Swallowed Foreign Bodies in Children: Aspects of Management

Ahmed H. Al-Salem, MBBS, FRCSI, FICS, FACS; Sayed Qaisarrudin, MS;
Ayyampalayam Murugan, FRCS; Haroun A. Hammad, FRCS; Vasant Talwalker, FRCS

A large variety of objects are swallowed by children including some which are very bizarre, but coins are the most common. From April 1989 to March 1994, 40 children were managed for swallowed foreign objects at our hospital. In 24 of the patients, the foreign bodies were in the esophagus when first seen. Eight of these passed to the stomach while waiting for endoscopic removal and one patient vomited a swallowed bulb. The remaining 15 esophageal foreign bodies were removed endoscopically. Twenty-four foreign bodies passed the esophagogastric junction but only two of these patients needed hospitalization; one patient swallowed a piece of blade, causing hematemesis and that was removed endoscopically from the stomach. The other patient had a nail stuck in the first part of the duodenum and that required laparotomy, as two endoscopic attempts failed to dislodge it. The rest of the 22 patients were managed conservatively as outpatients. Whereas the presence of an esophageal foreign body requires immediate attention, swallowed foreign bodies that have passed into the stomach are to be treated conservatively unless they cause complications, as most will pass uneventfully in the stool. Aspects of management of swallowed foreign bodies in children are also discussed.

The ingestion of foreign bodies is a common problem in the pediatric age group, but fortunately the majority of ingested foreign bodies pass through the gastrointestinal tract without any adverse effects.[1,2] A large variety of objects are swallowed including some which are very bizarre, but coins are the most common.[3,4] The esophagus is the narrowest part of the pediatric gastrointestinal tract and is the site where a significant number of ingested foreign bodies lodge with the danger of impaction, ulceration and perforation.

This is a review of our experience with swallowed foreign bodies in children and discussion of the aspects of management.

From the Division of Pediatric Surgery (Drs. Al-Salem, Talwalker, Mr. Qaisarrudin) and Department of ENT (Drs. Murugan, Hammad), Qatif Central Hospital, Qatif.

Address reprint requests and correspondence to Dr. Al-Salem: P.O. Box 18432, Qatif Central Hospital, Qatif 31911, Saudi Arabia.

Accepted for publication 27 November 1994.

Material and Methods

The charts of all children seen for swallowed foreign bodies at Qatif Central Hospital over a five-year period from April 1989 to March 1994 were reviewed. The points noted were age at presentation, sex, history of esophageal disease, duration of ingestion, type of foreign body swallowed, history of complications such as dysphagia, respiratory distress or hematemesis, method of extraction and late complications.

Results

During the study period, 40 children were seen for swallowed foreign bodies. Their ages ranged from five months to eight years (mean 5.8 years) with 28.2% less than three years of age and 57.5% less than six years of age. There were 24 males and 16 females. There was only one patient with pre-existing esophageal disease. This was a child who had congenital tracheoesophageal fistula repaired and who was also found to have congenital esophageal stenosis distal to the site of tracheoesophageal repair. He had a peanut stuck at the site of the congenital esophageal stenosis. The average duration of ingestion was 11.3 hours (range from one hour to seven days). Plain cervical and chest x-rays were obtained to locate the site of the foreign body. For those patients in whom the foreign bodies had passed to the stomach and/or distally, follow-up plain abdominal x-rays were performed in those who had not passed a foreign body in the stool or to confirm the passage of the foreign body if in doubt.

Bizarre foreign bodies were swallowed including a metallic dog toy and a small bulb (Figure 1) but coins were the most common objects swallowed (42.5%). In 24 out of 40 children, the foreign bodies were esophageal when first seen. Eight of these passed to the stomach while waiting for endoscopic removal in the hospital. The patient who swallowed the bulb vomited it out. The remaining 15 esophageal foreign bodies were removed using a rigid esophagoscope. The average duration from ingestion to endoscopic intervention in these 15 patients was 6.5 hours and six were sharp objects. Twenty-four foreign bodies passed the esophagogastric junction. Two of these 24 patients needed hospitalization. One had swallowed a piece

of blade used for cutting carpets, causing hematemesis. This was removed endoscopically from the stomach. Another patient had a seven-day history of swallowing a nail. The nail was stuck in the wall of the first part of the duodenum. This two-year-old female needed a laparotomy, as two endoscopies had failed to dislodge the nail from the first part of the duodenum. The rest of the 22 patients were managed conservatively as outpatients and the foreign bodies passed uneventfully.

Discussion

Children commonly place objects in the mouth. This often results in accidental swallowing of foreign bodies. The exact incidence of foreign body ingestion varies widely. Various series report from about eight to 300 esophageal foreign bodies per year.[5-7] We see about six to eight swallowed foreign bodies in children per year, but we think this may be an underestimate, as many children swallow foreign bodies without the parents becoming aware and proceed to pass unnoticed.

The highest incidence of swallowed foreign bodies occurs in children between six months and three years.[3] Kelly et al. reported 67% of their patients were less than three years of age.[3] Our patients were slightly older with 57.6% less than six years of age. A large variety of foreign bodies are swallowed by children, but coins are the most commonly ingested items.[3,4] This is similar to our findings.

There is a definite predilection for esophageal foreign bodies to become stuck at the level of the cricopharyngeus and just below it. More than two-thirds of our esophageal foreign bodies became impacted at the level of the cricopharyngeus. Odelowo et al.[4] attributed this to the inferior edge of the cricopharyngeus muscle appearing to be somewhat narrowed. Others attribute this to spasms, irritation and contraction of the muscles. The main hazard is a foreign body becoming stuck in the esophagus, which may result in esophageal ulceration and perforation. So the presence of an esophageal foreign body requires immediate attention.[8,9] There is a general consensus for endoscopic retrieval of esophageal foreign bodies.[10] Either rigid or flexible endoscopes are employed for removal of esophageal foreign bodies. Extraction of sharp foreign bodies endoscopically requires the use of an overtube to protect and minimize injury to surrounding tissues. Foley balloon extraction and bougienage of coins located in the esophagus in selected children was found both safe and cost-effective.[11,12] Jona et al.[13] advocated esophageal bougienage of esophageal coins that are single, of less than 24 hours' duration, with no respiratory distress and no history of esophageal pathology. Kelly et al.[3] advocated Foley catheter extraction of coins lodged in the proximal one-third of the esophagus and bougienage of coins lodged in the distal two-thirds of the esophagus.

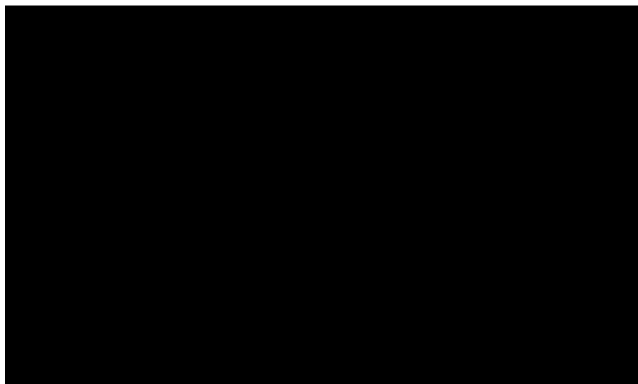

FIGURE 1. Foreign bodies swallowed by children.

Once a swallowed foreign body has passed the esophagogastric junction, most will pass uneventfully in the stool. The exact amount of time it will take to pass is not predictable as the transit time is variable.[14] Al-Beriki et al.[15] advocated keeping these patients under observation and suggested hospitalization if the foreign body is sharp and unusually large. We feel that admitting these patients to the hospital is unnecessary as it may take several days and sometimes a few weeks for these foreign bodies to pass.[14] None of our patients (22 with foreign bodies beyond the esophagus including seven which were sharp) developed any complications during their passage. Only two of our patients required intervention. One patient swallowed a piece of blade and presented with hematemesis. This foreign body was in the stomach and was removed endoscopically. The other patient was referred from another hospital after a seven-day history of swallowing a nail which was impacted in the first part of the duodenum. This required laparotomy after two failed trials of endoscopic removal. A metal detector can be used to locate and monitor the progress of intrathoracic and intra-abdominal metallic foreign bodies. This is a useful and noninvasive procedure. Magnets have been used successfully for removal of swallowed metallic foreign bodies.

An important and increasingly swallowed foreign body is the disc or button battery.[16,17] There are different types of disc batteries, but mercury ones are the most common and the most dangerous.[17] They can pass through the gastrointestinal tract without adverse effects but may become lodged in the gut, leading to ulceration, necrosis and perforation. There have been reports of tracheo-esophageal fistula[18] and Meckel diverticulum perforation[19] secondary to disc battery ingestion. These are attributed to pressure necrosis, corrosive toxic contents and short circuit burns. Another complication of these mercury salts is acute mercury poisoning.[20] None of our patients presented with a swallowed disc battery. These types of foreign bodies should be treated aggressively. If the disc battery is in the

esophagus, immediate endoscopic removal is indicated. Magnetic removal of ingested button batteries has been described as an alternative therapeutic approach for ingested button batteries.[21] If the battery is further along in the gastrointestinal tract, the patient should be admitted to the hospital and kept under close observation and the disc battery should be removed surgically if it remains in any one position for 24 hours or if symptoms develop.[17]

The problem of swallowed foreign bodies has long been recognized. The peak age for such ingestion is between six months and three years as it is the natural tendency for infants and small children to put things in their mouth, frequently resulting in swallowing of foreign objects. Older children usually swallow foreign bodies accidentally. Parents should be aware of the dangers of swallowed foreign bodies and avoid leaving small objects lying around and avoid giving their children small objects and toys to play with.

References

1. Clerf LH. Foreign bodies in the air and food passages - observations on end results in a series on 950 cases. Surg Gynecol Obst 1940;70:328-39.
2. Murtagh J, Yuen A. Swallowed foreign objects. Aust Fam Physician 1986;15:463-4.
3. Kelley JE, Leech MH, Carr MG. A safe and cost-effective protocol for the management of esophageal coins in children. J Pediatr Surg 1993;28:898-900.
4. Odelowo EOO, Komolafe OF. Diagnosis, management and complications of esophageal and airway foreign bodies. Int Surg 1990;75:148-54.
5. Nandi P, Ong GB. Foreign body in the esophagus: review of 2394 cases. Br J Surg 1978;65:5-9.
6. Gill GS. A six-month review of foreign bodies in Casualty Department of Kenyatta National Hospital, Nairobi. East Afr Med J 1972;49:428-35.
7. Obiako MN. Foreign bodies in the esophagus. Postgrad Doctor 1983;5:382-8.
8. Janik JS, Bailey WC, Burrington JD. Occult coin perforation of the esophagus. J Pediatr Surg 1986;21:794-7.
9. Obiako MN. Tracheoesophageal fistula: a complication of foreign body. Ann Otol Rhinol Laryngol 1982;91:325-7.
10. Giordano A, Adams G, Boies L, Meyerhoft W. Current management of esophageal foreign bodies. Arch Otolaryngol 1981;107:249-51.
11. Shackelford GD, McAlister WH, Robertson CL. The use of a Foley catheter for removal of blunt esophageal foreign bodies from children. Radiol 1972;105:455-6.
12. O'Neil JA, Holcomb GW, Neblett WW. Management of tracheobronchial and esophageal foreign bodies in childhood. J Pediatr Surg 1983;18:475-9.
13. Jona JZ, Glicklich M, Cohen RD. The contraindications for blind esophageal bougienage for coin ingestion in children. J Pediatr Surg 1988;23:328-30.
14. Mocanse DE, Kurchin A, Hinshaw JR. Gastrointestinal foreign bodies. Am J Surg 1981;142:335-7.
15. Al-Beriki JH, Vaidya MO, Al-Habdan V, Parashar SK. Swallowed foreign body. Saudi Med J 1987;8:104-9.
16. Litovitz TL. Button battery ingestions. Pediatr 1985;75:469-76.
17. El-Barghouty N. Management of disc battery ingestion in children. Br J Surg 1991;78:247.
18. Vaishnav A, Spitz L. Alkaline battery-induced tracheoesophageal fistula. Case report. Br J Surg 1989;76:1045.
19. Willis GA, Ho WL. Perforation of Meckel diverticulum by alkaline hearing aid battery. Can Med Assoc J 1982;126:497-8.
20. Mant TFK, Lewis JL, Matto TK, et al. Mercury poisoning after disc battery ingestion. Human Toxicol 1987;6:179-81.
21. Volle E, Beyer P, Kaufmann HJ. Therapeutic approach to ingested button type batteries - magnetic removal. Pediatr Radiol 1989;9:114-8.