

Frequency and Types of Foreign Body Airway in Children

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ABSTRACT

Aim: To determine the frequency and types of airways foreign body in children undergoing bronchoscopy.

Study Design: Cross-sectional/descriptive study

Place and Duration of Study: Department of ENT, Sheikh Zayed University Medical College Khost Province Afghanistan from 1st January 2018 to 31st March 2021.

Methodology: Ninety patients of both genders and aged between 6 months to 15 years were enrolled. Patient's details demographics like age, sex and weight were recorded after taking informed consent from the patient's guardian. Patients with foreign body aspiration presented within weeks of aspiration. Patients were subjected to rigid bronchoscopy under general anaesthesia after doing chest X-ray. Clinical and radiological findings were observed among all cases.

Results: Mean age of the patients was 4.52±6.35 years. Sixty five (72.22%) were males and 25 (27.8%) were females. Mean time interval between foreign body aspiration and admission to hospital was 1.04±0.9 weeks. The right main bronchus was the most common site 50 (55.55%) followed by left bronchus 35 (38.9%), and trachea found in 5 (5.55%). Most common foreign body retrieved was pine nut (Chilgoza) found in 77 (85.6%) followed by peanut in 5 (5.56%), seeds 4 (4.4%), whistle 2 (2.2%) and stone pieces in 2 (2.2%) cases.

Conclusion: Foreign body aspiration in male children is more common, mainly under the age of four years. It has been found during the bronchoscopy that the foreign body was commonly lodged in the right main bronchus. The most common foreign body was pine nut.

Keywords: Children, Pine nut (Chilgoza), Tracheobronchial, Rigid bronchoscopy, Children, Foreign body aspiration

INTRODUCTION

The lack of molar teeth to molten correctly and the tendency to split food and to play with or talk with food in the mouth causes foreign body aspiration mainly in youngsters; however it can also affect adults.^{1,2} A rigid bronchoscopy is the gold standard for the therapy of aspiration, while flexible bronchoscopic removal in certain cases is beneficial³. In cases of failure to perform rigid bronchoscopy, however, tracheostomy, bronchotomy and thoracotomy are offered as operation options for recovery of the foreign body.⁴⁻⁸ The postoperative mortality rate varies between 0 and 2.6 percent.⁵⁻⁹

The presentation and the consequences of foreign body aspiration depends on the degree of airway obstruction, the location of the object, as well as on the age of the child, the type of object, and the time elapsed since the event. Therefore, the classic triad of cough, wheeze, and diminished breath sounds is not always present¹⁰⁻¹³. While the majority of foreign body aspirations are resolved spontaneously after a coughing episode or through assisted manoeuvres that assist expulsion, a small proportion of cases do arrive at the hospital either because the child has clinical symptoms and/or because of varying degrees of suspicion of the event happening among relatives or careers. Radiological chest x-ray evaluations should be conducted in patients with suspected foreign body aspiration¹⁴⁻¹⁵. However, it is important to note that the findings may appear normal within the first 24 h and a number of foreign bodies are radiolucent. Bronchoscopy is a useful diagnostic and therapeutic tool in patients with suspected foreign body aspiration¹⁶.

Detailed history and physical exams, aberrant radiology results and final deletion by rigid bronchoscopy of the aspired foreign body are the basis for the foreign body

aspiration diagnosis¹³. While most foreign body aspirations are spontaneously resolved by a coughing episode or assisted maneuvers to assist expulsion, small numbers of cases either arrive in the hospital because the child suffers from clinical symptoms or because there is a varying level of suspicion among relatives or caregivers of the situation. In patients with suspected aspiration of foreign body, radiological chest X-ray assessments should be undertaken. It should be noted, however, that for the first 24 hours the results may seem normal and that some foreign bodies are radiolucent. In patients with suspected foreign body aspiration, bronchoscopy is a valuable diagnostic and therapeutic technique.¹⁷

MATERIALS AND METHODS

This descriptive/cross-sectional study was conducted at Department of ENT, Sheikh Zayed University Medical College Khost Province Afghanistan from 1st January 2018 to 31st March 2021 and consists of 90 children. Patient's details demographics i.e. age and genders were recorded after taking informed consent from parents/guardians. Patients aged >15 years and had severe other medical illness were excluded. Patients aged 6 months to 15 years were included. Patients were subjected for rigid bronchoscopy (general anaesthesia after doing chest X-ray). Clinical and radiological findings were observed among all cases. Data were analyzed by SPSS 24.

RESULTS

Mean age of the patients was 4.52±6.35 years. Out of 90 patients 65 (72.2%) were males and 25 (27.8%) were females. Seventy six (84.4%) were <4 years of age and 72 (80%) children were less than 13kg in weight. Mean time interval between FBA and admitted to hospital was

1.04±0.9 weeks (Table 1).

We found that right main bronchus was the most common foreign body 50 (55.5%) followed by left bronchus 35(38.9%) and trachea found in 5 (5.6%) [Table 2].

Most common foreign body retrieved was pine nut (Chilgoza) found in 77 (85.6%) followed by peanut in 5 (5.56%), seeds 4 (4.4%), whistle 2 (2.2%), and stone pieces in 2 (2.2%) [Table 3].

Table 1: Demographics of patients (n=90)

Variable	No.	%
Mean age (years)	4.52±6.35	
Mean time (weeks)	1.04±0.9	
Gender		
Male	65	72.2
Female	25	27.8
Age (years)		
< 4	76	84.4
> 4	14	15.6
Weight (kg)		
< 13	72	80.0
> 13	18	20.0

Table 2: Area after bronchoscopy (n=90)

Area	No.	%
Right main bronchus	50	55.5
Left bronchus	35	38.9
Trachea	5	5.6

Table 3: Categories of different foreign body's found after bronchoscopy (n=90)

Category	No.	%
Pine nut (Chilgoza)	77	85.6
Peanut	5	5.5
Seeds	4	4.4
Whistle	2	2.2
Stone pieces	2	2.2

DISCUSSION

Inhalation of a foreign body is a common problem in youngsters and a diagnostic difficulty sometimes.¹⁸ In the present study, 72.2% of children undergoing bronchoscopy were males. In previous studies, similar results were also found which show male children were more common whom were diagnosed with foreign bodies aspiration.^{11,14} Mean age of the patients was 4.52±6.35 years. These results were similar to some previous studies.^{19,20} Seventy six (84.4%) were <4 years of age and 72 (80%) children were less than 13kg in weight. These were comparable to the study conducted by Korlacki et al²¹ and Asif et al²² Mean time interval between foreign body aspiration and admitted to hospital was 1.04±0.9 weeks. Our findings were comparable to the previous some studies.^{14,20}

We found that right main bronchus 50 (55.55%) was the most common, followed by left bronchus 35(38.9%), and trachea in 5 (5.55%) cases. Halwai et al²³, Karazanis et al²⁴ and Ahmed & Shuiabu²⁵ found that most items on the left bronchus were inconsistent. Our analysis confirms that 5.55% of the children under research found foreign body in trachea. The foreign body position depends primarily on the patient's age of aspiration and their physical activity.²⁶

In this study, the most common foreign body retrieved was Pine nut (Chilgoza) found in 77 (85.6%) followed by

peanut in 5 (5.56%), seeds 4 (4.4%), whistle 2 (2.2%), and stone pieces in 2 (2.2%). These were comparable to the previous study.²⁰ In other research, peanut was the most frequently pursued foreign body^{21,25} while scarf pins were the most common foreign body collected from middle-eastern females.²⁷ Safari and Manesh⁸ identified the most prevalent foreign body seed. In children, the diagnosis and early bronchoscopy extraction of a foreign body is both diagnostic and therapeutic and helps reduce difficulties over time.

In the other bronchial system, ventilation can be more reliable even if it extends the bronchoscopy duration. On the contrary, attempts to remove one huge piece at a time require the bronchoscope to be drawn out alongside the piece and require a further bronchoscopy in order to check the distal segment for further foreign bodies. In foreign body aspiration, the late-stage consequences can be bronchiectasis and pulmonary injury. In infants under 12 months, bronchoscopy demands skill since technical issues are typical as compared to older children due to small instrumentation and bronchospasm. Factors contributing to the spasm might be included boorish bronchoscope or forceps contact and prolongation of bronchoscopy with the bronchial wall. A bronchoscope with the suitable diameter is stated to be chosen, and the operation to prevent sub-glottic and lyric edema or bronchospasms following bronchoscopy should be confined to 20 minutes.²⁸⁻³⁰

Ideal anaesthesia requires hypnosis, analgesia and muscle relaxation. Balanced anaesthesia is usually the technique opted for rigid bronchoscopy. Anaesthesia may be induced with propofol, etomidate or ketamine with fentanyl or remifentanil in adults and inhalational agents in children. Fentanyl boluses and short acting beta blocker can be used to avoid pressor response. Vocal cords should be sprayed with 4% lignocaine to prevent post-operative laryngospasm. Anaesthesia is maintained with remifentanil and intravenous infusion of propofol or inhalation of sevoflurane. Nitrous oxide is contraindicated in patients with air trapping because of the risk of over inflation. Use of short acting muscle relaxants is recommended. Target controlled infusion as part of TIVA may also be used. Use of TIVA may result in awareness in many patients.³¹

CONCLUSION

Foreign body aspiration in male children is more common, mainly under the age of four. It has been found during the bronchoscopy that the foreign body is largely in the right main bronchus. The most frequent foreign body has been determined to be pine nut (Chilgoza).

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