

## Study of Foreign Body Aspirations

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**Abstracts:** Objective: Foreign body aspirations comprise the majority of accidental deaths in childhood. Diagnostic delay may cause an increase in mortality and morbidity in cases without acute respiratory failure  
**Methods:** In our Hospital, bronchoscopy was performed on 105 patients with the diagnosis of foreign body aspirations. Of these cases, 65.77% were male and 34.29% female. Their ages ranged from 2 months to 13 years. Diagnosis was made on history, physical examination, radiological methods and bronchoscopy. Results: Foreign bodies were localized in the right main bronchus in 59 (56.19%) patients followed by left main bronchus in 191 (18.8%), trachea in 173 (17.1%), vocal cord in 75 (7.4%) and both bronchus in 28 (26.67%). Foreign body was not found during bronchoscopy in 4 cases (3.81 %). The majority of the foreign bodies were ground nut. Foreign bodies were removed with bronchoscopy in all cases  
**Conclusion:** Rigid bronchoscopy is very effective procedure for inhaled foreign body removal with fewer complications. Proper use of diagnostic techniques provides a high degree of success, and the treatment modality to be used depending on the type of the foreign body is mostly satisfactory. [ Modi M et al NJIRM 2012; 3(3) : 156-159]

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**Introduction:** Foreign body aspiration can be a life-threatening emergency. An aspirated solid or semisolid object may lodge in the larynx or trachea. If the object is large enough to cause nearly complete obstruction of the airway, asphyxia may rapidly cause death. Lesser degrees of obstruction or passage of the obstructive object beyond the carina can result in less severe signs and symptoms.

Chronic debilitating symptoms with recurrent infections might occur with delayed extraction, or the patient may remain asymptomatic. The actual aspiration event can usually be identified, although it is often not immediately appreciated. The aspirated object might even escape detection. Most often, the aspirated object is food, but a broad spectrum of aspirated items has been documented over the years. Commonly retrieved objects include seeds, nuts, bone fragments, nails, small toys, coins, pins, medical instrument fragments, and dental appliances<sup>1</sup>.

Management of inhaled foreign body depends on the site of impaction of foreign body. Laryngeal and subglottic foreign bodies need urgent intervention in the form of tracheostomy or urgent bronchoscopy, whereas

foreign bodies in the right or left main bronchus cause comparatively less airway problem<sup>2-5</sup>.

Rigid bronchoscopy is the recommended procedure in children with suspected FBs. However, flexible bronchoscopy is less invasive, more cost-effective, does not require general anesthesia and seems more helpful in children with insufficient historical, clinical or radiological findings for FBA<sup>6-7</sup>. This retrospective study was conducted to investigate the incidence of clinically unsuspected FBA in patients who underwent flexible bronchoscopy in our institution; and evaluated the causes resulting in diagnosis of FBA, and the location and type of foreign body, anesthesia methods, complications, and outcome

**Materials and Methods :** In our Hospitals 105 cases with the diagnosis of FBA were evaluated and treated. The study was approved by the Ethics Committee of our institute and informed parent have signed the consent form of these patients. Plain chest radiography (CXR) was done in patients who underwent immediate bronchoscopy owing to acute respiratory distress following history and physical examination. Computed tomography was used

to determine the presence of lung complications due to FB in late period.

**Results :** In Present Study there were 65.77% male and 34.29% female. Maximum patients were from age 1-3 year (73.33%). Followed by less than one year (18.1). Detail Age distribution is shown in table I. Type of Airway Foreign body is shown in table II, distribution of subject according to Duration of enlodgment of foreign body is given in Table III, Presenting history of signs and symptoms of subject are describe in Table IV. A total of 105 bronchoscopies using a rigid bronchoscope in appropriate size and under general anesthesia were done.

**Table 1- Distribution of cse according to Age**

| Year | No. of patients | Percentage (%) |
|------|-----------------|----------------|
| < 1  | 19              | 18.1           |
| 1 -3 | 77              | 73.33          |
| 3 -6 | 5               | 4.76           |
| >6   | 4               | 2.90           |

**Table2 : Types of airway foreign bodies in children**

| Foreign body  | No. of patients | Percentage (%) |
|---------------|-----------------|----------------|
| Ground Nut    | 60              | 57.14          |
| Chana         | 7               | 6.67           |
| Coconut       | 5               | 4.67           |
| Tamarind Seed | 4               | 3.81           |
| Betal nut     | 3               | 2.86           |
| Seed of Baval | 2               | 1.9            |
| Carrot        | 2               | 1.9            |
| Chickoo Seed  | 1               | 0.95           |
| Charcoal      | 1               | 0.95           |
| Dal           | 1               | 0.95           |
| Unidentified  | 1               | 0.95           |

Foreign bodies were localized in the right main bronchus in 59 (56.19%) patients followed by left main bronchus in 191 (18.8%), trachea in 173 (17.1%), vocal cord in 75(7.4%) and both bronchus in 28 (26.67%). Foreign body was not found during bronchoscopy in 4 cases (3.81 %).

Plain chest radiography (CXR) was required in all. In 12 cases Foreign Body was present in

trachea and in 49 cases it was in main stem bronchi. Immediate complication were laryngobronchial oedema in 4 cases cardiac arrest in 2 cases, respiratory arrest in 1 and bleeding was observed in 1 case.

**Table 3 : Duration of enlodgment of foreign body**

| Length of time     | No. of patients | Percentage (%) |
|--------------------|-----------------|----------------|
| 0- 8 hours         | 28              | 26.67          |
| 8 - 24 hours       | 14              | 13.33          |
| 1-7 days           | 35              | 33.33          |
| 7 - 14 days        | 16              | 15.24          |
| 14- 30 days        | 8               | 7.62           |
| 30 - 180 days      | 3               | 2.86           |
| More than 180 days | 1               | 0.95           |

**Table 4 : Presenting history of signs and symptoms**

| Symptoms   | No. of patients | Percentage (%) |
|------------|-----------------|----------------|
| Choking    | 73              | 69.52          |
| Coughing   | 62              | 59.04          |
| Dyspnea    | 62              | 59.04          |
| Fever      | 23              | 21.9           |
| Wheezing   | 13              | 12.38          |
| Conculsion | 2               | 1.90           |
| Cyanosis   | 1               | 0.95           |

**Discussion:** Foreign body aspiration is frequently encountered in pediatric practice; however, the condition is often not diagnosed immediately because there are no specific clinical manifestations. Usually, there is a suggestive history of choking, although the classic clinical presentation, with coughing, wheezing, and diminished air inflow, is seen in less than 40% of the patients; other symptoms include cyanoses, fever, and stridor. Sometimes, FBA can be completely asymptomatic. The evolution of FBA can lead to variable degrees of respiratory distress, atelectasis, chronic coughing, recurrent pneumonia, and even death<sup>8-9</sup>. Previous reports indicate that male gender is present in 60–66% of cases and children in the first and second year of life are predominantly affected<sup>10-11</sup>. In

this study the frequency of FBA in male was 65.77% and the ages 1 to 3 years were predominantly affected. The most common foreign body inhaled, Symptoms, most frequent age, and type of inhaled foreign body are different from region to region across the world.

Bronchoscopy should be used as a diagnostic method in cases where the possibility of FB aspiration cannot be ruled out through history, physical and radiological examination. Upon diagnosis, early bronchoscopy is necessary because the earlier the bronchoscopy the lesser the complications. Some children with respiratory complaints wrongly have long been receiving treatment for pneumonia or asthma only because these current diagnostic methods were ineffective. Their definite diagnosis and treatment were provided by bronchoscopy, which was resorted to after unresponsiveness to previous treatment. Dikensoy et al. reported that morbidity evaluated in cases where medical treatment without bronchoscopy was used curatively<sup>12</sup>.

Ventilation in the other bronchial system is more reliable even if it prolongs the duration of bronchoscopy. On the contrary, the attempts to remove a large piece at a time require that the bronchoscope be pulled out together with the piece and necessitate a further bronchoscopy to check for additional FBs in the distal segment. In FBA, bronchiectasis and pulmonary damage can occur as complications of the late period<sup>13</sup>. Bronchoscopy in children under 12 months requires skill because technical difficulties due to small instrumentation and bronchospasm commonly occur when compared to older children. Boorish contact of the bronchoscope or forceps with the bronchial wall, and the prolongation of bronchoscopy can be considered to be factors which contribute to spasm. It has been reported that a bronchoscope with appropriate diameter should be chosen and the procedure should be limited to 20 min in order to avoid possible sub-

glottic and laryngeal edema and bronchospasm after bronchoscopy<sup>14</sup>.

Previous reports indicate that male gender is present in 60—66% of cases and children in the first and second year of life are predominantly affected<sup>15-17</sup>. Our data regarding the incidence, gender, and age of patients with foreign body aspiration were consistent with the literature. Aspirated foreign bodies can be classified into two categories, organic and inorganic. Most of the aspirated foreign bodies are organic materials, such as nuts and seeds in children, and food and bones in adults. The most common type of inorganic aspirated substances in children are beads, coins, pins, small parts of toys, and small parts of school equipment such as pen caps<sup>18</sup>.

Almost 38% of our patients were diagnosed as having FBA 24 hrs after onset of symptoms. The delayed diagnosis rate in our locality was high compared to rates of 17% and 23% reported in other Asian studies<sup>19-20</sup>. One possible reason for a delayed diagnosis was that parents were not aware of the significance of sign and symptoms such as cough and choking. Because the children usually do not have severe symptoms immediately after the choking, parents may not seek medical help until there is a persistent cough and fever. Young children below the age of 3 years are particularly at risk of aspiration, as demonstrated in our study as well as others<sup>19-21</sup>.

**Conclusion:** Diagnosis of FBA in children is difficult, because its presentation can be mistaken as asthma or respiratory tract infection, which leads to delayed diagnosis and treatment, and can result in intrabronchial granuloma formation. Therefore, early rigid bronchoscopy is very effective procedure for inhaled foreign body removal with fewer complications. Although the rate of mortality resulting from foreign body aspiration is low, cooperation amongst pediatricians, radiologists, and ENT specialists is required for rapid diagnosis and treatment.

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