

CASE REPORT

A pea in a peculiar place: Unusual case of left upper lobe bronchial foreign body

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Key Clinical Message

Foreign body aspiration is common in old age, sometimes lodged in unusual locations like the left upper lobe bronchus when aspiration happens in a recumbent position. Computed tomography is the preferred diagnostic tool, while flexible bronchoscopy is effective for removing the foreign body.

Abstract

Tracheo-bronchial foreign body aspiration (FBA) is common in children and elderly, but often goes unnoticed due to vague symptoms and atypical imaging findings. We present a case of aspiration of pea in elderly presenting with acute symptoms. Computed tomography (CT) revealed an atypical site of foreign body (FB), that is left upper lobe bronchus and immediate removal of the FB was done using a flexible bronchoscope. The symptoms subsided after removal of the FB. Missed FBs can lead to chronic issues like pneumonia and airway obstruction. Advanced age, psychiatric illness, stroke, seizure disorder, and neuromuscular disease increase the risk of aspiration in older adults. Commonly, FBs get lodged in the right middle and lower lobes after aspiration due to vertical orientation of the airways. CT is a helpful tool for diagnosis of FBA and flexible bronchoscopy is effective in removal of the FB in elderly.

KEYWORDS

aspiration, bronchoscopy, computed tomography, foreign body

1 | 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

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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 (FB) 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. The current clinical practice is to diagnose FBA in flexible bronchoscopy and use rigid bronchoscope to extract the FB. But our experience in this case is to use a high-resolution computed tomography (HRCT) of the chest to diagnose FBA and use flexible bronchoscope to extract the FB. Rigid bronchoscope can be kept as a backup.

2 | CLINICAL HISTORY

We report a case of a 91-year-old male with hemiparesis of the left half of the body due to a right middle cerebral artery territory stroke that occurred 5 years ago. He was a known case of diabetes mellitus and hypertension under medication for 30 years. The patient was also treated for rheumatic heart disease 40 years back. His swallowing function was normal for age. He complained of a choking episode while being fed a solid food (samosa with pea curry) in a recumbent position. Subsequently, he experienced severe symptoms, including tachypnea, dry cough, tachycardia, and an inability to speak. He was brought to emergency

department of our hospital within 30 min of choking. On physical examination, his respiratory rate was notably high at 35 breaths/min and pulse rate was 140 beats/min. His blood pressure was mildly elevated at 150/90 mmHg, temperature 97.9°F. The buccal mucosa was mildly dry. On auscultation, breath sound was decreased in left supra mammary and supra scapular region. Rest of systemic respiratory examinations including inspection, palpation, and percussion were unremarkable. Other systemic examinations were normal except mild weakness in left half of body. A 16-gauge intravenous cannula was inserted in antecubital vein and a ringer lactate drip was started. Supplemental oxygen was started at 1 L/min with a nasal prong.

3 | 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

4 | INVESTIGATIONS

The arterial blood oxygen saturation was 93%. Arterial blood gas analysis was normal, and blood investigation showed essentially normal result. Electrocardiography was normal. A plain chest radiograph was taken which

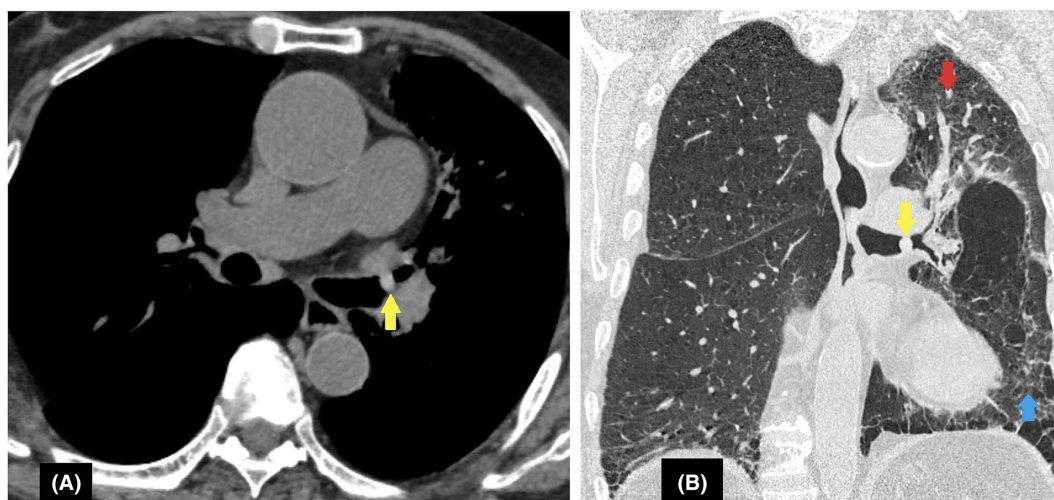


FIGURE 1 (A) An axial computed tomography (CT) section in the mediastinal window reveals an 8 × 7 mm hyperdense foreign body (FB) (yellow arrow) at the left upper lobe bronchus. (B) A coronal CT section in the lung window, shows an oval-shaped FB (yellow arrow) in the same location. Additionally, there is partial atelectasis of the left upper lobe (red arrow) and mild emphysematous changes in the left lower lobe (blue arrow).

showed mild haziness in left upper zone. Suspecting FBA, a HRCT of the chest was conducted, which revealed the presence of an oval, relatively dense object measuring approximately 8×7 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).

5 | TREATMENT AND OUTCOME

Blood pressure was checked after half an hour which was normal (126/78 mmHg), hence no drug was required for it. The patient party was counseled about the condition and advised to undergo bronchoscopic removal of the FB. Flexible bronchoscopy confirmed the diagnosis made on HRCT chest, revealing a yellow oval FB in the left upper lobe bronchus (Figure 2A). Using alligator tip forceps, the FB, identified as a pea, was successfully retrieved (Figure 2B). No other abnormalities were detected during bronchoscopy. No complications occurred 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 FB in the left upper lobe bronchus (Figure 3A) and there was proper inflation of the collapsed left upper lobe (Figure 3B). The successful retrieval and subsequent recovery underscored the effectiveness of the bronchoscopic intervention. Patient party was educated about strategies to prevent aspiration in future. The strategies were to feed the patient in upright position, soften solid food, thicken liquid food, feed in small bite and sips, feed slowly, create calm and focused environment during feed, and maintain

good oral hygiene. Blood pressure of the patient was normal after removal of the FB. The patient is in routine follow up for diabetes mellitus and hypertension. Physiotherapy was advised for left sided hemiparesis.

6 | DISCUSSION

In 1897, Gustav Killian achieved a historic milestone by successfully extracting a tracheo-bronchial FB 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 FBA. The advent of the rigid bronchoscope allowed for more precise and less invasive removal of FBs 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 FBs 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 FBs 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 FB, and the patient's age.

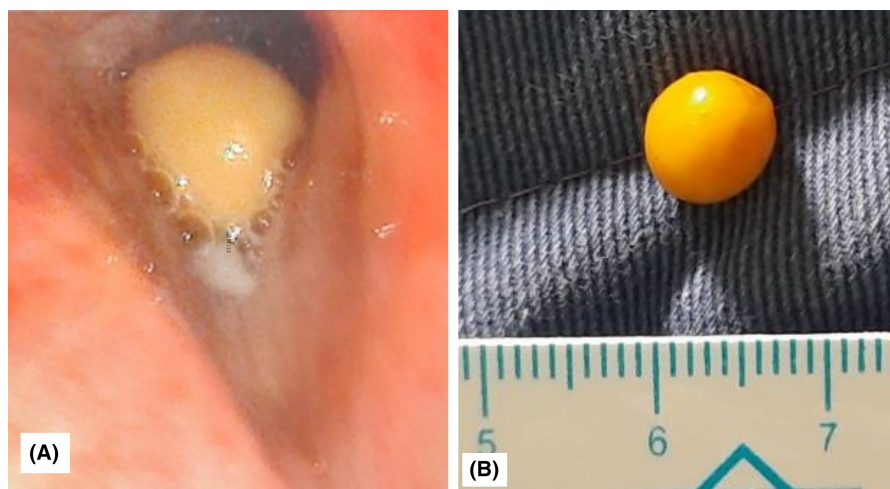


FIGURE 2 (A) Image taken during bronchoscopy. A yellow colored, round foreign body (FB) is lodged in the left upper lobe bronchus. (B) Photograph of the FB extracted after bronchoscopy. It is a pea measuring approximately 7×8 mm size.

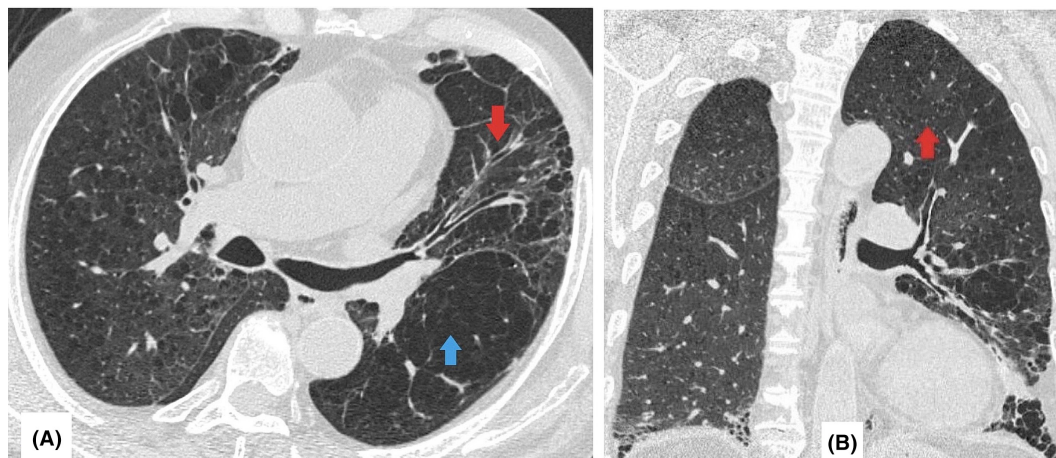


FIGURE 3 (A) Axial computed tomography (CT) section in lung window at the level of left upper lobe bronchus. The foreign body (FB) is not present. Left upper lobe is inflated (red arrow). (B) Coronal CT section in lung window at left upper lobe bronchus level. The FB is not visualized. Left upper lobe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

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 FBs tend to lodge in the right bronchial tree, particularly favoring the bronchus intermedius and basal segments.⁵ However, as observed in our case, FBs can also be found in the left bronchial tree. FBs 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 FBs in proximal airways. HRCT of the chest is the preferred imaging modality for organic and radiolucent foreign bodies.⁵ Both chest x-ray and computed tomography (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 FB.⁹ Early detection and appropriate management are crucial to preventing complications and ensuring successful removal of the FB.

The risk factors for FBA in our patient was old age, history of stroke, poor oral hygiene, and hemiparesis in left half of the body. No other predisposing factors like alcohol intoxication, psychiatric illness, seizure disorder, altered sensorium, impaired cough/swallow reflex were present. No other similar choking episodes occurred in the past. Cátia et al.⁵ reported a case similar to ours in

which a 78-year-old gentleman aspirated a drug tablet in the left main bronchus. The diagnosis was confirmed by flexible bronchoscopy, and the FB was extracted using a rigid bronchoscope. Reddy et al.² reported a case of a 42-year-old man with a chronically retained FB (a piece of an aluminum beverage container) in the left main stem bronchus. In this case, the diagnosis was also made using a flexible bronchoscope, and the FB was retrieved using a rigid bronchoscope. In our case, we confirmed the diagnosis with HRCT chest and used a flexible bronchoscope to retrieve the FB. Ma Weijun et al.⁷ conducted a study in which they described the use of flexible and rigid bronchoscopy for removing FBs in adults. Out of a total of 57 patients, flexible bronchoscopy was used in 40 patients. However, in 17 patients, flexible bronchoscopy failed, and a rigid bronchoscope was used for retrieval of the FB. The authors recommend flexible bronchoscopy as the first-line tool for the extraction of FBs in adults and to keep a rigid bronchoscope as a backup. We treated our patient using flexible bronchoscope.

7 | CONCLUSION

The diagnosis of FBA is challenging in the elderly due to vague symptoms. HRCT of the chest should be considered the mainstay of investigation in suspected FBA. Flexible bronchoscopy is helpful for the extraction of the FB. Discussing strategies to prevent aspiration in the future is also important in the management of the patient.

AUTHOR CONTRIBUTIONS

Prajwal Dahal: Conceptualization; resources; writing – original draft; writing – review and editing. **Ravi Mahat:** Investigation. **Sabina Parajuli:** Software; writing – review

and editing. **Natasha Dhakal:** Writing – review and editing.

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None.

CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest regarding the publication of this paper.

DATA AVAILABILITY STATEMENT

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

ETHICS STATEMENT

The need for ethical approval was waived and consent from patient's guardian was deemed sufficient.

CONSENT

A written consent was obtained from the patient's father (since patient was a minor) for publication of the case report and accompanying images. A copy of written consent will be available for review by the editor-in-chief of this journal if requested.

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