

Delayed Diagnosis of Foreign Bodies in Children's Tracheobronchial Trees: A Review Radio-Clinical Diagnosis and Treatment: 133 Cases- Tehran

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Abstract

Background: Foreign body aspiration (FBA) of tracheobronchial trees is accidental evidence in children. It occurs the most common in less than 3-year age old. Diagnosis of inhaled FB is a dilemma in the pediatric, particularly in delayed or missed conditions. The aim of the study assessed the clinical features and rigid bronchoscopic finding of aspirated FB in tracheobronchial trees of children. **Material and Methods:** Medical records of aspirated FB among children gathered based on the International cod system from 1987 to 2007 years. All patients who removed FB were entered into the study. **Results:** a total 133 cases enrolled in the study with mean age 3.51 ± 2.55 (51 boys and 82 girls). 85% of aspirated FB frequency detected under five years, with 78% peak incidence in four years of life. Delayed duration of FB aspiration to the onset of removing was 90.62 ± 68.13 SD days. One hundred and six (79.7%) was detected vegetable's FB on the tracheobronchial tract. History of aspirated FB did not find in 60% of cases. The most common clinical presentation was chronic cough and respiratory tract infections. Chest x-ray had positive signs in 79.7 % (106) of the subjects. **Conclusion:** chronic cough or recurrent lower respiratory tract infection should be particularly suggested missed FB in the airways of children under the age four years. Detection of organic FB was difficult within airways. In addition, chest x-ray and well-inform history can be benefited in the early diagnosis. Giving information about aerated FB to the parents may be decreased length of delayed time to the onset of diagnosis. Moreover, the parents should not be worried from evaluation of children's airways by bronchoscopy.

Keywords: Foreign body, Airway, Children

Introduction

Aspiration foreign bodies (FB) are accidental evidence in children. It is a communal cause of respiratory distress and the most common occurrence within primary three years. It estimated 300-600

death occurred in children under 15 years annually in developed countries [1],[2]. Early diagnosis and removing of FB inhalation prevents the victims from appearance chronic illness in future and delaying may also be cause death [3]. Detection of airway FB

is a diagnosis dilemma in children, and diagnosis often suggested based upon the history taking, clinical manifestations and standard chest x-ray [4]. Rigid bronchoscopy is the procedure of choice for definitive diagnosis of aspirated FB [5].

The aim of the study assessed the clinical features and rigid bronchoscopic finding of aspirated FB in tracheobronchial trees of children.

Material and methods

The study was descriptive, retrospective and cross-sectional. It finalized in the Logman Hakim general teaching hospital, pulmonary division of Shahid-Beheshti University of medical sciences (SBMU), Tehran-Iran.

Sample population consisted of all medical records of children who admitted with history of aspirated FB and removing via rigid bronchoscopy. The suspected children often admitted to our department while lapsed time from the onset of clinical symptoms. The medical records of target population selected based up on the ICD10 (ICD 10: T17 point 5 and T17 point 8) since between 1987 to 2007 years. Review data of the present study was personal experiences. Highlight data was collected including; age, sex,

clinical presentation, pre-operative radiography, type of foreign body, suspected length of onset symptoms. Rigid bronchoscopy was performed on the all patients under general anesthesia. Exclusion criteria included incomplete records and negative FB.

The data collected on the SPSS analyzing program version 16. Variable summarized in percent, and the mean compared with chi-square test. P-value was set at 0.05 thought of the study.

Results

Of the 133 cases, boys were 51 (38.4%) and girl 82 (61.7%). Total mean age in children was 3.51 ± 2.55 SD years, ranged in age from one – 14 years old, (Mode=2). Mean age \pm SD among boys and girls subgroups were 3.57 ± 2.4 and 3.48 ± 2.65 years, respectively. Range in girls was 13 and higher than boys 10 years.

Children less than five years consisted of 85% of FBA in total target population, of those 78% had peaked at an incidence of FBA in the four year of life. The number of incidents decreased after the age six old-ages. Noticeable of sex frequency distribution occurred by the girls in both age

Table -1 shows distribution of radiographical signs in right and left lung

Radiographic signs	Left Lung	Percent %	Right Lung	Percent%
Air trapping	31	23.3	16	12
Atelectasia	11	8.3	18	13.5
Infiltration	17	12.8	27	20.3
Bronchectasis	0		4	4.5
Normal	7	5.3	6	4.5

categories; less than five yearsold and also up to six years. Generally, an impression of FB aspiration happened with low frequency in boys. However, there were not significant differences between sex with age categories ($\chi > 0.5$).

Clear history of FBA was presented by the parents in retrospective evaluation, and it found in only 40% of cases. The most frequent symptom in clinical presentation included chronic cough, as seen in 75% of patients. Other presenting symptoms included chronic or recurrent lower respiratory tract infections. It occurred in 55% of cases.

Delayed diagnosis was defined if the removing occurred due to any causes over than 24h . Retrospective delayed duration of FBA until to remove was 90.62 ± 68.13 days. 77% of cases had delayed diagnosis of FBA in less than three months, and 7% of cases revealed history of remained FB over one year.

Entirely children with aspirated foreign body had chest radiography. Radiological finding demonstrated abnormalities chest X-ray (CXR) in the total of 79.7% (106) patients. Chest abnormalities were considerable in the younger age group of children (<five years). It

observed in 81 % of the young children. Radio-opaque FB was detected in only seven cases (5.3%). Right lung manifested higher frequency of abnormalities in the chest x-ray 71 (53.4%) than left lung (46.6%). Indirect radiological signs of FBA detected in the left lung with frequency of air trapping 23% and consolidation 13%. However, right lung showed CXR abnormalities with the noticeable frequency of consolidation 20%, atelectasis 14% and air trapping 12%. There were significant differences between x-ray finding with location of FB in the lung ($\chi = 0.038$), Table-1 reveals chest radiography signs. Types of inhaled FB tightly related to custom and diet of general population. Of 133 cases, one hundred and six (79.7%) identified vegetables' FB on the airway tracts, and 20 (18.7%) of subjects disclosed a only stigma of aspirated FB within airways such as vegetations that associated with subtle of resolved organic material. It occurred while FB recently resolved spontaneously or removed with the cough mechanism, and aerated materials often are organic types.

Location of aspirated FB was different in the airways tract. It lodged prominently in the right bronchus

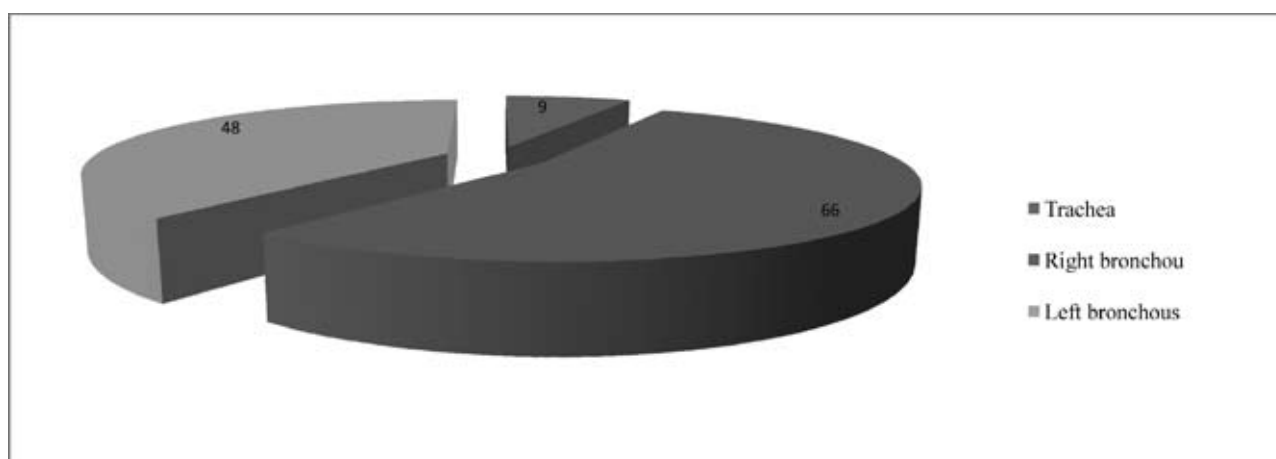


Figure-1 demonstrated distribution of foreign body's location in the tracheobronchial tree

71(53%). Figure-1 demonstrated distribution of foreign body's location in the tracheobronchial trees. Statistically significant differences presented between gender with location of FB in the lung ($\chi=0.02$). 73% of girls revealed left lung aspiration, whereas boys group demonstrated right lung FBA 48%.

Discussion

Distribution of age showed that 85% of total inhaled FB detected at preschool-aged in the below five years old age, and four years of life was critical age of occurrence FBA. The resulting was an improvement with the only one report. It presented children with less than four years was susceptible to inhalation FB⁶. However, the nearly all reports showed that FB aspiration occurred the majority commonly fewer than three years [7], [8], [9]. Suggestive mechanism may be related to following conditions, poor chewing ability from a lack of the posterior dentition (molars), tendency to experience of the world with using their mouths, unsuitable airway guard and coordination mechanisms while laughing or crying occurred, protective reflex, which is immature in small children [10].

Boy to girl's ratio was the predominate feature in the occasionally reports [11] [12]. Some investigations believed that boys had more activity and epiglottis function is not good in infants and toddlers [13]. However, in our survey, sex ratio was inverse respect to recent studies.

Positive history of penetrating syndromes was observed in apparently 40% of cases. It is agreed with a few studies [14], [15], [16]. It may be related to typing of patients who referred for evaluation of pulmonary symptoms. In our cases, history taking was obtained

in more delayed time of onset of FBA, and parents often forgot the symptoms or misinterpreted with respiratory infection features.

Organic material was the communal finding in our removed FB of tracheobronchial tree evaluation. It leads diagnosis of FB to be difficult and chest x-ray cannot be to visualize on the plain film. Consequently, rate of missed FB or delayed diagnosis are increased in clinical evaluation. In addition, susceptibility to respiratory tract infections has been raised by vegetable aspirated FB (55%).

Chest radiography is an accepted tool in evaluation of FBA. The more frequent radiologic signs were found air trapping, consolidation and atelectasis (table -1). Right lung abnormalities were significantly detected in our end point. However, right bronchus is the most FBA location. It is due to well-known anatomic and physiological characteristics of airways [17]. Our data improved with a recent report.

In conclusion; chronic cough or recurrent lower respiratory tract infection should be particularly suggested missed FB in the airways of children under the age four years. Detection of vegetable FB was difficult within airways. In addition, CXR, well-inform history can be able to help early diagnosis. Giving information about aerated FB to the parents may be decreased length of delayed time to the onset of diagnosis. Moreover, the parents should not be worried from evaluation of children's airways by bronchoscopy.

In conclusion: the most frequent of target population of children with FBA found below five-year old age, critical age detected in the four years. Girls were noticeable sex in both age groups of the study. The penetrating symptoms included chronic cough and respiratory infection features. Organic material

was noticeable finding in the airway. Right bronchus had peaked at the incident of FB. Air trapping, consolidation and atelectasis were the communal radiological signs.

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