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Case Report

Mucoid impaction of bronchi with *Aspergillus* (A case mimicking lung cancer)

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Thirty two year-old male, immunocompetent patient was admitted to the hospital with complaints of cough, dyspnea, nocturnal fever and anorexia. The chest radiography and computerized tomography revealed a mass lesion with adjacent parenchymal infiltrations suggesting lung cancer of the right lower lobe, initially. Bronchoscopy demonstrated the presence of an intraluminal mucoid mass in superior segmental bronchial orifice at the right lower lobe. Histopathological examination of the biopsies from this mass revealed *Aspergillus* amidst a background of inflammatory exudate rich in eosinophils and Charcot-Leyden crystals with the use of special histochemical stains. Voriconazole at a dose of 6 mg/kg/day in the first day of treatment and maintained as 4 mg/kg/day in the subsequent days resulted in complete resolution in three weeks.

Key words: Aspergillosis, endobronchial aspergilloma, mucoid impaction of bronchi.

INTRODUCTION

Infections caused by *Aspergillus* sp. in the lung can be divided into three forms: invasive, saprophytic (mycetomas) and allergic (Ritter and Krigman, 2008; Katzenstein, 2006; Kim et al., 2010; Zmeili and Soubani, 2007). Nonetheless, it is not always possible to effectively categorize cases of these diseases. Particularly, in immunocompromised patients, aspergillus lung infection may be a life-threatening condition (Zmeili and Soubani, 2007). However, relatively indolent conditions addressed as MIB with *Aspergillus* may be difficult to diagnose and may mimick a mass lesion giving an impression of lung cancer and differential diagnosis is of vital importance.

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CASE REPORT

A 32 year-old male was admitted to hospital due to complaints of recent cough, dyspnea, nocturnal fever and anorexia. He was a non-smoker and had no comorbidity, any use of immunosupressives was not revealed in his medical history. He received BCG vaccination in two doses at the ages of 2 months and 7 years. On admission he had arterial blood pressure of 130/60 mmHg, heart rate of 92/min, respiratory rate of 24/min, and temperature of 37.6°C. His lung sounds were clear on auscultation. Physical examination of other systems were also normal. Laboratory findings were as follows; WBC count: 13,800/mm^3, ESR: 47 mm/h, CRP: 101 mg/L, total Ig E: >2000 IU/ml. Eosinophil count was normal. Tuberculin skin test (TST) was 18 × 10 mm in diameter. There was no significant findings in the microscopic examination of sputum and was also negative for acid-resistant

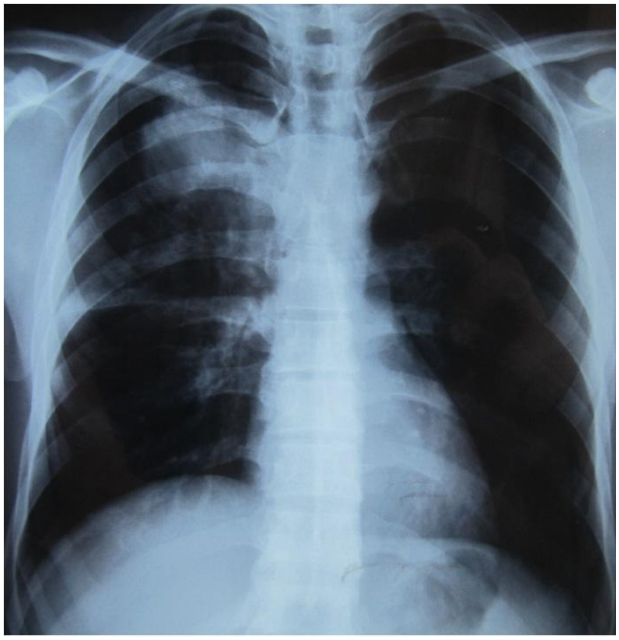

Figure 1. The patient's initial chest x-ray showing homogenous opacity with irregular margins at the right suprahiler area.

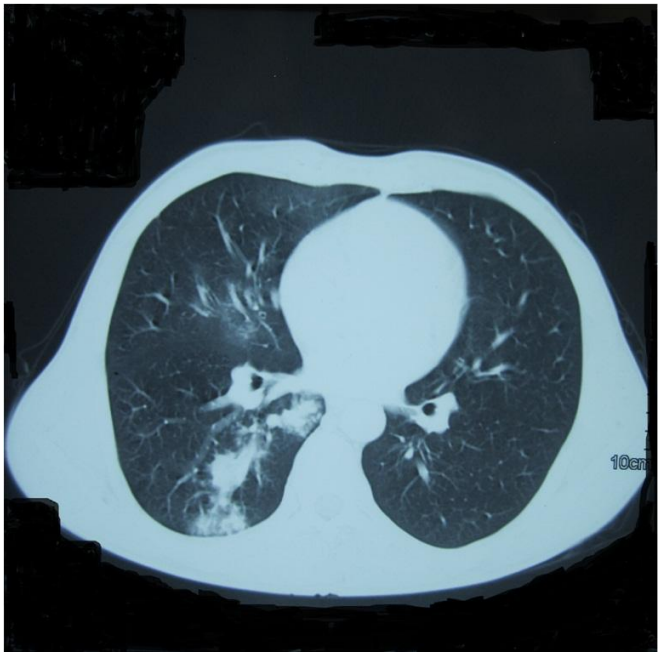

Figure 2. Thorax CT revealed a mass lesion with adjacent parenchymal infiltrations suggesting lung cancer of the right lower lobe.

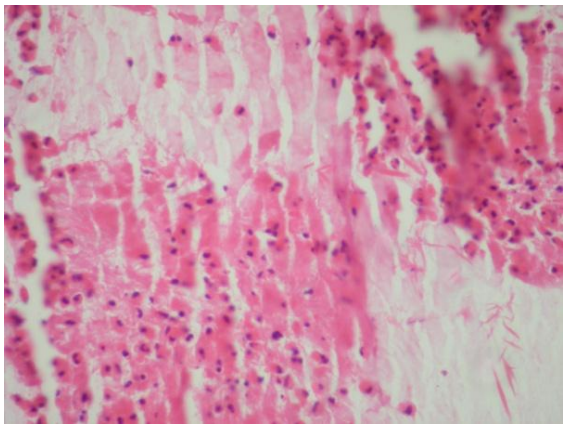

Figure 3a. Dense mucoid exudate rich in eosinophils and Charcot-Leyden crystals without any malignant cells. (Hematoxylin eosin X100).

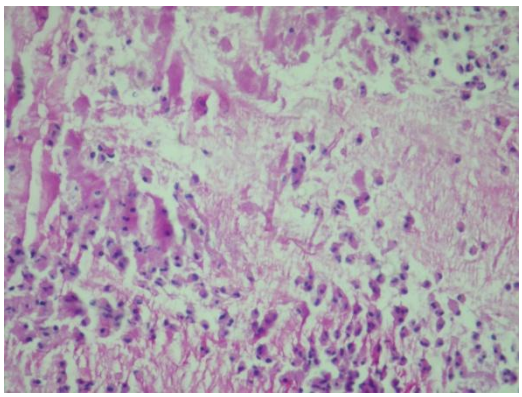

Figure 3b. Fungal hyphae that are typically visible with Periodic Acid Schiff (PAS) reaction can be hardly distinguished in the mucus covered background (PAS X400).

bacilli. Pulmonary function tests were in normal range. The patient's initial chest x-ray showed homogenous opacity with irregular margins in the suprahiler area of the right upper zone (Figure 1).

The patient was hospitalized with early diagnosis of pneumonia and lung cancer. A computerized tomography (CT) of the thorax was performed for further evaluation and revealed subpleural and parenchymal infiltrations, which were adjacent to each other with irregular margins in the superior segment of right lower lobe (Figure 2). Diagnostic fiberoptic bronchoscopy was performed. An irregular intraluminal mass obstructing the superior segmental bronchial orifice of the right lower lobe was seen. Histopathologic examination of the biopsy specimens of the endobronchial lesion revealed a mucoid exudate mainly consisting of eosinophils and Charcot-Leyden crystals. PAS and GMS special histochemical stainings revealed hyphal fungal organisms consistent with *Aspergillus* species. There were no atypical cells seen microscopically (Figure 3a,b,c). The microbiologic examination of the bronchial lavage revealed a negative culture result for tuberculosis.

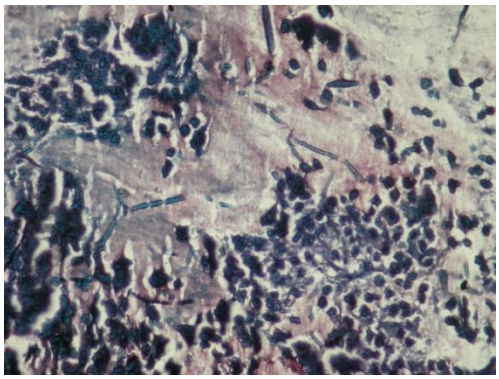

Figure 3c. Fungal hyphae is distinctively visible via silver reaction (GMS method X400).

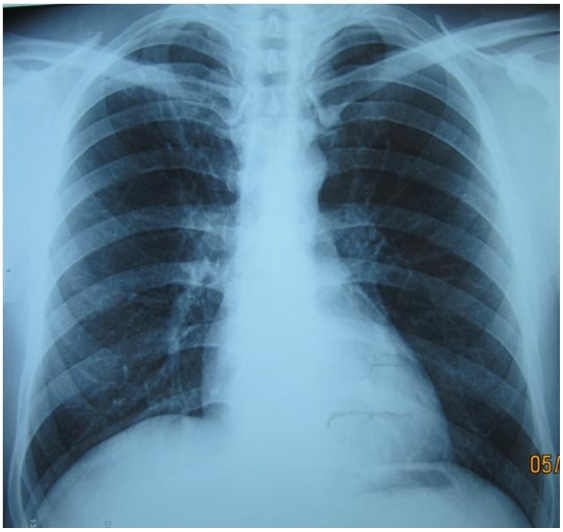

Figure 4. Chest X-ray revealing significant regression at the third week of treatment.

Depending on these clinical and laboratory data, voriconazole at a dose of 6 mg/kg/day in the first day of treatment was administered to the patient and maintained as 4 mg/kg/day in the subsequent days. Chest x-ray in the third week of the antifungal treatment showed disappearance of the lesion (Figure 4). The patient underwent repetition bronchoscopy in order to exclude any malignant lesion masked by this fungal infection but no endobronchial lesion was seen. The patient received a maintainance therapy for the next three months period and he had no evidence of recurrence at the time of follow-up after 9 months from the first admission to the clinic.

DISCUSSION

Mycetomas or fungus balls are saprophytic growths within a preexisting lung cavity. Presentations of *Aspergillus* related invasive lesions may be as pneumonia, necrotizing tracheobronchitis, necrotizing granulomatous inflammation, and chronic necrotizing aspergillosis. The third category includes closely related conditions namely, allergic bronchopulmonary aspergillosis (ABPA) and mucoid impaction of bronchi (MIB) (Ritter and Krigman, 2008; Katzenstein, 2006; Kim et al., 2010; Zmeili and Soubani, 2007). Endobronchial aspergillosis presented as MIB is a rare entity considered as a separate clinical form that is detected incidentally, particularly in immunocompetent individuals (Ritter and Krigman, 2008; Katzenstein, 2006; Kim et al., 2010; Zmeili and Soubani, 2007). This form of disease is not well-defined and classified, however, it can be described as a massive obstruction of bronchus with aspergillus overgrowth, or whether the parenchymal lesion is present or not, as a non-invasive endobronchial fungus ball. The patients may have an underlying lung disease such as asthma, chronic bronchitis, or cystic fibrosis.

Patients present with evidence of lobar collapse or an irregular branching mass-like density and histologic sections of the impacted material in most cases show “allergic mucin” that consists of laminated collections of eosinophils, debris, and mucinous exudates (Ritter and Krigman, 2008; Katzenstein, 2006). Patients are usually asymptomatic, if there is no underlying disease. Cough and hemoptysis are most common symptoms leading to admission (Soubani and Chandrasekar, 2002; Ma et al., 2011; Dobbertin et al., 2010). In this case, no evidence of any systemic disease, supported by radiological or laboratory data was recorded. The patient was immunocompetent and received neither a prior antibiotic therapy nor immunosuppressive agents. He had no history of atopy and asthma. Potential diagnosis of malignancy was also excluded in this case, by radiological, endoscopical and histopathological work-up. Colonization of aspergillosis on endobronchial tumors can mask the cancer tissue, as well. Aspergillosis of the bronchial stump has also been reported rarely after pulmonary resections (Dobbertin et al., 2010; Le Rochais et al., 2000; Noppen et al., 1995). Therefore, clinicians should pay attention for this differential diagnosis. In regard to simple airway colonization with aspergillus seen in immunocompetent individuals there is no consensus on optimal management (Noppen et al., 1995). Antifungal therapy appears to be the only viable treatment. There is no valid data related to the duration of treatment and the effective dose since this unique presentation of *Aspergillus* seen in immunocompetent individuals are usually diagnosed incidentally.

This rare entity should be easily diagnosed by meticilious histopathologic examination of the endoscopic biopsies with special histochemical stains such as PAS and GMS applications (Ritter and Krigman, 2008; Katzenstein, 2006). Hence, endobronchial aspergilloma should be considered in the differential diagnosis of a necrotic mass lesion causing obstruction in the bronchus and should be confirmed by biopsy.

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