Case Report

**Rhodotorula Endogenous Endophthalmitis: A Novel Harbinger of the Injection Drug Epidemic in the United States**

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Endogenous endophthalmitis is a rare but feared infectious ocular complication of injection drug use (IDU). The recent opioid epidemic in the United States threatens to increase the incidence of this disease. We report the first case of endogenous endophthalmitis in the United States caused by the emerging fungal pathogen *Rhodotorula* in an injection drug user which led to no light perception vision (NLP). Worldwide experience with *Rhodotorula* endogenous endophthalmitis is limited, but existing cases suggest infection by this particular fungal genus has a grim prognosis.

1. Introduction

Mortality from the United States opioid epidemic has tripled to 9 per 100,000 persons since 2000 [1]. The health problems associated with injection drug use (IDU) are legion, with endogenous endophthalmitis among the most debilitating. Endogenous endophthalmitis can result from blood stream dissemination of organisms that contaminate injected drugs and may occur alone or secondary to endocarditis [2].

Fungi and bacteria both cause endogenous endophthalmitis with the most common pathogens being streptococci, staphylococci, and *Candida* spp. [2]. The rise of IDU raises the opportunity for uncommon microbes to be implicated as causative agents. *Rhodotorula* is a pink-pigmented yeast found widely in soil, water, and air. It has been isolated in infections from catheters and other foreign bodies [3]. A 2008 systematic review of all *Rhodotorula* infections in the medical literature cited only two cases of *Rhodotorula* endogenous endophthalmitis worldwide [3]. To our knowledge, no other case has been reported since. Here we present the first described case of *Rhodotorula*-associated endogenous endophthalmitis in the United States.

2. Case Report

A 21-year-old man with four days of left sided vision loss, eye pain, and conjunctival injection was examined. He reported floaters for two weeks. He was previously healthy but admitted to IDU. He had no recent surgeries, dental work, or intravenous catheters.

Upon examination in the left eye, the best-corrected visual acuity was counting fingers at one foot. Slit lamp examination revealed 4/4 conjunctival injection, 4/4 anterior chamber cells with hypopyon, and posterior synechiae. Ophthalmoscopic exam yielded a hazy view of two white collections in the posterior vitreous. The right eye was normal upon examination. He underwent pars plana vitrectomy with intravitreal injection of amphotericin B (5 mcg), ceftazidime (2.25 mg), and vancomycin (1.0 mg). He was discharged to home with atropine (1%), moxifloxacin (0.5%), prednisolone (1%), and oral azithromycin (250 mg). No microbes were isolated from blood and vitreous cultures nor did Gram stain or calcofluor white reveal any organisms.

At one-month follow-up, although pain had completely subsided, visual acuity remained unchanged at hand motion.
Table 1: Rhodotorula endogenous endophthalmitis cases to present.

| Year | Country | Age/sex | Coinfection | History of IDU | Affected eye | Treatment | Visual outcome |
|------|---------|---------|-------------|----------------|--------------|-----------|---------------|
| 2001 | Italy   | 27/M    | Hepatitis C | Positive       | Right        | IA + oral ketoconazole | Uncertain light perception |
| 2002 | Canada  | 26/M    | HIV         | Positive       | Right        | IA + SA   | Enucleation  |
| 2011 | USA     | 21/M    | Hepatitis C | Positive       | Left         | IA + oral posaconazole | No light perception |

* The current case presented
HIV: Human Immunodeficiency Virus
IA: intravitreal amphotericin B, SA: systemic amphotericin B.

The prognosis of Rhodotorula endogenous endophthalmitis stands in contrast to the better prognoses seen in other eye infections such as scleritis and keratitis caused by this rare yeast [6, 7]. Although vitreous culture is the gold standard for the diagnosis of fungal endogenous endophthalmitis, its sensitivity varies greatly, with values reported as low as 40% [8]. Our case underlines the importance of resampling and retreatment with suspected endogenous endophthalmitis as microbes may be sequestered and inaccessible in an abscess.

Our patient is the first described case of Rhodotorula endogenous endophthalmitis in the United States. Increasing opioid use in the last decade portends a rise of endogenous endophthalmitis and the emergence of rare infectious agents and poor visual outcomes. Rhodotorula should be considered in the differential diagnosis of IDU patients with sudden profound visual loss, especially if response to initial therapy is suboptimal. Given the association with endocarditis, blood cultures should be drawn in all patients with endogenous endophthalmitis prior to the institution of broad spectrum antibiotics. Hepatitis C and HIV coinfection is also common and too should be evaluated in these cases. The prognosis in Rhodotorula endogenous endophthalmitis is grave, so increased investment in prevention of IDU is critical.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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