

A hospital-based assessment of the role of surgical intervention in case if foreign body is in abdomen: a comparative study

ABSTRACT

Aim: The aim of the present study was to investigate the clinical situation, treatment methods, and clinical predictors of surgical intervention if foreign bodies are in the abdomen.

Methods: A total of 50 individuals were selected as study participants after being hospitalized to our hospital for unintentional intake of foreign bodies. The patients were categorized into two categories, namely the surgery group and the non-surgery group, based on the treatment approach. The admission status of both groups was then analyzed.

Results: The research consisted of 54% male participants and 46% female participants. The unintentional ingestions varied from 2 to 95 instances, with the longest duration surpassing 1 month. In the instances discussed in this article, magnetic foreign objects inside the digestive system are largely managed by methods such as surveillance, removal using a gastroscope, and surgical intervention. There was a total of 50 instances, with 25 involving surgical interventions and the other 25 involving non-surgical interventions. The two groups did not vary in terms of age, gender, ingested number by mistake, local soreness on physical examination, and mass. Regarding statistical significance, there were indeed significant differences between the groups in terms of the timing of accidental ingestion, clinical symptoms (such as nausea, vomiting, persistent stomach discomfort, and abdominal muscular tension), and movement seen in the 24-hour radiographs. Foreign objects in the digestive system are linked to unintentional ingestion, clinical symptoms (such as nausea, vomiting, persistent abdominal discomfort, and abdominal muscular tension), and the path of movement determined by 24-hour radiographs associated with surgical interventions. Thus, the multivariate logistic regression analysis used just the relevant univariate components, while removing any confounding variables.

Conclusion: The harm inflicted by foreign objects in the digestive system is quite serious, thus, prevention is often more desirable than cure. Hence, it is essential to encourage the societal stratum to actively foster knowledge and prompt pertinent makers to fabricate conspicuous signage.

Keywords: surgical intervention, foreign body, abdomen

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I. INTRODUCTION

Foreign body ingestion is a common occurrence worldwide. Although foreign objects often pass through the gastrointestinal (GI) tract and leave the body naturally, some situations may need surgical intervention. Foreign body ingestion is a regular occurrence across all age groups; however, it is more prevalent among children and early adolescents.¹ Ingesting foreign materials via the digestive system is a major cause of unintentional harm in children. This is mostly due to children's weak perception and strong curiosity.² Foreign body ingestion is a potentially grave issue that reaches its highest point in youngsters between the ages of six months and three years. Less than one percent of all patients experience severe morbidity, whereas around 1,500 fatalities per year are directly linked to the consumption of foreign objects. Typical forms of foreign surgical objects include magnetic bodies and button batteries. Varying kinds, amounts, and sizes of foreign substances can lead to specific difficulties.³ Adults in good health may inadvertently ingest items such as needles, toothpicks, dentures, fish bones, and chicken bones. Furthermore, patients with mental problems often consume a wide range of alien objects. The majority of foreign objects that are swallowed pass through the gastrointestinal system without causing any complications.⁴⁻⁵ Alternatively, the presence of mucosal erosion and abrasion may lead to bleeding, which has the potential to be quite severe or even fatal. Although there is a pretty comprehensive understanding of the frequency and consequences of some kinds of surgical mistakes, our information of the underlying causes of these errors remains limited.⁶ An enigmatic instance of grave surgical mistakes is the presence of residual surgical foreign bodies, such as sponges, equipment, needles, and so on.^{7,8} Retained surgical foreign bodies (RSFB) may pose a risk to the patient and lead to significant professional and legal repercussions.⁸⁻¹⁰ The predicted occurrence rate of retained surgical foreign bodies is about 0.3–1.0 per 1,000 abdominal procedures.⁹

Surgical intervention is seldom necessary for foreign body (FB) ingestion, since the majority of FBs pass through the gastrointestinal system without complications or may be effectively removed via endoscopy.^{11,12} It is only considered as a last resort when endoscopic extraction has been unsuccessful or when difficulties from ingesting a foreign body have arisen. The occurrence of these problems is often a result of gastrointestinal perforation and encompasses a broad range of clinical manifestations, such as localized or widespread peritonitis, abscesses in the abdominal wall, and abscesses inside the abdomen.¹³

The traditional approach to surgical treatment has mostly included doing an abdominal laparotomy. The advantages of using a laparoscopic technique in abdominal surgery are well recognized. These include decreased occurrence of postoperative ileus and discomfort, smaller incisions resulting in better esthetic outcomes, shorter hospital stays, quicker recovery and a lower risk of postoperative hernias.^{14,15}

The aim of this study was to investigate the clinical situation, therapeutic methods, and clinical markers that may need surgical intervention in instances of foreign substances in the gastrointestinal tract.

II. MATERIALS AND METHODS

We selected 50 individuals to participate in the study because they had been brought to our hospital after accidentally swallowing foreign substances.

Inclusion criteria:

Either a prior history of swallowing magnetic foreign bodies or evidence of their existence via endoscopy, imaging, or surgery is required.

Exclusion criteria:

The patient is unable to comply because of additional concerns, and the foreign body in their digestive system is not magnetic.

Methodology

Patients were categorized into two groups based on their treatment method: those who had surgery (laparoscopic, laparotomy) and those who did not have surgery (conservative, gastroscopic removal). The admission status for each group was then compared.

Patients who have inadvertently consumed magnetic foreign bodies should have their following clinical data recorded: age, gender, duration from start to consultation, main symptoms, kind of accidental ingestion, number of accidental ingestions, further examinations, treatment technique, complications, and prognosis.

Statistical analysis

A database was created using Excel. A third person checked the data submitted by the first two. We used SPSS 22.0 to do the statistical analysis. P values less than 0.05 were deemed statistically significant, and all statistical tests were two-sided. Univariate logistic regression analysis is one of the significant risk variables that have been gathered.

III. RESULTS

Table 1: Comparison of clinical data between the surgical and non-surgical groups

	Surgery group (n = 25)	Non-surgical group (n = 25)	P-value
Age/Year	55.15±12.48	58.23±12.58	0.190
Gender Male:Female	12/13	15/10	0.910
Accidental ingestion time/day	2.00 (1.00, 4.00)	0.72 (0.23, 1.63)	0.001
Accidental ingestion number/capsule	7.00 (5.00, 10.75)	5.00 (3.00, 9.00)	0.145
Clinical manifestations			
Nausea	12	6	0.007
Vomiting	13	7	0.012
Intermittent abdominal pain	23	7	0.001
Abdominal muscle tension	14	0	0.015
Local mass	1	1	1.000
Local tenderness	12	4	0.064
Movement trajectory by every 24-h radiograph	0	15	0.001

The research consisted of 54% men and 46% females. The range of unintentional ingestions varied from 2 to 95, with the longest duration surpassing 1 month. In the instances discussed in this page, magnetic foreign objects in the digestive system are largely managed by methods such as surveillance, removal with a gastroscope, and surgical intervention. There were a total of 50 instances, with 25 involving surgical interventions and 25

involving non-surgical interventions. The two groups did not vary in terms of age, gender, number swallowed by mistake, local soreness on physical examination, and mass. Regarding statistical significance, there were indeed significant differences between the groups in terms of the time of accidental ingestion, clinical symptoms (such as nausea, vomiting, persistent stomach discomfort, and abdominal muscular tension), and movement seen in the 24-hour radiographs.

Table 2: Logistic regression analysis of factors related to surgical intervention for magnetic foreign bodies in the gastrointestinal tract

Variables	Univariate regression analysis			Multivariate regression analysis		
	OR	95%CI	P-value	OR	95%CI	P-value
Accidental ingestion time/day	0.894	0.764–1.035	0.136			
Movement trajectory by every 24-h radiograph	1.350	0.004–0.299	0.003			
Clinical manifestations						
Nausea	4.952	1.239–19.789	0.025			
Vomiting	5.000	1.606–15.566	0.007			
Intermittent abdominal pain	6.667	1.816–16.810	0.002	1.177	0.834–1.918	0.036
Abdominal muscle tension	0.090	0.018–0.040	0.002	18.417	2.115–20.976	0.007

Foreign objects inside the gastrointestinal system are linked to instances of unintentional ingestion, and are characterized by clinical symptoms such as nausea, vomiting, chronic stomach discomfort, and abdominal muscular tension. The movement of these objects may be tracked by 24-hour radiographs, which are often performed in relation to surgical operations. Hence, the multivariate logistic regression analysis used just the relevant univariate components, while removing any confounding variables.

IV. DISCUSSION

The current primary choices for treating foreign bodies in the digestive system are conservative self-discharge, gastroscopic removal, and surgical treatments. Based on relevant data, more than 80% of instances involving the swallowing of foreign objects are managed by non-invasive methods, while just 1% need surgical intervention.¹⁶ Typical examples of foreign objects found in surgical cases are magnetic objects and button batteries. Varying kinds, amounts, and sizes of foreign substances can lead to specific difficulties. Under such circumstances, the magnetic compounds may cause an attraction between them in the digestive system, resulting in the forceful expulsion of the gastrointestinal tract wall due to a lack of oxygen, the death of intestinal tissue, the creation of a hole, blockage, or the development of an abnormal passage.¹⁷

The research consisted of 54% male participants and 46% female participants. The range of unintentional ingestions varied from 2 to 95, with the longest duration surpassing 1 month. In the instances discussed in this article, magnetic foreign bodies inside the digestive system are mostly managed using methods such as surveillance, removal with a gastroscope, and surgical intervention. There was a total of 50 instances, with 25 involving surgical interventions and 25 involving non-surgical interventions. The age, gender, number ingested by mistake, local pain on physical examination, and mass did not show any differences between the two groups. Regarding statistical significance, there were indeed significant differences between the groups in terms of the timing of accidental ingestion, clinical symptoms (such as nausea, vomiting, persistent stomach discomfort, and abdominal muscular tension), and movement seen in the 24-hour radiographs. Continuous monitoring of abdominal X-rays is a crucial indication for surgical intervention. Regrettably, abdominal B-ultrasound lacks specificity in detecting magnetic foreign substances in the digestive system, leading to a significant number of undiagnosed cases. Magnetic foreign materials in the digestive system seldom induce perforation, which usually manifests as a small-diameter internal fistula. Consequently, abdomen X-rays demonstrate a reduced presence of unbound gas behind the diaphragm.¹⁸ Foreign objects may be extracted using a gastroscope in cases when they have been accidentally ingested or if the object is located in the duodenum or above within a 24-hour timeframe. If complete removal of the gastroscope is not possible, continuous monitoring of the foreign body's dynamic changes is necessary, and surgical intervention should be considered if it persists for a prolonged duration.¹⁹

Foreign objects inside the digestive system are linked to instances of unintentional ingestion, presenting symptoms such as nausea, vomiting, prolonged stomach discomfort, and tension in the abdominal muscles. The movement of these objects may be tracked by 24-hour radiographs, which are connected to surgical treatments. Thus, the multivariate logistic regression analysis used just the relevant univariate components, while removing any confounding variables. Certain researchers advocate for laparotomy as the primary option for surgical intervention.²⁰ We concur that laparoscopic exploration should be the preferred option for surgical intervention,

particularly due to its dual nature as both a surgical technique and a visual examination. Laparoscopic exploration may aid in the diagnosis of patients who are unable to localize the foreign body on an abdominal X-ray and lack the ability to assess the extent of necrosis and perforation.²¹

V. CONCLUSION

Ultimately, the harm inflicted by foreign objects in the digestive system is quite severe, making prevention often more desirable than therapy. Hence, it is essential to encourage the societal stratum to actively advocate for education and compel pertinent businesses to provide conspicuous signage. Medical professionals should promptly implement a treatment plan for individuals who have accidentally eaten foreign objects. It is recommended to priorities the use of gastroscope removal or a combination of gastroscope and laparoscopy to enhance the success rate of foreign body removal, minimize complications, and guarantee the preservation of life.

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