Aspergillus terreus Endophthalmitis in a Patient With Chronic Lymphocytic Leukemia

Paul H. Kalina, MD, R. Jean Campbell, MB, ChB

- A 65-year-old woman with a 7-year history of chronic lymphocytic leukemia presented with acute visual loss, pain, and redness in her right eye. Results of stains and cultures of anterior chamber fluid were negative. Neurologic problems, bronchopulmonary pneumonia, recurrent skin lesions, and a low-grade fever developed. Progressive respiratory distress ensued, and the patient died 1 month after presentation. Cultures from antemortem sputum and skin samples were positive for Aspergillus terreus. Postmortem histologic results showed extensive A terreus invasion of the posterior vitreous, retina, choroid, and anterior optic nerve. This organism was also found in histologic sections from the right adrenal gland, left kidney, thyroid, urinary bladder, right lung, skin, esophagus, sputum, vessels of the myocardium, and brain. To our knowledge, A terreus endophthalmitis has not been reported previously.

(REPORT OF A CASE)

Aspergillus endophthalmitis has been reported in immunosuppressed patients and in patients on intravenous drug use. This organism is found in soil and decaying plant matter, and the species most frequently associated with disease are Aspergillus flavus and Aspergillus fumigatus. We describe a unique case of fungal endophthalmitis caused by Aspergillus terreus in a patient with chronic lymphocytic leukemia. To our knowledge, this is the first reported case of endophthalmitis caused by this fungus.

A 65-year-old white woman had a 7-year history of chronic lymphocytic leukemia. On February 3, 1989, she presented to her physician with the acute onset of discomfort, redness, and blurring of vision in the right eye. Gentamicin eye drops were prescribed. During the next 3 days, her vision worsened and eye redness and discomfort increased. She presented to an ophthalmologist and was hospitalized for investigation of a fever of unknown origin and the associated eye problems. The visual acuity was light perception in the right eye and 20/25 OS. Examination of the right eye showed marked conjunctival erythema accompanied by minimal lid swelling. Extraocular movements were normal. The pupil was 3 mm and fixed. Slit-lamp examination showed a turbid exudate with stringy, white lines and small, globular densities in the anterior chamber. Posterior pole visualization was poor. Results of examination of the left eye were normal, except for a few intraretinal hemorrhages consistent with a leukemic process.

Fluid from an anterior chamber tap performed on February 6 contained many lymphocytes, but results from special stains and cultures, including those for fungi, were negative. Periocular injections of 40 mg of gentamicin sulfate (Garamycin) and 100 mg of cefazolin sodium were administered after the tap.

Results of blood cultures were negative. A chest roentgenogram was suggestive of either a right lung infiltrate or right hilar adenopathy. Sinus roentgenograms were normal. A sputum sample culture was positive for Aspergillus of an undetermined type. Bronchoscopy was recommended, but the patient left before this could be performed. A bone scan showed localized uptake in the proximal left humerus that was of unknown significance.

Treatment following paracentesis included administration of topical gentamicin, atropine sulfate, and systemic intravenous antibiotics. The anterior chamber material dissolved dramatically after administration of topical steroids. On February 12, the patient was referred to our institution for assessment of her chronic lymphocytic leukemia and endophthalmitis; the latter was presumed to be of a sterile inflammatory nature.

Our findings concurred with those of the previous examination. The right anterior chamber contained a few lymphocytes. Through a dense, confluent vitreous infiltrate, only the superior portion of the retina and a few nonspecific intraocular hemorrhages were visible. Other than a few Roth's spots, the left eye was normal. B-scan ultrasonography showed a flat retina. Diagnostic vitrectomy was suggested for identification of the organism but was declined because of more urgent problems related to the patient's leukemia. A lumbar puncture showed clear fluid that, on later testing, was shown to contain 97% lymphocytes, 2% monocytes, 1% neutrophils, and no blast cells or malignant cells. The total protein value was 0.38 g/L (normal, 0.14 to 0.45 g/L) and the glucose value was 3.7 mmol/L (normal, 2.8 to 4.2 mmol/L). Results of cultures and stains for bacteria, fungi, viruses, and mycobacteria were negative. Immunoelectrophoresis for Streptococcus pneumoniae, Haemophilus, and Neisseria meningitidis was also negative. The patient received intrathecal methotrexate sodium, a course of cyclophosphamide (Cytoxan), doxorubicin hydrochloride (Adriamycin), and prednisone hydrochloride, and 6 Gy of external-beam radiation to the right globe. Treatment with topical 1% prednisolone acetate (Pred Forte) and 1% atropine was continued to the right eye.
The low-grade fever persisted, and multiple recurrent skin lesions consistent with Osler's nodes appeared 8 days after admission. Skin cultures later yielded A terreus. Again, vitreous was declined. Blood and cerebrospinal fluid cultures remained negative. Progressive respiratory distress ensued. On February 28, 1989, a bronchoalveolar lavage was performed; A terreus was cultured from this material. Ten milligrams of amphotericin B was administered intravenously after the lavage, but the patient's condition deteriorated. Same-day therapeutic bronchoscopy showed a complete obstruction of the right middle lobe bronchus secondary to a large blood clot. The patient died of respiratory distress on March 2, 1989.

PATHOLOGIC DESCRIPTION

A complete autopsy was performed, and all tissues were fixed in 10% formaldehyde solution.

The right eye showed a thick, grayish white exudate in the posterior pole that appeared gelatinous. Multiple retinal hemorrhages also were present (Fig 1). The left eye showed only a few scattered Roth's spots anteriorly.

Sections from the right eye examined microscopically showed extensive septic hyphae within the vitreous, retina, and choroid and extensive hyphal vascular involvement. The inflammatory reaction was minimal in the stroma, but the retinal and choroidal vessels contained many lymphocytes. The posterior retinal showed partial focal necrosis. The central retinal vein of the optic nerve showed occlusion by fungal elements (Fig 2).

No fungal elements were seen in the left eye. The nerve fiber and outer plexiform layers contained focal hemorrhages. Mature lymphocytes were prominent in many choroidal vessels.

Postmortem histologic examination showed septate fungal elements in the right adrenal gland, left kidney, thyroid, urinary bladder, right lung, skin, esophagus, sputum, brain, and vessels of the myocardium.

COMMENT

Fungal endophthalmitis is uncommon. In most cases, Candida is the causal organism. However, in immunosuppressed patients and intravenous drug users, the causative organism may be an Aspergillus species. In intravenous drug users, Aspergillus endophthalmitis may occur without extracocular infection. Although Aspergillus organisms are ubiquitous in soil, they only rarely infect humans, and in most cases the fungus manifests as a lung disease. The species involved is usually A fumigatus or A flavus.

Aspergillus terreus often considered a laboratory contaminant. Recently, A terreus was reported to have caused allergic bronchopulmonary aspergillosis and invasive pulmonary aspergillosis. The fungus previously has been reported as causal in pneumonia, endocarditis, skin abscesses, osteomyelitis, and meningitis.

Aspergillus terreus is a rapidly growing mold with velvety colonies that appear cinnamon or orange-brown. The conidophores are smooth-walled and colorless and terminate in a hemispherical vesicle. Morphologically, this fungus species is recognized in culture and tissue sections by the presence of lateral conidia. It is these lateral conidia that are unique to the A terreus-flavipes group.

In this case, fungal endophthalmitis was caused by A terreus, which also was present in multiple body organ systems. The diagnosis was established by antemortem lung and skin cultures that were positive for A terreus. No eye cultures were done. To the best of our knowledge, this is the first report of endophthalmitis caused by this organism. In view of the rapidly increasing number of immunosuppressed patients and intravenous drug users, we believe that A terreus should be taken seriously as an ocular pathogen, especially in these two patient subgroups. It should not be disregarded as a contaminant.

References