Pulmonary Mucormycosis in a Diabetes Patient

A Case Report

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Abstract

Mucormycosis is a rare but potentially lethal fungal infection caused by Zygomycetes, from the order of Mucorales. It commonly affects immunocompromised patients and drug users. We report a 63-year-old woman, with poorly-controlled type 2 diabetes mellitus, presented with cough, hemoptysis and body weight loss from 60kg to 50kg over 6 months. Chest X-ray and computed tomography both showed cavitory lesion over left upper lung field with fluid level and peripherative pneumatication. One big tissue clamp, 0.4cm x 0.4cm x 2.5cm in size, was aspirated out from the left main bronchus during the bronchoscopy examination, and its histopathology showed extensive tissue necrosis and fungal hyphae characteristic of mucormycosis. After the tissue clamp removed and good blood glucose control, her clinical symptoms as well as serial image studies improved rapidly.

Introduction

Zygomycosis, or mucormycosis is a life-threatening angio-invasive infection caused by fungi of the class Zygomycetes, order Mucorales. However, unlike other filamentous fungi, such as Aspergillus that are largely opportunistic in immunocompromised patients, mucormycosis also can be a frequently lethal infection in hosts with greater immunocompetency, such as those with diabetes mellitus, those receiving dermatomycin therapy, injection drug users, and those with no apparent immune impairment. Pulmonary mucormycosis may be presented as consolidation, cavitary lesion or pulmonary nodules. Its diagnosis depends on histopathological demonstration of tissue invasion by the characteristic hyphae. Treatment of zygomycosis includes early removal of infected tissue, early reversal of the predisposing factors, and antifungal agents.

Case report

A 63-year-old woman was admitted due to intermittent cough, hemoptysis and body weight loss from 60kg to 50kg over 6 months. She had the history of diabetes for many years without regular control, and the HbA1C was 12.9%. The chest X-ray (Fig 1A) and chest computed tomography (Fig 1B) both showed cavitory lesion with air-fluid level and peripherative pneumatication over left upper field. The bronchoscopy examination showed a growing and movable long soft tissue like lesion over the left main bronchus. The whole lesion, 0.4cm x 0.4cm x 2.5cm in size, was aspirated out, and the histology showed suppurative necrosis with bronchial, wall, rib-bose like hyphae was seen (Fig 2A). In addition to the hyphae, round sporangia with flatten base was also found (Fig 2B). Special stain with Gomori Methenamine Silver (GMS) (Fig 2C) and periodic acid-Schiff’s (PAS) (Fig 2D) were arranged which disclosed sparsely septated broad hyphae with rectangular branching. All of the above findings were compatible with mucormycosis. However, to our surprise, even no anti-fungal agent was given, her clinical symptoms improved rapidly after the big tissue removed, and the follow up CXR (Fig 3) one month later also showed significant improvement. So, the scheduled surgical intervention was hold, and we thought that her lung lesions were caused not only by poorly-controlled DM related pulmonary mucormycosis but also by the tissue clamp related obstructive parenchyma. So, after the antibiotic treatment, tissue clamp was removed, and good sugar control, her lung lesion resolved rapidly.

Discussion

The Zygomycetes are a class of fungi that can cause a variety of infections in humans, particularly in immunocompromised patients, and those with DM. There is some controversy over the terminology. The older, and more common, term “mucormycosis” is familiar to most clinicians. However, most mycologist prefer the term “zygomycosis” since other members of this class of fungi can cause infections in addition to those in the orde Mucorales. The clinical manifestations of pulmonary zygomycosis are similar to those of invasive pulmonary aspergillosis. In short, these two entities are almost indistinguishable clinically. Angioinvasion is very common and results in necrosis of tissue parenchyma, which may ultimately lead to cavitation and/or hemorrhage. Besides, patient with diabetes mellitus have an apparent predilection for the development of endobronchial lesions, accounting for more than 80% of reported cases. Just like this case, the endobronchial lesions often lead to obstruction of major airways, and could occasionally create major pulmonary blood vessels resulting in fatal hemoptysis.

Timely diagnosis of zygomyces requires a high index of suspicion and largely depends on bronchoscopic demonstration of tissue invasion by the characteristic hyphae. Bronchoscopic examination with biopsy should be considered for early diagnosis. Timely diagnosis, early reversal of the underlying predisposing factors, and early removal of infected tissue in conjunction with systemic antifungal agents are crucial for the prognosis.

Fig 1 (A) Chest radiography and (B) Computed tomography on admission showing cavitory lesion over left upper lung field with air-fluid level and peripherative pneumatication.

Fig 2 (A) Histopathology from left lung lesion. High power view for fungus showing broad, wavy, rib-bose like hyphae with rectangular branching. (hematoxylin and eosin stain)

Fig 2 (B) Close up view for fungus showing broad, wavy, rib-bose like hyphae with rectangular branching.

Fig 2 (C) Gomori Methenamine Silver (GMS) and (D) Periodic acid-Schiff’s (PAS) stain demonstrating sparsely septated broad hyphae with rectangular branching.

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