

## Vitreotomy in Exogenous *Candida* Endophthalmitis\*

Gholam A. Peyman, David W. Vastine, and James G. Diamond

The Department of Ophthalmology of the University of Illinois  
Eye and Ear Infirmary, Chicago, Illinois 60612

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*Summary.* A case of *Candida* endophthalmitis was clinically diagnosed three weeks after perforating injury. It was successfully treated with vitrectomy and intravitreal injection of 5 mcg of amphotericin B. A *Candida* species was cultured from the vitreous aspirations.

*Zusammenfassung.* Drei Wochen nach einer perforierenden Verletzung wurde eine Endophthalmitis durch *Candida albicans* diagnostiziert. Sie wurde erfolgreich durch Vitrektomie und mit intravitrealen Injektionen von 5 mcg Amphotericin B behandelt. *Candida* konnte aus dem Material, das aus dem Glaskörper ausgeschieden worden war, isoliert werden.

### Introduction

The rate of endophthalmitis after cataract surgery has been reduced with improved sterile technique and judicious use of pre- and postoperative antibiotics (Allen and Mangiaracine, 1964, 1974; Locatcher-Khorazo, Seegal, and Gutierrez, 1972). However, endophthalmitis is not an uncommon complication of traumatic eye injuries (Duke-Elder and Perkins, 1966). Although endogenous fungal endophthalmitis is treated by systemic antibiotics, the results of exogenous fungal infections are not favorable.

This paper presents a clinical case of exogenous fungal endophthalmitis and discusses its management by vitrectomy and intravitreal amphotericin B.

### Case Report

A 10-year-old white boy sustained a corneoscleral laceration by glass to his right eye on April 13, 1974. The vision was hand movement. The anterior chamber was flat, and there was a corneal laceration from 4 to 8 o'clock with a 2-mm scleral extension at each end. Immediate repair was accomplished by interrupted 9-0 Ethilon and 8-0 silk sutures placed in the cornea and sclera respectively, and cryopexy was applied in a horseshoe fashion around the scleral wounds. The patient was discharged on April 18 with visual acuity of light perception. The intraocular pressure was 12 mm Hg. A deep anterior chamber with a 4×4-mm fibrin clot over the pupillary aperture with 3+ beam and cell was noted. The posterior pole could not be visualized. Postoperative treatment for the ensuing two weeks consisted of 50 mg of prednisone daily, 2 drops of Maxitrol four times a day, 2 drops of 1% cyclopentolate hydrochloride (Cyclogyl) four times a day, and 1 gm daily of oxacillin, administered orally in divided doses.

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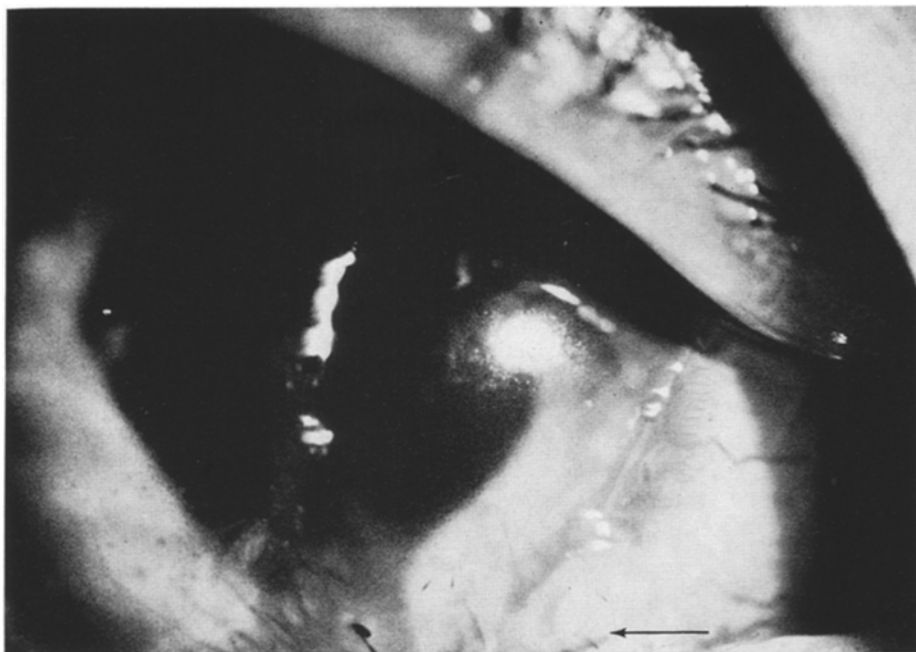


Fig. 1. Preoperative appearance showing corneal haze, keratic precipitates, and poor fundus reflex. Suture repair of corneal laceration is inferior (arrow)

On May 1, a dense, yellowish fundus reflex was noted inferiorly in the vitreous. Ultrasound examination revealed an attached retina behind diffuse vitreous opacities.

On May 8, the vision was poor light perception, the intraocular pressure was 5 mm Hg, and the anterior chamber was very shallow. The lens was displaced forward in the anterior chamber. There were large keratic precipitates on the inferior corneal endothelium (Fig. 1).

Because of progressive deterioration of the condition of the right eye, the patient was operated on under general anesthesia on May 14. A 180° peritomy was performed in the superior quadrant of the right eye. Five millimeters posterior to the limbus at 11 o'clock, a 3.5-mm sclerotomy was done parallel to the limbus. A 4-0 Dacron suture was placed mattress style through the wound lips in posterior to anterior direction. A No. 52 Beaver blade was then introduced through this site into the vitreous, then a No. 27 needle was inserted into the vitreous cavity and a specimen for culture and sensitivity was taken. The Peyman vitrophage (Peyman, Daily, and Ericson, 1973; Peyman and Huamonte, 1975) was then introduced into the eye and the mattress suture tightened around the shaft. The lens was removed, multiple iris sphincterotomies were made, and a vitrectomy was performed. After the anterior segment was cleared, a dense fibrous ingrowth was noted inferiorly. This was cut and removed. In addition, we encountered a dense fibrovascular stalk which connected the ingrowth to the optic disk. This fibrovascular stalk was severed and removed without complication. Examination

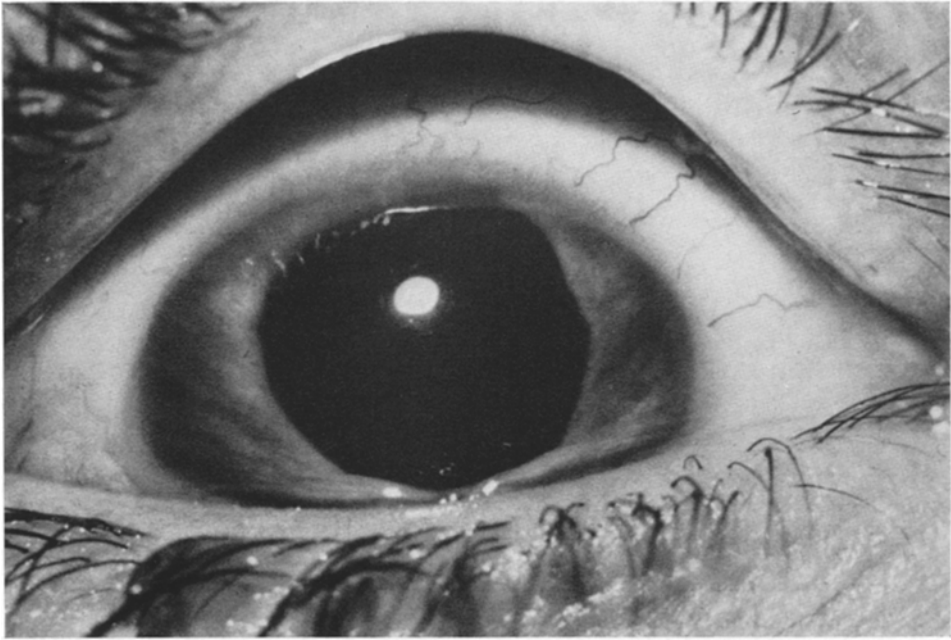


Fig. 2. Postoperative appearance six months after the onset of fungal endophthalmitis and treatment with vitrectomy and intraocular amphotericin

of the fundus revealed that the equatorial fundus was studded by multiple preretinal, round, soft, whitish deposits, one-fourth disk diameter in size. The vitrophage was removed and the sclerotomy site closed. The clinical impression was that of fungal endophthalmitis. Five micrograms of amphotericin B was injected slowly through the corneal limbus into the anterior portion of the vitreous with a 25-gauge needle, bevel directed toward the cornea (Axelrod and Peyman, 1973; Axelrod, Peyman, and Apple, 1973). All of the material removed from the eye was collected in a sterile suction bottle, spun down, and cultured for organisms. This culture and previous vitreous tap culture grew out *Candida* species (not *C. albicans*). No antibiotics were administered either systemically or topically postoperatively.

Postoperatively a severe vitreous haze persisted for four days which gradually cleared over the ensuing week.

Two weeks postoperatively an exudative detachment was noted in the inferior quadrant, and 50 mg of prednisone daily was administered orally. The detachment disappeared after one week's therapy.

One June 26, six weeks after operation, the visual acuity was 20/200 with correction. The conjunctiva was slightly injected, the cornea clear, the anterior chamber deep, and a 20/25 view of the fundus revealed a normal-appearing disk, macular edema, and complete absence of retinal deposits. The intraocular pressure was 8 mm Hg. Treatment consisted of cyclopentolate 1% and Maxitrol, 2 drops each three times a day.

Nine months after the vitrectomy and intraocular injection of amphotericin B, the patient's visual acuity was 20/60 with best correction of 11.50 sph +5.00 cyl  $\times 90^\circ$ . The cornea was clear (Fig. 2). The anterior chamber contained an occasional inflammatory cell with 1+ flare. The intraocular pressure was 6 mm Hg with clear cornea. There was a clear view to the posterior pole showing a preretinal membrane exerting traction on the macula and inferior part of the disk. An electroretinogram at this time was depressed to 175 mV, approximately half the voltage in the normal eye.

### Discussion

The diagnosis and management of endophthalmitis were complicated in this case by the unusual clinical presentation. Although the minimal symptoms and slow progression are somewhat typical of fungal endophthalmitis, the prephthical state of the eye, the fibrous ingrowth, and disk fibrovascular stalk are not. The degree of posterior segment involvement often cannot be appreciated until the lens, iris, and vitreous debris are cleared from the anterior segment. Thus, mechanical intraocular debridement is of particular value in traumatic eye injuries (Peyman and Diamond, *in press*).

Two specific objectives of management of endophthalmitis by the vitrophage are (1) removal of the infecting microorganism and vitreous cellular reaction, and (2) immediate treatment of the infection by infusion of gentamicin (8 mcg/ml) or injection of amphotericin at the time of surgery. Proper culturing of the intraocular material is important. Once the sclerotomy site is prepared, the specimen is obtained from the vitreous and anterior chamber. This gives the least possibility of contamination from the exterior surface of the eye. The specimen should be plated immediately on appropriate culture media for fungi and bacteria. The vitrophage is then introduced into the eye, and residual lens or vitreous debris are removed and collected in a sterile bottle for culture and sensitivity after centrifugation. If the infection clinically appears as a bacterial endophthalmitis, the infusion fluid for the vitrophage is changed from Ringer's solution to Ringer's solution containing 8 mcg of gentamicin (0.2 ml of gentamicin in 1000 ml of solution). In cases of fungal endophthalmitis, the toxicity of antifungal drugs prohibits its use in the infusion fluid, therefore intravitreal injection of nontoxic doses of amphotericin is recommended after vitrectomy (Axelrod, Peyman, and Apple, 1973).

Results of treatments of exogenous fungal endophthalmitis have been poor after trauma or cataract surgery (Theodore, Littman, and Almeda, 1961). Successful treatment of exogenous fungal endophthalmitis is unusual. Numerous patients with endogenous fungal endophthalmitis have been cured in spite of the poor penetration of amphotericin B into the vitreous (Fishman, Griffin, Sapico, and Hect, 1972; Getnick and Rodrigues, 1974; Greene and Wiernik, 1972; Michaelson, Stark, Reeser, and Green, 1971). The difference in response is related to the pathogenesis of the disease. Endogenous fungal endophthalmitis is a result of hematogenous spread and begins as a retinitis or chorioretinitis with secondary vitreous involvement. In exogenous fungal endophthalmitis the vitreous or anterior chamber fluid is involved first with vitreous abscess progressing to

diffuse endophthalmitis. High intravitreal concentration of amphotericin is much more critical in exogenous fungal disease. Penetration of amphotericin B in normal and inflamed rabbit eyes is minimal (Green, Bennett, and Goos, 1965).

The technique used in our patient allows removal of lens remnants, fibrin, and inflammatory deposits, which prevent recovery of vision and contribute to late organization and tractional detachment. In addition, fungal elements are removed and residual fungal organisms are inhibited by the intravitreal instillation of amphotericin B, the toxicity of which has been established (Axelrod, Peyman, and Apple, 1973). The slow injection of amphotericin in the anterior vitreous cavity with the bevel of the needle anterior is crucial. With the poor survival of eyes with exogenous fungal endophthalmitis, the method of therapy may be the only chance for useful vision.

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Gholam A. Peyman, M.D.  
 University of Illinois Eye and Ear Infirmary  
 1855 W. Taylor St.  
 Chicago, Ill. 60612, USA