Recurrence of Acanthamoeba Keratitis after Deep Anterior Lamellar Keratoplasty

Behzad Fallahi Motlagh, MD[1]

Abstract

***Purpose*:** To report a case of bilateral acanthamoeba keratitis with recurrence after keratoplasties

***Case report*:** Here we report a case with bilateral acanthamoeba keratitis who initially responds to medical treatment, after discontinuation of treatment the disease flared up and not responded to medical therapy so superficial keratectomy was done and medical treatment continued and the ulcer improved. Eleven months later only central corneal scar remained. For restoration of vision conventional lamellar keratoplasty (LK) and deep anterior lamellar keratoplasty (DALK) accomplished for left and right eye respectively. The left eye had uncomplicated post operative course, but in the right eye three weeks after DALK recurrence of acanthamoeba keratitis occurred, the keratitis not responded to medical treatment and therefore therapeutic penetrating keratoplasty (PK) was done. In last visit the graft was clear and the patient had uncomplicated postoperative course.

***Conclusion*:** PK and postoperative antiamoeba treatments are appropriate treatments for restoration of vision in acanthamoeba keratitis. It is recommended that for prevention of recurrence antiamoeba agent to be continued for at least two months.

***Keywords*:** Acanthamoeba Keratitis, Deep Anterior Lamellar Keratoplasty, Recurrence

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Introduction

Acanthamoebas are ubiquitous amoebae belonging to eukaryotes and have been isolated from soil, water (even the pureified water), air, and dust are accused to be the source of various tissue involvements. Cornea is one of the sites of devastation by this organism causing keratitis.[1]

The estimated rate of acanthamoeba keratitis is 1 per 250,000 person in the United States, but this rate varies from 1.65-2.01 per million in general population to 1 per 10,000 person who wear contact lenses.[2] Keratitis is usually associated with a history of improper cleaning of contact lenses by using home-made sodium chloride solution or tap water and swimming in fresh water or a pool with contact lenses on eye.[3-5] In the majority of cases contact lenses specially soft hydrogel lenses are the important risk factor for akantaemoba keratitis (AK).[6,7] Keratitis typically begins with a foreign-body sensation, pain, tearing, photophobia, blepharospasm, and blurred vision. Bilateral involvement has been described in up to 11% of cases.[4,6]

1. Assistant Professor of Ophthalmology, Nikookari Eye Hospital, Tabriz University of Medical Sciences, Tabriz, Iran

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Correspondence to: *Behzad Fallahi Motlagh, MD*
Assistant Professor of Ophthalmology, Nikookari Eye Hospital, Tabriz University of Medical Sciences, Tabriz, Iran
Email: bfm1346@yahoo.com

The initial treatment of AK is topical therapy with biguanides such as polyhexamethylene biguanide, topical chlorhexidine 0.02%, diamidenes such as propamidine (Brolene), aminoglycosides (Neosporin) and imidazoles (oral ketoconazole).[7] Epithelial debridement enhances the removal of the majority of organisms and penetration of medication.[8] In sever nonresponsive cases, superficial keratectomy with or without keratoplasty are warranted.[9] In addition, promising results of corneal cross-linking and phototherapeutic keratectomy is publishing.[10,11] Keratoplasty should be deferred if possible until a medical cure has been achieved but in unresponsive cases to medical treatment therapeutic keratoplasty can be done.[12,13] Corneal transplantation in the form of penetrating or lamellar keratoplasty (LK) may be necessary in cases with severe scar for restoration of vision.[14]

We describe a case with bilateral AK who was undergone deep anterior lamellar keratoplasty (DALK) for scar of previous AK and recurrence of infection in the graft.

Methods

Our patient, an 18 years old lady, was a known case of bilateral keratoconus that was prescribed rigid gas-permeable hard contact lens (RGPL). She was frequently washing the lenses with tap water. In the January 2002, she was visited due to redness, photophobia and sever pain of both eyes which was much more intensive at the right eye. No prominent discharge or conjunctival reactions were observed. The corneal findings were similar in both eyes and included corneal ulcer, stromal infiltration and edema. The examination of posterior segment did not yield any abnormality.

Corneal ulcer was cultured on blood agar, MacConkey agar and Sabouraud dextrose agar and fortified antibiotic solutions of cefazolin and gentamicin was prepared and used. Because of the severity of pain and corneal ring infiltration, confocal biomicroscopy was accomplished and the diagnosis of acanthamoeba keratitis was confirmed. Medications prescribed for both eyes included ophthalmic solution of Brolene and Neosporin a drop every two hours and oral ketokonazol. Relative favorable response to treatment was observed in both eyes. Eight months later, she abruptly cut the consumption of anti-amoebic agents and the disease flared up and then patient was admitted in our hospital. The right eye harbored a central corneal infiltration and the left eye had a central corneal epithelial defect. Also a ring infiltration was obvious around the defect. Eye drop Brolene and Neosporin every two hours for the left and every three hours for the right eye plus tablets of ketoconazol 200 milligram BID were prescribed. After 11 days she was discharged with above medications.

Five days after the discharge, patient was re-hospitalized due to aggravated ocular pain, redness and photophobia. Visual acuity (VA) was decreased to hand motion in the left eye corneal epithelial defect and ring infiltration of the left eye were enlarged in size (Figure 1). The examination of the right eye did not unveil any notable changes. Two weeks later pain and infiltration in the left eye increased and in absence of any response to medical treatment superficial keratectomy in the left eye was performed and anti-ameobic medications were continued, wound epithelialization was completed in next six weeks (Figure 2). The result of pathologic report was chronic keratitis.

Four weeks later, the pain and photophobia of the right eye increased and the patient was an obvious candidate for superficial keratectomy of the right eye. Keratectomy was done and patient was discharged with brolen, Neosporin and systemic ketokonazol, with gradual epithelialaization and scaring of cornea the topical medications was tapered but systemic ketoconazol continued up to three months. Eleven months later the eyes were quiescent, but the central scars related to the previous superficial keratectomy were prominent features. VA of both eyes were one meter finger count, for the restoration of vision conventional LK accomplished for the left eye and oral ketokonazol was started two weeks before surgery and continued up to six months, graft was clear in follow-up visits (Figure 3).

After three years of LK, the VA of the right and left eyes were one meter finger count and $^{20}/_{100}$, respectively. Therefore, DALK was performed on right eye. Systemic ketoconazol and topical Brolen were prescribed for three weeks before surgery postoperatively she was treated with topical corticosteroid and

antibiotic every six hours and preservative free artificial tear every four hours and antiameobic medications were continued. Three weeks after DALK infiltration of the margin of the wound extending two hours and also in the interface of donor and recipient. Cortcosteriod was discontinued. Infiltration extending to interface and donor tissue in next few weeks and because of gradual extension of infiltration and no response to medical treatment with probable diagnosis of recurrence of acanthaemoba after 9th weeks of DALK procedure therapeutic PK was done (Figure 4). The recovered button was dispatched to pathology laboratory and the diagnosis was confirmed by demonstration of the intrastromal trophyzoites of acanthamoeba (Figure 5). In 6th postoperative month the graft was clear and BSCVA was $^{20}/_{80}$ in the right eye.

Figure 1. Active keratitis OS

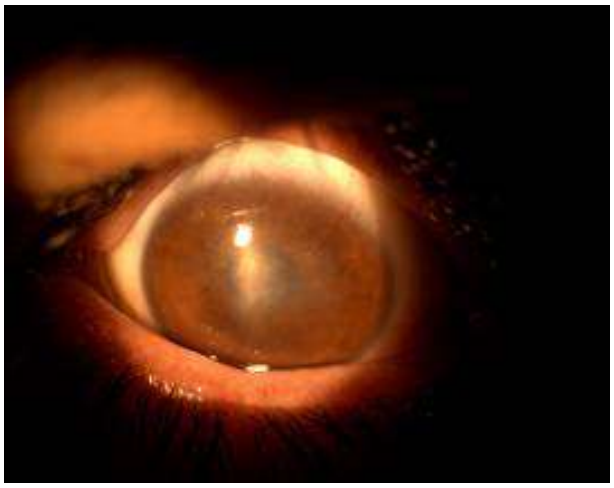

Figure 2. Resolution of infection after superficial keratectomy in left eye

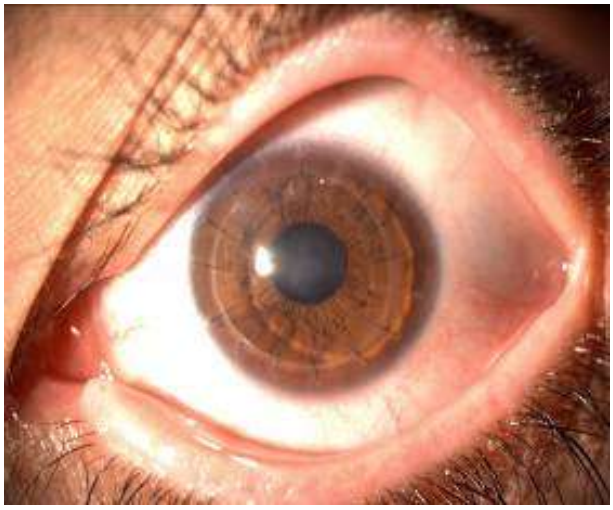

Figure 3. Conventional lamellar keratoplasty in left eye

Figure 4. Recurrence of akantaemoba keratitis after deep anterior lamellar keratoplasty in right eye

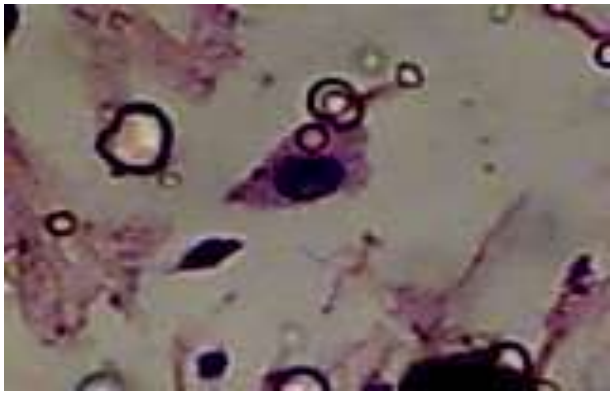

Figure 5. Histology of recovered button, intrastromal trophozoites of acanthamoeba

Discussion

Prevalence of acantamoeba keratitis has been increasing in past several decades.[14-16] First step in treatment of AK is medical treatment and conventional approach is to avoid keratoplasty in acute phase of AK.[14] In respect to optical keratoplasty, complication rates in therapeutic and tectonic graft in AK are high.[14,17]

Herein we described a bilateral case of AK with complicated course which responded to medical treatment and superficial keratectomy. In preserve of corneal scar we performed LK and DALK in the left and the right eye, one and four years after controlling infection, respectively. Recurrence occurred in the right eye and because of medical resistance and progressive course of the disease we performed therapeutic PK nine weeks after DALK.

Recurrence of infection is one of the most important complications after keratoplasty for AK. Kitzmann and et al[14] reported two folds greater recurrence rate in therapeutic keratoplasty in respect to optical keratoplasty in AK (41% v/s 22%). In a case series Awwad et al[18] reported no recurrence after PK during 30 months of follow-up in quiescent eyes. Cysts have been shown to persist many months after initiation of medical therapy[18,19] and reactivation of cysts which are located in the peripheral cornea is responsible for recurrence of infection. Wright et al[19] showed cyst remnants were present in cornea 22 months after the onset of treatment. Our case demonstrated that cyst can be present up to four years after medical treatment in acanthamoeba infected corneas. How long is it necessary to wait before keratoplasty in an acanthamoeba infected cornea? Awwed et al[18] proposed at least three months period between the discontinuation of treatment and keratoplasty. Also they proposed preoperative confocal microscopy to rule out the presence of acanthamoeba cysts in recipient cornea. Our case showed that three months period seems to be very short and longer waiting time may be necessary specially in absence of confocal microscopy, although we recommend preoperative confocal microscopy before keratoplasty in acanthamoeba keratitis induced corneal scar, in all cases.

Recurrence of acanthameoba in the graft occurs mostly as peripheral stromal infiltration or elevated epithelial lines in the graft[16] in our case recurrence initiated by infiltration in peripheral and interface, so in DALK, interface is one of the sites that recurrence may be seen initially.

Our case raises questions about appropriate postkeratoplasty treatment in AK. It is recommended that for prevention of recurrence anti-amoebic agents to be continued postoperatively for at least two months,[15,16] also it is recommended to delay steroid therapy in the early postoperative period as it has been known as a risk factor for the recurrence.[15]

Conclusion

Our case suggests that PK and postoperative anti-amoeba treatments are appropriate treatments for restoration of vision in acanthamoeba keratitis.

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