

Background

Exposure keratopathy (EK) is the drying of the cornea due to incomplete lid closure or reduced blink rate.¹ Chronic ocular surface inflammation can lead to neurotrophic keratopathy (NK): the partial or complete loss of corneal sensation due to impaired innervation.² Corneal desiccation from EK and NK can cause discomfort, reduced vision, corneal scarring, ulceration and corneal penetration.^{1,2}

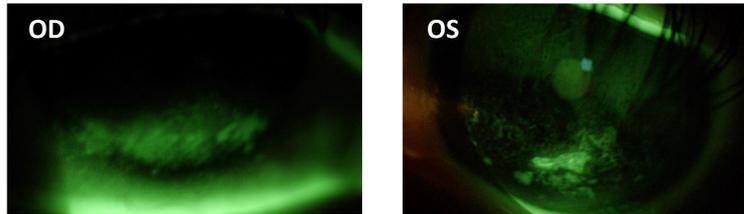
EK and NK are typically treated with artificial tears, gels and ointments, lid taping, moisture goggles, punctal occlusion, amniotic membrane, therapeutic contact lenses, tarsorrhaphy, and botulinum toxin injection in the levator muscle.^{1,2,3} Scleral contact lenses (ScCLs) can be utilized to treat these two conditions by providing protection and constant lubrication of the ocular surface.⁴

Case History

- TWB is a 38-year-old female referred for ScCL fitting to treat bilateral EK and NK, and a neurotrophic ulcer in the left eye.
- TWB was diagnosed with brain stem astrocytoma as a child. Surgical resection and radiation therapies for the astrocytoma resulted in bilateral VI, VII, IX, and X cranial nerve palsies, limited mobility, hearing loss and pituitary dysfunction.
- Ocular involvements include nystagmus, limited eye movements, and esotropia.
- Bilateral CN VII palsy caused incomplete lid closure and severe bilateral EK that led to irritation, fluctuating vision and bulbar injection.
- EK was treated with preservative-free artificial tears and ointments, warm compress, pulses of topical loteprednol, lid taping at night and permanent punctal plugs
- TWB developed NK and a sterile corneal ulcer in the left eye in December 2018.
- The corneal ulcer was treated with moxifloxacin, prednisolone acetate and autologous serum. The ulcer did not re-epithelialize after 5 months of treatment and a referral for ScCL fitting was made.

Scleral Lens Fitting and Progress Checks

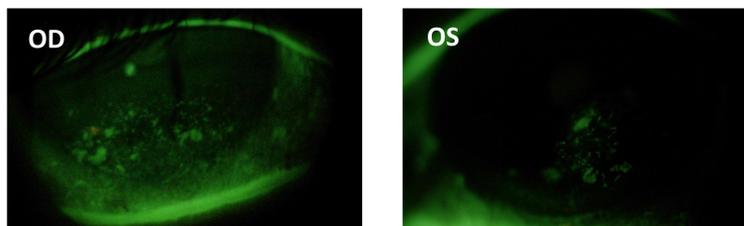
Initial Assessment:



Initial Assessment

Presenting unaided VA was 20/60⁻² OD and OS. Anterior segment exam revealed incomplete lid closure, debris in the tear film and instant TBUT in both eyes. Fluorescein staining showed grade 3 diffuse SPK inferiorly OD, and grade 2 diffuse SPK inferiorly OS. The corneal ulcer inferior-temporal OS measured 2mmx1mm. Diagnostic fitting was performed with Onefit™ MED (Blanchard, Montreal, Canada) for both eyes.

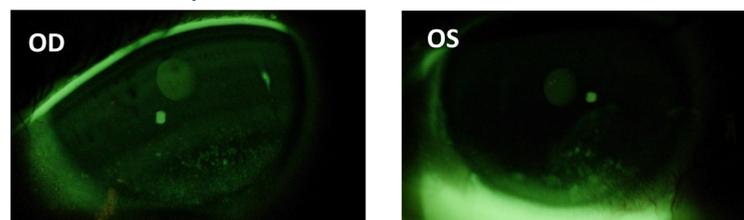
5-Day Follow-up:



Delivery Appointment

CL assessment showed inferior decentration of both CLs and adequate central, mid-peripheral and limbal clearance. After insertion & removal and lens care training was completed by TWB's mother, the ScCLs were delivered to the patient for daily wear. All treatments for corneal ulcer and dry eyes were maintained. Use of artificial tears during lens wear and removal & cleaning of the ScCLs throughout the day were encouraged.

3-Week Follow-up:



5-Day Progress Check

Noticeable improvement in corneal staining was seen in both eyes. A 2nd pair of ScCL was ordered to promote better centration and power change to improve vision. Severe lens deposition and fogging of the post-lens tear film was noted; the importance of removing and cleaning the ScCLs mid-day to improve vision was reiterated.

2-Month Follow-up:

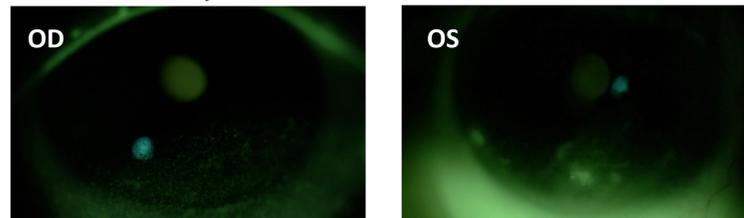


Figure 1: Fluorescein images of the right and left eye at each visit

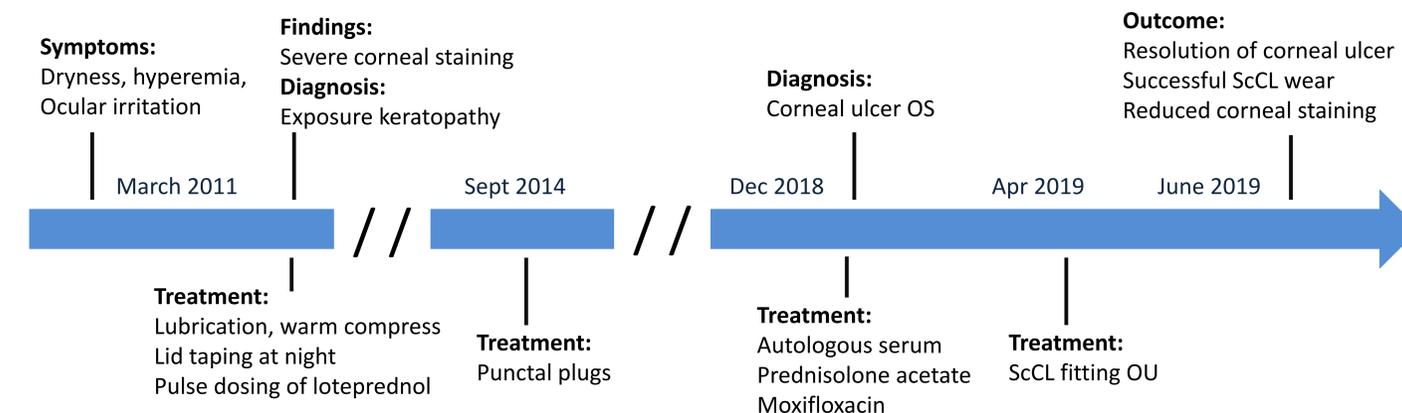


Figure 2: Clinical timeline of a 38-year-old female treated for exposure keratopathy and subsequent corneal ulcer in the left eye

3-Week Progress Check

The corneal ulcer in the left eye was completely re-epithelialized; SPK improved to grade 1 in both eyes. TWB started to manual "blink" over the ScCLs regularly which resulted in significant reduction in lens deposition and fogging of the post-lens tear film. The 2nd pair of ScCL was also delivered at this visit. Both CLs showed adequate clearance over the cornea and slight inferior decentration.

2-Month Progress Check

Corneal staining OD remained stable. A small area of epithelial defect was seen inferior-temporal OS. Aided VA measured 20/25 OD and 20/30 OS. ScCLs showed adequate fit in both eyes. Moxifloxacin drop once per day and all other dry eye treatments are continued. TWB will be monitored quarterly.

Conclusion

EK and NK resulting from multiple cranial nerve palsies are difficult to manage and have the potential to cause severe damage to the cornea. ScCL wear can protect the ocular surface from further desiccation, provide constant lubrication, and deliver vision correction. This case illustrates the effectiveness of ScCLs in promoting corneal epithelium healing in a patient with severe epithelial defects and a sterile corneal ulcer. Practitioner should consider the use of ScCL to treat severe cases of EK and NK.

References

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