Original Article

Trachiobronchial Foreign Bodies

Types, Management and Complications of Trachiobronchial Foreign Bodies

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ABSTRACT

Objective: To determine the types, management and complications of tracheobronchial foreign bodies.

Study Design: cross sectional study

Place and Duration of Study: This study was conducted at ENT Department of Nishtar Hospital Multan from January 2010 to December 2011.

Patients and Methods: 150 patients underwent rigid bronchoscopy under general anesthesia after routine investigations and x-rays chest where feasible.

Results: A total 150 patients underwent bronchoscopy for diagnostic as well as therapeutic purposes. Most common foreign bodies were peanuts (40.66%), beetle nuts (18.66%) and whistles (18.66%). In 137 (91.33%) patients, foreign bodies were removed on bronchoscopy at first attempt. 10 (6.67%) cases were diagnostic and only 2 (1.33%) cases were subjected to open surgical removal. One (0.67%) of the patients died in ICU after removal of foreign body.

Conclusion: Early diagnosis and timely management of foreign bodies with bronchoscopy saves patients life and avoids complications. Younger children should not be offered peanuts, whistles or toys that can be inhaled.

Key Words: Foreign body airway, Tracheobronchial tree, Bronchoscopy

INTRODUCTION

Foreign body (FB) aspiration causes thousands of deaths each year as they sometime do not reach in time for intervention all over the world[1].It is 4th leading accidental cause of death under 3 years of age and 3rd most common cause of death under one year of age[2]. FB aspiration is one of the most life threatening conditions which need urgent intervention. In this context, bronchoscopy is a life saving procedure for FB removal in emergency set-up as well as a therapeutic procedure and a diagnostic tool for tracheobronchial tree[3]. Most of the time FB aspiration is encountered in children.The patients may present with respiratory distress, chocking, protracted wheeze, dysphagia, stridor or recurrent chest infections or unilateral recurrent pneumonia. Types of FBs usually differ with geographical locations[4]. Watermelon seeds in Turkey, fish bones in Greece and Asia are the most frequent causes of FB inhalation[5]. In Pakistan, by contrast, peanuts, coins, small toys, betel-nuts and whistles are the most common FBs[6].

For the establishment of diagnosis, definite history and proper examination play a major role. Management of inhaled FBs depends on the sight of impaction. Laryngeal or subglottic FBs need urgent intervention in the form of tracheostomy or urgent bronchoscopy, where asFB in the bronchus cause comparatively less air way problem[7]. Most of the procedures are carried out with the rigid ventilating bronchoscope and grasping forceps under GA. Flexible bronchoscope has alsobeen used for the removal of FBs in the tracheobronchial tree[8]. Sometimes FB inhalation may be asymptomatic[9] leading to pneumonia and even lung collapse, not responding to conservative treatment[10].

Nishtar Hospital Multan comprising 1400 beds including 48 beds of ENT department is one of the leading hospitals and drains a large area of Southern Punjab, Baluchistan and K.P.K. Most of the cases of FBs are referred from remotes areas. So we conducted a study to determine the type of FBs, mode of presentation, management and complications in terms of age and sex distribution so that we may design such a system to offer immediate management without any unnecessary delay.

MATERIALS AND METHODS

A cross sectional prospective study of 150 patients was conducted at ENT Department of Nishtar Hospital Multan (NHM) from January 2011 to December 2012 with the permission from the Ethics and DisciplineCommittee of NHM. Most of the patients were referred from remote areas as emergency cases and some of the patients were admitted through OPD or referred from Pediatric Department of Nishtar Hospital Multan and Children Complex Multan for urgent and sometimes for planned bronchoscopy.Mandatory investigations such as CBC, PT, APTT and viral markers were run and chest x-rays were obtained where feasible.

All the patients underwent rigid ventilating bronchoscopy. Risks and complications were explained

to the relatives and informed consent was taken. Some patients having chest pathology and resistant to conservative treatment underwent planned diagnostic bronchoscopy. All the patients presenting in emergency with the history of FB inhalation in the upper air way were subjected to urgent bronchoscopy and those in whom FB had settled to either of the main bronchus were put on routine elective list for bronchoscopy.All the patients were kept under observation for next 24 hours and x-ray chest were taken in each patient on next day of bronchoscopy except those in whom foreign body was in subgllotis or in the larynx. The patients were discharged to home or referred back to pediatric units after the observation of 24 hours. The patients who suffered from any complications were put for further observation and management. Data was analyzed using SPSS version 16 and tables were created to elaborate the results.

RESULTS

All the patients with definite history of foreign body aspiration or suspicion of foreign body lodged in their airway underwent bronchoscopy under general anesthesia. Male to female ratio was 1.56:1. Most of the patients (65.33%) were under 3 years of age. Duration between impaction and removal of FBs was from 24 hours to one year. 137 (91.33%) patients presented with definite history of FB inhalation while in rest of the patients(13 cases, 8.67%) they came into knowledge on x-ray or bronchoscopy. Most common type of FB encountered was peanut (40.66%), following were those of beetle-nuts (18.66%) and whistles (18.66%).

Table No.1: Types of foreign bodies.

Sr. No.	Types of foreign Bodies	No. of Cases	Percentage
Organic			
1	Peanut	61	40.66%
2	Beetle nuts	28	18.66%
3	Maize grains	9	6%
4	Peanut shell	6	4%
5	Beans	5	3.33%
Inorganic			
6	Whistles	28	18.66%
7	Beads	4	2.6%
8	Toy pistol bullets	3	2%
9	Metallic tracheostomy tube prong	3	2%
10	Steel nails	2	1.33%
11	Nose pin	1	0.6%

Different types of FBs are shown in table-1. In 137 (91.33%) patients, FBs were removed easily, successfully and uneventfully on bronchoscopy at first attempt, either from the bronchus or from the space between the vocal cords. 10 (6.67%) cases were diagnostic, 2 (1.33%) cases were subjected to preoperative tracheostomy and 3 (2%) patients underwent postoperative tracheostomy due to respiratory distress. One (0.67%) of the patients died in intensive care unit (ICU) after removal of foreign body.
Site of FB impaction was right main bronchus in 108 (72%) cases, left main bronchus in 32 (21.33%) cases, glottis in 7 (4.6%) cases, and trachea in 3 (2%) patients.Difficult removal was associated with circular or oval shaped FBs such as toy pistol bullets and beads (table-2). Special grasping forceps were used for the removal of these FBs. Table-3 shows the incidence of foreign bodies in different age groups.

Table No.2: Difficult removal of foreign bodies

Sr. No.	Type of foreign body	No. of cases	Percentage
1	Peanut	8	44.4%
2	Beads	4	22.22%
3	Toy pistol bullets	3	16.66%
4	Nose pin	1	5.5%
5	Metallic Tracheos-tomy tube prong	2	11.11%

Table No.3: Foreign body aspiration in different age groups

Age in Years	No. of cases	Percentage
0-1	13	8.66%
1-3	98	65.33%
3-5	16	10.66%
5-12	18	12%
Above 8 years	4	2.66%

DISCUSSION

As we mentioned earlier that FB aspiration is fourth leading accidental cause of death in children under 3 years of age and third most common cause of death in children under one year of age[2]. It therefore refers to the acquisition of prompt diagnosis and instant management of the patients with FB aspiration. Sometimes it may lead to fatal consequences due delay in the removal of FB or when they are missed or left unnoticed[11].In this regard, our study reveals that NHM is offering its best services to the patients who present with the history of FB inhalation. It also indicates that in-time bronchoscopy is the best measure to deal with FB aspiration as over 90% FBs were removed at the time of the procedure and the patients were sent home after 24 hours.
In our study male to female ratio was slightly less than that reported by Kiyanet al[12]and Ezer et al[13]in Turkey. In Iran, Saki et al[14] reported male to female ratio 1.73:1. It means, regarding FB aspiration, male to female ratio is almost same in many areas of the world. In our study, children were the common sufferers (65.33%). In another study ontracheobronchial FBs carried out at Ayub Teaching Hospital, Abbottabad by Asifet al[15] from Pakistan, 77.8% patients were under five years of

age.In a study done by Yadavet al[16] in India, majority of the patients (46%) were under three years.Recently, Foltranet al[17] conducted a meta-analysis of English written articles referring to foreign body inhalation over a 30 years period (1978-2008) and reported that 20% of the patients were of 0-3 years.

In our study, the most common type of foreign body was peanuts (40.66%) while in the study by Ezeret al[13]in Iran seeds (63.87%) were the most common FB with peanuts making 9.8%.In another study by Asifet al[15], peanut (55.6%) was the most common FB. It reveals that in Pakistan, peanut is the most common FB, especially in children below three years of age. So, peanuts and other such edibles must be avoided until the children are able to adequately chew them.

In our study, we removed FBswith rigid bronchoscopy under general anesthesia as it is considered the gold standard management of airway FBs. More than 90% FBswere easily removed at first attempt. The advantage of rigid bronchoscope for the airway FB removal is that, at the same time, it works as an endotracheal tube[18]. Aydoganet al[19] studied 1887 patients with FB aspiration and used rigid brochoscopyto remove the FBs. However, other bronchoscopy techniques such as flexible bronchoscopy, suspension laryngoscopy, and fluoroscopy can also be used.

Most of the foreign bodies were removed from right main bronchus which is in line with trachea as seen in other studies also.In the study by Asifet al[15], 74.1% FBs were found in right main bronchus. Saki et al[14] reported 55.1% FBs lodged in the right main bronchus. Similarly, Gilyoma and Chalya[20] reported 75% FB impaction in the right bronchus in their study 98 patients with FBs in aerodigestive tract.

In our study, only4% patients experienced complications and 0.7% patient died postoperatively. This occurrence ofcomplications is low as compared to other studies. Tang et al[21] conducted a retrospective study in China and reported severe complications in 21.38% patients with the death of the three. Another retrospective study conducted in Turkey by Soysalet al[22] reported the requirement of thoracotomy in three patients and morbidity in 7.9% patients after bronchoscopy. Similarly, in a study on FB inhalayion by Passali[23] et al in Italy reported complications in 12.7% children. However, a study of 45 patients carried out in Poland by Korlackiet al[24]reported no complications at all. Here, we can comment that ENT department of Nishtar Hospital Multan is working wonderful in the management of foreign body inhalation with least incidence of complications.

CONCLUSION

Early diagnoses and bronchoscopy reduces the risk of complications as well as mortality in patients with foreign body aspiration.Whistles should not be packed as gifts in candies and necessary awareness should be offeredto the manufacturers.Edibles like peanuts and small toys should be kept out of the reach of children, especially from those who are less than 3 years of age.

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