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


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.
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).

On confocal scan of the cornea, distinct clusters of hyper-reflective granular deposits measuring 3 to 5\(\mu\)m 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.

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 regraft, 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\(\mu\)g amphotericin B, anterior chamber irrigation with 50 \(\mu\)g/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](image.png)

**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.

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.²⁻¹¹

A case of late onset donor to host
transmission of Candida glabrata following
penetrating keratoplasty was reported by
Al-Assiri et al¹ 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,⁴⁻⁷⁻⁹ 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 cases¹,¹⁴ 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.

**References**


