



## ORIGINAL RESEARCH PAPER

## Otorhinolaryngology

### A RETROSPECTIVE STUDY ON EVOLVING TRENDS IN LOWER AIRWAY FOREIGN BODIES IN INDIAN CHILDREN AT A TERTIARY CARE HOSPITAL

**KEY WORDS:** Foreign body aspiration, Virtual bronchoscopy, Optical forceps. Toddlers

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#### ABSTRACT

**Introduction** Foreign body (FB) in the pediatric airway is a prevailing and crucial emergency with presenting symptoms often overlapping with other common pediatric conditions. [ ] The best way to manage it is an early diagnosis and a rigid bronchoscopy removal under general anesthesia used by fully trained staff . Lack of proper health education, superstitions, negligence from parents side and lack of availability of timely and expert medical help results in delayed or inadequate management. .A foreign body aspiration into the respiratory tract is a serious condition of the respiratory system, characterised by a variability of medical history, symptoms and prognosis.<sup>[2]</sup> **Methodology** This study was a retrospective conducted from Jan 2018 to Dec 2022. We selected a series of 50 patients under the age of 5 yrs conducted in the Department of ENT of M.G.M Medical College and M.Y.Hospital Indore(MP). **Discussion** In our study highest incidence of FB was seen in the children between the age group of 1-3years which is more common because toddlers of this age group are prone to put anything coming in their hands in mouth as they explore the world. This is clearly evident in our study that the incidence of FB is more in rural areas. Tracheobronchial metallic foreign bodies early detection and removal is necessary to avoid life threatening respiratory complication. **Conclusion** Foreign body aspiration is a common but largely preventable problem and every case of a respiratory distress should be suspected for foreign body. Rigid Bronchoscopy is the gold standard for the diagnosis and the most safe treatment method for foreign body removal. Use of optical forceps is advantages not only for foreign body removal but also for educational, teaching, learning, record keeping & medicolegal purpose also.

#### INTRODUCTION

Foreign body (FB) in the Pediatric airway is a prevailing and crucial emergency that every practitioner involved in pediatric care. Lack of proper health education, superstitions, negligence from parents side and lack of availability of timely and expert medical help results in delayed or inadequate management. Variation in types of FB materials can be explained by cultural, regional and feeding habits. Bronchial foreign bodies are common in children because they have difficulty in swallowing hard foodstuffs such as nuts and have an inadequately developed protective respiratory reflexes, which makes them vulnerable to inhalation of foreign bodies.<sup>[3]</sup> A foreign body aspiration into the respiratory tract is a serious condition of the respiratory system, characterised by a variability of medical history, symptoms and prognosis. Early diagnosis and prompt attempt at the time of extraction of sharp FBs are important for the success of the procedure and avoidance of complications, which can be fatal at times. Virtual bronchoscopy is a noninvasive technique which provides an intraluminal view of the tracheobronchial tree.<sup>[4]</sup>

#### AIM & OBJECTIVES

- To study the evolving trends in lower airway foreign bodies in Indian children. (Vegetative to non vegetative FB).
- To study the changes in instruments used for foreign body removal with time. (Conventional to Optical forceps)

#### MATERIALS AND METHODS

This study was a retrospective conducted from Jan 2018 to Dec 2022. We selected a series of 50 patients under the age of 5 yrs

having complaints of difficulty in breathing with or without history of foreign body ingestion which undergoes removal of foreign body from lower airway, done in the Department of ENT of M.G.M Medical College and M.Y.Hospital Indore. Patients with complaint of difficulty in breathing with suspicious of some foreign body were clinically examined by signs of respiratory distress were looked for like subcostal, intercostal and suprasternal retractions, stridor. O<sub>2</sub> Saturation was looked for and accordingly O<sub>2</sub> flow was started.

Signs of foreign body in airways were looked for

- Air entry in lungs :- Foreign body in bronchus leads to decrease air entry on affected site.
- Tracheal stud :- Present when FB is lodged in trachea and subglottis.
- Chocking episodes :- Usually seen in glottic FB, these cases need to be taken in OT.

X-rays chest is performed (Changes seen in X-rays)

- Metallic FB shadow:- Can be clearly seen.
- Hyperinflation of lungs:- Seen if one bronchus is blocked with FB. The air on affected is trapped due to obstruction and dark lung shadow is seen.
- Collapsed lung:- In long standing cases of foreign body causing complete obstruction, the affected site of lung is collapsed.

#### CT virtual brochoscopy

It was done to confirm the presence and the site of FB. It also help us to find the exact size of FB. CT virtual bronchoscopy help with the 3D image of the trachea & bronchus with the

lodgment of FB. Once the presence of FB is confirmed, the child is taken in OT for Rigid Bronchoscopy and FB removal.Now a days, we have optical forceps in which we use the telescope, and thus the FB can be removed under vision. This reduces the chances of complications as were with the conventional methods most of the times blind procedure was performed.

Various Types Of Optical Forceps For Different Foreign Bodies.

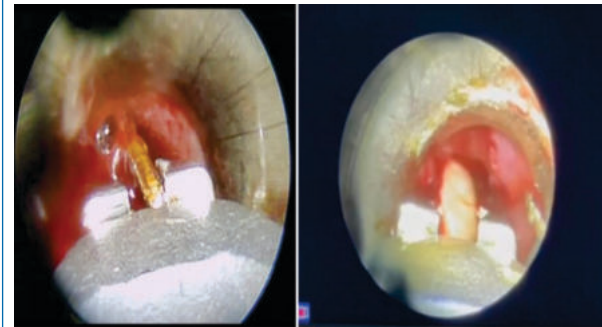


Fig 1 Optical Forceps With Alligator Jaws
 Fig 2 Optical Forceps With Small Jaws

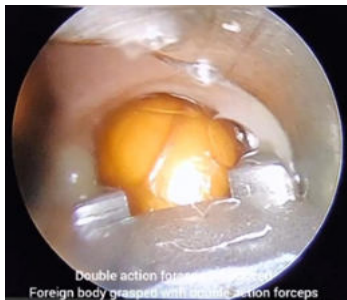


Fig3 Optical Forceps With Killians Bean Jaws

Inclusion Criterion

- Patient under 5 years of age.
- History of suspected foreign body ingestion.
- Attender giving consent.

Exclusion Criterion

- Patient above 5 years of age.
- No foreign body sited on CT virtual bronchoscopy.
- Attender not giving consent.

RESULT

Table 1 : Age Incidence In The Study Groups

AGE GROUP	01 Jan 2018-31 Dec 2018	01 Jan 2019-31 Dec 2019	01 Jan 2020-31 Dec 2020	01 Jan 2021-31 Dec 2021	01 Jan 2022-31 Dec 2022
	N=5	N=8	N=11	N=12	N=14
Yrs					
0-1	1	2	2	2	2
1-3	3	4	6	7	9
3-5	1	2	3	3	3

It was observed that the relative incidence of foreign body was mainly encountered in children (1-3 years) [29 out of 50 patients.]

Table 2 : Sex Incidence In The Study Groups

SEX	01 Jan 2018-31 Dec 2018	01 Jan 2019-31 Dec 2019	01 Jan 2020-31 Dec 2020	01 Jan 2021-31 Dec 2021	01 Jan 2022-31 Dec 2022
	N=5	N=8	N=11	N=12	N=14
Male	3	5	7	7	8
Female	2	3	4	5	6

It is evident from the above table that male sex was predominant in this study. Every year incidence of male was more than females.

Table 3 :distribution In The Study Population

Locality	01 Jan 2018-31 Dec 2018	01 Jan 2019-31 Dec 2019	01 Jan 2020-31 Dec 2020	01 Jan 2021-31 Dec 2021	01 Jan 2022-31 Dec 2022
	N=5	N=8	N=11	N=12	N=14
Rural	4	6	8	7	8
Urban	1	2	3	5	6

People from rural areas or with low socio economic status shows more incidence of foreign bodies than from urban areas.The socioeconomic status has a limited, yet a significant impact on the burden of airway FB.

Table 4 : Type Of Foreign Bodies In The Study Groups

Type Of Foreign Body	01 Jan 2018-31 Dec 2018	01 Jan 2019-31 Dec 2019	01 Jan 2020-31 Dec 2020	01 Jan 2021-31 Dec 2021	01 Jan 2022-31 Dec 2022
	N=5	N=8	N=11	N=12	N=14
Vegetative	4	6	8	7	8
Non-Vegetative	1	2	3	5	6

The type of ingested FB has a global variation. The study done in our department incidence of vegetative FB is much higher (most common being the peanut) but through the years the incidence of non-vegetative FBs have increased significantly.

Table 5 : Instruments Used For The Foreign Body Removal

Instruments	01 Jan 2018 - 31 Dec 2018	01 Jan 2019 - 31 Dec 2019	01 Jan 2020- 31 Dec 2020	01 Jan 2021 - 31 Dec 2021	01 Jan 2022- 31 Dec 2022
	N=5	N=8	N=11	N=12	N=14
Optical Forceps With Small Jaws	2	3	3	2	2
Optical Forceps With Killian Bean Jaws	2	3	4	4	3
Optical Forceps With Alligator Jaws	1	2	4	6	9

As the incidence of non vegetative FB increased , this study showed that the use of alligator jaw forceps increased which is used for removing metallic FBs.

DISCUSSION

In our study highest incidence of FB was seen in the children between the age group of 1-3years which is more common because toddlers of this age group are prone to put anything coming in their hands in mouth as they explore the world. They have started their mobility (crawling & walking) therefore are at risk. Incidence of FB in air passage shows male predominance. The time taken from ingestion/ aspiration of foreign body by patient to consultation is dependent upon the socio-economic and educational status of the family. This is clearly evident in our study that the incidence of FB is more in rural areas. In the case of vegetative foreign bodies, rapid obstructive changes occur due to a combination of mucosal irritation and swelling by hygroscopic action.<sup>[5]</sup> Tracheobronchial metallic foreign bodies early detection and removal is necessary to avoid life threatening respiratory complication such as atelectasis, pneumonia, pulmonary hyperinflation and pneumomediastinum.<sup>[6]</sup> Higher incidence of FB lodged in Right main bronchus. It is because of Its vertical orientation compared to left main bronchus therefore FB easily slip in right side.It is more wider than the left main bronchus.<sup>[7]</sup>

CONCLUSION

Foreign body aspiration remains a common but largely preventable problem. The aspiration of a foreign body should be suspected in each and every case of a pulmonary infection marked by ambiguous symptoms, especially with concomitant atelectasis or emphysema of some parts of pulmonary parenchyma.The symptomless interval phase

may precede a dangerous condition. Rigid Bronchoscopy is the gold standard for the diagnosis and the most safe treatment method for foreign body removal.<sup>[8]</sup> Use of optical forceps is advantages not only for foreign body removal but also for educational, teaching, learning, record keeping & medicolegal purpose also.<sup>[9]</sup> Peanuts, seeds, and fruits with round shapes are the most often aspirated food in children. We have also reported unusual cases of FB aspiration like LED bulbs, Whistle, Safety pins and Bajra bali.

Education of parents, babysitters, teachers, and caregivers remains an essential factor in preventing airway foreign body aspiration. Proper history taking, clinical examination are key to diagnosing the FB in airway. Rigid bronchoscopy performed under GA remains the gold standard for FB removal. Optical forceps play an add on role for removal under vision. Proper selection of forceps is key for success of FB removal.

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