

Acute-onset Breathlessness: An Unexpected Etiology?

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ABSTRACT

Acute-onset breathlessness has multifactorial causes where early spotting of etiology assists in prompt treatment of these cases. Other than usual causes, an often-neglected cause, especially in adults, is non-asphyxiating foreign body aspiration. Here, we describe a case of a 40-year-old male who had aspirated an organic foreign body under alcohol intoxication and presented with symptoms of acute-onset breathlessness and severe hypoxia. Prompt diagnosis and bronchoscopy-guided removal result in a quick recovery of symptoms in the index patient.

Keywords: Acute hypoxemic respiratory failure (AHRF), Critically ill adults, Lung primary.

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INTRODUCTION

Acute-onset breathlessness in adults includes multiple causes ranging from acute exacerbation of asthma to life-threatening causes such as pulmonary thromboembolism and pneumothorax. An often neglected cause, especially in adults, is foreign body aspiration. Non-asphyxiating foreign body aspiration needs a high degree of suspicion for diagnosis, especially in the absence of a history of aspiration. Prompt diagnosis and bronchoscopy-guided removal result in a quick recovery of symptoms.

CASE DESCRIPTION

A 40-year-old male admitted to the emergency unit with complaints of acute-onset breathlessness, progressively increasing since the last 3 days. He denied any history of fever, cough with expectoration, chest pain, or hemoptysis. Past history was significant for pulmonary tuberculosis treated with anti-tuberculous therapy successfully 2 years back and has been asymptomatic since then. He denied any history of asthma, and he is a non-smoker but conceded that he drinks alcohol occasionally. General physical examination was unremarkable. Vitals examination revealed the pulse rate of 108 beats per minute, respiratory rate of 32 breaths per minute, and saturation of 78% at room air. Respiratory system examination revealed that he was tachypneic with the trachea shifted to the

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left. Auscultation revealed decreased breath sounds over the left lower lung fields.

INVESTIGATIONS

Complete blood count revealed raised total leukocyte count. Renal and liver function tests were within normal limits (Table 1). Patient cardiac biomarker and acute-onset shortness of breath profile were within normal limits (Table 2).

Table 1: Patient's laboratory parameters at the time of admission and discharge

| Sl. No. | Parameter | At admission | At discharge | Reference range |
|---------|------------------------------------|-------------------|-------------------|---------------------------------------|
| 1 | Hemoglobin (g/dL) | 11.8 | 13.4 | 12–16 |
| 2 | Total leukocyte count (per cu. mm) | 14,100 | 13,300 | 4,000–11,000 |
| 3 | Platelet count (per cu. mm) | 259×10^3 | 310×10^3 | 150×10^3 – 450×10^3 |
| 4 | Serum sodium (mEq/L) | 141 | 145 | 135–145 |
| 5 | Serum potassium (mEq/L) | 3.8 | 3.5 | 3.5–5.0 |
| 6 | Urea (mg/dL) | 24 | 26 | 10–50 |
| 7 | Creatinine (mg/dL) | 0.83 | 0.68 | 0.5–1.2 |
| 8 | S. bilirubin (mg/dL) | 1.0 | 0.70 | 0.2–1.2 |
| 9 | Aspartate aminotransferase | 25 | 19 | 2–40 |
| 10 | Alanine aminotransferase | 27 | 22 | 2–41 |
| 11 | Alkaline phosphatase | 94 | 86 | 42–128 |

Table 2: Patient's acute shortness of breath (SOB) profile parameters

| Sl. No. | SOB profile parameter | Value at admission | Reference range |
|---------|--|--------------------|-----------------|
| 1 | CK-MB (creatin kinase myocardial band) | 3.2 ng/mL | 0–4.3 |
| 2 | Myoglobin | 100 ng/mL | 0–107 |
| 3 | Troponin I | <0.05 ng/mL | <0.05 |
| 4 | Brain natriuretic peptide (BNP) | 84.5 pg/mL | 0–125 |
| 5 | D-dimer | 250 ng/mL | 0–240 |

Electrocardiogram (ECG) was significant only for sinus tachycardia. Given the current coronavirus disease of 2019 (COVID-19) pandemic, reverse transcription - polymerase chain reaction (RT-PCR) and rapid antigen test (RAT) were both carried out and turned out to be negative.

Imaging

A chest X-ray subsequently showed features suggestive of the left lower lobe collapse and a suspicious hyperdense opacity in the left main bronchus (Fig. 1). Contrast-enhanced CT chest and computed tomography scan (CT) pulmonary angiogram were done to rule out pulmonary thromboembolism. The scan was negative for thromboembolism, but it showed a 12 × 13 mm foreign body, about 19 mm distal to carina lodged in the left main bronchus, along with features suggestive of post-obstructive pneumonitis of the left upper and lower lobes (Fig. 2).

DIFFERENTIAL DIAGNOSIS

Main differentials in this case were pulmonary thromboembolism and pneumonia. Given the background of acute-onset and progressively worsening dyspnea with severe hypoxemia not explained by the degree of involvement seen on the chest X-ray, contrast-enhanced CT chest and CT pulmonary angiogram were done to rule out pulmonary thromboembolism. The scan was negative for thromboembolism. Absence of fever and cough with expectoration coupled with acute onset and rapid progression of dyspnea goes against a diagnosis of pneumonia. This case was, however, complicated by a post-obstructive pneumonitis following foreign body obstruction.

TREATMENT

The patient underwent rigid bronchoscopy under intravenous sedation, and small pieces of fishbone were removed piecemeal (Fig. 3). Check bronchoscopy revealed a slightly edematous left main bronchus, and the patient discharged on a short course of oral steroids and amoxicillin-clavulanate 625 mg thrice a day. At discharge, he was asymptomatic, maintaining a saturation of 99% at room air. Repeat chest X-ray showed expanded lower lung fields (Fig. 4). He recollected having consumed fish under alcohol intoxication 2 days before the onset of symptoms. This case reminds us that the foreign body is an often neglected cause of sudden-onset dyspnea, even in adults, especially with a history of alcohol intoxication.

OUTCOME AND FOLLOW-UP

Patient is currently doing well with no shortness of breath, and he is able to do his regular activities comfortably. He is maintaining saturation of 99% at room air. Repeat chest X-ray showed expanded left lung fields.

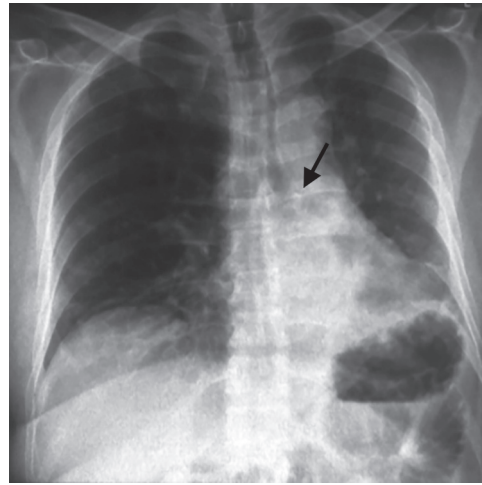


Fig. 1: Chest X-ray with the left lower lobe collapse and suspected hyperdense opacity in the left lower lobe bronchus

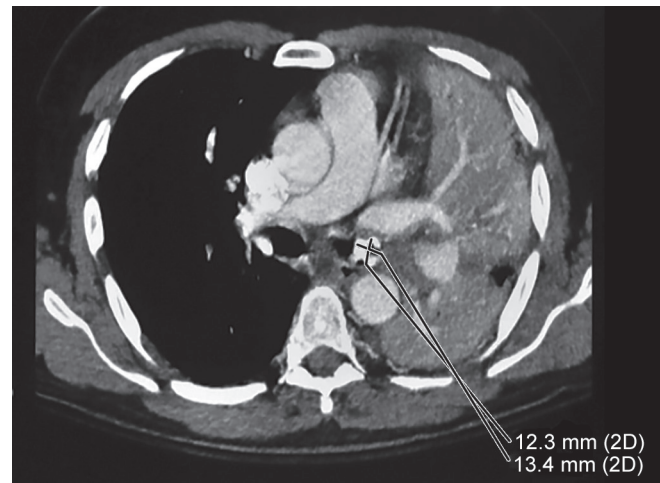


Fig. 2: High-resolution computed tomography scan (HRCT) axial cut shows a 12 × 13 mm foreign body, about 19 mm distal to carina lodged in the left main bronchus



Fig. 3: Pieces of fishbone removed after bronchoscopy

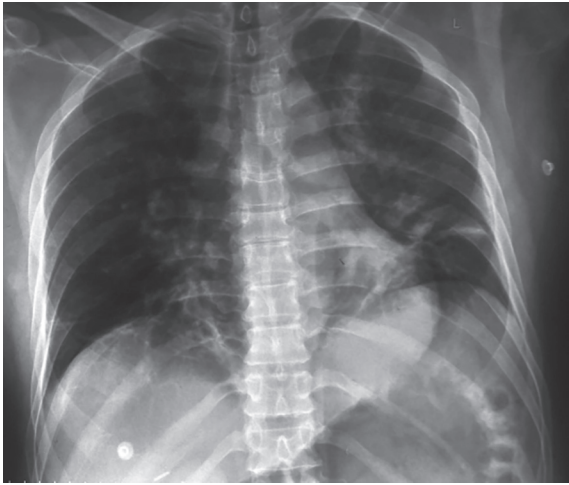


Fig. 4: Repeat chest X-ray reveals expanded lung field with no collapse

DISCUSSION

Tracheobronchial foreign body aspiration is rarely seen in adults, accounting for less than 20% of the reported cases.¹ There are often underlying risk factors predisposing to aspiration, such as alcohol intake, drugs like sedatives and antihistamines, especially in the elderly. Dysphagia associated with impaired cough reflex is seen in neurological conditions like amyotrophic lateral sclerosis and Parkinson's disease.¹⁻⁴ The incidence of aspiration increases with advancing age, and the elderly beyond the sixth decade are at profound risk.⁵ According to a systematic review on foreign body aspiration in the adult population, most patients presented pretty late to the hospital, with only 25% of patients presenting in the first 7 days.⁶ More peripheral the lodging of the foreign body in the airways, more innocuous the symptoms and later the presentation.^{7,8} The most common location of the foreign body is in the bronchial tree of the right lower lobe, as it is more vertically oriented than the left.^{2,8-10}

A retrospective analysis revealed that "penetration syndrome," which refers to sudden-onset choking and cough, was seen only in 49% of patients at the initial presentation. Other common symptoms at admission include cough (37%), fever (31%), breathlessness (26%), and wheezing (26%).¹⁰ Neglected foreign body aspiration results in obstructive pneumonitis, collapse, lung abscess, empyema, bronchiectasis, stricture formation, and rarely, pneumomediastinum and pneumothorax.¹¹ Chest radiographs performed in an emergency revealed a foreign body in only 22–24% of cases at admission, with negative radiographs seen in 8–80% of adults as the visibility on a radiograph depends on the physical properties of the aspirated material.^{6,12,13} In a study (Sehgal et al.) looking at the findings in radiographs of foreign body aspiration, the frequency of radiographic abnormalities was reported as follows: non-resolving pneumonia (30.8%), atelectasis (20%), bronchiectasis (9.2%), air trapping (1.5%), and normal (13.8%).⁶ While CT is more sensitive than chest radiography, it is not always specific. Limitations in CT are the slice thickness relative to the size of the foreign body and the presence of motion artifacts.¹

The present case is unusual because the subject is a young male with no prior comorbidities, the risk factor is alcohol intoxication with the patient not recollecting the history of aspiration, and the foreign body was aspirated into the left main bronchus and not the right. The foreign body aspirated was a fishbone, and it was

barely discernible on the chest radiograph. Fishbone detection on radiographs is highly variable and depends on the species of fish. Bones from cod, haddock, and salmon are radiopaque, while bones from trout, mackerel, and herring are radiolucent.¹⁴ The presentation was in the form of acute breathlessness, fairly simulating a picture of pulmonary thromboembolism clinically, and a contrast CT chest with CT angiogram undertaken despite negative D-dimers subsequently yielded the diagnosis.

Prompt removal of the foreign body with either flexible or rigid bronchoscope results in the resolution of symptoms, with the latter providing superior airway control and suction capabilities.^{6,9} Various types of forceps are used in removal—shark-tooth, alligator, rat-tooth, and dormia basket. Check bronchoscopy is done to look for granulation tissue which is treated with a brief course of oral steroids or cryoablation, and bronchostenosis, if present, may necessitate the need for balloon dilatation.⁶

WHAT EMERGENCY PHYSICIAN SHOULD KNOW

- Foreign body aspiration, especially in the elderly, is fairly prevalent and needs a higher degree of suspicion, especially in the absence of a prior history of aspiration.
- Risk factors predisposing to aspiration like alcohol intoxication, drug history, and neurological diseases have to be sought for in such cases.
- Definitive management is bronchoscopy-guided removal and follow-up to treat complications, if any.

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