



ORIGINAL RESEARCH PAPER

ENT

**A RETROSPECTIVE STUDY:
MULTIDISCIPLINARY APPROACH OF FOREIGN
BODY IN AIRWAY FROM 2013 TO 2019 AT A
TERTIARY CARE CENTRE.**

KEY WORDS: Foreign Body, Airway, Bronchoscopy.

Semridhi Gupta

Associate professor, Department of ENT, MDM hospital, Dr. S.N. Medical college, Jodhpur

Diksha Gupta*

Postgraduate, Department of ENT, MDM hospital, Dr. S.N. Medical college, Jodhpur *Corresponding Author

ABSTRACT

Background-To analyse the clinical and radiological presentation of foreign body aspiration in patients reaching a tertiary care centre.

Method-Our study included the patients presented to our institution with suspected foreign body aspiration from November 2013 to July 2019. Data studied were age, sex, site of foreign body lodgement, clinical presentation, radiological features and type of foreign body.

Results-Of 96 children who underwent the rigid bronchoscopy, 86 had foreign bodies in their airways. 63% cases were below the age of 3 years. Vegetative foreign bodies, mainly betel nuts were most commonly found in the patients. 93% patients presented with the history of cough. 39% cases have positive radiological findings. 11% had complications, most common was the laryngospasm. Most of the cases were referred as the diagnosis was missed initially.

Conclusion-It is important for the clinician to have a high suspicion of foreign body aspiration in patients with sudden onset of cough and wheeze without any previous history of asthma, so that timely intervention can be taken which can decrease both the mortality and the morbidity.

INTRODUCTION

Foreign body aspiration is always accidental life threatening condition and needs urgent intervention. It is more frequent in children as their swallowing functions, neurological and dental structures have not developed completely. It can also be found in adults with neurological and muscular diseases, alcohol consumption and head trauma. It is the 4th common accidental cause of death under 3 years of age and 3rd cause of death under 1 year of age.⁽¹⁾

The most common presentation is cough, wheeze, noisy breathing or respiratory distress. Symptoms depends on time since aspiration of foreign body. Delayed symptoms and signs can be confused with those of asthma, and the radiological findings with those of pneumonia. Therefore a prompt management is important in this condition.

In cases with clinical suspicion, rigid bronchoscopy remains both the definitive diagnostic approach as well as a treatment modality.

MATERIAL AND METHODS

This is a retrospective study carried out in the department of otorhinolaryngology, Mathura Das Mathur, hospital, Jodhpur from November 2013 to July 2019. Patients included were

1. Having definite history of foreign body aspiration.
2. Referred from paediatric department and medical department with chronic chest infections not getting relieved even after prolonged treatment.
3. Having suspicion of foreign body aspiration.

Patients were undergone radiological investigations. But few of them who came in respiratory distress with the definite history of foreign body aspiration did not underwent radiological investigations.

RESULTS

In our study, 96 cases underwent rigid bronchoscopy and foreign bodies were found in 86 cases. 60%(58) were male and 39%(38) were female. 63%(61) were below the age of 3years (Table no.1). There were 2 adults in our study with accidental inhalation of betel nut.

Table no.1 (original) Age distribution

Age	Total
<1yr	14(14%)
1-3yr	47(48%)

3-5yr	18(18%)
5-10yr	5(5%)
>10yr	12(12%)

Betel nut constitutes the highest proportion, 46%(40) followed by the groundnut 17%(15). Other foreign bodies found were peanut 12%(12), bengal gram 5%(5), whistle 3%(3), sharpener screw 2%(2), stone 1%(1), tooth 1%(1), pearl 1%(1), paracetamol wrapper pieces 1%(1), watermelon seeds 1%(1) and other organic foreign bodies 3%(3). To our surprise, a big lead pencil of size 5cm was also found in one case. In our study, foreign bodies were found to be lodged in left and right main bronchus with equal proportions, 46%(40) and 45% (39) respectively, 4 (4%) in subglottis and 3 (3%) in right intermediate bronchus.

Cough was found to be the most common presentation in 93% (90) cases followed by breathlessness in 89% (86) cases (Table no.2).

Table no.2 (original) Clinical presentation

Symptoms	Cases
Cough	90(93%)
Breathlessness	86(89%)
Fever	15(15%)
Unconsciousness	2(2%)

35%(34) cases presented along with the complications (Table no.3).

Table no.3 (original) Presentations along with the complications

Complications	Cases
Pneumonia	20(20%)
Subcutaneous emphysema	6(6%)
Pneumothorax	8(8%)

Most of the patients underwent chest x-ray but only 39% (38) cases had the findings suggestive of foreign body aspiration. 60%(58) cases had the negative radiological findings. On physical examination, 52%(50) patients presented with the diminished breath sounds on one side followed by the rhonchi 41%(40), rales 31%(30), intercostal retraction 20%(20), stridor 18%(18) and 14%(14) had equal breath sounds on both sides. After bronchoscopy, 10%(10) patients had laryngospasm and 1%(1) patient had pneumothorax. In our study, out of 96 patients only 11%(11) patients came

directly to the ENT outdoor rest all were the referred cases from other departments. 55% (53) from Paediatric emergency with positive history of foreign body aspiration, 31% (30) from Paediatric department with non-responding chest illness, and 2% (2) from medical department. In our study, there was no mortality.

DISCUSSION

Foreign body aspiration occurs most commonly between 1 and 3 years old. This is because children can't crush peanut, beans and other foods like nuts because of poor chewing function. Most of the children in our study were younger than 3 years (63%) which was similar to study done by Gang.⁽⁶⁾

The ratio of boys and girls ranged from 1.13:1 to 2:1 in previous reports.^(2,3) It was 1.52:1 in our study. Boys inhale foreign bodies more than the girls because they are thought to be more active.

Among aspirated objects, 'food' is the commonest category and betel nuts, are the commonest type of food aspirated. Samarei and Murat found that sunflower seeds to be the most common in their study.^(4,5) In our study, the common type of foreign bodies were betel nuts (46%) and groundnuts (17%).

The triad of wheezing, paroxysmal cough and decreased air entry are highly suggestive of foreign body aspiration, was seen in 28% of our cases as compared to 39% in other study.⁽⁶⁾ In a previous study done by Black, one symptom out of the triad was present in over 96% patients with foreign body aspiration.⁽⁷⁾ In our study, 90% of the patients had at least one of the symptoms present.

Few foreign bodies lodge in the trachea whereas majority are found in the proximal airways. They most commonly locates in the right main bronchus due to its more acute angulation and wider calibre in relation to the rest of the tracheobronchial anatomy.⁽⁸⁾ But in our study foreign bodies were found in both right and left bronchus with almost equal incidences, 46% and 48% respectively. The placement of foreign bodies is laryngotracheal in about 10% in the study done by Tan and Brown.⁽⁹⁾ In our series this rate was only 4%.

Radiologic examination reveals obstructive emphysema, pneumonia, mediastinal swaying, pulmonary atelectasis, mediastinal emphysema and pneumothorax. A previous study done by ChenCH, with an airway foreign body 21% had positive radiological findings.⁽¹⁰⁾ But in our study 39% patients have positive radiological findings. Chest radiograph is normal in as many as 9-30% cases.^(7,11) Radiographs were normal in 60% of our cases. In 2 of our cases these radiological finding were misleading as patients had pneumonia like findings in chest x-rays. These patients underwent rigid bronchoscopy in which no foreign body was found. Later on these were found to be swine flu positive.

Pulmonary infection due to a foreign body aspiration is frequently reported in the literature. As the study done by Hasdiraz et al, pneumothorax was found in 0.2% and pneumomediastinum in 0.1%.⁽¹²⁾ In our study this percentage was high with pneumothorax in 8% of our cases. Subcutaneous emphysema was found in 6% of our cases which can be explained due to rupture of pleural blebs by the pressure exerted by the foreign body.

Foreign body aspiration presents with acute episodes of choking, coughing or wheezing, along with auscultation findings of unilateral abnormal or reduced breath sounds. In the study done by Saki et al, most common clinical presentation was cough in 73% cases whereas in our study it is present in 93% of cases.⁽¹³⁾

Rigid bronchoscopy remains the gold standard for the definitive diagnosis and management of foreign body

aspiration. Its rare but serious complications are upper and lower airway trauma, laryngospasm, bronchospasm and pneumothorax. A recent review by Stahl *et al.* reported complication rates ranging from less than 0.1 to 13%.⁽¹⁴⁾ In our study also, 11% patients had complications. Nowadays, complication rates are decreasing with the advent of endoscopes.

In our study 91% were the referred patients. 86% from the paediatric department and 2% from the medical department. These were the patients who were having chronic chest infections and not getting relief from the treatment and the patients with suspected foreign body inhalation but reached to these departments primarily. In our study, one of the patient was treated for 2 months for the pneumonia in medical ward but did not relieved, rigid bronchoscopy was done and a foreign body (betel nut) was found and removed. Patient immediately got relief after the foreign body removal.

The mortality of airway foreign bodies ranged from 0.21% to 3% according to other studies.⁽¹⁵⁾ It was 0% in our study.

Our study demonstrated positive rigid bronchoscopy findings in 89.6%. 10% of children with clinically suspected foreign body aspiration had normal (negative) bronchoscopies. This is against the current literature, with negative bronchoscopy reported in 25% to 90% of cases.^(16,17) This may be due to the variable indications and referral processes for bronchoscopies in different paediatric hospitals.

Conclusion:

The possibility of an airway foreign body should not be excluded even if the clinical and radiological findings in chest are non-diagnostic, particularly in patients with unilateral wheezing refractory to treatment for new onset asthma, bronchitis or pneumonia. It is recommended that every patient with or without any history of foreign body inhalation having features of chronic cough, wheezing, recurrent chest infections must undergo rigid bronchoscopy.

References:

- Rovin JD, Rodger MB. (2000). Pediatric foreign body aspiration. *Pediatric Review*. 21:86-90. [PubMed] [Google Scholar]
- Gang W, Zhengxia P, Hongbo L et al. (2012). Diagnosis and treatment of tracheobronchial foreign bodies in 1024 children. *J Pediatr Surg*. 47: 2004-2010.
- Latifi X, Mustafa A and Hysenaj Q. (2006). Rigid tracheobronchoscopy in the management of airway foreign bodies: 10 years experience in Kosovo. *Int J Pediatr Otorhinolaryngol*. 70:2055-2059.
- Samarei R. (2014). Survey of foreign body aspiration in airways and lungs. *Glob J Health Sci* 2014; 6: 130-135
- Oncel M, Sunam GS and Ceran S. (2012). Tracheo- bronchial aspiration of foreign bodies and rigid bronchoscopy in children. *Pediatr Int*. 54:532-535
- Denny MK, Berkas EM, Snider TH. (1968). Foreign body bronchiectasis. *Dis Chest*. 53:613-616.
- Black RE, Johnson DG, Matlak ME. (1994). Bronchoscopic removal of aspirated foreign bodies in children. *J Pediatr Surg*. 29:682-684.
- Asmatullah , Inayatullah , Rasool G. (2004). Endoscopic removal of tracheobroncheal foreign bodies at a peripheral hospital. *JPMI*. 8(3):447-452. [Google Scholar]
- Tan HKK, Brown K, Mcgill T et al. (2000). Airway foreign bodies (FB): a 10-year review. *Int J Pediatr Otorhinolaryngol*. 56:91-9. [PubMed] [Google Scholar]
- ChenCH, LaiCL, TsaiTT et al. (1997). Foreign body aspiration into the lower airway in Chinese adults. *Chest*. vol. 112(pg. 129-133) Google Scholar Crossref PubMed
- Wiseman NE. (1984). The diagnosis of foreign body aspiration in childhood. *J Pediatr Surg*. 19:531-535.
- Hasdiraz L, Oguzkaya F, Bilgin M, et al. (2006). Complications of rigid bronchoscopy for foreign body removal: experience in 1,035 cases. *Ann Saudi Med*. 26:283-7. [Crossref] [PubMed]
- Saki N, Nikakhlagh S, Rahim F et al. (2009). Foreign body aspirations in infancy: a 20-year experience. *Int J Med Sci* 6(6):322-328
- Stahl DL, Richard KM, Papadimos TJ. (2015). Complications of bronchoscopy: A concise synopsis. *Int J Crit Illn Inj Sci*. 5:189-95. [Crossref] [PubMed]
- Orji FT and Akpeh JO. (2010). Tracheobronchial foreign body aspiration in children: how reliable are clinical and radiological signs in the diagnosis? *Clin Otolaryngol*. 35:479-485.
- Emir H, Tekant G, Be ik C, et al. (2001). Bronchoscopic removal of tracheobroncheal foreign bodies: value of patient history and timing. *Pediatr Surg Int*. 17:85-7. [Crossref] [PubMed]
- Oncel M, Sunam GS, Ceran S. (2012). Tracheobronchial aspiration of foreign bodies and rigid bronchoscopy in children. *Pediatr Int*. 54:532-5. [Crossref] [PubMed]