Aspergillus terreus endophthalmitis

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Abstract
We report a case of Aspergillus terreus endophthalmitis and review the 4 previously reported cases. Immunosuppression, intravenous drug use, intraocular surgery or trauma, and a compatible clinical picture should raise suspicion of the diagnosis. This species often exhibits resistance to amphotericin B and outcomes are poor despite current therapies.

Introduction
Aspergillus fumigatus and A. flavus comprise the majority of Aspergillus endophthalmitis infections [1–4]. Since 1991, A. terreus has been reported as a rare cause of endophthalmitis [2]. A case of A. terreus endophthalmitis is reported along with a review of those previously described.

Case report
A 71-y-old male with history of lung adenocarcinoma and emphysema presented with 3-d complaints of decreased visual acuity, redness, and pain in his left eye. His systemic medications included taxol, carboplatin, and prednisone. Limited information could be ascertained from the patient and family, and additional medical records were unavailable. On examination, visual acuity was 20/80 OD and hand movements at 3 inches OS. Pupillary examination revealed an afferent pupillary defect. Anterior segment examination of the left eye showed significant injection and severe inflammation with a 1.2 mm layered hypopyon. Posterior segment examination revealed an afferent pupillary defect. Anterior segment examination of the left eye showed significant injection and severe inflammation with a 1.2 mm layered hypopyon. Posterior segment examination revealed a moderate vitritis. Along the inferotemporal retinal vessels, a 2-disc diameter, exudative yellowish mass with an overlying layer of inflammatory cells, consistent with a pseudohypopyon, was found. Adjacent to this lesion were multiple pre- and intra- retinal hemorrhages and ischemic areas. Apart from age-appropriate nuclear sclerotic cataracts, no additional pathology was found. Most probable diagnosis was endogenous endophthalmitis, followed by metastatic disease. Ophthalmology service recommended hospital admission, vitrectomy, and intravitreal and systemic antimicrobials. The patient refused admission and vitrectomy but consented to an office-based vitreous tap with intravitreal injection of ceftazidime, vancomycin, and dexamethasone. Follow-up the next morning was planned, but the patient never returned. Vitreous Gram and fungal stains and cultures were negative. The patient died shortly thereafter and the family refused autopsy. Later review of medical records revealed a hospitalization for culture-proven A. terreus pneumonia 10 d prior to development of the endogenous endophthalmitis.

Discussion
Of the 5 total cases identified, 3 were endogenous and 2 were post-surgical (Table I). Malignancy, chemotherapy, corticosteroid use, and intravenous drug abuse were seen in the endogenous cases. Both post-surgical cases occurred after cataract extraction and one had comorbid uncontrolled diabetes mellitus. Risk factors previously reported for Aspergillus endophthalmitis mirrored comorbidities present in this series [1–5].

Clinical characteristics of patients in this series correspond to previously described Aspergillus endophthalmitis [4]. Patients generally present with unilateral ocular discomfort and subacute visual loss. Conjunctival hyperemia and severe anterior chamber reaction are also seen. Posterior segment findings can include: moderate to severe vitritis, a yellowish exudative lesion, frequently involving the retinal vessels, associated pre- and intra- retinal hemor-
Table I. Clinical Characteristics of 5 Patients with Endophthalmitis Caused by *Aspergillus terreus*

<table>
<thead>
<tr>
<th>Reference Number</th>
<th>Mechanism of Infection</th>
<th>Age (y)/Sex</th>
<th>Associated Conditions</th>
<th>Clinical Manifestations</th>
<th>Sites of Organism Recovery</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Endogenous</td>
<td>65 F</td>
<td>Chronic lymphocytic leukemia</td>
<td>Visual acuity light perception; fixed pupil; anterior chamber turbid exudate; dense vitreous infiltrate</td>
<td>Sputum Bronchoalveolar lavage</td>
<td>Intravenous amphotericin B Vitrectomy refused</td>
<td>Death</td>
</tr>
<tr>
<td>2</td>
<td>Endogenous</td>
<td>32 M</td>
<td>Intravenous drug use</td>
<td>Visual acuity count fingers at 6’’; 1 mm preretinal pseudohypopyon; midperipheral hemorrhagic vasculitis; mild inferior vitreous hemorrhage; 2 mm hypopyon; “fluffy” white vitreous opacities; scattered subretinal infiltrates</td>
<td>Vitreous</td>
<td>Vitrectomy; then intravitreal and subconjunctival amphotericin B</td>
<td>Visual acuity counting fingers</td>
</tr>
<tr>
<td>3</td>
<td>Cataract surgery</td>
<td>50 M</td>
<td>Not specified</td>
<td>Visual acuity light perception with projection; white “fluffy” mass in anterior vitreous; anterior chamber reaction; vitreous opacities</td>
<td>Vitreous</td>
<td>Vitrectomy; then intravitreal amphotericin B, topical natamycin, and oral ketoconazole</td>
<td>20/60</td>
</tr>
<tr>
<td>4</td>
<td>Cataract surgery</td>
<td>80 M</td>
<td>Diabetes mellitus</td>
<td>Anterior chamber reaction; keratitis; scleral abscess</td>
<td>Aqueous humor Corneoscleral biopsy</td>
<td>Topical natamycin and oral ketoconazole Vitrectomy and further surgical treatment refused</td>
<td>Phthisis bulbi</td>
</tr>
<tr>
<td>5</td>
<td>Endogenous</td>
<td>71 M</td>
<td>Lung adenocarcinoma, emphysema, chemotherapy, corticosteroid use</td>
<td>Visual acuity hand motion at 3’’; 1.2 mm layered hypopyon; cloudy vitritis; inferior yellow hemorrhagic retinal mass</td>
<td>Bronchoalveolar lavage Sputum</td>
<td>Oral fluconazole Further treatment refused</td>
<td>Death</td>
</tr>
</tbody>
</table>
rhages, and retinal vascular occlusion with ischemia. Pseudohypopyon (gravitational layering of preretinal and subhyaloid inflammatory cells), yellow intrar- or subretinal infiltrates, which preferentially affect the macula [3], and exudative retinal detachment have also been described [4].

In previous reports, most cases have disseminated aspergillosis prior to presentation of endophthalmitis, especially in the immunosuppressed [4]. As in the present report, the fungus often initially manifests as a lung disease [2,3]. Aspergillus endophthalmitis without systemic aspergillosis is more commonly seen in post-surgical cases and those associated with intravenous drug abuse [4].

Diagnosis is often delayed and clinicians need a high index of suspicion. Upon presentation, a smear and culture of both the anterior chamber and vitreous should be performed. PCR analysis can increase yield, depending on laboratory availability. Culture or biopsy of other suspected sites may isolate the pathogen. Complete microbiological evaluation may fail to identify the pathogen because vitreous aspirates, PCR analysis, and vitrectomy specimens have sensitivities of only 50, 72, and 90%, repectively [4,6].

An additional reason for infrequent reporting of A. terreus endophthalmitis could be due to the fact that this organism is often considered a laboratory contaminant [3]. Because of the changing microbiology pattern of endophthalmitis, we should be careful not to dismiss culture results as laboratory or normal flora contaminants [1,2].

Antimicrobial therapy for Aspergillus endophthalmitis consists of intravitreal and intravenous amphotericin B. Since A. terreus often exhibits resistance to amphotericin B in up to 98% of isolates [7], other alternative antifungals include systemic itraconazole, voriconazole and caspofungin [3,4]. Intraocular injections of antifungal agents other than amphotericin B have not been investigated and thus are not currently implemented. A vitrectomy, which can provide larger samples more safely and debulk the involved vitreous, has been shown to improve outcome [3,4].

A. terreus is a rare cause of Aspergillus endophthalmitis. Immunospression, intravenous drug abuse, intraocular surgery or trauma, and a compatible clinical picture should raise suspicion of diagnosis. Even with appropriate therapy, visual outcomes are poor and overall mortality is high [4].

References