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SHORT COMMUNICATION

Rhodotorula rubra keratitis and melting after repeated penetrating keratoplasty

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PURPOSE. *To describe a rare case of* Rhodotorula rubra *keratitis in a corneal graft, and to discuss the management of this unusual pathogen.*
METHODS. *A 78-year-old debilitated man was treated for corneal abscess and descemetocele in his right eye. Urgent penetrating keratoplasty (PKP) with old donor material was performed. The patient underwent a new PKP when appropriate donor cornea was available. The graft was clear after the operation. Corneal cultures were negative.*
RESULTS. *One month after the second PKP procedure, deep stromal infiltrate with hypopyon appeared. Cultures grew* R. rubra. *A third PKP operation was performed. Systemic and topical amphotericin B treatment was started. Six months after the last operation the graft remains clear.*
CONCLUSIONS. Rhodotorula *keratitis is an extremely rare infection that should be considered in debilitated patients with persistent and progressive corneal infection despite adequate antibiotic therapy. (Eur J Ophthalmol 2005; 15: 135-7)*

KEY WORDS. *Keratitis, Penetrating keratoplasty,* Rhodotorula rubra

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INTRODUCTION

Rhodotorula is a yeast characterized by production of a coral-red pigment. *Rhodotorula* spp. are commensals in the natural environment and in humans. They have been isolated from the skin, nails, conjunctiva, and respiratory and gastrointestinal tracts (1). Among the several species of *Rhodotorula* described as human pathogens, *Rhodotorula rubra* is the most common. Serious infections in humans are rare, but have been described (2, 3). Immunocompromised patients, such as patients with solid tumors, lymphoproliferative diseases, AIDS, diabetes mellitus, and chronic renal failure, are at greater risk. Ocular infections due to *Rhodotorula spp.* are an emerging complication, and only a few cases of keratitis (4-6) and endophthalmitis (7-9) have been reported. We describe a patient with *R. rubra* keratitis and melting after penetrating keratoplasty for recurrent corneal abscess.

Case report

A 78-year-old man sought treatment for a 3-week history of painful red eye and discharge, and decreased vision in his right eye. Medical history revealed arterial hypertension, chronic mild renal failure, and diabetes mellitus non-insulin dependent without strict control. The patient was known to have chronic blepharitis, but he was not on regular follow-up. He also had tarsal conjunctival scarring, trichiasis, and corneal opacification bilaterally due to old trachoma, leading to a visual acuity of counting fingers

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from 1 meter only. Ocular examination showed a visual acuity of hand motion in his right eye. The conjunctiva was mildly congested, and a mucoid discharge was present. A deep large stromal infiltrate of 3 x 4 mm with surrounding descemetocele was observed. Large hypopyon and hyphema obscured anterior chamber features. Corneal scrapings were taken and plated onto blood, chocolate agar, and Sabouraud's dextrose agar media, but did not grow any pathogen. Urgent penetrating keratoplasty (PKP) with old donor corneal material ((e.g., corneal tissue preserved in Optisol GS medium (Bausch & Lomb, Irvine, CA) for 3 weeks)) was performed; the recipient bed size was of 7.0 mm. Intraoperatively, protrusion of the lens was observed, and cataract extraction and posterior intraocular lens implantation was also performed.

Corneal cultures (blood, chocolate agar, and Sabouraud's dextrose agar media) and microbiologic studies from donor and removed buttons were negative. Histopathologic examination of the removed corneal button revealed an inflammatory infiltrate but did not show any pathogen. Postoperatively, the graft became edematous, without signs of recurrent keratitis. Six days later, when appropriate donor cornea was available, a new PKP procedure was performed. Corneal cultures and microbiologic studies from donor and removed buttons were also negative. Postoperatively, the patient received dexamethasone and ofloxacin drops qid, and prednisone tablets 30 mg/d. Visual acuity improved to counting fingers from 1 meter. The corneal graft was clear, but a persistent epithelial defect was present at the interface between 3 and 6 o'clock. This epithelial defect persisted despite intense lubricant and serum drops treatment. The patient did not return for regular follow-up. One month after the second PKP procedure, the patient complained of painful eye. Visual acuity was full light perception only. On examination a deep stromal corneal infiltrate and melting were observed, extending outside the graft-host margin (Fig. 1). There were no satellite infiltrates, and the margins of the stromal infiltrate were clear. Intense fibrin reaction and hypopyon were observed in the anterior chamber. Ultrasound examination did not show vitreous opacification, and the retina was flat. Corneal scrapings were taken and plated onto blood, chocolate agar, and Sabouraud's dextrose agar media. Four days after presentation, Sabouraud's dextrose agar grew *R. rubra*, and a new PKP procedure with peripheral iridectomy was performed. The recipient bed size was of 9.0 mm for including the entire abscess. Histopathologic examination of the removed corneal button revealed abscess formation and gram-positive yeast forms not involving the peripheral edges of the excised tissue. After infectious disease specialist consultation, intravenous amphotericin B treatment was started, and a total dose of 1 g was administered. Topical treatment of ofloxacin, and amphotericin B 0.15% drops QID was also initiated. Topical dexamethasone drops were started first twice a day, and after 1 week without fungal recurrence in the graft were administered QID. Postoperatively, the graft was clear, and no signs of recurrent keratitis were present. Visual acuity gradually returned to counting fingers from 1 meter.

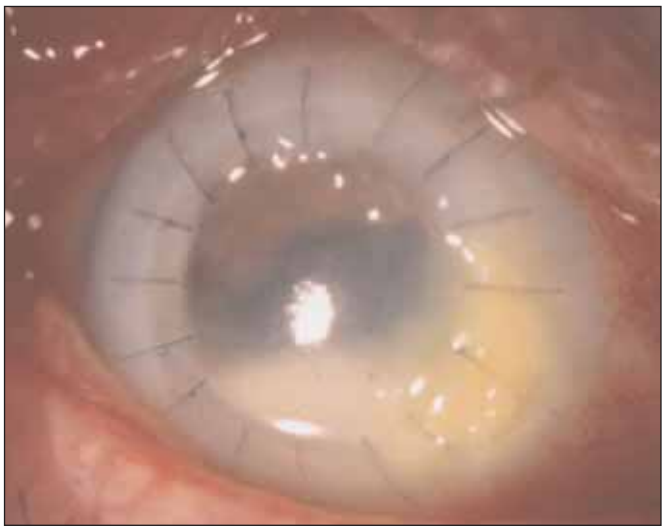

Fig. 1 - *Deep stromal* Rhodotorula rubra *infiltrate, melting, and hypopyon are observed 1 month after the second penetrating keratoplasty procedure in the right eye, extending outside the graft-host margin.*

The patient received amphotericin B 0.15% drops TID for 1 month, ofloxacin drops TID for 2 months, and dexamethasone drops TID for 3 months and then once a day. At present, 6 months after the last operation, the graft remains clear without any epithelial defect, and visual acuity improved to counting fingers from 2 meters only due to myopic changes at macula.

DISCUSSION

Rhodotorula is a yeast that belongs to the family *Cryptococcaceae*. It is known to be a potential pathogen in immunocompromised individuals. Our patient had diabetes, had mild chronic renal failure, and was on systemic steroid treatment, so the risk for this infection was considerably increased.

Ocular infection due to *Rhodotorula* is extremely rare. Romano et al (10) isolated *Rhodotorula* from only 1 of 304 healthy eyes, and from 3 eyes of 313 patients with chronic keratoconjunctivitis, keratoconjunctivitis, or keratitis.

Clinical features suggestive of fungal keratitis are long-term steroid treatment, deep infiltrates, satellite lesions, and progression despite topical antibacterial therapy. Except for the satellite lesions, the rest of the clinical features presented in the literature of *Rhodotorula* keratitis were present in our patient (4-7).

Because corneal penetration of antifungal topical treatment is poor, cases with deep stromal infiltration often require therapeutic PKP to prevent further scleral or intraocular extension. Postoperative topical amphotericin B treatment for several weeks is necessary to avoid recurrences.

Previous reports (1, 2) showed that in case of systemic infection or endophthalmitis, *Rhodotorula species* are sensitive to amphotericin B, ketoconazole, itraconazole, and flucytosine, and resistant to fluconazole. In our patient, after infectious specialist consultation and considering the proximity of the corneal infiltrate to the sclera, we also administered intravenous amphotericin B.

Clinical features but not laboratory studies seem to be critical for correct management in these rare cases. In our patient, after the second PKP procedure, the corneal graft was completely clear, and only a persistent epithelial defect was observed, without any stromal involvement. Cultures and microbiologic studies from donor and recipient corneal buttons were negative for bacteria or fungi.

Considering the emerging number of reports of *Rhodotorula* keratitis, this extremely rare infection should be considered in debilitated patients with persistent corneal infection even in cases with negative laboratory studies.

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