Management of ingested foreign bodies in upper gastrointestinal tract: report on 170 patients

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Background: Ingestion of foreign bodies (FB) is commonly encountered in gastrointestinal practice. Methods: Retrospective analysis of data on endoscopic removal of FB in 170 patients (124 children) who were managed at a tertiary referral center over a six-year period. Outcome: Coins were the most common FB removed (n=134). Dentures (12), food boluses (19), sharp objects such as needles and pins (7), and certain unusual FB (12) made up the remainder. Esophagus was the most common site of FB lodgement (56%). Most patients with esophageal FB complained of FB sensation, dysphagia, odynophagia or chest pain. Gastric and duodenal FB produced no symptoms. FB could be successfully removed endoscopically in 166 patients (97.6%) without morbidity or mortality. Four patients required surgical removal of FB. Certain innovative methods like loop basket, electrocautery and suction retrieval were used to remove some FB. Conclusion: Endoscopic removal of FB in the esophagus and stomach is safe but often requires the use of innovative techniques and accessories. [Indian J Gastroenterol 2003;22:46-48]

Key words: Endoscopy, therapeutic

Ingestion of foreign bodies (FB) is commonly encountered in gastrointestinal practice. Accidental FB ingestion is usually encountered in children because of oro-lingual curiosity, and less commonly in adults, in whom FB ingestion may be accidental or deliberate.

Most (80%-90%) of the ingested FB do not require removal as they pass out spontaneously through the gastrointestinal tract without any sequelae. Foreign bodies that do not pass or get impacted, penetrate or perforate require therapeutic intervention. Almost all the ingested FB can be successfully managed endoscopically. Penetrated or perforated FB require surgical removal.

We report here our experience with 170 patients of FB ingestion who were managed at a tertiary referral center over a period of six years.

Methods

In a retrospective analysis from August 1996 through October 2001, 285 patients (223 children) presented to our center with history of FB ingestion. In case the FB was located distal to the duodenum, patients were observed for its spontaneous passage. The remaining patients were considered for therapeutic intervention.

Endoscopic removal of FB was attempted in all patients who had 1) uncomplicated FB located in the esophagus, 2) FB in the stomach that failed to pass beyond the pylorus in 72 hours, or 3) sharp FB. Endoscopic removal was not considered, or aborted, in FB that had penetrated or caused perforation. In case endoscopic retrieval failed or was considered hazardous, surgical consultation was sought.

Radiographic evaluation was done in all patients. X-ray of the neck, chest and abdomen in antero-posterior and lateral projections was done according to the clinical presentation. Foreign body removal was attempted using flexible endoscope (GIF-130, PQ-20; Olympus, Japan) and standard accessories such as alligator forceps, snare baskets, electrocautery and needle-knife sphencterotome. Certain innovative instruments like loop basket and suction retrieval cylinder were also used. A dry run of FB removal with the selected accessory was performed prior to the procedure, whenever considered necessary. All patients were administered intravenous pre-medication, which included 10 mg diazepam and 20 mg hyoscine bromide, prior to the procedure. None of the patients required general anesthesia.

Results

The FB (mostly coins) had already traversed the duodenal sweep in 95 of the 285 patients. On follow up with serial X-rays, all the FB passed out spontaneously. Of the remaining 190 patients, 35 did not initially give consent for endoscopy. They were kept under observation; in 20 of them, FB passed out spontaneously, and the other 15 patients later consented to endoscopic removal. Therefore, a total of 170 patients (124 children) underwent therapeutic intervention for FB removal.

Endoscopic removal was successful in 166 of 170 patients (97.6%). Distribution of type of FB and sites of FB location on initial endoscopy are shown in the Table. Esophagus was the most common site where FB were encountered (55.9%). Most patients with esophageal FB complained of FB sensation (85%), dysphagia (64%), odynophagia (20%), or chest pain (12%). Patients with impacted FB in the esophagus, especially proximal to strictures, presented with absolute dysphagia. Gastric and duodenal FB caused no symptoms. Most gastric FB were located in the fundus or body of the stomach on initial endoscopy.
The unusual FB encountered included a magnet piece (n=1), marbles (n=2), keys (n=2) and rings (n=2) in children. All these were retrieved from the stomach using a loop basket. Unusual FB in adults included a broken spoon, beer-bottle cap, and the distal end of a toothbrush (one each) in the stomach, and a beetle nut (n=1) in the duodenal bulb. A bunch of plastic-coated electrical copper wires was found in the stomach of a mentally retarded patient. The spoon was retrieved endoscopically with alligator forceps, the toothbrush with a snare, and the beetle nut with a basket. Beer-bottle cap and bunch of wires in the stomach required surgical removal.

Discussion

FB ingestion is common, especially in children.²,³,⁸ A majority of FB can be successfully managed endoscopically.³ In our series, FB could be successfully removed endoscopically in 97.6% cases while 4 patients required surgical removal. None of the patients had perforation, but two dentures had penetrated the esophageal wall and required surgical removal.

Coins are the most common FB and are ingested accidentally, especially by children.⁷ Smaller coins usually pass out spontaneously once they cross the pylorus. A majority of coins in our series that required removal were one-ruppee and two-ruppee coins (25 mm and 26 mm diameter, respectively). The recommended duration of observation in asymptomatic coins in the stomach before attempting endoscopic removal varies in different series from 72 hours⁶ to 3 weeks.³,⁷ Objects greater than 20 mm in diameter may not pass across the pylorus.¹⁰ We removed coins >20 mm in diameter in the stomach endoscopically if they did not pass the pylorus within 72 hours.

Coins impacted at the pharyngo-esophageal junction or those in the esophagus require prompt removal to prevent complications.³,⁸ Alligator forceps was the accessory of choice for removal of coins impacted at the cricopharynx or in the esophagus, whereas those in the stomach were removed with alligator forceps or, lately, using home-made loop basket.⁷ The loop basket can be easily positioned over an end-on placed coin, as compared to the tangential position required for catching with FB forceps, especially in the fundus. Another advantage is that once the coin is caught in the loop basket, there is no possibility of it slipping out at the gastro-esophageal junction and the pharyngo-esophageal sphincter, which may happen with FB forceps.

Dentures and bone fragments frequently get impacted in the esophagus. Early endoscopic intervention with FB forceps and snare was helpful in disimpacting and retrieving all but two of them, possibly because of the smaller size of the dentures (maximum size 3.5 cm).
A majority of patients with food bolus impaction had esophageal strictures. Conventional snares and baskets are useful accessories for removal, but we could manage most of them using the suction retrieval method. The soft and light meat bolus can be removed by creating a vacuum between the endoscope tip and the FB using the cylinder of the variceal ligation.\textsuperscript{5,11}

Though use of an overtube has been recommended for sharp objects, poor patient tolerance discouraged us from doing so. The removal of sharp objects requires expertise, since the direction of foreign body has to be maintained to avoid mucosal injury.

Four FB could not be retrieved endoscopically and required surgical removal. Impacted dentures in two patients had penetrated the esophageal wall. The beer-bottle cap in the stomach had sharp serrated edges that prevented its removal across the gastro-esophageal junction without causing mucosal injury. The patient with psychiatric disorder and wire ingestion had a mesh of entangled wires in the stomach, which would not cross the gastro-esophageal junction in spite of firm grip with rat-toothed forceps and snare.

Certain innovative methods, such as removal of impacted plum fruit using cautery current to cut the peel and pulverize the pulp,\textsuperscript{14} coin removal using loop basket,\textsuperscript{4} and suction retrieval of food bolus\textsuperscript{6} were used by us successfully. Other innovative methods, especially for unusual FB, have also been reported and include cautery-snare capture and removal of esophageal food bolus,\textsuperscript{12} magnetic device for the removal of button batteries,\textsuperscript{13} extraction of esophageal foreign bodies in children using Foley’s catheter balloon,\textsuperscript{16} removal of ring-type foreign body with ‘U-wire’\textsuperscript{15} and laser-assisted removal of bone from the esophagus.\textsuperscript{18}

The few Indian studies on FB removal\textsuperscript{17,18,19} published previously have data similar to those of our study. Coins were the commonest FB encountered and endoscopic removal was found to be very safe and effective.

Mortality due to ingestion of FB is rare now due to the widespread availability of endoscopy and prompt surgical backup in case of complications. There was no mortality in our series.

Most ingested FB that need removal can thus be managed successfully using the flexible esoscope and various accessories. Coins are the most frequently ingested FB, and all coins more than 20 mm diameter located in the esophagus or remaining in the stomach for more than 72 hours should be removed endoscopically. Penetrating or perforating FB require surgical treatment. Certain innovative methods for removal of FB, like suction retrieval using loop basket and cautery, add to the success of endoscopic removal.

References


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