevent repetition in the same child or siblings.

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