Case Report

Intracavitary Pulmonary Mass in a Patient with Acquired Immunodeficiency Syndrome (AIDS)

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Abstract

Aspergillus species, although so common in the natural environment, rarely causes disease in a normal host. In settings of immunocompromised state, these infections are common and cause considerable morbidity and mortality. We discuss an AIDS case with an unusual presentation of a fungal ball, its diagnosis, management, and significant complications. Its different nodes of presentation and the mechanism of formation also are discussed. Emphasis is also laid on the different approaches toward treatment of this condition. Discussions include the right time to intervene surgically in these cases in order to decrease mortality, and, finally, the spectrum in which this disease occurs in immonocompromised patients who live longer in this state.

Keywords: Aspergilloma, AIDS, intracavitary, pulmonary mass.

AIDS patients have a predilection for developing opportunistic infections. However, there is a paucity of reported cases of AIDS patients who develop an infection of the Aspergillus species of fungi. We report an interesting case of a patient with AIDS who developed an aspergilloma of the lung, which was resected surgically.

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Case Report

A 34-year-old man, an intravenous drug user, presented with a cough and shortness of breath of two weeks duration. The cough was associated with blood-streaked sputum. The patient had documented AIDS of seven years duration, with a CD_4 count of 59 (normal 390 1460/cumm). Six months before the present admission, he had a pulmonary infection, which was felt to be fungal in nature, based on a sputum culture that grew Aspergillus fumigatus. His brief trial onamphotercin was discontinued after 20 days because of adverse effects. He was maintained on fluconazole. His physical examination revealed no respiratory distress. He had pallor, clubbing of the fingers with associated scanty left upper lobe crepitations on auscultation. All other systems were unremarkable. Chest X-ray findings revealed a

Figure 1.

3-by-2 cm cavity on the upper left lobe with smooth margins and an intracavitary mass (Figure 1). EKG results were normal. Arterial blood gas on room temperature revealed a pH of 7.4; $PO_2$98, mmHg; PCO_2, 30 mmHg; HCO_3, 32. His WBC was 11.1 K/mm3 with 50% neutrophils and 17% lymphocytes. Routine sputum cultures did not grow bacteria or fungi. He was subsequently bronchoscoped and no evidence of Pneumocystis carinii was found. Subsequent fungal cultures from bronchial washings were negative for Aspergillus fumigatus. In view of the lack of a definitive diagnosis, radiologic impression of a fungus ball, and prior intolerance to amphotericin therapy, he had a left upper lobectomy along with a left lower segmetectomy. On the first postoperative day, the patient developed tachycardia, hypotension with right mediastinal shift and a massive left hemithorax. The patient underwent a repeat exploratory thoracotomy and an evacuation of thoracic hematoma. The patient was stabilized and eventually discharged with regular follow-up at the outpatient clinic.

The resected gross specimen measured 10-by-18-by-5 cm. The pleural surface showed a moderate degree of anthracotic mottling near the opening of the superior lobe. There was a rounded cystic structure measuring 6-by-4-by-4 cm. On opening, it revealed a thick-walled cavity with corrugated margins, filled with a tan cheesy material.

Histopathologic examination revealed a fibrous cyst wall filled with fungal elements and necrotic debris. The fungal elements comprised branching septate hyphae and spores characteristic of aspergillosis (Figure 2). In addition, there were areas of acute and organizing pneumonia and giant-cell infiltration. Representative sections from the remaining lung also showed fungal invasion of the terminal bronchiole (Figure 3) and the pneumonic lung parenchyma.

Discussion

Aspergilus species are ubiquitous in the environment and only rarely cause significant disease in healthy hosts. The common risk factors for opportunistic infections are corticosteriods, broad spectrum antibiotics. Other possible risk factors include diabetes, alcohol abuse, chronic lung disease, cavitary lung disease, viral infections, etc. The relationship between the HIV infection and aspergillosis evolves as patients live longer and develop granulocyte dysfunction, either due to the HIV infection or the concomitant use of steroids or AIDS-related therapies such as Zidovidine and Ganciclovir, which can result in neutropenia. The overall incidence of Aspergillus in HIV patients ranges from 0.16-5% out of 3,170 patients with AIDS, which were reported to the Centers for Disease Control and Prevention between May 1983 and June 1984, to 0.9% from out of 470 patients at the University of Pennsylvania from July 1988 to December 1991.[2]

When Aspergillus develops in AIDS patients, it can range from invasive to the localized. The lung has been documented as the most common site for Aspergillus, with hemoptysis as the most common and life-threatening symptoms occurring in 60-80% of the cases. A few may also present a productive cough, weight loss, and finger clubbing.[1] Unusual variants have been presented with extensive necrotic bronchitis, which sometimes leads to fetal hypoxia. Other features described include maxillary sinusitis, skin infections, and, vary rarely, with endocarditis, esophagitis, brain abscesses and renal cysts.[3]

Pulmonary aspergillosis presenting as cavitary lung disease, particularly in the upper lobe, was present in 13 to 16 patients reported.[2] The presence of an intracavitary mass was noted in only three of these patients.[2] Aspergilloma forms when the fungus grows on the walls of a lung cavity and mycetoma with the debris becomes detached to form a concretion of amorphous material containing tangled septate hyphae with altered blood elements.[1] The radiographic features include an intracavitary, solid, rounded mass often associated with a positive sputum culture for Aspergillus as presence of precipitin antibody against the Aspergillus fumigatus. The major complication of aspergilloma is massive current hemoptysis, and frequent mild hemotyic episodes also may occur. Of the 13 patients with cavitary lung disease caused by Aspergillus reported, six had hemoptysis, which was fatal in five patients.[2] This should be borne in mind when decisions regarding management are made concerning HIV patients with cavitary lung disease related to Asperigillus. The pathogenesis of hemotysis involves frictional forces within the cavity wall, hemolytic endotoxins, or proteolytic enzymes from granulocytes.[4]

Fatal incidence of hemoptysis in cavitary Aspergillomas vary between 0 and 25%, creating controversy regarding the

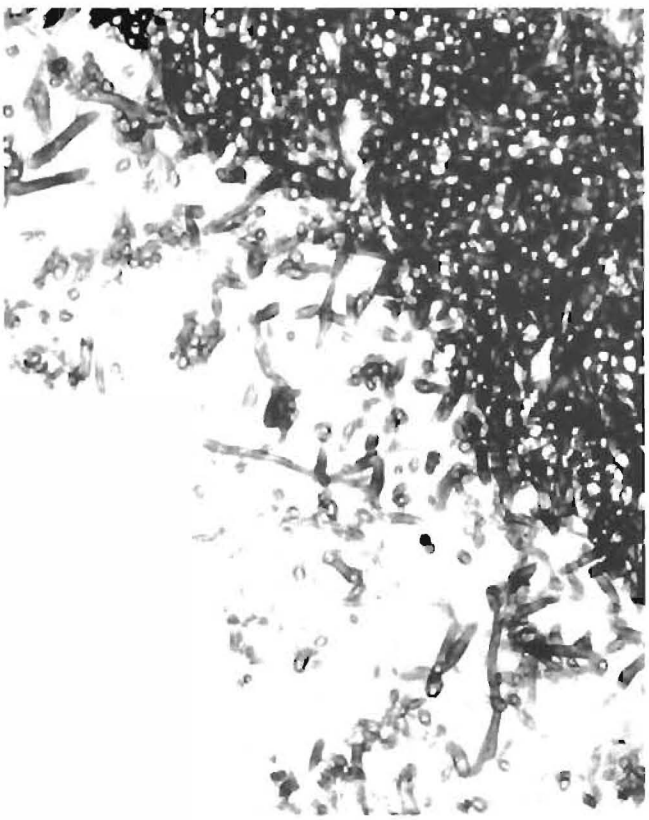

Figure 2.

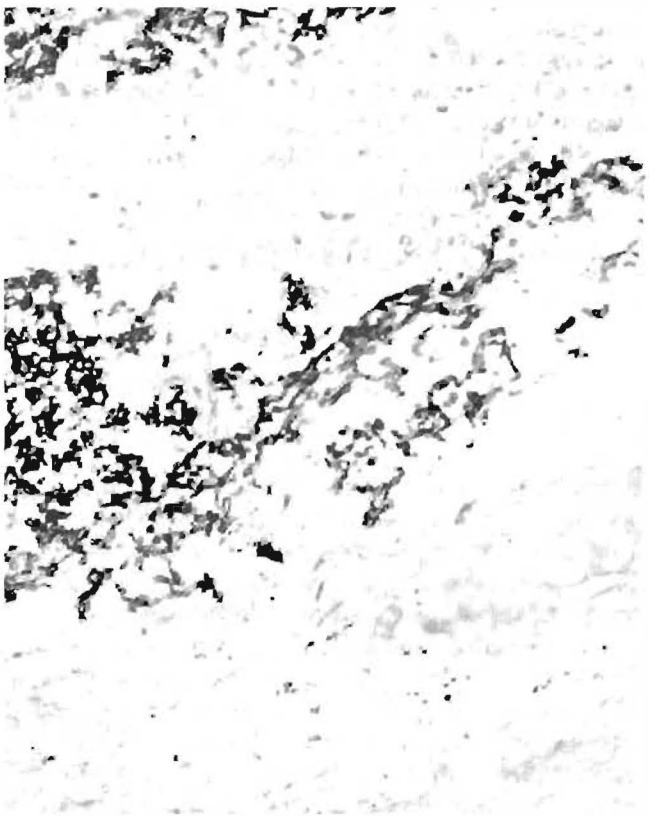

Figure 3.

treatment and the role of surgical intervention.[5] Although one study concludes that surgery is inescapable in 30% of the cases, other groups suggest a conservative approach based on a low fatal hemoptysis.[5,6] Conservatively, antifungal treatment varies considerably and is evaluated case-by-case depending of the effects on mortality and morbidity. Potential value of amphotericin combined in some with flucytosine and also ketoconazole have been implicated.[1] However, surgical intervention is reserved for patients who continue to have symptoms after medical therapy, or those who have indeterminate masses.[7]

It is also recommended that resection be done for patients with recurrent episodes of massive or severe hemorrhages associated with pulmonary Aspergillosis.[8] The first surgical resection was reported in 1948 and for many years, until this point of view has been questioned, was the treatment of choice.[1] Major postoperative complications such as bronchopleural fistula, resistant airspace problems, empyema and hemorrhage have been reported.[1] Persistent symptoms generally implicate recurrent disease, which, again, could be fatal and which argues for close postoperative surveillance in these patients. Periodic surveillance also has been recommended for the late appearance of new or persistent disease.[7]

In summary, we believe this case report highlights the following clinical features:

1. Aspergillus as an opportunistic infection is uncommon in HIV-infected patients
2. As patients with HIV disease live longer and receive treatment that alters granulocyte function, they become more susceptible to the Aspergillus infection
3. In the HIV patient, Asperigullus may present as a cavitary lung disease, with occasional intracavitary mass, focal alveolar opacity, bilateral opacity, and invasive Asperigillosis
4. Presence of the cavitary form of Asperigillus in HIV patients carries a serious prognosis and early surgical therapy may be beneficial in preventing the often lethal complication of hemoptysis.

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