

Allergic Bronchopulmonary Aspergillosis Coupled with Sinusitis in a Nonasthmatic Patient

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Allergic bronchopulmonary aspergillosis (ABPA) is a complex clinical entity resulting from an allergic immune response to *Aspergillus* species, and most often occurs in patients with asthma. ABPA is rarely observed in the absence of asthma, which is, in fact, the principal criterion for its diagnosis. Our patient was a 53-year-old woman with no history of bronchial asthma. She presented with a 1-month history of cough, mucopurulent nasal discharge, and localized pulmonary consolidation. Peripheral blood eosinophilia and elevated serum IgE were observed. Sinus radiography showed right maxillary sinusitis. Pathologic examination of bronchoscopic biopsy specimens revealed conglomerates of fungal hyphae. Pulmonary function and bronchial provocation tests were within normal ranges. The patient was successfully treated for 3 months with itraconazole and oral prednisolone. There has been no evidence of recurrence over a 7-month follow-up. ABPA coupled with sinusitis in a nonasthmatic patient is a very rare occurrence and warrants reporting.

Key Words: Aspergillosis, Allergic Bronchopulmonary; Sinusitis; Asthma

Introduction

Allergic bronchopulmonary aspergillosis (ABPA) is a disease caused by hypersensitivity reactions to antigens of *Aspergillus* species, and is characterized by bronchial asthma, pulmonary infiltrates, and eosinophilia¹. The allergic response leads to an influx of inflammatory cells and resultant early- and late-phase inflammatory reactions, including elevated total serum IgE and *A. fumigatus*-specific IgE levels, mast cell degranulation, and promotion of a strong eosinophilic response². Bronchial asthma is considered to be essential for diagnosis and is thought to play an important role in the development of the disease³. Hideaki et al believe that the role of

bronchial asthma in ABPA development includes impeding the excretion of *Aspergillus* and facilitating its colonization because of the production of viscous sputum⁴. We report on a 53-year-old woman who did not present with clinical asthma, but manifested a localized pulmonary consolidation coupled with maxillary sinusitis. The patient was ultimately diagnosed with ABPA.

Case Report

A 53-year-old woman was referred to Chung-Ang Medical Center for further evaluation of a productive cough which had persisted for 3 weeks and left lower lung infiltrates in chest radiograph. She was a housewife, a non-smoker and had no previous disease except for chronic hepatitis B. She was treated in the outpatient clinic with a 15-day course of antibiotics, but the symptoms persisted, so she was admitted to our hospital. On admission, she complained of productive cough with low-grade fever, mucopurulent nasal discharge, sneezing, and nasal obstruction. Laboratory findings included

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a hemoglobin of 11.5 g/dL, white blood cell count of $11,590/\text{mm}^3$ with 71.4% neutrophils, 9.4% lymphocytes, 13% eosinophils, and 5.9% monocytes. The C-reactive protein was 148.95 mg/L, and serum IgE was 1,544 IU/L (normal, 0~100 IU/L). All other blood chemistry values were within normal limits. Spirometry revealed normal airway function, with a forced vital capacity (FVC) of 2.74 L (96% of predicted), forced expiratory volume in 1 sec (FEV_1) of 2.57 L (120% of predicted), and an FEV_1/FVC ratio of 94%. The methacholine inhalation test was negative for bronchial hyperreactivity. Chest radiography and chest computed tomography (CT) showed consolidations in the left lower lobe with the bronchial lumen completely obstructed by a mass (Figure 1). Paranasal sinus (PNS) radiography revealed right maxillary sinusitis (Figure 1). Bronchoscopy revealed an off-

white, caseous polypoid mass that obscured the left lingular bronchus. Light microscopy of biopsy specimens revealed fungal balls (*Aspergillus*) containing laminated clusters of eosinophils (Figure 2). Intradermal skin testing using *A. fumigatus* extracts yielded immediate wheal and flare reactions, but no late reactions. *A. fumigatus*-specific IgE (radioallergosorbent test) was elevated at 36.8 kU/L (normal, 0~0.35 kU/L). A serum sample was positive for *Aspergillus* antigen and IgG antibody. The patient fulfilled all the primary criteria for ABPA except for not having bronchial asthma and central bronchiectasis, and two of the secondary criteria listed by Rosenberg et al¹. She was treated with daily prednisolone and itraconazole. On the fifth hospital day, follow-up PNS CT and chest radiograph showed marked improvement, and peripheral eosinophil counts were

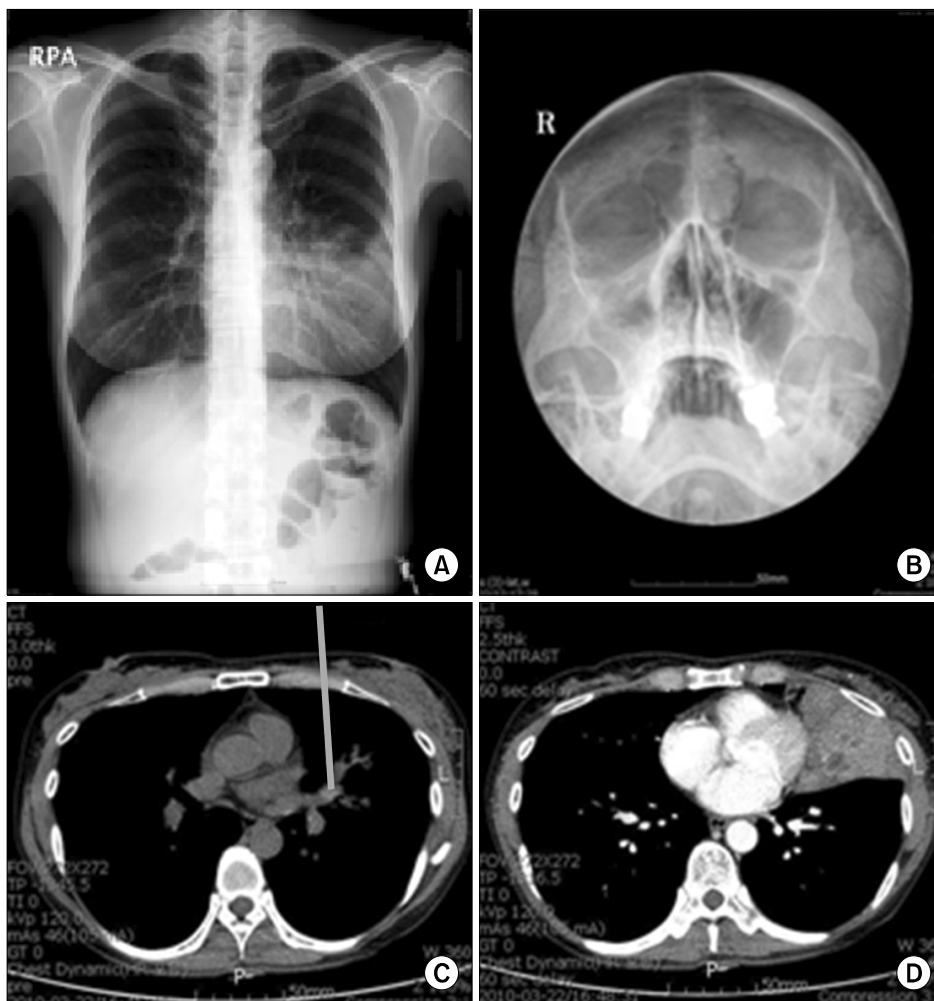


Figure 1. (A) Opacities in the left lower lung field, (B) Right maxillary sinusitis, (C) Complete endobronchial obstruction with high-attenuation material within the lingular division of the left upper lobe bronchus, (D) Associated peribronchial consolidation with central necrotic portions in the lingular division of the left upper lobe.

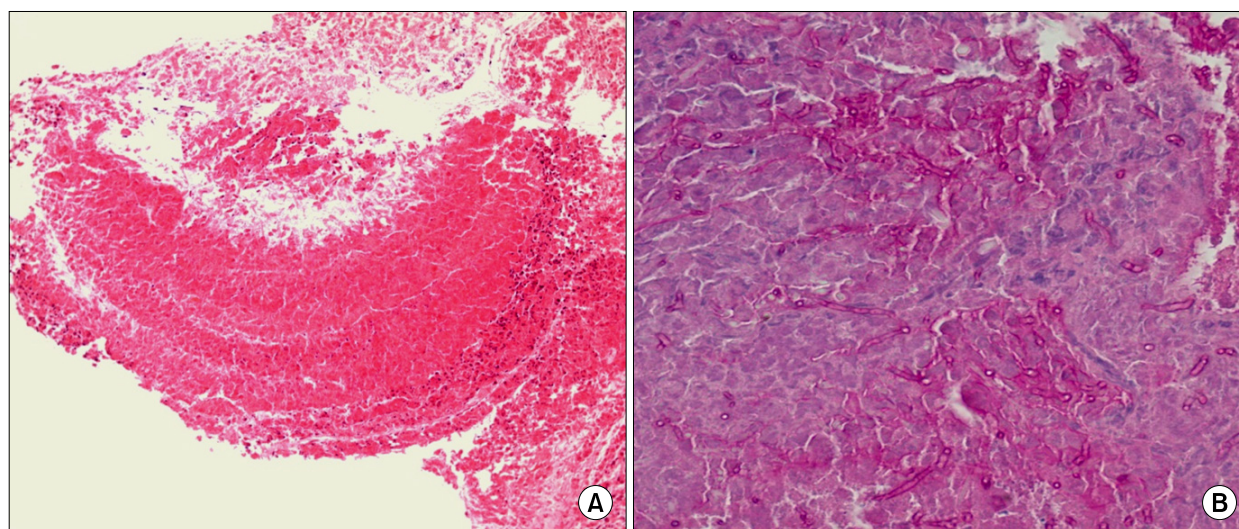


Figure 2. (A) Fungal ball consists of concentric layers of *Aspergillus* hyphae and eosinophil clusters arranged in a lamellar pattern (HE, $\times 100$). (B) The organism has regular, homogeneous hyphae with parallel contours and regular septa (PAS, $\times 400$).

normalized. She was discharged 2 days later. After 3 months of steroid and itraconazole therapy, the pulmonary lesion completely resolved, and there has been no recurrence over 7 months follow-up. Bronchial asthma has also not developed.

Discussion

ABPA is only very rarely observed in the absence of asthma. Therefore a high index of suspicion for ABPA should be maintained while managing any patient with bronchial asthma, whatever the disease severity or the level of control. Bronchial asthma has classically been considered an essential diagnostic criterion for ABPA, and has also been believed to play a crucial role in its development¹. However, a few cases of ABPA have been reported in nonasthmatic patients, but they are rare, with less than 20 cases having ever been described in the literature⁵⁻⁷. However, in those reports, some of the patients were in a pre-asthmatic state and ultimately developed bronchial asthma. The natural course of ABPA is not known in detail, but a diagnostic criterion that is absent at the time of the diagnosis can develop during follow-up⁸. Greenberger and Patterson^{8,9} have proposed that patients can be classified into 5 stages,

namely: acute, remission, exacerbation, corticosteroid-dependent asthma, and fibrotic end stage, and an individual diagnostic manifestation can occur in different stages. With this perspective, it is probable that bronchial asthma may appear later in the course of the disease. Therefore, bronchial asthma may not be essential for the diagnosis of ABPA, especially in the early stages.

Our case is rather interesting, because the patient presented with maxillary sinusitis. ABPA may be accompanied by allergic *Aspergillus* sinusitis (AAS). AAS is a clinical entity in which mucoid impaction similar to that seen in ABPA occurs in the paranasal sinuses¹⁰. The pathogenesis is also similar to ABPA, and involves a hypersensitivity response to the presence of fungus within the sinus cavity¹¹. Although in many patients with ABPA, sinusitis can often be radiologically demonstrated, it may not be possible to confirm the diagnosis of AAS, because many patients decline to undergo the diagnostic procedures required to establish the diagnosis. The concomitant occurrence of ABPA and AAS appears to be rarely reported; to date there have been only 5 published detailed case reports¹¹⁻¹³. Our patient had nasal symptoms, and admission x-rays revealed maxillary sinusitis, but there had been little change in symptoms

despite treatment with antibiotics. After steroid and itraconazole treatment, her nasal symptoms got better, and follow-up PNS CT showed resolved sinusitis. Although AAS was clinically suspected, AAS was not confirmed in our case by histopathology. As appears by this case, if an ABPA patient who also has sinusitis does not improve with conventional sinusitis treatment, for example antibiotics, we could consider AAS and employ diagnostic procedures such as biopsy, and if necessary, treatment for refractory AAS.

In this report, we described a rare case of ABPA coupled with sinusitis in a nonasthmatic patient. ABPA should be included in the differential diagnosis of localized pulmonary consolidations coupled with sinusitis, even in nonasthmatic patients.

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