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STUDY OF AIRWAY FOREIGN BODIES IN A TERTIARY HOSPITAL

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ABSTRACT

Introduction: Accidental inhalation of foreign bodies in respiratory tract is potentially life threatening emergency. A team work of otolaryngologist, pediatrician and anaesthesiologist is required to manage the condition.

Material and Methods: We have conducted a study of 25 cases of airway foreign bodies admitted in Mediciti Institute of Medical Sciences between August 2012 to August 2017 for a period of 5 years.

KEYWORDS

Airway Foreign bodies, Obstructive Emphysema, Bronchoscopy, Optical forceps

Introduction:

Management of airway foreign body involves multidisciplinary field between otolaryngology, pediatrics and anesthesia. It is potentially life threatening condition which is not uncommonly seen in pediatric age group. Accidental inhalation of foreign body into the airway can lead to various clinical manifestations in children below 3 years. It is one of the leading cause of deaths in infants and fourth in preschool children. The common site of foreign body in the airway is right bronchus as it is shorter, wider and more vertical [1]. Haugen first reported a series of deaths in restaurants in 1963[2]. Fatal airway obstruction occurs in adults who accidentally inhale large piece of meat while chatting or laughing 'Caf'e coronary'. Gustav Killian managed such emergencies in 1897 by bronchoscopic extraction[3].

Classification of various airway foreign bodies is according to the age, type of object and site of impaction[4].The degree of foreign body obstruction can be partial or complete. The sudden complete obstruction can result in fatalities. Endogenous foreign bodies may be mucus plugs or bronchial casts[5]. Exogenous foreign bodies may be organic like pea nuts or inorganic like plastic or metal items[6]. The incidence of Airway Foreign Bodies is 0.66 per one lakh[7]. It is one of the leading cause of accidental deaths in infants and the fourth among preschool children[8]. 80% of foreign bodies are seen below the age of 3 years with peak age incidence between 1-2 years[9]. Male predominance is common feature of this condition[10]. The cause for the predominance is impulsive and adventurous behavior[11].

Material and Methods:

We have conducted a study of 25 cases of airway foreign bodies admitted in Mediciti Institute of Medical Sciences between August 2012 to August 2017, for a period of 5 years. Type of study is cross sectional. All patients underwent basic investigations like X-ray chest, sometimes HRCT, and virtual bronchoscopy. Bronchoscopic removal was done under general anaesthesia with jet ventilation and optical forceps.

Figure 1: Procedure of Bronchoscopy

Results:

In our study of 25 cases of airway foreign bodies peak age incidence is 0-3 years (60%). This corresponds to the study done by Ciftci AO et al. Male to female ratio in our study is 2.6:1.

Table 1 – Age incidence of airway foreign bodies

Age (in years)	Incidence	Percentage
0-3	15	60%
3-5	2	8%
5-10	3	12%
10-15	2	8%
>15	3	12%

History of aspiration is seen in 64% of cases with history of paroxysmal cough, wheezing and dyspnoea. Suspicious and inconclusive history is seen in 20% of cases and negative history is found in 16% of cases.

Symptoms - In our study, common presentation in airway foreign bodies is cough (56%) followed by wheeze (52%). Fever is seen in 20% of patients which is due to pneumonitis, particularly seen in organic foreign bodies like pea nuts and seeds.

Table no 2 – symptoms suggestive of airway foreign body

Symptoms	Percentage
Cough	56% (14)
Wheeze	52% (13)
Respiratory Distress	16% (4)
Fever	20% (5)
Choking	12% (3)

Signs – Reduced air entry is seen in 21 of cases (84%) and wheeze is seen in 13 cases (52%). Crepitations are seen in 5 cases (20%), stridor in 3 cases (12%) and chest retraction in 1 case (4%). Radiographic findings – These depend on the size, shape and nature of the foreign body. Most of the foreign bodies are lodged in left bronchus (14 cases, 56%), followed by right (11 cases, 44%), particularly in children below 3 years. In our study, obstructive emphysema is the most common radiological finding seen in 11 cases (44%), followed by lower lobe collapse 9 cases (36%).

Table 3 – Radiological findings

Radiograph Finding	Percentage
Obstructive emphysema	44% (11)
Lower lobe collapse	36% (9)
Atelectasis	4% (1)
Consolidation	4% (1)

Radioopaque foreign body	4% (1)
Normal Chest X ray	8% (2)

Figure No2 : Foreign body left bronchus producing collapse of left lung with mediastinal shift

Nature of foreign body – Majority are organic seen in 15 cases (60%) followed by inorganic foreign bodies, seen in 10 cases (40%).

Table no 4 – Nature of foreign body

Organic	No. of cases	Percentage	Inorganic	No. of cases	Percentage
Ground nut	6	24	Pen knob	3	12
Custard apple seed	2	8	Button	1	4
Mutton bone	2	8	Beed	1	4
Chicken bone	2	8	Plastic piece	1	4
Tamarind seed	1	4	Scarf pin	1	4
Beetle nut	1	4	Dress hook	1	4
Berry seed	1	4	whistle	1	4
			safety pin	1	4

Figure 3: Optical bronchoscopic picture of foreign body showing distal knob of pen

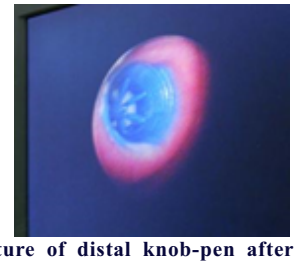
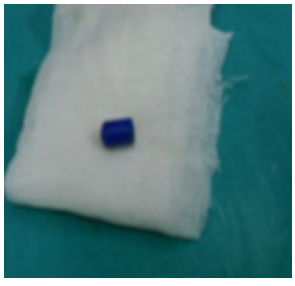


Figure 4: Picture of distal knob-pen after bronchoscopic extraction



Discussion:

Airway foreign bodies are most common in children below the age of 5 years with a peak age incidence of 1-3 years which corresponds with the study conducted by Ciftci AO et al[9]. This is due to improper swallowing mechanism, prematurity of glottic closure, absence of molar teeth, crying, playing while eating and lack of parental supervision. It is more commonly seen in male children than female with a ratio of 2.6:1 which is comparable to study conducted by Shivakumar AM et al[10]. Male predominance is due to impulsive and aggressive behavior of male children[11]. Foreign bodies are predominantly seen in left bronchus (14 cases) compared to right bronchus (11 cases). This is due to the angulation of left and right bronchi in relation to trachea upto the age of 3 years which is 55 degrees after which right bronchus becomes straighter in relation to trachea i.e. 25 degrees compared to left bronchus i.e. 45 degrees in adults.

There is a global variation on the type of inhaled foreign body. 91% of western patients have an organic material pea nuts being 50%[12]. In our study, 60% of the objects are of organic in nature. The leading presenting symptom is cough followed by wheeze (56% and 52% respectively) in comparison with Pinto et al, where higher proportion of patients were presenting with cough (87.1%) whereas choking, fever and cyanosis were seen in 85.1%, 22.6% and 16.1% respectively[13]. Physical examination shows decreased air entry in 84% of cases, wheeze in 52% of cases in comparison with Singh B et al, where raspy respiration, hypopnea, dyspnea were the predominant signs[14]. The leading radiological findings in our study were obstructive emphysema followed by lower lobe collapse in comparison with Svedstrom et al, who observed radiological findings like unilateral atelectasis and local hyperinflation or obstructive emphysema in 67.7% of cases[15]. In our study, radio opaque foreign bodies were seen in 7 cases (28%) in comparison with 16% reported by Cantaneo AJ[16]. CT scan is superior to X ray chest particularly in radiolucent foreign body[17,18].

General anaesthesia with jet ventilation and use of optical telescope and optical forceps are extremely useful in successful and complete bronchoscopic removal of foreign bodies.

Conclusion:

Accidental inhalation of foreign bodies in respiratory tract is potentially life threatening emergency. Peak age incidence is 0-3 years with male predominance. A team work of otolaryngologist, pediatrician and anaesthesiologist is required to manage the condition.

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