Radiology Forum

A Rare Cause of Complete Lung Collapse Due to Allergic Bronchopulmonary Aspergillosis

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Clinical Summary

Allergic bronchopulmonary aspergillosis (ABPA) is a hypersensitivity lung disorder caused by the inhalation of the fungus *Aspergillus fumagitus*. Classically, ABPA is diagnosed in patients with asthma and cystic fibrosis. The patients present with intractable bronchospasm, fleeting pulmonary infiltrates, peripheral eosinophilia and serological evidence of *Aspergillus* infection.[1] We highlight a rare presentation of ABPA as a complete left lung collapse.

Investigations

A 18-year-old male presented with complaints of fever since two months and cough with expectoration for the last one month. There was no significant past history or co-morbid conditions. The patient had no history suggestive of bronchial asthma or any other allergic diathesis. On examination, breath sounds were absent on the left side.

Routine haematological investigation was normal except a leucocyte count of 14000/mm^3 with a neutrophilic predominance. The absolute eosinophil count was 532/mm^3. Other biochemical investigations were within normal limits. A chest radiograph (postero-anterior view) revealed complete collapse of the left lung with ipsilateral shift of the mediastinum (Figure 1). A contrast-enhanced computed tomography (CECT) of the chest revealed a complete collapse of the left lung with mucus plug in the left distal mainstem bronchus (Figure 2A). Non-contrast CT chest showed high attenuating mucus (HAM) in the segmental bronchi of the left lung (Figure 2B).

Sputum analysis revealed hyaline septate fungal hyphae. Immunoglobulin E (IgE) levels were found to be markedly raised at 9430 IU/mL (normal range 150-1000 IU/mL). Notably, *Aspergillus fumagitus*-specific IgE was positive, while sputum for *Nocardia* and galactomannan assay were negative. The patient was started on parernteral piperacilin-tazobatam, voricanzole, hydrocortisone, nebulised bronchodilators and chest physical therapy (CPT). He had significant symptomatic as well as radiological improvement and the chest radiograph after 10 days of the treatment (Figure 3) showed near complete expansion of the left lung.

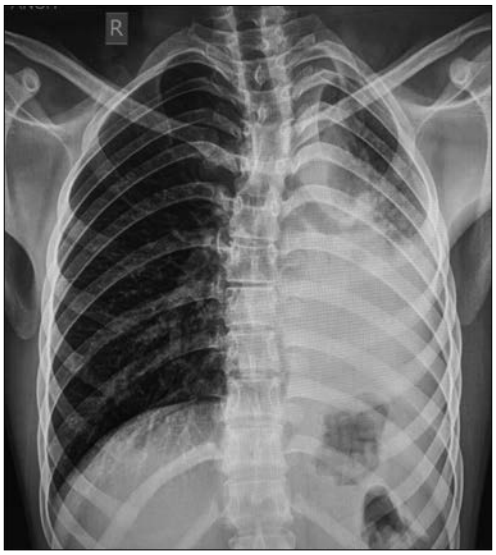

Figure 1. Chest radiograph (postero-anterior view) showing collapse of the left lung with ipsilateral shift of the mediastinum. Right lung shows compensatory hyperinflation.

Diagnosis

Allergic bronchopulmonary aspergillosis presenting with complete collapse of left lung.

Discussion

Allergic bronchopulmonary aspergillosis is a manifestation of pulmonary aspergillosis at the mild end of the spectrum of the disease.[2] It is most commonly seen in patients with long standing asthma. However, this young 18-year-old male patient denied any prior history of asthma or any allergic diathesis. However, with high index of suspicion of ABPA, unusual clinico-

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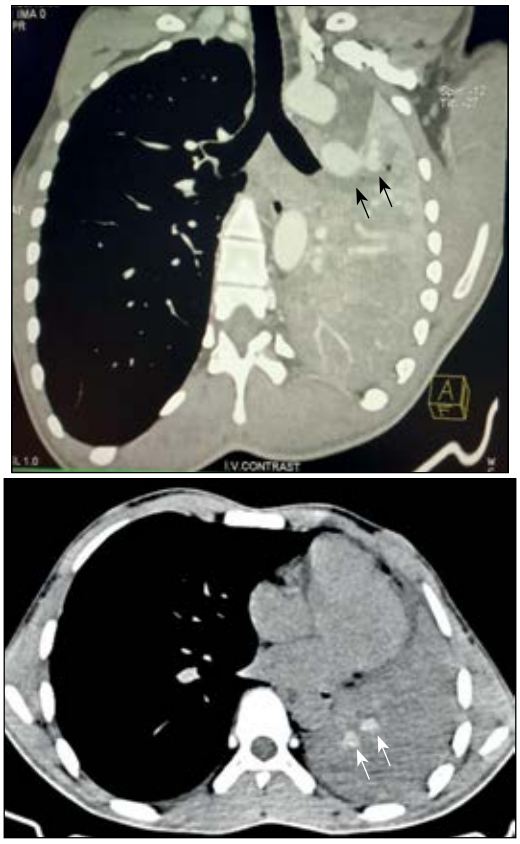

Figure 2 (A). Coronal reconstruction of contrast-enhanced computed tomography of the chest showing complete collapse of the left lung due to mucus plug in the left main bronchus (black arrows), and (B) non-contrast computed tomography of the chest showing collapse of the left lung with high attenuation mucus (HAM) in the segmental bronchi of the left lower lobe (white arrows).

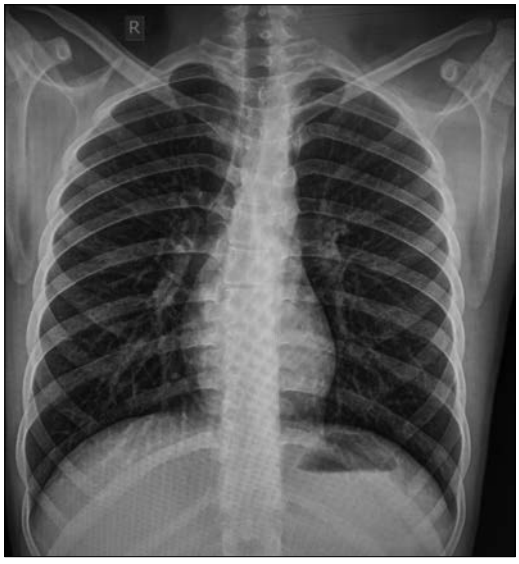

Figure 3. Chest radiograph (postero-anterior view) after 10 days of the treatment and chest physical therapy showing near normal aeration of the left lung.

radiological presentations of the disease would also become more manifest in clinical practice.

Mucoid impaction is described as filling of the airways by mucoid secretions. The bronchial mucus plugging in ABPA is generally hypodense, but may also have high CT attenuation values. High-attenuation mucus is said to be present if the mucus plug is visually denser than the paraspinal skeletal muscle. Currently, the presence of HAM is considered pathognomonic of ABPA. Mucoid impaction can results in bronchocoele formation giving a "finger-in-glove sign" on chest radiograph and CT.[3]

Other imaging findings on CECT chest include fleeting pulmonary alveolar opacities in the form of centrilobular nodules representing dilated and opacified bronchioles. Saccular central bronchiectasis involving segmental and sub-segmental bronchi is common. Chronic/recurrent disease may progress to pulmonary fibrosis, predominantly in the upper lobes.[4]

However, a complete collapse of the lung is an extremely uncommon manifestation of ABPA and may mislead the radiologist and/or treating physician to consider it is an endobronchial lesion.[5] In this case, a high index of suspicion of ABPA on imaging due to the presence of HAM on non-contrast CT of chest avoided invasive diagnostic modalities, such as bronchoscopy to confirm the cause of complete collapse of the left lung. The subsequent clinical course with complete expansion of the left lung on chest radiograph after 10 days of treatment confirmed the diagnosis of resolved mucus impaction. This case of unilateral complete lung collapse secondary to mucus plug formation highlights a very rare manifestation of ABPA.

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