



## Foreign Body Aspiration in Paediatric Airway

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### ABSTRACT

Foreign body aspiration is one of leading cause of accidental deaths among children. Early diagnosis is most important because any diagnostic delay may cause increase in mortality and morbidity. In this study, we evaluated different clinical features with which children presented along with different types of foreign body, site of impaction and outcome. We compared the diagnostic and results with other studies. **Material and methods:** It is a descriptive study of 95 children diagnosed to have foreign body aspiration. Each patient was examined for the age, sex, nature, site of the foreign body, interval between inhalation or the symptoms to admission in the hospital, presenting symptoms and signs, appearance of chest roentgenograms at the time of admission and results of bronchoscopy were noted. **Results:** In our study, maximum incidence of 35.7% occurred among children with 1-2 years of age. Only 47% of children had definitive history of foreign body aspiration. Acute onsets of respiratory symptoms were most common presenting complaints. In our study, we found that sudden onset of cough (71%), breathlessness (47%) and fever (43%) were most common presenting symptoms. On examination, unilateral diminished air entry (61%) was most common sign found. On examining chest X-rays we found that obstructive emphysema was (56%) most common radiological sign. Chest X-ray was normal in 8% of cases. Among the foreign bodies removed 86% were organic in nature and most commonly were lodged in right bronchus (48.3%).

**Keywords:** Foreign body, acute respiratory symptoms, rigid bronchoscopy

### INTRODUCTION

Foreign body aspiration present may present as medical emergency condition, outcome of which depends on how early condition is suspected and managed. It is common emergency encountered in children less than 3 years old [1]. History of foreign body aspiration may not be that reliable in children so high index of suspicion is required to diagnose the condition as early diagnosis has good outcome where as if left untreated it may lead to life threatening complications [2]. Children are more prone for complications because of peculiar anatomy of their airway [3]. Aim and objectives of this study is to know clinical and radiological profile of children diagnosed to have foreign body aspiration and their outcome.

### MATERIALS AND METHODS

In this cross sectional descriptive study of 95 paediatric cases of foreign body removal done from May 2013 to October 2016 were evaluated.

The records of each patient were examined for the age, sex, nature, site of the foreign body, interval between inhalation or the symptoms to admission in the hospital, presenting symptoms and signs, appearance of chest roentgenograms at the time of admission and results of bronchoscopy were noted.

Rigid bronchoscopy was performed in patients presenting with definitive history of foreign body aspiration, or recent onset of cough, or breathlessness with suspicion of foreign body aspiration. Bronchoscopy was done under general anaesthesia. On visualization of foreign body, it is grasped with forceps and removed [4].

Intravenous steroids along with antibiotics were routinely used to decrease post-operative sub glottis oedema.

**RESULTS**

Our study is based on removal of foreign bodies in 95 paediatric patients. The period of study was 3 years. Youngest child to aspirate was 6 month of age where as maximum age documented was 12-year-old. High incidence is seen in male children as compared to female.

**Age and sex distribution**

Figure 1 shows the distribution according to age and sex.

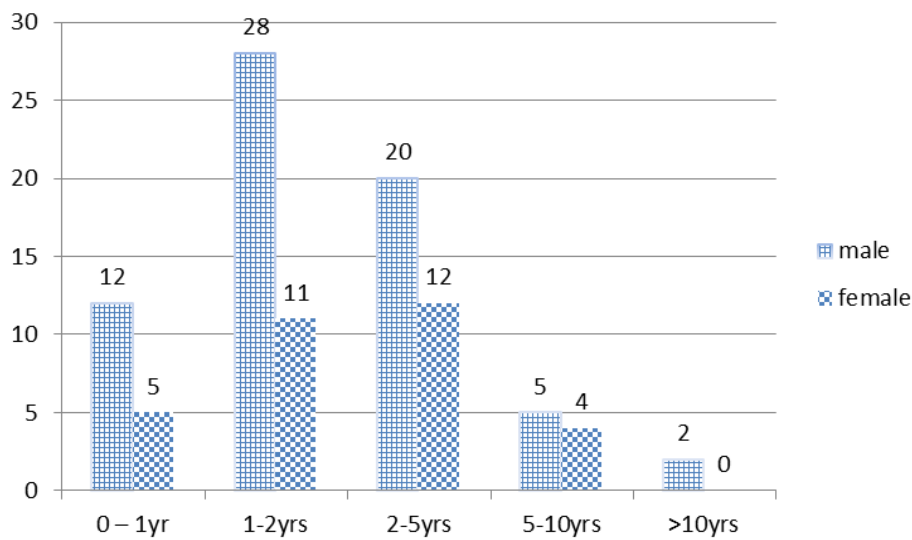


Figure 1 Age and sex distribution of cases

**Presenting symptoms**

When detailed history was taken, it is found that only 47% cases had definite history of aspiration as compared to 53% cases where there was no history of aspiration (Table 1).

Table 1 History of cases

History	Cases
History of aspiration	45 (47%)
Without aspiration	50 (53%)

Table 2 Symptoms of cases

Symptoms	Cases
Cough	68 (71.66%)
Breathlessness	45 (47%)
Fever	40 (43%)
Choking	5 (5.2%)
Vomiting	3 (3.1%)
Seizures	2 (2.1%)
Grunting	1 (1.05%)

Among the symptoms presented sudden onset of cough was most common presenting symptom followed by breathlessness. Fever was present in 43% of children (Table 2). Few children presented with symptoms of asphyxiation such as choking, seizures and grunting.

Table 3 Common signs among the cases

Signs	Cases
Diminished air entry	59 (64%)
Wheeze	31 (30%)
Stridor	5 (5.2%)

On clinical examination, unilateral diminished air entry was most common sign found followed by wheeze/ronchi (Table 3).

**Radiological findings**

Obstructive emphysema was the most common radiological finding. It was observed in 42 (56%) of cases. Collapse of lung is seen in 12 cases. Radio opaque foreign bodies seen in 2 cases. Normal X-ray chest does not rule out the possibilities of foreign body as it is seen in 6 (8%) cases (Table 4).

Table 4 Radiological findings among the cases

Radiology	Cases
Obstructive emphysema	53 (56%)
Collapse	15 (15.7%)
Consolidation	10 (10.6%)
Lower lobe collapse	9 (9.3%)
Radio opaque FB	2 (2.6%)
Normal	6 (8%)

**Site of foreign body**

There was slight increase in right bronchus foreign body as compared to left main bronchus (48.3% vs. 40%). In 2 cases, there was a subglottic lodgement of foreign body and in 9 cases foreign body was found in trachea (Figure 2).

Site of foreign body

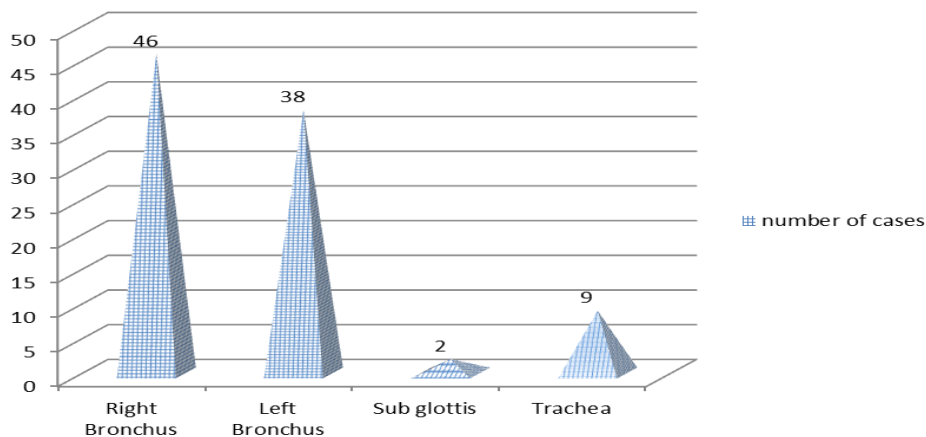


Figure 2 Site of foreign body

**Types of foreign bodies**

The majority of foreign bodies in our series were organic in nature. Groundnut seed was most common foreign body extracted. We also removed different types of foreign bodies as shown in Tables 5 and 6.

Table 5 Types of foreign bodies as per origin among the cases

Type of foreign body	Cases
Organic foreign body	82 (86.7%)
Non-organic	13 (14%)

Table 6 Types of foreign bodies as per specific sources among the cases

Types of foreign bodies	Cases
Groundnut	28 (29.5%)
Chickpeas	22 (23.1%)
Custard apple seed	15 (15.8%)
Betel nut	12 (12.7%)
Tamarind seed	7 (7.4%)
Toy parts	5 (5.3%)
Coconut	3 (3.2%)
Metal ball	2 (2.1%)
Plastic pen cap	1 (1.05%)

### Time taken to report at hospital

Most of the patients with definitive history reported immediately to hospital (Table 7). Maximum number of patients reported in first 48 h of aspiration. One patient underwent bronchoscopy after period one year.

Table 7 Time taken between aspiration and removal of foreign body

Days	Cases	Percentage
0-24 h	73	77.40%
24-48 h	17	17.30%
>48 h	5	5.30%

## DISCUSSION

Foreign body inhalation affects many children every year and it is significant cause of morbidity and mortality among children. Clinical presentation of affected children may range from nonspecific respiratory symptoms to respiratory failure associated with asphyxiation [5].

Difficulty in swallowing hard foodstuff along with poorly developed protective respiratory reflexes make children more vulnerable than adults to inhalation of foreign bodies into respiratory passage [6].

In our study, out of total 95 cases studied 80% were male. This male predominance is seen in agreement with other studies [7,8]. Children between 1-2 years of age had maximum incidence (35.7%) of foreign body aspiration. Youngest child to aspirate was 6-month-old and eldest child was 12-year-old who accidentally aspirated pen cap. Similar age peak reports were seen in other studies [4,9,10].

Forty-five (47%) cases presented with definitive history of foreign body aspiration whereas maximum patient came with nonspecific symptoms like sudden onset of cough and rapid breathing. Rajasekaran, et al. [4] reported 60% cases, Srppnath, et al. [10] 60% and Merchant, et al. [11] 76% of cases with definitive history of aspiration, hence high index of suspicion is necessary in children with acute onset of respiratory symptoms.

Cough (71%), breathlessness (47%) and fever (43%) were predominating presenting complaints among the children. Most of the patients had more than one symptom. Kumbhar, et al. [9], Rajasekaran, et al. [4] and Srppnath, et al. [10] reported cough as predominate symptom followed by breathlessness and fever.

Fever was present in 43% of cases of organic foreign bodies; this confirms the observation of Jackson and Jackson [12] that organic foreign bodies are liable to evoke violent laryngo-tracheal bronchitis and to predispose to lung

infection. Unilateral decrease in air entry was present on 59 (64%) cases whereas bilateral respiratory symptoms and wheeze were present in 30% cases and 2 cases presented with seizure. Kumbhar, et al. [9] also reported 8 cases with neurological involvement in the form of altered Sensorium and seizures.

The commonest radiological finding was obstructive emphysema (56% cases). This is in conformity with other reports [4,11,12]. Further, X-rays of the chest were completely normal in 8% cases while it was 10% in Rajasekaran, et al. [4] and 19% in the study of Merchant, et al. [11]. This would indicate that even a normal X-ray of the chest does not negate the diagnosis of a foreign body in the respiratory passage.

Right main bronchus was the commonest site for foreign body lodgement found in 46 (48.3%) cases, followed by left main bronchus in 38 (40%) cases. Similar results were reported in Kumbhar, et al. [9], Lakhkar, et al. [13] and Hughes, et al. [14].

Groundnut was the commonest foreign body found in 28 (28.6%) cases followed by peanut in 22 (23.6%) cases respectively. Coconut piece, tamarind seed, bean seed, rice piece, sugarcane chip and plastic piece of whistle was found in few cases. Eighty-six per cent cases were having organic foreign body with 14% inorganic foreign body. Most of the foreign bodies were removed in first 48 h. Average hospital stay of patient was 48-72 h as most of the patients were discharged on third day.

### CONCLUSION

High index of suspicion is required in children presenting with acute onset of respiratory symptoms. Bronchoscopy should be done in all cases suspected to have foreign body aspiration despite negative history of aspiration. X-ray chest plays a crucial role in diagnosing the condition. Condition can be prevented by giving proper education to parents regarding food size and providing proper supervision by caregivers to children while playing with small objects.

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