International Journal of Research in Medical Sciences
Sharma K et al. Int J Res Med Sci. 2025 Jan;13(1):119-123
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20243779

Original Research Article

Foreign body ingestion: distribution, its complication and management

Kalpana Sharma, Kune S. Pyrbot*, Nasimus Sava

Department of E.N.T and Head and Neck Surgery, Gauhati Medical College and Hospital, Guwahati, Assam, India

Received: 28 November 2024
Revised: 08 December 2024
Accepted: 09 December 2024

***Correspondence:**
Dr. Kune S. Pyrbot,
E-mail: drkunesaphi@gmail.com

ABSTRACT

Background: Foreign body ingestion can lead to severe complications, especially if the object becomes lodged in the oesophagus. Complications may include perforation, obstruction, and secondary infections. Early diagnosis using soft tissue neck and chest radiographs can help determine the location, type of foreign body and any associated abscess formation. In cases with complications, the primary treatment involves intravenous antibiotics followed by removal of foreign body.
Methods: This prospective observational study was conducted in the Department of Otorhinolaryngology and Head and Neck Surgery at Gauhati Medical College and Hospital, Guwahati. A total of 144 patients with foreign body ingestion treated in our hospital from September 2023 to August 2024 were included. Each patient underwent a thorough clinical assessment and radiographs of the soft tissue neck, chest, and abdomen (both lateral and anteroposterior views). A computed tomography (CT) scan was performed, if necessary, to confirm the presence of foreign body and to identify any potential complications.
Results: Among the 144 patients, 18 developed complications related to foreign body ingestion ranging from 6-60 years old with a male-to-female ratio of 2:1. The most frequent complication was retropharyngeal abscess, followed by oesophageal obstruction, respiratory obstruction, and oesophageal tear. Out of the 18 patients, one patient expired as a result of complications.
Conclusions: Foreign body ingestion can cause serious complications such as oesophageal obstruction, mucosal laceration and perforation, airway obstruction, and infections. Prompt identification and intervention are essential to manage these complications effectively and to reduce morbidity and mortality in affected patients.

Keywords: Foreign body, Complications, Oesophageal perforation, Retropharyngeal abscess

INTRODUCTION

Foreign body ingestion is a frequent clinical occurrence, with approximately 80-90% of ingested foreign bodies passing through the digestive tract without the need for intervention. Only about 10-20% of cases require endoscopic removal, while less than 1% necessitate surgical intervention.[1] The phenomenon of accidental foreign body ingestion has been documented for centuries, with the first recorded case occurring in 1692, when the 4-year-old Crown Prince of Brandenburg, Frederick the Great, swallowed a shoe buckle.[2]

The clinical presentation of foreign body ingestion can be diverse. Acute symptoms often include pharyngeal discomfort, epigastric pain, vomiting, odynophagia, dysphagia, and chest pain. Interestingly, approximately 30% of patients may remain asymptomatic for extended periods, sometimes even for years, despite the presence of an ingested foreign body.[1] Diagnosis is primarily based on detailed history taking and physical examination, with the patient's symptoms, type of foreign body, and timing of ingestion being key components. In cases where a foreign body is lodged above the cricopharyngeus, pain in the throat may help localize the site of lodgement; however, this is not possible if the foreign body is located below the

cricopharyngeus. Furthermore, in cases of airway obstruction, the Heimlich maneuver may be considered to dislodge the foreign body, particularly in emergency situations.

Plain radiography is the first-line imaging technique, allowing clinicians to assess the size, shape, number and location of the foreign body. However, some foreign bodies, such as those that are radiolucent, may not be visible on X-rays. In such cases, alternative imaging techniques like computed tomography (CT) or diagnostic esophagoscopy are employed for further evaluation. Other imaging modalities, including ultrasonography and magnetic resonance imaging, have limited utility in this clinical scenario.[3]

While most foreign body ingestions result in less severe symptoms, oesophageal obstruction caused by an impacted foreign body is a potentially life-threatening condition. If left untreated, complications such as oesophageal ulceration, ischemia, or perforation may arise. Persistent oesophageal obstruction often results in increased salivation, and the removal of the foreign body not only resolves the obstruction but also provides an opportunity to inspect the oesophagus for any underlying pathology. For patients presenting with fever, obstruction lasting more than 24 hours, or the ingestion of sharp foreign bodies (e.g., fish bones), hospitalization is recommended**,** along with intravenous antibiotics and radiographic evaluation of the neck and chest. It is important to note that radiographic contrast studies are generally not advisable**,** as they may interfere with subsequent endoscopy or esophagoscopy, both of which are essential for foreign body removal.

In some instances, conservative methods such as sipping carbonated beverages, sublingual nifedipine, or intravenous glucagon have been used to resolve oesophageal food impaction. However, the efficacy of these interventions remains uncertain, and they are typically reserved for cases with lower risk of complications.[4-6]

Although foreign body ingestion is a common medical emergency, however there are no proper protocols for this clinical scenario. This study aimed to identify the distribution of foreign body in regards to proper diagnosis of type and location along with detection of complications when present and their appropriate management.

METHODS

This prospective observational study was approved by the institutional ethics committee. This study was carried out in the Department of Otorhinolaryngology and Head and Neck Surgery at Gauhati Medical College and Hospital, Guwahati from September 2023 to August 2024. Data preparation and analysis were done using the data analysis tool of Microsoft excel. The study included all patients with history of foreign body ingestion and in those with suspicious of ingestion of foreign body who presented with one or more of the following clinical symptoms: nausea or vomiting, dysphagia, pharyngeal pain or discomfort, cough, drooling, odynophagia, chest pain, abdominal pain, and respiratory distress.

All patients with a history of or suspected foreign body ingestion underwent routine radiological examination to determine the type and location of the foreign body. Additionally, laryngoscopic examination was performed to detect any oropharyngeal foreign bodies. When present, these foreign bodies were directly removed using a tongue depressor and various forceps. Computed tomography of the neck and chest was conducted only if the diagnosis of a foreign body was uncertain or if complications were suspected.

Asymptomatic patients or those without complications typically underwent rigid esophagoscopy within 12-24 hours of admission. In contrast, patients presenting with complications initially received intravenous antibiotics for a minimum of 48 to 72 hours before being scheduled for rigid esophagoscopy. Serial X-rays were performed to monitor the daily progress or resolution of complications. If necessary, additional interventions were carried out to address complications, such as tracheostomy for respiratory distress or transoral drainage for retropharyngeal abscess. Once complications had resolved, patients were scheduled for rigid esophagoscopy.

For the rigid esophagoscopy procedure, all patients provided informed written consent prior to the procedure. The procedure was performed under general anaesthesia using a Negus rigid oesophagoscope. Foreign bodies were removed using alligator forceps. Post-removal, any minor mucosal injuries, such as abrasions or small erosions, if present, were managed conservatively with the placement of a nasogastric tube and the recommendation of nil per os (NPO) for 3-7 days, depending on the severity of the injury. Severe injuries were managed with surgical intervention if necessary.

RESULTS

Demography

During this one-year study involving 144 patients, a slight male predominance was observed (57.64%) with a male to female ratio 1.36:1. The most common age group was 9 months-10 years. The predominant clinical presentation was history of foreign body ingestion (43.75%), pharyngeal discomfort (18.75%), with dysphagia (18.06%) being the second and third most common symptoms (55.56%).

Characteristics and location of foreign bodies

The most frequently encountered foreign body was coin, identified in 54 cases (37.5%). This was followed by meat bone, present in 40 cases (27.78%), and fish bone, found

in 36 cases (25%). Other foreign bodies observed included dentures (6 cases, 4.17%), safety pins (3 cases, 3.06%), plastic fragments (2 cases, 2.04%), magnet (1 case, 1.02%), metal cap (1 case, 1.02%), and hair pin (1 case, 1.02%).

The oesophagus was identified as the most common site of foreign body lodgement, with a total of 132 cases (91.67%). Among these, the upper oesophagus was the predominant location, accounting for 113 cases (78.47%).

Furthermore, it was noted that sharp foreign bodies, such as fish bones and meat bones, are more frequently associated with complications compared to blunt objects like coins. Some of the foreign bodies are shown in below figures.

Table 1: Distribution of studied patients and patients who presented with complications.

Demography	No. of patients (%)	Complications (%)
Sex		
Male	83 (57.64)	12 (66.66)
Female	6 (42.36)	6 (33.33)
Age range (years)		
0-10	63 (43.75)	1 (5.55)
11-20	9 (6.25)	3 (16.67)
21-30	19 (13.19)	2 (11.11)
31-40	25 (17.36)	5 (27.78)
41-50	12 (8.33)	3 (16.67)
51-60	10 (6.94)	4 (22.22)
61-70	3 (2.08)	0
71-80	1 (0.69)	0
81-90	2 (1.39)	0

Table 2: Presenting complaints.

Presentation	Count (n=144)	Percentage
History of foreign body ingestion	63	43.75
Pharyngeal discomfort/throat pain	27	18.75
Dysphagia	26	18.06
Odynophagia	21	14.58
Vomiting	3	2.08
Chest pain	2	1.39
Drooling	1	0.69
Respiratory distress	1	0.69

Complications

In this study, a total of 144 patients with foreign body ingestion were included, out of which 114 patients who presented without any complications underwent removal of ingested foreign body, all procedures were successful.

Table 3: Location of ingested foreign body.

Location of foreign body	Count (n=144)	Percentage
Pharynx	12	8.33
Oesophagus		
Upper	113	78.47
Middle	16	11.11
Lower	3	2.08

Table 4: Types of ingested foreign body.

However, complications were observed in 18 patients (12.5%). Specifically, each of these patients developed retropharyngeal abscess. As a result of the abscess, 12 patients experienced oesophageal obstruction, while 1 patient suffered from respiratory obstruction, necessitating tracheostomy to secure the airway. Additionally, 1 patient had a perforation in the thoracic part of the oesophagus, which was initially managed conservatively followed by removal of foreign body with the placement of a nasogastric tube and a nil per os (NPO) regimen for 14 days. Unfortunately, in this study, one pediatric patient died due to mediastinitis and septicemia, which resulted from the rupture of the retropharyngeal abscess.

Table 4: Types of ingested foreign body.

Types of foreign body	Count (n=144)	Percentage
Coin	54	37.5
Meat bone	40	27.78
Fish bone	35	24.30
Denture	6	4.17
Safety pin	3	2.08
Rubber	3	2.08
Magnet	1	0.69
Metal cap	1	0.69
Hair pin	1	0.69

Table 5: Distribution of patients who presented with complications.

Presentation	Count (n=18)	Percentage
Dysphagia	11	61.11
Odynophagia	4	22.22
Chest pain	1	5.56
Drooling	1	5.56
Respiratory distress	1	5.56

Table 6: Types of ingested foreign body in patients with complications.

Types of foreign body	Count (n=18)	Percentage
Meat bone	8	44.44
Fish bone	8	44.44
Denture	2	11.11

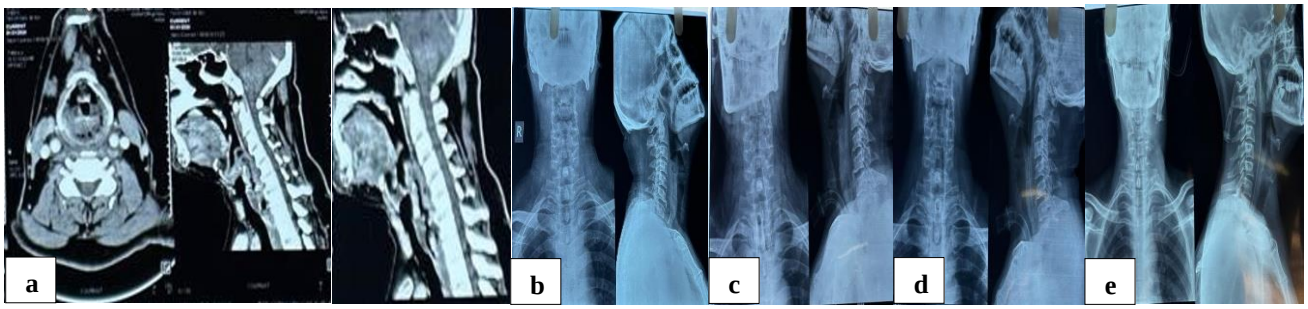

Figure 1: (a) CT images of a 59-year-old male showing foreign body (meat bone) in retropharyngeal space at the level of T1 vertebra piercing the adjacent oesophageal wall with retropharyngeal abscess and air foci (red arrow) in the retropharyngeal space extending from C3 to T1 vertebrae; (b) through (e) showing serial X-rays of the soft tissue neck and chest in both anteroposterior (AP) and lateral views of the above same patient; (b) depicts the presence of a retropharyngeal abscess (black arrow), which led to the patient presenting with respiratory and oesophageal obstruction. As a result of these complications, the patient underwent an emergency tracheostomy, the abscess was drained intraorally, and a nasogastric tube was inserted; (c) through (e) illustrate the regression of the abscess over time. The tracheostomy was closed on day 7, and the nasogastric tube was removed on day 14.

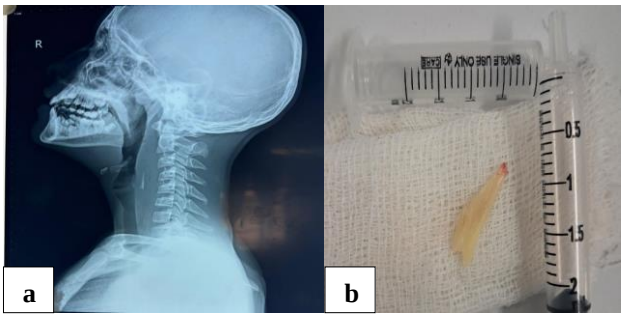

Figure 2: (a) Presents a lateral view X-ray of the neck in an 11-year-old child with a foreign body identified as a fish bone. The image shows the foreign body located opposite the C5-C6 vertebrae (black arrow), and presence of a retropharyngeal abscess. Additionally, the X-ray reveals straightening of the cervical spine, which is attributable to the retropharyngeal abscess; and (b) displays foreign body fish bone after removal.

Table 7: Types of complications.

Complications	N	Percentage
Retropharyngeal abscess	18	100
Oesophageal perforation	2	11.11
Respiratory distress	1	5.56
Mediastinitis	1	5.56

DISCUSSION

Foreign body ingestion is a prevalent issue across various age groups, with the potential to lead to severe complications if not managed promptly and effectively. This study examined 144 cases of foreign body ingestion, providing important insights into the clinical characteristics, types of foreign bodies, associated complications, and their management strategies.

This study shows that foreign body ingestion was most common in children aged from 9 months to 10 years with the most common location of foreign body impaction is in the oesophagus and the most common presentation was having a history of foreign body ingestion followed by pharyngeal discomfort. This is in accordance with the study done by Yoo et al.[7]

In this study, coins were identified as the most frequently ingested foreign bodies, followed by meat bones and fish bones. This finding is consistent with previous research by Arana et al, which also suggests that coins are the major type of ingested foreign body.[8] Meat bones and fish bones, which can be more hazardous due to their sharp edges, often lead to more severe complications, such as retropharyngeal abscesses and oesophageal perforation.[9]

This study also shows the significant impact of sharp foreign bodies, like meat bones and fish bones which were associated with higher rates of complications compared to blunt objects. This aligns with previous studies which have shown that sharp objects are more likely to cause perforations and abscesses.[9-12] The development of retropharyngeal abscess was the most common complication observed in this study and it was associated with several outcomes.

Effective management of foreign body ingestion starts with prompt diagnosis and intervention. In this study, primary treatment typically includes early removal of foreign body using rigid oesophagoscopy within 24 hours of diagnosis which is in accordance to the study done by Yoo et al.[7,13,14] The use of X-rays and CT scans was crucial in identifying the location and type of foreign body and in detecting associated complications. Despite these interventions, complications such as retropharyngeal abscesses, oesophageal obstructions, and respiratory distress were observed. In some cases, these complications led to severe outcomes, including the unfortunate death of one patient due to development of mediastinitis and

septicemia. This highlights the critical importance of early detection and intervention to mitigate the risk of severe complications.

There are few major limitations in this study that could be addressed in the future studies which include- single-center study: This study was conducted at a single institute in Guwahati, which may limit the generalizability of the findings to other geographical locations or healthcare settings. A multicenter study could provide a broader perspective on the prevalence and management of foreign body ingestion complications. Lack of long-term follow-up: The study focused on immediate clinical outcomes and didn't assess long-term complications or recurrence of symptoms after the removal of foreign bodies. A longer follow-up period would provide valuable insights into the long-term health consequences of foreign body ingestion. Delayed clinical presentations: impact of delayed seeking medical attention can alter the management of choice.

CONCLUSION

In summary, foreign body ingestion can lead to serious complications, particularly when sharp objects are involved. Early diagnosis, prompt intervention, and thorough management are essential to minimize the risk of adverse outcomes. This study highlights the importance of a systematic approach to diagnosis and treatment, emphasizing the need for ongoing research to enhance patient care and outcomes in cases of foreign body ingestion.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Guelfguat M, Kaplinskiy V, Reddy SH, DiPoce J. Clinical guidelines for imaging and reporting ingested foreign bodies. AJR Am J Roentgenol. 2014;203(1):37-53.
2. Silva Júnior DSD, Markus JR, Lopes AB, Sousa LDS, Maciel EDS, Nascimento LRD, et al. Protocol of care for foreign-body ingestion in children: a qualitative study. Rev Assoc Med Bras (1992). 2022;68(9):1270-15.
3. Thomson M, Tringali A, Dumonceau JM, Tavares M, Tabbers MM, Furlano R, et al. Paediatric Gastrointestinal Endoscopy: European Society for Paediatric Gastroenterology Hepatology and Nutrition and European Society of Gastrointestinal Endoscopy Guidelines. J Pediatr Gastroenterol Nutr. 2017;64(1):133-53.
4. Tiebie EG, Baerends EP, Boeije T, Frankenmolen PG, Lameijer H, van den Berg W, et al. Efficacy of cola ingestion for oesophageal food bolus impaction: open label, multicentre, randomised controlled trial BMJ. 2023;383:e077294.
5. Willenbring BA, Schnitker CK, Stellpflug SJ. Oral nitroglycerin solution for oesophageal food impaction: a prospective single-arm pilot study. Emerg Med J. 2020;37(7):434-6.
6. Peksa GD, DeMott JM, Slocum GW, Burkins J, Gottlieb M. Glucagon for Relief of Acute Esophageal Foreign Bodies and Food Impactions: A Systematic Review and Meta-Analysis. Pharmacotherapy. 2019;39(4):463-72.
7. Yoo DR, Im CB, Jun BG, Seo HI, Park JK, Lee SJ, et al. Clinical outcomes of endoscopic removal of foreign bodies from the upper gastrointestinal tract. BMC Gastroenterol. 2021;21(1):385.
8. Arana A, Hauser B, Hachimi-Idrissi S, Vandenplas Y. Management of ingested foreign bodies in childhood and review of the literature. Eur J Pediatr. 2001;160(8):468-72.
9. Liu Q, Liu F, Xie H, Dong J, Chen H, Yao L. Emergency Removal of Ingested Foreign Bodies in 586 Adults at a Single Hospital in China According to the European Society of Gastrointestinal Endoscopy (ESGE) Recommendations: A 10-Year Retrospective Study. Med Sci Monit. 2022;28:e936463.
10. Sung SH, Jeon SW, Son HS. Factors predictive of risk for complications in patients with oesophageal foreign bodies. Dig Liver Dis. 2011;43(8):632-5.
11. Hong KH, Kim YJ, Kim JH. Risk factors for complications associat ed with upper gastrointestinal foreign bodies. World J Gastroenterol. 2015;21(26):8125-31.
12. Geng C, Li X, Luo R. Endoscopic management of foreign bodies in the upper gastrointestinal tract: A retrospective study of 1294 cases. Scand J Gastroenterol. 2017;52(11):1286-91.
13. Birk M, Bauerfeind P, Deprez PH, Hafner M, Hartmann D, Hassan C, et al. Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. Endoscopy. 2016;48:489-96.
14. Ikenberry SO, Jue TL, Anderson MA, Appalaneni V, Banerjee S, Ben Menachem T, et al. Management of ingested foreign bodies and food impactions. Gastrointest Endosc. 2011;73:1085-91.

Cite this article as: Sharma K, Pyrbot KS, Sava N. Foreign body ingestion: distribution, its complication and management. Int J Res Med Sci 2025;13:119-23.