Case report

**Cladophialophora bantiana isolated from an AIDS patient with pulmonary infiltrates**

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**Introduction**

Patients with the acquired immunodeficiency syndrome (AIDS) are at increased risk of having unusual fungal infections [1,2]. *Cladophialophora bantiana* (formerly *Xylohypha bantiana*, *Cladosporium trichoides*, *Cladosporium bantianum* [3]) is a rare dematiaceous fungus that can cause systemic phaeohyphomycosis in both normal and immunocompromised patients. However, to our knowledge, there are no published reports of the isolation of this organism from a pulmonary source in a patient with AIDS [4]. We describe a patient with AIDS and pulmonary infiltrates whose sputum repeatedly grew *C. bantiana*.

**Case history**

A 32-year-old man with AIDS whose HIV infection had been diagnosed in 1989 presented with a 3-week history of shortness of breath, weakness and a cough productive of brownish-yellow sputum. The CD4 cell count 2 months before presentation was 6/mm³ (4% of total lymphocytes). He had a history of presumptive *Pneumocystis carinii* pneumonia with bilateral pneumothoraces 2 years prior to admission with the development of bullous lung disease, *Candida* esophagitis, disseminated *Mycobacterium avium* complex (MAC) and severe anaemia (haematocrit 18% 7 months prior to admission). He denied haemoptysis, chest pain, fever, chills, nausea, vomiting or diarrhoea. Medication included zidovudine, ketoconazole, trimethoprim-sulphamethoxazole, ethambutol, clarithromycin and clofazimine. He occasionally smoked marijuana and cocaine but denied the use of intravenous drugs. He had two cats, but he had no history of farming or gardening.

The patient was afebrile, cachectic and weighed 40 kg. His chest had diffuse rhonchi; there were no neurological abnormalities. The remainder of the physical examination was unremarkable. His haematocrit was 16.7% with a haemoglobin of 5.3 g dL⁻¹, leucocyte count of 2500 per cubic millimeter, with a differential of 86% segmented neutrophils, 1% bands, 2% lymphocytes and 1% monocytes; the platelet count was 176 000/mm³. A room air blood gas showed pH 7.45, Pco₂ 33, Po₂ 35, with an oxygen saturation of 72%. His LDH was 174 IU dL⁻¹, albumin 2.2 g dL⁻¹. All other serum chemistry tests were normal. The chest radiograph revealed bilateral patchy diffuse interstitial infiltrates that were new since a chest radiograph several months prior to admission. He was treated with oxygen and intravenous ticarcillin and clavulanic acid. On hospital day 2 he showed increasing lethargy. Ticarcillin and clavulanic acid were discontinued and cefuroxime was begun. Because of the patient's deteriorating condition, bronchoscopy was not performed. The patient died later that day, and no autopsy was performed.

Although no fungal sputum cultures had been sent, four AFB (Lowenstein Jensen medium, BBL,
Becton-Dickinson Microbiology Systems, Cockeysville, MD) sputum cultures collected over a period of 3 days yielded darkly pigmented, mycelial colonies after 14 days of incubation at 37 °C. Sputum specimens were decontaminated using the Zephran-trisodium phosphate method [5,6]. Dematiaceous, septate hyphae consistent with C. bantiana were observed in the sputum. Lactophenol cotton blue mounts of the cultured fungus revealed pigmented conidiophores and chains of blastoconidia. It was differentiated from saprophytic, non-pathogenic dematiaceous fungi by the ability to grow at 42 °C, its microscopic morphology and by the fact that it did not liquefy gelatin [3,7,8]. Four cultures grew C. bantiana; in addition to C. bantiana, two AFB sputum cultures also grew Mycobacterium avium complex. One bacterial sputum culture grew only Streptococcus mitis and another grew Aspergillus fumigatus. No fungal hyphae were observed in the sputum Gram stain preparation. No fungus other than C. bantiana was repeatedly isolated.

**Discussion**

Although cerebral C. bantiana infection has been associated with AIDS [9], our patient had no evidence of cerebral involvement. There are no reported cases of AIDS-associated pulmonary C. bantiana in the literature. Among the three published confirmed cases of pulmonary C. bantiana, one patient was reported to also have a brain abscess [10–12], one was a Thai farmer with non-invasive pulmonary disease (fungus ball [8,13]), and the third was a gardener with Crohn’s disease who had taken steroids and had invasive pulmonary disease [4]. Only one had a documented history of immunosuppression, and one had a fungus ball rather than invasive disease.

Evidence from animal studies suggests that compromised cellular immunity may increase susceptibility to C. bantiana infection. Athymic nude mice are more susceptible than are heterozygous controls to C. bantiana infection [14]. In rabbits, alveolar macrophages have been shown to be important in phagocytosis and subsequent killing of C. bantiana [15]. After intranasal inoculation, C. bantiana was more likely to persist in the lungs of cortisone-treated mice than in normal mice [16]. Thus, defects in cellular immunity as a result of AIDS may have predisposed this patient to the development of C. bantiana fungal disease.

Animal models also suggest that respiratory infection leads to haematogenous dissemination. In mice, intranasal infection is followed by pulmonary infection. Organisms are found in the lungs before they are found in the brain [16]. In addition, intranasal infection leads to CNS infection less often than does intravenous inoculation [16]. Histopathological studies in mice confirm that C. bantiana invades the microvasculature of the CNS prior to brain infection [17]. Our patient’s fungal blood culture was negative.

C. bantiana can be found in nature, especially decaying wood and red cedar, and in animals (e.g. cats, dogs, parrots) [8,18]. A brief telephone survey of 28 microbiology laboratories in the Atlanta area revealed that none had ever isolated C. bantiana from a sputum culture and only one laboratory reported a positive culture from a brain abscess.

Our patient’s sputum grew M. avium complex, S. mitis and A. fumigatus in addition to C. bantiana. Although the clinical picture could be compatible with invasive aspergillosis, the fact that his sputum grew only one colony of Aspergillus in one culture, and the isolation of C. bantiana from multiple sputum cultures suggests that the latter fungus was more likely to have contributed to his illness.

Appropriate therapy for C. bantiana is not well defined. Surgery has been useful [4,13], but results with medical therapy have been disappointing [19]. Our patient died before the results of therapy could be assessed.

Fungi should be considered when patients with AIDS present with unexplained pneumonia. If supported by future reports, C. bantiana should possibly be added to the growing list of opportunistic pathogens seen in HIV-infected patients [20].

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**References**


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