Scleral Lens Co-Management of Chronic Exposure Keratitis status post Craniotomy

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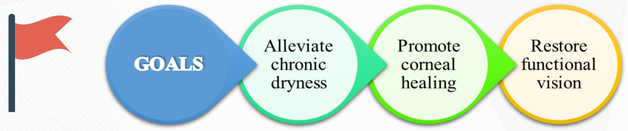
Background

Corneal decompensation secondary to chronic exposure keratopathy can result in vision loss from scarring and pain from corneal ulceration and perforation. Facial nerve palsies or abnormal lid anatomy can cause exposure keratopathy and depending on the severity, treatment can vary from aggressive lubrication, tarsorrhaphy, levator muscle botulinum injections and weight implantations. Scleral lenses can be strategically used to preserve corneal integrity, improve vision and quality of life for patients with exposure keratopathy.

Case Description

A 49-year-old Caucasian female presents to our clinic seeking a second opinion in managing the ocular surface OS. It was previously suggested she receive a corneal transplant to restore vision OS; however, it was cautioned against due to the patient's neuropathy. Patient reports poor vision and severe dryness OS due to chronic exposure keratitis status post craniotomy.

- **Medical history:** thyroid cancer, renal carcinoma, optic nerve sheath meningioma
- **Surgical history:** thyroidectomy and craniotomy in 2018
- **Ocular history**: chronic EK and recurrent neurotrophic ulcers due to paralytic lagophthalmos OS, high myopia OU
- **Ophthalmic medications**: Systane PFATs q1h, Systane ung QID, moisture goggles/lid taping nightly



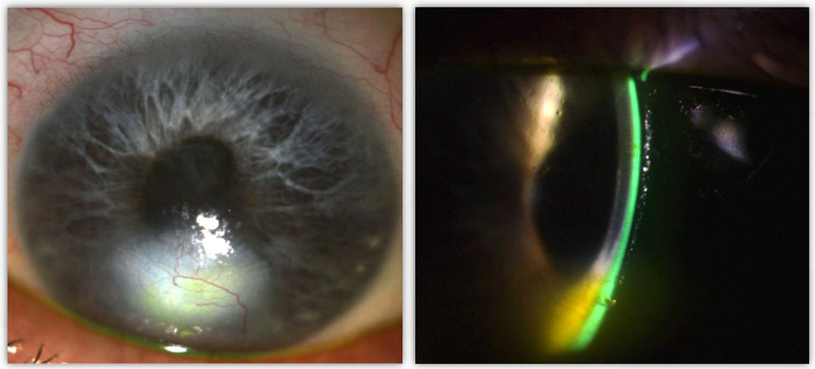


Figure 1: *Initial presentation OS (left) and fluid reservoir highlighted by sodium fluorescein with scleral wear (right)*

Anterior Segment:

- **OD:** Adnexa unremarkable, 1+ diffuse PEE of cornea
- **OS:** UL ptosis, proptosis, dense 3x6mm stromal corneal scar with inferior feeder vessel located slightly below visual axis w/ 4+ localized and diffuse PEE

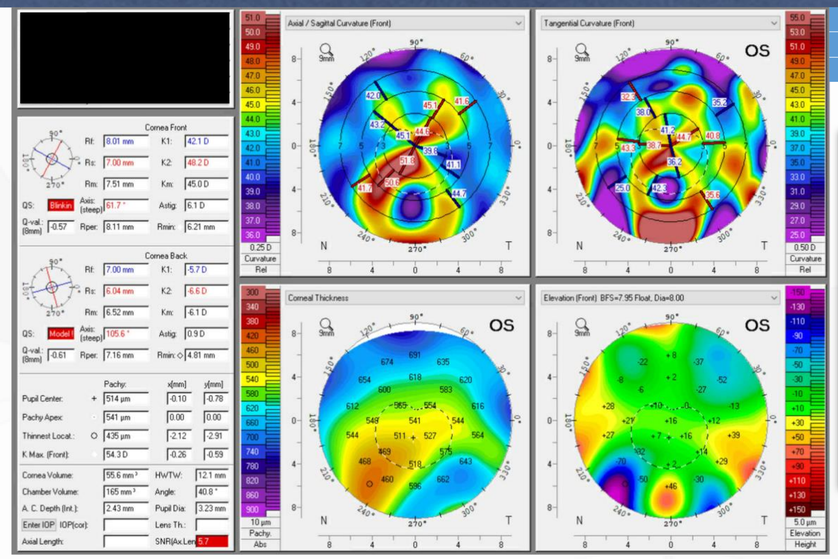


Figure 2: *Scheimpflug tomography highlighting corneal irregularities*

Management

A scleral lens was indicated to protect the corneal surface from exposure due to impaired lid function. A fit was initiated with the goal of providing the patient symptomatic relief and decreasing her dependency on topical meds. Secondary goals included improving corneal physiological health by protecting against desiccation and restoring functional vision.

The patient immediately experienced improved comfort once a diagnostic scleral lens was applied. Throughout the fit process, the patient reported improved functional vision in daily activities and therefore quality of life. The patient's OD was fit with a soft contact lens so that she can wear goggles while doing pool physical therapy.

Baseline photos were documented and the corneal scar was monitored over time to note for gradual scar regression. As illustrated in Figure 3 and patient's vision after seventy-six days of scleral wear, there was significant improvement in visual acuity that will hopefully continue over the next several years.

Discussion

Chronic exposure results in the breakdown of epithelial cells and interrupts the normal homeostasis of the cornea, which is crucial in preserving corneal clarity. This is exacerbated by the lack of blink function, resulting in poor distribution of the tear film and increased vulnerability to trauma and infection.

Scleral contact lenses are large lenses that land on the sclera, creating a fluid reservoir. This feature provides therapeutic properties and advantages in enhancing optical quality, thus making it a useful treatment for severe ocular disease or irregular corneas.

This report documents an example in which a scleral lens can serve as a liquid bandage and promote re-epithelialization to improve patient's ocular health, comfort and vision.

	Lens Brand	BC	DIA	Power	SAG	CT	CCZ	LZ	SLZ (F/S)
OD	Precision1	8.30	14.2	-8.00 DS	-	-	-	-	
OS	Valley Contax Elite	8.44	15.8	-8.50 DS	4614	300 um	-2.5	+1	-1/-8

Table 1: *Finalized contact lens parameters*

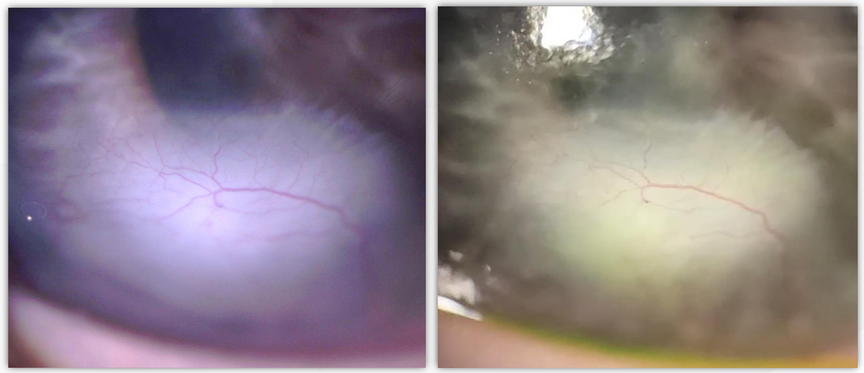


Figure 3: *Paracentral stromal scar OS at initial presentation (left) versus scar after two and a half months of scleral wear (right)*

Clinical Outcomes

Initial VA c spectacles: 20/20 OD, **CF 2' OS**
Day 1 VA c contacts: 20/20 OD, **20/600**
Day 76 VA c contacts: 20/20 OD, **20/200**

Clinical Pearls

- Scleral lens indications include promoting physiological function and should be considered as an alternative to invasive surgeries in managing diseased corneas
- Corneal scarring as a result of chronic exposure has the potential to fade over time with scleral lens wear
- An eye care team is encouraged to manage complex cases, valuing the perspectives of various providers including contact lens, oculoplastic and corneal ophthalmology
- Best practice requires thorough patient education on contact lens limitations and treatment expectations

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