

Clinical Profile and Management of Tracheobronchial Foreign bodies

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Abstract

Background: Despite significant advance in prevention, first aid and endoscopic technology, foreign bodies of the tracheobronchial tree in general population remain a diagnostic and therapeutic challenge. In this study an attempt is made to analyse some of the key issues about diagnosis and management of foreign bodies in the tracheobronchial tree.

Aim: To know the commonest symptoms and signs of presentation, average duration of time lapse between inhalation and seeking of medical help and the common difficulties encountered during the endoscopic removal of foreign bodies in the tracheobronchial tree.

Method: This study comprises 52 cases of tracheobronchial foreign bodies. This was a descriptive time bound study conducted at department of ENT, KIMS, Hubli, Karnataka, India. All cases of clinically suspected foreign bodies of tracheobronchial tree were included in the study.

Results: The age group of 1-2 years had the highest incidence of airway foreign bodies (46.15%). Sex ratio was 1.6:1 showing male preponderance. 50% of the airway foreign bodies presented within 24 hours of onset of symptoms. Cough (84.61%), respiratory distress (61.53%) were the predominant symptoms and decreased air entry (84.61%) followed by rhonchi (69.23%) were the main signs of airway foreign bodies. Ground nut and tamarind seeds were the most common foreign bodies inhaled. In the airway right main bronchus (59.61%) was the frequent site of lodgment.

Conclusion: Foreign bodies in air passage with their own morbidity and mortality are preventable when diagnosed early and treated properly.

Key words: foreign bodies, tracheobronchial tree, endoscopy.

Introduction

Foreign body aspiration is a potentially life-threatening event, more common in children than in adults. The signs and symptoms of foreign body aspiration vary according to the age of the subject, the type of object aspirated, the location of the object, and the elapsed time since the event. The removal procedure is safe and rewarding if it is carried out with the right instruments and by experienced physicians in specialised centers.

Accidental aspiration of a foreign body into the tracheobronchial tree in both adults and children can result in significant morbidity and mortality. A missed diagnosis can lead to life-threatening airway

obstruction, chronic wheezing, protracted cough, and recurrent pneumonia. A delay in diagnosis can also result in significant airway compromise including edema, granulation tissue, bronchiectasis, and obstructive pneumonia [1].

Management of airway foreign bodies consists of clinical examination, appropriate tests to diagnose the presence of an airway foreign body, and quick removal of the foreign body from the airway.

Objectives

Ø To know the commonest symptoms and signs of

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presentation in patients with respect to airway foreign bodies.

Ø To know the average duration of time lapse between inhalation and seeking of medical help.

Ø To know and overcome the common difficulties encountered during the removal of foreign bodies in the tracheobronchial tree.

Methodology

The present study was conducted in the Department of ENT, Karnatak Institute of Medical Sciences, Hubli, Karnataka, for a period of two years. A total of 52 cases were studied in detail and the particulars were recorded in the proforma, specially designed for the study.

Study subjects were all those patients with history of foreign body aspiration, patients with clinical evidence of airway foreign bodies such as sudden onset of bouts of cough, respiratory distress in an apparently healthy patient, and patients with radiologic evidence of sudden onset of lung collapse, emphysema, radio opaque foreign body in the tracheobronchial tree. Patients with suspected foreign body in the laryngotracheobronchial tree who underwent subsequent endoscopic intervention for the same were only included in the study.

All patients were managed accordingly as follows,

- 1) Detail history from patient and the attendants
- 2) Detail physical examination of the patient.
- 3) X-ray chest (PA and lateral)
- 4) CT-Scan and MRI; (in presence of complications)
- 5) Endoscopy (Diagnostic and Therapeutic).

I. Bronchoscopy- The Karl Storz Ventilating fiber-illuminated Bronchoscopes (size- 3.5, 4.0 and 6.5mm) and Hopkins rod-lens telescopes (Karl Storz) were the scopes used for foreign body extraction. The size of the bronchoscope was selected according to the age of the patient.

II Forceps - Positive-action (center-action) forceps.

Proper informed written consent was taken from the patients and their attendants.

Results

Out of 52 patients, 32(61.53%) were males and 20(38.46%) were females. Majority of cases, 24 (46.15%) were in the age group of 1-2 years (Table 1). In most of the cases, 42(80.76%) the history of foreign body inhalation was negative and in only 10(19.23%) cases there was positive history of inhalation. Almost 50% of the cases (26) presented within 24 hours of onset of symptoms and about 14 cases presented after one month (Table 2). The most common symptom was cough, which almost 84.6% of the cases had. Respiratory distress and wheeze were experienced by about 61.5% of the cases. About 46.15% of the patients also complained of fever (Table 3). On clinical examination, most of the cases had decreased air entry (84.6%), followed by rhonchi (69.2%) and crepitations (42.30%) (Table 4). Out of 52 foreign bodies retrieved, 45 (86.53%) were organic in type, and 7 (13.46%) were inorganic in type. Ground nut and tamarind seeds were the most common types of foreign bodies inhaled (Table 5). On bronchoscopic examination most of the foreign bodies were lodged in right main bronchus 31(59.61%) which was the most frequent site followed by left main bronchus 14(26.92%), trachea 5 (9.61%), and larynx 2 (3.84%).

Table 1. Age distribution of patients with airway foreign body

Age group (years)	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	> 8
No of cases	Nil	24	8	4	Nil	2	Nil	6	8

Table 2. Time lag between onset of symptoms and seeking medical care

Time lag (days)	0-1	2-3	4-7	8-30	>30
No of cases	26	6	6	Nil	14

Table 3. Symptoms of presentation

Symptoms	No of cases (%)
Cough	44 (84.61%)
Respiratory distress	32 (61.53%)
Wheeze	32(61.53%)
Fever	24 (46.15%)

Table 4. Signs at presentation

Signs	No of cases (%)
Decreased air entry	44 (84.61%)
Rhonchi	36 (69.23%)
Crepitations	22 (42.30%)
Cyanosis	8 (15.38%)
Stridor	5 (9.61%)

Table 5. Type of foreign bodies

Type of FB	In Airway
Ground nut	19
Tamarind seed	11
Betel nut (areca nut)	8
Jowar seed (maize)	4
Red gram	3
Safety pin	2
Plastic whistle	2
Tracheostomy flange	2
coat button	1

Discussion

Children younger than three years old, with the peak incidence between one and two years of age, account for the majority of cases. Mishra A et al [2] also quote

a similar observation. At this age, children are apt to explore their world via the oral route, but they do not yet have molars to chew food adequately. In our study sex ratio was 1.6:1 showing male preponderance which was in accordance with Mishra A et al [2].

In our study 50% of the cases presented within 24 hours. This finding correlates with that of A.Banerjee et al [3], who found the value as 52%. However Nazar.B.Elhassani [4] found the value to be 34.41%. In our study 14 cases reported to us after 30 days. This could be because of rapid fatigue of cough reflex, perhaps due to adaptation of the surface sensory receptors to the presence of any alien object, is followed by an asymptomatic phase that tends to create a false sense of security [5]. The most common symptom was cough (84.61%), and the most common sign was diminished air entry (84.61%). Kim et al [6] and Rothmann BF et al [7] also quote similar findings. Ground nuts were the commonest type of foreign bodies aspirated (36.53%). This finding correlates with that of Cohen SR et al (34.3%), [8] Inhaled vegetable matters, such as peanuts, seeds and nuts, because of their oil content, can lead to severe mucosal inflammation and accumulation of bulky granulation tissue within a few hours leading to complication such as tracheobronchial mucosal bleeding during the extraction procedure. Airway foreign bodies were found frequently in right main bronchus in 59.61% of cases followed by left main bronchus (26.92%) in our study. This observation correlates with Brown DA et al [9]. All the cases were managed using rigid bronchoscopy (emergency/elective) under general anesthesia. However, we encountered some difficulties during endoscopic removal of foreign bodies.

1) One was a case of large foreign body which got stuck in subglottis during removal as the patient was not well relaxed. The patient went in for fatal airway obstruction. Immediately the bronchoscope was reintroduced and the foreign body was pushed to right main bronchus and removed afresh.

2) In one case, because the foreign body (tamarind seed) was too large for the glottic chink, a tracheostomy was performed and the foreign body was removed through the tracheostomy stoma.

3) One was a case of open safety pin facing upwards in

right main bronchus (Figure1). The pointed end was partially embedded in the bronchial wall. This was disimpacted and pointed end was held with forceps and was removed carefully. Hemostasis was achieved.

4) There were two cases of Fuller's tracheostomy tube flange as foreign body in main bronchus (Figure 2). This had to be removed carefully without causing trauma to the bronchial mucosa as the cut ends of the flange would be sharp. This is described as "season cracking". The alkaline reaction of the tracheobronchial secretions has eroding effect on the flange of the tracheostomy tube, particularly at the junction of the flange and the shield of the tube, where the chances of stagnation of secretions are much more.

5) One was a case of foreign body in left bronchus (areca nut) with subcutaneous emphysema over the neck and upper chest. (Figure 3) Foreign body was removed by rigid bronchoscopy and the emphysema settled over a period of 5 days. The cause for the emphysema could not be established, as there was no breach in the tracheobronchial mucosa.

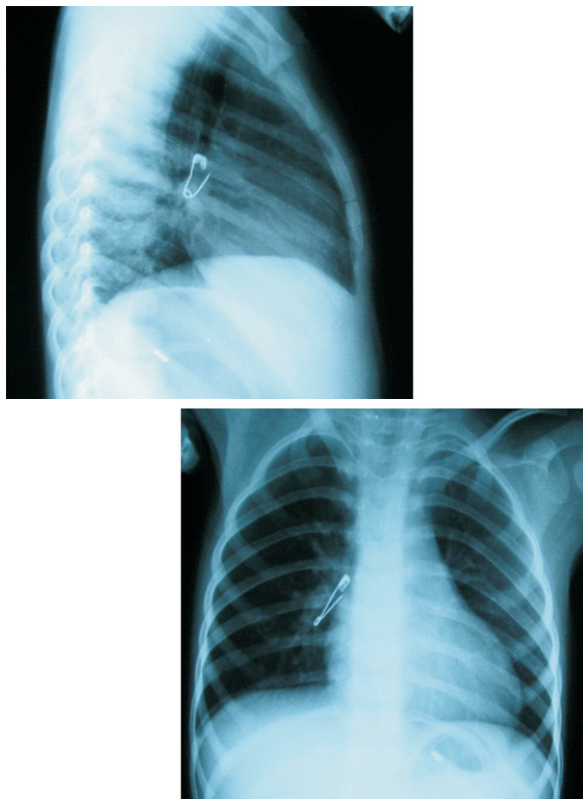


Figure1. Open safety pin in right main bronchus

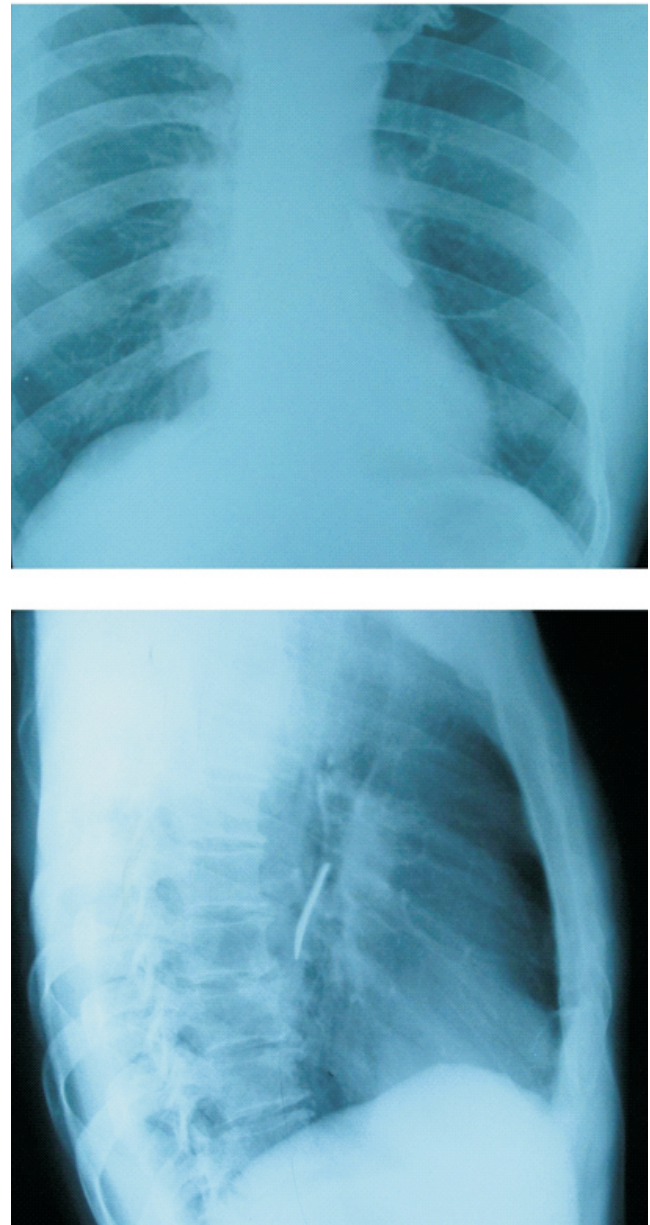


Figure 2. Fuller's tracheostomy tube flange in left main bronchus

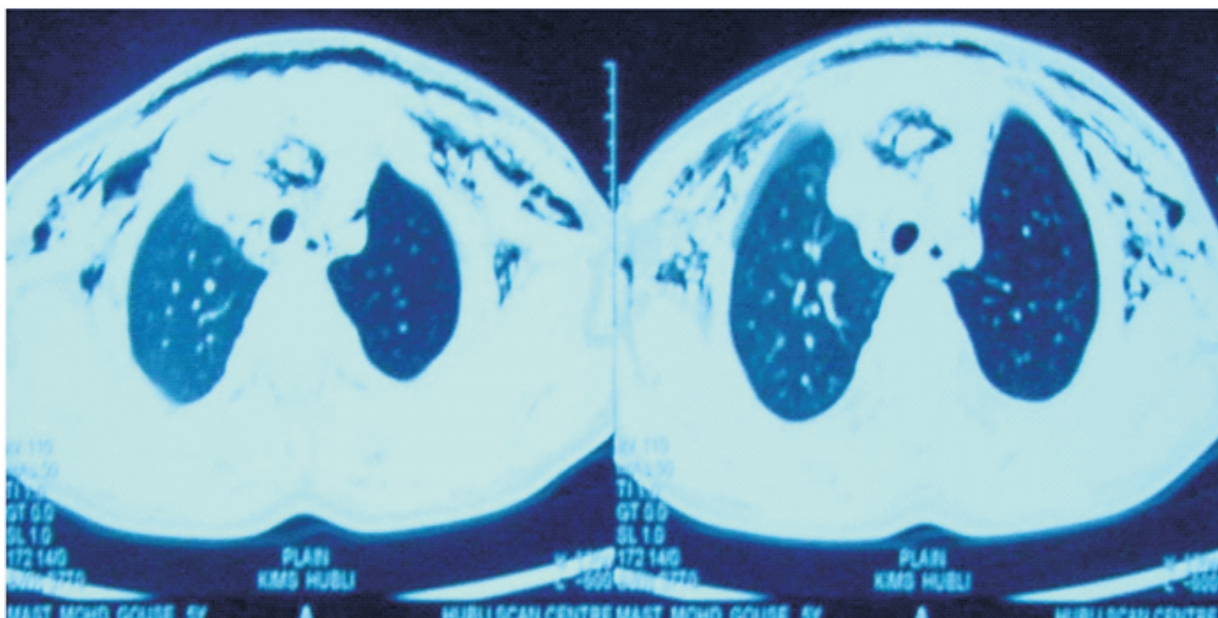


Figure 3. Sub cutaneous emphysema complicating foreign body in left bronchus

References

1. Majori M, Fecci L, Monica M, Casalini AG, Monal DI. Bronchoscopy. Airway Foreign Bodies. Arch Chest Dis. 2011; 75(1):86-8.
2. Mishra A, Shukla GK, Bhatia N. Aerodigestive Foreign bodies. Indian Journal of Pediatrics 2000;67(6):429-33.
3. Banerjee A, Rao KSVKS, Khanna SK, Narayan PS, Gupta BK, Retnam CR et al. Laryngo-tracheobronchial foreign bodies in children. The Journal of Laryngology and Otology.1988; 102:1029-32.
4. Nazar B, Elhassani. Tracheobronchial foreign bodies in the Middle East. ThoracCardiovascSurg 1988; 96:621-25.
5. Blazer S, Naveh Y, Friedman A. Foreign body in the airway. American Journal of Diseases of Children 1980;134:68-81.
6. Kim IG, Bremmit WM, Humphrey A. Foreign body in the airway: a review of 202 cases. Laryngoscope 1973; 83:347-54.
7. Rothmann BF, Boeckman CR. Foreign bodies in the larynx and tracheobronchial tree in children. A review of 225 cases. Ann OtolRhinolLaryngol 1980;89:434-36.
8. Cohen SR, Herbert WI, Lewis GB, Celler KA. Foreign bodies in the airway. Five-year retrospective study with special reference to management. Ann Otol 1980;89:437-42.
9. Brown DA and Clard CM. Inhaled foreign bodies in children. Med J Australia 1983;2:322-26.

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