

Original Research Article

Management of oesophageal foreign bodies in pediatric patients: our experience

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ABSTRACT

Background: Amongst pediatric patients, oesophageal foreign bodies (OFBs) are relatively common clinical problem. Majority pass harmlessly through gastrointestinal tract, some can cause complications or morbidities. Our study considered and reviewed our experience in managing OFBs in pediatric patients, with emphasis on the management and outcomes of complicated cases.

Methods: 77 cases of OFBs (diagnosis established), upto 12 years of age admitted at our tertiary hospital between January 2015 to December 2020 (duration of 6 years) were reviewed and analysed. On the basis of our analysis accounting demographic data, presenting symptoms, workup investigation, management, complications and outcomes, results and conclusions were derived.

Results: Amongst cases, 43 were male and 34 female. Mean age for our cases was 5.4 years. 56 cases (72.7%) cases presented in the hospital within first 24 hours. Commonest foreign body found in 64 cases (83.1%) was coin. Most cases had history of witnessed ingestion. Commonest presentation was asymptomatic (with history of witnessed ingestion), followed by complaint of vomiting and drooling of saliva. Most patients were discharged within 48 hours post-operatively except for 2 patients who presented intra-operatively with edematous inflamed mucosa with slight charring on oesophagoscopy where foreign body was button battery (cell). Follow-up period ranged from 2 to 8 months and all patients had complete recovery without any sequelae.

Conclusions: Our experience of 6 years with 77 pediatric patients with OFBs having various presentations have been reviewed, analysed and concluded here. All the patients had complete recovery without any sequelae.

Keywords: Oesophageal foreign body, Oesophagoscopy, Gastrointestinal tract

INTRODUCTION

Foreign body (FB) ingestion is a common problem worldwide with more than 100,000 cases reported each year even in a developed nation like the United States and more than 80% of the reported cases occurring in children.¹ Unless FB ingestion is witnessed, establishing the diagnosis in children is difficult.²

FB of various types have been reported varying according to the country, culture, socio-economic background and medical specialty reporting the ingestion. Rigid oesophagoscopy has always been recommended as the procedure of choice to remove the FB. Other modalities for the management of ingested FBs include flexible oesophagoscopy, oesophageal bougienage and balloon extraction under fluoroscopic guidance.³ Our study was conducted to review our experience in managing OFBs in pediatric patients (upto 12 years of age), with emphasis

on complicated cases. In our study we determined the cases with regard to FB characteristics, management and outcomes.

METHODS

Our study was a retrospective review of all children (up to the age of 12 years) who were admitted in our tertiary hospital between January 2015 and December 2020, with a final diagnosis of OFB ingestion, who then underwent rigid oesophagoscopy with FB removal under general anaesthesia. Cases were selected using purposive sampling (non-probability sampling method). The data collected included the demographics, presenting symptoms, investigations, management, complications and outcomes. The data was scrutinized by descriptive analysis (statistical method) and conclusions were drawn.

Inclusion criteria

Children upto the age of 12 years having final diagnosis of OFBs who underwent rigid oesophagoscopy with FB removal under general anaesthesia in the study period were included in the study.

Exclusion criteria

Cases that did not fulfil every aspect of the inclusion criteria were not included in the study.

Chest radiographs were performed in both antero-posterior and lateral view. Post radiograph, rigid oesophagoscopy was performed in the operating room under general anaesthesia. On visualization and identification, the FB was removed using grasping forceps followed by check scopy post removal of the foreign body.

Patients were observed for minimum of 24-48 hours post procedure and then discharged eventually after ensuring being stable. These patients were kept for follow-up for weeks to months to evaluate and ensure no sequelae.

RESULTS

A total of 77 pediatric patients were admitted with a diagnosis of OFB. The mean age was 5.4 years amongst the cases. There were 43 males and 34 females and the duration of FB ingestion prior to admission ranged from 30 minutes to nearly 2 weeks. Most patients, that is, 64 cases (72.7%) presented within first 24 hours of ingestion of the FB. There was a history of witnessed FB ingestion in 67 patients (87%).

Most common presentation was asymptomatic but with history of witnessed FB ingestion 62 (80.5%), followed by history of vomiting 11 (14.3%) and drooling of saliva 4 (5%) (Table 1).

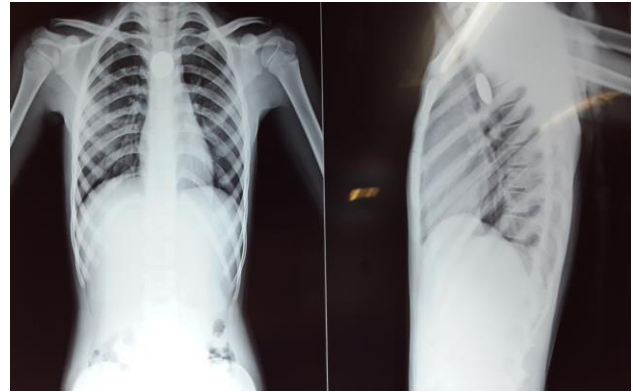


Figure 1: Plain radiograph showing lodged radio-opaque foreign body (coin) in the oesophagus.



Figure 2: Plain radiograph showing lodged radio-opaque foreign body (coin) in the hypopharynx.

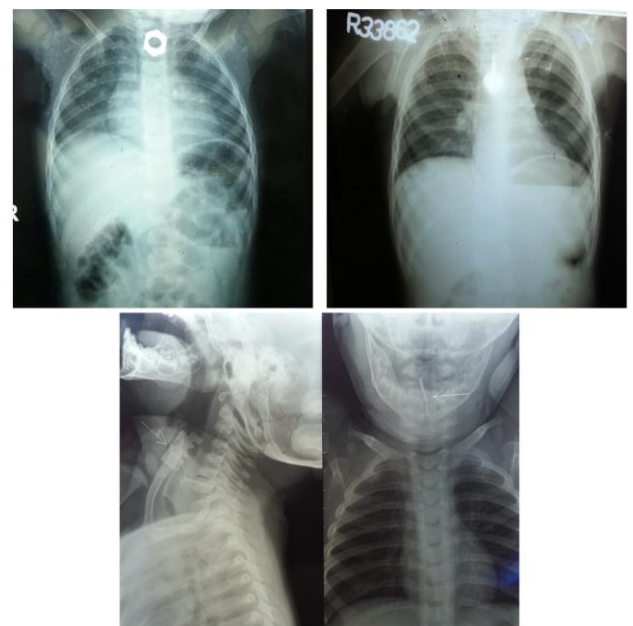


Figure 3: Plain radiograph showing other lodged radio-opaque foreign bodies in the gastrointestinal tract.

The FBs removed were a coin in most patients 64 (83.2%), followed by button battery (cell) 7 (9%) and other objects both metallic and non-metallic 6 (7.8%) (Table 2) (Figure 1-3).

Chest radiographs were performed in all the cases pre-operatively and FBs were detected in 75 of these patients (Figure 1). In the rest 2 cases, rigid endoscopy was performed based on strong history provided by the parent and FB was found and removed. On radiography and rigid endoscopy, the FBs were located in the oesophagus in 42 patients (54.5%) and in the hypopharynx in 35 patients (45.5%) (Figure 1 and 2).

Table 1: Presentation of patients with oesophageal foreign bodies.

Symptoms	No. of patients	Percentage (%)
Asymptomatic	62	80.5
Vomiting	11	14.3
Drooling of saliva	4	5
Total	77	100

Table 2: Type of foreign body ingested.

Type of foreign body	No. of cases	Percentage (%)
Coin	64	83.2
Button battery (cell)	7	9
Others	6	7.8
Total	77	100

The average approximate hospital stay ranged between 24-48 hours post procedure, with exceptions in complicated cases. There were 2 patients who presented intra-operatively with edematous inflamed mucosa with slight charring on oesophagoscopy where foreign body was button battery (cell). These patients were vitally stable but were kept longer for observation and then discharged. All patients had a complete recovery without complications or sequelae, even on follow-up.

DISCUSSION

FB ingestion is very a common problem amongst children.¹ Due to the tendency of exploring and interacting with the new things in the world, children tend to inevitably place FBs into their mouths and swallow the objects accidentally and/or on purpose, with most swallowed FBs passing harmlessly through the gastrointestinal tract.⁴ Various studies showed similar results, with the majority of patients being <5 years of age.^{1,3,4} In our study, we had 56% of patients <5 years of age. A witnessed history of FB ingestion is extremely important for reaching a quick, definite diagnosis.⁵ Louie et al published a study of 255 pediatric patients, with the majority of their patients having a witnessed history of

FB ingestion.⁵ In our study, a witnessed history of FB ingestion was found in 80.5% of the cases.

The superior oesophagus is the narrowest portion of the pediatric gastrointestinal tract (cricopharynx) and is, therefore, the most common site for lodged FBs.³ Consistent with previous studies, the majority of FBs in our study were located in the oesophagus and mainly in the upper oesophagus.^{3,6} In our study, 54.5% of patients had lodged FBs in the upper oesophagus and 45.5% had lodged FBs in the hypopharynx.

Patients present with a variety of signs and symptoms depending on the age of the child, nature of the object, anatomical site involved and the time interval since ingestion.⁵ Vomiting, dysphagia, drooling of saliva and respiratory symptoms were the most common presenting symptoms in several studies.^{3,4,7} In our study, most cases presented asymptomatic with positive history of witnessed foreign body ingestion, followed by vomiting and drooling of saliva.

The types of ingested FBs differ among countries according to feeding habits, cultural features, socio-economic background and socio-cultural properties.⁸⁻¹⁰ Various studies suggested that coins were the most frequently encountered FB ingestion in different populations.^{3,8} According to our study as well, coins were the most common type of FB, followed by a wide variety of other FBs. In other regions, such as eastern populations, fish bones were the most common types of FB ingestion.³⁻¹⁰ Food bolus as a FB was seen more in patients with a pre-existing esophageal abnormality.⁶ OFB impaction is frequently associated with pre-existing esophageal diseases, such as atresia, stricture or dysmotility.^{4,6,11} No cases of pre-existing oesophageal conditions were found though in our study with pediatric patients but we did encounter a good number of cases in adults.

As stated by Lin et al the diagnosis of a FB is based on three important elements, eye-witness accounts, X-ray and endoscopic findings.¹¹ Several studies advocated the value of a radiological workup in the diagnosis of FB ingestion.^{2,8,10,12} Although negative radiology findings could not exclude FB ingestion, imaging studies should be performed for any child who is suspected of ingesting a FB. Chest/abdominal X-rays are the most common and most ideal radiological method used.^{2,8} Another review by Luk et al showed that CT scans had a specificity of 96% and a high negative predictive value when endoscopy was negative in the diagnosis of FB ingestion.¹² CT scans are useful if endoscopy is negative and the patient still has persistent symptoms associated with FB ingestion.¹² In our study, chest and abdomen radiograph sufficed the purpose and was very sensitive hence we did not require to explore other modalities.

Many methods have been described in the literature for the removal of FBs such as balloon extraction,

advancement of a bougie and flexible and rigid scopes. The choice of method depends upon the instruments available and on surgeon preference.⁸ We preferred rigid oesophagoscopy to remove FBs and this method was successful in 100% of cases.

FBs that damage the gastrointestinal tract become lodged or have associated toxicity must be identified and removed.¹³ A review by Waltzman et al reported that 25% to 30% of oesophageal coins in children would pass spontaneously without complications.¹³ The treatment of these patients might reasonably include a period of observation in the range of 8 to 16 hours, particularly among older children and children with distally located coins. Lin et al and Kamath et al noted that ingested FBs should be removed as soon as possible, with delays in the diagnosis and management possibly leading to life threatening complications.^{11,14} Ours also advocate that the removal of FBs should be as soon as possible without delay.

Complications related to FB ingestion are not very common but the associated morbidity might be severe and even life threatening in certain cases.⁷ Long-retained FBs have a higher incidence of causing complications which include oesophageal perforation, secondary collections, neck abscess, mediastinitis, peritonitis and fistula formation.¹⁴ A life-threatening fistula formation might occur between the oesophagus and the innominate artery, causing severe bleeding.¹⁵ Saki et al published a review of 240 pediatric patients with OFBs, with 10% having complications secondary to oesophageal FBs, mainly oesophageal perforation and none of the complications associated with long-term morbidity.⁴ Another study by Gregori et al noted that 14 patients had complications.¹⁵

The type and characteristics of the ingested FB have a vital role in the outcome.¹⁵ According to studies, inorganic FBs are less associated with complications as compared with organic FBs.¹⁵ In comparison to previous studies, we had only two (2.5%) patients who developed complications secondary to FB ingestion where the FB was button battery (cell), which were morbid but not life-threatening. No long-term complications occurred. Fever, pain, tenderness and subcutaneous or mediastinal emphysema are alarming symptoms and are signs of oesophageal perforation secondary to FB ingestion.¹⁵ Timely diagnosis and management are mandatory to prevent these complications.¹⁵ Being vigilant helps early screening and diagnosis of complications, hence better and timely management.

There was a limitation of this study that our study included our experience over a period of six years with pediatric OFBs and even though it included a lot of aspects involved in the diagnosis and management of the same, doesn't exclude the possibility of other scenarios. Every OFB by virtue of its shape, size, nature and location in the gastro-oesophageal tract is a challenge to

the surgeon and requires an on-table tactic to deal with the foreign body.

CONCLUSION

OFBs are a common problem in pediatric patients and underlying predisposing factors to OFB impaction are not uncommon. Long-retained OFBs are associated with a higher incidence of complications. Rigid oesophagoscopy was successful in extracting all of the OFBs and proved to be a safe and effective procedure.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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