Drug delivery and round-the-clock scleral lens wear for recalcitrant neurotrophic keratopathy

Mary Avisado OD MS, Patrick Caroline, Matthew Lampa OD, Mari Fujimoto OD, Randy Kojima
Pacific University College of Optometry, Forest Grove, Oregon

Background

Neurotrophic keratopathy (NK) is a corneal degenerative disease that requires aggressive management to prevent irreversible vision loss. Ocular conditions associated with NK include herpetic keratitis, contact lens abuse, topical drug toxicity, and chemical injury.[1] We describe a case of NK management utilizing scleral lenses (SLs) for drug delivery and round-the-clock wear.

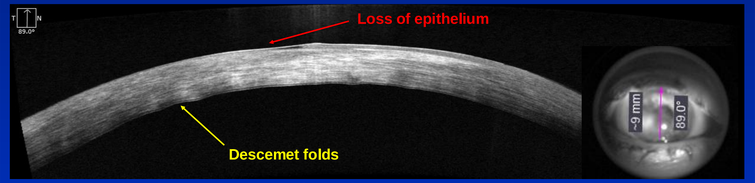

Fig. 1. OCT showing corneal morphological changes in patient LP with stage II NK.

Case History

A 66 year-old Caucasian female (LP) with history of recurrent herpes keratouveitis and moderate primary open angle glaucoma OD presented to the clinic after being cleared to return to SL wear by her ophthalmologist.

LP underwent an internal levator resection where she possibly sustained an abrasion that did not improve with ofloxacin. A temporary partial tarsorrhaphy was later performed, but the persistent epithelial defect (PED) progressed.

Clinical Findings and Management

Failed Treatments

- Bandage contact lens
- Topical insulin QID OD
- Temporary partial tarsorrhaphy
- Amniotic membrane tissue

Current Medications

- *Moxifloxacin TID OD
- *Autologous serum TID OD
- Valtrex 1g PO TID
- Latanoprost QHS OU
- Prednisolone acetate QD OD
- Topical hepatocyte growth factor QID OD (phase 1/2 clinical trial)

*Administered in Ampleye SL

Fig. 2. Ampleye SL filled with PF moxifloxacin, autologous serum, and buffered saline.

The PED did not heal despite months of treatment including daytime SL wear. LP reported getting minimal sleep due to discomfort when not wearing her SLs. It was at that time we decided continuous SL wear might help improve comfort and healing.

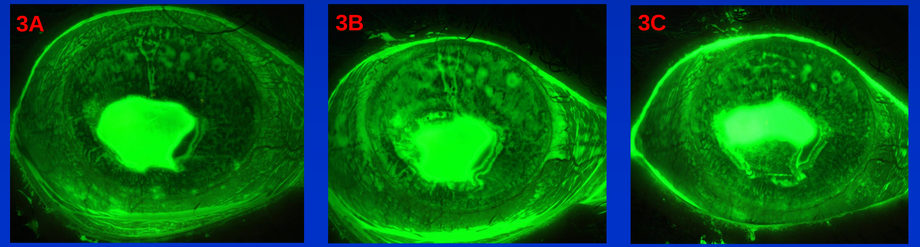

Fig. 3. PED staining with fluorescein. BCVA counting fingers at two feet. (3A) Minimal improvement after two months of daily SL wear. Three days (3B) and one month (3C) after round-the-clock SL wear showing re-epithelialization.

Discussion

Patients with NK are typically thought to lack symptoms of discomfort due to trigeminal nerve denervation and loss of corneal sensitivity. However, this is not always the case.[2] LP experienced intense ocular pain and discomfort without her SLs.

After initiating round-the-clock SL wear with Ampleye (Art Optical, Inc.), ocular signs and symptoms greatly improved. SLs provided constant hydration and protection to augment epithelial wound healing. We expect the defect to heal slowly as she has likely developed limbal stem cell fatigue secondary to the NK.

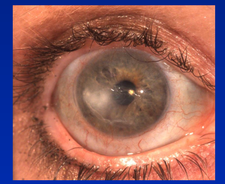

Fig. 4. PED with rolled edges and temporal scar.

Conclusions

SLs can be an effective non-invasive treatment option for NK at any stage of the disease. A combative approach with round-the-clock SL wear, topical therapies, and surgery may be needed to manage recalcitrant cases. With the increase in NK-associated conditions in the United States such as diabetes mellitus[3], it is critical for eye care practitioners to diagnose and initiate treatment early in the disease process.

References

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2. Yavuz-Saricay et al. Concurrent ocular pain in patients with neurotrophic keratopathy. Ocul Surf 2021;22:143-151
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