

A Clinical Study on the Prevalence of Foreign Bodies in the Oropharynx and Oesophagus in a Tertiary Care Hospital in Telangana

Venkatarathnam C¹, Nandini S², Sindhuja S.B³, K. Priyanka⁴

¹Assistant Professor, Department of ENT, Kakatiya Medical College, Warangal, Telangana,

² Assistant Professor, Department of ENT, Kakatiya Medical College, Warangal, Telangana.

³Postgraduate Resident, Kakatiya Medical College, Warangal, Telangana

⁴Assistant Professor of ENT, Kakatiya Medical College, Warangal, Telangana,

Received: 12-06-2022 / Revised: 10-07-2022 / Accepted: 14-08-2022

Corresponding author: Dr K. Priyanka

Conflict of interest: Nil

Abstract

Introduction: Foreign bodies in the upper aerodigestive tract project a diagnostic and therapeutic challenge for an Otolaryngologist. Foreign bodies result in the death of patients before they arrive at a hospital. They form an emergency situation in the Hospital.

Methods: A prospective study was conducted for two years at Mahatma Gandhi Memorial Hospital, Warangal. 187 Patients of all age groups with foreign bodies in the Oropharynx and esophagus, and meeting the inclusion criteria were added. Roentgenograms, C.T. scans, and Endoscopy were used to diagnose and treat. A rigid laryngoscope or esophagoscope with a rigid fiber-optic light carrier was used for laryngeal and hypopharyngeal and esophageal foreign body removal.

Results: Out of 187 patients, 76 (40.64%) were children and 111 adults (57.75%). There were 99/187 males (54.01%) and 86/187 females (45.98%). The gender ratio, males to females was 1.1:1 in children and 17:1 in adults. The highest incidence was among 31 to 40 years old and the lowest incidence in the 21 to 30 years and above 61 years age group. Cricopharynx was the most commonest site of impaction of foreign bodies; in 78/187 (41.71%) patients, the middle third of the esophagus in 59/187 (31.55%) and in 18 (09.62%) FB was in the lower third of the esophagus.

Conclusions: Foreign bodies were more common in adults than in children and more common in males than females. The most common age for throat and airway foreign bodies was in the 1st decade. In the digestive tract, mutton/chicken bones were the most common foreign bodies in the adults and Coins in the children. Throat pain and difficulty in swallowing were the most common symptoms in digestive tract foreign bodies. The most common site of foreign body impaction was cricopharynx in the digestive tract.

Keywords: foreign body, tongue tonsil fossa, vallecula, cricopharynx, pharynx, oesophagus and impacted.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

In 1808 A.D., first successful esophagoscopy was performed by Kussamaul of Freiburg in Briesgan. In 1881 A.D. Von Mikulicz published his

experience in esophago-gastroscopy and after years Vienna remained the centre for Esophago-gastroscopy [1-3]. Foreign bodies (FBs) impacted in the aero-digestive tract pose serious health hazard and results in morbidity and mortality. They are common in both the extremes of age [4]. The incidence of foreign bodies is more common in the pediatric age group especially in the first 6 years of life [5]. But they are equally common in the adult groups also [6]. In adults the common occurrence is related to dietary factors and eating habits such as accidental ingestion of mutton bolus or bone pieces [7].

In adults they are also common in inebriated status [8], leading to their impaction. Impaction of foreign bodies may also occur due to negligent chewing of food and swallowing in patients with edentulous status, wearing dentures and sedation [9]. Food as foreign body may get impacted due to pre-existing esophageal pathology such as strictures, weak peristalsis due to old age and esophageal (mucosal) ring [10].

Foreign bodies in the Aero- digestive tract can be divided according to the involved site; namely, oral cavity, Oropharynx, Hypopharynx, Larynx, Esophagus and trachea-bronchial tree. Among these foreign bodies 90% are retained at the site of impaction only 10% pass down the food passage [1]. Among those retained 86.2% were found in hypo pharynx or esophagus; 13.7% were lodged in the trachea-bronchial tree [2]. In recent times there was rapid advancement in the diagnosis and therapeutic methods including endoscopy has increased the efficiency of removal of foreign bodies.

Now except the foreign bodies in the trachea-bronchial tree are termed as gastroenterological [3]. The nature of foreign bodies differs in adults from children. (4) In children foreign bodies other than food items were found to be more common than in adults like coins, screws, buttons, pebbles, beads etc. [4], In adults true food foreign bodies are

common and in elderly patients the common accompanying cause was psychiatric condition, geriatric in coordination in gut movement, inebriated status and intentional swallowing (prisoners) [5,6]. The commonest food foreign bodies all over the world were meat, meat with bone attached, fish bones and sometimes live fish and leeches [7].

In 74 to 83 % of the patients endoscopic removal of the foreign bodies was successful and surgery was required in 18 to 21 % of the patients [8]. In western countries food bolus impaction in the food and air passages was found to be common than in Asian countries where food foreign bodies are common [9]. In South China it was fish bone which was common (60%), in Korea they were found common in upper gastrointestinal tract [9,10]. Males were found commonly affected than females all over the world [9].

The mean ages in males were lower than the mean ages in females as reported by few Asian journals [10,19]. The frequent lodging sites of the foreign bodies were tonsils, Oropharynx, tongue base, valleculae, and pyriform recesses [10]; the tonsils being the most common site. Few authors have recommended inspection of tonsils before examining other sites [9]. Another leading cause of foreign body impaction in the aero-digestive tract in adults may be due to altered mental status, patients recovering from head and facial injuries with decreased level of consciousness [11].

Among the available methods of removal of foreign bodies the best one is endoscopic guided pharyngoscopy, esophagoscopy and laryngo- tracheoscopy [7]. However the use of rigid endoscopy has become controversial and increasing use of fiber-optic endoscopy is on the rise [6]. However, the rigid endoscopy remains the choice of FB removal in impacted foreign bodies and large foreign bodies [12]. Both rigid and flexible bronchoscopes can attain above 90–95%

success rate [13], but there is no consensus as to which is better.

Materials

Aims and Objectives

To study the prevalence and demography of foreign bodies at different sites of aerodigestive tract; to study the clinical features of foreign bodies and their complications. 187 patients were included in this study which was a prospective and Descriptive study. The study period was between December 2017 and June 2019.

The study was conducted in the Department of ENT, Mahatma Gandhi Memorial Hospital, Warangal attached to Kakatiya Medical College. The study population included the patients who presented with foreign bodies in the Oropharynx and esophagus. An institutional ethics committee approved this study before commencement. An ethical committee cleared consent form and proforma were used for the consent of the patients.

Sample size calculation: Using the sample size formula $SS = Z^2 P(1-P) / C^2$, Where SS = Sample Size, Z = Z-Value, P = Percentage of Population proportion-50%, C = Confidence level- 95%. The sample size was calculated as 187. The data was analyzed using statistical methods like, percentage, mean and standard deviation.

Inclusion Criteria were, patients of all age groups with history of foreign body aspiration / ingestion. Patients presenting with complications of foreign bodies even without a history were included. Patients not with associated co-morbidities like diabetes, tuberculosis, HIV infected those on steroid or chemo radiotherapy was included.

Patients giving consent for surgical intervention when needed were included. Exclusion criteria patients not willing for study or surgical intervention were not included. Foreign body passing beyond the esophagus were not included. Patients

fulfilling inclusion criteria were clinically examined, investigated and treated accordingly. Routine blood and urine investigations, Roentgenograms (as indicated), C.T. scan (in case of embedded / migratory foreign bodies and when X-rays were inconclusive, Endoscopy (diagnostic / therapeutic). Prior written consent was taken from all patients. A total of 60 cases were studied in detail and particulars were recorded as per Performa.

Cases were analyzed with respect to aims and objectives of the study. Rigid laryngoscope or esophagoscope with rigid fiber optic light carrier was used for laryngeal and hypopharyngeal and esophageal foreign body's removal. Antibiotics were administered intravenously in all the patients and wherever there was suspicion of mucosal erosion or perforation nasogastric feeding tube feeding was given for 48 hours.

Immediate postoperative period included surveillance during 24 hours. After each procedure, a chest x-ray was taken. FB removal was accomplished in all the cases; though some cases posed difficulties which were overcome by the methods which are mentioned and discussed. Foreign bodies passing beyond esophagus were not included.

Statistical Analysis

All the data was analyzed using the standard statistical methods like mean standard deviation, percentage. The data was tested with t-tests for quantitative variables and Chi-square tests for qualitative variables. All tests were two-sided, and a p value < 0.05 was considered statistically significant.

Results

The study was conducted from December 2017 to November 2019 for a period of two years. Patients were categorized as nasal foreign bodies, digestivetract foreign bodies and airway foreign bodies. There were 76 (40.64%) children and 111 adults (57.75%). There were 99/187 males (54.01%) and 86/187 females (45.98%) in

this study. The gender distribution in children with male to female ratio was 1.1:1 and in adults the ratio was 1.17:1 (Table 1). Analysis of the different age groups among the adult patients showed

that the incidence was highest in the age group of 31 to 40 years and the lowest in the 21 to 30 years age and above 61 years age group. (Table 1)

Table 1: Showing the Age and gender distribution of the subjects in the study (n- 187).

Age in Years	Male (n-101)	Female (n-86)	Total Number (n-187)	Percentage
0-12	40	36	76	40.64
13-20	04	05	09	04.80
21-30	08	07	15	08.20
31-40	14	13	27	14.43
41-50	11	10	21	11.20
51-60	16	09	25	13.36
>61	08	06	14	07.40

The commonest symptom with which the patients presented were observed in this study and tabulated in Table 2. The most common symptom was pain in the throat in 150 patients (80.21%), dysphagia in 102 (54.54%) patients followed by foreign body sensation in the throat in 88 (47.05%) patients. The less common complaints were refusal to feed in 17 (09.09%) of the patients, pooling of saliva in 12 (06.10%) patients and fever in 08 (04.25%) and vomiting in 04 (02.12%) patients (Table 2).

Table 2: Showing the incidence of symptoms in the patients of the study (n-187).

Symptom	Number and percentage
Pain in the throat	150 (80.21%)
Dysphagia	112 (59.89%)
Foreign body sensation in throat	88 (47.05%)
Refusal to fee	17 (09.09%)
Refusal to feed	17 (09.09%)
Pooling of saliva Fever	12 (06.10%)
Vomiting	08 (04.25%)
Fever	04 (02.13%)

Analysis of the lodgment of the foreign bodies in this study was done and it was observed that Cricopharynx was the commonest site with 78/187 (41.71%) patients had the impaction, followed by middle third of esophagus in 59/187 (31.55%) and 18 (09.62%) patients the foreign body in the lower third of the esophagus. The less common sites of foreign bodies were tonsil- fossa 17 (09.09%), base of the tongue 07 (03.74%), Valleculae in 03 (01.60%), posterior pharyngeal wall in 02 (01.06%) and post cricoids region in 04 (02.13%) of the patients (Table 3).

Table 3: Showing the site of lodgment of the foreign body in the study (n-187).

Site of foreign body	Number
Tonsillar fossa	17 (9.09%)
Base of tongue	07 (3.74%)
Vallecula	03 (1.60%)
Posterior pharyngeal wall	02 (1.06%)
Cricopharynx	78 (41.71%)
Pyriiform sinus	03 (1.60%)

Post cricoid region	02 (01.06%)
Middle 1/3 rd of esophagus	59(31.55%)
Lower 1/3 rd of esophagus	18(9.62%)

Analyzing the nature of the foreign bodies in the study showed that coins were found in 65 (34.75%) of the patients, mutton or chicken bones in 65 (34.75%), fish bones in 40 (21.30%), battery cells in 10 (05.34%), dentures in 03 (01.60%) of the patients. Other substances like glass pieces, rubber pieces, buttons and whistles were found in 03 (01.60%) of the patients (Table 4).

Table 4: Showing the types of foreign bodies lodged in the aero digestive tract in the study (n-187).

Types of foreign body	Number
Coins	65 (34.75%)
Battery cell	10 (05.34%)
Safety pin	01 (00.5%)
Mutton or chicken bone	65 (34.75%)
Fish bone	40 (21.3%)
Dentures	03 (01.60%)
Others (glass piece, rubber piece etc)	03 (01.60%)

Hospital stay of the patients admitted for removal of the foreign bodies in the aero-digestive tract was analyzed and found that the hospital stay was less than 3 days in 172/187 (91.97%) patients and more than three days in 15 (08.02%) patients.

Table 5: Showing the duration of stay of the patients in the study (n-187).

Hospital stay	Number and % of patients with <3 days hospital stay	Number and % of patients with >3 days hospital stay
No of patients	172 (91.97%)	15 (08.02%)

The complications noted in the study were retropharyngeal abscess in 03 (01.60%) of patients, Charring of esophageal mucosa was observed during endoscopy in 04 (02.13%) of the patients (Table 6). Esophageal perforation was not noted in this study.

Table 6: Showing the Incidence of complications in the study (n-187).

Complication	Incidence
Retropharyngeal abscess	03 (1.60%)
Esophageal perforation	00
Charring in the Esophagus	04 (2.13%)

The final outcome of the study was that in 180 patients the foreign bodies could be removed successfully and the patients were discharged uneventfully. In 07 (03.75%) patients the foreign bodies slipped while attempting for removal using rigid endoscopy and passed into the stomach (Table 6).

Table 7: Showing the final outcome of the study (n-187).

Outcome	Number	Percentage
Successful removal	180	96.25%
Failed/slipped	07	03.75%

Discussion

The study was conducted from December 2017 to November 2019 for a period of two years. Patients were categorized as nasal foreign bodies, digestivetract foreign bodies and airway foreign bodies. There were 76 (40.64%) children and 111 adults (57.75%). There were 99/187 males (54.01%) and 86/187 females (45.98%) in this study. The gender distribution in children with male to female ratio was 1.1:1 and in adults the ratio was 1.17:1.

In the present study of an analysis of foreign bodies in a clinical set up of a tertiary care center, occurring in the aero-digestive tract accounted for 40.64% of the patients in the age group of below 12 years. This was similar to a studies by Khorana J, Tantivit Y, Phiuphong C, *et al* and Zhang X, Jiang Y, Fu T, Zhang X [3,14], who reviewed patients treated over a 5-year period and observed that 17% of the patients were 5 years of age or older.

Other studies by Ho NH, Chang FC, Wang YF *et al.* also concluded that older children and adolescents represented a distinct group of patients at risk for foreign body ingestion accidents [15]. In the present study, among the adults the incidence was highest in the age group of 31 to 40 years (14.43%) and the lowest in the 13 to 20 years age (04.30%).

In patients aged above 61 years age group, it was 07.40%. But the highest incidence of food foreign bodies in this study was among the children and adolescents aged between 0 to 12 years (40.64%), (Table 1) From studies of Ho NH, Chang FC Wang YF [15], Heung Up Kim [16] and Kikuchi D, Ikeda M, Muroso S [17], it was noted that children younger than 10 years were the most vulnerable, as it was observed in this study followed by the adults of 31 to 40 years age groups (14.43%).

Whereas, Qureshi T A, Awan M S, Hussain M *et al* [18] have found the peak incidence of foreign bodies at 2 years in

children. In the present study of foreign bodies of aero-digestive tract, coins were the most common occurrence (34.75%) in children. Whereas in adults, mutton bones, chicken bones and fish bones were the commonest foreign bodies; also accounting to 34.75%. Similar observations were also made by Chen, Guowei PhD, Luo, Yizhen MD. *et al.* [19] and Aslan, N, Yildizdas, D, Ozden, O, *et al.* [20] from their studies in the coastal belts of their countries recorded an incidence of 39% and 42% respectively in the children.

In the present study the most common symptom observed among the patients was pain in the throat pain in 80.21% followed by difficulty in swallowing in 59.89%. This observation correlates well with the study of Khorana J, Tantivit Y, Phiuphong C, *et al* [21] and Aslan N, Yildizdas D, Ozden O, *et al.* [22]. In this study the pain localization was better in pharyngeal foreign bodies than in the oesophagus, similar to the observations made by Abdul aziz K Alaraifi, Raghad K Alsalamah *et al.* [23].

Side of throat pain or foreign body sensation correlated well with the site impaction. Pooling of saliva was seen in 02%, but not as found in the study of Swain SK, Mallik KC (85%) [24]. The most common site of foreign body impaction in throat was cricopharynx in 41.17% of the patients in the present study. This also correlated well with the study of Khorana J, Tantivit Y *et al* [21], Aslan N, Yildizdas D, Ozden O, *et al* [22] and several other authors like K. Athanassiadi, M. Gerazounis, E *et al* [25].

The commonest site for fish bone lodgment was found to be tonsil fossa in 17% patients in this study. Whereas Swain SK, Mallik KC *et al* [24] reported a very high incidence (47.8%) which may be due to the study was conducted in coastal belts. In this study, complication such as

esophageal perforation was nil. In a study by Swain SK, Bhattacharyya B *et al* and Khorana, J, Tantivit, Y, Phiuphong, C, *et al*, [26,27] Yamashita K, Oda M, Tanaka T *et al* [25] perforations occurred in 03%. Successful removal as outcome was seen in 96.25%. This was seen in sharp foreignbodies.

Most common complication due to foreign body was retropharyngeal abscess which occurred in 01.60% of the patients. The total incidence of complication was 3.73%. 03 patients with mutton/chicken bone impaction developed retropharyngeal abscess. Retropharyngeal abscess was treated by incision and drainage. 4 cases (02.13%) in the children age group with battery cell ingestion had charring of the esophageal mucosa.

Limitations of the Study

The main points to be considered as limitations to this study were, a smaller sample size, study center was not in a coastal belt and the sample size represented only a fragment of the incidents of food foreign bodies in this community, because there are more than 18 practicing ENT surgeons who handle such foreign bodies in their private nursing Homes. This tertiary referral center being a Government organization only low socio economic patients approach this center.

Conclusion

Foreign bodies were more common in adults than in children and more common in males than females. The most common age for throat and airway foreign bodies was in the 1st decade. In the digestive tract, mutton/chicken bone was the most common foreignbody in adults and Coins in children.

Throat pain and difficulty in swallowing were the most common symptoms in digestive tract foreign bodies. Most common site of foreign body impaction was cricopharynx in the digestive tract. Rigid endoscopic removal remains the procedure of choice in removal of foreign

body in esophagus. Charring of the esophageal mucosa was the most common encountered complication in children followed retropharyngeal abscess. Duration of hospital stay was less than 3 days in most of the uncomplicated cases.

References

1. Shahi S, Bhandari TR, Thapa PB, Shrestha D, Shrestha K. Foreign body esophagus: Six years of silence. *SAGE Open Med Case Rep* 2020; 8:2050313X20944322. PMID: 32754336.
2. Suzuki J, Koizumi S, Endo T, Hemmi T, Katori Y. Magnetic foreign bodies in the hypopharynx: Usefulness of video laryngoscopy. *Pediatr Int.* 2020;62(6):748–9.
3. Khorana J, Tantivit Y, Phiuphong C, *et al*. Foreign body ingestion in pediatrics: distribution, management and complications. *Medicina (Kaunas)* 2019; 55: 686.
4. Aslan N, Yildizdas D, Ozden O, *et al*. Evaluation of foreign body aspiration cases in our pediatric intensive care unit: single-center experience. *Turk Pediatri Ars* 2019; 54: 44–48.
5. Klein A, Ovnat-Tamir S, Marom T, Gluck O, Rabinovics N, Shemesh S. Fish Bone Foreign Body: The Role of Imaging. *Int Arch Otorhinolaryngol.* 2019;23(1):110–5.
6. Kim HU. Oesophageal fish bone foreign body. *Clin Endosc* 2016; 49: 318–326.
7. Klein A, Ovnat-Tamir S, Marom T, Gluck O, Rabinovics N, Shemesh S. Fish Bone Foreign Body: The Role of Imaging. *Int Arch Otorhinolaryngol.* 2019 Jan;23(1):110-115.
8. Koizumi S, Suzuki J, Honkura Y, Watanabe K, Katori Y. Buried oropharyngeal metal mesh foreign bodies in an infant. *Otolaryngology Case Reports.* 2021; 20:100317.
9. T. George and R. Andrew, Update on foreign bodies in the esophagus: diagnosis and management, *Current*

- Gastroenterology Reports, 2013; 15: 317.
10. Kikuchi D, Ikeda M, Murono S. Endoscopic removal of a fish bone foreign body in the hypopharynx with the modified Killian's method. *Auris Nasus Larynx*. 2020. Epub 2020/07/14. PMID:32654797.
 11. Castán Senar A, Dinu LE, Artigas JM, Larrosa R, Navarro Y, Angulo E. Foreign Bodies on Lateral Neck Radiographs in Adults: Imaging Findings and Common Pitfalls. *Radio Graphics* 2017; 37:323-45.
 12. Fung BM, Sweetser S, Wong Kee Song LM, Tabibian JH. Foreign object ingestion and esophageal food impaction: An update and review on endoscopic management. *World J Gastrointest Endosc* 2019; 11(3): 174-192
 13. Lin C, Liu D, Zhou H, Zhang X, Lu L, Gao X. Clinical diagnosis and treatment of throat foreign bodies under video laryngoscopy. *J Int Med Res*. 2020 Jul; 48(7): 300060520940494.
 14. Zhang X, Jiang Y, Fu T, Zhang X, Li N, Tu C. Esophageal foreign bodies in adults with different durations of time from ingestion to effective treatment. *J Int Med Res*. 2017;45(04):1386–1393.
 15. Ho NH, Chang FC, Wang YF. Clinical approaches to migrating ingested foreign bodies in the neck. *Ear Nose Throat J*. 2020:145561320948787
 16. Heung Up Kim. Oroesophageal Fish Bone Foreign Body, *Clin Endosc* 2016;49 (4):318-326.
 17. Kikuchi D, Ikeda M, Murono S. Endoscopic removal of a fish bone foreign body in the hypopharynx with the modified Killian's method. *Auris Nasus Larynx*. 2020;48:1035-1037.
 18. Qureshi T A, Awan M S, Hussain M, Wasif M. Effectiveness of plain X-ray in detection of fish and chicken bone foreign body in upper aerodigestive tract. *J Pak Med Assoc*. 2017; 67(04):544–547.
 19. Chen, Guowei PhD; Luo, Yizhen MD; Pan, Hongguang PhD; Teng, Yishu MD, Liang, Zhenjiang PhD; Li, Lan PhD. Uncommon foreign body in the hypopharynx: A case report. *Medicine*: June 2018;97(26): e11242
 20. Aslan, N, Yildizdas, D, Ozden, O, *et al*. Evaluation of foreign body aspiration cases in our pediatric intensive care unit: single-center experience. *Turk Pediatri Ars* 2019; 54: 44–48.
 21. Khorana J, Tantivit Y, Phiuphong C, *et al*. Foreign body ingestion in pediatrics: distribution, management and complications. *Medicina (Kaunas)* 2019; 55: 686.
 22. Aslan N, Yildizdas D, Ozden O, *et al*. Evaluation of foreign body aspiration cases in our pediatric intensive care unit: singlecenter experience. *Turk Pediatri Ars* 2019; 54: 44–48.
 23. Abdul aziz K Alaraifi, Raghad K Alsalamah, Abdulaziz A Alsalem, and Khurram Waheed. Hypopharyngeal Perforation Following Foreign Body Ingestion: A Case Report, Published online 2021 Nov 18.
 24. Swain SK, Mallik KC. Ear, nose, and throat foreign bodies in pediatric age. *Med J Babylon* 2020; 17:238.
 25. Yamashita K, Oda M, Tanaka T, Nishida I, Wakasugi-Sato N, Matsumoto-Takeda S, *et al*. Changes in tonsillolith characteristics detected in a follow-up CT study. *BMC Oral Health* 2021; 21:72.
 26. Swain SK, Bhattacharyya B, Sahu MC. An unusual cause of long-standing foreign body sensation in throat. *Ann Indian Acad Otorhinolaryngol Head Neck Surg* 2019; 3:82.
 27. Khorana, J, Tantivit, Y, Phiuphong, C, *et al*. Foreign body ingestion in pediatrics: distribution, management and complications. *Medicina (Kaunas)* 2019; 55: 686.

