Figure 1. Total WBC count (○) and ANC (●) for patient 1, a 37-year-old male who developed vancomycin-induced neutropenia. G-CSF (600 μg iv) was initially administered on days 30 and 33 of therapy. Additional 300-μg doses of iv G-CSF were administered twice weekly (on days 38–52) and thrice weekly (on days 55–78) until vancomycin therapy was completed. ANC = absolute neutrophil count.

References

Rhinocerebral Mucormycosis in a Patient with AIDS: A Complication of Diabetic Ketoacidosis Following Pentamidine Therapy

We report the case of a patient with AIDS in whom rhinocerebral mucormycosis developed after treatment with pentamidine. As far as we know, this is the first report of a case of rhinocerebral mucormycosis occurring as a complication of iatrogenic diabetes in a patient with AIDS.

A 33-year-old former intravenous drug user with HIV type C3 infection and no personal or family history of diabetes mellitus was receiving outpatient therapy with intravenous pentamidine for Pneumocystis carinii pneumonia. On day 20 of therapy, he presented to the hospital because of 3-day history of acute deterioration in his general condition and anorexia and vomiting. He also reported progressive right periorbital pain, local swelling, rhinorrhea, and nasal congestion that had developed a few days before.

Physical examination revealed that he was confused and had right ocular proptosis with periorbital soft-tissue edema. Blood tests disclosed the following initial values: glucose, 812 mg/dL; urea, 167 mg/dL; creatinine, 2.0 mg/dL; amylase, 4,702 μL; and lipase, 2,176 U/L. The venous pH was 7.28, and the serum bicarbonate level was 14 mmol/L. The level of urinary ketone bodies was 80 mg/dL. The neutrophil count was 1.9 × 10^9/L, and the CD4+ lymphocyte count was 20/μL. Abdominal ultrasonography showed an edematous pancreas. A brain CT revealed thickened mucosa in the right sphenoidal sinus; no abnormalities were found in the brain and frontal sinuses. An ophthalmologic consultation was sought, and acute dacryocystitis and diabetic ketoacidosis were diagnosed; treatment with broad-spectrum antibacterial agents, rehydration, and intravenous insulin was started.

Despite metabolic compensation, the lesions rapidly became necrotic, and his level of consciousness gradually decreased to a deep stupor. Two days after admission, a new CT showed involvement of all the sinuses with erosion of the hard palate and sphenoid bone and two hypodense lesions in the right frontal lobe. Because
Mucormycosis was suspected, biopsy specimens of the sinuses were taken, and therapy with rapidly escalating doses of amphotericin B (up to 1.5 mg/[kg × d]) was started. A joint decision by the patient’s relatives and the physicians ruled out surgery, and the patient died 3 days later.

Examination of the biopsy specimens disclosed the presence of many fungal hyphae in the fragments of oral mucosa in the epithelium, in the underlying chorion, and inside blood vessels. Such hyphae were nonseptate, and some of them were branched with clear central halos, characteristics consistent with fungi of the genus *Mucor* (figure 1). Since the material could not be cultured, the species could not be identified.

Mucormycosis is very rare in patients with AIDS. However, some cases have been reported, mostly in Spain, involving the brain, lung, skin, or kidney. Some of these cases occurred in HIV-infected patients who were also intravenous drug users; intravenous drug use by itself seems to be a significant risk factor for the development of mucormycosis, at least the cerebral form. In regard to the rhinocerebral form of the disease, we have found only one case in a non-diabetic patient with AIDS [1]; this patient had subacute rhinocerebral mucormycosis that responded to treatment with surgery and amphotericin E.

Pancreatitis is a well-known adverse effect of pentamidine therapy; it usually occurs from 6 to 21 days after the onset of treatment [2]. Diabetic ketoacidosis rarely occurs during acute pancreatitis; it is usually associated with severe necrosis of the pancreas. A few cases of diabetes mellitus induced by pentamidine therapy that presented as diabetic ketoacidosis have been reported [3].

The treatment of rhinocerebral mucormycosis involves identification of the underlying cause, adequate surgical debridement, and amphotericin B therapy; nevertheless, the mortality rate associated with this condition is about 50%. Reports of curing mucormycosis with antifungal treatment alone are anecdotal, and adequate surgical debridement of necrotic tissues should always be performed [4]. Thus, the fatal outcome in this case was predictable, since consent was not obtained for surgery.

**References**