

CORRELATION OF OPERATIVE FINDINGS WITH PRE-OPERATIVE CLINICAL SIGNS AND ANALYSIS OF X-RAYS IN PATIENTS WITH AIRWAY FOREIGN BODIES

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Background: Foreign body aspiration is one of the commonly encountered emergencies in ENT and still it remains a significant cause of mortality and morbidity. However with the development of modern endoscopic techniques and controlled anaesthesia, most foreign bodies can be removed safely with a bronchoscope. **Methods:** This study was carried out at Department of ENT, Head and Neck Surgery, Ayub Medical College, Abbottabad from 1st Jan 2003 to 30th June 2005. Total 81 patients were registered in the study. Two patients, in whom the foreign body could not be removed, were excluded from the study. **Results:** The most consistent finding was decreased air entry on chest auscultation on the side of impacted foreign body which was present in 72 (91.1%) patients. The second most consistent finding was audible wheeze on the side of impacted foreign body found in 42 (53.2%) patients. The most common finding on Chest X-ray was emphysema found in 19 (61.3%) patient, followed by atelectasis in 9 (28%) patients while 3 (9.7%) patients had normal Chest x-ray. **Conclusion:** The pre-operative clinical signs in patient with aspirated foreign body give an idea about the site of foreign body in an airway. Although chest x-ray gives an idea about the pathological changes in respiratory tract it has little impact in the management of a patient with aspirated foreign body.

Keywords: Airway, foreign body, chest x-ray

INTRODUCTION

The aspiration of foreign body is one of the most common causes of accidental death in home in children under five years of age.¹ The diagnosis of aspirated foreign body is made on history, physical and radiographic signs and confirmed on bronchoscopy. The high incidence of aspiration of foreign body in early childhood is of course related to the fact that children have the habit of putting objects into their mouth to determine their texture and taste and to chew on when teething.² The right main bronchus is the site of predilection for inhaled foreign bodies.

The signs, symptoms, and outcome after inhaled foreign body depend on the type of inhaled foreign body as well as on the site of impaction of foreign body in the airway. If the foreign body is large enough to nearly completely obstruct the larynx or trachea, asphyxia and subsequent death can occur. Incomplete or partial obstruction can result in less severe signs and symptoms.

The airway foreign bodies are divided into organic and non-organic. Organic foreign bodies cause severe inflammatory reaction in the airway and subsequently to severe sign and symptoms. In case of peanut in the airway, after a latent period of approximately 24 Hours, the patient develops fever and productive cough of purulent sputum. On the other hand non-organic foreign bodies causing partial obstruction of the airway may be tolerated for long period with mild sign symptoms and may lead to formation of granulation tissue after a long period.³

MATERIAL AND METHODS

This study was carried out at Department of ENT, Head & Neck Surgery, Ayub Medical College Abbottabad. The period of study was between 1st Jan 2003 to 30th June 2005. The total number of patients included in the study was 79. All 81 patients with a history of inhaled foreign body coming either directly to ENT Unit or referred from the Paediatric Department because of suspected airway foreign body due to un-resolving lower respiratory tract infection were registered. Only those patients were included for the final analysis in whom the foreign body was retrieved on bronchoscopy. Haematological investigations and chest x-ray was done in those patients only who were stable at the time of presentation.

RESULTS

The most important physical sign which consistently correlated with the site of foreign body was decreased air entry found in 72 patients. The second most common sign was the audible wheeze found in 42 patients. The third sign was cyanosis seen in 5 patients. Most common finding on chest x-ray was emphysema in nineteen patients followed by atelectasis in 9 patients (Table-1-3).

Table-1: Clinical findings of patients

Clinical Findings	Patients	%
Decreased air entry on chest auscultation	72	91.1
Audible Wheeze	42	53.2
Cyanosis	5	6.3

Table-2: Site of foreign body in airway

Site of foreign Body	Patients	Percentage
Right or Left main bronchus	77	97.5
Trachea	1	1.3
Laryngeal inlet	1	1.3

Table-3: X-ray findings of patients

X-ray finding	Patients	Percentage
Emphysema	19	61.3
Atelactasis	9	29.0
Normal	3	9.7

DISCUSSION

Aspiration of a foreign body is an important cause of morbidity and mortality especially in very young children. Diagnosis is sometime missed or made late due to the fact that aspirated foreign body produces subtle signs on examination. However, if present physical findings can help not only in the diagnosis but also give an idea about the site of impacted foreign body in the respiratory tract.

The most important finding in our study was found between the site of impaction of foreign body and decreased air entry on chest auscultation. It was found that out of 77 patients in whom the foreign body was either in right or left main bronchus, 72 (93.5%) had pre-operative decreased air entry on the side of impacted foreign body. Another important finding was pre-operative audible wheeze on the side of impacted foreign body found in 42 (54.5%) patients. However cyanosis was found in only 5 (6.3%) patients. It is due to the fact that cyanosis is more common if the foreign body is large and is in the larynx, trachea or when foreign bodies are bilateral. Partial obstruction of the airway, or peripherally located unilateral foreign bodies usually do not produce cyanosis. Wiseman NE⁴ found that in 72% of his patients the clinical signs correctly revealed the site of impaction of aspirated foreign body. The commonest signs of aspirated foreign body were decreased breath sounds and wheezing.⁵ Audible wheezing was also one of the commonly found physical finding in the study of Burten EM *et al* and Yeh-LC.^{6,7} Therefore it must be remembered that wheeze is one of the important sign in patients with airway foreign body and wheezy chest may not be due to asthma only, especially in 1–2 years old child, and an airway foreign body must also be ruled out.

In our study the chest x-ray was done in only 31 patients. In rest of the patients it was not done because either the history or physical finding were strongly in favour of an airway foreign body or the respiratory distress was so severe that the patient was immediately taken to the operation theatre for emergency bronchoscopy without delay. The most common finding on chest x-ray was emphysema, found in 19 (61.3%) patients, followed by atelactasis in 9 (29%) patient, while 3 (9.7%) patients had normal chest x-ray. The accuracy of diagnosis of foreign bodies by

plain x-ray is about 66%, since only 10% of the airway foreign bodies are radio opaque.⁸ The signs on chest x-ray are the secondary results of airway obstruction, rather than direct visualisations of the foreign body.⁹ Finding in chest x-ray are emphysema, atelactasis, infiltrates and occasionally a radio-opaque foreign body. Emphysema is due to partial obstruction of the airway leading to air trapping while atelactasis is due to total obstruction of the airway. Schmidt while reviewing the data of children with foreign body aspiration noted that 84% of the children had pathologic chest x-rays.¹⁰ The study of Yeh LC showed that the most obvious radiological evidence of airway foreign body was emphysematous change at the same side of the foreign body caused by expansile ‘Check Valve’ phenomenon.⁷ An interesting observation was made by Baharaloo F *et al* who noted that atelactasis was more common in adults while emphysema was more common in the children after foreign body aspiration.¹¹ But it must be remembered that a normal chest x-ray does not rule out airway foreign body. Three (9.7%) patients in our study had normal chest x-ray. Various studies have reported an incidence of 6–80% for normal radiograms with airway foreign bodies.^{4,8,9} One of the factor which is associated with normal x-ray finding is early diagnosis. In a large series, 33% of those diagnosed early had normal x-rays while only 9% had normal x-rays who were diagnosed late.⁴ Wagner MH found that only 5% of those diagnosed after 30 days had a normal chest x-ray.⁸ Normal chest x-ray may also be found if the foreign body is above the carina or in case of bilateral foreign bodies when the changes on x-ray may be slight and symmetrical.^{8,9} Beside the normal Chest x-ray (false negative) despite the foreign body in the airway, other diagnostic pitfalls exist. A false positive x-ray was seen in about 33% of children in whom no foreign body was found on bronchoscopy.⁸

A very useful and accurate imaging modality is the high resolution CT scan which may not only show the air trapping but may also visualise the foreign body.

CONCLUSION

It was concluded that preoperative physical signs in patients with airway foreign body are significant not only because they help in the diagnosis but also give an idea about the site of impacted foreign body. Chest x-ray has little significance in the overall management of a patient with airway foreign body.

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