

# Foreign body presenting as a persistent lung infiltrate

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## Abstract

Complete clinical history and a high index of suspicion is the mainstay for the diagnosis and management of foreign body aspiration. Radiographic imaging can often detect the presence of a foreign body even when there is no clinical suspicion. In the case presented here, computerized chest tomogram (CT) played an important role in the detection of an intra bronchial radio-opaque foreign body which was not visible on plain chest roentgenogram (CXR). CT was also useful in demonstrating patency of the airway after bronchoscopic removal of the foreign body.

## ABBREVIATIONS

Computed tomogram =CT

Chest roentgenogram = CXR

Fiberoptic bronchoscopy= FOB

Foreign body= FB

Right lower lobe=RLL

## INTRODUCTION

Endobronchial foreign bodies usually result from the aspiration of oropharyngeal material into the lower respiratory tract. Foreign body (FB) aspiration is a frequent and life-threatening condition in children. But they are being seen and recognized with increasing frequency in adults and if removed, can lead to dramatic resolution of associated atelectasis and post-obstructive pneumonia. On occasion, the aspirated foreign body is not visible on CXR and the CT scan may provide the first clue towards the presence of an aspirated FB in the tracheo-bronchial tree.

## CASE REPORT

51 years-old man, with past medical history of hypertension, diabetes mellitus and gouty arthritis, presented in August 2007 with intermittent fevers, chills and cough productive of brownish sputum since five months. He had quit smoking a few years ago. Physical examination was essentially unremarkable except for rales over the right lower lobe.

The initial laboratory tests (cell blood count and complete metabolic profile) were normal. The CXR revealed a right lower lobe (RLL) infiltrate with silhouetting of the lateral aspect of the right hemi diaphragm. (Figure 1).

{image:1}

{image:2}

The patient was admitted to the hospital and treated for seven days with ceftriaxone and azithromycin for community acquired pneumonia. His respiratory symptoms improved and he was discharged. Two and a half months later, he presented to the pulmonary clinic complaining of persistent productive cough and sputum. Examination revealed localized wheezes and scattered crepitations over the right lung base. CXR showed persistent right lower lobe infiltrate and chest CT revealed a radio opaque foreign body in the right bronchus intermedius with RLL infiltrates. (Figures 2 and 3).

{image:3}

{image:4}

On further questioning patient stated that few months prior to the initial presentation, he had choked on a fish bone, but ignored it, because he felt better after coughing.

Patient underwent FOB for inspection and possible FB removal under general anesthesia. Inspection revealed yellowish secretions, which cleared after suctioning, revealing a fixed foreign body in right bronchus intermedius, surrounded by granulation tissue. (Figure 4).

{image:5}

The foreign body was later removed successfully with the forceps and snare and was identified as a fish bone. When

seen a month later, he was feeling better, cough had improved, and on auscultation good breath sounds were heard over RLL without any wheezing or crepitations. Follow up CT scan showed a patent airway without the FB. (Figure 5)

{image:6}

{image:7}

### DISCUSSION

Endobronchial foreign bodies are being seen with increasing frequency in adults and are very often unsuspected as they may be difficult to diagnose without the appropriate imaging. Amongst adults, aspirated foreign bodies are found more commonly in patients with a predisposition to aspiration. Conditions such as mental retardation, psychosis, a history of intravenous drug use, alcoholism and neurological disorders result in a reduced level of consciousness or impaired swallowing. Foreign bodies in the airways may also occur due to ingestion, inhalation, or due to penetrating lung injuries. The aspirated material may differ according to lifestyle and eating habits. In children, nuts especially peanuts are the most commonly seen FB. In adults, besides nuts and vegetable matter, other FBs such as fish, chicken bones, and teeth have been reported.<sup>123</sup> The mean time to diagnosis was significantly shorter in the children than in the adult group and hence the presentation is usually more acute in children. In one report, only 12% of adults with non asphyxiating FB aspiration presented within a week of the incident. In patients with delayed presentation, the FB appears to have been present approximately 25 months <sup>4</sup>.

Depending on where the FB lodges, ie the lobar or segmental bronchus, the clinical picture may vary in severity. Symptoms may be trivial and chronic nonspecific symptoms mimicking other lung diseases such as bronchial asthma, obstructive pneumonitis or lung abscess. If the foreign body is not removed, then more persistent findings may be seen such as atelectasis, post obstructive pneumonia, bronchiectasis, or lung abscess, and/or emphysema. Significant tissue reaction with inflammation is commonly seen in the delayed cases at bronchoscopy.

Chest radiography and chest CT are the initial diagnostic tools used to evaluate the clinical condition. Depending on the size and location of the FB the CXR picture may vary. During the acute stage, the chest radiographic signs may include hyperinflation due to a ball-valve phenomenon,

volume reduction with atelectasis, and occasionally a radiopaque FB may be seen. Atelectasis is seen considerably more commonly in adults, occurring in approximately 50% of patients. The majorities of inhaled foreign bodies are radiolucent and can be seen on the plain chest radiograph <sub>5</sub>

The occurrence of normal radiographs with FB aspiration reported in the literature varies from 8% to 80%, depending on the study and the location of the foreign body. Chest CT is often used in the diagnostic work-up of patients with unresolved pneumonia to rule out bronchiectasis, neoplasia, empyema, and persistent atelectasis and may reveal a FB as the cause.. CT is helpful in demonstrating the presence of radiolucent foreign bodies and determining the exact location of the foreign bodies within the airways or lung parenchyma. Thin-section or helical chest CT images are particularly valuable in assessing the morphology of calcified or ossified endobronchial lesions and in the identification of FBs. Virtual Bronchoscopy has not been found to be adequate to evaluate endobronchial lesions beyond the mainstem bronchi <sub>5</sub>

Many techniques have been used to remove FBs from the bronchial tree. As early as 1897, Gustav Killian described removal of a foreign body using a rigid bronchoscope. Until then, removal of foreign body was done by direct trans-thoracic approach and was associated with considerable mortality. More recently, flexible fiberoptic bronchoscopy and rigid bronchoscopy have been widely used for foreign body removal, with a mortality of less than one percent.<sup>78910</sup> Tools such as the Wire basket, claw, forceps, (cup forceps or alligator forceps), loop, hooks, electromagnet, Nd-YAG laser, snare device, and the Fogarty balloon catheter are helpful in the successful removal of FBs lodged in the airway. With the right tools and a competent bronchoscopist FOB is a safe procedure. It must be emphasized however that these tools must be available at hand when performing FOB to confirm the presence of a FB. Successful removal of a FB was reported using steerable hydrophilic guidewires and snares by interventional radiology <sub>11</sub>

Although various retrieval instruments are available, the advantages of one over another depend on the size, location and type of material aspirated <sub>12</sub>.. In adult patients, a flexible bronchoscope has many advantages over a rigid bronchoscope in the initial diagnosis and management of a foreign body. It is less invasive, safe, and allows more distal and thorough inspection and can be performed with local anesthesia <sub>12</sub>. The success rate of the flexible bronchoscope

in removing foreign bodies can be as high as 100% in experienced hands. If unsuccessful, FOB may be repeated or other alternatives such as rigid bronchoscopy, or surgery could be undertaken depending on the nature of foreign body and patient's condition. Thoracotomy is generally reserved as a last resort due to the inherent risks of the procedure. In difficult cases high kilo voltage radiography, fluoroscopy, xeroradiography and even nuclear scanning have been used to locate the foreign body that remains undetected.

## **CONCLUSION**

Careful clinical history and a high clinical index of suspicion are often required to diagnose tracheobronchial aspiration of a foreign body. Occult foreign body aspiration in adults may remain undetected for years and lead to erroneous clinical diagnoses. Foreign bodies can be usually removed by FOB once discovered, leading to immediate and dramatic resolution of symptoms. With the right retrieval tools and in experienced hands FOB can be very successful. At the very least an inspection will aid in locating the FB and plans can be made for successful extirpation. When a suspected foreign body is not seen on a plain CXR, then a CT scan of the chest must be done to look for other clues. The case presented here, demonstrates the usefulness of CT scan when the plain radiograph fails to demonstrate a FB. CT scan due to its superior contrast resolution and cross sectional capability is an ideal investigation in this difficult group of patients<sup>13</sup>. Though CT scan is not recommended as a routine in the diagnosis of tracheobronchial foreign bodies, it should be done in the more difficult cases with unequivocal findings. CT is extremely valuable in localizing

a foreign body and guiding efforts at removal by fiberoptic bronchoscopy.

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