Brief Communication

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The Efficacy of Rigid Bronchoscopy for Foreign Body Aspiration

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ABSTRACT

The aim of the current study was to determine the pattern, presentation and management of foreign body aspiration in our population. This prospective study comprised 55 patients with foreign body aspiration admitted to our department from January 2009 to December 2011. All patients underwent rigid bronchoscopy under local or general anesthesia. The patients' demographic information along with clinical characteristics and their outcome were recorded and reported. The mean age of the children was 13.3±3.6 years. There were 32 (58.2%) females and 23 (41.8%) males. The frequent symptom was an attack of chocking followed by cough. The predominant sign was wheezing. Rigid bronchoscopy was successful in removing foreign body from 52(94.5%) patients. Three (5.5%) patients who had undergone thoracotomy with bronchotomy needed exploration, after failure of bronchoscopy to remove the foreign body. There was no mortality in our series. Average hospital stay was 12 hours. It could be concluded that rigid bronchoscopy is modality of choice in management of foreign body aspiration especially in pediatric population.

Keywords: Foreign body aspiration; Rigid bronchoscopy; Pediatrics; Computed tomography.

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Foreign body aspiration is always accidental and sudden with very high mortality. It is a life threatening condition and needs urgent intervention. Rigid bronchoscopy, using rigid ventilating bronchoscope, is a life saving procedure for removal of foreign body in emergency situation. The patient's management by ventilating bronchoscope reduces the mortality rate from 24% to 2% and even less, provided that the patient comes in time to the department with available facilities [1]. Foreign body aspiration claims thousands of lives each year, because they rarely reach in time for intervention [2]. It is the 4thleading accidental cause of death under 3 years of age and 3rd cause of death under 1 year of age [3,4]. It usually affects children under 3 years of age [5,6]. Sometime there may be no history of foreign body aspiration and a high degree of suspicion is needed to diagnose foreign body inhalation. X- Rays may be in conclusive on occasion, and bronchoscopy is the ultimate procedure to exclude foreign body [7,8]. Our institute is the only tertiary care centre of the valley where rigid bronchoscopy is carried out for foreign body aspiration. The aim of this study was to analyze the pattern, presentation and management of foreign body aspiration in our region.

This prospective study comprised 55 patients with foreign body aspiration admitted to the emergency department of Cardiovascular and Thoracic Surgery, Sher-i-Kashmir Institute of Medical Sciences, Srinagar, and Kashmir from January 2007 to December 2011. The patients were examined in detail, and thorough history was taken from them and in the case of minors from their attendants. Chest X-ray followed by non contrast computed tomography was done in every patient. After locating the foreign body by these measures, emergency rigid bronchoscopy was carried under local or general anesthesia. Foreign body was removed from 52 out of 55 patients, but failed in 3 patients who had undergone thoracotomy for removal of foreign body. The patients were hospitalized for 12 to 24 hours after the intervention

Mean age of the patients was 13.3±3.6 years. Youngest patient was 8 months old and oldest aged 53 years. There were 32 (58.2%) females and 23 (41.8%) males. The frequent symptom was an

Table 1. Types of foreign bodies being aspirated in our series of 55 children.

Foreign body	No. of Patients	Percentage
Peas and beans	15 (27.3%)	27.27
Fish Bone	7 (12.7%)	12.7
Meat piece	7 (12.7%)	12.7
Paper Pin	6 (10.9%)	10.9
Plastic Whistle	6 (10.9%)	7.27
Pen Cap	4 (7.3%)	7.27
Stone particle	4 (7.3%)	7.27
Shirt Button	3 (5.4%)	5.45
Dentures	2 (3.6%)	3.63
Apricot core	1 (1.8%)	1.81

attack of chocking followed by cough. The predominant sign was wheezing. The collapse of the affected lobe was a most frequent finding shown by chest x-ray, which was consistent with the result of computed tomography (CT) scan findings. However not all the patients had radio opaque foreign body, but showed telling signs of foreign body ingestion on radiology. There was no mortality in our series. The patients had ingested different types of foreign bodies (Table 1). Additionally, the patients were directly subjected to rigid bronchoscopy. Most of the patients underwent bronchoscopy within 6 -12 hours of aspiration. Three patients who had undergone thoracotomy with bronchotomy needed exploration, after failure of bronchoscopy to remove the foreign body.

Accidental foreign body inhalation is a relatively common occurrence in the pediatric population [9,10] and may lead to asphyxiation and death especially among those younger than 4 years of age [1]. Physical examination findings include fever, stridor, retractions, and decreased breath sounds. Obstructive emphysema of the same or contra lateral side is found in majority of the cases. Radiographic imaging can be helpful if the object aspirated is radiopaque or if there are signs of hyper expansion on expiration. However negative-imaging studies, do not exclude the presence of a foreign body in the airway. The longer a foreign body resides in the airway, the more likely it is to migrate distally and give an inflammatory reaction leading to granulation and impacting. When this occurs, symptoms of chronic cough and wheezing may mimic asthma like condition [1].

When the chest radiograph is normal and the clinical diagnosis suggests aspirated foreign body, helical CT and virtual bronchoscopy can be considered in order to avoid needless rigid bronchoscopy [2]. Rigid bronchoscopy under general anesthesia is preferred method for removal of aspirated foreign body in pediatric patients. General anesthesia can be avoided in adults, but presence of anesthesiologist with proper workstation to combat emergency situation is essential. Surgery should be performed only as a last resort and is rarely necessary. The foreign bodies may get slipped off at the level of the glottis in some cases leading to repeated attempts and catastrophic squeal such as respiratory difficult syndrome, massive bleeding and choking. An accurate pre-operative diagnosis is most important in operative management of irregularly shaped foreign bodies. If the foreign body is too big to pass through the glottis, removing by tracheostomy should be considered. Urgent tracheostomy, intercostal drainage, thoracotomy and bronchotomy may be required to rescue from catastrophic complications such as airway obstruction, pneumothorax and bleeding [3]. We performed all the procedures with rigid ventilating bronchoscope. Some of the authors have managed removal of foreign bodies from trachea-bronchial tree with flexible bronchoscope, but if this fails, they suggested that rigid bronchoscope should be at hand for removal of foreign body. In our study males are more affected than females (Male: Female 1.5:1). It is also reported in others studies that male children are more susceptible than females which is not different from previously reported cases 1.4:1.8 [8,9]. The reason for gender propensity it is not known, but it may be due to the over active nature of the male children. Our finding is consistent with other studies in that vegetative foreign body provokes more body response in the form of increased secretions and edema of the airways compared to the non-vegetative foreign bodies [5,6,11]. Dexamethasone as a single dose followed by divided doses in the next 24 hours, decreases edema in the trachea-bronchial tree [12]. Most of the foreign bodies were in the right main bronchus, and is related to the fact that it is more vertical and wider than the left bronchus [7,10]. Our success rate is (97.6%) and mortality rate is (2.38%) which coincides with other international studies [6]. Complications of bronchoscopy for foreign body aspiration may occur even in experience hands [12]. One of our patients with aspiration of corn grain, detected on bronchoscopy exhibited acute asthmatic attack. The possibility of foreign body aspiration, particularly with unilateral wheezing was considered in children refractory to treatment for new onset asthma, bronchitis or pneumonia [1]. Early diagnosis and intervention is essential in children with foreign bodies in the airway to prevent mortality and morbidity. Small materials, especially food particles should be kept far away from young toddlers, and parents should be educated about the risk involved in foreign body aspiration. Whistle toys which are freely available in the market should be withdrawn from the market and reinforced by passing appropriate legislation. Bronchoscope should be made available at least at every district hospital to save precious lives by making an early intervention possible, as most of these patients die on the way to the tertiary care hospitals.

Conflict of Interest: None declared.

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