From The New York-Presbyterian Hospital, Columbia-Presbyterian Medical Center

Palatal Necrosis in an AIDS Patient: A Case of Mucormycosis

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We report a case of rhinocerebral mucormycosis presenting in a patient with AIDS and review the literature on mucormycosis occurring in the setting of HIV disease. Mucormycosis in HIV is rare. However, it can be the presenting opportunistic infection in AIDS. Predisposing factors for Mucor *infection in HIV disease include low CD4 count, neutropenia, and active intravenous drug use. Mucormycosis can present in the basal ganglia, the skin, the gastrointestinal tract, the respiratory tract, or may be disseminated. The disease may develop insidiously or may progress rapidly with a fulminant course. Therapy usually consists of surgical debridement/excision accompanied by intravenous amphotericin B.*

Mucormycosis, although infrequently encountered, is an important opportunistic infection in the setting of HIV disease. We report the fourth case of rhinocerebral mucormycosis in an AIDS patient – only the second case reported in a non-diabetic AIDS patient.

Case Report

A 36-year-old male with AIDS, a CD4 count of 59 cells/liter, and a viral load of 480,000 copies, presented to The New York Presbyterian Hospital with complaints of a painful oral lesion, difficulty eating, and an inability to completely close his left eye for 1 week.

His past medical history included *Pneumocystis carinii* pneumonia, multiple community-acquired pneumonias, oral candidiasis, herpes simplex, HIV-related cardiomyopathy, and a right-sided endocarditis.

His medications included zidovudine, lamivudine, indinavir, digoxin, lasix, and captopril. He had no history of drug allergies.

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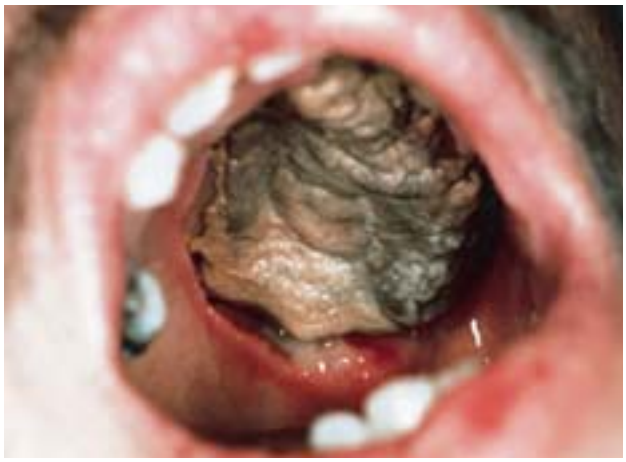

FIGURE 1. Gray-black eschar with undermined border of the left hard palate in an AIDS patient.

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FIGURE 2. A left-sided Bell's palsy in an AIDS patient with mucormycosis.

On examination, the left side of the hard palate had a gray-black eschar, with undermined borders, to the midline (Figure 1). The left side of the nasal septum also demonstrated a gray eschar. Left-sided Bell's palsy was present (Figure 2).

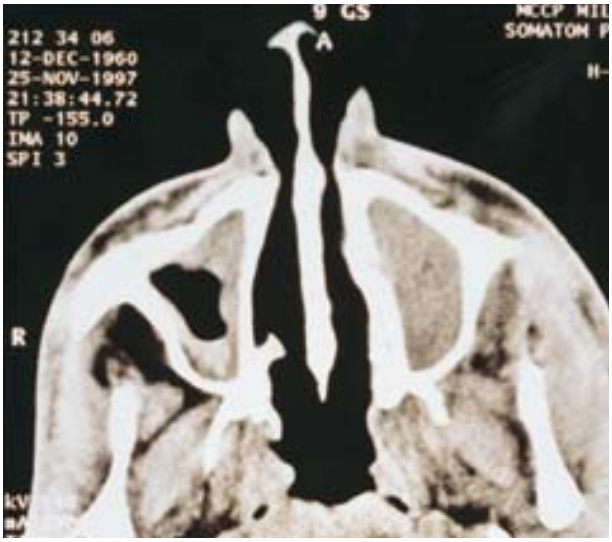

FIGURE 3. Computed tomographic scan demonstrating soft tissue swelling,edema, and inflammatory changes involving the tissue around the left masseter muscle.

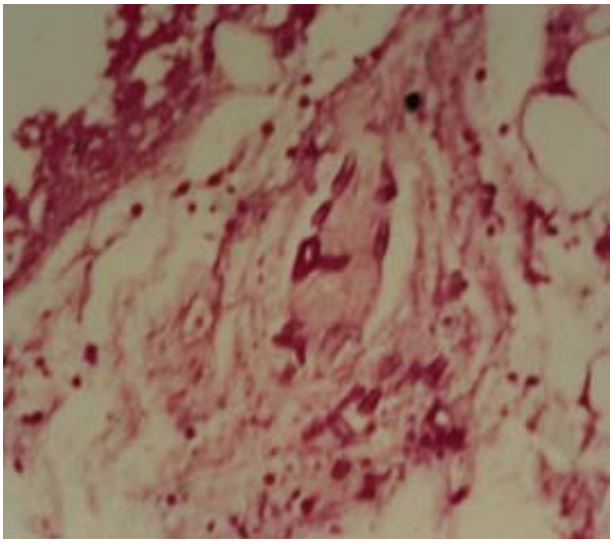

FIGURE 4. Periodic acid-Schiff stain demonstrating non-septate broad branching hyphae with right-angle branching.

On admission, our differential diagnosis included mucormycosis, noma (cancrum oris), herpes zoster, aspergillosis, atypical mycobacterial infection, Kaposi's sarcoma, a high-grade HIV-associated lymphoma, and necrotizing stomatitis.

Computer tomographic scan demonstrated soft tissue swelling, edema, and inflammatory changes involving the tissue around the left masseter muscle and retromaxillary region. Erosion of the adjacent posterior aspect of the left maxilla and a small amount of soft tissue gas lateral to the posterior aspect of the left maxilla was seen (Figure 3).

Tzanck smear and direct fluorescent antibody examinations were negative for varicella zoster virus and herpes simplex 1 and 2 viruses. Biopsy of the nasal septum demonstrated tissue partially lined by respiratory epithelium. Nonseptate fungal hyphae consistent with *Mucor* were found (Figure 4). The fungal culture taken from the hard palate grew out *Rhizopus* species.

Because of our high index of suspicion, the patient was immediately begun on amphotericin B. He developed renal insufficiency on this medication, which resolved when he was switched to the liposomal form of the drug. On hospital day 20, he went to the operating room for surgical debridement and a dental prosthesis.

Tissue from his maxilla and palate was largely necrotic, and densely infiltrated by broad, non-septate fungal hyphae that branched at right angles. Necrosis of the facial nerve was found in the buccal fat pad, explaining the Bell's palsy (Figure 5). Cultures were negative after partial treatment with amphotericin B.

The patient responded very well to treatment, was discharged home, and continued to receive liposomal amphotericin B three times per week.

Comments

Mucormycosis is an infection that is caused by several species of the orders Mucorales and Entomophthorales. The agents most commonly involved are *Rhizopus*, *Mucor*, and *Absidia*. Less often, species from *Rhizomucor*, *Cunninghamella*, and *Mortierella* are involved.[1] Infection arises through inhalation of spores, contamination of traumatized tissue, ingestion, and direct inoculation.[2]

Mucormycosis in HIV disease is rare. It occurs primarily in patients with very low CD4 counts (mean = 106). In the setting of HIV disease, the usual predisposing factors for mucormycosis, such as diabetic ketoacidosis and trauma, are not present. Mucormycosis may be the presenting opportunistic infection in AIDS.[3] In one review, symptoms associated with *Mucor* infection led to the diagnosis of HIV seropositivity in half of the patients. While it is important to consider HIV infection in patients presenting with mucormycosis, few cases have been reported.

The major risk factors for contracting *Mucor* in HIV disease are recurrent episodes of neutropenia and active intravenous drug use.[3] The clinical manifestations of mucormycosis can be divided into six separate syndromes: rhinocerebral, pulmonary, cutaneous, gastrointestinal, central nervous system (basal ganglia), disseminated, and miscellaneous (bones, kidney, heart, and mediastinum).[2]

Most commonly, HIV-negative intravenous drug users present with basal ganglia (central nervous sys-

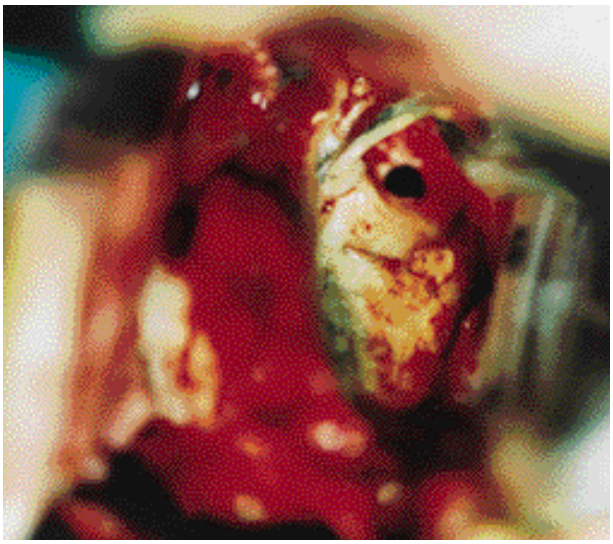

FIGURE 5. Left buccal fat pad with necrosed facial nerve.

tem) disease,[3,4] demonstrating seizures, hemiplegia, and coma. There are several cases of the classically described cerebral form of *Mucor* in active intravenous drug-using patients with AIDS.[4] However, a review of the literature demonstrates that most active intravenous drug users with AIDS present with manifestations of mucormycosis other than the well-described cerebral form. Cutaneoarticular, renal, disseminated disease and infection of the spleen have all been demonstrated.[3,5-7]

A patient with cutaneoarticular mucormycosis presented with a 14 × 9-cm necrotizing, ulcerated plaque adjacent to an infected knee. A serosanguinous, odorless, reddish exudate containing abundant creamy-white granules 3 to 6 mm in diameter yielded cultures of *Cunninghamella bertholetiae*.[5]

There has been one case of renal mucormycosis in an active intravenous drug user with AIDS who actually survived for 11 months without nephrectomy (but with 3 1/2 months of amphotericin B therapy). Two cases of isolated renal mucormycosis have been reported in AIDS patients who were not intravenous drug users. They presented with diffuse enlargement of the kidney. No route of entry was proven in these patients. Renal mucormycosis should be considered in the differential diagnosis of diffuse renal enlargement in HIV-infected patients.[8] Both patients did well after nephrectomy and treatment with amphotericin B.

There have been two fatal cases of AIDS patients with disseminated mucormycosis. There were no skin manifestations in either of the cases.[3]

The rhinocerebral form of mucormycosis found in our patient is exceedingly rare in HIV disease. The classically associated risk factor for this type of mucormycosis is diabetic ketoacidosis. Only three cases have been previously reported in the setting of HIV, with only one case found in a nondiabetic patient with AIDS. The first case reported was a 30-year-old man with AIDS who presented with right maxillary sinusitis. He developed facial swelling over the next 2 weeks. No lesions were noted on his hard palate and his cranial nerves were intact. Sinus aspiration eventually grew *Rhizopus arrhizus*. He responded well to surgical debridement and intravenous amphotericin B therapy.[9] The second patient had iatrogenically caused diabetes mellitus as a complication of pentamidine therapy. This 33-year-old male presented to the hospital complaining of progressive right periocular pain, local swelling, rhinorrhea, and nasal congestion. His examination revealed right ocular proptosis with periorbital edema. A computed tomography scan showed involvement of all the sinuses and erosion of the hard palate and sphenoid bone. He refused surgery and succumbed to his infection.[10] The third case reported was a 47-year-old female with AIDS and adult-onset diabetes mellitus. She presented with sudden onset of blindness in the left eye. She suffered a diffuse left cerebral stroke 36 hours after presentation and expired 6 days after initial presentation despite therapy with amphotericin B. Autopsy revealed extensive invasion by *Rhizopus* species into the sinuses and orbits. Vessels of an infarcted optic chiasm were thrombosed and contained fungal organisms.[11]

There have been several cases of primary cutaneous mucormycosis in HIV patients. One patient presented with a rapidly enlarging abscess on the dorsal aspect of his right forearm. In 2 weeks he developed an ulcerated, necrotic 8 × 5-cm purulent, foul-smelling ulcer that cultured out *R. arrhizus*. He died 2 weeks after refusing intravenous amphotericin B therapy after the surgical debridement of his ulcer.[12] In another case, a woman presented with a clear blister around an intravenous injection site on the dorsum of her left forearm. Two weeks later, she developed a black eschar extending proximal and distal to the injection site. She required amputation of her hand after refusing surgical debridement even though she did receive intravenous amphotericin B.[13] A 35-year-old male with AIDS presented with pea-sized nodules located on the forehead, jaw, and chest. He was treated with local excision as well as amphotericin B, and on 3-month follow-up had no recurrence. Cultures of the excised nodules grew *Absidia corymbifera*.[14]

Early diagnosis and treatment of mucormycosis is extremely important. Once the infection is established, *Mucor* occludes arterial blood flow, causing thrombosis, ischemia, and necrosis of structures supplied by the vessels involved. Control of the underlying disease must be established, metabolic abnor-

malities corrected, and aggressive antifungal therapy with amphotericin B combined with surgical debridement of all necrotic tissue.[15]

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