

Acanthamoeba Keratitis in a Scleral Lens Wearer

Abigail Strauss, OD, FAAO, Ellen Shorter, OD, FAAO, and Elmer Tu, MD
University of Illinois at Chicago

Background

A 40 y/o white male was referred for corneal evaluation due to right eye pain history from a persistent corneal ulcer OD. His current treatment included cefazolin every hour and tobramycin every hour while awake. His ocular history included bilateral keratoconus with prior full thickness corneal transplantation in the right eye with use of scleral lenses in both eyes.

Initial Presentation

	OD	OS
Visual Acuity	Counting Fingers sc PHNI	20/30 cc scleral lens PHNI
Conjunctiva	3+ diffuse conjunctival injection	W&Q
Cornea	PKP w/ intact running suture, central 5 mm x 4 mm epithelial defect w/ ring infiltrate (Figure 1)	Stromal thinning with consistent with keratoconus
Anterior Chamber	D/Q (-) cell/flare/hypopyon	D&Q
Iris	Round, reactive	Round, reactive
Lens	Clear	Clear

- Same day confocal microscopy revealed findings consistent with a diagnosis of Acanthamoeba Keratitis (AK).
- The patient denied sleeping, swimming or showering in his contact lenses. He reported using Clear Care and Optimum Extra Strength Cleaner for nightly disinfection with Purilens Plus Saline to fill the bowl of the scleral lenses. He denied using water to rinse his lenses.

Assessment & Plan After Initial Presentation

- Acanthamoeba Keratitis: The patient was started on chlorhexidine every hour and Valacyclovir 1g daily. Tobramycin and cefazolin were discontinued.

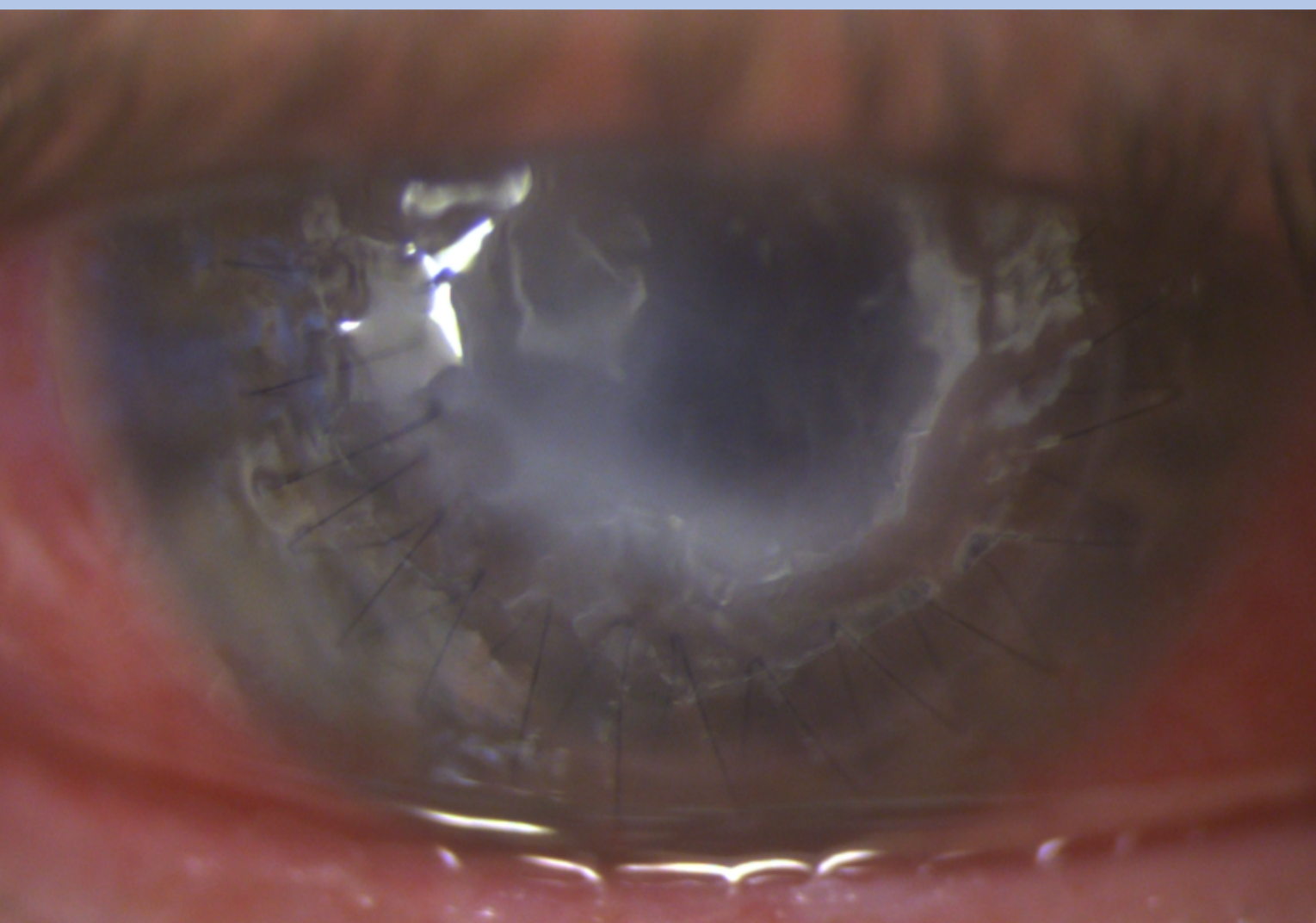


Figure 1. Anterior segment OD at initial presentation with a ring infiltrate.

Follow Up #1

	OD
Vision	Counting Fingers sc PHNI
Conjunctiva	1+ diffuse conjunctival injection
Cornea	PKP w/ central 5 mm x 4mm ring infiltrate and complete re-epithelialization
Anterior Chamber	D/Q (-) cell/flare/hypopyon

- Treatment was continued with chlorhexidine hourly for one week with plan to taper to every 2 hours. Valacyclovir was continued daily.

Continued Follow Ups

- During the following weeks he developed further central corneal stromal thinning with perforation requiring cyanoacrylate glue.
- The patient presented for emergency visit after hitting his right eye with the tip of the eye drop bottle with increased pain and light sensitivity. Slit lamp examination reveal corneal perforation.

Findings at Emergency Visit	
	OD
Vision	Hand Motion PHNI
Conjunctiva	1+ diffuse injection
Cornea	PKP w/ central 5 mm x 4mm ring infiltrate, glue disruption and corneal perforation
Anterior Chamber	D/Q (-) cell/flare

- The patient was taken to the operating room for same day repeat penetrating keratoplasty.
- The patient remains under close observation after having an emergent PKP. The exact source of infection of AK for the case presented remains to be determined.

AK Background (Cont.)

Treatment of AK is difficult as AK has two forms: cysts and trophozoites. Current treatment typically consists of either PHMB or Chlorhexidine in combination.^{1,4,5}

Scleral Lenses and AK:

AK is commonly associated with poor contact lens habits such as topping off solution, showering in contact lenses due to the presence of acanthamoeba in contaminated water, as well as sleeping on contact lenses.^{2,3}

Scleral lenses have gained popularity over the last several years. According to the SCOPE study, more than half (54%) of providers started fitting scleral lenses after 2010.⁶ Sticca et al. suggested that the risk for AK in scleral lenses is due to hypoxic changes in the corneal epithelium.⁷ Additionally, it has been thought that because scleral lenses are filled with a preservative-free saline, the saline could act as basin for acanthamoeba, especially if patients have poor contact lens cleaning habits. Scleral lenses require the use of additional tools such as two suction cups, one for insertion, and another for removal that could be another potential source of contamination. There are currently no clear guidelines for replacement of the suction cups unlike contact lens cases according to the FDA.⁷

AK in patients using scleral lenses require additional questioning, including, how often are you changing your handling tools, lens case as well as what solutions and salines are you using. It is important to discuss and correct patients who are improperly disinfected their lenses or reusing non preserved saline solutions. Additional studies are needed to determine risk factors for AK particularly in patients using scleral lenses.

AK Background

The diagnosis of AK is rare and accurate diagnosis is often delayed. It is most commonly associated with soft contact lens wear, although a history of contact lens wear is not a requirement for infection with acanthamoeba.¹⁻⁴

A diagnosis of AK can be achieved with confocal microscopy, however a culture is considered the gold standard for diagnosis.^{1,4,5}

References

1. Randag A.C.; van Rooij J.; van Goor A.T.; Verkerk S.; Wisse R.P.L.; Saelens I.E.Y.; Stoutenbeek, R.; van Dooren, B.T.H.; Cheng, Y.Y.Y.; Eggink, C.A. (2019) The rising incidence of *Acanthamoeba keratitis*: A 7-year nationwide survey and clinical assessment of risk factors and functional outcomes. *PLoS ONE*. **2019**, *14*.
2. Cheung, N.; Nagra, P.; Hammersmith, K. Emerging trends in contact lens-related infections. *Curr. Opin. Ophthalmol.* **2016**, *27*, 321-332.
3. Cope, J.R.; Collier, S.A.; Schein, O.D.; Brown, A.C.; Verani, J.R.; Gallen, R.; Beach, M.J.; Yoder, J.S. *Acanthamoeba Keratitis among Rigid Gas Permeable Contact Lens Wearers in the United States, 2006 through 2011.* *Ophthalmology*. **2016**, *123*, 1435-1441.
4. Lorenzo-Morales, J.; Khan, N.A.; Walochnik, J. An update on *Acanthamoeba* keratitis: diagnosis, pathogenesis and treatment. *Parasite*. **2015**, *22*.
5. Saidel M.A. (2006). *Acanthamoeba Keratitis Treatment*. American Academy of Ophthalmology: Current Insights. 01 April. <https://www.aao.org/current-insight/acanthamoeba-keratitis-treatment>
6. Nau C.B.; Harthan J.; Shorter E.; Barr, J.; Nau, A.; Chimato, N.T.; Hodge, D.O.; Schornack, M.M. Demographic characteristics and prescribing patterns of scleral lens fitters: the SCOPE study. *Eye Contact Lens*, **2018**, *44*, S265-S272.
7. Sticca, M.P.; Carrijo-Carvalho, L.C.; Silva, I.M.B.; Vieira, L.A.; Souza, L.B.; Belfort Jr, R.; Carvalho, F.R.S.; Freitas, D. *Acanthamoeba keratitis in patients wearing scleral contact lenses.* *Cont. Lens Anterior Eye*, **2018**, *41*, 307-310.