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ORIGINAL ARTICLE

Frequency of Foreign Body Bronchus in Patients with Pneumothorax

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ABSTRACT

Aim: To determine the frequency of airways foreign body bronchus in children pneumothorax.
Study Design: Cross-sectional/descriptive study
Place and Duration of Study: Department of Thoracic Surgery, Sandeman Provincial Hospital Quetta from 1st January 2020 to 31st December 2020.
Methodology: Forty five patients of both genders and aged between 1 to 15 years were enrolled. Patients details demographics age, gender, residence and body mass index were recorded after taking informed consent. Chest computed tomography and X-ray to bronchus were performed to examine the nature and site of foreign body. Bronchoscopy was performed and outcomes were analyzed.
Results: There were 30 (66.67%) males and 15 (33.33%) females. Majority of patients 27 (60%) were ages <6 years. Mean body mass index was 12.08±6.33 kg/m^2. Mean time interval between foreign body aspiration and admitted to hospital was 4.08±2.08days. Foreign body bronchus was found in 14 (31.11%) patients. The right main bronchus was the most common site in 9 (64.28%) followed by left bronchus in 5(35.71%).Most common foreign body retrieved was seeds found in 9 (64.28%), piece of plastic in 3 (21.43%), peanut in 1 (7.14%) and nuts in 1 (7.14%) patients respectively. Bronchoscopy performed in 14 patients and none of patients had developed any complication.
Conclusion: Foreign body bronchus was found in 31.11% patients presented with pneumothorax and most common foreign body aspiration was seeds. Bronchoscopy was safe and effective with no major complication.
Keywords: Children, Foreign body aspiration, Bronchus, Pneumonia

INTRODUCTION

External body aspiration is frequently greater than the diagnosed velocity in the pathway. The majority of patients with aspiration from alien corpses are youngsters under the age of 4 years and most deaths are also caused by aspiration from foreign bodies at that age.[1] These kids typically put objects in their mouths and often keep away even from the strongest eye treatment. At this age too, foreign body aspiration to the airways is more probable as there is lack of adequate neuromuscular coordination of the throat.[2] Because of the chip, the right main bronchus is straighter than left bronchus, so that foreign bodies are more likely to come into the right lung, but this straightness means that it is possible for the foreign body to leave the right bronchus after the cough more than the left bronchus.[3] Usually, a consistent and prolonged cough without phlegm shows foreign body aspiration (although in some cases it may be due to damage of the airways associated with hemoptysis). If the aspiration of the foreign body is large or linked to laryngospasm, it can lead to respiratory distress and cyanosis.[4]

Rarely is the foreign body large enough to cause blockage and shock. Foreign bodies are in many cases non-blocking, causing straying and hearing breaths. Sometimes as the air entries into the lungs in the process of inhaling, the airway diameter is reduced during exhale due to the mucosal edema of the airway, and the air does not quit, causing obstructive emphysema. Atelectasis is occasionally produced by lack of airflow during inhalation and exhale and, ultimately, atelectasis in the area occluded.[5,6] For emphysema, CXR will show signals when hyperinflation shift to the right side and in the area of an atelectasis, CXR will indicate that the area affected is higher and the mediastinum will be shifted to the area affected. When a youngster speaks of chronic cough and sputum, it should consider the foreign body airway. The first diagnostic step is the history of the patient, whether or not there is a past record of the aspiration and chokes of an outer body that, if present, informs us of a possible aspiration of an outer body.[7]

The issue and challenge in the diagnosis and management of tracheobronchial foreign body patients with a pneumothorax. On basic radiograms, mild to moderate pneumothorax cannot even be seen. The pneumothorax' typical finding is the search for the peripheral lung margins between the lung edge and the thoracic wall. Massive and tension pneumothorax can show mediastinal displacement.[8] During bronchoscopy with a general anesthesia by Venturi injectors, attention needs to be taken as positive pressure might increase pneumothorax during ventilation, and there is a high risk of advancement towards tension pneumothorax.[9,10]

Rigid bronchoscopy can remove most tracheobronchial foreign bodies (TFBs). During the operation, however, it is full of hazards. Ear, nose and throat (ENT) doctors and anesthesiologists must conduct the procedure because this often leads to grave consequences such as bronchospasm, pneumomediastinum and cardiac arythmias. For numerous decades rigid bronchoscopy was employed for removing TFBs. We have carried out this study to assess the frequency of aspiration of foreign bodies in patients with pneumothorax to the bronchus.

MATERIALS AND METHODS

This cross-sectional/descriptive study was conducted at

Department of Thoracic Surgery, Sandeman Provincial Hospital Quetta from 1st January 2020 to 31st December 2020 and comprised of 45 patients of both genders and age between 1-15 years was enrolled. Patient's detailed information was recorded after taking written consent. Patients those did not give written consent and aged >15 years were excluded. Patients details demographics age, sex, residence and body mass index were recorded. Chest CT and X-ray to bronchus were performed to examine the nature and site of foreign body. Bronchoscopy was performed and outcomes were analyzed. All the data was analyzed by SPSS 24.

RESULTS

There were 30 (66.67%) were males while 15 (33.33%) were females. Majority of patients 27 (60%) were ages <6 years. Mean body mass index was 12.08±6.33 kg/m^2. Mean time interval between foreign body aspiration and admitted to hospital was 4.08±2.08 days (Table 1).

Foreign body bronchus was found in 14 (31.11%) patients. The right main bronchus was the most common site in 9 (64.28%) followed by left bronchus in 5 [35.71%] (Table 2). Most common foreign body retrieved was seeds found in 9 (64.28%), piece of plastic in 3 (21.43%), peanut in 1 (7.14%) and nuts in 1 (7.14%) patients respectively. Bronchoscopy performed in 14 patients and none of patients had developed any complication (Table 3).

Table 1: Demographics of patients (n=45)

Variable	No.	%
Mean BMI (kg/m^2)	12.08±6.33	
Mean duration (days)	4.08±2.08	
Gender		
Male	30	66.7
Female	15	33.6
Age (years)		
<6	27	60
>6	18	40
Mean age (years)	9.14±7.64	
Symptoms		
Cough	20	44.4
Chest Pain	10	22.2
Wheezing	8	17.8
Shortening of breath	7	15.5

Table 2: Site of foreign body bronchus (n=14)

Area	No.	%
Right main bronchus	9	64.28
Left bronchus	5	35.71

Table 3: Nature of different foreign body (n=14)

Category	No.	%
Seed	9	64.28
Piece of plastic	3	21.43
Peanut	1	7.14
Nuts	1	7.14

DISCUSSION

Inhalation from a foreign body is a common problem in youngsters and a diagnostic difficulty sometimes. Majority of the patients 27 (60%) were <6 years of age. Our findings were comparable to the previous study.[11] Mean age of the patients was 9.14±7.64 years with mean BMI 12.08±6.33 kg/m^2.[12] We found that kg/m^2 mean time interval between foreign body aspiration and admitted to hospital was 4.08±2.08days. Cough was the most common found in 44.4% children followed by chest pain 22.2%.[13]

In current study, foreign body bronchus was found in 14 (31.11%) patients. The right main bronchus was the most common site in 9 (64.28%) followed by left bronchus in 5(35.71%). Different previous studies presented same results in which right main bronchus was the most common site.[14,15] Bronchiectasis is the most common complication in late-term aspirations of the tracheobronchial alien body.[16] Bronchiectasis has been documented to have an impact from foreign bodies settling in the airways ranging between 1 per cent and 5.6 per cent in the literature.[17] Pseudo-bronchiectasis arises due to acute infection or inflammation and can regress following removal of the foreign body. Nonetheless, resection can heal permanent bronchiectasis. However, studies have shown that after removing the long term foreign body from the airways, severe bronchiectasis can improve. In later years, inorganic foreign materials are generally overlooked and produce persistent bronchiectasis.

Most common foreign body retrieved was seeds found in 9 (64.28%), piece of plastic in 3 (21.43%), peanut in 1 (7.14%) and nuts in 1 (7.14%) patients respectively. Bronchoscopy performed in 14 patients and none of patients had developed any complication in this study. Previous studies presented same results in that rigid foreign bodies were the most common causes of bronchus.[18,19] A foreign body is a nightmare for the physicians in both bronchi without proper history as symptoms advance very rapidly. In the same patient there may be more than one blockage mechanism. For successful treatment of these patients a high suspicion index and coordinated teamwork are needed by a paediatricians, anaesthetists and otolaryngologists. Mechanical ventilation to keep the pneumothorax or pneumomediastinum is useful, but the ventilation might also worsen the psychiatric condition.[20,21] While anaesthetic bronchoscopy with topical anaesthesia is a very safe and successful technique for a patient with a foreign tracheobronchial body, it is highly dangerous for patients who require bilateral removal of a foreign bronchial body. Different studies estimate the current death rate between 0.24 and 2 percent for a bilateral bronchial foreign body.[22]

The procedure of choice is rigid bronchoscopy with a bronchoscope linked to the ventilator. In comparison with unilateral patients with foreign bronchial bodies, these desiderate quickly. After removing the foreign body, the bronchoscope must be reinstated in order to evaluate the tracheal tree for the potential of a foreign body remains or a second foreign body.[23] Prompt detection and recovery of the foreign material is essential to avoid breathing difficulties and possibly death. We determined from this study that aspiration from a foreign body is a common problem in kids and can lead to morbidity and death. In 31.11% of patients suffering from pneumothorax and most common aspiration were seeds. Bronchoscopy without serious complications was safe and effective.

CONCLUSION

Foreign body aspiration is a common problem in children and can lead to morbidity and mortality. Foreign body

bronchus was found in 31.11% patients presented with pneumothorax and most common foreign body aspiration was seeds. Bronchoscopy was safe and effective with no major complication.

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