

## FOREIGN BODY IN AERO-DIGESTIVE TRACT: A DESCRIPTIVE ANALYSIS AT TERTIARY CARE TEACHING HOSPITAL

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### ABSTRACT

**Objectives:** The objectives of the study were to analyze some of the key issues about the presentation, types, complications, and management arising about foreign body in the upper aero-digestive tract.

**Methods:** All the patients presenting with or without history of swallowing or inhaling foreign bodies with symptoms such as dysphagia, drooling of saliva, stridor, and acute respiratory distress were included in study. Extraction of foreign body in airway tract was done by bronchoscopy and in digestive tract by esophagoscopy. Patient's demographic details, types, symptoms and nature, size, and location of the inhaled foreign bodies were analyzed.

**Results:** Patients aged more than 10 years constituted maximum number 14 (28%) in digestive tract. Patient aged 1-2 and 2-3 years accounted for most of the cases 10 (50%) in airway. Sensation dysphagia (100%) and foreign body sensation including cough (100%) were the most common symptom of digestive tract and airway tract, respectively. Currency coins (64%) were the most common type of foreign body in case of digestive tract ground nut (30%) was the most common type of airway foreign body.

**Conclusions:** This study concluded that symptoms of foreign bodies in the aerodigestive tract are mainly nonspecific and needs high degree of suspicion, experience, and clinical acumen to diagnose and manage these patients.

**Keywords:** Foreign body, Airway tract, Digestive tract, Bronchoscopy, Esophagoscopy.

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### INTRODUCTION

A foreign body in upper aero-digestive tract continues to be a diagnostic and therapeutic challenge for otolaryngologist. Despite improvement in public awareness and emergency care, foreign body results in death of children due to asphyxiation before any hospital intervention [1]. Upper aero-digestive tract foreign bodies are common ENT emergencies. These foreign bodies can potentially be aspirated or inhaled into the airway or may be swallowed especially by children, mentally ill persons, and older adolescents [2]. History taking and physical examination remains the corner stone for assessment of these patients. Plain radiographs are routinely used. Otolaryngologist should have a high index of suspicion for a foreign body aspiration or ingestion. Because a foreign body can mimic other conditions, particularly without a witness event, there can be delay in diagnosis and management which may lead to complication. Foreign body ingestion could be accidental but may cause airway obstruction. Sharp foreign bodies if not retrieved at the earliest may penetrate esophageal wall and cause complication. Hence, aggressive approach is required for sharp foreign bodies [3].

Removal of foreign bodies is certainly challenging to the otolaryngologist because of the variety of objects swallowed or aspirated. The technical difficulties involved and complication which may occur due to the lack of knowledge about the foreign body complication of layman and unavailability of specialists are the main reason for life threatening morbidity and mortality [4].

The knowledge of applied anatomy, physiology, and pathology is essential for managing this potential life-threatening event. Due to the development of advanced methods of diagnosis and management, mortality has reduced to <2%. This study was planned to analyze some of the key issues about the presentation, types, complications, and management arising about foreign body in the upper aero-digestive tract.

### METHODS

This prospective observational study was conducted in patients that sought treatment at the ENT Department at RNT Medical College and attached group of hospitals, Udaipur for a period of 2 years. Institutional ethics committee permission was taken before commencement of the study. All the patients during the study period were enrolled; means consecutive sampling was done. All consecutive patients with confirmed foreign body in aero-digestive tract admitted to RNT Medical College and hospital, Udaipur, were included in the study. Patients irrespective of age, sex, religion, and socio-economic status were included in this study. Informed consent was taken from all the patients. A detailed history regarding the illness of the patient followed by clinical examination was carried out on the patients in a systemic manner.

Patients presenting with or without history of swallowing or inhaling foreign bodies with symptoms such as dysphagia/odynophagia, drooling of saliva, stridor, and acute respiratory distress were included in study. Patients in which foreign body passed beyond esophagus, foreign body in the lung tissue were excluded out from the study.

Extraction of foreign body in airway tract was done by bronchoscopy and in digestive tract by esophagoscopy. Alligator forceps were used to remove the foreign bodies of digestive tract irrespective of the type.

Patient's demographic details, the time lag between the inhalation and diagnosis, seasonal variation of aspiration for vegetative foreign bodies during the period of ripening of fruits were noted for each patient. The presenting symptoms and signs such as persistent irritating cough, fever wheezing, respiratory distress, decreased breath sound, pneumonia, hoarseness of voice, and stridor were noted of each patient. Nature, size, and location of the inhaled foreign bodies were interpreted

through radiological examination. Both hematological and radiological examinations were done in all patients during post endoscopy care.

The data were recorded in Microsoft Office Excel 2010. The data were compiled and statistically analyzed. The data were expressed in numbers and percentages. Suitable statistical test was used to analyze the data.

**RESULTS**

In this prospective study, cases were categorized as digestive tract foreign bodies and airway foreign bodies. 50 in digestive tract and 20 in airway tract were included during the study period. Patients aged more than 10 years constituted maximum number 14 (28%) in digestive tract. Patient aged 1-2 and 2-3 years accounted for most of the cases 10 (50%) in airway (Table 1).

About 68% were male and 32% were females in digestive tract foreign bodies. About 75% were males and 25% were females in airway foreign bodies. All patients required hospital admission in both foreign bodies. Of these 90% got discharged within 3 days while 10% required more than 3 days of hospital stay in digestive tract foreign bodies. About 65% got discharged within 3 days while 35% required more than 3 days of hospital stay in airway foreign bodies (Table 2).

Sensation dysphagia (100%) was the most common symptom followed by foreign body sensation (100%) in throat, refusal to feed (100%), and throat pain (90%). Vomiting and cough was seen in 60% and 70%, respectively, in digestive tract foreign bodies (Table 3). Foreign body sensation (100%) in throat was the most common symptom, followed by cough, dyspnea (90%), wheeze in 85% and fever in 70% and stridor (30%) in airway foreign bodies (Table 3).

About 78% of the cases were in cricopharynx, followed by 20% were in middle 1/3<sup>rd</sup> of esophagus, 2% in posterior pharyngeal wall in case of digestive tract. About 55% of the cases were in right main bronchus followed by 30% cases in trachea and 15% cases were in left main bronchus in cases of airway tract (Table 4).

Currency coins (64%) were the most common followed by meat piece (20%) in case of digestive tract foreign bodies. Ground nut (30%) was the most common followed by tamarind seed, plastic cover, and plastic whistle each in 5% of cases in airway foreign bodies (Table 5).

**Table 1: Distribution of digestive and airway tract cases as per age group**

Age group (years)	Digestive tract number of cases (%)	Airway tract number of cases (%)
1-2	1 (2)	6 (30)
2-3	2 (4)	4 (20)
3-4	4 (8)	1 (5)
4-5	7 (14)	3 (15)
5-6	9 (18)	1 (5)
6-7	3 (6)	2 (10)
7-8	4 (8)	2 (10)
8-9	4 (8)	0 (0)
9-10	2 (4)	0 (0)
>10	14 (28)	1 (5)

**Table 2: Distribution of digestive and airway cases as per sex and hospital stay**

	Digestive tract number of cases (%)	Airway tract number of cases (%)
Male	34 (68)	15 (75)
Female	16 (32)	5 (25)
<3 days of hospital stay	45 (90)	5 (25)
>3 days of hospital stay	13 (26)	7 (35)

About 22% were vegetative while 78% were non-vegetative foreign bodies in digestive tract. Majority (98%) of the cases were vegetative, only 2% was constituted by non-vegetative variety in case of airway foreign bodies.

**DISCUSSION**

Foreign bodies in the upper aerodigestive tract are common clinical problem in otolaryngological practice. The availability of diagnostic trial has improved instrument technique and anesthetic technical expertise help in decreasing mortality and morbidity. Foreign body in the upper aerodigestive tract does not pose a serious problem as highlighted in the previous studies, provided they are managed timely and appropriately in trained and experienced hand.

About 28% of the patients in aerodigestive tract foreign bodies were more than 10 years in digestive tract and 30% of the patients were in age group between 1 and 2 years. This incidence was similar to Lemberg et al. who treated patients over a period of 5 years. In this study 17% of the patients were 5 years of age or older [5]. These data suggest that older children and adolescents represent a distinct group of patients at risk for foreign body accidents.

**Table 3: Comparative symptoms in both the group**

	Digestive tract number of cases (%)	Airway tract number of cases (%)
Dysphagia	50 (100)	-
Throat pain	45 (90)	-
Foreign body sensation in throat	50 (100)	20 (100)
Refusal to feed	50 (100)	-
Fever	-	14 (70)
Vomiting	30 (60)	-
Cough	35 (70)	18 (90)
Dyspnea	-	18 (90)
Wheeze	-	17 (85)
Stridor	-	6 (30)

**Table 4: Site of foreign body in both the group**

Site	Digestive tract number of cases (%)	Site	Airway tract number of cases (%)
Cricopharynx	39 (78)	Trachea	6 (30)
Posterior pharyngeal wall	1 (2)	Right main bronchus	11 (55)
Middle 1/3 <sup>rd</sup> of esophagus	10 (20)	Left main bronchus	3 (15)
Lower 1/3 <sup>rd</sup> of esophagus	-		

**Table 5: Types of foreign body in both the group**

	Digestive tract number of cases (%)	Airway tract number of cases (%)
Tamarind seed	-	1 (5)
Ground nut	-	6 (30)
Plastic cover/beads	-	1 (5)
Plastic whistle	-	1 (5)
Battery cell	1 (2)	-
Safety pin	1 (2)	-
Meat piece	10 (20)	-
Fish bone	1 (2)	-
Currency coins	32 (64)	-
Others (egg shell/fruit piece/ rubber piece/ glass piece)	4 (8)	-

## Demographic

### Digestive tract foreign bodies

In the present study, patients aged more than 10 years constituted maximum number (28%) which was in contrast to the study on esophagoscopy performed over a 19 years period to remove blunt esophageal foreign bodies by Hawkins which reported 74% were in children under 3 years of age [6].

### Airway foreign bodies

Patients aged 1–2 years accounted for most of the cases (30%) in the present study. A study by Banerjee showed that children below 3 years of age were found to be the most vulnerable [7]. In a retrospective study by Mc Guirt *et al.* which reviewed 88 cases of foreign body aspiration, the peak incidence of foreign body aspiration occurred in children <3 years of age [8]. Similar results were also reported by Mu *et al.* study [9].

Children account for most of the airway foreign bodies. However, adults have more predilections for digestive tract foreign bodies which are mainly because of dietary habits and hasty eating. Educating the parents about keeping away the articles from the reach of children and to observe the activity of a child will prevent the higher incidence of foreign body in the children.

## Types

### Digestive tract foreign bodies

Currency coins (64%) were the most common followed by fish meat piece 20% in present study. Battery cell, safety pin, and fish bone were found each in 1% of the case. About 81% of the foreign bodies were of coins type in Hawkins study which correlates to present study [6]. Shivakumar *et al.* study showed that blunt foreign body was common in children, whereas meat with bone was common in adults [10].

### Airway foreign bodies

In the present study, ground nut (30%) was the most common followed by tamarind seed, plastic cover and plastic whistle each in 5% of cases. In Banerjee study; an analysis of the management of 223 children with laryngo-tracheobronchial foreign bodies, 66.4% cases of the recovered foreign bodies were organic in origin, the majority of them being ground nuts which was similar to present study [7]. In a study by Elhassani 2170 infants and children with suspected aspiration of tracheobronchial foreign bodies, water melon seed was the commonest foreign body accounting for 66.3% in contrast to present study [11].

## Site

### Digestive tract foreign bodies

In the present study, 78% of the cases were in cricopharynx, 20% were in middle 1/3<sup>rd</sup> of esophagus while 2% in posterior pharyngeal wall. In Shivakumar *et al.* study, most of blunt foreign body in children 83.5% were impacted in post cricoid region whereas in adults, the foreign bodies 80% were seen in the upper esophagus which correlates with the present study [10].

### Airway foreign bodies

In the present study, the right main bronchus constituted 55%, followed by trachea 30%, least foreign found in the left main bronchus 15%. In a retrospective review of 400 Chinese children who had inhaled foreign bodies was undertaken, the majority of the foreign bodies were found most often in right bronchial tree (46%) which was similar to present study [12]. Banerjee study also reported 47.1% in right bronchial tree which was similar to the present study [7].

## Symptoms

### Digestive tract foreign bodies

Most common symptoms were dysphagia (100%), refused to feed (100%), foreign body sensation (100%), and throat pain (90%) was the common symptom, followed by cough (70%) and vomiting (60%). Throat pain was seen in 49% and dysphagia in 49% of cases in the

study by Lim *et al.* series [13]. Dysphagia was seen in 36% of cases in the study by Mishra *et al.* series [14]. However, they have not mentioned about drooling of saliva, dysphagia, poor feeding, and vomiting as the common symptoms [15]. Throat pain as a prominent symptom in the present study could be attributed to the factors like in the present study many of foreign bodies being meat piece with bone and safety pins which had injured the mucosa and some of the cases being late presentations by the time infection might have set in. Drooling of saliva (36%) was also a common symptom. The reason could be the currency coins very common in children causing total obstruction. Dysphagia was also seen in 55.55% of the cases in Mishra *et al.* study which was almost similar to the present study [14].

### Airway foreign bodies

In the present study, dyspnea (90%) was the most common symptom followed by wheeze in 85% and stridor in 30% cases. However, dyspnea (325) was a predominant symptom in Mishra *et al.* study and choking (87%) in the study of Banerjee [7].

## CONCLUSIONS

This study concludes that symptoms of foreign bodies in the aerodigestive tract are mainly nonspecific and needs high degree of suspicion, experience, and clinical acumen as many does not pose an immediate problem of airway, some of them are serious and life threatening emergencies. However, the only single reliable factor is a positive history which often is not contributory in spite of careful and tactful attempt to elicit it and particularly in children where it goes unnoticed.

## AUTHORS' CONTRIBUTION

All the authors contributed to the preparation of the final manuscript.

## CONFLICTS OF INTEREST

None.

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