MONOSPORIUM APIOSPERMUM ENDOPHTHALMITIS
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Fungal endophthalmitis is a well-recognized, but infrequently reported, complication of cataract surgery. Fine and Zimmerman\(^1\) and Theodore\(^2\) helped alert ophthalmologists to the problem of postoperative mycotic endophthalmitis. In 1972, François and Rysselaere\(^3\) compiled 74 cases that occurred between 1914 and 1965, of which 36 were documented by culture. DeVoe and Silvashutner\(^4\) added nine more cases from literature. In the last few years at least one more case documented by culture has been reported.\(^5\) Although a few of the offending organisms were common pathogens, most were saprophytes. In this paper we describe a case of fungal endophthalmitis due to Monosporium apiospermum, a pathogenic fungus never before isolated as the causative agent in endophthalmitis.

CASE REPORT
A 49-year-old woman had a 15-year history of diabetes mellitus treated with oral medications. Over the two years preceding her first hospital admission, she noted a marked, painless decrease in visual acuity. On ocular examination, she had a dense cataract with capsular involvement in her left eye and a corrected visual acuity of 20/400. Her right eye had a corrected acuity of 20/30 and moderate posterior subcapsular lens changes. The right fundus had a normal disk and vessels; there were a few scattered microaneurysms and exudates. The left fundus could not be visualized.

On March 10, 1972, under local anesthesia, the patient had a cataract extraction and sector iridectomy in her left eye. We instilled alpha chymotrypsin for zonolysis and used a cryoextractor for lens extraction. Upon delivery, the lens capsule ruptured, but we removed the capsular remnants. The limbal incision was closed with nine 7-0 chromic sutures. Postoperative medications included polymyxin, neomycin, bacitracin, hydrocortisone (Neopolycin), and atropine drops.

On the second postoperative day, we noticed a small hyphema. By the fifth day, the hyphema cleared and corticosteroid drops were discontinued. Over the next ten days the eye became painful and the conjunctiva hyperemic. Ocular examination on the 17th postoperative day showed that the left eye had a visual acuity of hand motion. Intraocular tension was 15 mm Hg by application. The conjunctiva was markedly hyperemic. Many corneal striae were present. The anterior chamber was shallow with marked cells and flare. We saw tiny white spherules on both the iris surface and vitreous face. On the 27th day the pupil measured 4 mm and the pupillary border was adherent to the vitreous face. The anterior vitreous contained much debris. A large choroidal detachment was present nasally, and the posterior pole was not visualized. We entertained a presumptive diagnosis of fungal endophthalmitis. We performed an anterior chamber paracentesis and placed the aspirate on blood agar, Littman's medium, and Sabouraud's dextrose medium. Smears were negative for bacteria and fungi, although we noticed a few white cells.

The patient was treated with the following topical medications: amphotericin B, 4 mg/ml every hour, chloramphenicol 0.5% and dexamethasone 0.1% every four hours, atropine 1% and Neo-Synephrine 10% twice a day. By the 19th day the anterior chamber flattened and pupillary block developed. A wound leak was demonstrated at the original corneoscleral incision, and we attempted pressure patching and medical techniques to break the pupillary block. On the 21st day the patient underwent release of suprachoroidal fluid, reformation of the anterior chamber with sterile air, and resuture of corneoscleral wound. On the same day bacterial cultures were reported negative, and no growth was noted on the Sabouraud's plates. Postoperatively medications were changed, and the patient received topical atropine 1% and Neo-Synephrine 10% every 12 hours and dexamethasone 0.1% every four hours. Oral prednisone, 80 mg/day, was given.

On the 27th day M. apiospermum was isolated on all Sabouraud's dextrose agar plates as a pure culture (Fig. 2). Examination of the left eye at that time revealed marked conjunctival injection, corneal striae, a mid-dilated pupil totally adherent to the vitreous face, and multiple white spherules, presumed to be fungal colonies, on both the iris and vitreous face. The anterior vitreous was still filled with debris and the fundus was not visualized. Intraocular tension was 10 mm Hg. Oral corticosteroids were discontinued and topical dexamethasone 0.1% given twice a day with atropine 1%. Amphotericin B, 4 mg/ml, was instilled every two hours.

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821
Over the next six weeks on this regimen the anterior chamber cleared. After three months, medications were discontinued. The cornea and anterior chamber were clear, and the vitreous was still full of debris and corrected visual acuity was counting fingers. Eight months after the initial operation, corrected visual acuity was 20/30. The only sequela of endophthalmitis was a partially opacified vitreous face.

DISCUSSION

In culture, *M. apiospermum*—or *Allescheria boydii* in its perfect, sexual form—demonstrates coarse hyphae bearing round and pyriform conidia laterally or on short conidiophores. It has frequently been isolated from soil. Entering soft tissues through a puncture wound, it causes a pyogenic abscess and, in this country, is a leading cause of Madura foot. In this disease the fungus demonstrates granule formation, soft tissue invasion, stimulation of pus production, and sinus tract formation with drainage of the pus and granules. The granules are white to brown in color and consist of colonies of fungal hyphae with a shell of fibrin derived from host tissues. The white spherules seen in this patient may have been granules, although none was isolated for study. Compared with other fungi, *Monosporium* is very resistant to amphotericin B and nystatin (Table). Although *Monosporium* has been isolated from patients with keratomycoses, no case of endophthalmitis due to this organism has previously been reported.

Our patient had a 15-year history of diabetes mellitus, a well-recognized factor influencing infections. Postoperative medication included corticosteroids, which have been shown to increase wound healing time, to increase the susceptibility to infection, and to accelerate the growth of fungi in healthy eyes. These factors probably contributed to the development of *M. apiospermum* endophthalmitis in the present case. *Monosporium* is not normally found in the fungal flora of the outer eye.

Present therapy for fungal endophthalmitis is either amphotericin B given intravenously, subconjunctivally, or topically, or
M. apiospermum isolated from anterior chamber fluid and grown on Sabouraud's-glucose agar. Note the wide septate hyphae with large pear-shaped conidia borne singly on the tips of conidiophores characteristic of this fungus (×16).

nystatin used as a topical or oral preparation. For the topical use, the dosage of amphotericin B is 2.5 to 10 mg/ml sterile water with 5% glucose, and for nystatin, 100,000 units/ml saline buffered to pH 7. Gordon and associates used nystatin drops successfully in A. boydii keratomycosis. Allen reported using amphotericin B successfully by conjunctival injection as 5 mg/0.5 ml in 5% nystatin solution. Rosen and Friedman administered 750 μg of subconjunctival amphotericin B every other day. Our patient was successfully treated with amphotericin B drops, 4 mg/ml, given hourly.

**Summary**

A 49-year-old diabetic woman developed fungal endophthalmitis after an extracapsular cataract extraction, postoperative corticosteroid therapy, a postoperative hyphema, and a postoperative shallow chamber. The etiologic agent was Monosporium apiospermum by culture, an organism never before cultured from within the eye. The endophthalmitis responded well to topical amphotericin B.

**Table**

<table>
<thead>
<tr>
<th>Fungus</th>
<th>Nystatin</th>
<th>Amphotericin B</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M. apiospermum</em></td>
<td>200</td>
<td>40</td>
</tr>
<tr>
<td><em>Candida albicans</em></td>
<td>3.12</td>
<td>3.7</td>
</tr>
<tr>
<td><em>Cryptococcus neoformans</em></td>
<td>1.56</td>
<td>0.6</td>
</tr>
<tr>
<td><em>Histoplasma capsulatum</em></td>
<td>1.56</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Aspergillus fumigatus</em></td>
<td>3.12</td>
<td>40</td>
</tr>
</tbody>
</table>

*Minimum inhibitory concentration (μg/ml). Adapted from Drouhet.*

**Acknowledgments**

We thank Alan H. Friedman, M.D., and Samuel Gartner, M.D., for reviewing the manuscript, Jeanette Lazarin for typing the manuscript, and Anthony Velez for the photography.
References


Ophthalmic miniature

Peter De Vries recalls that Thurber's mind was full of bits and pieces of medical lore, particularly about the eye. At parties he would give impromptu lectures on such topics as the surprising toughness of the eye (“It's the toughest thing in the body”) or the odd fact that the eye is the one part of the body that is the same size at birth as in maturity (“That's why all babies are beautiful”).

Charles S. Holmes
Clocks of Columbus
New York, Atheneum, 1972