Apophysomyces elegans Limb Infection with a Favorable Outcome: Case Report and Review

Apophysomyces elegans is a saprophytic soil fungus of the class Zygomycetes and the order Mucorales, which is distributed worldwide [1, 2].

A. elegans is able to progressively invade tissues in healthy and immunocompromised hosts; this invasion apparently begins at the site of a prior injury such as a trauma, a burn, or invasive procedures [1–3]. We report, to our knowledge, the first case of limb infection caused by A. elegans in an immunocompetent patient from Venezuela; the patient was treated successfully without amputation.

A 34-year-old previously healthy male who lived in a rural area 45 miles from Caracas sustained a traumatic wound on his right thigh, which was produced by a soiled weedhook on 17 December 1994. On admission, the patient was severely ill, and necrosis of the skin, subcutaneous fat, and muscles in the area of the wound was noted. Some necrotic areas were covered by a whitish mold-like growth; therefore, empirical treatment with amphotericin B and fluconazole was started.

Progressive necrosis and new cotton-like lesions appeared, and the patient underwent surgery on 2 January. Biopsy of the resected tissue showed necrotizing cellulitis caused by a zygomycete, and oral itraconazole (200 mg/d) was substituted for fluconazole in the treatment regimen. The local wounds began to heal, and the remaining necrotic tissue was removed on 9 January. The large blood vessels of the right thigh were exposed.

On 10 January, the culture was reported as being positive for A. elegans (figure 1). The patient’s condition improved, but on 10 February, severe right femoral artery bleeding developed. A Fogarty catheter was passed through the artery for removal of clots and surgical repair of the artery. On 25 February a second episode of bleeding from the superficial femoral artery occurred. The bleeding was stopped by covering the vessel with muscle. There were no further complications. After 1 month, grafts were placed on the thigh, and amphotericin B was administered (total dose, 3.5 g). Itraconazole was withdrawn after 8 weeks. The patient was discharged in excellent condition in April 1995. In June 1995, his graft and wounds had healed, with no evidence of recurrent fungal infection.

A. elegans is able to invade the subcutaneous tissue, causing necrosis of fat and the superficial fascia. Further spread may produce massive muscle necrosis, destruction of blood vessel walls with subsequent thrombosis, hemorrhagic infarction, and mycotic embolization to distant tissues. In our immunocompetent patient, this fungus produced progressive necrosis. We believe the portal of entry for the infection was the traumatic wound involving the skin and subcutaneous tissues [1].

A. elegans was first described by Misra et al. in 1979 [4]. In 1982, A. elegans was isolated from the bronchial washings for A. elegans (figure 1). The patient’s condition improved, of a patient in the United States [5]. In our case, A. elegans grew well on Sabouraud dextrose agar at a temperature ranging from >37°C to 40°C but failed to sporulate on Sabouraud dextrose agar. After 1 week, the fungus sporulated on lactram and sablac agars at room temperature (23–28°C) [6].

We performed an extensive literature search and found 14 cases of A. elegans infection. Eleven of them had occurred in the United States, one in Australia, one in India, and one in Aruba [3, 7–10]. Most of the patients had infections in the extremities, and trauma or skin lesions were the portals of entry for the infections, except in the patient from India, who had undergone a postinguinal herniorrhaphy before onset of infection [7]. All but one of the patients (a female from the United States who had uncontrolled diabetes mellitus [3]) had been previously healthy.

Late diagnoses were common among these patients. They underwent extensive surgical debridement, and tissue necrosis was the common pathological finding. Most of these patients received high doses of amphotericin B, and some also received liposomal amphotericin B. Seven of the 14 patients had limb involvement. Two of these seven patients died, and three underwent amputation.

Early diagnosis is the key to an improved prognosis for patients with A. elegans infection. New antymycotic drugs and in vitro studies of susceptibility of this fungus to the new drugs are needed to provide a better initial therapeutic approach. Our patient represents the 15th case of A. elegans infection described in the worldwide literature and the first case from...
Measurement of Human Immunodeficiency Virus (HIV) Type 1 RNA Load Distinguishes Progressive Infection from Nonprogressive HIV-1 Infection in Men and Women

The HIV-1 load in plasma or serum has been found to correlate with disease progression in men as well as response to antiviral therapy and transmission of HIV-1 from mother to child [1–7]. Because the worldwide incidence of HIV-1 infection among women, including those in the United States, has increased dramatically in recent years, studies of viral load need to include women as well as men to determine if the relationship between HIV-1 load and disease progression applies to both genders. To investigate distinctive patterns of HIV-1 disease progression and their relationship to viral load in both women and men, we used reverse transcription quantitative competitive PCR (RT QC-PCR) to measure serum or plasma HIV-1 RNA levels in four groups of well-characterized HIV-1-infected patients. We retrospectively studied 45 patients, including 22 women and 23 men. These HIV-1-infected adults were stratified, on the basis of patterns of clinical HIV-1 disease progression, into the following four categories:

Category 1, long-term nonprogressive disease (n = 7). These patients had been infected at least 8 years and had CD4+ cell counts of >450/mm³ at the most recent measurement. None of these patients had received antiretroviral treatment.

Category 2, clinically stable nonprogressive disease (n = 12). These patients had CD4+ cell counts of 200–450/mm³. Eleven of these patients had received antiretroviral treatment.

Category 3, progressive HIV-1-related disease (n = 9). The disease was considered progressive if the patient developed any of the following problems during the 1- to 2-year observation period after the blood was collected: an AIDS-defining opportunistic infection, wasting, or any other HIV-related clinical condition; p24 antigenemia; or a loss of >100 CD4+ cells/mm³. None of these patients had histories of opportunistic infections at the time the blood specimen was obtained. Eight patients had received antiretroviral treatment.

Category 4, a history of AIDS-defining opportunistic infections at the time the blood was collected (n = 17). Eleven of these patients were taking antiretroviral drugs.

Each of the patients in categories 1–3 were followed up clinically for at least 1–2 years after the specimen was obtained. Six women in category 4 (patients 40–45) were included in a substudy of the Womens Interagency HIV Study (WHIS) in the Bronx, New York, and they provided plasma. All other patients were patients at Long Island Jewish Medical Center (New Hyde Park, NY), and they provided serum. HIV-1 RNA was extracted from frozen serum or plasma and quantitated by means of RT QC-PCR with use of a modification of the technique of Piatka et al. [1, 6]. Correlations between CD4+ cell count, HIV-1 RNA level, and disease category were studied by using the nonparametric Spearman correlation coefficient and its P value.

We first analyzed how the HIV-1 RNA load related to the category of disease. When the four categories were analyzed statistically as a whole, we found that the mean HIV-1 RNA load increased with increasing category of disease progression (Spearman correlation = 0.73; P = .0001; figure 1). This correlation also pertained when the populations of men and women in each group were analyzed separately (Spearman correlation = 0.74; P = .0001 for men; Spearman correlation = 0.73; P = .0001 for women).

References