

Foreign Body Ingestion in Children

Prepared by: **Dr. Ali Agheli** | Reference: *UpToDate. Foreign body ingestion in children, Version 48.0*

Supervised by **Dr. Amir Naghshzan** (AmirNaghshzan@gmail.com)





Important Facts

6–36

Months of Age

Most ingestions occur between 6 months and 3 years of age

80–90%

Pass Spontaneously

The majority of ingested foreign bodies resolve without intervention

10–20%

Need Endoscopy

Only a minority require endoscopic removal

Most children who ingest a foreign body are **asymptomatic**. However, potential complications include esophageal obstruction, bleeding, perforation, fistula formation, and airway compromise — making prompt evaluation essential.

Common Foreign Bodies

Certain objects pose greater risks than others. Recognizing the type of ingested object is critical for guiding management decisions.



Coins

Most common ingested object in young children



Button Batteries

High-risk; can cause severe tissue injury rapidly



Magnets

Dangerous when multiple; can trap bowel wall between them



Sharp Objects

Pins, needles — risk of perforation and bleeding



Food Bolus

Impaction common in children with esophageal abnormalities



Long Objects (>5 cm)

Difficult to pass through pylorus or duodenal sweep



Objects containing **lead** also require special attention due to systemic toxicity risk.

Risk Factors

Certain patient populations are at significantly higher risk for foreign body ingestion and its complications.

Age <3 Years

Young children explore the world orally and lack the judgment to avoid swallowing objects.

Esophageal Abnormalities

Structural narrowing or dysmotility increases the likelihood of foreign body impaction.

Previous Esophageal Surgery

Post-surgical strictures or anatomical changes predispose to retention of ingested objects.

Gastroesophageal Reflux Disease

Chronic inflammation may alter esophageal motility and mucosal integrity.

Eosinophilic Esophagitis

A leading cause of food bolus impaction in older children and adolescents.

Neuromuscular Disorders

Impaired swallowing coordination increases risk of ingestion and aspiration.

Clinical Presentation: Esophageal Foreign Body

Esophageal Symptoms

- **Dysphagia** — difficulty swallowing solids or liquids
- **Droping** — inability to manage secretions
- **Refusal to eat** — common in toddlers
- **Retrosternal pain** — chest discomfort or pressure
- **Vomiting** — may be forceful or regurgitant
- **Choking** — especially at time of ingestion



Airway Symptoms — Emergency

- **Stridor** — high-pitched inspiratory noise
- **Wheezing** — lower airway involvement
- **Cyanosis** — sign of severe hypoxia
- **Respiratory distress** — requires immediate action

Airway compromise from an esophageal foreign body is a **life-threatening emergency**. Any child presenting with stridor, cyanosis, or severe respiratory distress must be managed immediately.

Clinical Presentation: Gastric Foreign Body

Foreign bodies that have passed into the stomach are **usually asymptomatic**. The stomach's large capacity and muscular walls often accommodate objects without causing immediate symptoms.

Typically Asymptomatic

Most gastric foreign bodies cause no symptoms and are discovered incidentally or after a witnessed ingestion event.

Vomiting

May occur if the object irritates the gastric mucosa or causes partial outlet obstruction.

Feeding Refusal

Children may refuse feeds due to discomfort or nausea associated with the retained object.

Gastric Outlet Obstruction

Large or irregularly shaped objects may lodge at the pylorus, preventing gastric emptying.

Clinical Presentation: Intestinal Foreign Body

Once a foreign body passes beyond the stomach into the small or large intestine, it is **usually asymptomatic** and will pass spontaneously in the majority of cases.

1

Abdominal Pain

Cramping or localized pain may indicate mucosal irritation or early obstruction.

2

Perforation

Sharp objects are most likely to penetrate the intestinal wall, causing peritonitis.

3

Appendicitis

Small objects can lodge in the appendix, triggering acute appendicitis.

4

Intestinal Obstruction

Large or multiple objects may cause mechanical obstruction requiring surgical intervention.



These complications are **rare** but must be recognized promptly. Any child with abdominal pain, fever, or peritoneal signs after a known ingestion warrants urgent evaluation.

Initial Evaluation: ABC First

The first priority in any child with suspected foreign body ingestion is a rapid, systematic assessment of **Airway, Breathing, and Circulation**.

1

A — Airway

Assess for **stridor, drooling, and respiratory distress**. A compromised airway demands immediate intervention before any further workup.

2

B — Breathing

Look for **wheezing and hypoxemia**. Oxygen saturation monitoring is essential. Auscultate both lung fields carefully.

3

C — Circulation

Assess **hemodynamic stability**. Check heart rate, blood pressure, capillary refill, and perfusion. Instability may indicate perforation or significant bleeding.

Physical Examination

A thorough physical examination should follow the initial ABC assessment. Each anatomical region provides important clues about the location and impact of the foreign body.



Oropharynx

Inspect for visible foreign bodies, mucosal injury, pooling of secretions, or signs of trauma. Some objects lodge at the level of the tonsils or posterior pharynx.



Neck

Palpate for subcutaneous emphysema, tenderness, or swelling. Crepitus may indicate esophageal perforation with air tracking into soft tissues.



Chest

Auscultate for asymmetric breath sounds, wheezing, or decreased air entry. Examine for signs of mediastinitis or pleural effusion in severe cases.



Abdomen

Assess for tenderness, guarding, rigidity, or distension. Peritoneal signs suggest perforation and require urgent surgical consultation.

Investigations: First-Line — Biplane X-Ray

Radiographic imaging is the cornerstone of initial investigation for suspected foreign body ingestion. **Biplane X-ray** (anteroposterior and lateral views) should be obtained of the neck, chest, and abdomen.

Neck X-Ray

Identifies objects lodged in the hypopharynx or upper esophagus. Lateral view is especially useful for detecting soft-tissue swelling or air.

Chest X-Ray

Localizes objects in the mid or distal esophagus. Also evaluates for mediastinal widening, pneumomediastinum, or pulmonary complications.

Abdominal X-Ray

Tracks objects that have passed into the stomach or intestines. Identifies free air under the diaphragm if perforation has occurred.



Biplane X-ray serves three key purposes: **determine location**, **identify type of object**, and **detect complications**.

Investigations: CT Scan

When to Order a CT Scan

1 Strong Suspicion with Negative X-Ray

Radiolucent objects (plastic, wood, glass) may not be visible on plain films but are detectable on CT.

2 Suspected Perforation

CT provides superior detail of free air, fluid collections, and bowel wall integrity.

3 Suspected Abscess or Fistula

CT with contrast delineates the extent of infection and any abnormal communications.



Important Imaging Notes

Not all imaging modalities are appropriate in the setting of foreign body ingestion. Two specific approaches must be **actively avoided**.

Avoid Barium Contrast Studies

Barium swallow studies are contraindicated because they:

- Significantly **increase aspiration risk** in a child who may already have a compromised airway
- **Interfere with endoscopy** by coating the mucosa and obscuring visualization
- May worsen outcomes if perforation is present

Avoid MRI

MRI is contraindicated when a **metallic foreign body** is suspected because:

- The strong magnetic field can cause the object to **migrate or rotate**
- This may result in serious internal injury or perforation
- Plain X-ray and CT are safer and more practical alternatives

Management — Step 1: Is the Airway Compromised?

The very first management decision is the most critical: **Is the child's airway at risk?** This must be assessed and addressed before any other intervention.

Immediate Airway Management

Secure the airway using the most appropriate method for the clinical situation. This may include positioning, supplemental oxygen, bag-mask ventilation, or intubation depending on severity.

Emergency Endoscopic Removal

Once the airway is stabilized, proceed immediately to endoscopic removal of the offending foreign body. Do not delay for further imaging if the airway is compromised.



If the airway is compromised, **do not delay**. Immediate multidisciplinary involvement — including anesthesia, ENT, and gastroenterology — is essential.

Management — Step 2: High-Risk Foreign Bodies

Certain foreign bodies require **urgent removal** regardless of symptoms, due to their high potential for rapid and severe tissue injury.

● Button Battery in Esophagus

Can cause liquefactive necrosis within **2 hours** of contact. Immediate removal is mandatory — this is the highest priority foreign body emergency.

● Multiple Magnets or Magnet + Metal

Attract across bowel loops, causing pressure necrosis, perforation, and fistula formation. Urgent removal required before passage beyond the stomach.

● Sharp Objects

Pins, needles, and broken glass carry high risk of mucosal laceration and perforation at any level of the GI tract.

● Long Objects (>5 cm)

Cannot navigate the duodenal sweep or ileocecal valve. Urgent removal before they pass beyond the stomach is recommended.

● Complete/Near-Complete Esophageal Obstruction

Inability to handle secretions indicates critical obstruction. Risk of aspiration and airway compromise is high — urgent endoscopy required.

Management — Step 3: Low-Risk Foreign Bodies

Not all ingested foreign bodies require intervention. **Low-risk objects** in stable, asymptomatic children can be managed conservatively with observation and parental education.

Examples of Low-Risk Objects

- Coins located in the stomach
- Small blunt objects (buttons, beads)
- Objects that have passed the pylorus without symptoms

Conservative Management

- **Observation** — monitor at home with clear return precautions
- **Expect spontaneous passage** — most pass within 4–6 days
- **Follow-up** — return if symptoms develop (pain, vomiting, fever)

 Parents should be instructed to check stools for passage of the object and to return immediately if the child develops abdominal pain, fever, or vomiting.



Endoscopic Techniques: Flexible Endoscopy

Flexible endoscopy is the **preferred method** for foreign body removal in the vast majority of pediatric patients. It combines diagnostic capability with therapeutic intervention in a single procedure.



Diagnostic and Therapeutic

Allows simultaneous visualization of the mucosa, assessment of injury, and removal of the foreign body in one session.



Less Traumatic

The flexible scope conforms to the natural curves of the GI tract, minimizing mucosal trauma compared to rigid instruments.



High Success Rate

Flexible endoscopy achieves successful removal in the overwhelming majority of cases, with a low complication profile.

Endoscopic Techniques: Rigid Endoscopy

Rigid endoscopy is a specialized technique reserved for specific clinical scenarios where flexible endoscopy may be less effective or safe.

Sharp Objects

Rigid scopes allow better control and protection of the mucosa when extracting sharp or pointed foreign bodies that could lacerate the esophagus during withdrawal.

Proximal Esophageal Foreign Bodies

Objects lodged at or just below the upper esophageal sphincter are often more accessible and safely removed with a rigid laryngoscope or esophagoscope.



Rigid endoscopy is typically performed under **general anesthesia** with airway protection, often in collaboration with ENT or thoracic surgery.



Endoscopic Techniques: Magill Forceps

Magill forceps are a simple but highly effective tool for retrieving foreign bodies that are accessible without deep endoscopy.

Foreign Bodies in the Oropharynx

Objects visible in the posterior pharynx, tonsillar fossae, or hypopharynx can be grasped and removed directly under direct visualization using Magill forceps — often at the bedside or in the emergency department.

Objects at the Upper Esophageal Sphincter

Magill forceps, used in conjunction with laryngoscopy, can retrieve objects lodged at the cricopharyngeus muscle level without requiring formal endoscopy suite setup.

- ✓ Magill forceps removal is quick, effective, and can be performed with minimal equipment — making it ideal for emergency department management of accessible foreign bodies.

FOREIGN BODIES IN THE GASTROINTESTINAL TRACT

A rapid-reference summary of the most clinically important foreign bodies and their required management approach.

Object	Management
● Button battery in esophagus	Immediate removal – highest priority emergency
● Multiple magnets	Urgent removal – risk of bowel wall entrapment
● Sharp object	Urgent removal – risk of perforation and bleeding
● Coin in esophagus	Endoscopic removal – does not pass spontaneously from esophagus
● Coin in stomach (asymptomatic)	Observation – expect spontaneous passage; follow-up if symptoms develop



Time is critical for **button batteries**. Tissue necrosis can begin within 2 hours of esophageal contact. Do not wait for symptoms to develop.

Key Home Messages

A concise summary of the essential clinical principles for managing foreign body ingestion in children.



Many Children Are Asymptomatic

The absence of symptoms does not exclude a foreign body. A witnessed ingestion or high clinical suspicion warrants investigation regardless of symptoms.



Biplane X-Ray Is the Initial Investigation

Obtain anteroposterior and lateral views of the neck, chest, and abdomen to localize the object and detect complications.



Flexible Endoscopy Is the Preferred Treatment

It is diagnostic and therapeutic, less traumatic, and has a high success rate in the majority of pediatric foreign body cases.



Always Assess ABC First

Airway, Breathing, and Circulation must be evaluated and stabilized before any further workup or intervention is undertaken.



Button Batteries, Magnets, and Sharp Objects Are Emergencies

These objects require urgent or immediate endoscopic removal due to their high risk of rapid, severe tissue injury.



Management Depends on Three Factors

1. Patient stability — is the airway or circulation compromised? **2. Type of foreign body** — high-risk vs. low-risk object? **3. Location** — esophagus, stomach, or intestine?