

Reclaiming Vision: Scleral Lens Fitting After Acanthamoeba Infection

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Introduction

Acanthamoeba is a free-living unicellular protozoon commonly found in fresh water and soil. The protozoa can be found in two forms: a metabolically active trophozoite and a resistant cyst. Acanthamoeba keratitis (AK) is an infection primarily associated with soft contact lens wearers who demonstrate improper contact lens hygiene practices, such as noncompliance with disinfection systems, cleaning lenses with tap water, or swimming while wearing lenses. Approximately 85% of cases of AK in developed countries are associated with contact lens wearers. The overall incidence of AK in the United States is 1.49-2.01 cases per million contact lens users per year. Individuals suffering from AK often experience a significant decrease in visual acuity and pain that is disproportionate to their clinical signs.

Background

A 54-year-old female presented for a corneal evaluation due to decreased vision and severe right eye pain. She had a history of being treated for suspected HSV and neurotropic keratitis without symptomatic relief. She also had a history of primary soft contact lens wear due to poor adaptation to vision in spectacles. She discontinued contact lens wear due to symptoms.

Table 1. Attempted Therapies

| | | |
|-------------------------------|---------------------------|---------------------|
| Autologous Serum 6-8x per day | Erythromycin ointment QPM | Oxervate 6x per day |
| Restasis BID | Valacyclovir 1g PO BID | Prokera |

Case Presentation

Chief Complaint: pain, blurry vision, tearing, burning, photophobia OD

Ocular History: corneal ulcer and scar OD

Systemic History: alcohol dependence with withdrawal, depression, and anxiety

Systemic medications: Citalopram, Folic Acid, Metoprolol, Phenobarbital, Quetiapine, Thiamine, Vitamin D

Table 2. Entrance Testing and Slit Lamp Findings

| OD | | OS |
|-------------------|-------------------------|-------------------|
| 20/80 (PH: 20/50) | Entering Uncorrected VA | 20/60 (PH: 20/30) |
| 10mmHg | Intraocular Pressure | 9mmHg |
| Reactive ptosis | External | No Abnormalities |
| No Abnormalities | Lids/Lashes | No Abnormalities |
| 2-3+ injection | Conjunctiva/Sclera | White and Quiet |
| See Figure 1 | Cornea | All layers clear |



Figure 1. Slit lamp external photograph of the patient's right eye showing diffuse punctate epithelial erosions, a central circular anterior stromal scar with surrounding haze, and an overlying epithelial defect

Methods

Cornea

Due to no improvement despite therapy a corneal culture of the right eye was obtained. Lab results were positive for Acanthamoeba.

Table 3. Therapeutic Regimen

| | | |
|--------------------|------------------------|----------------------|
| Moxifloxacin TID | Chlorhexidine QID | PHMB Q1H |
| Cyclopentolate BID | Valacyclovir 1g PO BID | Artificial Tears PRN |

Contact Lens Fitting

OD: Upon resolution of active infection, the patient was referred by the corneal service for a scleral lens evaluation

OS: The patient was refit into a daily disposable soft contact lens

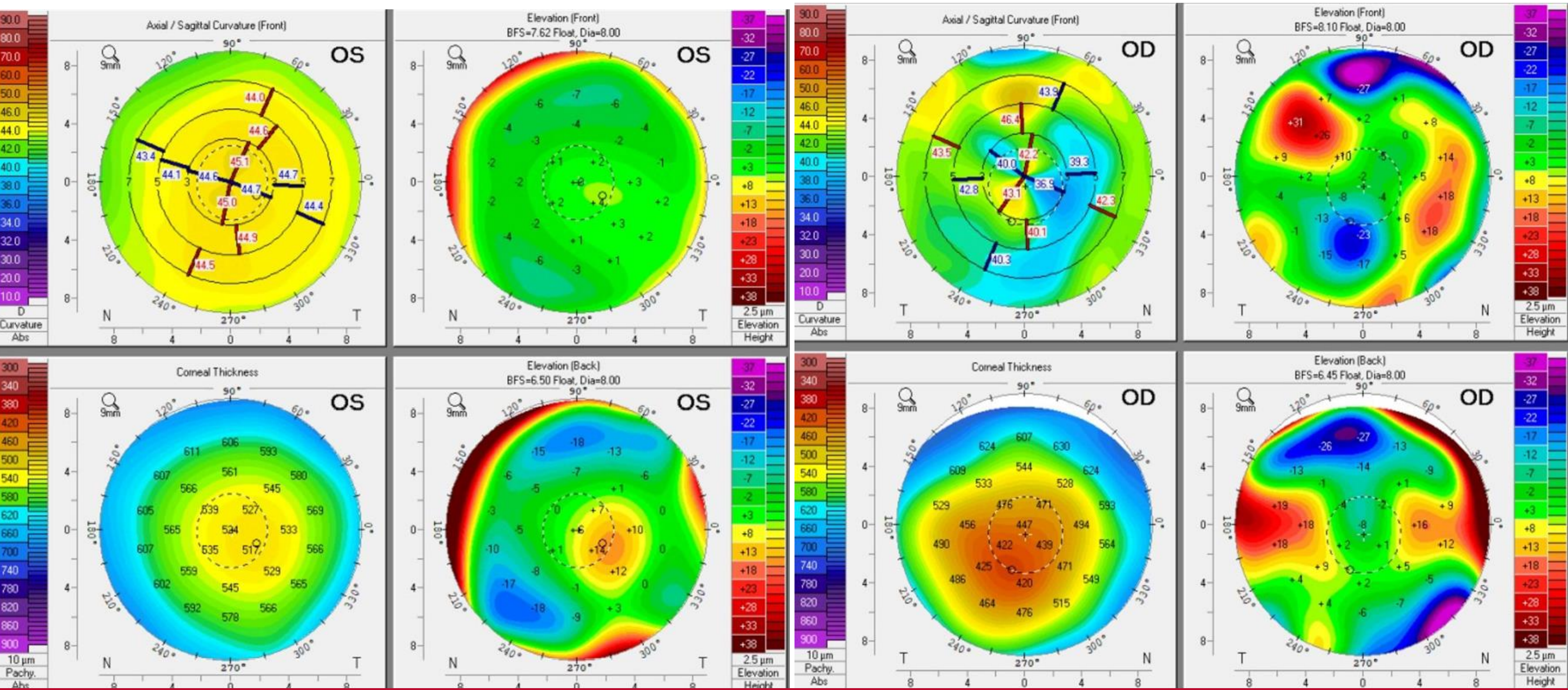


Figure 2. OD (right) and OS (left): Scheimpflug tomography

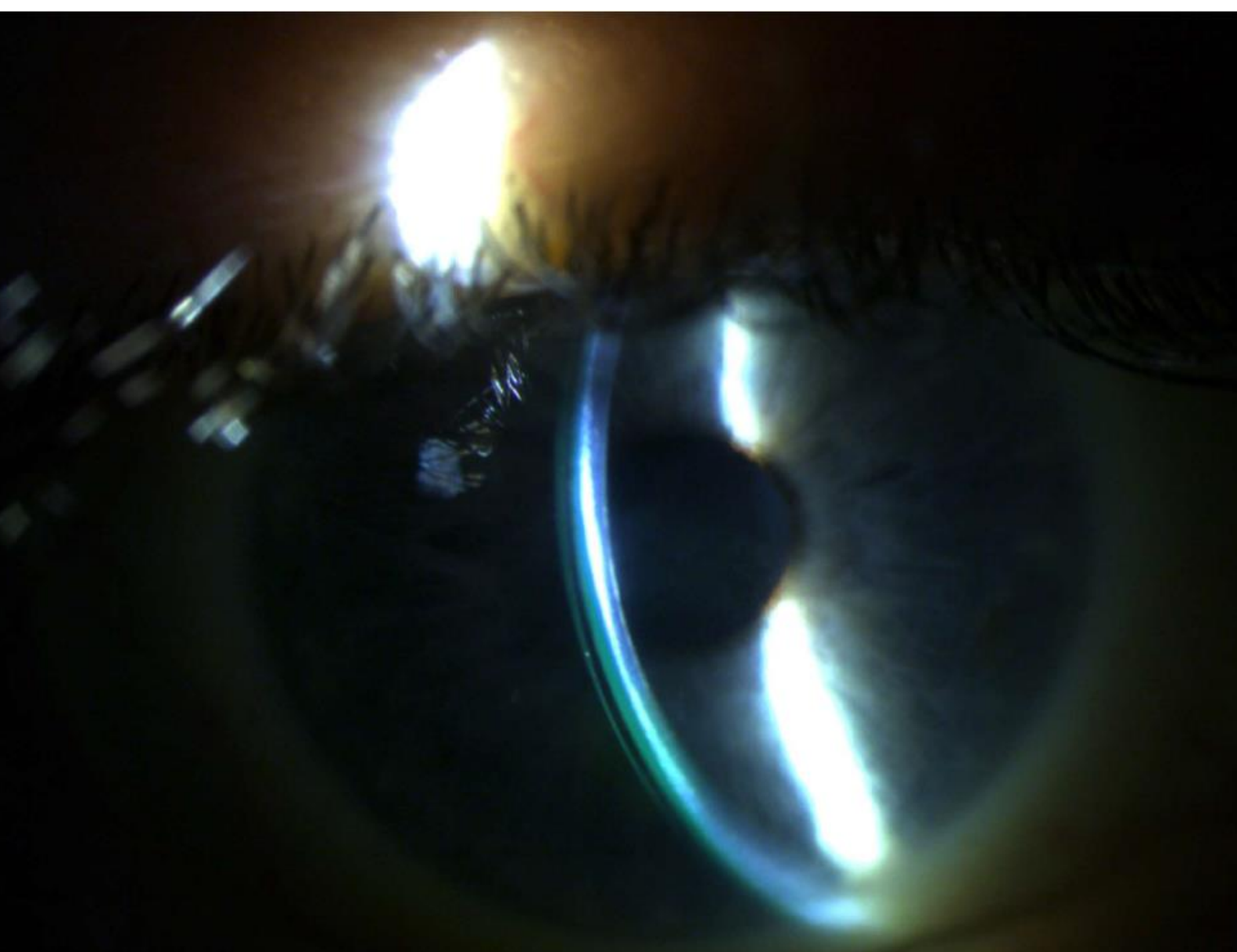


Figure 3. Slit lamp photograph of, OD, scleral lens with an optic section

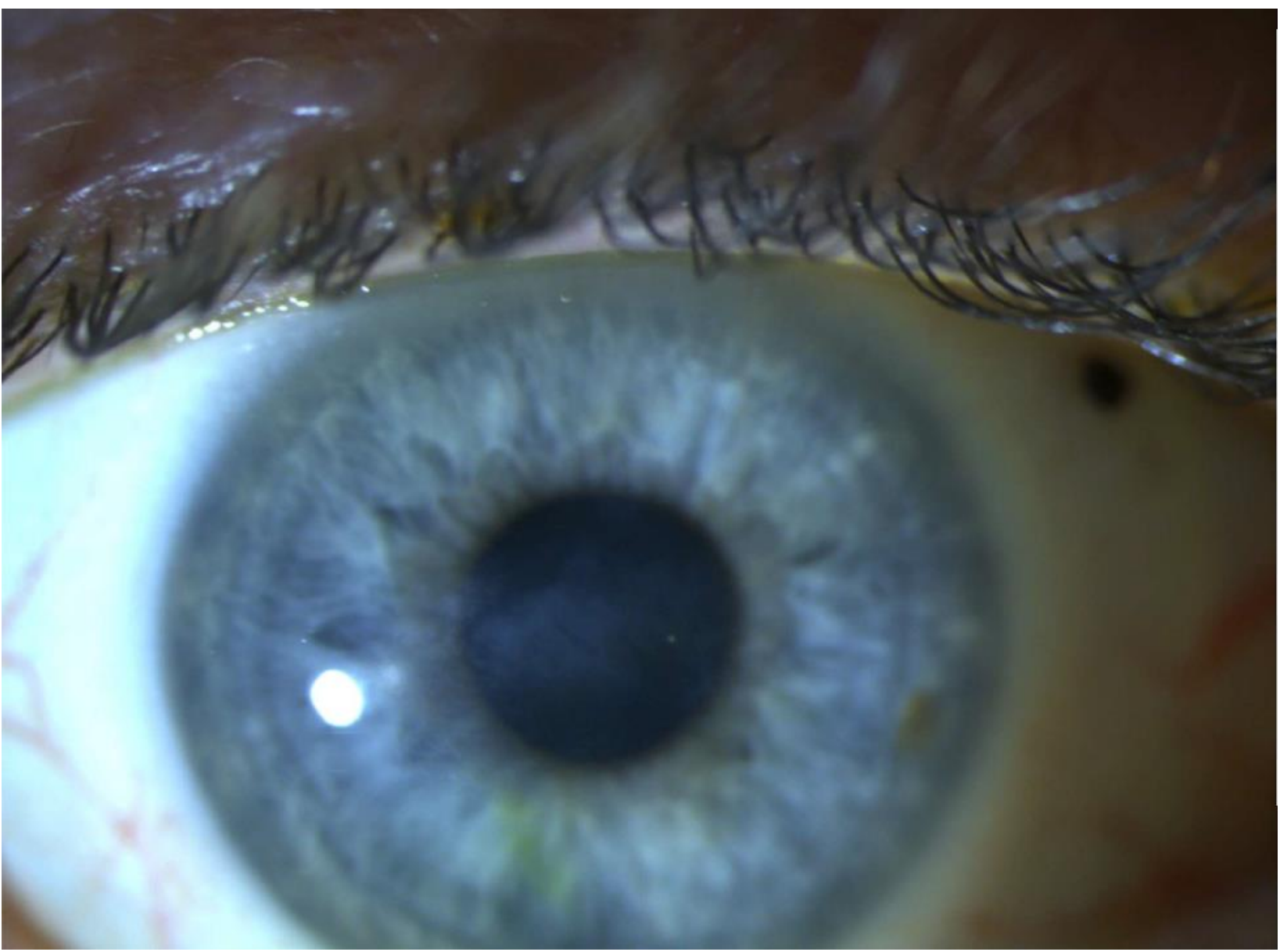


Figure 4. Slit lamp photograph of, OD, scleral lens in primary gaze

Table 4. Final Scleral Lens Parameters

| Eye | Brand | Lens | Base Curve (mm) | Lens Diameter (mm) | Power | Material | Total Sag |
|-----|-------------|----------------------|-----------------|--------------------|----------|----------------------------|-----------|
| OD | BostonSight | BostonSight S CLERAL | 8.0 | 18.0 | +0.75DS | Contamac Optimu m Infinite | 2750 |
| OS | Alcon | Dailies Total 1 | 8.5 | 14.1 | -2.75 DS | Delefilcon A | N/A |

Results

Clinical Outcome

OD

- BCVA: 20/40+2
- Mild irregular corneal epithelium overlying a central scar, faint neovascularization, and stromal haze
- No staining upon removal

OS

- BCVA: 20/20
- Well centered fit with adequate coverage and movement
- No staining upon removal

Discussion

- Patients suffering from AK present with eye pain, lacrimation, redness, blurred vision, and foreign body sensation
- AK usually presents unilaterally, with only 7.5% of cases presenting bilaterally
- Early clinical indicators of AK include an irregular epithelium and pseudodendrites, which can advance to radial keratoneuritis, as well as diffuse or focal anterior stromal ring infiltrates
- In severe cases, AK may progress to conditions such as limbitis, scleritis, uveitis, and corneal melt, potentially resulting in perforation if untreated
- Diagnosis of AK can be challenging due to the variance in clinical signs and symptoms
- Early detection of AK is the most critical factor for achieving a favorable visual outcome due to the infection being limited to the superficial cornea
- The average delay in diagnosis of AK is 50 days after the first presentation of symptoms
- If the disease persists for more than 4 weeks without appropriate treatment, the final visual prognosis is worse
- 25% of AK cases result in the need of a penetrating keratoplasty
- HSV keratitis, fungal keratitis, and Pseudomonas keratitis are all important differential diagnosis to consider

Conclusion

- A high clinical suspicion of AK should be present in primary contact lens wearers with a history of noncompliance.
- Corneal culture or confocal microscopy are imperative in identifying corneal pathology when conventional treatment is ineffective
- The current treatment approach for AK involves debridement of the infected epithelium as well as PHMB and Chlorhexidine with medical treatment lasting 3-6 months
- Scleral lenses are indicated after the active disease process has subsided to provide the best visual outcome over resulting corneal scars, sub epithelial haze, and irregular astigmatism
- Educating and emphasizing proper contact lens hygiene is vitally important in insuring the corneal health of patients

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