

High-attenuation mucus in a patient with allergic bronchopulmonary aspergillosis

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DESCRIPTION

A 63-year-old Japanese woman presented with a 9-month history of productive cough. Although she had been treated with oral antibiotics (amoxicillin and levofloxacin), her symptoms worsened. She had no history of allergic diseases, including asthma, except for known allergies to eggs. She had never smoked.

Her vital signs and physical examination were unremarkable. Laboratory tests revealed white blood cell count of $12.26 \times 10^9/\text{L}$ (normal: $3.3\text{--}8.6 \times 10^9/\text{L}$) with absolute eosinophil count of $2.45 \times 10^9/\text{L}$ (normal: $0.10\text{--}0.30 \times 10^9/\text{L}$), serum total IgE levels of 235 IU/mL (normal: $<173 \text{ IU/mL}$), *Aspergillus*-specific IgE levels of 5.49 UA/mL (normal: $<0.35 \text{ UA/mL}$), positive for *Aspergillus*-specific precipitin and negative for serum antigen of *Aspergillus* spp.

Chest radiography showed consolidation in the left middle lung field. Chest CT revealed high-attenuation mucus (HAM), a typical finding in allergic bronchopulmonary aspergillosis (ABPA), and central bronchiectasis (figure 1). We performed a transbronchial biopsy of the mucus plugs in the left upper lobe. Pathological findings showed remarkable eosinophil infiltration with Charcot-Leyden crystals, and branching hyphae on Grocott stain (figure 2). In the culture of bronchial lavage fluid, *Aspergillus fumigatus* was detected.

Consequently, the patient fulfilled 8 of 10 components in the criteria for allergic bronchopulmonary mycosis (ABPM) by the Japan ABPM Research Programme.¹ Therefore, we confirmed the diagnosis of ABPA, and subsequently, prednisolone with tapering was administered. After the treatment, her symptoms, eosinophilia and

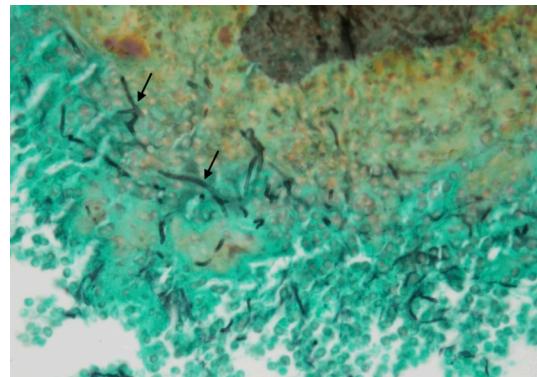


Figure 2 Grocott stain for biopsied specimen of mucus plugs shows branching hyphae (arrows).

consolidation on chest radiography were gradually improved.

ABPM is a disease caused by an allergic reaction to fungi in the lower respiratory tract, especially those caused by *Aspergillus* spp are called ABPA.² There are several clinical diagnostic criteria for ABPM, including Rosenberg-Patterson criteria proposed in 1977,³ the International Society for Human and Animal Mycology (ISHAM) criteria in 2013⁴ and the Japan ABPM Research Programme criteria in 2020.¹

The Rosenberg-Patterson criteria have a high specificity of 98.4% but a low sensitivity of 49.2%, while the ISHAM criteria have a sensitivity of 82.7% and a specificity of 86.8%. In contrast, the sensitivity and specificity of the Japan ABPM Research Programme criteria are 94.4% and 90.0%, respectively, indicating that ABPM can be diagnosed with high accuracy.¹

ABPM often shows mucoid impaction, and its differential diagnosis includes endobronchial lesions or foreign bodies, bronchial atresia and bronchiectasis due to various causes.⁵ HAM is defined as mucus plugs with higher densities than paravertebral muscles on high-resolution CT, and the CT density value of 70 Hounsfield units is an



Figure 1 Chest CT shows high-attenuation mucus (arrow).

Learning points

- Allergic bronchopulmonary mycosis can be diagnosed by Japan Allergic Bronchopulmonary Mycosis Research Programme criteria with higher accuracy than other criteria.
- High-attenuation mucus is an important finding in the early diagnosis of allergic bronchopulmonary mycosis.



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adequate cut-off value.⁶ It has been assumed that iron, manganese and calcium produced by fungi in the mucus may cause higher densities.⁶ The sensitivity and specificity of HAM for ABPA are reported as 39.7% and 100%, respectively.⁷ HAM is an important finding in the early diagnosis of ABPM.

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