ORIGINAL ARTICLE

EFFICACY OF RIGID BRONCHOSCOPY FOR EXTRACTION OF BEADS FROM AIRWAYS

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ABSTRACT

Background: Foreign body inhalation is a common problem in children. In our setup beads are available in the form of cheap jewelry and prayer beads. With improvement in endoscopic technology for extraction of foreign body from the airways, mortality has reduced. This study was carried out to determine the efficacy of rigid bronchoscopy for extraction of beads from airways in a tertiary care hospital.

Material & Methods: This cross-sectional descriptive study was conducted at Department of ENT, Head & Neck Surgery, Lady Reading Hospital, Peshawar, from January 2012 to December 2013. Any patient of any age and either sex with inhaled bead was evaluated in terms of detailed history, thorough examination and relevant investigation. After taking consent bead was retrieved with rigid bronchoscopy and patient was put on injectable antibiotics and steroid. All these patients were followed up to one month. The data was collected on a proforma and statistical analysis was performed using SPSS version 17.

Results: This study included 23 cases constituting 16 male and 7 female, with male to female ratio of 2.2:1. Mean age was 5.47+4.38 years (range 1-18 years). Majority of patients 15(56.21%) belonged to lower socioeconomic group. Most of the patients (69.56%) presented within three days. The commonest site for lodgment of bead was the right main bronchus 56.52%. Cough was the commonest presentation (52.17%) followed by wheezy chest 43.47% and in 15(65.21%) cases bead was visible on chest x-ray.

Conclusion: Rigid bronchoscopy is an effective procedure for extraction of beads from tracheobroncheal tree.

Key Words: Foreign body; Bead; Tracheobroncheal tree; Rigid bronchoscopy.

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INTRODUCTION

Foreign Body (FB) inhalation is a common problem occurs in children younger than 15 years with peak incidence between one and three years of age.[1] Although majority of inhaled foreign bodies in children are generally organic in nature, though they vary widely according to geographical location.[2] The cardinal symptoms of FB inhalation are choking, coughing and wheezing.[3] However, it may causes atypical symptoms like dysphagia, stridor and sometime may lead to complications like pnemothorax, pneumonia and mediastinal shift.[4] As the bead has hole, so air can pass through it, causing either delay in the diagnosis or minimal complications.[5] With improvement in the endoscopic technology for extraction of FB from the airways mortality has reduced but still removal of spherical FB is a challenge for the clinicians around the globe.[6] Beads are available in the form of cheap jewelry and prayer bead (Tasbih) in our setup. Inhalation of beads by children is a common clinical problem in Middle East and Islamic countries as it is commonly used by Muslims.[7] The first rigid bronchoesophagoscopy was performed by Jackson & Ingal on a wake patient in sitting position.[8] Advancement in technology for removal of beads from the airways started by the introduction of the rod- Lens telescope in 1970.[9]

In the past mortality rate of bead inhalation was quite high about 30% because most of the patients were treated by thoracotomy due to non-availability of efficient instruements.[10] The success rate of bead removal by rigid bronchoscopy may reach up to 99% and the morbidity and mortality has decreased from 1.8% to 0%.[11]

This study was carried out to determine the efficacy of rigid bronchoscopy for removal of beads from the tracheobroncheal tree in our set up.

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MATERIAL AND METHODS

This cross-sectional descriptive study was conducted at the Department of ENT, Head & Neck Surgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar, Pakistan from January 2012 to December 2013.

Patients of any age and either sex from whom FB (bead) was retrieved on rigid bronchoscopy from the tracheobroncheal tree was included in the study. While patients from whom FB other than bead was extracted, patients undergone bronchoscopy in other hospital and those patients where thoracotomy was performed due to failed of bronchoscopy were excluded from the study. The diagnostic criteria for bead in airway were triple assessment i.e. history of bead inhalation, physical findings complemented with radiological evidence. After being admitted into ENT ward detailed history regarding FB inhalation was taken from patients or guardians and thorough examination especially focusing on chest findings was performed. Baseline investigations specifically pre-operative chest x-rays were carried out in all cases. CT scan and MRI were performed in some of the patients where baseline investigations were insufficient and clinical evaluation strongly favoring FB airway. A well-informed consent was taken from patients /guardians explaining the procedure, its risks, benefits and associated complications and the study was approved by the Hospital Ethical Committee. Patients were put on intravenous Ceftriaxone 30-50 mg/kg body weight and Dexamethasone 0.5 mg/kg body weight in divided doses. Rigid bronchoscopy was performed under general anesthesia with bronchoscope (Karlstorz, Germany) by Otolaryngologist of consultant cadre. Post-operative chest x-ray was carried out. Patients were discharged on the 2nd day of surgery if found stable. All these patients were

Table 1: Socio-demographic features of patients with bead in the trachea-broncheal tree (n=23)

Socio-demographic features	Frequency	Percentage
Lower socioeconomic group	15	65.21%
Middle socioeconomic group	5	21.73%
High socioeconomic group	3	13.04%
Total children in family < 5	4	17.39%
Total children in family 6-10	7	30.43%
Total children in family >10	12	52.17%
Duration between lodgment and removal of bead		
<3 days	16	69.56%
Duration between Lodgment and removal of bead		
<3 weeks	4	17.39%
Duration between Lodgment and removal of bead <3 months	2	8.69%
Duration between Lodgment and removal of bead <3 years	1	4.34%
Bead in right main bronchus	13	56.52%
Bead in left main bronchus	5	21.73%
Bead at lower end of trachea	4	17.39%
Bead at subglottis	1	4.34%

Table 2: Mode of admission and demographic location of patients with bead in the trachea-broncheal tree (n=23)

Mode of admission and demographic location	Frequency	percentage
Accident and Emergency Department	7	30.43%
Outpatient Department	5	21.73%
Pediatric Department	4	17.39%
Peripheral Hospitals	3	13.04%
Private Hospitals	2	8.69%
Pulmonology Department	2	8.69%
Tribal Areas	5	21.73%
Southern Districts of Khyberpakhtunkhwa	4	17.39%
Northern Districts of Khyberpakhtunkhwa	3	13.04%
Eastern Districts of Khyberpakhtunkhwa	3	13.04%
Western Punjab	3	13.04%
Afghanistan	5	21.73%

Table 3: Clinico-radiological features of the patients with bead in the trachea-broncheal tree (n=23)

Clinical Feature	No. of cases	Percentage
Cough	12	52.17%
Wheeze	10	43.47%
Reduced air entry	11	47.82%
Breathlessness	6	26.08%
Strider	2	8.69%
Fever	6	26.08
Cyanotic spell	4	17.39%
Visible bead on chest x-ray	15	65.21%
Non-visible bead on chest x-ray	5	21.73%
Pneumothorax on chest x-ray	3	13.04%

Figure 1: Beads retrieved on rigid bronchoscopy

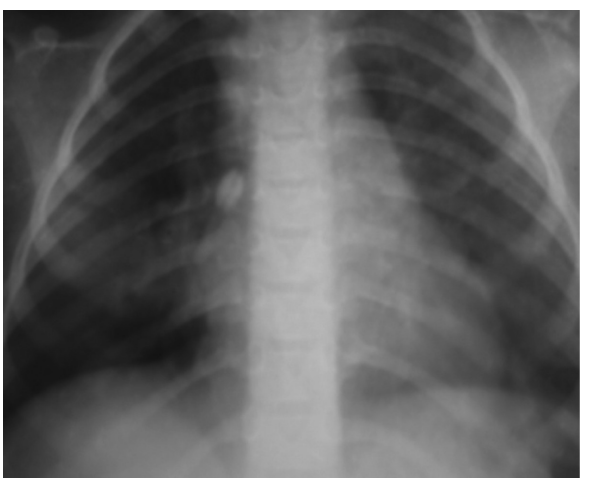

Figure 2: Chest x-ray of a 4 years old child showing bead in the right main bronchus

Figure 3: Chest x-ray of a two years old child showing bead in the right main bronchus

followed up to one month.

The data was collected on a preformed proforma and statistical analysis was performed using the statistical program for social sciences (SPSS version 17).

RESULTS

This study included 23 patients; 16 male and 7 female, with male to female ratio of 2.2:1. The mean age was 5.47±4.38 years (range 1-18 years). Bead was extracted from majority of patient in the age range of 1-3 years with average age of 2 years.

Majority of patients 15 (56.21%) belonged to lower socio-economic group. Inhalation of bead was common (52.17%) in the children belonging to families having more than 10 children per family. Most of the patients (69.56%) presented to ENT department within three days of inhaling bead and only one patient (4.34%) presented with inhaled bead after 30 months. The commonest site for lodgment of bead was the right main bronchus (56.52%) followed by left main bronchus (21.73%). (Table 1)

The main bulk of patients (30.43%) were admitted to ENT ward via Accident & Emergency Department and Outpatient Department (21.73%), while rest of the patients were received as referred cases from other departments.

Most of the patients (21.73%) belonged to tribal area of Pakistan. (Table 2)

Among the clinical features cough was the commonest presentation (52.17%) followed by wheezy chest 43.47% and in 15 cases (65.21%) bead was visible on x-ray chest while in 5 patients (21.73%) bead was invisible radiolodgically. (Table 3)

There was no mortality in this study during one month postoperative follow-up.

DISCUSSION

Bead is a spherical FB inhaled by the children frequently in Islamic countries as it is used for pray.[12] In this study there was male dominance with male: female ratio of 2.2:1, which is in agreement with most of the studies reported yet.[13] This male preponderance can be explained as male children are more active and they come in close contact with parents and grandparents using bead (Tasbeeh) for pray. In this study majority of patients were in age range of 1-3 years with average age of 02 years that is comparable to other studies.[14] In this study majority of patients (n-15, 56.21%) belonged to lower socioeconomic group of society. Inhalation of bead was common (52.17%) in the children belonging to families having more than 10 children/family. The reason could be inadequate care and supervision of large number of children in poor families. In our study most of the patients (69.56%) presented to ENT department within three days of inhaling bead and only one patient (4.34%) presented with inhaled bead after 30 months, that is in accordance to the study of Khayat[15] from Iran with a 25 years duration consisted on 75 patients with bead inhalation, where 85.3% children presented to hospital within 24 hours, 9.3% patients in 1-2 days and 4% patients in a week time after inhalation. Similarly Saki[16] reported that most of the patients (44.5%) presented to hospital within a week time after inhalation while only 26.6% patients presented within 24 hour after lodgment of FB. The reasons for delayed presentation of patients in my study were far flung areas with inadequate transport facility, unfavorable situation due to terrorism and lack of knowledge of the parents regarding complication of bead inhalation. In this study bead was extracted from right and left main bronchi in 13 cases (56.52%) and 5 cases (21.73%) respectively that simulates to the study of Sirmali[17] from Turkey where more than half of the foreign bodies were lodged in the right bronchial system (55.9%, n: 147) while 41.8% (n: 110) were within the left bronchial system. Likewise Budensab[18] from India also reported that FBs were localized predominantly in the right main bronchus in 66 (57%) patients followed by left main bronchus in 18 patients (16%), and in trachea in 12 patients (10%). But my result differs from that of Korlacki's[19] study from Poland where left bronchial tree was affected in 15 cases (53.57%) and right bronchial tree in 12 cases (42.85%). The reason for right main bronchus dominance is due to its being wide, straight and more in alignment with trachea. In this study most of the patients (30.43%) were received through A& E department and majority of them (21.73%) belonged to tribal areas. As people living in tribal areas preferentially followers of religious virtues with poor socioeconomic status using bead (Tasbeeh) for pray, that's leads to increased incidence of bead inhalation in these families. There is a hole in the centre of bead so air can pass through it, thus main symptoms of patient with bead inhalation are cough and wheezing while there is minimal breathlessness or acute complication as compared to organic FB. In this study cough was the commonest presentation (52.17%), followed by wheezy chest (43.47%), which is consistent with reports of Chew[20] from Singapore where top five clinical presentations were: cough (61.5%), choking (46.2%), wheeze (42.3%), stridor (34.6%) and breathlessness (34.6%). Similarly in Budensab's[18] study clinical features were cough (53%) choking (10%) and dyspnea (9%). The symptoms of this study are also coinciding to Yetim's[21] results who found cough (53%), dyspnea (17%), wheezing (8%), and cyanosis (4%). Although bead is a radiolucent object, however it can be visible or may results into complication that can be appreciated on CXR. In this study bead was visible in 15 cases (65.21%) on X-Ray chest while in 5 patients (21.73%) bead was invisible radiolodgically. Radiological findings in Chew's[20] study were normal CXR (23.1%), visible FB (23.1%), atelactasis (19.2%) and consolidation (30.8%). Similarly Shafi[22] revealed that the commonest radiographic findings were patchy consolidation (24%), and obstructive emphysema (31.9%). In Passali's[23] study the commonest radiological findings were distal emphysema (63%) and radio-opaque FBs (23.56%). All the patients were recovered from rigid bronchoscopy uneventfully and no mortality was encountered in this study.

CONCLUSION

Bead is a commonly inhaled FB by young children of poor and crowded families. Rigid bronchoscopy is an effective procedure for extraction of bead from the tracheobroncheal tree.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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None declared.