Long term management of persistent neurotrophic keratitis with scleral lens wear

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Abstract

This is a case presentation of persistent neurotrophic keratitis (NK) in a 72-year-old white male. Among the various tools available to providers for managing patients with NK, this case highlights the optometrist's role in managing NK patients using the therapeutic and visually rehabilitative properties of scleral lenses for a long-term management solution. The pathogenesis, presentation, classification and treatment of NK will be discussed.

Case Report

Demographics: 72-year-old white male, presented to establish eye care in February 2019
Chief Complaint: Blurry vision OS with photophobia, redness, and discomfort following an episode of "ocular herpes" four years prior.
Ocular History: Cataracts OD, Pseudophakia OS, Glaucoma suspect OU, Herpes Zoster Ophthalmicus OS in 2015, Persistent punctate keratitis OS, NK OS, Post-herpetic trigeminal neuralgia, Dry eye syndrome OU
Medical History: H/o Basal cell carcinoma, Benign prostatic hyperplasia, Herpes zoster in 2015
Systemic Medications: Acyclovir 800mg PO QD, Alfuzosin 10mg, Advil 200mg PRN
Ocular Medications: Fluorometholone 0.1% ophthalmic suspension 1 drop QAM OS, Optive sensitive (PF) drops PRN, GenTeal Gel TID OS

Clinical Exam:
BCVA OD 20/20, OS 20/150 (no improvement by pinhole)
Ancillary Tests: normal CFF/ pupils / EOMs;
Corneal sensitivity: OD normal, OS significantly reduced
Central corneal thickness: OD 530um, OS 474um
IOP (by GAT) 16/16mmHg

Slit Lamp Exam:

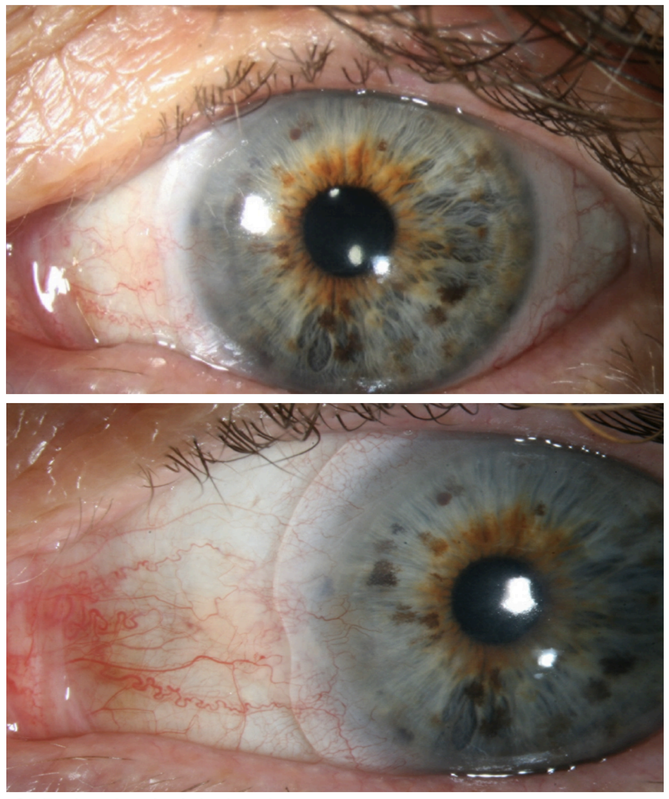
	RIGHT EYE	LEFT EYE
External	Normal	Normal, no vesicles
Lids/Lashes	Normal	**LL tender to touch**
Conjunctiva/ Sclera	White & quiet	**1+ diffuse injection 360**
Cornea	Clear	**3+ diffuse SPEE; nasal irregular epi w/ 2mm neovascularization @9:00 with sub-epi haze**
Anterior Chamber	Deep & quiet, no cells/flare	Deep & quiet, no cells/flare
Iris	Flat, no atrophy, no TIDs	Flat, no atrophy, no TIDs
Lens	Trace NS	PCIOL clear & centered
Vitreous	Normal, Shafer negative	Normal, shafer negative

Treatments tried: preservative-free artificial tears, gel and ointment; punctal plug LLL; steroid gtts; amniotic membrane; bandage contact lens

Long term treatment options: tarsorrhaphy, scleral lens

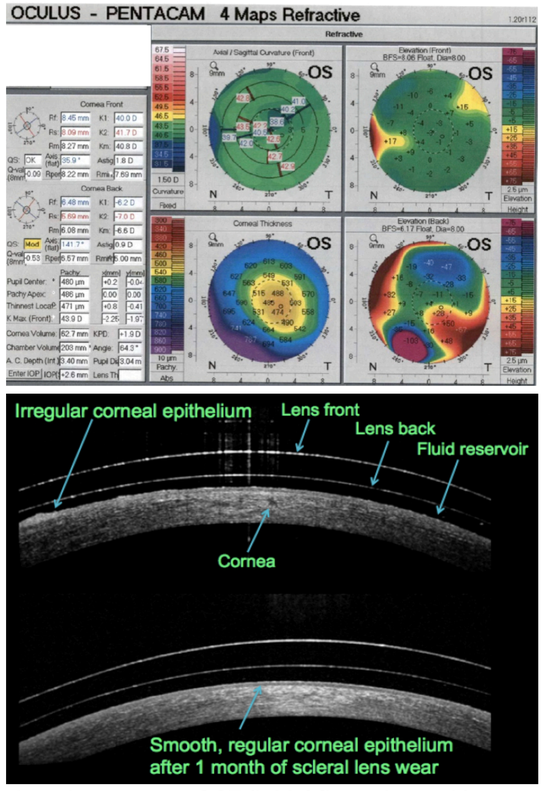
Imaging

Successful scleral lens fit OS



CPR: 0.5 depth, 3.0 chord
Notched to reduce compression & compression over pinguecula.

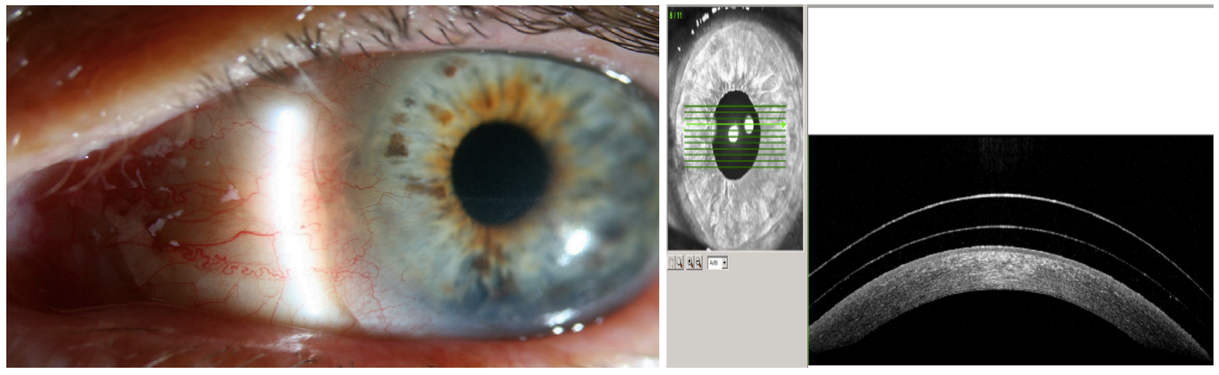
Corneal topography OS



Anterior segment OCT (initial fit vs. 1 month)
Note: the significant improvement in corneal regularity & contour after only 1 month of SL wear OS.

Case conclusion

The patient was examined by our cornea specialist who recommended a tarsorrhaphy or a scleral lens for management. The patient elected to be fit with a scleral lens, left eye only. The patient's vision improved from 20/150 to 20/20 with full time, comfortable scleral lens wear since 2019. The patient's cornea has remained quiet without flare-ups with close monitoring. The improvement in the patient's corneal surface was appreciated immediately and his quality of lfe has been improved.
Lens parameters: Onefit 2.0 / BCr 8.10 / Pwr +0.75 / Diam 15.20 / XLC / HydraPEG / CPR for pinguecula.



Discussion

Healthy corneal nerves are critical to maintaining overall corneal integrity. Neurotrophic keratitis develops when trigeminal corneal nerve damage or destruction occurs leading to corneal hypoesthesia, resulting in decreased blinking and tear production, which predisposes the epithelium to desiccation. Decreased corneal sensation can result in a dry, irregular cornea with delayed healing. This cascade of events may lead to corneal thinning, melt, super-infection and permanent vision loss.

NK can result from a number of conditions including: HSV and HZV keratitis, LASIK, chronic contact lens over-wear, stroke, diabetes mellitus, topical anesthetic abuse, irradiation, and use of chronic topical medications (i.e. Timolol, Diclofenac, Sulfacetamide).

Patients with NK present with small punctate epithelial defects, decreased corneal sensitivity, and poor healing. The punctate defects can merge with other epithelial erosions to form larger, non-healing defects. A coarse epithelial keratitis follows and can lead to neurotrophic ulcers with rolled, smooth borders. Early diagnosis and intervention is essential. It is crucial to establish corneal re-epithelialization to prevent complications and preserve vision.

Neurotrophic keratitis is a difficult condition to manage. Treatment options include aggressive lubrication, discontinuing toxic topical medications, punctal plugs, moisture chambers, bandage soft contact lenses, amniotic membranes, autologous serum tears, recombinant human nerve growth factor, tarsorrhaphy, conjunctival flap, or scleral lenses.

Scleral lenses are an excellent treatment option due to their therapeutic properties that include providing continuous corneal hydration, promoting corneal re-epithelialization, providing ocular surface protection, and establishing optimal vision. Scleral lenses have transformed the management of NK through their rehabilitative properties, thus reducing or delaying the need for surgical intervention while improving a patient's quality of vision and life.

Conclusion

Scleral lenses are a great option for corneal irregularities, ocular surface disease, and significant refractive error. This case demonstrates the effectiveness of scleral lenses as a long term management option for patients with NK. Scleral lenses are a therapeutic tool at the disposal of optometrists allowing us to play a role in the management of NK and delaying the need for surgery and other more invasive or aggressive treatment options. Full time scleral lens wear is a safe and effective option to be considered for long term management of patients with NK.

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