ENDOSCOPIC REMOVAL OF THE TRACHEOBRONCHIAL FOREIGN BODIES AT A PERIPHERAL HOSPITAL

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ABSTRACT

Objective: To evaluate the use of therapeutic endoscopic procedures for inhaled foreign bodies at a peripheral hospital.

Material and Methods: This study was conducted from 28th April 2001 till May 2003 at DHQ Hospital Timergara District Dir NWFP. Forty eight patients (34 male and 14 female, age range 7 months -14 years) who underwent endoscopic examination for foreign bodies were included in this study. The endoscopic procedure was performed under general anaesthesia.

Results: The most common affected age group was under 3 years. The commonest site in order of frequency was right main bronchus 30 (62.5%) followed by left main bronchus 13 (27.0%), trachea 3(6.3%) and larynx 2(4.2%). The commonest foreign body was peanut 31(64.6%) followed by whistles 8(16.6%), bean seed 4(8.3%), maize seed 2(4.2%) bead, disposable needle and Chalia (2.1%) each. The success was achieved in 100% cases with no mortality.

Conclusion: Early diagnosis and management is essential to prevent morbidity and mortality associated with foreign bodies.

Key words: Foreign Bodies, Tracheobronchial tree, Endoscopy.

INTRODUCTION

Foreign body inhalation is a worldwide health problem, which often results in life threatening complications[1] and is a paediatric emergency[2]. More than two thirds of foreign body inhalations occur among children younger than 3 years[3]. None of the imaging methods employed in such cases are diagnostic, and bronchoscopy is ultimately necessary for the diagnosis as well as the treatment[4]. That is the reason, if the history

is suggestive, a normal chest radiograph does not rule out a diagnosis of foreign body inhalation[5]. High degree of suspicion should be exercised to decrease the morbidity associated with this condition[6]. Obstruction of the tracheobronchial tree by a foreign body has a variety of clinical presentations[7]. The common clinical features are cough, stridor, dyspnoea, wheeze and decreased breath sounds[8,9]. Some time the foreign body may present with atypical symptoms and signs, like chest pain, haemoptysis[10] or non-resolving pneumonia[11]. Right main bronchus is the commonest site followed by left main bronchus for the foreign body to lodge[12].

The bronchoscopy is a definitive tool for the diagnosis as well as removal of foreign body of tracheobronchial tree.

This is a study of the regional experience of endoscopic removal of inhaled foreign bodies and compares it with other studies.

MATERIAL AND METHODS

This is a retrospective study of foreign body removal at DHQ Hospital Timergara District Dir NWFP. We included 48 patients who underwent endoscopic removal of foreign body from respiratory passages under general anaesthesia, from April 28th 2001 to May 2003 with the diagnosis of foreign body inhalation. Analysis of the 48 cases showed all the patients to be in the paediatric age group (under 15 years). Chest x-ray and complete blood count were performed on all patients when they arrived at the emergency department. Those with severe respiratory distress were taken to operation theatre for emergency bronchoscopy without doing investigations. In all patients, the foreign bodies were removed under general anaesthesia, using ventilating rigid bronchoscope made by Nagasaki Japan[13]. The size of the bronchoscope (external diameter) varied from 3.5 mm to 5 mm, and was selected according to the age of the patient. The principal author performed bronchoscopy on all the cases. Antibiotics, oxygen and steroids were administered to prevent complications.

RESULTS

Of the 48 patients in the study, 34 were male (70.8%) and 14 female (29.2%). Their ages ranged from 7 months to 14 years. Twenty nine (60.4%) patients were under the age of three (table No. 1).

AGE AND SEX DISTRIBUTION OF PATIENTS

Age in years	Patients No. (%age)	Male No.	Female No.	Commutative No.	Commutative %age
Below 1	7 (14.6)	5	2	7	14.6
1 – 3	22 (45.8)	16	6	29	60.4
4 – 6	10 (20.8)	7	3	39	81.2
7 – 9	5 (10.4)	2	3	44	91.6
10 and above	4 (8.3)	4	0	48	99.9
Total	48 (100)	34	14	48	100

TABLE – 1

The time interval between aspiration and removal of the foreign bodies ranged between 24 hours and 48 hours, while 70.8% of the cases were seen within the first 24 hours. In one case the foreign body was removed after one year.

Choking and paroxysmal coughing were the most common presenting symptoms. Wheezing, rhonchi and diminished breath sounds was the most common clinical finding table No. 2.

CLINICAL FEATURES

Symptom/signs	No.	%age
Paroxysmal coughing	40	83.3
Chocking	34	70.8
Respiratory distress	7	14.6
Wheeze	40	83.3
Decreased breath sounds	25	52.1
Rhonchi	27	56.2
Crepitations	12	25.0

TABLE – 2

In 40 patients we were able to do X-ray chests while 8 patients were is severe respiratory distress and were taken to operation theatre immediately. Twenty four out of 40 (60%) patients had normal chest x-ray findings, due to the fact that most foreign bodies encountered were radiolucent, and 30% showed compensatory emphysema. Opaque foreign bodies were seen in 7.5% of the patients, while atelectasis occurred in 2.5% table No. 3.

RADIOLOGICAL FINDINGS

Finding	No.	%age
No findings on X-Ray	24	60
Radio-opaque shadows	3	7.5
Compensatory Emphysema	12	30
Atelectasis	1	2.5
Total	40	100

TABLE – 3

During bronchoscopy, 30(62.5%) of the patients had the foreign body in the right main bronchus, 13 (27%) in the left main bronchus, 3(6.3%) in the trachea and larynx 2(4.2%) table No. 4.

SITE OF FOREIGN BODIES

Site	No.	%age
Right main bronchus	30	62.5
Left main bronchus	13	27.0
Trachea	03	6.3
Larynx	02	4..2
Total	48	100

TABLE – 4

Most of the foreign bodies aspirated were organic in nature. Peanuts were found in 31(64.6%) of the cases and was the most common foreign body encountered. The next most common was whistle 16.6%, bean 8.3%, maize 4.2%, disposable needle, bead and chalia 2.1% each table No. 5.

TYPES OF FOREIGN BODIES

Type	No.	%age
Peanut	31	64.6
Whistle	08	16.6
Bean seed	04	8.3
Maize seed	02	4.2
Bead	01	2.1
Disposable needle	01	2.1
Chalia	01	2.1
Total	48	100

TABLE – 5

There was no mortality associated with bronchoscopy.

DISCUSSION

Bronchoscopy is the procedure of choice for the diagnosis as well as removal of foreign bodies of the tracheobronchial

tree. Other procedures which can be performed are Heimlich manoeuvre, tracheostomy and thoracotomy. In Heimlich manoeuvre physician places his arms around the patient abdomen and holds one of his own wrists with the other hand. He then thrusts sharply inward and upwards in the patients' epigastrium several times in the hope of blowing out the impacted object. Tracheostomy is performed when the foreign body is in the larynx to bypass the obstruction and make a patent airway. Thoracotomy is an open surgical procedure performed when the bronchoscopic removal fails.

Our review of foreign bodies in airways confirms the view of others that the highest incidence of foreign body inhalation occurs in the under-three-year age group[14]. In this study, 59% of the patients were under three years of age. This peak incidence in early childhood is, of course, related to the fact that children are in the habit of putting objects into their mouth to determine their texture and taste, and to chew on when teething.

The male to female ratio in our study (2.4:1) is not significantly different from previously reported cases (2:1)[15].

There was a history of foreign body inhalation in 91.6% of patients which is similar to the study carried out by Laks and Barzilay (1988) who obtained a positive history in 135 (91%) of patients[16].

The most frequent symptoms of foreign bodies were cough (83.2%) and wheezing (83.3%) in our patients while Burton et al (1996) observed that the most frequent symptoms of foreign bodies were cough (85/155 patients) and wheezing (60/155 patients)[17]. The diagnostic triad of wheezing, coughing, and decreased breath sounds was noted in 51.3 % of patients while Wiseman (1984) observed in 47% of patients with foreign body aspiration[18] and black et al (1994) observed coughing chocking and wheeze in 98% of patients[19].

Radiographic findings are often not very helpful, especially in radiolucent foreign bodies[20] which accounted for 37 (92.5%) of our cases. For this reason, bronchoscopy is indicated when the clinical history is strongly suggestive of foreign body inhalation. Compensatory emphysema was seen in 30% of our patients caused by "expansile check-valve" phenomenon. Pneumatic changes were absent in our patients because the majority of the patients were seen in 24 – 48 hours. Most of the foreign bodies found in our analysis were peanuts, which is similar to other studies[21]. This is due to the fact that the peanut is cheap widely used in rural areas especially in winter season. The inorganic foreign bodies were mostly whistles, beads and disposable needles.

This study, like most other studies on the subject, shows the right main bronchus as the main site of foreign body to lodge, which is in agreement with Svensson (1985)[22]. This is related to the fact that the right main bronchus is larger, more vertical than the left and the interbronchial septum projects to the left. The effect of inspiratory air current also determines the site of final impact.

We had encountered only one cardiac arrest associated with bronchoscopic procedure, which was successfully resuscitated, while mortality associated is from 1 to 6% with other workers[23].

CONCLUSION

It is important to educate parents on the potential risks involved in foreign body inhalation, and advise them to keep small objects away from children and to increase awareness in medical practitioners for early referral of patients suspected of foreign body inhalation. A successful method is an intensive educational campaign through the media. We conclude that no foreign body in the tracheobronchial tree should be left

alone with the hope that it will come out spontaneously. All the impacted foreign bodies should be, removed as soon as possible to minimise the morbidity and mortality.

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