

Curvularia Endophthalmitis Following Open Globe Injuries

Curvularia is a dematiaceous filamentous fungus found in soil and plants of tropical and subtropical countries. It is the third most common filamentous fungi and the most common dematiaceous fungi isolated from microbial keratitis.¹ We describe 2 patients with open globe injuries who developed endophthalmitis caused by *Curvularia*.

Report of a Case. *Case 1.* A 23-year-old Hispanic man was initially seen on July 14, 2007, with a 1-week history of increased pain, redness, and decreased vision in his left eye. He sustained a corneal injury in his left eye while hammering a nail and had undergone corneal laceration repair elsewhere on July 6, 2001. At the time of presentation, the patient had been using topical prednisolone acetate, 1%, hourly and moxifloxacin, 0.5%, eye drops 4 times a day.

Best-corrected visual acuity was 20/200 OS. The examination showed edematous eyelids, congested and edematous conjunctiva, a corneal infiltrate with feathery margins involving a sutured corneal laceration, marked anterior chamber fibrin with hyphema, and a disrupted anterior lens capsule in the left eye. Vitreous opacity obscured a view of the retina, but on ultrasonography, dense vitreous opacities with associated posterior lens fragments and an attached retina were noted. A diagnosis of endophthalmitis, microbial keratitis, and retained posterior lens fragments was made. He underwent pars plana vitrectomy, removal of lens fragments, and intravitreal injection of 1 mg/0.1 mL of vancomycin, 2.25 mg/0.1 mL of ceftazidime, and 0.05 mg/0.1 mL of voriconazole. Voriconazole was included because of the suspicion of a fungal etiology based on the corneal appearance. The keratitis in the left eye was scraped and sent for culture, along with the aqueous and vitreous. Postoperatively, the patient was treated with prednisolone acetate, 1%, and

topical amphotericin B. No growth was observed on the cultures from the aqueous and corneal samples. The vitreous specimen became culture positive after 4 days. A dematiaceous, black mold was identified as *Curvularia* species using growth and morphological characteristics. Initially, the inflammation was reduced but an increase was noted at 38 days. Clinical findings included reactivated keratitis with feathery margins, trace pigmented hypopyon, and vitritis (**Figure 1**). Corneal scraping with vitreous tap along with intravitreal injection of voriconazole was performed. There was no growth of fungus on culture from either specimen. The patient was treated with topical voriconazole and amphotericin B. A similar recurrence was noted again at 2 months. Cultures obtained from the cornea and vitreous were negative. Intraocular inflammation resolved with topical voriconazole, amphotericin B, and 200 mg of oral voriconazole twice a day, which was continued for 4 weeks. Five months later, the patient returned with symptoms of pain and redness. A diagnosis of microbial keratitis with corneal perforation was made for which the patient underwent therapeutic penetrating keratoplasty. Histopathologic analysis of the excised cornea showed acute inflammatory cells on the posterior corneal surface. Fungal elements were identified on periodic acid–Schiff stain and Gomori methenamine silver stains (**Figure 2**). After 2 months, allograft rejection occurred and the cornea became edematous. Visual acuity with aphakic correction at last follow-up (10 months) was 20/200 OD.

Case 2. Following an injury sustained while cutting grass, a 55-year-old Hispanic man was initially seen on July 9, 2001, with a 4-hour history of decreased vision and pain in his right eye. Visual acuity was light perception and a scleral laceration with prolapse of uveal tissue and hyphema was noted in the right eye. Ultrasonog-

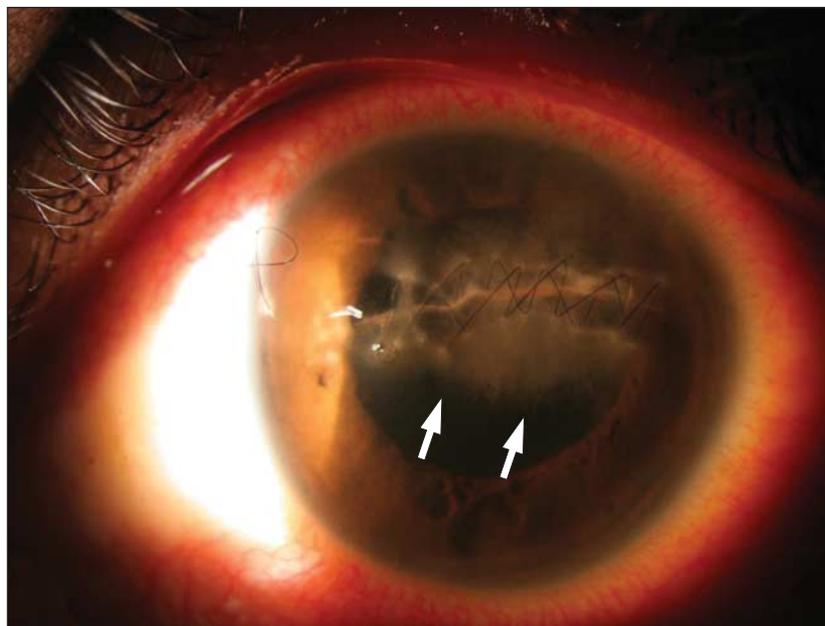


Figure 1. Slitlamp photograph of case 1 showing sutured corneal laceration and infiltrate with feathery margins (arrows).

raphy showed moderately dense vitreous opacities and membranes and an intraocular foreign body inferiorly with an attached retina (**Figure 3**). The patient underwent repair of the scleral laceration, scleral buckling, pars plana lensectomy, vitrectomy, intraocular foreign body removal, endolaser, and intravitreal injection of 1 mg/0.1 mL of vancomycin and 2.25 mg/0.1 mL of ceftazidime. Intravitreal antibiotics were injected because infiltrates were noted in the vitreous during vitrectomy. Gram stain of the vitreous specimen showed many gram-positive and gram-negative rods. Cultures from the vitreous and intraocular foreign body were positive for *Enterococcus gallinarum*, *Bacillus* species, and *Escherichia coli* at 24 hours. All bacteria were susceptible to initially administered antibiotics. On day 6, 3 black, dematiaceous molds were identified as *Curvularia* species using growth and morphological characteristics. Eight days postoperatively, 0.005 mg/0.1 mL of amphotericin B were injected intravitreally to treat for *Curvularia*. The inflammation resolved but the retina detached 45 days after the initial treatment. Pars plana vitrectomy, membrane peeling, endolaser, and silicone oil injection were performed to reattach the retina. At the last follow-up (8 months), the visual acuity with aphakic correction was 20/400 and the retina remained attached.

Comment. Endophthalmitis caused by *Curvularia* is rare; only 2 case reports from India following delayed-onset postoperative endophthalmitis have been published.^{2,3} The visual acuity outcomes were light perception and 20/30 following treatment with appropriate antifungal agents.^{2,3}

Trauma is a commonly associated risk factor in the development of *Curvularia* keratitis in tropical and subtropical countries.¹ Case 1 presented with indolent recurrent inflammation. Prior use of topical corticosteroids probably led to sequestration of the organism within the cornea and could account for recurrent inflammation.⁴

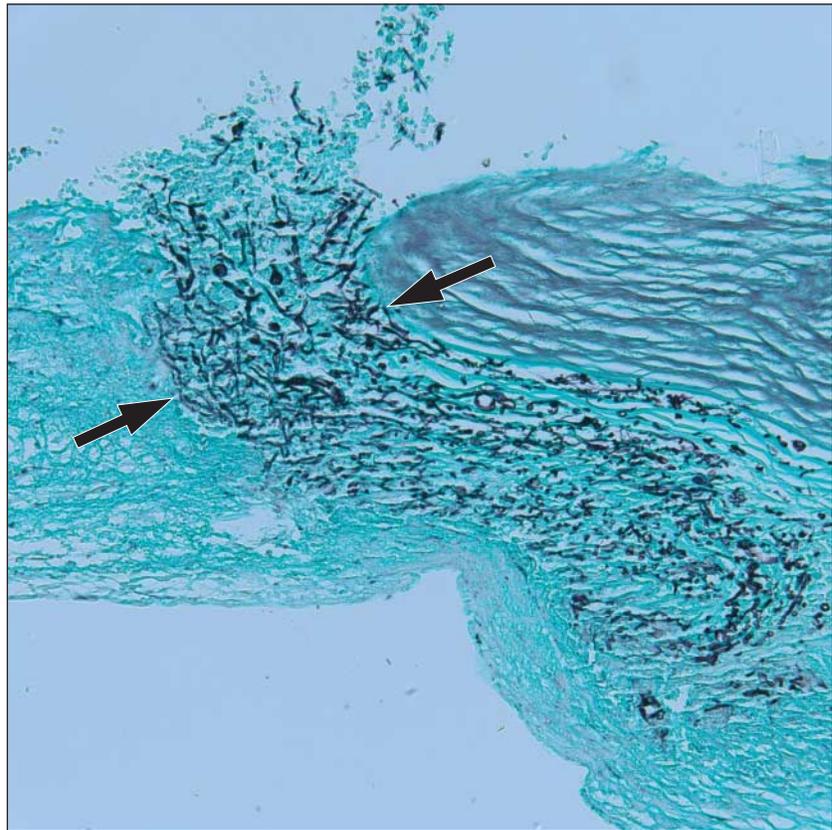


Figure 2. Fungal elements depicting *Curvularia* (arrows) are present throughout the corneal stroma (Gomori methenamine silver, original magnification $\times 200$).

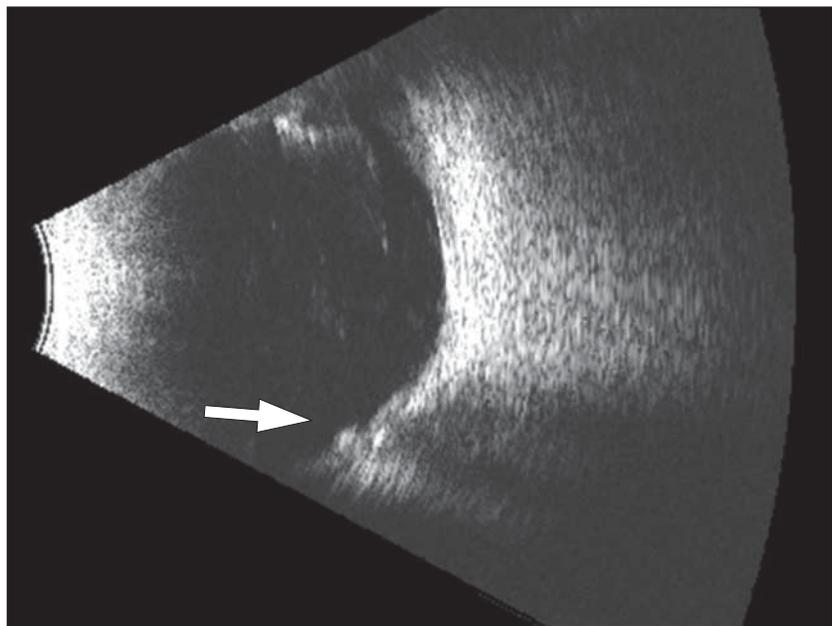


Figure 3. Ultrasonography of case 2 showing multiple vitreous opacities with an intraocular foreign body (arrow).

The ideal treatment for *Curvularia* infections has not been clearly defined. In patients with microbial keratitis, topical natamycin suspension, 5%, may be the preferred choice.¹ However,

amphotericin B and voriconazole have also been found to be effective against *Curvularia* in vivo and in vitro.⁵⁻⁷ Polymicrobial infection is not an uncommon occurrence in endophthalmitis associated with

open globe injuries, as noted in case 2.

In the current cases and the previously reported postoperative cases, endophthalmitis due to *Curvularia* can require a prolonged course of treatment even after vitrectomy, intravitreal antifungal therapy, and systemic antifungal agents. Endophthalmitis due to *Curvularia* should be considered in the differential diagnosis of posttraumatic endophthalmitis in tropical and subtropical countries.

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Correction

Error in Byline. In the Clinical Sciences article titled "Postoperative Visual Acuity in Patients With Fuchs Dystrophy Undergoing Descemet Membrane–Stripping Automated Endothelial Keratoplasty: Correlation With the Severity of Histologic Changes" by Happ et al, published in the January issue of the *Archives* (2012;130[1]:33-38), the fourth author's name should have appeared as "Heather D. Potter, MD."