

Foreign Body in Tracheobronchial Tree

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Aims & objectives To study the different aspects of foreign body inhalation. **Study design** Interventional, Cross sectional. **Place & duration** The department of otorhinolaryngology unit II, Mayo Hospital, Lahore over a period of eighteen months i.e. from June, 1996 through December, 1997. **Subject & Methods** Fifty consecutive patients with a history of foreign body inhalation belonging to either sex and any age sex group were included. All patients underwent endoscopy under general anesthesia. **Results** There were 31 males and 19 females. Youngest patient was 6 months old, oldest was 41 years of age. Symptoms include cough (92%) dyspnoea (34%) and wheezing (28%). Signs were decreased air entry on auscultation (78%), rhonchi (48%) and use of accessory muscles of respiration (36%). X-rays showed radio-opaque foreign body in 14% cases. Endoscopic extraction was successful in 100% patients. Site of lodgment of foreign body was the right main bronchus (58%), left main bronchus (22%) and bilateral (4%). **Conclusions** Children are at risk of foreign body inhalation which is almost entirely preventable. Development of sudden respiratory symptoms should raise the suspicion of foreign body inhalation in children.

Key words Tracheobronchial foreign bodies, bronchoscopy

Foreign body lodgment in larynx, trachea or bronchi is called aspiration. It is usually accompanied by severe coughing, wheezing, stridor or dyspnoea. If the acute episode escapes notice, symptoms may disappear and patient may be all right for several weeks. This can lead to considerable pulmonary complications later on including consolidation, pneumonia, collapse and atelectasis of lung.

Early diagnosis and prompt treatment are of paramount importance in preventing complications. Delay in referral, lack of transport and more importantly lack of awareness among the public and medical personnel continue to cause significant complications. The following study highlights the various aspects of this problem and helps to formulate recommendations for reducing the incidence of foreign body inhalation.

Materials and methods:

The study was undertaken at the department of otorhinolaryngology unit II, Mayo Hospital, Lahore over a period of eighteen months. Patients admitted from June 1996 through December 1997 for treatment of foreign body aspiration were enrolled in the study. No particular age group was selected and fifty consecutive patients were included in the study.

All the patients underwent endoscopy under general anesthesia. In 47 patients rigid bronchoscopy was performed, whereas in three patients laryngoscopy was done. Intraoperative monitoring of pulse, ECG, pO₂ with pulse oximetry was performed for foreign bodies present for longer period. Re-examination for residual foreign bodies was also done. Routine investigations i.e. blood complete, urine complete, blood gases and blood sugar were done in all patients. Preoperative x-ray was also obtained in all patients. All the patients were managed in the ENT department.

Results:

Out of the total 50 patients there were 31 males and 19 females. Their ages ranged from 6 months to 41 years. Majority of the patient (72%) were less than 6 years old. The symptoms are summarized in table 1. They include cough (92%), dyspnea (34%), wheezing (28%), fever (24%), acute respiratory distress (18%), choking (16%) and dyspnea (4%).

Table 1 Symptoms caused by airway foreign bodies

Symptoms	n=	%age
Cough	46	92
History of inhalation	43	86
Dyspnoea	17	34
Wheezing	14	28
Fever	12	24
Acute respiratory distress	9	18
Audible whistling sound	5	10
Dysphonia	4	8

Table 2 Physical signs caused by airway foreign bodies

Signs	n=	%age
Decreased air entry	39	78
Rhonchi	24	48
Accessory muscles involvement	18	36
Cyanosis	9	18
Whistling sound	6	12
Stridor	4	12
Tracheal shift	3	6
Creptitations	3	6

A history of inhalation was available in 86% patients. Signs are shown in table 2. Commonest physical sign on auscultation was a limitation in air entry and breath sounds either in whole of the lung or a part of pulmonary field. Decreased air entry was observed in 78% patients and rhonchi in 48% of the patients. Accessory muscles of

respiration were active in 36% i.e. there were suprasternal and intracostal recessions and prolonged expiration.

Radio-opaque foreign body was demonstrated in 14% of patients on radiographic examination. The foreign bodies were extracted successfully in 100% of the patients. Rigid bronchoscopy was done in 96% patients while 4% needed direct laryngoscopy to remove subglottic foreign bodies. The various foreign bodies recovered from the tracheobronchial tree are shown in table 3. They included nuts (48%) and whistle (18%).

Table 3 Various types of foreign bodies recovered from the tracheobronchial tree

Foreign bodies	n=	%age
Betal nut	15	30
Whistle	9	18
Peanut	9	18
Almond, maize	8	16
Fruit seeds	3	6
Plastic pearls	2	4
Metallic pin	2	4
Thumb pin	1	2
Screw	1	2

Discussion:

It is a well known fact that younger children (1-3 yr. old) are at a greater risk of foreign body aspiration than older ones^{1,2,3}. Carelessness on the part of parents and caretakers contributes to this mishap. It is extremely rare to have foreign body inhalation before the age of six months as the child's ability to reach and grasp objects is limited and even if something is put into the mouth swallowing is limited.

Similarly it is rare to have adults coming up with foreign body inhalation although people more than 50 years old can suffer from this problem. It is probably due to loss of teeth or use of dentures causing altered sensations in the oral cavity. Other factors include cerebrovascular accidents, seizures, mental retardation, unconsciousness, alcohol or drug abuse².

Nature of inhaled foreign bodies is changing with time. In early 50's⁴ no plastic bodies were inhaled as shown in a large study of over 4000 cases. In the 70's 6-8% of objects inhaled were made of plastic^{5,6}. As plastics are non-irritating and radiolucent, they may remain as foreign bodies in the tracheobronchial tree for prolonged periods of time. The most frequent inhaled foreign bodies in our study were nuts. This has also been reported by other local as well as international studies^{7,8,9}. Nuts are usually fragmented by the frontal incisor teeth with formation of smaller pieces which are more readily aspirated⁹. Any patient with symptoms of coughing, wheezing and decreased air entry would be suspected of having an airway foreign body, even if chest radiographs appear normal. Similarly if history of aspiration is available and no clue is found on examination, bronchoscopy is still indicated. Prolonged stay of foreign

body in the tracheobronchial tree can lead to irreversible pulmonary changes^{10, 11, 12}.

Nature of foreign body partly determines the changes that follow its aspiration. Metallic foreign bodies cause mechanical pressure effect, chemical reaction, malignant transformation¹² bronchiectasis, atelectasis and lung abscess^{13,14}. Therapeutic rigid bronchoscopy is the mainstay of treatment.^{12,15} Inhaled foreign body can be removed successfully in 95-99% cases because of improved endoscopic equipment.

Conclusions:

Young male children are at greater risk of foreign body aspirations than their female counterparts. Early diagnosis and prompt treatment is important in preventing complications. Infants and children under the age of three should not be allowed to eat peanuts or betel nuts and their play area should be cleared of small objects that can be inhaled.

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