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Case Report
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Management of Acanthamoeba Keratitis after Collagen Cross Linking For Keratoconus - A Rare and Challenging Case

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Abstract

Keratoconus is a degenerative, noninflammatory ectasia of the cornea characterized by progressive corneal thinning and irregular astigmatism. Previous investigations have reported decreased mechanical stability in keratoconus corneas compared with normal corneas due to a reduced amount of collagen crosslinks. Collagen Crosslinking (CXL) with riboflavin and ultraviolet- A (UVA) is a proven treatment for arresting the progression of the disease. It consists of polymerization of the stromal fibers with the combined action of riboflavin (a photosensitizing substance) and UVA rays (riboflavin–UVA), which changes the intrinsic biomechanical properties of corneal collagen by increasing its rigidity. Though collagen crosslinking in cases of keratoconus is generally a safe surgery without sight-threatening complications, microbial keratitis after CXL has been reported infrequently. We report a case of Acanthamoeba keratitis after CXL procedure.

Case Presentation

A 28-year-old female presented with a history of progressively increasing pain, redness and defective vision after collagen cross-linking procedure in her right eye 21 days prior in her native place. The Bandage Contact Lens (BCL) was removed after 5 days, since she felt irritation after washing her face with tap water. She was comfortable for 3 days, but became symptomatic again and BCL was reapplied. She was using topical Loteprednol 0.5% (L-Pred, Allergan, India) Moxifloxacin 0.5% (Vigamox, Alcon, India), Tobramicin 0.3% (Tobaren, Warren, India) for 4 times a day and Homatropine 2% (Homide, Warren, India) 2 times a day. She underwent the same procedure in her other eye 3 months before and it was uneventful. On examination the visual acuity in the right eye was 6/60 and left eye was 6/12. Slit-lamp examination of the right eye showed ciliary congestion, full thickness corneal ring infiltrate of about 7 mm with overlying epithelial defect, perinueritis and 2 mm hypopyon (Figure 1). The crystalline lens was clear. Fundus examination was normal. She was not suffering from any systemic illness. Confocal Microscopy showed multiple cysts (Figure 2). The ulcer was then scraped, and samples were sent for microbiological tests. Her random blood glucose was 88 mg/dl. The patient was admitted and started on topical 0.04% PolyHexa Methelene Biguanide and 0.04% Chlorhexidine eye drops hourly. Culture showed *Acanthamoeba* growth on Non-Nutrient Agar plate on day 6 (Figure 3). Even after maximum possible medical therapy since the lesion was increasing and vision dropped to hand movements 9/9.5 mm therapeutic penetrating keratoplasty was done under general anesthesia. Since the lens was clear it was left untouched during the procedure. The excised host corneal button was sent for histopathological examination revealed

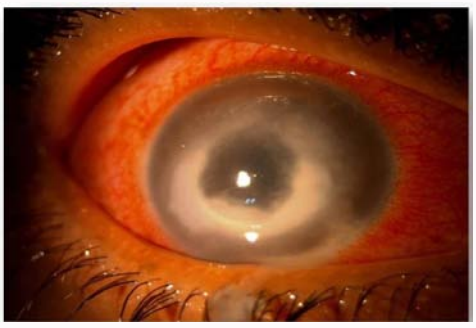

Figure 1: Full thickness corneal ring infiltrate with hypopyon.

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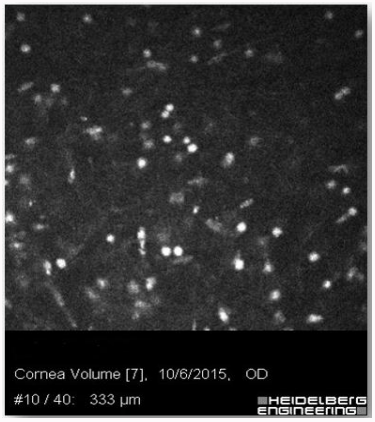

Figure 2: Confocal microscopy: Multiple double walled cystic structure's characteristic of *Acanthamoeba* cyst's.

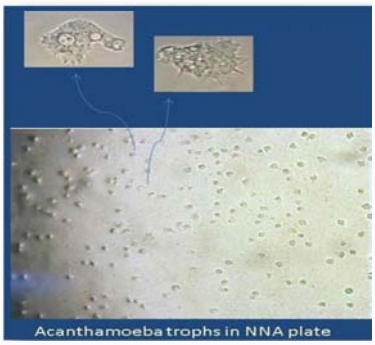

Figure 3: *Acanthamoeba* trophozoite's in Non-Nutrient Agar.

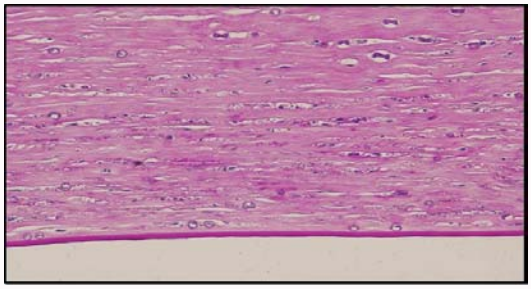

Figure 4: Histopathological examination of the infected host corneal tissue: *Acanthamoeba* cyst's seen up to Descemet's membrane.

multiple cysts of *Acanthamoeba* up to the Descemet's membrane (Figure 4). Post-operatively tapering doses of 0.04% PHMB, 0.04% Chlorhexidine, and Prednisolone acetate 1% eye drops were given till 1 year, which was replaced with Loteprednol 0.5% and Tacrolimus 0.1% (Talimus, Ajanta, India) eye ointment. The last follow-up was at 20 months post-operative period the graft was clear (Figure 5), all the sutures were removed, lens was clear and post segment was within normal limits with BCVA of 6/6P.

Discussion

Collagen crosslinking is a minimally invasive method requiring corneal epithelial removal and exposure of the corneal stroma to riboflavin and UV-A light for 10 to 30 min. The epithelial defect usually takes 2 to 5 days to heal completely [1]. An intact corneal epithelium is an important barrier to prevent infection. The non-adherence to post-operative antibiotic treatment and ocular hygienic

Figure 5: Clear graft at 20 month's post penetrating keratoplasty.

measures like washing the eyes with tap water, handling the bandage contact lens can pre-dispose to microbial infection. Original treatment protocol Wollensak et al. [2] proposed the use of antibiotic ointments in the postoperative period after CXL. Various other studies have highlighted the use of postoperative steroids or non-steroidal anti-inflammatory drugs (NSAIDs) along with an antibiotic agent [3-5]. However, it is also known that the use of topical corticosteroids and/or NSAIDs has the potential to exacerbate an infection, and corneal melting, especially in the presence of epithelial defects and hypoxic conditions induced by the application of bandage contact lens. Hence it is always safe to use steroids only after complete healing of the epithelial defect and after removing the bandage contact lens [6-8]. In our case the possible risk factor could be washing the eye with tap water by the patient in immediate post-operative period itself even before the epithelial defect closure, with the BCL in situ. The previously only reported case of Acanthamoeba keratitis post CXL by Rama et al. [9] were confocal, corneal scraping smear's revealed *Acanthameoba* cyst's and culture failed to grow any organism, in our case Confocal, Culture growth in Non-Nutrient Agar and Histopathology of the excised corneal button all three proved the etiological agent. Similar to the Rama et al. [9], we also could not heal the infection with medical therapy possibly because the patient presented to us late after the onset of the infection and required a penetrating keratoplasty. Though the disease was much advanced with large ulcer, with timely surgical intervention, long term post-operative steroid, and anti-amoebic therapy the graft survived with good visual recovery.

Conclusion

Post collagen crosslinking strict aseptic measures, antibiotic treatment and careful surveillance till the epithelial defect closure is of at most importance. Targeted maximal medical therapy for the identified infecting organism with vigilant follow up is required. In case of worsening of the disease with maximum possible medical therapy Penetrating Corneal Transplant options should be opted without delay.

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