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Bronchoscopic Foreign Body Removal in Pediatric Population Less Than 10-Year-Old from 2018-'21 in A Rural Teritiary Care Hospital

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ABSTRACT:The authors reviewed their experience with therapeutic rigid bronchoscopy for removal of tracheobronchial foreign bodies in the paediatric population less than 10-year-old age group. Bronchoscopy records and collection of foreign bodies in the endoscopic department were retrospectively examined. For this study, a total of 82 bronchoscopies performed to remove aspirated tracheobronchial foreign bodies, between 2018-'21 were taken into consideration. The procedure was performed based on confirmation from various radiological investigations, clinical examination or by medical history with adequate suspicion suggestive of foreign body aspiration.

KEYWORDS: Bronchoscopy, Foreign body. Dyspnoea,

I. INTRODUCTION

Aspiration of foreign bodies is a very serious and vital problem, sometimes leading to sudden death and may cause chronic and irreversible lung injury. The Council of America cited the inhalation of foreign bodies, as a leading cause of accidental death at home, in children younger than six years of age.1,2 Annual death rates from foreign body aspiration in the USA range from 500 to 2000. In India and especially in our region (Maharashtra, Loni) the prevalence of foreign bodies aspiration is high. The type of foreign body that is most frequently seen in this geographic area and the incidence of foreign body in relation to the habits of people have been studied.

II. BACKGROUND

Foreign body aspiration is a potentially life-threatening medical scenario. Immediate diagnosis and intervention can save the many adverse outcomes. The aim of our study was to determine the pattern, presentation and management of foreign body aspiration in our population. Most foreign bodies found in the airway or alimentary tract occur in boys under the age of 3 years. Common airway foreign bodies include peanuts, seeds, and vegetable matter. Thoracic percussion was first discovered by Auenbrugger in 1753, and Skoda further refined this diagnostic tool in 1839. Laennee then pioneered chest auscultation in 1816, although it has been said that Hippocrates utilized it as well. Examination of the airway continued to progress with the first attempted mirror laryngoscopy in 1828. Manuel García further developed this field by inventing the laryngeal mirror in 1854. That same year at the University of Louisville, Sam Gross published the first study of its kind profiling and describing hundreds of cases of airway foreign bodies. One of the first attempts at direct laryngoscopy was performed by Kirstein in 1895. That same year, Killian was able to pass a 9-mm endoscope into the bronchus of a man, and he was able to remove a foreign body using the same manoeuvre a few years later. In 1898, Coolidge successfully performed a bronchoscopy using a ureteroscope. In 1905, Jackson reported the removal of foreign bodies in the bronchi. Jackson ultimately improved the instrumentation and brought laryngoscopy and bronchoscopy to its present state.

III. CLINICAL PRESENTATION

It is more common for a FB to get impacted in the right bronchial tree due to the straighter alignment of the right mainstem with trachea compared to left. Due to relatively small diameter of the tracheobronchial tree, FB gets lodged in the proximal airways in children resulting in stridor and acute respiratory distress. The most common presenting symptom of FB aspiration is cough, which is a primitive airway protective reflex, and is observed in 58–96% of the cases (8-11). Other symptoms include wheezing, dyspnoea. symptoms of non-resolving cough or recurrent

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bronchitis or pneumonia warrant careful clinical evaluation and FB aspiration must be considered even in patients without risk factors.

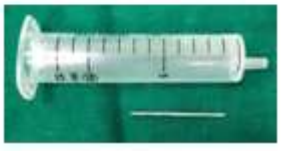
SYMPTOMS AND FINDINGS IN FOREIGN BODIES

Symptoms	N	%
Cough	52	63.4
Wheezing	70	85.36
Decreased breath sounds	68	82.92
Dyspnoea	42	51.21
Vomiting	58	70.73

IV. MATERIALS AND METHODS

This is a retrospective study carried out in the Department of ENT and Head and Neck Surgery, Pravara Institute of Medical Sciences, Loni comprising of 82 patients with foreign body aspiration admitted to our department from February 2012 to December 2020.All patients with high suspicion of foreign body aspiration were included in our study. All patients underwent rigid bronchoscopy under general anaesthesia. Primary mode of extraction was rigid bronchoscopy. A well written informed consent, explaining the procedure and about the referral for a rigid bronchoscopy in operation theatre of the same hospital by the otolaryngologist, was obtained from the parents. Clearance was obtained from hospital ethics committee. A pre-bronchoscopic assessment was done in all cases. Chest X-ray and CT bronchogram was done routinely where it was possible, except in a few cases who presented with acute respiratory emergencies with a history suggestive of foreign body aspiration. They underwent bronchoscopy as an emergency procedure.

Rigid bronchoscope was used in this study with its ancillaries. Trained anaesthetists, technicians, nurses, and intensivists comprised our team. All procedures were carried by a single trained bronchoscopist. In all cases, a check bronchoscopy was done after extraction of the FB. Clinical presentations, radiological findings, location and types of tracheobronchial FB.



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AGE DISTRIBUTION

AGE	N	%
0-1	9	10.97
1-3	46	56
4-7	24	29.26
8-10	3	3.65
TOTAL	82	100

Management of Patients with Aspirated Foreign Body:

Management	Number of Cases
Bronchoscopy Elective Emergency	 70 12
Tracheostomy with bronchoscopy	7
Thoracotomy	1

V. RESULTS

Among 82 bronchoscopies, Foreign bodies were found in the right bronchial tree on 28 occasions, in the left bronchial tree 18, trachea and carina 27. The origins of the foreign bodies included: peanuts (n=40), plastic and plastic products (n=8), stone (n=5), chickpea (n=2), ground nut (n=3), corn (n=2), mucopurulent secretions (n=7), li-ion button cell (n=2), metallic sewing needle (n=1), wooden piece (n=1), tamarind seed (n=3), electric diode (n=1), and on two occasions there was no foreign body detected. The foreign bodies were successfully removed on all occasions except in one patient, where thoracotomy was performed with foreign body removal with paediatric surgeon assistance. On 7 occasions emergency tracheostomy was performed for successful foreign body removal. The most useful instruments for removal were alligator forceps (with toothed and serrated ends)

LOCALIZATION OF FOREIGN BODIES

Site	N	%
Carina	27	32.92
Right bronchus	32	39.02
Main	25	30.48
Secondary	7	8.53
Left bronchus	23	28.04
Main	17	20.73
Secondary	6	7.31

TYPE OF FOREIGN BODIES

Type of foreign body	N	%
Organic		
Ground nut	43	52.3
Mucous plug	7	8.53
Seeds (tamarind, corn, chickpea)	14	17.07
Inorganic		
Plastic	8	9.75
Stone	5	6.09
Needle	1	1.21
Batteries	3	3.65
Wooden piece	1	1.21

VI. DISCUSSION

The spectrum of airway foreign bodies varies from country to country, depending on the diet and customs of population. Limper and Prakash, in their study of 60 consecutive paediatric patients with tracheobronchial foreign body aspiration, found that the most common type of foreign body was vegetable matter. Mu and

colleagues reported that in China, nearly 95% of aspirated foreign bodies in children were organic. In contrast, more industrialized countries have a greater incidence of plastic foreign body aspiration. This is due to the frequent use of small plastic parts in the toy industry. The nature of aspirated foreign bodies reported in various studies differs according to lifestyle and eating habits. Nuts in general and peanuts in particular remain the most commonly found aspirated foreign bodies in children. The high prevalence is due to possible lack of parental attention and dietary habits. Although foreign body aspiration can be seen in all ages, it is most common under the age of three. Even in our series shows foreign body aspiration was observed most commonly between the ages of 1 to 3 (56%) years and most commonly localized to right main bronchus (39%) and most common foreign body detected is peanut (52.3%). We attributed this result to the widespread lack of awareness of the parents in the rural community about what to feed to the children who are less than 3-year-old. we detected plastic object aspiration in 9.75% of the cases accounting to inorganic foreign bodies.

VII. CONCLUSION

Tracheo-bronchial foreign body aspiration is potentially fatal and serious condition in patients, especially when occurring in children. A surgeon must have a strong suspicion in a child presenting with a history of choking episode or with persistent or recurrent pulmonary infections. Bronchoscopic evaluation in such patients may prove valuable, even in the absence of clinical or radiological evidence. Emergency bronchoscopy is warranted in case the child is in acute respiratory distress or an elective procedure with adequate preparation should be considered.

VIII. PREVENTION OF FOREIGN BODY ASPIRATION

Tackling carelessness on the part of caretaker by:

1. Increasing awareness among the caretaker especially among the rural population by conducting awareness campaigning.
2. Adults should set an example of never placing pins or objects in mouth/nose/ear.
3. Small objects should always be kept out of the reach of the children.
4. Eating during conversation, playing and running.
5. Avoid playing with toys with loosely attached or detachable parts.
6. Hard, smooth, vegetative type foods such as peanuts to children less than three years of age.

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