Surgical Intervention for Gastrointestinal Foreign Bodies in Adults: A Case Series

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Key Words

Foreign body ingestion • Complications • Surgical treatment

Abstract

Objective: The aim of our study was to demonstrate our experience regarding the surgical treatment of complications after foreign body ingestion. **Subject and Methods:** From 1997 to 2005, we treated 16 adult patients (mean age 44.8 years, range 21–77), who presented with complications after foreign body ingestion. **Results:** The complications treated were perforation-peritonitis: n = 7 (44%), intra-abdominal abscess formation: n = 5 (31%), upper gastrointestinal bleeding: n = 3 (19%) and inflammatory mass formation: n = 1 (6%) patient. The diagnosis was made intra-operatively in 13 (81.3%) of the cases. The commonest anatomical position of the perforation was the large bowel, in 7 (43%) of the cases. Bony food parts were the commonest foreign bodies accidentally swallowed, in 9 (56%) patients. The median hospital stay was 7 days (2–18), while no death occurred in the post-operative period among the patients of the study. The post-operative morbidity rate was 22.2%. **Conclusions:** The most common complication after foreign body ingestion was the perforation of the gastrointestinal tract. The risk of perforation was higher when sharp foreign bodies were ingested. The pre-operative diagnosis was difficult, and it was usually achieved intra-operatively.

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Introduction and Objective

Ingestion of foreign bodies is a significant problem that causes surprisingly high morbidity and mortality [1]. Despite the fact that it is reported to be more common in children, especially in patients between 6 months and 6 years of age, foreign body ingestion can also occur among adult patients [2–4]. In the majority of cases, foreign bodies can pass successfully through the proximal oesophageal sphincter and the ileocaecal valve, before they are discharged in the faeces [2, 5, 6]. Endoscopic intervention is the gold standard technique used for the removal of foreign bodies from the gastrointestinal (GI) tract [7]. However, in some cases, foreign body ingestion is followed by life-threatening complications, for which surgical intervention is essential, such as perforation and peritonitis, perforation with secondary abscess formation, GI bleeding, bowel obstruction or even perforation with injury of adjacent viscera [8, 9]. The aim of this retrospective study was to report our experience after surgical treatment of complications secondary to foreign body ingestion in adult patients.

Subjects and Methods

From 1997 to 2005, we treated 16 patients who presented with a major complication after foreign body ingestion. The study group consisted of 10 male and 6 female patients with a mean age

of 44.8 years (range 21–77). The majority of the patients (n = 13) presented to the accident and emergency department of our hospital complaining of acute abdominal pain. The remaining 3 were referred from the endoscopic department of the hospital after failure of endoscopic removal of the foreign body from the GI tract. The main presenting symptoms were abdominal pain: n = 13; fever: n = 10; melaena: n = 3; tenesmus: n = 2, and vomiting: n = 7.

The imaging techniques used for the diagnostic approach of the patients included plain abdominal and chest X-ray films, abdominal ultrasound scan and computed tomography (CT) scan. In 3 of the cases, endoscopic approach was attempted prior to the surgical intervention.

Results

Despite the wide variety of diagnostic tools used, accurate pre-operative diagnosis could not be established in most of the patients (n = 13) and, therefore, explorative laparotomy was required.

Table 1. Anatomical position of the complication

Anatomical position	Cases	
	n	%
Large bowel	7	43
Small bowel	5	31
Duodenum	2	13
Stomach	2	13
Total	16	100

The complications after foreign body ingestion included perforation-peritonitis: n = 7 (44%), intra-abdominal abscess formation: n = 5 (31%), upper GI bleeding: n = 3 (19%) and inflammatory mass formation: n = 1 (6%) patient.

The commonest anatomical position of the perforation was found to be the large bowel, in 7 (43%) of the cases (table 1). Bony food parts were found to be the commonest foreign bodies accidentally swallowed by the patients of our study. The foreign bodies detected were bony parts: n = 9 (56%); toothpick: n = 5 (31%), and wire: n = 2 (13%). In all but 2 of the patients, the foreign body ingestions occurred accidentally during feeding. The remaining 2 patients, who had a psychiatric background, swallowed the foreign bodies on purpose.

The type of operation performed was chosen according to the intra-operative findings and the anatomical position of the complication. In 8 (50%) of the cases, simple closure of the perforated bowel, peritoneal washout and drainage of the peritoneal cavity was adequate treatment, but in the remaining cases, more complex procedures were required. The foreign body, the anatomical position of the complication, and the type of operation performed for each case are presented in table 2.

No death occurred among the patients; complications during the postoperative period occurred in 4 (25%) of the patients. The complications consisted of wound infection: n = 2, pneumonia: n = 1, and bile fistula formation: n = 1 patient, who had undergone duodenotomy and suturing of a bleeding point at the second part of the du-

Table 2. Detailed presentation of the cases

Patient	Anatomical position	Complication	Foreign body	Management
1	caecum	perforation – abscess	toothpick	appendicectomy – suturing of perforation
2	transverse colon	perforation – abscess	toothpick	suturing of perforation
3	ileum	perforation – peritonitis	toothpick	appendicectomy – suturing of perforation
4	Meckel's diverticulum	perforation – peritonitis	bone	appendicectomy – Meckelelectomy
5	transverse colon	perforation – abscess	bone	omentectomy – ileostomy
6	ileum	perforation – peritonitis	bone	suturing of perforation
7	sigmoid colon	perforation – peritonitis	bone	suturing of perforation
8	duodenum ¹	bleeding	bone	suturing of bleeding point
9	stomach ¹	bleeding	wire	suturing of bleeding point
10	jejunum	perforation – peritonitis	toothpick	suturing of perforation – appendicectomy and Meckelelectomy
11	duodenum	perforation – peritonitis	bone	suturing of perforation
12	ileum	perforation – peritonitis	wire	suturing of perforation
13	right colon flexure	inflammatory mass on the right colon flexure	bone	removal of inflammatory mass, omentectomy
14	appendix vermiformis	perforation – abscess	toothpick	appendicectomy
15	stomach ¹	bleeding	bone	suturing of bleeding point
16	sigmoid colon	perforation – abscess	bone	Hartmann's sigmoidostomy

¹ Referred from endoscopy.

odenum. The latter was successfully treated conservatively as the fistula subsided after total parenteral nutrition for 15 days.

The median hospital stay was 7 days (2–18) and the median operation time was 70 min (range 35–175).

Discussion

Foreign body ingestion is a major problem, as it is reported to be accompanied by remarkably high morbidity and mortality rates [10]. Approximately 1,500–1,600 people die each year in the USA of complications after foreign body ingestion [10].

Most of the ingested foreign bodies pass successfully through the GI tract and get discharged with the faeces. Therefore, in patients who present with accidental foreign body ingestion, daily observation with abdominal X-ray is adequate, as long as these bodies are radiopaque and blunt. Sharp objects (e.g. needles, toothpicks) are more likely to infiltrate or perforate the bowel wall. Therefore, all sharp foreign bodies must be removed before passing the stomach, as it is reported that 15–35% of them will perforate the bowel, usually around the ileocaecal valve [11, 12]. According to Webb [13], if a sharp foreign object has not advanced in the GI tract after 3 days, then surgical intervention should be considered, and if the patient becomes symptomatic, then surgical intervention is mandatory. Ingestion of sharp foreign bodies is accompanied by higher morbidity and mortality rates, compared to the rest of the foreign body groups [14–16]. In our study all complications were caused by sharp foreign bodies.

Foreign body ingestions are more common in children, as they tend to place foreign bodies in their mouth. This results in the accidental ingestion of them and their impaction in different sites of the GI tract, with the oesophagus being the commonest site reported [17–19]. Odelowo and Komolafe [19] have observed a physiological stenosis in the lower part of the cricopharyngeal muscle in children. It is more likely that the ingested foreign body can pass through the GI tract without causing any complications in children than in adults [20]. However, we could not compare our findings with those of children because our study group comprised only adult patients.

A large variety of ingested foreign bodies have been reported with a majority of them being metallic objects instead of bony elements of food as in our study [21]. The commonest impaction site of the GI tract for foreign bodies in adults was the oesophagus [10, 22]. The other com-

mon reported impaction site was the splenic flexure [23]. In our study, the commonest site of the complications was the large bowel. Furthermore, the appendix and Meckel's diverticulum also appeared to be potential sites of perforation due to foreign bodies.

Diagnosis of radiopaque foreign bodies is not difficult, since plain chest and abdominal X-rays can be sufficient, but detection of radiolucent foreign bodies can be difficult; oral contrast studies may be useful in these cases. In case of a perforation, abdominal ultrasound and CT scan have proven to be very useful [24]. In the rare cases of duodenal perforation, it is difficult to diagnose it quickly and accurately, if the perforation is not accompanied by symptoms of generalized peritonitis or by abscess formation. The use of double-contrast X-rays is necessary for the diagnosis of such perforations [9]. In our study, most of the foreign bodies were radiolucent. Moreover, abdominal ultrasound and CT scan were not useful in detecting the cause of the GI perforation in our series, hence explorative laparotomy was required.

Conclusion

The most common complication after foreign body ingestion seems to be the perforation of the GI tract, but it is not always complicated by generalized peritonitis. The risk of perforation seems to be higher when sharp foreign bodies are ingested. The pre-operative diagnosis is difficult and despite the wide range of imaging methods, the diagnosis of foreign body complication is usually achieved during operation, especially when the foreign body is radiolucent.

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