Investigation and Management of Ingested Foreign Bodies

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Written by: Dr Samantha Conroy
Peer reviewer Mr Richard Lindley
Miss Aikaterini Dritsoula
Dr Deirdre O’Donnell
Dr Edward Snelson
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Purpose

The ingestion of a foreign body or multiple foreign bodies is a common presenting complaint in paediatric surgery. Ingested foreign bodies rarely cause problems, however, if problems do occur, they can cause significant morbidity, for example, oesophageal rupture. The following guideline has been developed following multidisciplinary consensus agreement on current best-practice in the management of ingested foreign bodies.

Intended Audience

All clinicians involved in the initial management of an infant or child who has ingested a foreign body.
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1. Introduction

The ingestion of a foreign body or multiple foreign bodies is a common presenting complaint in paediatric surgery, with a peak incidence from 12-24 months\(^1\). Ingested foreign bodies rarely cause problems; almost 80% of patients pass the foreign body – without intervention – in seven days\(^2\) (only 1% require surgical removal). However, occasionally foreign bodies can cause significant morbidity (for example, oesophageal rupture) and 1% require surgical removal\(^2\).

The presenting symptoms and outcomes of an ingested foreign body is highly dependent on the swallowed object, and for this reason, the guidance for hazardous and non-hazardous foreign body ingestion has been divided accordingly.

2. Intended Audience

This guidance has been produced to enable all clinicians to use best practice, based on current evidence, in the initial management of an infant or child who has ingested a foreign body.

3. Guideline Content

A. Defining hazardous foreign bodies
B. Special considerations for button battery ingestion
C. Considerations for upper third oesophageal FBs
D. Flow chart 1: Initial management of non-hazardous ingested foreign body
E. Flow chart 2: Initial management of ingested button battery
F. Flow chart 3: Initial management of magnet ingestion
G. Flow chart 4: Initial management of ingested sharp object or other hazardous foreign body

A. It is difficult to define every ingested foreign body into hazardous and non-hazardous groups, however, we tend to classify hazardous objects as those that have the potential to cause significant harm. Most frequently, this includes:
   1. Button batteries
   2. Multiple magnets
   3. Sharp objects
   4. Very large objects
   5. Filled balloons
B. Special considerations for button battery ingestion

All children who have swallowed a battery or if there is a suspicion of swallowing a battery (round metal object that wasn’t clearly a coin) should have an PA CXR. If there is any uncertainty about the nature of the object then a lateral CXR should also be done. This allows for differentiation between battery and coin, and the 'step off' sign allows for identification of the negative electrode (slightly smaller in diameter), which is more likely to cause damage to adjacent tissues. If not visible on CXR, an AXR should be requested, as metal detectors are unreliable in button battery identification.

An oesophageal battery requires immediate referral to the Paediatric Surgeons. As battery burns can occur within two hours of ingestion, it is essential to diagnose and remove batteries in the oesophagus immediately.

Once the button battery is in the stomach, the patient can be discharged if they are asymptomatic. Depending on the size of the battery and the age of the patient, there may be a need for the patient to return for a follow up XR. This is to ensure that the battery is progressing and not simply fragmenting in the stomach/adhering to the gastric mucosa.

If in doubt at any stage, please discuss with the surgical registrar.

See section D for more details.

C. Things to consider for upper third oesophageal FBs

Upper third oesophageal FBs should be managed as per the guidelines below. If there are concerns about a patient’s airway at any point, ENT +/- anaesthetic assessment should be sought immediately. In the case of upper third oesophageal FBs, the inter-departmental consensus (ED, paediatric surgery, ENT) is that if the patient requires rigid oesophagoscopy, the paediatric surgery consultants can discuss with the ENT consultants for their input (if required); if not, the patient would remain under paediatric surgery.
D. Flow chart 1: Initial management of non-hazardous ingested foreign body
(Adapted from 2015 PSU guideline ‘swallowed foreign bodies’^4, 5, 6)

**Initial steps:**
ABCDE
NBM

**Could it be a BB?**

- **Unwitnessed 'coin' ingestion/ symptoms of BB ingestion**
  - Refer to BB flow chart

- **Symptoms of BB ingestion:**
  - Airway obstruction or wheeze
  - Drooling/dysphagia
  - Refusing to eat/vomiting
  - Chest pain/discomfort
  - Coughing/choking/gagging when eating
  - Abdominal pain (particularly upper abdomen)

- **Witnessed definite coin/non-hazardous object**
  - Metallic object
  - **Metal Detector**
    - Inconclusive OR above xiphisternum
    - Positive below Xiphisternum AND E&D OK
      - **AP CXR**
        - Seen IN upper 1/3 of oesophagus (ie above clavicle) or concerns about radiolucent FB in upper oesophagus
          - Attempt foley catheter removal if appropriate.
          - If fails - **D/W Paeds surgeons**
        - Seen BELOW upper 1/3 of oesophagus (ie below clavicle)
          - E&D then repeat metal detector
            - (If refusing to E&D - **D/W Paeds surgeons**)
            - Still positive above Xiphisternum
            - Positive below Xiphisternum AND E&D OK
  - Non-metallic and E&D normally
    - 1. Reassure
    - 2. DO NOT instruct parents to inspect faeces for FB
    - 3. Review +/- repeat XRs if symptomatic*

**THINK AIRWAY**
If concerned FB is in the airway, contact ENT surgeons +/- anaesthetist immediately
E. Flow chart 2: Initial management of ingested button battery

Initial steps:
ABCDE
NBM
Check replacement battery size
Urgent XR - chest (with neck visualised) +/- abdo

THINK AIRWAY
If concerned BB is in the airway, contact ENT surgeons +/- anaesthetist immediately

Yes
Oesophageal?

No

Yes

D/W Paeds surgeons
Urgent endoscopic evaluation

Gastric/beyond

Co-ingestion with a magnet?

Yes

*Symptoms of BB in stomach/beyond:
- Refusing to eat/vomiting
- Abdominal pain/tenderness on examination
- Abdominal distention

No

Is the patient symptomatic*?

Yes

D/W Paeds surgeons
If BB is in stomach, may remove endoscopically.
If more distal, then may require surgical removal if symptoms are persistent and severe

No

BB >15mm AND patient <6 years old?

Yes

Repeat XR in 4 days (or sooner if has symptoms)

No

BB still in stomach

BB distal to stomach

D/W Paeds surgeons
If BB is in stomach, may remove endoscopically.
If more distal, then may require surgical removal if symptoms are persistent and severe

Manage conservatively at home with safety netting

F. Flow chart 3: Initial management of magnet ingestion

Adapted from Kramer et. al (2018) report and proposed management algorithm for magnet ingestion in children.
G. Flow chart 4: Initial management of ingested sharp object or other hazardous FB

Initial steps:
ABCDE
NBM

Radio-opaque

XR chest +/- abdo

Oesophageal/Gastric

D/W Paeds surgeons
Urgent endoscopic evaluation

Symptomatic*

Asymptomatic

Radiolucent

Symptomatic*

Asymptomatic

1. Parental education (advice on removal of other magnets from environment).
3. If becomes symptomatic* consider repeat assessment +/- XR.

THINK AIRWAY
If concerned FB is in the airway, contact ENT surgeons +/- anaesthetist immediately

*Symptoms of sharp/hazardous object:
- Refusing to eat/vomiting
- Abdominal pain/tenderness on examination
- Abdominal distention

Adapted from Kramer et. al (2018) report and proposed management algorithm for ingested sharp or pointed objects in children®.
4. References


