A Pea in a Peculiar Place: Unusual Case of Left Upper Lobe Bronchial Foreign Body

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Introduction

Foreign body aspiration (FBA) is common at both extremes of age and is a potentially life-threatening event(1). Advanced age, alcohol intoxication, psychiatric illness, seizure disorders, stroke, neuromuscular disorders, sedative or hypnotic drugs, and chronic debilitating conditions predispose the elderly to FBA(2). Common foreign bodies (FBs) aspirated include metallic objects, organic substances, dentures, chicken or fish bones, and peas(3). FBA in the elderly poses a diagnostic and therapeutic challenge due to several factors. These include the masking of respiratory symptoms post-aspiration, atypical imaging findings, the patient's inability to recall the aspiration event, and the challenges encountered during bronchoscopy(4). FBA usually follows a choking event, often during feeding. The patient might present with dyspnea, hemoptysis, cough, a fall in oxygen saturation, anxiety, etc.(5). The signs and symptoms depend on the size of the foreign body and the level of obstruction. Small objects lodged in distal airways seldom produce acute symptoms, while the opposite is true for larger FBs lodged in larger airways. Stridor is present if FBs are lodged in trachea(6). FBA results in collapse/hyperinflation of lungs aerated by the airway. If there is chronic obstruction, obstructive pneumonia, bronchiectasis, and lung abscess can develop(2). FBs generally lodge in the right middle and lower lobe bronchi(4). FBA causing acute airway obstruction and respiratory failure requiring urgent intervention.

Clinical History

We report a case of a 91-year-old male with paraparesis of the left half of the body due to a right middle cerebral artery territory stroke that occurred 5 years ago. The patient was in a debilitating state and had been experiencing significant health challenges. He complained of a choking episode during feeding while in the recumbent position. Subsequently, he experienced severe symptoms, including tachypnea, dry cough, tachycardia, and an inability to speak. On physical examination, his respiratory rate was notably high at 35 breaths per minute. The rest of his vital signs were stable, although his blood pressure was mildly elevated at 150/90 mm Hg. Despite these issues, there were no other immediate signs of distress.

Differential Diagnosis

On the basis of history and clinical examination, following differential diagnosis were considered.

1. Foreign body aspiration
2. Pneumonia
3. Congestive cardiac failure
4. Myocardial Infarction
5. Stroke

Investigations

The arterial blood oxygen saturation was 93%. Arterial blood gas analysis was normal, and blood and urine investigations showed essentially normal results. Electrocardiography was normal. Suspecting foreign body aspiration (FBA), a high-resolution computed tomography (HRCT) of the chest was conducted, which revealed the presence of an oval, relatively dense object measuring approximately 8 x 7 mm, likely causing partial obstruction of the bronchus (**Figure 1A**). Additionally, there was partial atelectasis of the left upper lobe, with the rest of the lungs showing mild emphysematous changes (**Figure 1B**).

Treatment and Outcome

The patient was counseled about his condition and advised to undergo bronchoscopic removal of the foreign body. Flexible bronchoscopy confirmed the diagnosis made on HRCT chest, revealing a yellow oval foreign body in the left upper lobe bronchus (**Figure 2A**). Using alligator tip forceps, the foreign body, identified as a pea, was successfully retrieved (**Figure 2B**). No other abnormalities were detected during bronchoscopy. The patient showed significant clinical improvement following the procedure, with oxygen saturation reaching 98%. Additionally, he regained the ability to speak with natural tone and strength. A repeat HRCT chest performed the following day showed the absence of the foreign body in the left upper lobe bronchus (**Figure 3A**) and revealed proper inflation of the left upper lobe (**Figure 3B**). The successful retrieval and subsequent recovery underscored the effectiveness of the bronchoscopic intervention.

Discussion

In 1897, Gustav Killian achieved a historic milestone by successfully extracting a tracheo-bronchial foreign body using an esophagoscope, removing a chicken bone lodged in the right main bronchus (7). This groundbreaking procedure led to the development of the rigid bronchoscope, which revolutionized medical practices by significantly reducing mortality and morbidity associated with foreign body aspiration (FBA). The advent of the rigid bronchoscope allowed for more precise and less invasive removal of foreign bodies from the airways, paving the way for safer and more effective treatments. Subsequently, in 1970, the discovery of the flexible bronchoscope further advanced FBA management, becoming the primary tool for extracting foreign bodies in adult airways and those lodged in distal airways (6). The flexible bronchoscope's versatility and ease of maneuverability made it a valuable addition to the arsenal of medical tools for airway management.

Despite these advancements, the rigid bronchoscope continues to play a crucial role, particularly in treating children and dealing with foreign bodies located in proximal airways (8). Flexible bronchoscopy typically involves conscious sedation, making it less invasive and more comfortable for patients, while rigid bronchoscopy often requires general anesthesia due to its more invasive nature. This distinction is important in clinical decision-making, as the choice of instrument can depend on the patient's condition, the location of the foreign body, and the patient's age.

Elderly patients often do not provide a history of FBA, complicating diagnosis. FBA is slightly more common in males, with the average age of occurrence typically ranging from 50 to 60 years (9). Iatrogenic procedures such as tooth extraction and tracheostomy, as well as traumatic airway events, are also associated with FBA (10). Foreign bodies tend to lodge in the right bronchial tree, particularly favoring the bronchus intermedius and basal segments (5). However, as observed in our case, foreign bodies can also be found in the left bronchial tree. Foreign bodies in the left upper lobe are relatively uncommon, possibly explained by the patient's recumbent position during feeding and left-sided hemiparesis.

Chest X-ray (postero-anterior and lateral) is often the initial investigation in suspected FBA, although its sensitivity is limited. However, it can accurately locate metallic and other dense foreign bodies in proximal airways. High-resolution CT (HRCT) of the chest is the preferred imaging modality for organic and radiolucent foreign bodies (5). Both chest X-ray and CT demonstrate secondary changes associated with FBA, such as collapse, consolidation, hyperinflation, bronchial stenosis, and bronchiectasis. Radiolucent foreign bodies, especially those chronically impacted, can be challenging to detect, even with CT imaging (7). Therefore, secondary signs like obstructive pneumonia, focal bronchiectasis, and segmental atelectasis should

provide hints to the possibility of a chronically impacted foreign body (9). Early detection and appropriate management are crucial to preventing complications and ensuring successful removal of the foreign body.

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Author Contributions

Prajwal Dahal: Conceptualization, manuscript writing, supervision.

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Sabina Parajuli: Software, manuscript writing.

Natasha Dhakal: Manuscript writing

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Figure Legends

Figure 1: Figure 1A, an axial CT section in the mediastinal window reveals an 8 x 7 mm hyperdense foreign body (yellow arrow) at the left upper lobe bronchus. Figure 1B, a coronal CT section in the lung window, shows an oval-shaped foreign body (yellow arrow) in the same location. Additionally, there's partial atelectasis of the left upper lobe (red arrow) and mild emphysematous changes in the left lower lobe (blue arrow).

Figure 2: Figure2A, is an image taken during bronchoscopy. A yellow colored, round foreign body is lodged in the left upper lobe bronchus. Figure 2B, photograph of the foreign body extracted after bronchoscopy. It is a pea measuring approximately 7 x 8 mm size.

Figure 3: Figure 3A: Axial CT section in lung window at the level of left upper lobe bronchus. The foreign body is not present. Left upper lobe is inflated (red arrow). Figure 3B: Coronal CT section in lung window at left upper lobe bronchus level. The foreign body is not visualized. Left upper lobe is inflated (red arrow).