

## Foreign Body Bronchus in Adult Presenting as Pneumothorax

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**ABSTRACT:** Aspiration of foreign body is relatively uncommon in adults. Foreign body aspiration presenting with pneumothorax is even rarer and pose an interesting dilemma both in diagnosis and management. Bronchoscopy with Venturi type injector can increase the pneumothorax which may be life threatening. We present a rare case of foreign body aspiration in an adult female presented with sign and symptom of pneumothorax. Clinical record and literature reviewed.

**KEY WORDS :** Foreign body, Bronchus, Adult, Pneumothorax.

**INTRODUCTION :** Aspiration of foreign bodies is a common phenomenon in children, however, it is comparatively rare in adults. A high index of suspicion is required for correct diagnosis of the condition. Only 77 cases of foreign body aspiration over a period of 20 years has been reported<sup>1</sup>. The patients of tracheobronchial foreign body with pneumothorax pose a dilemma and challenge, both in diagnosis and management. Mild to moderate pneumothorax may not be even evident on plain radiograms. The classic finding of pneumothorax is to look for peripheral lung margin with lucency between lung margin and chest wall. Mediastinal shift may be seen in massive and tension pneumothorax<sup>2</sup>. During bronchoscopy under general anaesthesia using Venturi type injector for positive pressure ventilation, great care has to taken since the positive pressure during ventilation can increase the pneumothorax and there is a high risk of progression to tension pneumothorax<sup>2,3</sup>. Tension pneumothorax is life threatening as it can cause massive collapse of the lung parenchyma and the increased pressure can affect the cardiovascular structures including tamponade of the mediastinal structures and kinking of the vessels at the point of entry in thorax.

**CASE REPORT :** A 35 year old female presented to the ENT department with complaints of coughing and chest pain on right side since six months and difficulty in breathing since 6 days. X-ray chest showed a sail shaped opacity silhouetting the right cardiac border and medial half of the dome of diaphragm along with curvilinear zone of hyperlucency extending costophrenically in mid and upper lung fields (Fig-1). ECG was normal. CT scan of thorax showed hyperattenuating intraluminal lesion in right lower lobe and collapse consolidation of postero basal segment of right lower lobe with mucous impaction in dilated bronchus with positive CT arteriogram (Fig-2). Sub pleural bullae in right upper and mid zone and free intraluminal air were also seen (Fig-3). A diagnosis of foreign body bronchus was made. Attempts to remove

the foreign body with flexible bronchoscope were not successful. A 7mm rigid bronchoscope was introduced under general anesthesia. All preparations were made for intercostal drainage tube insertion. Tension pneumothorax develop intra-operatively because of positive pressure mechanical ventilation. Foreign body (supari) was seen in right bronchus and after numerous attempts dislodged and removed in pieces (Fig-4). Post-operative recovery was uneventful and patient was discharged in satisfactory condition. No intercostals tube insertion was required.

**DISCUSSION :** Gustav Killian reported the first case of bronchoscopic removal of foreign body from the trachea in 1897<sup>4</sup>. Zavala and Rhodes demonstrated the use of flexible bronchoscope to remove the foreign body in artificial lungs and animals<sup>5</sup>. Foreign body inhalation is very common in the part of Western Rajasthan because of the rampant habit of chewing betel nut. People go to sleep with the betel nut in their mouth and accidentally inhale it. The sudden choking and bouts of coughing are forgotten after a few months and so long standing forgotten foreign bodies in tracheobronchial tree are common. Factors predisposing to foreign body inhalation includes dental and medical problems (60%), neurological problems (19%), excessive alcohol or sedative intake (10%)<sup>6</sup>. No such predisposing factor was seen in our case. The majority of cases of foreign body aspiration are seen in children between 1-2 years<sup>7</sup>. Foreign bodies in adults are even more uncommon. Moura et al<sup>1</sup> saw only 76 cases of F.B aspiration in adults over a period of 20 years. Tracheobronchial foreign body presenting with pneumothorax are very rare. Retrospective analysis of 76 patients of tracheobronchial foreign bodies in our institute over a period of 2 years (Jan2005-Dec2006) did not reveal a single case presenting with pneumothorax. Liancai et al evaluated 343 cases of tracheobronchial foreign bodies and found that the most common radiological findings included obstructive emphysema (62%), mediastinal shift (55%), pneumonia (26%), atelectasis (18%). No case of

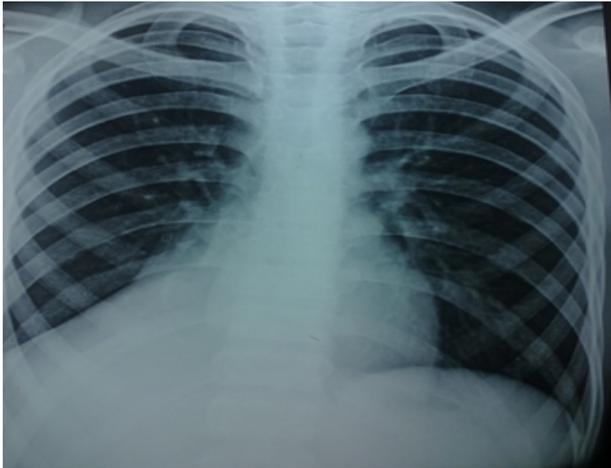


Fig-1: Plain X-ray chest showing collapsed (Rt) lung.



Fig-2: CT scan chest show hyperattenuating intraluminal foreign body and collapsed consolidation of right lower lobe.

pneumothorax was seen in this series<sup>8</sup>. Kim et al observed no case of pneumothorax in their radiological finding of 180 cases of tracheobronchial foreign bodies<sup>9</sup>. Danniilidis et al found no case of pneumothorax in a review of 90 cases of endobronchial foreign bodies<sup>10</sup>. Agarwal et al reported a case of subcutaneous emphysema due to smooth foreign body bronchus<sup>11</sup>. The imaging studies include lateral view of soft tissue of the neck, Chest radiographs (P-A View & lateral view). Radiopaque foreign bodies are easy to diagnose but with radiolucent foreign bodies, secondary radiographic signs such as obstructive emphysema, atelectasis, pneumonia, mediastinal shift help in diagnosing the foreign bodies. CT scan has been used to demonstrate the radiolucent foreign bodies. In addition to demonstrating the other features such as collapse etc., the CT scan can demonstrate the intraluminal foreign body<sup>11</sup>. CT scan should be considered if radiographs are not conclusive in cases

of occult foreign bodies<sup>11</sup>. However, any pathology such as neoplasm, mucous plug etc which can obstruct the lumen of bronchus can mimic the foreign body. In our case, the CT scan was of immense help not only in localizing the foreign body but also in demonstrating the collapse and pneumothorax. MRI has been advocated for diagnosis of the foreign bodies specially peanuts but their cost is prohibitive<sup>12-14</sup>. Treatment is removal by bronchoscopy. Loo et al used flexible bronchoscope and only if they were unable to remove the foreign body with the flexible bronchoscope, they use rigid bronchoscope. They were able to remove the foreign body with flexile bronchoscope in 3 cases (50%). Rest 3 (50%) were removed with rigid bronchoscopy<sup>4</sup>. Rigid bronchoscopy is the gold standard for removal of the foreign bodies. It has the advantage of a larger working channel and use of variety of rigid forceps. The rigid forceps allow a better grip, pulling as well as rotating the foreign body especially in an impacted

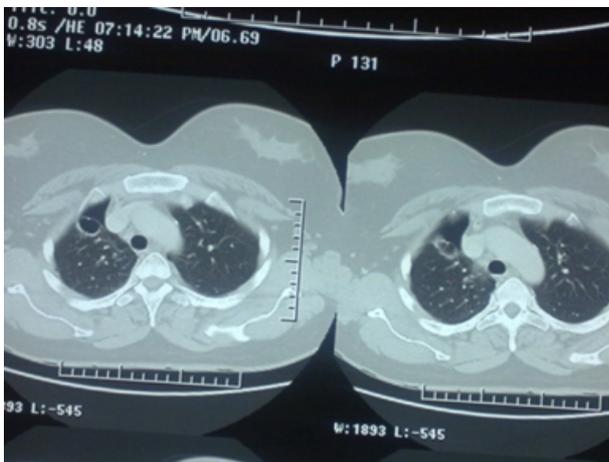


Fig-3: CT scan chest with sub pleural bullae in right upper and mid zone.



Fig-4: Foreign body removed in pieces by rigid bronchoscopy.

one. Limper and Prakash noted a higher success rate with rigid bronchoscopy (98%) as compared to Flexible bronchoscopy (60%)<sup>6</sup>. Advantages of flexible bronchoscopy are that it can be done under local anaesthesia, in cases where foreign bodies are located too distally and so are out of reach of rigid bronchoscope and in cases of cervical instability. Pneumothorax in our case can be explained by the presence of the multiple bullae in the lung parenchyma which may have ruptured during the violent bouts of coughing. The obstruction of the bronchus creates an ball valve mechanism which allows for ingress of air but no egress during exhalation causing increase in the pressure in the alveoli. This may have caused some of the weakened bullae to leak. Not all pneumothorax require specific therapy. Small asymptomatic or mildly symptomatic cases may resorb spontaneously. Chest tube drainage is only required in cases of large pneumothorax.

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