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Case Report

Intravenous Drug Use-Associated *Scopulariopsis* Endophthalmitis Treated with Systemic and Intravitreal Voriconazole

Joseph J. Raevis Neha Shaik Joseph Tseng

Department of Ophthalmology, SUNY Downstate Medical Center, Brooklyn, NY, USA

Keywords
Endogenous · Endophthalmitis · Fungal · Intravenous drug abuse · *Scopulariopsis*

Abstract
Purpose: To report a case of intravenous (i.v.) heroin use-associated endogenous endophthalmitis caused by *Scopulariopsis* fungal species, and its response to intravitreal and oral voriconazole treatments. ***Patient:*** A 21-year-old-female with chronic hepatitis C and i.v. heroin use presented with subacute decreased vision to hand motion in her left eye. ***Results:*** Endogenous fungal endophthalmitis caused by *Scopulariopsis* was confirmed by vitreous biopsy. The patient improved clinically after vitrectomy with intravitreal voriconazole and 3 weeks of oral voriconazole. The final vision was 20/60 after 6 months. ***Conclusions:*** *Scopulariopsis* is a rare cause of endophthalmitis, and is often difficult to treat due to its resistance to commonly used antifungals. This case is the first report of *Scopulariopsis* endophthalmitis secondary to i.v. drug use.

Introduction

Scopulariopsis, a genus of anamorphic fungi typically found in soil and decaying wood, is an opportunistic mold pathologic to humans [1]. The spectrum of infections includes pulmo-

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Joseph J. Raevis, MD
SUNY Downstate Medical Center, Department of Ophthalmology
Kings County Hospital Center, 451 Clarkson Avenue, 8th Floor
Brooklyn, NY 11203 (USA)
E-Mail Jjr223@georgetown.edu

nary fungal balls, endocarditis, and disseminated skin lesions. Reported ocular infections include keratitis [2] and posttraumatic endophthalmitis [3, 4].

Voriconazole is one of the main intravitreal and systemic medications used to treat *Scopulariopsis*. It has not been shown to cause retinal toxicity with doses less than 25 ug/mL in rats [5] and has safely been used in humans orally and intravitreally. This contrasts with amphotericin B, which is used less often systemically due to its nephrotoxicity [6]. Some clinicians prefer using systemic caspofungin in addition to voriconazole in the treatment of fungal endophthalmitis [7].

Scopulariopsis endophthalmitis has been reported only with trauma and ocular postoperative patients [3, 4]. Our patient developed *Scopulariopsis* endophthalmitis due to intravenous (i.v.) heroin use, making this the first such case reported.

Case Report

A 21-year-old female with a history of i.v. heroin abuse and bipolar disorder presented with painless vision loss of the left eye over 4 weeks. She endorsed i.v. heroin use within weeks of the onset of visual symptoms. Examination revealed count-fingers vision in the affected left eye with trace cell in the anterior chamber. Fundus examination of the left eye revealed optic nerve head edema and vitreous debris in a "string of pearls" formation overlying a white chorioretinal lesion in the foveal center (Fig. 1b). Clinical examination of the fellow right eye was unremarkable (Fig. 1a). Preoperative fluorescein angiography of the left eye showed a lesion with early hyperfluorescence and late staining (Fig. 2). Optical coherence tomography (OCT) of the left macula preoperatively showed a foveal lesion with resultant distortion of the foveal contour, associated epiretinal membrane, and overlying vitreous inflammation (Fig. 3). The patient was diagnosed with presumed infectious fungal endophthalmitis. A vitrectomy and membrane peeling was performed, with an undiluted vitreous biopsy sample being plated on aerobic, anaerobic, and Sabouraud agar. The Sabouraud mycological culture revealed heavy growth of *Scopulariopsis* within 3 days of the sample being sent to the lab. Sensitivities were unable to be obtained due to the small volume of the vitreous biopsy.

The patient was admitted to the hospital and started on oral voriconazole 4 mg/kg twice a day for 3 weeks. She also received 0.1 mL intravitreal voriconazole intraoperatively, but refused further intravitreal treatment. Systemic workup revealed asymptomatic hepatitis C, and an echocardiogram showed no signs of vegetation. Two sets of blood cultures taken at different times were negative. One week postoperatively, the vision improved to 20/400 with reduction in the size of the central chorioretinal lesion and the optic nerve edema (Fig. 1d). The OCT showed disruption of foveal ellipsoid layer but with resolution of vitreous inflammation and no residual retinal membrane (Fig. 3). After 6 months, the OCT depicted significant improvement in the foveal contour with a vision of 20/60 (Fig. 3).

Discussion

We describe the first case of i.v. drug-associated endogenous endophthalmitis due to *Scopulariopsis*, the source of which is likely from contaminated needles or mixing agents during illicit drug administration. The diagnosis of mycotic endophthalmitis can be difficult due to its indolent course and sometimes unclear history. Endogenous endophthalmitis re-

lated to drug use can be suspected in patients with needle tracks and skin popping [8], while blood and urine tests can help determine which patients have used recreational drugs in the more recent past. Other diagnoses, including infectious and inflammatory causes, should always be considered, and a thorough uveitis evaluation with the involvement of internal medicine and infectious disease specialists should be considered. Diagnostic studies such as echocardiography or radiographic imaging to evaluate for cardiac and pulmonary lesions may also be considered.

The visual prognosis for patients with endogenous endophthalmitis is guarded, with final visual acuities commonly reported to be 20/400 [9]. The vitreous biopsy demonstrated *Scopulariopsis* as the causative organism; sensitivities were not successfully obtained by the testing laboratory. However, our patient did show improvement with intravitreal and oral voriconazole therapy. While the most effective treatment for *Scopulariopsis* infections has yet to be elucidated, we believe that intravitreal voriconazole and systemic voriconazole (4 mg/kg twice daily) for 2–3 weeks may be an acceptable treatment regimen unless biopsy-guided sensitivities offer other options.

Statement of Ethics

The authors of this study declare no ethical conflicts.

Disclosure Statement

The authors of this study have no conflicts of interest or proprietary interests.

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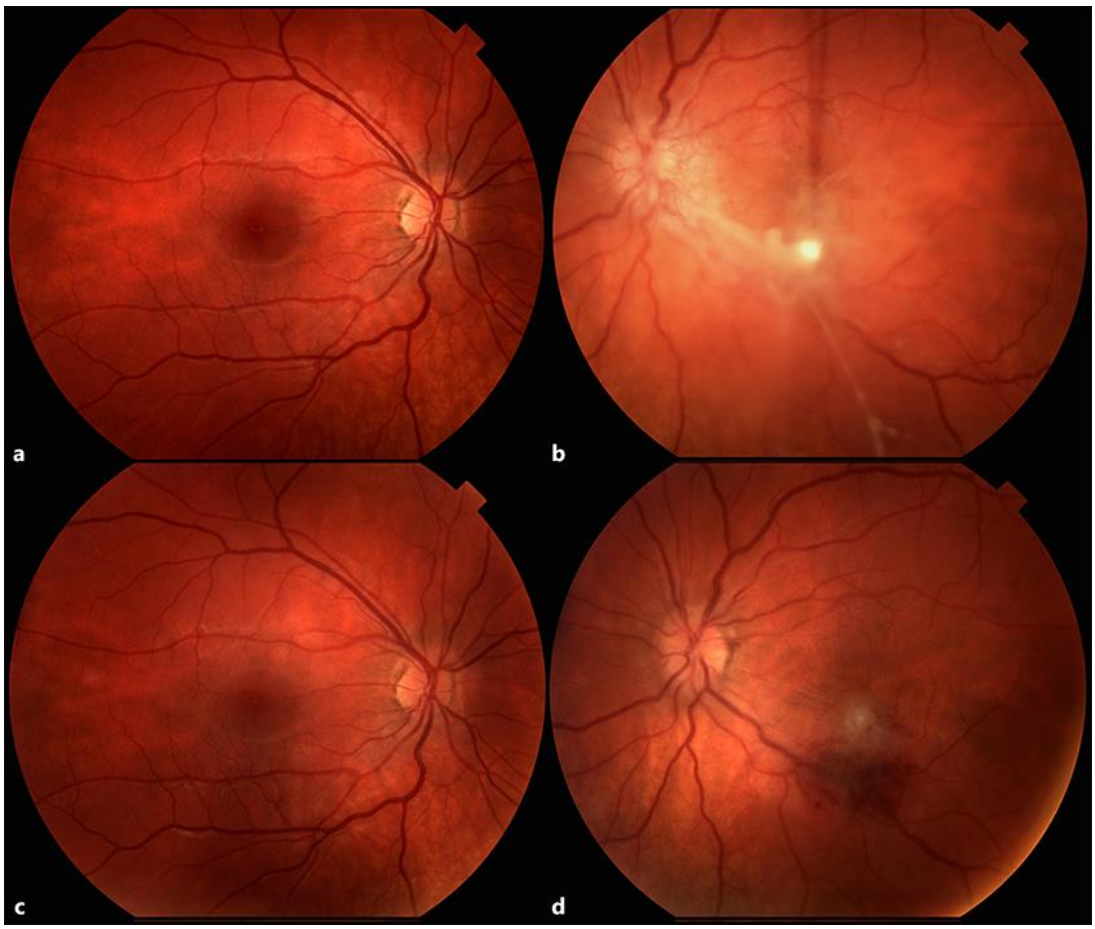

Fig. 1. Color fundus photographs of the right and left eyes preoperatively and postoperatively. Normal preoperative right fundus (**a**) and postoperative (**c**). **b** The left eye had optic disc edema and "string of pearls" vitreous debris from the disc to the macular overlying a white chorioretinal lesion. **d** One week after pars plana vitrectomy with intraoperative voriconazole, the disc edema appeared improved and the chorioretinal lesion relatively consolidated.

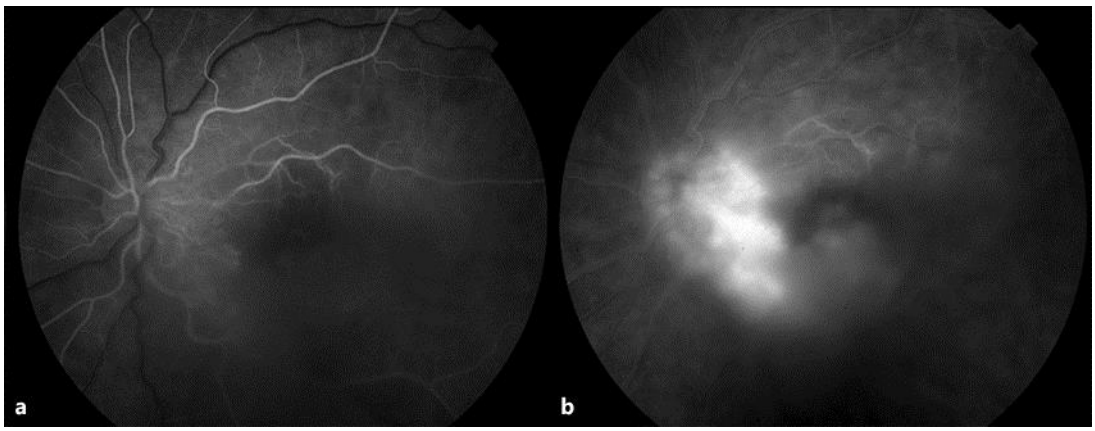

Fig. 2. Preoperative fluorescein angiography of the left eye displayed an early hyperfluorescence lesion (**a**) with late staining of the chorioretinal lesion (**b**).

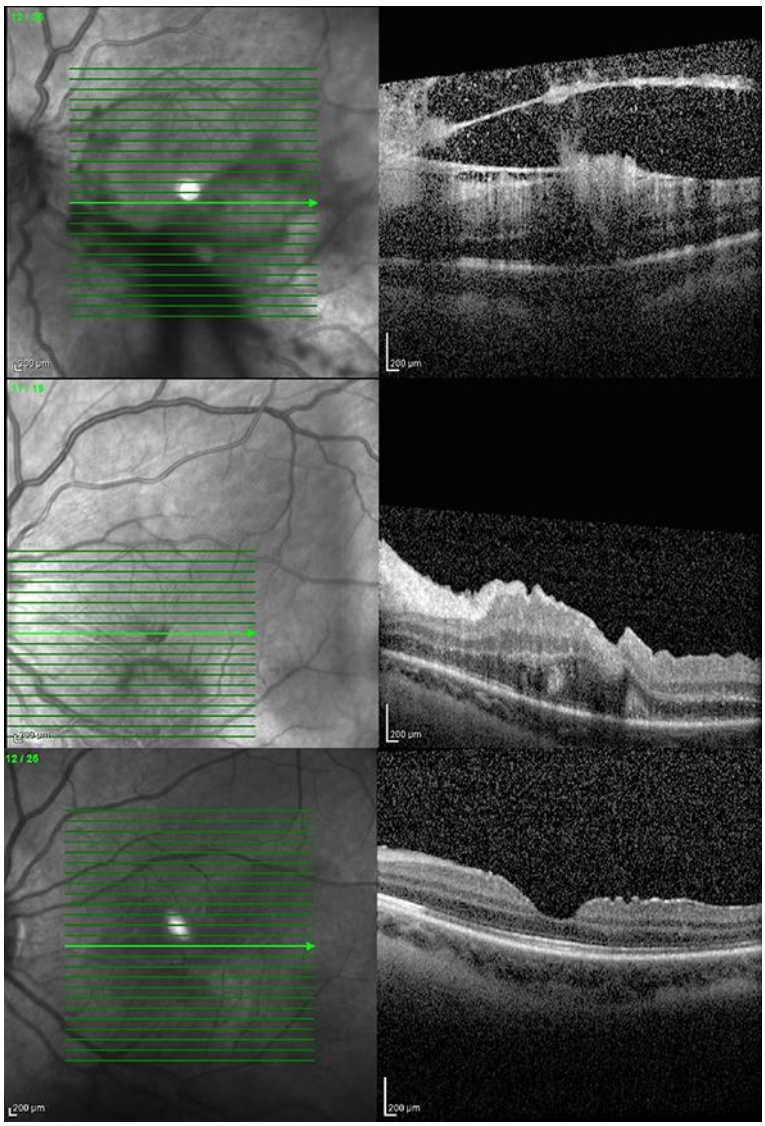

Fig. 3. Optical coherence tomography (OCT) of the left macula preoperatively showing focal vitreous inflammation with foveal contour distortion and epiretinal membrane (top). One week postoperative OCT macula showing loss of foveal ellipsoid layer but with resolution of vitreous inflammation and epiretinal membrane (middle). OCT macula at 6 months after vitrectomy depicting significant improvement in foveal contour (bottom).