

An Unusual Cause of Bronchiectasis and Asthma

A 69-year-old female, non-smoker, who enjoyed good health in the past, was referred to our chest clinic for a 6-month history of worsening breathlessness, nocturnal cough and occasional blood stained sputum. She denied any fever, weight loss or recent travel history. Physical examination showed polyphonic wheeze. Lung function test showed FEV₁ (forced expiratory volume in one second)/FVC (forced vital capacity) of 0.56; FEV₁ of 53%

predicted with 21% of improvement after bronchodilator. Thus, diagnosis of asthma was confirmed. Sputum culture grew commensals only. Blood test showed eosinophilia of $0.9 \times 10^9/L$ ($n = 0.0$ to $0.3 \times 10^9/L$). Other routine laboratory tests were unremarkable. Chest radiograph was performed (Fig. 1A). A follow-up chest radiograph was performed 2 weeks later (Fig. 1B) followed by high resolution computed tomography (HRCT) 1 month later (Fig. 2).

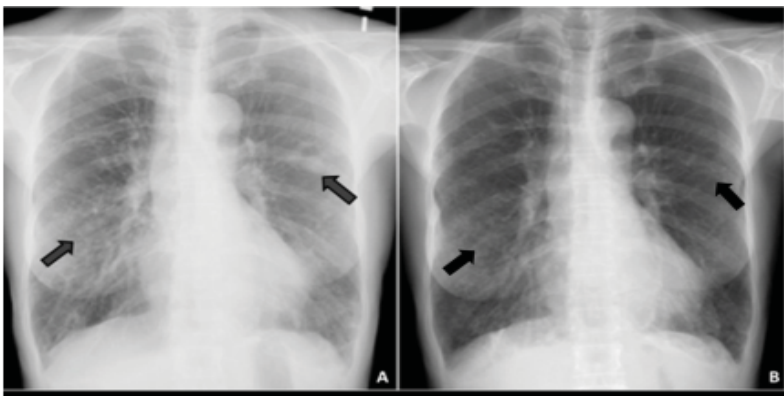


Fig. 1. Chest radiographs. (A) indicates the Y shaped branching opacities in the right and left middle zones (at arrows). (B) Taken 2 weeks later, resolution of the right and left middle zone opacities are indicated (at arrows).

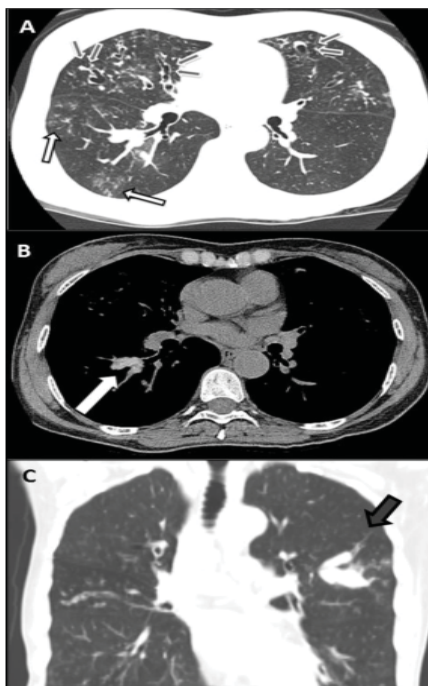


Fig. 2. High resolution computed tomography. (A) Lung window. Small centrilobular nodules (white arrows) and dilated bronchi suggestive of cylindrical bronchiectasis (grey arrows). (B) Mediastinal window. Arrow indicates hyperdense mucoid impaction. (C) Lung window with coronal reconstruction. Arrow indicates tubular mucoid impaction radiating from left hilar region.

What is the most likely diagnosis?

- A. Tuberculosis
- B. Eosinophilic pneumonia
- C. Sarcoidosis
- D. Lymphangioleiomyomatosis (LAM)
- E. Allergic bronchopulmonary aspergillosis (ABPA)

Chest radiograph (Fig. 1A) showed Y shaped branching tubular opacities in the right and left middle zones in keeping with “finger-in-glove” appearance. Follow-up chest radiograph (Fig. 1B) in 2 weeks’ time showed resolution of the tubular opacities. HRCT (Fig. 2) revealed cylindrical bronchiectasis and extensive centrilobular nodules in both lungs. Hyperdense mucus impactions are noted with characteristic “finger-in-glove” appearance.

With strong clinical suspicion of ABPA, further investigations were carried out. Serum *Aspergillus fumigatus*-specific IgG and IgE were elevated. Skin test for *Aspergillus* demonstrated type I immediate cutaneous hypersensitivity. Diagnosis of ABPA was thus confirmed and patient was commenced on prednisolone and itraconazole.

Discussion

Eosinophilic lung disease is a diverse group of pulmonary disorders linked by the common findings of peripheral or tissue eosinophilia. ABPA is part of the spectrum of eosinophilic lung disease caused by complex immune hypersensitivity reaction of the airway to *Aspergillus fumigatus*. Patient typically presents with chronic asthma, recurrent pulmonary infiltrates and bronchiectasis. Prevalence of ABPA is believed to be about 1% to 2% in patients with asthma.¹ The dominant airway disease seen in ABPA is unusual in other eosinophilic lung diseases such as Löffler's syndrome which classically presents as migratory infiltrates in bilateral lung fields and Churg-Strauss syndrome, commonly consisting of transient and patchy opacities without lobar or segmental distribution.

The Rosenberg criteria are most widely used for diagnosis and include 8 major and 3 minor criteria.² The major criteria (easily remembered by the mnemonic ARTEPICS) are:

- A: Asthma
- R: Radiographic fleeting pulmonary opacities
- T: Skin test positive (type 1 reaction) for *Aspergillus fumigatus*
- E: Eosinophilia
- P: Precipitating antibodies (Immunoglobulin G [IgG]) in serum

I: Immunoglobulin E (IgE) in serum elevated (1000 IU/mL)

C: Central bronchiectasis

S: Serum-specific IgG and IgE against *Aspergillus fumigatus*

If 6 of the 8 primary criteria are met, the diagnosis is certain.

A wide spectrum of radiographic changes can be seen in patients with ABPA. Chest radiograph appearances include transient migrating opacities, finger-in-glove opacities and bronchiectasis. Central bronchiectasis, mucoid impaction and centrilobular nodules are the typical findings on computed tomography (CT).³ High attenuation mucoid impaction, as seen in our case, is a pathognomonic finding in patients with ABPA.

Major differential diagnosis includes cystic fibrosis, bronchial atresia and previous tuberculosis infection. Bronchiectasis and mucoid impaction are relatively common in patients with cystic fibrosis and not uncommonly, other radiological findings such as emphysema, abscess and bullous formations are also present. Bronchial atresia, on the other hand, may also demonstrate mucoid impaction, but characteristically involves a single lobe or segment. Previous pulmonary tuberculosis infection typically demonstrates fibrocalcific changes and traction bronchiectasis with predominance for upper lobes and superior segments of lower lobes involvement.

Despite presence of considerable overlap between the CT findings of different eosinophilic lung diseases, presence of peripheral airspace consolidations are more in keeping with chronic eosinophilic pneumonia, whereas a combination of interlobular septal thickening, bronchovascular bundle thickening, and pleural effusion are most suggestive of acute eosinophilic pneumonia. Careful clinical evaluation is required for a definitive diagnosis.

Once diagnosed, management of ABPA includes institution of glucocorticoid to control immunological activity and use of antifungal agents to attenuate the fungal burden.

Answer: E

REFERENCES

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