

Late-Onset Candida glabrata Endophthalmitis Following Deep Anterior Lamellar Keratoplasty: A Case Report

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Abstract

Purpose: To report a case of Candida glabrata endophthalmitis after deep anterior lamellar keratoplasty

Methods: Interventional case report

Results: A young male patient presented with asymptomatic white to cream-colored interface deposits two months after deep anterior lamellar keratoplasty. After a while, severe anterior chamber reaction together with decreased visual acuity developed. Because of the progression of the lesions, irrigation of the interface was considered and finally, penetrating keratoplasty was performed due to a rupture in the Descemet's membrane. The microbiological evaluation of the irrigation fluid demonstrated Candida glabrata. After regrafting, scattered endothelial plaques together with hypopyon formation and anterior vitreous inflammation developed, that improved with intensive antifungal therapy. The patient remained asymptomatic with a clear graft in the 6-month follow up.

Conclusion: Yeast-induced keratitis may rarely occur after corneal transplantation and it should be considered and treated aggressively in all cases of interface deposits due to fungi after lamellar corneal graft.

Keywords: lamellar keratoplasty, candida glabrata, endophthalmitis

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Introduction

Penetrating keratoplasty carries an infectious risk, and donor to host transmission of bacteria and fungi is a well recognized etiology of the microbial keratitis and endophthalmitis following penetrating keratoplasty. Although bacterial contamination of the donor rim is relatively common but the occurrence of fungal contamination is much less frequent.¹

Herein, we report a case of late-onset corneal interface candida plaques after deep anterior lamellar keratoplasty without any evidence of inflammation at the early stages, which progressed to endophthalmitis after penetrating keratoplasty. The condition was ultimately controlled by intracameral and intravitreal injection of amphotericin B, which led to the eradication of the corneal fungal plaques and the intraocular infection.

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Case Report

A 21-year-old man underwent deep anterior lamellar keratoplasty of the right eye for keratoconus in the *Tehran Rasool-e-Akram* hospital in the February 2006. He was on topical betamethasone 0.1% and topical ciprofloxacin 3%, each 4 times a day postoperatively. It should be stated that there was no evidence of keratitis or persistent epithelial defect in the donated fellow cornea after lamellar keratoplasty. The graft was unremarkable early but 2 months after surgery, multiple white to cream-colored posterior corneal plaques were noted in the interface on the slit lamp biomicroscopy. There was not any associated conjunctival injection, corneal edema, decreased visual acuity or ocular pain. The uncorrected visual acuity was $20/50$ that improved to $20/25$ with pinhole. Therapy with topical betamethasone 0.1% every an hour was restarted and tapered over a 2-week period without any change in the size or numbers of the corneal interface plaques (Figure 1).



Figure 1. Biomicroscopic photograph of the patient's cornea with multiple corneal interface plaques 2 months following deep anterior lamellar keratoplasty

On confocal scan of the cornea, distinct clusters of hyper-reflective granular deposits measuring 3 to 5 μm in diameter were noted at the interface (Figure 2). There was not any evidence of inflammation, epithelial-like, or hyphae-like structures. Three weeks later, the patient presented with ocular pain, decreased visual acuity, conjunctival injection, corneal edema and severe anterior chamber reaction. With the presumption of graft rejection, treatment with topical betamethasone 1% every an hour and oral prednisolone 1 mg/kg

was started. The inflammatory reaction and the corneal edema subsided for a short time.

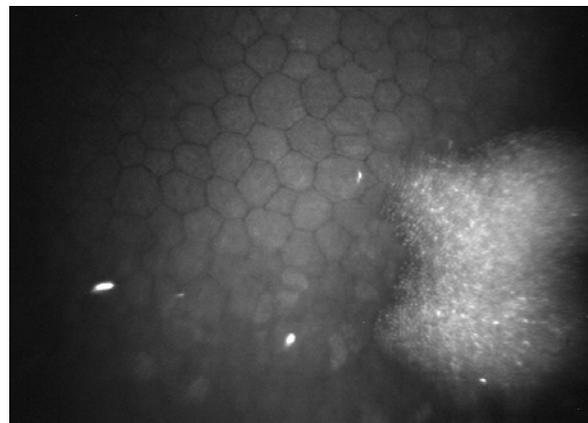


Figure 2. Distinct clusters of the hyper-reflective, granular, round to oval shaped structures, measuring 3 to 5 μm in diameter at the lamellar interface plane and no evidence of inflammatory cells on confocal scan of the involved cornea

In the August 2006, irrigation of the interface was performed because of the progression of the deposits. Since the interface plaques were dense during peeling, the Descemet's membrane was ruptured and a new penetrating keratoplasty had to be done. The post operative regimen was topical betamethasone 0.1% and ciprofloxacin 3%, each 4 times a day.

Six days after the regrant, the patient presented with redness, tearing and blurred vision of the involved eye. The uncorrected visual acuity was $20/400$ with no improvement on pinhole. Slit lamp examination demonstrated endothelial plaques without any associated epithelial defect, mild hypopyon, and severe anterior chamber reaction. B scan ultrasonography of the involved eye showed anterior vitreous involvement. The microbiological culture of the irrigated material and of the donor cornea also revealed infection with *Candida glabrata*. Therefore, with the suspicion of candida endophthalmitis, the patient was admitted to the hospital and treated with intravitreal injection of 5 μg amphotericin B, anterior chamber irrigation with 50 $\mu\text{g}/\text{ml}$ of amphotericin B, topical amphotericin B 0.15% every 3 hours, intravenous amphotericin B 50 mg daily, oral fluconazole 200 mg twice a day, topical natamycin 5% every 3 hours, topical fortified

vancomycin 5% and ceftazidim 5%, 4 times a day, and homatropine 2% eye drop 3 times a day. Subsequently, the endothelial plaques and the hypopyon disappeared and the patient was discharged on topical amphotericin B 0.15% and natamycin 5% every 3 hours, oral fluconazole 200mg twice a day, and homatropine 2% eye drop 3 times a day.

The patient was completely asymptomatic after about 2 weeks with no evidence of residual corneal endothelial plaque or anterior chamber reaction, although mild corneal edema was present. The uncorrected visual acuity was $20/200$ that improved to $20/80$ with pinhole.

Topical betamethasone 0.1% three times a day was added to the treatment regimen and the topical natamycin and systemic antifungal medications were gradually tapered and discontinued over the next 3 months. Topical amphotericin B twice a day was continued for 5 months, during which there was no evidence of recurrent fungal keratitis or endophthalmitis. The patient remained completely asymptomatic during the 6 month follow up, the graft is entirely clear (Figure 3) and the uncorrected visual acuity is $20/160$ that improves to $20/30$ with pinhole.

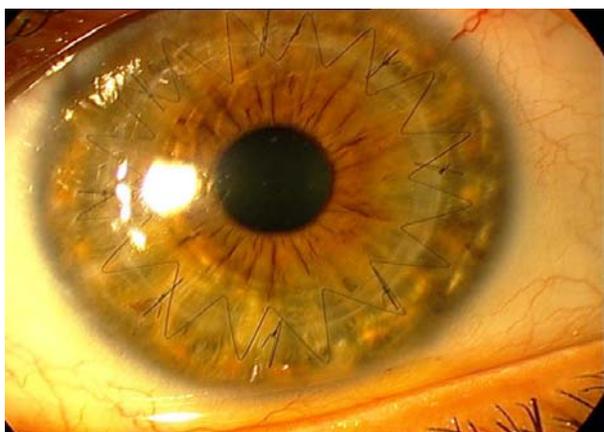


Figure 3. Biomicroscopic photograph of the patient's cornea with an entirely clear graft after intensive antifungal therapy following penetrating keratoplasty

Discussion

Fungal keratitis is a rare complication following penetrating keratoplasty. Corneal transplantation is one of the major risk factors for candida keratitis and concurrent administration of topical steroids increases the risk of the infection. The infection may occur

due to either the donor corneal contamination or infection of the pre-existing epithelial defects by the indigenous microflora of the conjunctiva and the ocular adnexa.²

In the recent years there has been a trend against performing routine cultures of the unused portion of the donor rims used for corneal transplantation.¹ There are several valid arguments supporting the case for discontinuation of routine bacterial cultures of the donor corneal rims; including cost, routine use of prophylactic antibiotics in the immediate post operative period, and the high incidence of positive bacterial cultures relative to the low frequency of the actual establishment of postoperative infection.³⁻¹¹

A case of late onset donor to host transmission of *Candida glabrata* following penetrating keratoplasty was reported by *Al-Assiri et al*¹ in a 69-year-old male, which was proved by the culture-positive donor tissue. Another case of donor to host transmission of *Candida albicans* was also reported after penetrating keratoplasty in a 15-year-old boy who developed keratitis and a lenticular abscess 26 days after surgery. The donor corneal rim culture and the polymerase chain reaction confirmed the donor as the source of the infection.¹² Unfortunately, donor rim culture was not performed in our patient and thereby, confirming the transmission of the infection from donor to the host was not possible, although it is a possibility that should not be disregarded especially when most of the postoperative fungal endophthalmitis cases are probably caused by the contaminated donor rims.^{4,10} Improvement of the donor corneal storage media to eradicate fungal elements may be associated with decreased risk of the corneal contamination.

Although fungal contamination of the donor tissue is much less common than bacterial contamination,^{4,5,7-9} the development of endophthalmitis or keratitis with the fungal-contaminated donor cornea is much more likely.^{4,5} In a series of 3000 consecutive penetrating keratoplasties, there were only 36 (1.2%) culture-positive donor rims for fungi, 3 (8.3%) of which developed fungal keratitis and or endophthalmitis.¹⁰ In the past 5 years, there have been 9 donor rims that were culture-positive for *Candida glabrata*, one (11.1%) of which developed postoperative keratitis.¹ In the same interval, there were no cases of

post-operative fungal keratitis or endophthalmitis in cases with culture-negative donor rims.¹

Unlike the previous reports on the late-onset occurrence of fungal keratitis (one week to one month) after penetrating keratoplasty,^{1,4,5,10,12,13} the candida keratitis in our case occurred about 2 months after an uncomplicated deep anterior lamellar keratoplasty, and presented initially with asymptomatic multiple interface plaques (Figure 1). It became symptomatic after a while and masquerading as an endothelial rejection.

The role of prophylactic treatment is not firmly established in patients whose graft rim was positive for fungi.¹⁴ In 2 reported cases with culture-positive donor rims for *Candida glabrata*,^{1,14} although the prophylactic anti-fungal treatment had been used in one case,¹⁴ post graft endophthalmitis developed in both cases^{1,14} with a poor prognosis and

recurrent flare up of the infection in the patient who had received the prophylactic treatment. Since we had not performed the donor rim culture, our patient didn't receive any prophylactic treatment. This may provide an additional support for the value of routine fungal culture of the donor rim at the time of corneal transplantation, although the role and the strategy of the prophylactic treatment (i.e. oral, intracorneal, and topical) and the duration of the treatment are not definitely established.

Conclusion

In conclusion, candida keratitis may rarely complicate corneal transplantation and it should be considered in all cases of interface deposits after lamellar corneal graft. Intense and early anti-fungal treatment is necessary to eradicate the infection, otherwise the visual and the graft prognosis may be devastating.

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