

Foreign body in tracheobronchial tree

Vikas Sinha · Viral Chhaya · Dilavar S. Brot · Keyur Mehta · Parin Patel · Swapna Pahl · Vishal Parmar · Pashanth C D · Niral Modi · Rahul Patel

Abstract Foreign body inhalation into the tracheobronchial tree can prove to be a life threatening unless timely intervened and appropriate steps are being taken towards its management [1]. A review of 32 cases was done at MP Shah Medical College Jamnagar over a period of 2 years. Children were most susceptible to aspiration of foreign bodies. All the cases were selected on the basis of detailed clinical history, clinical features, and radiological findings. The cases which had a strong index of suspicion without any positive clinical history were also subjected to rigid bronchoscopy under general anesthesia. Maximum number of cases was in the age group of 1 to 3 years (62.5%). The minimum age group ranging from 6 months to maximum 8 years. The time of presentation of the patients varied from within 24 hours to upto 6 months. Only four patients presented within 24 hours. The maximum presenting period was within 1 week. Organic foreign bodies were most common presentation (groundnut). Other foreign bodies were grains, seeds, ball pen cap, stones and slate pencil. Definite history of inhalation was available only in 19 cases with symptoms of choking, breathlessness, cough and recurrent upper respiratory tract infection. Right main bronchus was found to be most common site of impaction (52%) followed by left main bronchus (32%) and tracheal foreign body (16%).

Keywords Foreign body · Tracheobronchial tree · Rigid bronchoscopy

V. Sinha · V. Chhaya · D. S. Brot · K. Mehta · P. Pahl · S. Pahl · V. Parmar · Pashanth C D · N. Modi · R. Patel
Department of Otorhinolaryngology and Head and Neck Surgery,
MP Shah Medical College, Saurashtra University,
Jamnagar, Gujarat, India

V. Sinha (✉)
E-mail: dr_sinhavikas@yahoo.co.in

Introduction

Inhalation of foreign body is one of the leading causes of sudden death in pediatric age group and hence one needs to be very vigilant in approach to such patients [2]. Child may present with definite history of aspiration, choking followed by paroxysms of cough or may present with recurrent chest infections, or pneumonia not responding to routine antibiotic treatment. Radiology may not necessarily be the primary means of confirming the diagnosis [3]. Unfortunately the most of foreign bodies are radiolucent and chest X-rays are usually normal, but not necessarily after 24 hours of presentation. Rigid bronchoscopy is primary maneuver to remove foreign bodies which is a specialized procedure requiring a skilled surgeon and a trained anesthetist. The first ever successful bronchoscopic removal of foreign body was performed by Gustav Killian in 1897 and since then bronchoscopy has come a long way. Currently the mortality following foreign body inhalation is only 1% compared to pre bronchoscopy era [4]. This study was aimed at discussing the symptomatology, duration of presentation, types of foreign bodies their removal by rigid bronchoscopy and their consequent management.

Material and Methods

A study of 32 patients within a period of December 2006–2008 with definite and even without definite history of aspiration underwent rigid bronchoscopy under general anesthesia at ENT Department of MP Shah Jamnagar. The age group was ranging from 6 months to 8 years where most patients were of age group between 1 to 3 years. Diagnosis was based on detailed clinical history taking, thorough clinical examination, radiological evaluation and a strong index of suspicion. Symptoms included choking, severe bouts of coughing, breathlessness, and recurrent attacks of upper respiratory tract infection, decreased or unequal air entry and wheezing. Rigid bronchoscopy was performed in all cases under general anesthesia which proved diagnostic

in 6 cases and therapeutic in rest of the cases. Repeat check bronchoscopy was carried out in all the patients to ensure that no foreign body was left out or to exclude multiple foreign bodies. Tracheostomy was done in four cases where oxygen saturation fell below dangerous level. Pre and postoperative supplementation with antibiotics, steroids, oxygen was given wherever needed. Repeat chest X-rays were done after 24 hours. Closed monitoring of the patients during postoperative period was done. Patients were discharged on complete resolution of symptoms.

Results

Rigid bronchoscopy which was performed in 32 patients from age group of 6 months to 8 years, the most susceptible age is 1 to 3 years age group (62.5%). Only 5 cases (15.6%) were reported in age more than 4 years. Male children are most prone to aspiration (68.7%) as compared to females (31.2%). Only four patients (12.5%) presented within 24 hours of inhalation. Most of cases presented within 1 week of aspiration and 2 cases (6%) after a period of 1 month. 59.3% patients presented with a definite history of inhalation while rest were with history of chronic cough, pneumonia not responding to routine antibiotics. Other symptoms and signs were coughing, breathlessness, and wheezing, decreased air entry. Radiologically only 15.6% patients showed radio-opaque foreign body but in remaining of the cases there were no radiological opaque foreign body but X-ray chest suggested indirect changes like collapse lung or emphysema, etc. (Fig. 2). Exogenous foreign bodies were most commonly organic type (67%) of which groundnut was most common. Others were seeds, grains, coconut pieces and inorganic like slate pencil and ball pen cap in 4 cases (12.5%) (Fig. 1). Only mucous plugs were found in seven patients (21%). Tracheostomy was done in four patients and foreign body was removed through tracheostoma in one



Fig. 1 Photograph showing different types of foreign bodies

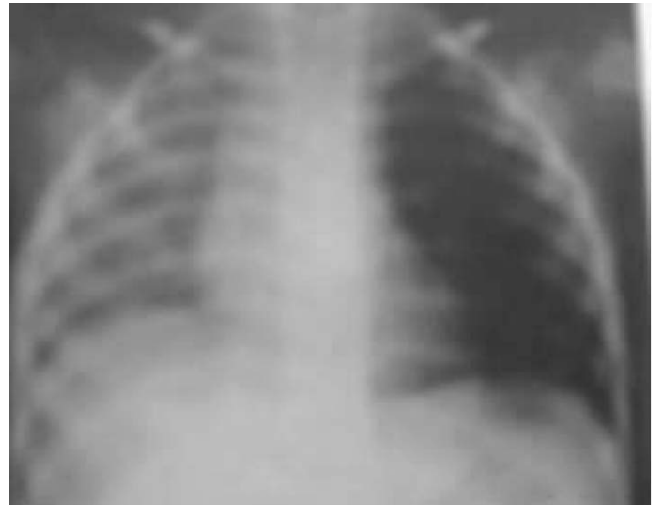


Fig. 2 X-ray chest showing collapse of right lung and shift of mediastinum due to radiolucent foreign body in right main bronchus

patient where foreign body was very large (coconut piece). Right main bronchus proved to be most common site of impaction (52%) followed by left main bronchus 32% and tracheal in 16% (Table 1).

Table 1 n = 25 (no. of cases with foreign body)

Site of foreign body	Percentage of cases
Right main bronchus	52%
Left main bronchus	32%
Trachea	16%

Discussion

Foreign body in tracheobronchial tree has a fairly common incidence with a high mortality if prompt measures are not being taken at the earliest. It is one of the most common cause of accidental death at home in age <5 years. One to 3 years of age group is most common due to various plausible reasons that at this age children are getting acclimatized to solid food, dis-coordinated swallowing and lack of last molar leads to improper chewing. At this age child has a habit of putting all objects in mouth to determine their texture while teething along with the habit of crying and shouting while eating. Males show predominance as compared to females in the ratio of 2.2:1, the reason could be that male children are mostly left unattended and unsupervised by parents as compared to females. Very few cases (12.5%) presented within 24 hours of aspiration and most of them (50%) within 1 week. The reason could be attributed to that the episode of cough, breathlessness subsides in 24 hours due to adaptation by the tracheobronchial tree and later on present with further severe consequences. Sometimes there is delay

in diagnosis as the suspect is not high and patients are being treated for recurrent upper respiratory tract infection [5]. Radiologically patients showed radio-opaque foreign body in only 5 cases. Many of the children who presented early had no significant radiographic changes and those presented late X-ray chest suggestive of lung collapse or emphysematous changes. The symptomatology ranged widely from sudden choking and stridor to features of pneumonia, recurrent upper respiratory tract infection. Right main bronchus was most common site of involvement (52%) as compared to left (32%). The reasons for predominance of right side could be that it is more in diameter than left; it is in direct alignment to the axis of trachea. Tracheostomy was carried out in four patients and in one patient foreign body of coconut piece was taken out through the tracheostomy opening. Repeat check bronchoscopy at the same seating to ensure no foreign body was missed especially in cases of multiple organic foreign bodies which were removed in fragments. Intense post-operative monitoring of patients and antibiotic therapy with steroids and nebulisation with oxygen and bronchodilators was done. Various types of foreign bodies, organic being most common (67%) and groundnut being most commonly found. Inorganic foreign bodies included ball pen cap, slate pencil.

Conclusion

Poor socioeconomic status and neglect of children makes

them prone to aspiration. Proper health education regarding care of children should be implemented as aspiration of foreign bodies is largely preventable. Age group of between 1 to 3 years was most commonly affected. Incidence of Male (68.7%) was found more over females (31.2%) in our study. Right main bronchus was found most common site of involvement as compared to left. Vegetative foreign bodies most commonly groundnut were reported in this study. Rigid bronchoscopy should be the final answer (diagnostic as well therapeutic) in all known as well as suspected cases of foreign body inhalation. A second look and checking all major bronchopulmonary segments soon after removal of foreign body is advised. Prompt referral, early diagnosis and vigilant management can prove to be life saving.

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