



CLINICAL STUDY OF FOREIGN BODIES IN THE UPPER AERODIGESTIVE TRACT

ENT

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ABSTRACT

Upper digestive tract foreign bodies are common ENT emergencies. Study was conducted in 132 patients who attended emergency either with history of foreign body ingestion, insertion and inhalation or were having symptoms like stridor, dysphagia, drooling of saliva. Children less than 10 years accounted for maximum incidence of airway foreign bodies while patients more than 10 years of age had more incidence of upper digestive tract foreign bodies. Majority of patients came with complaint of foreign bodies being ingested or inhaled and most of them were of non vegetative type. Cricopharynx was found to be most common site for lodgement of foreign body in upper digestive tract and right main bronchus for airway foreign bodies. Early seeking for medical help that is within 24 hours of onset of symptoms helped early intervention and thus reducing complications and duration of hospital stay. No death was reported in our study.

KEYWORDS

Foreign bodies, Aerodigestive tract

AIMS AND OBJECTIVES:

To study the clinical spectrum/presentation of foreign bodies in the upper aero digestive tract.

INTRODUCTION:

A foreign body in upper aero digestive tract continues to be a diagnostic and therapeutic challenge for Otolaryngologist and are common ENT emergencies.

Foreign bodies can potentially be aspirated or inhaled into the airway, or maybe swallowed especially by children, mentally ill persons, and older adolescents. Most common foreign bodies in children are coins, but others that are being reported are marbles, buttons, batteries, safety pins and bottle tops. In adults common foreign bodies are bone, dentures are metallic wires^{1,2,3}. Symptoms and course of illness mainly depends on type of foreign body and site of obstruction. Smooth foreign bodies may cause airway obstruction, but sharp foreign bodies if not retrieved at earliest may penetrate oesophageal wall and cause complications. So, aggressive approach is required for sharp foreign bodies.⁴

History-taking and physical examination remain the hallmarks for assessment of these patients⁵. Otolaryngologists should have a high index of suspicion for foreign body aspiration or ingestion. Its certainly challenging to the Otolaryngologist because of the variety of the objects swallowed or aspirated, the technical difficulties involved and complications which may occur. Radiological localization becomes mandatory for radio opaque foreign bodies⁶. In airway either we can directly visualize radio opaque foreign bodies or can find atelectasis, post obstructive changes or pneumomediastinum⁶. Chevalier Jackson's initial description of endoscopic removal of foreign bodies in 1936 revolutionised the treatment options for management of foreign bodies^{7,8}. The lack of availability of a specialist is the main reason for life threatening morbidity and mortality.

In this study, an attempt is made to analyze some of the key issues regarding clinical presentation of different foreign bodies in upper aero digestive tract.

MATERIAL AND METHODS:

The present study was conducted in outpatient or inpatient department of OTORHINOLARYNGOLOGY and HEAD & NECK SURGERY at Rajendra Institute of Medical Sciences, Ranchi from March 2018 to august 2019 during a period of 18 months.

INCLUSION CRITERIA:

- Patient presenting with history of foreign body ingestion, insertion or inhalation.
- Patient presenting without history of swallowing, inserting or inhaling foreign bodies but with symptoms like dysphagia, drooling of saliva, stridor, wheeze and acute respiratory distress.

All 132 cases were analysed and particulars were recorded with respect to aims and objectives of the study.

OBSERVATIONS:

The study was conducted from March 2018 to august 2019. Cases were categorized as a nasal foreign bodies, upper digestive tract foreign bodies and airway foreign bodies. The 50 cases in nasal, 50 cases in digestive tract and 32 cases in airway were qualified for this study. Analysis of the positive cases revealed the following observations.

1. Age distribution

Table 1 shows the age wise distribution of nasal foreign bodies, upper digestive tract foreign bodies and airway foreign bodies.

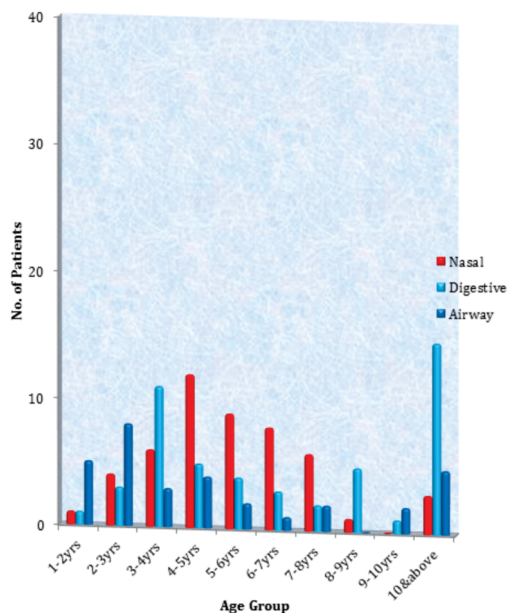
Table 1: Age distribution

Age group	Nasal	Digestive	Airway
1-2yrs	1 (2%)	1 (2%)	5 (15.6%)
2-3yrs	4 (8%)	3 (6%)	8 (25%)
3-4yrs	6 (12%)	11 (22%)	3 (9.4%)
4-5yrs	12 (24%)	5 (10%)	4 (12.5%)
5-6yrs	9 (18%)	4 (8%)	2 (6.2%)
6-7yrs	8 (16%)	3 (6%)	1 (3%)
7-8yrs	6 (12%)	2 (4%)	2 (6%)
8-9yrs	1 (2%)	5 (10%)	0 (0%)
9-10yrs	0 (0%)	1 (2%)	2 (6%)
10 yrs & above	3 (6%)	15 (30%)	5 (15.6%)

Nasal foreign bodies: Children in the age group of 4-5 years had the maximum incidence of nasal foreign bodies i.e. 24%. The youngest patient was 1.5 year old and the oldest was 62 years old.

Digestive foreign bodies: Patients of the age group of more than 10 years accounted for 30% of the cases.

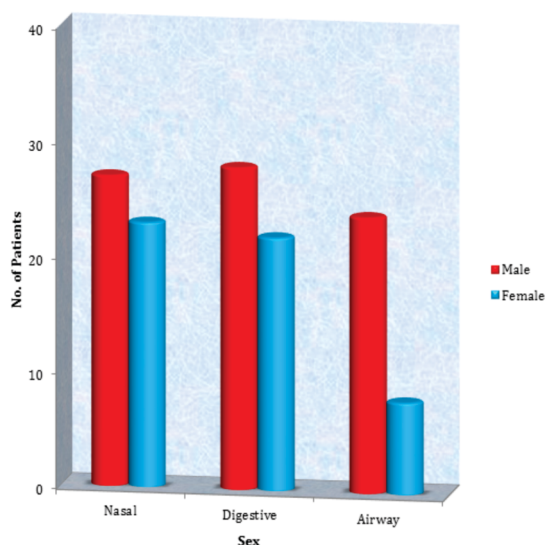
Airway foreign bodies: The age group between 2-3 years had the maximum number of cases of about 25%. Rest of them were mainly between 3-5 years of age i.e. 22%.



2. Sex distribution

Table 2: Sex distribution

Sex	Male	Female
Nasal	27 (54%)	23 (46%)
Digestive	28 (56%)	22 (44%)
Airway	1. (75%)	8 (25%)



3. Duration of Hospital Stay

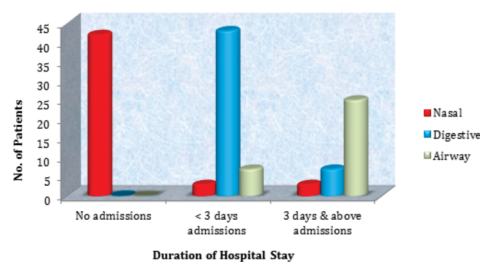
Nasal foreign bodies: Only 16% of patients needed removal under general anaesthesia of which 10% stayed in hospital for less than 3 days and only 6% stayed for more than 3 days.

Digestive foreign bodies: All patients needed hospitalization of which 86% were discharged within 3 days whereas 14% had a hospital stay for more than 3 days.

Airway foreign bodies: All patients needed admission of which 21.8% of patients needed less than 3 days of hospital stay and 78.2% were discharged after 3 days.

Table 3: Duration of Hospital Stay

	No admissions	< 3 days admissions	≥ 3 days admissions
Nasal	42 (84%)	5 (10%)	3 (6%)
Digestive	Nil	43 (86%)	7 (14%)
Airway	Nil	7 (21.8%)	24 (78.2%)



4. History of Foreign Body

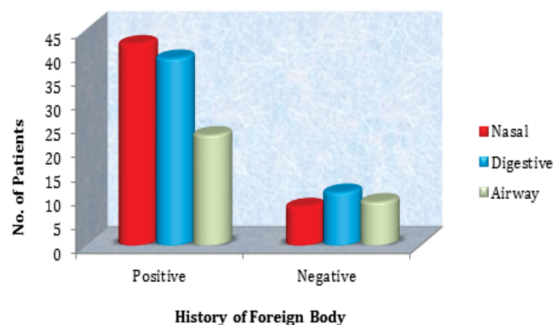
Nasal foreign bodies: In 16% of cases there was negative history and in rest 84% cases the history was positive i.e. the event being witnessed by the patient's parents or relative.

Digestive foreign bodies: 78% cases gave positive history of ingestion. In only 22% the history was negative.

Airway foreign bodies: History was positive in 72% cases only.

Table 4: History of Foreign Body

	Positive	Negative
Nasal	42 (84%)	8 (16%)
Digestive	39 (78%)	11 (22%)
Airway	23 (72%)	9 (28%)



5. Symptoms of Presentation

Nasal foreign bodies: Foreign body in nasal cavity presents 54% of cases. Mucopurulent or foul smelling nasal discharge was present in 22% of cases. Nasal obstruction in 26% whereas fever was present in 8% of cases and epistaxis in 6% of the cases.

Digestive foreign bodies: Dysphagia was the most common symptom followed by throat pain. Drooling of saliva was seen in 10% of cases and refusal to feed was present in 32% of the cases.

Airway foreign bodies: The most common symptom was cough followed by dyspnea. Wheeze and stridor was present in 56.3% patient . 45% patients had fever as a non-specific symptom.

Table 5: Symptoms of Presentation

Symptoms	Nasal	Digestive	Airway
Foreign body in nasal cavity	27 (54%)	-	-
Nasal obstruction	13 (26%)	-	-
Mucopurulent / foul smelling nasal discharge	11 (22%)	-	-
Dysphagia	-	35 (70%)	-
Throat pain	-	21 (42%)	-
Foreign body sensation in throat	-	7 (14%)	-
Odynophagia	-	6 (12%)	-
Drooling of saliva	-	5 (10%)	-
Refusal to feed	-	16 (32%)	-
Fever	4 (8%)	1 (2%)	18 (45%)
Vomiting	-	2 (4%)	-
Cough	-	-	24 (75%)
Dyspnea	-	-	15 (46.8%)
Wheeze	-	-	18 (56.3%)
Stridor	-	-	18 (56.3%)
Bleeding	3 (6%)	-	-

6. Signs at time of Presentation

Nasal foreign bodies: Presence of foreign body in the nasal cavity on anterior rhinoscopic examination was the most frequent sign in 94% of the cases followed by mucopurulent or foul smelling nasal discharge in 48%. Maggots were seen in only 4% of the cases.

Digestive foreign bodies: Pooling of saliva in pyriform sinuses was seen in 52% of the cases whereas tenderness over the neck was present in 28% of the cases. Foreign body was seen on indirect laryngoscopic examination in only 10% of the cases.

Airway foreign bodies: Decreased air entry was seen in most of the cases i.e. about 81% followed by rhonchi in 62.5% and respiratory distress in 65.6% of cases.

Table 6: Signs at time of Presentation

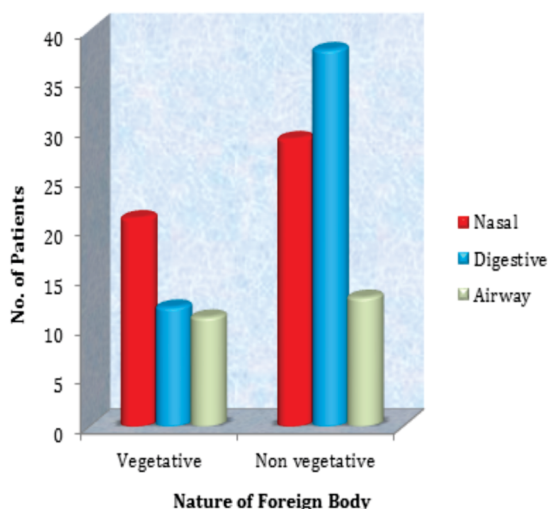
Signs	Nasal	Digestive	Airway
Mucopurulent / foul smelling nasal discharge	24 (48%)	-	-
Foreign body seen in nasal cavity	47 (94%)	-	-
Bleeding	8 (16%)	-	-
Maggots	2 (4%)	-	-
Tenderness over the neck	-	14 (28%)	-
Pooling in the pyriform sinuses	-	26 (52%)	-
Foreign body seen on IDL examination	-	5 (10%)	-
Decreased air entry	-	-	26 (81%)
Rhonchi	-	-	20 (62.5%)
Respiratory distress	-	-	21 (65.6%)
Cyanosis	-	-	2 (6%)
Tracheal thud	-	-	1 (3%)

7. Nature of Foreign Body

Airway foreign bodies: In 25% of cases no foreign body was seen.

Table 7: Nature of Foreign Body

	Vegetative	Non vegetative
Nasal	21 (42%)	29 (58%)
Digestive	12 (24%)	38 (76%)
Airway	11 (34.4%)	13 (40.6%)



8. Site of Foreign Body

Nasal foreign bodies: 50% cases presented with foreign bodies in right nasal cavity while 46% presented with left nasal cavity. There were two cases of bilateral nasal myiasis.

Digestive foreign bodies: Cricopharynx was the most common site seen in 46% followed by pyriform sinus in 24% and middle 1/3rd of esophagus in 14% of the cases.

Airway foreign bodies: Most frequent site was right main bronchus followed by left main bronchus. No foreign body was seen in larynx.

Table 8: Site of Foreign Body

Nasal cavity	25 (50%) Rt 23 (46%) Lt 2 (4%) B/L
Nasopharynx	-
Tonsillar fossa	2 (4%)
Vallecula	2 (4%)
Posterior pharyngeal wall	1 (2%)
Cricopharynx	23 (46%)
Pyriform sinus	12 (24%)
Post cricoid	2 (4%)
Middle 1/3 rd esophagus	7 (14%)
Lower 1/3 rd esophagus	1 (2%)
Larynx	-
Trachea	2 (6.25%)
Right main bronchus	18 (56.25%)
Left main bronchus	12 (37.5%)

9. Time Lag between onset of Symptoms and Seeking Medical Care

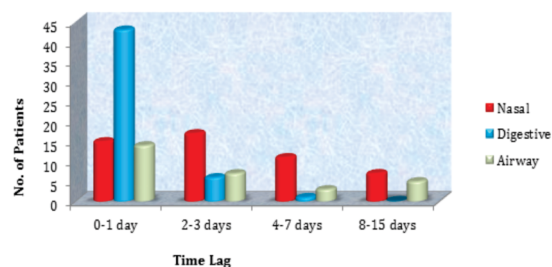
Nasal foreign bodies: Majority of patients presented between 2nd and 3rd day of the onset of symptoms in seeking medical help. The earliest patient reported was within one day and most delayed was after 10 days.

Digestive foreign bodies: 86% of the patients presented in 24hrs of onset of symptoms and majority of patients sought medical help within 72hrs. The earliest case reported was within one hour and the most delayed was after 5 days.

Airway foreign bodies: Majority of cases presented within 24 hours. Most delayed case was diagnosed after 15 days on endoscopic examination.

Table 5: Time Lag between onset of Symptoms and Seeking Medical Care

	0-1 day	2-3 days	4-7 days	8-15 days
Nasal	15 (30%)	17 (34%)	11 (22%)	7 (14%)
Digestive	43 (86%)	6 (12%)	1 (2%)	0 (0%)
Airway	14 (43.8%)	7 (21.9%)	3 (9.4%)	5 (15.6%)



DISCUSSION:

Symptoms of Presentation:

Nasal foreign bodies :

Though all cases were presented early, 54% of our cases presented with foreign body in the nasal cavity, 26% with nasal obstruction and 22% presented with mucopurulent or foul smelling nasal discharge. This is very much in contrast to that of Anupam Mishra et al study who quoted nasal obstruction as the main symptom (12.96%).⁹

Fever was an uncommon symptom and was seen in only 4% of cases.

Digestive tract foreign bodies :

Dysphagia was the commonest symptom seen in 70% of the cases followed by throat pain in 42%. Drooling of saliva was seen in 10% and refusal to feed in 32% of cases.

Throat pain was seen in 49% of cases and dysphagia in 49% in Chong-Teek Lim et al series¹⁰. Dysphagia was seen in 36% of cases in Anupam Mishra et al series.⁹ However, they make no mention of throat pain.

Jeffrey A. Koempel et al in their clinical study stated that the commonest symptoms are drooling of saliva, dysphagia, poor feeding and vomiting.¹¹

Throat pain as one of the common symptoms in our study could be attributed to the following factors.

- Many foreign bodies were meat pieces with bone and safety pins which had injured the mucosa.
- Some of the cases presented late and by that time infection had set in.

Droping of saliva was also a common symptom seen in 10% of patients. The reason could be the currency coins which were very common in children causing total obstruction. However, fever was seen in some cases.

Airway foreign bodies :

The most common symptom was cough (75%) followed by dyspnea (46.8%) . These symptoms closely correlate with most of the other studies like Liancai Mu et al (98%),¹² Blazer et al (94%)¹³ and Puhakka et al¹⁴ (77%). However dyspnea was a predominant symptom in Anupam Mishra et al⁹ (32%)⁹ series and choking in the study of Banerjee et al (87%)¹⁵. Stridor was seen in 56% of cases which does not correlate with Blazer et al (12%)¹³. However, Puhakka et al¹⁴ opined a finding as high as 61%. Fever was seen in 45% of our cases, fairly in consensus with Puhakka et al¹⁴, Liancai Mu et al¹² (30%) and Blazer et al¹³ (36%).

Site of impaction:

Foreign bodies lodgement was more in right main bronchus as compared to left which can be attributed to right main bronchus being more straight and also inter bronchial septum is more toward left. It is similar with Hassan et al and they also opined that anatomical and aerodynamic considerations determine the site of final impaction¹⁶.

Cricopharynx being most common site in upper digestive tract as superior constrictor muscles are stronger enough to propel foreign bodies but oesophagus being weaker comparatively unable to push it downward.

Time lag between onset of Symptoms and Seeking Medical Care:

Nasal foreign bodies: 34% of the patients in our study group sought medical help between 2nd and 3rd day from the onset of symptoms. Mishra et al also quote a similar duration of 3 days. The early presentation can be attributed to better accessibility of patient to seek medical care and quick onset of symptoms.

Digestive foreign bodies: 86% of the patients presented within 24hrs from the onset of symptoms and majority of them within 72hrs. This study correlates with that of Chong-Teek Lim et al¹⁰ (96%). The earliest case presented within one hour and the most delayed was 5 days.

Airway foreign bodies: 43.8% of the cases presented within 24 hours from the onset of symptoms. However Liancai Mu et al¹² found the value as 27.5% and Blazer et al¹³ found values of 34%. 31.3% of our cases presented between 1st day and 1st week, a value similar to that of Blazer et al¹³ (32.5%) and however far from Liancai MU et al¹² (43.8%). 15.6% of the patients in the present study sought medical care between 1st and 2nd week closely correlating with that of Blazer et al¹³ (14.5%). In contrast to Liancai Mu et al¹² series, in Blazer et al¹³ only 6.8% cases were seen after one month.

In contrast to nasal and digestive foreign bodies there were a good number of (9%) cases left undiagnosed for long periods (> 30 days) in airway foreign bodies.

This could be because of :

- The patient become asymptomatic after acute episode and remaining so till the 2nd set of symptoms like fever and cough sets in. This may take days, months or years.
- Rapid adaptation of sensory receptors of tracheobronchial tree and rapid fatigue of initial cough reflex as a result of which one may miss initial diagnosis.

Mortality and Morbidity:

No death was reported in our study. However, B. Wolack et al¹⁷ in their series had 2 cardiac arrests, cardiac arrhythmias in one child and bronchospasm in 2. Tension pneumothorax was seen in one case by Cohen et al¹⁸.

S.N. Merchant et al¹⁹ in their study of 10 years reported five patients death and two of them died before any treatment could be attempted.

One death was reported in a study of 200 cases done by Blazer et al. Complications were seen in 6% of the cases.

CONCLUSION:

Foreign bodies in upper aerodigestive tract are common clinical problem in otolaryngological practice as evident in our study. Foreign bodies in many patient do not pose serious complications because of early seeking for medical help and advancement in technologies however delay in diagnosis and management can lead to life threatening complications. Children accounted for more incidence of upper aerodigestive tract foreign bodies as compared to adults. Patients presented with symptoms which were non specific but positive history and high degree of suspicion helps in management.

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