

A Retrospective Study of Oesophageal Foreign Bodies using Rigid Oesophagoscopy from Mandya, Karnataka, India

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ABSTRACT

Introduction: Foreign bodies in the oesophagus is one of the commonly seen conditions in the Department of Otorhinolaryngology.

Aim: To describe the clinical features and time delay of patients presenting with oesophageal foreign bodies.

Materials and Methods: Present study was a retrospective study of case records of 60 patients who underwent rigid oesophagoscopy for foreign body removal at Mandya Institute of Medical Sciences Mandya, Karnataka, India, from January 2017 to December 2019. Details like age and sex of the patient, presenting symptoms, time delay in presentation to the hospital, the type of foreign body ingested, location of the foreign body in oesophagus, any complications were noted in a detailed case history proforma proforma. Preoperative X-ray of neck and chest was done in all patients. Descriptive statistical tests like percentage and mean were used to analyse the data.

Results: Out of 60 patients, 36 (60%) were children and 24 (40%) patients were adults. Coin was the most common foreign body seen in children (n=32/60, i.e., 53.3%) whereas meat bone was the most common foreign body in adults (n=16/60, i.e., 26.6%). Forty two patients out of 60 presented within 24 hours of foreign body ingestion. Two patients presented after 72 hours of foreign body ingestion. Thirty one patients presented with foreign body sensation in throat, dysphagia was present in 21 patients and two patients presented with fever. Two patients who presented more than 72 hours after foreign body ingestion had mucosal oedema on rigid oesophagoscopy. There was mucosal injury in four patients intraoperatively, two were with dentures, one was with button battery and the other was with a sharp metal locket.

Conclusion: Coin was the most commonly seen foreign body in children whereas meat bolus with or without bone was most commonly seen in adults. Timely diagnosis and early removal of the foreign body should be done to prevent complications.

Keywords: Cricopharynx, Foreign body oesophagus, Otorhinolaryngology

INTRODUCTION

Patients presenting with history of foreign body ingestion is one of the complaints seen in an outpatient setting in Otorhinolaryngology. Foreign body ingestion is a well-known occurrence worldwide in children, especially in their sixth year of life, with a peak in children older than three years [1-3]. The proportion of foreign body ingestion cases occurring in children varies from 6.5-80% with a marked ethnic variation between Oriental and Western populations [2]. Material taken in the oesophagus usually falls into two categories: foreign bodies and food bolus. Children most frequently ingest coins and toys, whereas adults normally tend to have difficulties with meat and bones [4,5]. Most ingested foreign bodies become impacted often in the oesophagus. Occasionally, foreign body may pass through the oesophagus into the stomach without any hitch to the patients. Impacted foreign bodies are typically found at one of the following three anatomic oesophageal narrowings: the level of cricopharyngeus muscle, the level of the aortic arch, and the lower oesophageal sphincter [6]. Radiological localisation is mandatory for decision making regarding removal of the foreign body [7]. A plain cervical X-ray has a low sensitivity (15.9%) and a high specificity (99.5%) in identifying the foreign bodies in the oesophagus [2].

Oesophageal objects can cause a foreign body sensation, drooling, or respiratory distress due to tracheal compression, gagging, dysphonia, vomiting, and dysphagia, depending on the location and the nature of the foreign body [8,9]. These foreign bodies are removed by rigid oesophagoscopy under general anaesthesia after radiological evaluation. The aim of the study was to describe the clinical features of patients presenting with oesophageal foreign

bodies and also to determine the time delay in their presentation to the outpatient department.

MATERIALS AND METHODS

This was a retrospective study of patients who underwent oesophageal foreign body removal at Mandya Institute of Medical Sciences, Karnataka, India, from January 2017 to December 2019. The analysis of data was done from October 2021 to December 2021. Institutional Ethical Committee (IEC) clearance was obtained for the study (No. MIMS/ IEC/ 532).

Inclusion criteria: Patients of all ages who were admitted with history of foreign body ingestion and who underwent rigid oesophagoscopy and foreign body removal at this institute were included in the study.

Exclusion criteria: Patients with history of foreign body coin ingestion, and whose X-ray showed foreign body coin in abdomen, beyond the oesophagus were excluded from the study. Case records of patients with ear and nose foreign bodies were not included in the study.

Case records of all the patients of all ages who presented within the study period to the hospital with history of foreign body ingestion were reviewed. Age range of patients in the present study was from one year to 70 years.

Study Procedure

A total of 60 patients presented with foreign body ingestion and underwent rigid oesophagoscopy in a span of three years from January 2017 to December 2019. The case files of these patients were obtained from medical record section. Demographic data like

age and sex of the patient; and clinical data such as time delay in presentation to the hospital, symptoms with which the patient presented, radiological evaluation showing the type of foreign body and their location in the oesophagus, and the length of hospital stay with any complications during or after the rigid oesophagoscopy procedure was noted in a detailed case history proforma. All patients underwent digital X-ray of the neck and chest. Computed Tomography (CT) was done in six patients who presented with time delay of more than 24 hours. Out of these six patients, in four patients there was no foreign body seen on X-ray neck and two patients had fever as one of the presenting complaint. All these patients underwent rigid oesophagoscopy and foreign body removal under general anaesthesia. A few of the patients with suspected complications as a result of longer duration of foreign body lodgement or due to mucosal injury during the procedure had longer duration of hospital stay.

STATISTICAL ANALYSIS

All the data collected was entered in an excel sheet and analysed using simple statistical tables with descriptive statistical tests like percentage and mean.

RESULTS

Out of 60 patients, 36 (60%) were children under the age of 14 years and 24 (40%) patients were adults [Table/Fig-1]. The youngest patient in this series was one and half years old.

Age (years)	Male	Female	Number of patients
1-2	2	1	3
3-5	9	7	16
6-9	7	8	15
10-14	0	2	2
15-20	2	1	3
21-30	1	2	3
31-40	3	1	4
41-50	3	1	4
51-60	4	2	6
61-70	2	2	4
Total	33	27	60

[Table/Fig-1]: Age distribution of patients with foreign body ingestion.

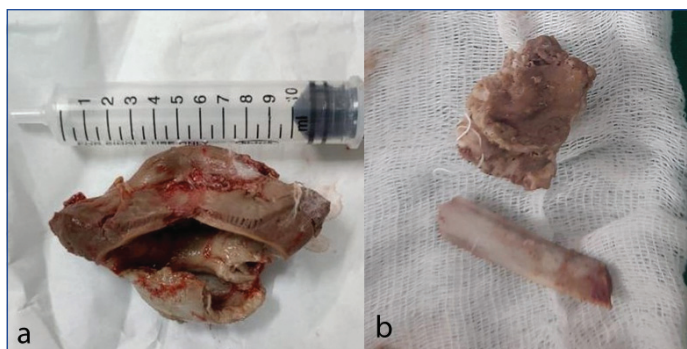
Coin was the most common foreign body (n=32/60, i.e., 53.3%) in children. In adults, meat bolus with or without bone was the most common foreign body (n=16/60, i.e., 26.6%) [Tables/Fig-2,3a,3b]. In this study of 60 patients, 31 patients presented with foreign body sensation in throat, and dysphagia was present in 21 patients [Table/Fig-4].

Foreign body	No. of cases	
	Children (n=36)	Adults (n=24)
Coin	32	1
Bone	0	16
Meat bolus	0	4
Button battery	2	0
Metal foreign body (toy key, locket)	2	0
Dentures	0	3

[Table/Fig-2]: Types of oesophageal foreign bodies.

Forty two patients (70%) presented within 24 hours of foreign body ingestion. Two patients presented after 72 hours of foreign body ingestion [Table/Fig-5].

All patients admitted with ingested foreign bodies underwent X-ray soft tissue neck and chest [Tables/Fig-6,7a,7b].



[Table/Fig-3]: a) Foreign body in cricopharynx- large meat bolus; b) Meat bolus with bone after removal.

Presenting symptom	Number of patients (percentage)
Dysphagia	21 (35)
Foreign body sensation in throat	31 (51.6)
Vomiting	12 (20)
Drizzling of saliva	6 (10)
Fever	2 (3.33)
Asymptomatic	3 (5)

[Table/Fig-4]: Clinical symptoms in patients with foreign body ingestion.

Time of presentation (hours)	Number of patients	Percentage of patients
First 24	42	70%
24-48	12	20%
48-72	04	6.67%
>72	02	3.33%

[Table/Fig-5]: Time delay in presentation to the hospital.

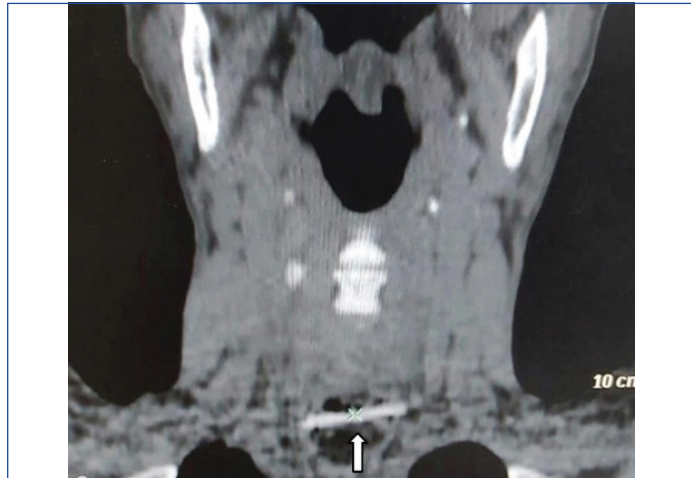


[Table/Fig-6]: Foreign body in cricopharynx in X-ray neck-lateral view.



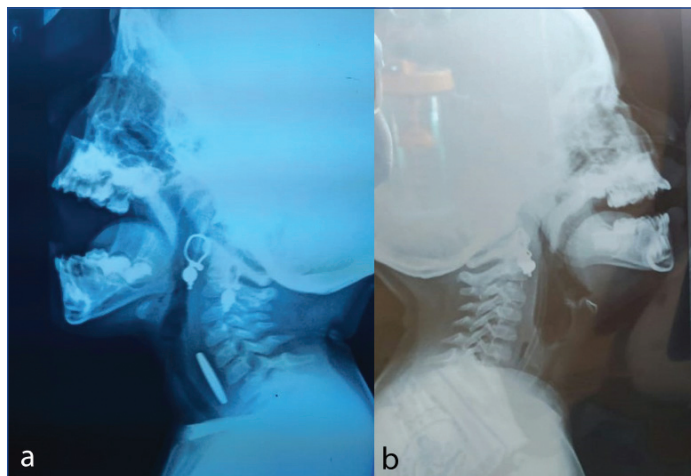
[Table/Fig-7]: a) Foreign body meat bolus with bone and b) Neck X-ray lateral view-faint shadow of bone within meat bolus opposite C7.

Six patients with ingested foreign body underwent CT neck. Among these six patients, four patients with persistent dysphagia had no foreign body visualised on X-ray neck. CT neck in these patients showed foreign body (meat bolus). Two patients who presented with fever underwent CT neck and were found to have suspected retropharyngeal abscess along with meat bone as foreign body [Table/Fig-8]. All these six patients who underwent CT neck presented more than 24 hours after foreign body ingestion.

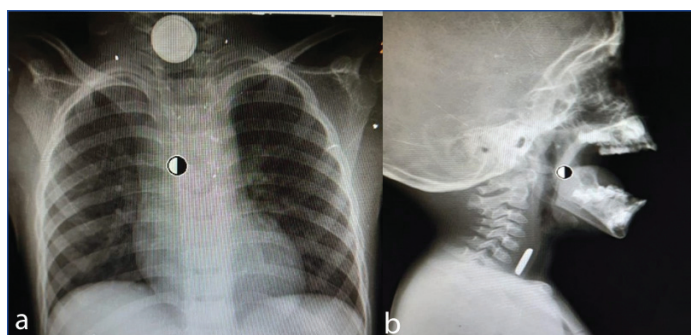


[Table/Fig-8]: CT scan showing foreign body placed horizontally in cricopharynx.

Two patients presented 72 hours after foreign body ingestion, both had fever as a presenting complaint, and there was mucosal oedema in both patients on rigid oesophagoscopy. Out of these two, one was an adult patient with meat bone ingestion and the other was a child with coin ingestion [Table/Fig-9a,b]. There was mucosal injury in four patients intraoperatively, two were with dentures, one was with button battery [Table/Fig-10a,10b] and the other was with a sharp metal locket [Table/Fig-11a,b]. Oesophageal foreign bodies like dentures are challenging to remove, as X-ray could not identify



[Table/Fig-9]: a) Foreign body coin in preoperative neck X-ray after 72 hours of ingestion; b) Post-operative neck X-ray after coin removal.

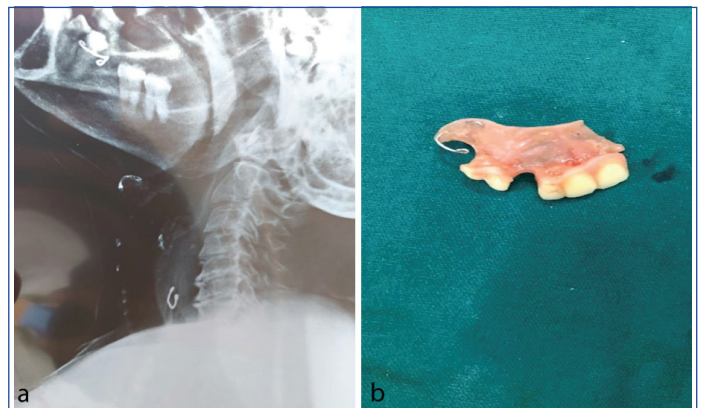


[Table/Fig-10]: a) Showing foreign body (button battery, double ring shadow) in X-ray antero-posterior view and b) lateral view neck X-ray showing button battery foreign body.

the exact shape and size of the foreign body, only the metallic wires were seen on X-ray [Table/Fig-12a,b].

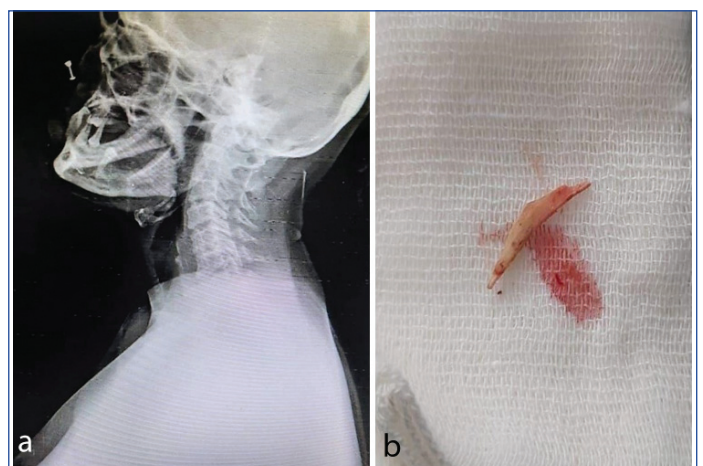


[Table/Fig-11]: a) X-ray neck and chest antero-posterior view with foreign body in cricopharynx; b) Metallic foreign body (locket) after removal.



[Table/Fig-12]: a) Foreign body denture in preoperative neck X-ray and b) foreign body denture after removal.

Rigid scope is preferred for removal of sharp and penetrating foreign bodies [Table/Fig-13 a,b]. In the present study, highest number of foreign bodies (39 out of 60) was found in cricopharynx during rigid oesophagoscopy [Table/Fig-14].



[Table/Fig-13]: a) Preoperative neck X-ray with foreign body; b) Sharp bone (foreign body) removed.

Site of lodgement of foreign body	Number
Cricopharynx	39
Upper oesophagus	10
Mid oesophagus	7
Lower oesophagus	4

[Table/Fig-14]: Site of foreign body lodgement.

All patients who underwent rigid oesophagoscopy and had no complications in the postoperative period were hospitalised for two days. Two patients who presented with fever in the preoperative period, four patients with mucosal injury during rigid oesophagoscopy, and one child with fever in the postoperative period after removal of ingested button battery had lengthened hospital stay for five days. A total of seven out of 60 patients had prolonged hospital stay for five days. The mean hospital stay duration among patients in this study was 2.35 ± 0.963 days. Postoperative fever and torticollis was seen in a child with button battery ingestion.

DISCUSSION

Impaction of ingested foreign bodies can occur in both children and adults. In present study, in a small sample group of 60 patients, a variety of foreign bodies were encountered that were ingested such as coins, meat bone, bolus of meat, dentures, button batteries, and sharp metal object. All of them were had foreign body removal by rigid oesophagoscopy under general anaesthesia. There is no flexible oesophagoscope available at our institute. Children most often ingest coins and toys whereas adults commonly tend to have problems with meat and bones [4,5]. Food bolus obstruction can occur in any patient group. It is sometimes associated with an underlying Schatzki ring, peptic stricture or eosinophilic oesophagitis, and occasionally is the first presentation of malignant stricture [10]. Pre-existing physical or mental conditions predispose patients to oesophageal impaction of foreign bodies [5].

In present study, 60% (n=36) of foreign bodies were found in children and 40% (n=24) in adults. In a similar study by Shivakumar AM et al., out of 152 patients with upper digestive tract foreign bodies, 104 (68.4%) were children and 48 (31.57%) were adults [7]. Young children in the age group of 3-9 years were the largest group with foreign bodies in present study. This was similar to study by Sharma PK and Shetty H and Gangadhar KS where foreign bodies in oesophagus were found in children in 1-10 year age group [3,11]. Coin was the most common foreign body (n=32/60, i.e., 53.3%) in children in present study. In adults, meat bone was the most common foreign body (n=16/60, i.e., 26.6%), which was similar to results in study by Shetty H and Gangadhar KS, (21% had meat bone as foreign body) [11].

In almost all the cases in present study, a typical history of swallowing a foreign body was available, with no symptoms reported in three patients. Dysphagia was the most common symptom present in 72% of cases in a study conducted by Mandowara P, whereas in present study 51.6% (n=31) patients had foreign body sensation in throat and 35% (n=21) patients had dysphagia as the presenting symptom. Coins located in the oesophagus can be asymptomatic in over 70% of the cases and patients can remain without symptoms for over five days [12,13]. In present study, there were three instances of foreign body coin where the child was asymptomatic, and parents were only suspicious of coin ingestion, but X-ray revealed foreign body at cricopharynx.

A study by Sharma PK showed that 49% of cases presented within less than 24 hours and 10% of cases after 72 hours of foreign body ingestion [3]. In contrast to this study, 70% (n=42/60) of patients presented within first 24 hours of ingestion, and 3.33% (n=2/60) of patients presented more than 72 hours after foreign body ingestion.

In X-ray soft tissue neck, ossification of the laryngeal cartilages can be confused with radio-opaque foreign bodies. The cricoid cartilage, in specific, ossifies along the posterior margin and superior tip, which can mimic a swallowed bone. The posterior lamina and inferior horn of thyroid cartilage can also ossify in a manner suggestive of a foreign body [14].

The timing of removal of foreign body depends on the increased risk of perforation, aspiration or aorto-oesophageal fistula. For instance, sharp objects or batteries require urgent intervention since the complication rate can be as high as 35% [8]. In present study three

dentures, two button batteries, and one sharp metal locket were encountered, which were promptly removed at the earliest. On rigid oesophagoscopy, two of the dentures were found to be impacted in the mucosa and were removed after careful disimpaction. All these cases were handled on an emergency basis and foreign bodies were removed at the earliest. In battery ingestion, the mechanism of injury occurs by four different means including direct corrosive action due to leakage, toxic effect due to absorption of substances, low voltage burns, and pressure necrosis. Liquefaction necrosis and perforation can occur in four to six hours after a disk battery is lodged in the oesophagus [15].

Oesophageal foreign bodies in adults are normally large and sharp and tend to become firmly engaged in the mucosa or adhere to the surrounding tissues. Larger forceps can pass through the rigid oesophagoscope to reach the foreign bodies for effective removal [16].

Five out of 60 patients (8.33%) were found to have complications due to ingested foreign bodies and rigid oesophagoscopy in the present study. Mucosal injury was seen in four patients intraoperatively. Out of these four patients, two foreign bodies were dentures, one was a sharp metal locket, and one was a button battery. Fever with torticollis was seen postoperatively in one child after removal of button battery. All these patients had Ryle's tube insertion, and required lengthened hospital stay during which their vitals were closely monitored and managed conservatively.

In a retrospective study of 60 patients with oesophageal foreign bodies by Patel NR and Sharma P, the incidence of complications was 8.33%, which is similar to the present study. Sharp nature of the foreign bodies ingested, long duration of impaction, late presentation to the hospitals and lack of appropriate facilities were the causes mentioned in their study for the occurrence of complications [6].

Reilly J et al., reported 9% of secondary injuries in children as a result of presence of oesophageal foreign bodies. They opined that these secondary events are most often related to the disease process initiated by the foreign body, and not the medical care of the child [16].

In a study of oesophageal foreign bodies in adults by Zhang X et al., ulceration or laceration with or without minor bleeding were the most common complications, followed by perforation, and perforation with mediastinitis or a mediastinal abscess. In their series complication rate was 25.79% (i.e, 57 out of 221 patients). Complications were less common in those who underwent flexible oesophagoscopy compared to those who underwent rigid oesophagoscopy in their study [17].

In a large case series of 2394 patients with oesophageal foreign bodies, over a span of 12 years from 1965-1976, a study done by Nandi P and Ong GB showed 21 patients with minor complications, and 25 patients with serious complications namely oesophageal perforation/abscess in the neck (n=22), mediastinitis and lung abscess (n=1), oesophago-aortic fistula (n=2). They reported mortality in three patients- two with oesophago-aortic fistula and one with mediastinitis and lung abscess. Foreign bodies perforating the cervical oesophagus result in para or retro-oesophageal abscess with or without descending mediastinitis. They suggested perforation of oesophagus could result from inflammatory reaction due to sharp foreign body and associated infection, with pressure necrosis in impacted smooth objects. They also opined that foreign bodies in the oesophagus, whatever its nature, must be removed under direct vision as soon as the diagnosis is made. Apart from prolonging the patient's discomfort, delay will only make subsequent attempts at removal more difficult and the risk of perforation will increase [1].

Limitation(s)

Sample size of this study was small. Study group comprising a large number of patients would give an insight into the complications that might be encountered due to late presentation of ingested foreign bodies and also complications of rigid oesophagoscopy.

CONCLUSION(S)

Coin was the most common oesophageal foreign body in this study, found in children while bone was the most common foreign body in adults. Radiographic evaluation by X-ray or CT identifies the site of foreign body lodgement in the oesophagus. All foreign bodies were removed by rigid oesophagoscopy under general anaesthesia. Timely diagnosis and early removal of the foreign body should be done to prevent complications.

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