

PHARYNGOESOPHAGEAL FOREIGN BODIES

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ABSTRACT

Objective: To find out the frequency, types and sites of impaction of foreign body ingestion and different management options to remove impacted foreign bodies.

Material and Methods: This descriptive study was carried out in Ayub Teaching Hospital in 2001. Patients with foreign body impaction with the exception of those having esophageal pathology were included. All patients were thoroughly examined and investigated. Almost all patients underwent endoscopy. Relevant data was recorded.

Results: Fifty cases were studied. Male to female ratio was 3:1. Mean age was 16.76 ± 19.95 years. 66% of patients were below 10 years. Coin was found in 48% of cases, bones in 18% and meat bolus in 8%. Mean age of coin ingestion group was lower than bone ingestion group ($p=0.003$). 70% of impactions were postcricoid which included all the coins. Significant association was noted between type of foreign body and site of impaction ($p<0.001$). Radiological investigations were positive in 69.39% cases. Significant association was found between type of foreign body and radiological findings ($p=0.001$). Minor trauma was seen in 8% cases and 92% procedures were without complications. There was significant association between type of foreign body and iatrogenic complication ($p=0.031$).

Conclusion: Coin ingestion by children was the most common presentation. X-Rays are not always reliable and diagnostic endoscopy has very important role in dealing with foreign bodies. Removal of foreign bodies posed only minor hazards to patients.

Keywords: Foreign bodies, Coins, Bones, Bolus, Pharynx, Esophagus.

INTRODUCTION

Not infrequently children tend to swallow different objects and present to the casualty with impacted foreign bodies. Psychiatric or mentally handicapped patients¹ and criminals have been reported to deliberately ingest foreign bodies.²

The foreign bodies commonly encountered are coins³ and meat bones, but all kinds of objects have been reported as foreign bodies. Only a small proportion of swallowed foreign bodies gets stuck in the esophagus and must be removed. More than three fourth of these foreign bodies are impacted at the cricopharyngeal sphincter.³ Underlying abnormalities in the esophagus also increases the risk of foreign body impaction. A review of different studies suggests an incidence of underlying esophageal problems in 23 to 90 per cent of these patients.⁴ Sharp foreign bodies can cause serious complication. Some of these complications have very high mortality figures.

All impacted foreign bodies cause local inflammation, which leads to pain and obstruction. Fibrosis and stricture formation can also occur. Laceration during removal can lead to bleeding and perforation, which has a very high morbidity and significant mortality rates.⁵

The epidemiological data on this particular subject has been collected in almost all countries of the world. In our country studies have been done in major cities.⁶⁻⁹ However no study has been conducted on the people living in the far flung areas of our province. We intend to collect the data regarding the common foreign bodies and the commonest age group of people affected by foreign body ingestion in Hazara Division. Also we tried to assess which type of foreign body is ingested by which age group of patients. With this information we can educate our people regarding the prevention of these occurrences. We also assessed the sensitivity of radiological findings for the detection of different foreign bodies.

FREQUENCY OF VARIOUS FOREIGN BODIES

Type of Foreign body	Subtypes (Frequency)	Number of Patients	Percentage
Coins	-	24	48
Meat bones	-	9	18
Meat bolus	-	4	8
Other food materials	Chicken skin (1)	5	10
	Meat tendon (1)		
	Guava (1)		
	Pop corn (1)		
	Mango seed (1)		
Sharp foreign body	Denture (2)	3	6
	Seed with thorns (1)	5	10
Inorganic smooth foreign bodies	Stone (1)		
	Back of wrist watch (1)		
	Metallic button (1)		
	Plastic button (1)		
	Marble (Banta) (1)		

Table 1

Complications of esophagoscopy with reference to different types of foreign bodies were also studied.

MATERIAL AND METHODS

This descriptive study was carried out in the Department of ENT of Ayub Teaching Hospital Abbottabad during the year 2001. A total of fifty six patients came with the complaint of foreign body in the esophagus during that period. Six patients were excluded from the study on the basis of our predetermined exclusion criteria. We excluded those patients from our study in which we noted some underlying esophageal abnormality like stricture, web or growth. Those cases in which no foreign body was found on endoscopy were also excluded from the study. Four of our cases had some underlying growth or stricture in the esophagus. In two patients the esophagoscopy did not show any foreign body in the esophagus. Among the fifty patients included in our study, one child had a bone impacted behind both the posterior tonsillar pillars. It was removed with the help of a tongue depressor and straight artery forceps in the outpatient department. Examination under anesthesia was performed in the rest of the forty-nine patients.

A proforma was designed to record the time of ingestion, the nature of foreign body if known, associated symptoms if any and past history of any impaction. One patient had come with history of repeated ingestion of foreign bodies. He was under treatment in a hospital for mentally handicapped children. Complete ENT Examination was also carried out to note down any positive findings. Anteroposterior and lateral

radiographs of the neck and chest were then done. X-rays with positive findings were very helpful in assessing the site and size of foreign body. Endoscopy was performed in forty-nine patients and the site of impaction and foreign body removed was noted. Esophagus was assessed for any associated lesions and for any iatrogenic complication.

Student's T test and Chi square test in the SPSS program, version 8.0, were applied for statistical analysis of the results obtained.

RESULTS

A total of fifty cases with the history of foreign body ingestion were studied. Male to female ratio was 3:1. The patients were between twenty days to sixty five years of age. The commonest age group affected was from birth to ten years of age (66 %), See figure 1. The mean age of the patients was 16.76 ± 19.95 years (12.92 ± 16.74 for females and 18.11 ± 21.00 for males). Several different types of foreign bodies were seen in our study (Table 1).

Coin was the most common foreign body seen in our study and was common in children. Among twenty-four cases of coin ingestion twenty-two patients were below ten years of age (91.7%). Meat bone was the second commonest object. Mean age of coin ingestion group was 6.34 ± 9.61 years and that of bone ingestion group was 20.53 ± 14.68 years. When t-test was applied the p value was found to be 0.003. So the mean age of coin ingestion group was significantly lower than mean age of bone ingestion group. Other rounded and inorganic foreign bodies like back of wristwatch,

INCIDENCE OF SITES OF IMPACTION OF DIFFERENT FOREIGN BODIES IN THE ESOPHAGUS

Site	Total	Coin	Meat bone	Meat bolus	Rounded foreign bodies	Denture	Food items	Other items
Pharynx	3 (6%)	0	2	0	0	1	0	0
Postcricoid	35 (70%)	24	4	0	4	1	1	1
17 cm from incisors	1 (2%)	0	0	1	0	0	0	0
19 cm from incisors	2 (4%)	0	0	0	0	0	2	0
20 cm from incisors	4 (8%)	0	1	2	0	0	0	1
25 cm from incisors	1 (2%)	0	1	0	0	0	0	0
30 cm from incisors	1 (2%)	0	1	0	0	0	0	0
35 cm from incisors	1 (2%)	0	0	0	0	0	1	0
More than 1 site	2 (4%)	0	0	1	0	0	1	0

Table 2

metallic and plastic buttons, stone and marble were also seen in children below ten years of age. Popcorn and dry seed with thorns were seen in infants introduced by their elder siblings. The dentures were only seen in patients above fifty.

Most common site of impaction was postcricoid area (Table 2). Among fifty foreign bodies removed, thirty-five (70 %) were impacted in the postcricoid area and most of these were smooth rounded foreign bodies. When Chi square test was applied the p value was < 0.001 , so it was found that there was a significant association between the type of foreign body and the site of impaction.

Coins were detected by X-rays in all cases (Figure 2). Sensitivity of radiological findings differed for various types of foreign bodies (Figure 3). Impacted metallic objects including coins were 100% radiosensitive. Marble (Banta) and stone were also visualized. Among the bones impacted 50% were radiosensitive. When Chi square test was applied a significant association was found between type of foreign body and radiological findings. The p value was $= 0.001$.

In cases of meat bolus impaction in the postcricoid area increased soft tissue shadow was noted in the x-rays.

The most common foreign body (coin) did not cause major complications. Meat bones have irregular and sometimes sharp edges. Two cases (22.2%) of these caused mucosal laceration on removal. Both the dentures had sharp hooks which caused mucosal lacerations and bleeding. The marble (Banta) and stone were both rounded foreign bodies with smooth surfaces. Their removal was very difficult. Manipulation with different instruments caused slight iatrogenic trauma to the esophagus but with no subsequent complications.

Majority of patients, i.e. 46/50 (92%), underwent these procedures without any complications, while 4 (8%) patients developed mild mucosal trauma. The Chi square test was used to find out any association between the type of foreign body and iatrogenic complications. The p value was 0.031. So there was significant association between the type of foreign body and iatrogenic complications.

DISCUSSION

Foreign body ingestion is a common ENT emergency especially in children. In our study thirty three (66%) patients were below ten years of age and the mean age group was 16.2 years. Other studies showed that 78% and 80% of the patients with foreign body ingestion were below the age of fourteen years^{6,10}. Children are more susceptible because they tend to put objects in their mouth while doing some other activity and can ingest those objects by mistake. The incidence of foreign body ingestion rises during school holidays when the children are free to play and roam about.⁶ Patients of other age groups were also seen. Ten patients (20%) were above the age of forty years. In the study done at Mayo Hospital 13.3% of the patients were above the age of forty five years.⁶ In this group of patients the foreign body is usually a food item, which is swallowed hurriedly without proper chewing.

Two infants had not ingested the foreign body by themselves. One of these was a six days old child. He was given popcorn by his brother. The other child was forty days old. He was given a dry seed with thorns and both these were impacted in the postcricoid area.

Foreign bodies in the esophagus can be divided into two types: Organic and inorganic foreign bodies. Organic foreign bodies include meat bones, meat boluses and big pieces of food.¹¹

AGE AND SEX INCIDENCE

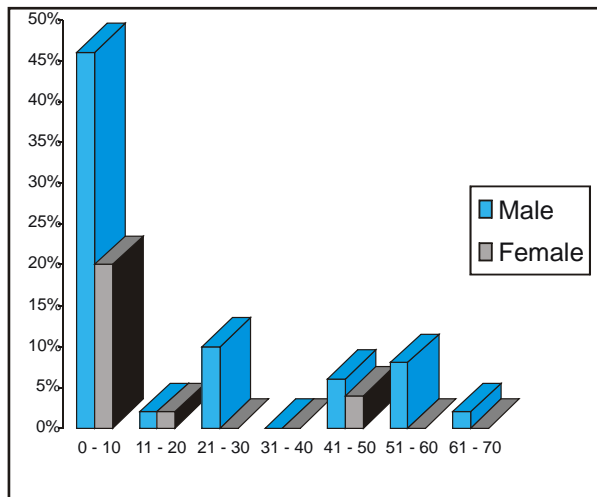


Fig. 1

Inorganic foreign bodies are coins, buttons and dentures. It is seen that inorganic objects are more common in the children and organic foreign bodies are more common in the adults.¹²

In our study we removed various types of foreign bodies. Coin was the commonest of them (48 %). Among the ingested foreign bodies coin is the most commonly encountered foreign body in clinical practice all over the world.^{3,5} Introduction of coins in the market increases the risk of coin ingestion in children.

The second commonest foreign body in our study was meat bone and the incidence was 18% (9 cases). These patients were older than the age group affected by coin ingestion. The youngest patient was three years old. He had a meat bone impacted behind both the posterior tonsillar pillars. It has been documented in literature that young people can sustain injuries to their oropharynx by penetrating objects.¹³ It is important to note that advancing points puncture and the trailing points do not damage the esophagus. These complications can become life threatening such as deep neck abscess discharging sinus, retropharyngeal emphysema, mediastinitis, mediastinal emphysema and aorto-esophageal fistula.¹⁴⁻¹⁷ Foreign bodies have been shown to migrate into the pharyngeal area by routes other than the oral route. One such case was reported by Anupam Mishra in which an eight cm long metallic object entered the neck from the outside in an accident and after migrating through the soft tissue of the neck it was impacted in the oropharynx.¹³ It stayed in the oropharynx for about four years before it was detected. The incidence of bone impaction varies around the world in different series of patients studied. Fish bone impaction is very common in areas where

POSITIVE RADIOLOGICAL FINDINGS IN DIFFERENT TYPES OF FOREIGN BODIES

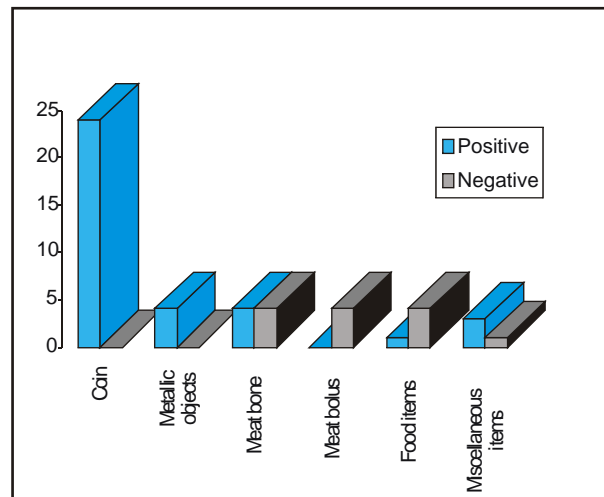


Fig. 2

fish is a main food item.³ But in our setup where fish is rarely included in the food of the general population, meat bones are more commonly impacted. In the study conducted on sixty patients in Lahore the incidence of meat bone impaction was 16.7%,⁶ which is comparable to our study where the incidence was 18%. Not a single case in this group was of fish bone impaction. The incidence of fish bone among different foreign bodies was 29% in the study done in Hong Kong.³ Fish bone impaction is common in areas where fish is the main part of the diet.¹⁸

The most frequent cause of esophageal impactions in adults is impaction of food.⁴ Meat bolus impaction is common in elderly patients. The incidence of meat bolus impaction in our study was 8% (four cases). The incidence of meat bolus impaction in international studies is between 2.6% to 10%.^{4,19} Food bolus impaction is usually due to hurried swallowing of partially chewed bolus. The factors which are adding to this problem are that elderly patients are edentulous so they are unable to chew the food. The terms Backyard barbecue syndrome, and Steakhouse syndrome, have originated because of the nature of the obstructing bolus and the history of the impaction.^{4,20}

There is also a greater incidence of esophageal abnormalities in the elderly. These include strictures, benign and malignant growths. Esophageal motility disorders are also an important cause of esophageal food bolus impaction.²¹ So the food bolus even if ground properly can become impacted at the site of the lesion in the esophagus.

In our study two patients (4%) had dentures impacted as foreign bodies in their esophagus. Both of these dentures had hooks,

SENSITIVITY OF RADIOLOGICAL INVESTIGATION OF DIFFERENT OBJECTS

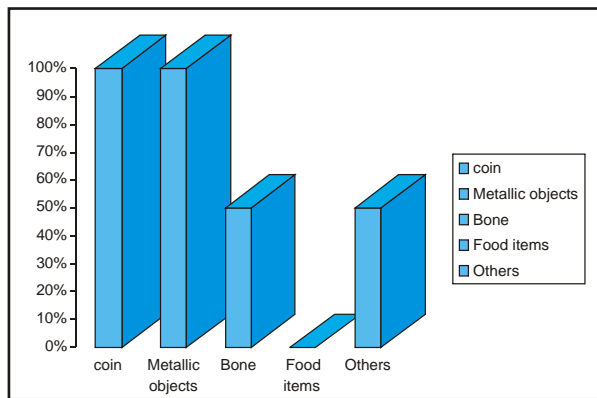


Fig. 3

which were embedded in the mucosa of the hypopharynx and the postcricoid area respectively. These hooks were visible in radiographs. The dentures were not regularly checked by the dentists and hence they were ill-fitting and had slipped into the esophagus. Denture is not an uncommon foreign body seen in the esophagus. It has been reported in most of the series done on foreign bodies in the esophagus. In the series done in Lahore the incidence of denture impaction was 6.7%, which is slightly more than our study incidence of 4%. In another study done in Kuala Lumpur incidence of impacted dental prosthesis was 11.5%.²² This difference in the incidence is probably due to the difference in the awareness of people regarding the use of dentures and prosthesis in Abbottabad, Lahore and Kuala Lumpur. Dental facilities available to people in Abbottabad are very limited so less number of people are using dentures and hence the impaction rate is also low. Other food related foreign bodies which we encountered in our patients were meat tendon, chicken skin pieces, guava and mango seed. Mango seed is a very unusual foreign body. The patient who had swallowed the mango seed was sixty years of age and was edentulous. The mango seed was impacted in the postcricoid area and was causing respiratory distress because of pressure on the trachea.

In our study, 70% of the foreign bodies were impacted at the postcricoid area. Cricopharyngeus or the postcricoid area is the narrowest portion in the gastrointestinal tract, and is the most common site of foreign body impaction. In a study from Lahore, 83% of the foreign bodies were seen at the postcricoid area.⁶

Radiological investigations play a very important role in the initial diagnosis, in recognition of complications and in treatment. The sensitivity of radiology in our study for metallic

objects was 100%. Among the bones, 50% were radiosensitive which is almost double as compared to the sensitivity seen in a study from Hong Kong in which radiographic studies were only 26% sensitive.³ The difference is because of the difference in the bones ingested. In the study mentioned the majority of the bones ingested were the fish bones. These are thin and delicate as compared to the thicker and larger meat bones seen in our patient group. One cannot rely upon the X-ray findings alone for the confirmation of presence of a foreign body in the esophagus. A negative radiographic analysis does not rule out the presence of a foreign body.²³

CT scanning has been tried in some countries to locate bones in the esophagus and it has been found to be very reliable for the detection of bones in the esophagus²⁴ as compared to plain radiography. We did not do CT scan in any patient.

Difficult removals

The guava was very difficult to remove. Whenever it was held by a forceps and pulled the piece in the forceps would be bitten off the rest of the guava. After piecemeal removal of the first piece and a small portion of the second piece the rest was pushed into the stomach. The procedure took about sixty minutes.

The other difficult esophagoscopy was for the removal of marble (Banta). It is a completely rounded and very smooth object. In comparison to the marble, a rounded stone was also found impacted in the esophagus. When the stone was manipulated it was possible to hold it with a forceps. But marble could not be held with ordinary forceps. So a different type of forceps was used.

We did not encounter any serious complications in our study group. Four patients sustained minor mucosal trauma. Two of these were the result of the esophagoscopy. The foreign bodies were marble and stone which needed manipulation inside the esophagus for their removal. The manipulation with instruments resulted in trauma to the surrounding mucosa. In comparative studies of 500 and 180 cases no major complications were seen.^{10,25}

Only one case of coin impaction was accompanied by trauma. The coin had caused edema and was impacted in the postcricoid area. When it was removed the mucosa was found to be lacerated. Potentially serious complications can occur due to foreign body in the esophagus. These complications are rare and even rarer with coin impaction. Any foreign body including coin, impacted for a longer duration can lead to complications. A case was seen in USA in 1999 in

which a coin had caused esophagoaortic fistula²⁶ resulting in sudden death of a three year old child. A few more cases of the rare aortoesophageal fistula have also been reported in the literature, although they were followed by ingestion of sharp foreign bodies like fish bones.¹⁷

In our study all the sharp foreign bodies caused some mucosal laceration in the pharyngoesophagus. A study was done in 1997 about the incidence of complications associated with foreign bodies in the upper aerodigestive tract. It was found out that the important factors responsible for the increased incidence of complications were delayed presentation more than twenty four hours.¹⁴

The patient who had ingested a stone was a mentally retarded child. He had one stone impacted at 20cm from the upper incisors and another was visible in the small intestine in the X-ray. The patient had stopped taking oral food for the last twenty four hours. And when he became lethargic he was taken to the mental hospital and from there he was referred to the Ayub Teaching hospital. There was a previous episode of stone ingestion in the same patient about a year back. Due to prolonged impaction the foreign body had caused significant edema and when it was manipulated the swollen mucosa got traumatized.

CONCLUSION

The conclusions that can be drawn from this study are as follows.

1. Preschool children are most prone to foreign body ingestion; therefore, parents and caretakers of children should be educated regarding this danger.
2. Infants and very young children need to be protected from their older siblings to prevent the occurrence of foreign body impaction in them.
3. Radiological investigations are very helpful in cases of radioopaque foreign bodies but negative results should not stop one from going for esophagoscopy as false negative results are not infrequent.
4. Ill fitting dentures can be swallowed and become impacted as foreign body so regular visits to the dentist are recommended.
5. It is important to consider the possibility of foreign body ingestion in mentally handicapped children whenever symptoms like inability to eat, drooling, gagging or choking occurs. These children should be properly taken care of.

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