Clinical Manifestations and Treatment Outcomes of Pulmonary Aspergilloma

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Background: Pulmonary aspergilloma usually results from the ingrowth of colonized Aspergillus from a damaged bronchial tree, a pulmonary cyst, or from the cavities of patients with underlying lung diseases. In the present study, we analyzed the clinical features, diagnostic methods, and managements of 36 patients with pulmonary aspergilloma.

Methods: Thirty-six patients were diagnosed as having pulmonary aspergilloma at Chung-An University Hospital between February 1988 and February 2000. Their medical records were reviewed retrospectively.

Results: The age of patients (median ± SD) was 53.3±11.8 years, the male to female ratio was 2.36:1, and the most frequent symptom was hemoptysis, which occurred in 24 patients (65%). The most common underlying disease was pulmonary tuberculosis (81%), and the upper lobes of both lungs were the most frequently involved sites. Nine patients received a chest CT in the prone position and seven of these showed a movable fungus ball. Eleven patients were positive for the precipitin antibody to A. fumigatus. Twenty patients underwent surgical resection, and post-operative complications were reported in seven cases. The post-operative mortality was 5.6% (2/36).

Conclusion: Pulmonary aspergilloma usually develops in the patients with underlying lung diseases. Resectional lung surgery is considered the mainstay of therapy for pulmonary aspergilloma. However, this operation is associated with significant complications and death in some cases. Therefore, it is necessary to develop reasonable criteria for selection of candidates for such surgery.

Key Words: Aspergilloma, Pulmonary tuberculosis, Hemoptysis

INTRODUCTION

Pulmonary aspergillomas, which is caused by Aspergillus fumigatus, can be classified into 5 categories according to its pathophysiology, clinical manifestation, and treatment modality. Allergic bronchopulmonary aspergillosis (ABPA) is characterized by peripheral blood eosinophilia in patients with bronchial asthma. Aspergilloma develops when aspergillus colonizes and grows inside lung cavities and forms a ball-like structure. Chronic necrotizing aspergillosis is a locally invasive form of aspergillosis, which involves surrounding lung parenchyma and pleura. When the systemic inflammatory form of aspergillosis develops in immunocompromised hosts, it is called invasive aspergillosis. Finally, hypersensitivity pneumonitis may develop after the inhalation of organic particles contaminated by aspergillus.

Aspergilloma is composed of hyphae of Aspergillus, fibrin, mucus, inflammatory cells, blood, and epithelial cell components. Many cavitary lung diseases—such as tuberculosis, sarcoidosis, cavitary tumor, pulmonary fibrosis, bronchiectasis, and histoplasmosis—are complicated by aspergilloma. Among these, pulmonary tuberculosis is the most common cause of cavities facilitating the development of aspergilloma. Around 11–17% of the cavitary forms of pulmonary tuberculosis have been reported to be complicated by aspergilloma. It has also been reported that aspergillomas can develop in otherwise healthy lungs. For example, Aspergillus species colonizing the respiratory tract can secrete digestive enzymes into the surrounding...
lungs and create space for the growth of the fungus ball. The clinical manifestations of pulmonary aspergillosis are diverse, ranging from asymptomatic cases to massive and sometimes fatal hemoptysis. Therefore, optimal therapeutic modalities for aspergillosis are dependent upon clinical presentations. In some cases of aspergillosis, natural dissolution could occur with the disappearance of pulmonary symptoms. However, in another disease spectrum, emergent thoracotomy is required because of massive hemoptysis. In the present study, we performed a retrospective analysis upon 36 patients with pulmonary aspergillosis, with a focus on the treatment modalities used and their outcomes.

METHODS

This study was based on the medical records of 36 pulmonary aspergillosis patients, from Chung-Ang University Hospital between February 1988 and February 2000. A diagnosis of pulmonary aspergillosis was made on the basis of pathologic examination of biopsied or resected lung specimens in 26 cases. In 10 cases, the diagnosis was made on the basis of characteristic radiological manifestations, such as the air–meniscus–sign or the movability of the fungus ball in the prone position on Chest CT. All patients with a radiology–based diagnosis showed a positive result for precipitating antibody against aspergillus or a positive sputum culture for aspergillus on at least two occasions. We evaluated demographic data, clinical manifestations, treatment modalities, and the outcomes for selected patients using the above criteria.

RESULTS

The ages of patients ranged from 21 to 65 years (median age ± SD: 53.3 ± 11.8), and there were 25 males and 11 females (M:F=2.36:1) (Figure 1). The chief complaints at the time of visit were hemoptysis (26 cases, 72%), cough, and dyspnea. Pulmonary tuberculosis was the most common underlying disease (24 cases, 66%), followed by bronchiectasis (3 cases). There were four cases of aspergillosis unaccompanied by underlying lung diseases. Patients with pulmonary aspergillosis also suffered from other chronic non-pulmonary diseases, such as type 2 diabetes mellitus (2 cases) and chronic hepatitis C (1 case). The time interval from the diagnosis of tuberculosis to the manifestation of aspergillosis varied from less than 1 year to over 10 years. The right upper lobe was the most frequent site of involvement for pulmonary aspergillosis (15 cases), followed by the left upper lobe (12 cases). This site preference of aspergillosis could be explained by the fact that both upper lobes are also the most common sites of involvement for cavitary pulmonary tuberculosis (Figure 2). The air–meniscus sign by radiography is one of the characteristic findings of pulmonary aspergillosis, and was found in 16 of the 36 cases enrolled in the present study (44%). In addition, prone position chest CT was performed in 9 cases and 7 (78%) showed a fungus ball that moved on changing position (Figure 3). The size of the cavities varied from 1 cm to 5 cm in diameter. However, no significant correlation was found between the size of the cavity and the amount or frequency of hemoptysis. A sputum examination was performed in 31 cases, 6 of these