Intraocular Coccidioidomycosis Diagnosed by Skin Biopsy

Emmett T. Cunningham, Jr, MD, PhD, MPH; Stuart R. Seiff, MD; Timothy G. Berger, MD; Paul E. Lizotte, DO; Edward L. Howes, Jr; Jonathan C. Horton, MD, PhD

Objective: To describe ocular findings in 2 patients with disseminated coccidioidomycosis diagnosed by skin biopsy.

Methods: The clinical and histopathologic findings of the 2 patients were reviewed retrospectively.

Results: One patient had a unilateral, granulomatous iridocyclitis with multiple iris nodules and a large vascularized anterior chamber mass, in the setting of pulmonary, cutaneous, and skeletal infection by Coccidioides immitis. The second patient developed papilledema and multifocal chorioretinitis accompanied by pulmonary, cutaneous, and meningeal C immitis infection. In each case, examination of the skin biopsy specimen revealed C immitis spherules. Treatments included local and systemic amphotericin B and oral fluconazole.

Conclusions: Although rare, intraocular involvement can occur in the setting of disseminated coccidioidomycosis. A thorough systemic evaluation and biopsy of suspicious skin lesions can aid in the diagnosis.


Coccidioides immitis is a dimorphic fungus endemic to semi-arid regions of the southwestern United States, including parts of Arizona, Nevada, New Mexico, Texas, Utah, and California. As many as 100,000 people are infected by C immitis annually in the United States, virtually all by inhalation of arthroconidial forms of the organism. Approximately 40% of infected persons contract a flulike illness including fever, cough, headache, and myalgias.1

Less than 1% of people infected by C immitis develop disseminated disease, defined as the presence of extrapulmonary infection, most commonly involving the skin, skeletal system, lymph nodes, or meninges.1 Intraocular involvement by C immitis is rare and often difficult to diagnose.2 We report 2 cases of disseminated coccidioidomycosis with intraocular involvement diagnosed by skin biopsy.

REPORT OF CASES

CASE 1

A 32-year-old man had a 1-month history of pain, photophobia, and decreased vision in his right eye. A review of his medical records revealed onset of high fever, cough, and myalgia 5 months previously while he was imprisoned in the San Joaquin Valley, California. He also complained of persistent right elbow pain. Systemic examination disclosed multiple pigmented, verrucous lesions on the face (Figure 1, A), chest, arms, and legs. The best-corrected visual acuity was 20/200 OD and 20/20 OS. No afferent pupillary defect was present. Intraocular pressures were normal. Slitlamp examination of the right eye showed large, inferiorly distributed “mutton-fat” keratic precipitates, moderate anterior chamber cell and flare, scattered midstromal iris nodules, and a large vascularized mass in the inferonasal aspect of the anterior chamber (Figure 1, B). Results of a fundus examination were normal. Positive laboratory test results included an elevated erythrocyte sedimentation rate (Westergren method) of 50 mm/h and a slightly elevated lysozyme level of 8.2 mcg/mL (normal, 2.8-8.0 mcg/mL). Chest x-ray film demonstrated a small right upper lobe granuloma. Lumbar puncture was normal. A whole-body technetium Tc 99m pyrophosphate bone scan to evaluate the patient’s right elbow pain showed increased perfusion and blood pooling in the region of the right medial epicondyle, as.
well as multiple additional skeletal lesions (Figure 1, C). Examination of a biopsy specimen obtained from a skin lesion near the left medial canthus showed hyperkeratosis and parakeratosis covering an area of pseudoepitheliomatous hyperplasia. The inflammatory cell infiltrate consisted of numerous plasma cells surrounding scattered Langerhans-type giant cells (Figure 1, D). Rare spherules with endospores, some within giant cells, were also evident (Figure 1, E). His condition was diagnosed as disseminated coccidioidomycosis with pulmonary, cutaneous, skeletal, and intraocular involvement, and he was admitted to the hospital for treatment with intravenous amphotericin B. On the fourth hospital day, the patient left against medical advice. He consented to an outpatient regimen of oral fluconazole but never returned for follow-up.

**CASE 2**

A 31-year-old woman noticed a painless lump on the left side of her neck. Examination of the biopsy specimen showed hyperkeratosis and parakeratosis covering an area of pseudoepitheliomatous hyperplasia with numerous infiltrating plasma and Langerhans-type giant cells (Figure 2, A). Rare spherules with endospores were also noted (Figure 2, B). A diagnosis of cutaneous coccidioidomycosis was made but no treatment was rendered. Two years later, the patient developed fever, a nonproductive cough, headache, nausea, and malaise during the first trimester of pregnancy. Her symptoms were initially dismissed, but, when she became disoriented, a computed tomography scan was...
obtained, with normal results. A culture of the cerebrospinal fluid grew C. immitis. A chest x-ray film showed miliary pneumonitis (Figure 2, C). The patient was treated with intravenous and intrathecal amphotericin B for 3 weeks, followed by oral fluconazole. Because of concerns over potential fetal infection, the pa-

Figure 2. Case 2. A, Low-power view of the biopsy specimen obtained from the patient’s neck shows hyperkeratosis and parakeratosis covering an area of pseudopithelomatus hyperplasia (hematoxylin-eosin, original magnification ×40). B, High-power view of the lower portion of part A shows numerous infiltrating plasma cells and a large Langerhans-type giant cell containing a spherule with endospheres (hematoxylin-eosin, original magnification ×200). C, Chest x-ray film shows miliary pneumonitis. D, Computed tomographic scan shows mild residual ventriculomegaly and a functioning right ventriculoperitoneal shunt following successful treatment of coccidioidal meningitis. E, Right fundus photograph shows a small choroidal lesion superotemporal to the fovea (arrow) and mild papilledema. F, Left fundus photograph shows 2 choroidal lesions, 1 superonasal to the optic nerve head and 1 inferotemporal to the fovea (arrows). Mild papilledema is also evident.
tient had an abortion during the fifth month of pregnancy. She developed hydrocephalus following the procedure, requiring placement of a right ventriculoperitoneal shunt (Figure 2, D). Ophthalmologic consultation after the shunt placement revealed a best-corrected visual acuity of 20/20 OU, no afferent pupillary defect, and full visual fields to confrontation. Intraocular pressure and anterior segment examination results were normal bilaterally. Fundus examination showed resolving papilledema and scattered choroidal infiltrates in each eye (Figure 2, E and F). Repeated examination of the cerebrospinal fluid was normal. The patient was prescribed long-term oral fluconazole therapy, resulting in control of her infection.

We describe 2 patients with disseminated coccidioidomycosis and intraocular involvement diagnosed by skin biopsy. The first patient had a unilateral, granulomatous, iridocyclitis accompanied by pulmonary, cutaneous, and skeletal infection. The second patient had a bilateral, multifocal choroiditis in the setting of pulmonary, cutaneous, and meningeal involvement. Recognized risk factors for disseminated disease included African American race in case 1 and first-trimester pregnancy in case 2. Both patients were treated with intravenous amphotericin B followed by oral fluconazole. The second patient also received intrathecal amphotericin B for coccidioidal meningitis. While long-term follow-up information was not available for case 1, the combined use of both intrathecal and systemic amphotericin B followed by oral fluconazole led to control of the infection in case 2.

Intraocular C immitis infection is rare, although isolated reports of patients with granulomatous iridocyclitis associated with iris or anterior chamber nodules, as observed in our case 1, or with multifocal choroiditis as observed in our case 2, have appeared in the literature. In addition, patients with retinitis, endophthalmitis, and extraocular involvement, including eyelid and eyebrow lesions, granulomatous conjunctivitis, phlyctenular keratoconjunctivitis, episcleritis, and scleritis have also been described. Of note, as many as 10% of patients with symptomatic coccidioidal pneumonia have been noted to develop visually asymptomatic chorioretinal scars, perhaps suggesting that self-limited ocular involvement is more common than previously suspected.

Diagnosis of intraocular C immitis infection is often difficult. Skin and serologic testing provide strong evidence for prior exposure to C immitis but alone do not confirm the presence of disseminated or ocular disease. Histopathologic or culture identification of C immitis in anterior chamber, vitreous, or choriotreal specimens is the most direct method to diagnose intraocular infection, but intraocular biopsy is not without risk. In contrast, biopsy of skin lesions has low morbidity and can provide definitive evidence for disseminated disease.

In summary, intraocular involvement, although rare, can occur in the setting of disseminated C immitis infection. A thorough systemic evaluation, including biopsy of suspicious skin lesions, can aid in the diagnosis. Once diagnosed, combination therapy with local and/or systemic amphotericin B followed by an oral triazole, such as fluconazole, seems to offer the best chance for long-term control of the infection.

Accepted for publication February 4, 1998.

This research was supported by grants from That Man May See and Research to Prevent Blindness Inc, New York, NY.

Corresponding author: Jonathan C. Horton, MD, PhD, Department of Ophthalmology, UCSF School of Medicine, San Francisco, CA 94143-0730 (e-mail: horton@itsa.ucsf.edu).

REFERENCES