

Gastrointestinal Foreign Bodies- Five Year Experience at Tertiary Care Center of Northern India

Parveen Malhotra*, Naveen Malhotra, Vani Malhotra, Ajay Chugh, Abhishek Chaturvedi, Parul Chandrika and Yogesh Sanwariya

Department of Medical Gastroenterology, Anesthesiology, Gynecology & Obstetrics, PGIMS, India

Submission: January 13, 2016; **Published:** February 15, 2016

*Corresponding author: Parveen Malhotra, Head, Department of Medical Gastroenterology, PGIMS, 128/19, Civil Hospital Road, Rohtak, Haryana (124001), India, Tel: 919671000017; Email: drparveenmalhotra@yahoo.com

Abstract

Aims and Objectives: The aim was to determine various causes of foreign body ingestion at a tertiary care center of Northern India.

Background: The majority of foreign body ingestions occur in children between the ages of six months and three years. Fortunately, most foreign bodies that reach the gastrointestinal tract pass spontaneously. Only 10 to 20 percent will require endoscopic removal, and less than 1 percent requires surgical intervention. Although mortality from foreign body ingestion is extremely low, deaths have been reported. Coins are the most common foreign bodies ingested by children. Ingestion of multiple foreign objects and repeated episodes are uncommon occurrences and usually occur in children with developmental delay.

Material and Methods: It was a retrospective analysis of 25,000 endoscopic procedures done in five years i.e. 2010-15 at department of Medical Gastroenterology, PGIMS, Rohtak.

Conclusion: Out of twenty five thousand endoscopies performed over five years, 30 patients were confirmed to have foreign bodies. The most common etiology was found to be coins, followed by dentures. All foreign bodies were successfully removed and there was no mortality or morbidity.

Keywords: Endoscopy; Gossypiboma; Trichobezoar; Coins; Magnet; Pins; Meat bolus

Introduction

The majority of foreign body ingestions occur in children between the ages of six months and three years [1-3]. Fortunately, most foreign bodies that reach the gastrointestinal tract pass spontaneously. Only 10 to 20 percent will require endoscopic removal, and less than 1 percent requires surgical intervention [1,2,4]. Although mortality from foreign body ingestion is extremely low, deaths have been reported [2,5,6]. In the United States, coins are the most common foreign bodies ingested by children. Other objects, including toys, toy parts, magnets, batteries, safety pins, screws, marbles, bones and food have been reported [3,7-9]. Ingestion of multiple foreign objects and repeated episodes are uncommon occurrences and usually occur in children with developmental delay [10].

Most children with esophageal foreign bodies are brought by their parents because the ingestion was witnessed or reported to them [11,12]. In these settings, they often are asymptomatic. Older children may localize the sensation of something "stuck" to the neck or lower chest, suggesting irritation in the upper or lower esophagus, respectively. Patients of any age may present with refusal of feeds or dysphagia, drooling, or respiratory symptoms including wheezing, stridor, or choking. Esophageal foreign bodies tend to lodge in areas of physiologic narrowing, such as the upper esophageal sphincter (cricopharyngeus muscle), the level of the aortic arch, and the lower esophageal sphincter [2,10]. Longstanding esophageal foreign bodies may cause weight loss or recurrent aspiration pneumonia, due to decreased caloric intake and mishandling of oral secretions, respectively. They can also damage the mucosa and lead to

strictures, or erode the esophageal wall, creating a fistula with the trachea or other nearby structures. Sharp objects may perforate the esophagus, resulting in neck swelling, crepitus, or pneumomediastinum [2]. Erosion into the aorta also has been reported, causing life-threatening gastrointestinal bleeding [13,14].

Management

A careful history and physical examination are the keystones to diagnosing an esophageal foreign body and to the prevention of its complications [15]. Imaging can be used to confirm the findings and to localize the site of the foreign body. The diagnostic steps and treatment depend on the patient's symptoms, the shape and location of the foreign body, and whether or not it is radiopaque [16,17].

Airway and breathing always should be examined first. The physical examination of the neck may reveal swelling, erythema, or crepitus, suggesting esophageal perforation has occurred, and surgical consultation is mandatory. The chest examination may reveal inspiratory stridor or expiratory wheezing, suggesting a lodged esophageal foreign body with tracheal compression. The abdominal examination may show evidence of small bowel obstruction or perforation, in which case immediate surgical consultation and abdominal imaging should be obtained.

Patients with suspected foreign body ingestion should be first subjected to biplane radiographs (anteroposterior and lateral) of the neck, chest, and abdomen [18]. Flat objects like coins usually appear as a circular object on an anteroposterior projection, whereas objects lodged in the trachea are best seen in lateral projection. The lateral projection radiograph may help to identify the object or establish if more than one foreign body is present, such as stacked coins. Toys made of plastic or wood, and many types of bones are not readily seen on plain films [19,20]. One should avoid gastrointestinal contrast studies when possible as barium contrast may obscure visualization on subsequent endoscopy and there is risk of aspiration, if the esophagus is obstructed. Hence, endoscopy may be preferred over contrast even if radiographs are negative [20].

Urgent intervention is indicated if ingested object is sharp, long (>5 cm), with multiple magnets, disk battery, patient shows signs of airway compromise or near-complete esophageal obstruction or features suggestive of inflammation or intestinal obstruction (fever, abdominal pain, or vomiting) [2].

Techniques

Various methods have been used to remove esophageal foreign bodies. They include rigid and flexible endoscopy, bougienage, Foley catheter, and the "penny pincher" technique.

Flexible endoscopy

Flexible endoscopy is preferred in most circumstances because the foreign body can be directly visualized and

manipulated, and the surrounding gastrointestinal tract can be examined for potential complications [21-23]. This procedure is performed under conscious sedation or general anesthesia, depending upon the patient's age, ability to cooperate, and the type and number of objects to be removed [24].

Magill forceps

Magill forceps can be used to extract foreign bodies impacted in the oropharynx or upper esophagus. In some cases, an object impacted in upper esophageal sphincter is visible at the time of tracheal intubation and can be directly removed with the Magill forceps without the need for intubation. However, in most cases, an endotracheal tube is placed to protect the airway, and a laryngoscope is used to gently open the esophagus and visualize the foreign body [25].

Types of Foreign Bodies

Coins

Coins are by far the most common foreign body ingested by children. In our series also, these were the most common variety i.e. in ten cases out of thirty (33.3%). A small percentage of the ingested coins become lodged in the esophagus, and these can cause serious complications including aspiration if not removed. Approximately two thirds of ingested coins are in the stomach at the time of initial radiographic evaluation [26] and in our patients also predominantly they were present in fundus. Spontaneous passage is more common in older children and when coins are located in the distal third of the esophagus. The esophageal coin should be removed promptly if the patient is symptomatic, if the coin does not pass spontaneously by 24 hours after ingestion, or if the time of ingestion is not known. In our practice, we prefer to remove most coins using flexible endoscopy.

Gossypiboma

One of the common medico-legal problems is retained sponge or any surgical instrument following an intra-abdominal surgery and is called Gossypiboma. The condition can have various kinds of manifestations ranging from asymptomatic stage to severe gastrointestinal complications like vomiting, pain abdomen, obstruction, perforation, peritonitis and even death. Transmural migration of gossypiboma is a very rare entity which leads to bowel or visceral perforation, obstruction or fistula formation. In our series there was one sixty year-old man who underwent six months back, open cholecystectomy for symptomatic gall stones. He became symptomatic after two weeks of operative interference and developed complaints of pain abdomen and persistent vomiting. The barium swallow and abdominal ultrasonogram revealed a mass located in the distal part of stomach and duodenum which gave suspicion of gastric carcinoma. On upper gastro-intestinal endoscopy, a surgical mop that had totally migrated into the stomach and duodenum was seen. The surgical mop was successfully removed by endoscopy through the esophagus. The recovery of the patient

was uneventful.

Sharp-pointed objects

The most common sharp-pointed objects ingested are straight pins, needles, and straightened paper clips; these represent 5 to 30 percent of swallowed objects. In our group, it was seen in three patients i.e. 10%. One patient had slipped nail while undergoing dental fixation procedure. The patient waited on her own for seven days but it was stucked at ileocecal junction and was removed on colonoscopy. Sharp-pointed objects lodged in the esophagus represent a medical emergency (risk of perforation ~15 to 35 %) [1]. When lodged in the hypopharynx, they can cause a retropharyngeal abscess. If the history or examination raises concern for a sharp pointed object, endoscopy should be performed even if the radiologic exam is negative, because many sharp-pointed immediately [24].

The risk of a complication caused by a sharp-pointed object passing through the gastrointestinal tract is as high as 35 percent, although some case series describe lower complication rates from sharp objects (4 percent) [27]. Sharp objects that pass beyond the reach of a flexible endoscope and then cause symptoms will require surgical intervention. If the object has passed into the small intestine and the patient is asymptomatic, it may be followed with serial radiographs to document its passage. Surgical intervention should be considered for objects that fail to progress for three consecutive days.

Trichobezoar

Trichobezoar is a ball of swallowed hair that collects in the stomach and fails to pass through the intestines. The risk is greatest among mentally retarded or emotionally disturbed children. In our series there were two 14 & 16-year-old (6.6%) mentally subnormal girls who presented with unexplained pain and lump abdomen. Abdominal examination revealed a firm, non-tender mobile mass occupying the epigastrium and extending to right hypochondrium and lumbar region. Endoscopy confirmed Trichobezoar in the stomach, in both the cases which were removed in multiple sittings using an endoscope and Argon plasma coagulator.

Magnets

With the increasing use of small magnets in toys and household items, ingestion of magnets is becoming a problem in children. These magnets usually come in the form of small cylinders or balls. Many of the children with complications of multiple magnetic ingestion had underlying conditions such as developmental delay or autism [28-31]. There was only one patient (3.3%) in our series that ingested one large magnet which was removed within two hours of ingestion from fundus of stomach. A single ingested magnet with smooth edges presents little risk, but two or more magnets may attract across layers of bowel leading to pressure necrosis, fistula,

volvulus, perforation or obstruction. As a result, it is of utmost importance to determine the location and number of magnets after a suspected ingestion, and 5 ingestion of multiple magnets warrants preemptive removal [31,32].

Dentures

It is most common etiology in old age patients. In our series, six patients (20%) had history of slipped dentures and in majority of them history of ill-fitting or looseness of them was present. Four of them were found impacted in stomach and two were seen in fundus of stomach. All of them were successfully removed endoscopically.

Long objects

Foreign bodies that are long and blunt, such as toothbrushes, batteries, and spoons, are most frequently ingested by older children, adolescents, or adults. Objects longer than 6 to 10 cm generally cannot pass beyond the stomach and should be removed [33]. In our series, there was one patient (3.3%) who underwent removal of brain tumour by neurosurgical team and Ryle's tube was inserted for feeding purpose. The patient was discharged with same Ryle's tube and due to some communication gap between the treating team and attendants of patient, the feeding continued with same Ryle's tube for six months. The family members reported back when this tube got blocked. On subjecting to endoscopy, an entangled and hard Ryle's tube was removed with great expertise and difficulty. Objects of intermediate length (over 5 cm) may pass the stomach but up to 50 percent become impacted in the ileocecal region.

Meat bolus & fish bone

Usually these two get impacted in two situations i.e. either there is stricture or under influence of alcohol. In our series there were two patients (6.6%) with impacted meat bolus and three patients (10%) with stucked fish bone. Out of these total five patients, three had stricture of esophagus beyond impacted site and two had history of alcoholic binge (Table 1) (Figures 1-5).

Table 1: The type of foreign bodies.

The Type of Foreign Bodies	Number	Percentages
Coins& Magnets	11	36.6
Fish bone	3	10
Trichobezoar	2	6.6
Denture	6	20
Pins & Needles	3	10
Gossypiboma	2	6.6
Meat bolus	2	6.6
Ryle's Tube	1	3.3
Total	30	100



Figure 1: Slipped Fixator Nail during dental procedure.



Figure 4: Entangled Ryle's Tube left by mistake for six months.



Figure 2: Endoscopically removed trichobezoar.



Figure 5: Swallowed Magnet after removal.



Figure 3: Gossypoma after endoscopic removal.

Summary and Recommendations

Patients with esophageal foreign bodies are asymptomatic or can present with symptoms like retrosternal pain, cyanosis, or dysphagia. The small children are unable to give exact history; hence suspicion arises when there is refusal of feeds or dysphagia, drooling, or respiratory symptoms. Older children and adults, usually give exact history, hence it becomes easier from management point of view. Patients with long-standing esophageal foreign bodies may present with weight loss, aspiration pneumonia, fever, or signs and symptoms of perforation including gastrointestinal bleeding or pneumomediastinum. Urgent intervention to remove a foreign body is indicated when the object is a sharp, long, or consists of multiple magnets, disk battery or there is suspected esophageal or intestinal obstruction. Upper endoscopy is very helpful in both ways i.e. diagnostic as well as therapeutic and can be adapted to a variety of foreign bodies in the esophagus, stomach, or proximal duodenum, and allows direct assessment of the mucosa for injury. Any sharp object or magnets in the esophagus or proximal gastrointestinal tract should be immediately removed because of high rates of complications. If these objects have passed beyond the proximal duodenum and the patient is asymptomatic, they can be managed with close observation and serial radiographs, as most will pass without complications.

References

1. Wyllie R (2006) Foreign bodies in the gastrointestinal tract. *Curr Opin Pediatr* 18(5): 563-564.
2. Uyemura MC (2005) Foreign body ingestion in children. *Am Fam Physician* 72(2): 287-291.
3. Banerjee R, Rao GV, Sriram PV, Reddy KS, Nageshwar Reddy D (2005) Button battery ingestion. *Indian J Pediatr* 72(2): 173-174.
4. Shivakumar AM, Naik AS, Prashanth KB, Yogesh BS, Hongal GF (2004) Foreign body in upper digestive tract. *Indian J Pediatr* 71(8): 689-693.
5. Westmoreland D, Grigsby K, Brown L, Latessa P, Huber D (1998) Replicating Project LINC in two midwestern states. Implications for policy development. *Nurs Health Care Perspect* 19(4): 166-174.
6. Yardeni D, Yardeni H, Coran AG, Golladay ES (2004) Severe esophageal damage due to button battery ingestion: can it be prevented? *Pediatr Surg Int* 20(7): 496-501.
7. Athanassiadi K, Gerazounis M, Metaxas E, Kalantzi N (2002) Management of esophageal foreign bodies: a retrospective review of 400 cases. *Eur J Cardiothorac Surg* 21(4): 653-656.
8. Kay M, Wyllie R (2005) Pediatric foreign bodies and their management. *Curr Gastroenterol Rep* 7(3): 212-218.
9. Sharieff GQ, Brousseau TJ, Bradshaw JA, Shad JA (2003) Acute esophageal coin ingestions: is immediate removal necessary? *Pediatr Radiol* 33(12): 859-863.
10. Reilly S, Carr L (2001) Foreign body ingestion in children with severe developmental disabilities: a case study. *Dysphagia* 16(1): 68-73.
11. Louie JP, Alpern ER, Windreich RM (2005) Witnessed and unwitnessed esophageal foreign bodies in children. *Pediatr Emerg Care* 21(9): 582-585.
12. Yalcin S, Karnak I, Ciftci AO, Senocak ME, Tanyel FC, et al. (2007) Foreign body ingestion in children: an analysis of pediatric surgical practice. *Pediatr Surg Int* 23(8): 755-761.
13. Baser M, Arslanturk H, Kisli E, Arslan M, Oztürk T, et al. (2007) Primary aortoduodenal fistula due to a swallowed sewing needle: a rare cause of gastrointestinal bleeding. *Ulus Travma Acil Cerrahi Derg* 13(2): 154-157.
14. Yamada T, Sato H, Seki M, Kitagawa S, Nakagawa M, et al. (1996) Successful salvage of aorto-esophageal fistula caused by a fish bone. *Ann Thorac Surg* 61(6): 1843-1845.
15. Tokar B, Cevik AA, Ilhan H (2007) Ingested gastrointestinal foreign bodies: predisposing factors for complications in children having surgical or endoscopic removal. *Pediatr Surg Int* 23(2): 135-139.
16. Ginsberg GG (1995) Management of ingested foreign objects and food bolus impactions. *Gastrointest Endosc* 41(1): 33-38.
17. Faigel DO, Stotland BR, Kochman ML, Hoops T, Judge T, et al. (1997) Device choice and experience level in endoscopic foreign object retrieval: an in vivo study. *Gastrointest Endosc* 45(6): 490-492.
18. Younger RM, Darrow DH (2001) Handheld metal detector confirmation of radiopaque foreign bodies in the esophagus. *Arch Otolaryngol Head Neck Surg* 127(11): 1371-1374.
19. Ngan JH, Fok PJ, Lai EC, Branicki FJ, Wong J (1990) A prospective study on fish bone ingestion. Experience of 358 patients. *Ann Surg* 211(4): 459-462.
20. Eisen GM, Baron TH, Dominitz JA, Faigel DO, Goldstein JL, et al. (2002) Guideline for the management of ingested foreign bodies. *Gastrointest Endosc* 55(7): 802-806.
21. Katsinelos P, Kountouras J, Paroutoglou G, Zavos C, Mimidis K, et al. (2006) Endoscopic techniques and management of foreign body ingestion and food bolus impaction in the upper gastrointestinal tract: a retrospective analysis of 139 cases. *J Clin Gastroenterol* 40(9): 784-789.
22. Dahshan AH, Kevin Donovan G (2007) Bougienage versus endoscopy for esophageal coin removal in children. *J Clin Gastroenterol* 41(5): 454-456.
23. Gmeiner D, von Rahden BH, Meco C, Hutter J, Oberascher G, et al. (2007) Flexible versus rigid endoscopy for treatment of foreign body impaction in the esophagus. *Surg Endosc* 21(11): 2026-2029.
24. Nelson DB, Bosco JJ, Curtis WD, Faigel DO, Kelsey PB, et al. (1999) ASGE technology status evaluation report. Endoscopic retrieval devices. February 1999. American Society for Gastrointestinal Endoscopy. *Gastrointest Endosc* 50(6): 932-934.
25. Janik JE, Janik JS (2003) Magill forceps extraction of upper esophageal coins. *J Pediatr Surg* 38(2): 227-229.
26. Waltzman ML (2006) Management of esophageal coins. *Curr Opin Pediatr* 18(5): 571-574.
27. Velitchkov NG, Grigorov GI, Losanoff JE, Kjossev KT (1996) Ingested foreign bodies of the gastrointestinal tract: retrospective analysis of 542 cases. *World J Surg* 20(8): 1001-1005.
28. Centers for Disease Control and Prevention (CDC) (2006) Gastrointestinal injuries from magnet ingestion in children--United States, 2003-2006. *MMWR Morb Mortal Wkly Rep* 55(48): 1296-1300.
29. Hwang JB, Park MH, Choi SO, Park WH, Kim AS (2007) How strong construction toy magnets are! A gastro-gastroduodenal fistula formation. *J Pediatr Gastroenterol Nutr* 44(2): 291-292.
30. Butterworth J, Feltis B (2007) Toy magnet ingestion in children: revising the algorithm. *J Pediatr Surg* 42(12): e3-5.
31. Schierling S, Snyder SK, Custer M, Pohl JF, Easley D (2008) Magnet ingestion. *J Pediatr* 152(2): 294.
32. Pryor HI, Lange PA, Bader A, Gilbert J, Newman K (2007) Multiple magnetic foreign body ingestion: a surgical problem. *J Am Coll Surg* 205(1): 182-186.
33. Pellerin D, Fortier-Beaulieu M, Guegen J (1969) The fate of swallowed foreign bodies: experience of 1250 instances of sub diaphragmatic foreign bodies in children. *Prog Pediatr Radiol* 2: 302.