

Successful Scleral Lens Wear Following Acanthamoeba Keratitis and Conjunctival Flap Removal

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Introduction

Acanthamoeba keratitis (AK) is a visually devastating condition causing significant corneal scarring. Patients presenting with signs and symptoms of Acanthamoeba keratitis frequently have a recent history of non-compliant soft contact lens wear, water exposure to the lenses, or injury to the ocular surface. This condition can persist for weeks to months without improvement due to the difficulty in diagnosing the condition and surgical procedures can be indicated to improve vision. Specialty contact lenses may be indicated in cases where corneal scarring has caused decreased vision.

Case Report

A 53 year old Caucasian male presented for evaluation of a para-central corneal ulcer in the left eye that was not responding to treatment. He reported to have non-compliant soft lens habits, such as topping off solution, not replacing his lenses on the recommended replacement schedule, and wearing lenses in a hot tub 6 days prior to onset of symptoms. The patient was using fortified Vancomycin and Tobramycin every hour without improvement for 1 week. He was admitted to the inpatient service where bacterial, fungal, and Acanthamoeba cultures were obtained and IV Ciprofloxacin was administered. Previous cultures by an outside eye care professional did not show any growth of organisms. A confocal microscope image was also obtained, which revealed high suspicion for Acanthamoeba. His vision at this visit with habitual spectacles was hand motion.

The patient's treatment was changed to the following topical medications in Table 1.

Figure 1. Topical treatment for left eye

Topical Medication	Dosage
Vigamox	1 drop every hour
Voriconazole	1 drop every hour
PHMB (Polyhexamethylene biguanide)	1 drop every hour
Neosporin	1 drop every hour
Brolene	1 drop every hour
1% Cyclopentolate	1 drop BID

The treatment above was continued with topical Natamycin added 4 weeks later, as the lesion was not exhibiting improvement. His vision slowly improved from hand motion to 20/100 in spectacles at 8 weeks. The size of the ulcerated area was stable over this time and patient reported constant pain and photophobia

Figure 2. Anterior segment photo of left eye with NaFl applied, 8 weeks after presentation

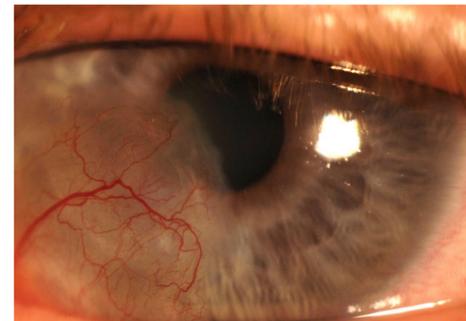


With the consistent corneal appearance above, the corneal specialist and patient elected to undergo a corneal biopsy, cryotherapy to the peripheral edges of the lesion, and conjunctival flap placement. Cultures up to this date had no significant growth. The photos in Figures 3 and 4 show the conjunctival flap post-operatively and it's changes over a 4 month period.

Figure 3. Conjunctival flap appearance 1 day post-operatively



Figure 4. Conjunctival flap appearance 4 months post-operatively



Contact Lens Evaluation

The patient continued close follow up care with the corneal specialist and was referred for a refraction and contact lens evaluation for best corrected vision. The patient's goal was to pass a commercial driver's license (CDL) test required by his current occupation which requires 20/40 vision in each eye.

Refraction: -2.50 -1.25 x 145 20/50

Diagnostic GP: unstable, unable to over-refract

Diagnostic Europa Scleral Lens (Visionary Optics): 43.00 D/18.00 mm (-0.50)

- adequate vault centrally
- touch over conjunctival flap inferior nasal
- moderate blanching inferior nasal
- over-refraction (OR): -3.75 DS **20/25-2**

The patient had significant cosmetic concerns regarding the appearance of the flap. The surgeon proposed removing the flap to aide in proper scleral lens fit and to improve the patient's cosmesis. The patient returned to applied the trial scleral lens in the left eye 3 weeks after flap removal.

Refraction: -2.50 -0.50 x 150 20/60

Diagnostic Europa Lens: 43.00 D/18.00(-0.50)

- decentered inferior
- adequate vault and limbal clearance when centered in the slit lamp
- Mild superior lift off
- OR: -3.50 DS 20/25-2

The lens was ordered with a 1.5 D back surface toric (BST) haptic to improve centration of the lens in the vertical meridian.

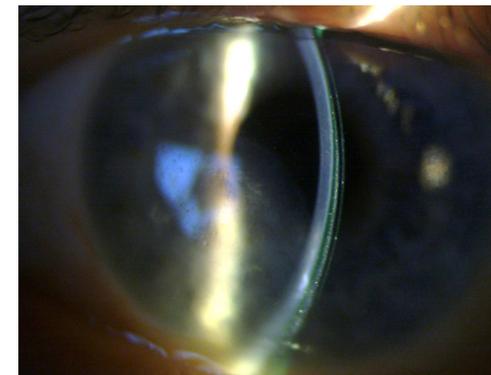
The patient returned 3 weeks later for the scleral lens dispense and application and removal training. The patient was educated extensively about proper contact lens hygiene and scleral lens wear.

The lens first lens was dispensed with mild inferior decentration present with the back surface toric aligned vertically. Superior landing was improved.

Distance Vision: **20/25+2**
OR: plano

After wearing the lens for 1 week, the patient returned with the lens on eye for 5 hours (Figure 5).

Figure 5. Settled lens appearance with 1.5 D BST

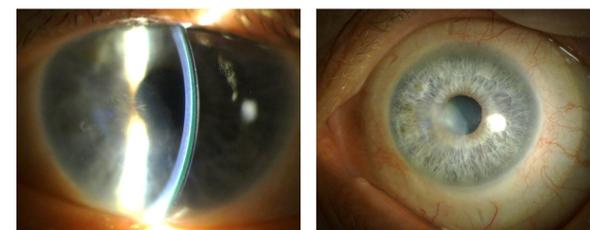


With the decentration still present, an additional 1 D was added to the back surface in the vertical meridian.

The patient returned for a follow up visit after wearing the new lens with 2.5 D back surface toricity. He reported wear time of 16 hours per day with great comfort. He denied any issues with removal, hyperemia throughout the day, or discomfort, and improved vision.

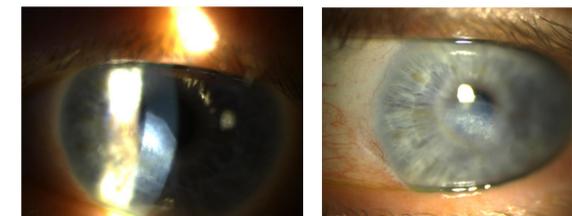
The lens was removed office and no staining with sodium fluorescein was noted and no change in conjunctival appearance. Figures 6,7 demonstrate the final lens appearance with 2.5 D of toricity, settled on eye for 6 hours.

Figure 6,7. Final scleral lens on eye for 6 hours, 2.5 D BST



The patient has been wearing a scleral lens in the left eye for 16 months without complications. He continues to be followed by a corneal specialist annually. Figure 8 demonstrates the remaining corneal scar present 18 months after conjunctival flap removal.

Figure 8. Corneal scar, left eye



Discussion

Acanthamoeba keratitis is caused by a free-living protozoan found throughout the environment in water, air from HVAC systems, and soil. This infection is predominately found in contact lens wearers with poor compliance of contact lens hygiene and. Diagnosis of AK is difficult based on appearance alone and early recognition of AK is critical for long term visual outcomes. Treatment for AK can include a significant amount of topical and oral medications. Once the corneal presentation is stable, surgical procedures may be indicated due to remaining inflammation or corneal scarring. Surgical procedures can range from extensive epithelial debridement, cryotherapy, penetrating keratoplasty, or a combination of multiple procedures. Scleral gas permeable lenses are a option to rehabilitate vision when traditional soft lenses and spectacles do not improve vision significantly.

References

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