

Background

Conjunctival injection associated with scleral lens (SL) wear is commonly associated with a poor fit, solution toxicity and/or hypersensitivity, systemic inflammation, or infection – most of which can be resolved by addressing the underlying etiology. A unique challenge is presented when a patient reports **persistent SL-related injection without one of the aforementioned causes**. In such cases, practitioners must be creative in their trial-and-error management methods.

Case Overview

34-year-old Hispanic with keratoconus presents for a SL fitting

- Habitual lens fit OU: 300 um apical clearance, limited limbal clearance 360, adequate scleral alignment 360
 - Persistent redness shortly after insertion OU (Fig. 3)
 - Moderate suction on removal OU
 - No pain OU

Ocular History: KCN OD>OS s/p CXL OU, steroid responder

Medical History: HTN (Lisinopril), bloodwork WNL

Discussion

Overview of approach to managing intolerable redness/suction:

- Lens fitting/alignment** – consider quadrant specific landing zone
- Infection** – antibiotics and lid hygiene
- Inflammation** – soft steroid and bloodwork
- Solutions** – preservative-free, essential electrolytes, hydrogen-peroxide cleaners
- Advanced lens customizations** – channels and fenestrations

-Patient's history as a steroid responder – *fluorometholone acetate ophthalmic suspension 0.1%*, which has greater penetrance and fewer side effects as a soft steroid, was used for this case with long taper⁴

-Mast cell stabilizers inhibit the release of mediators such as histamine and *prevent both immediate and late reactions*⁵

This case was met with many challenges involved in the lengthy fitting process, and success would not have been possible without the advancements of contemporary scleral lenses. Unique fitting strategies are sometimes required to address concerns despite the appearance of a suitable lens fit with standard parameters.

References

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Summary of Scleral Lens Fitting Process

	Pertinent Scleral Lens Parameters	Subjective and Objective Observations	Theoretical Justification	Concomitant Topical Medication
1	High Dk, 18.0 mm diameter SL with <i>quadrant specific landing zone</i>	<ul style="list-style-type: none"> Adequate fit Continued lens suction during removal Severe injection after <i>25 minutes of wear</i> 	Most patients exhibit rotational asymmetric scleral shapes ¹	<ul style="list-style-type: none"> Cromolyn sodium 4%: 1 gtt qid Fluorometholone acetate 0.1%: 1 gtt bid x 10d
2	Parameters above with <i>4 milled channels</i> 250um in depth stretching from the limbal zone to lens edge in each quadrant	<ul style="list-style-type: none"> Trace blanching along channel borders Mild suction with lens removal Injection after <i>3 hours of wear</i> 	Peripheral channels can prevent or minimize lens suction and promote tear exchange ²	<ul style="list-style-type: none"> Cromolyn sodium 4%: 1 gtt qid Fluorometholone acetate 0.1%: 1 gtt qd x 10d
3	Parameters above, however depth of channels decreased to 100um with the addition of <i>1 fenestration</i> incorporated in the superior quadrant	<ul style="list-style-type: none"> Adequate fit Trace resistance noted with lens removal Injection noted after <i>8 hours of lens wear</i> 	Scleral lens fenestrations relieve lens suction ³	<ul style="list-style-type: none"> Cromolyn sodium 4%: 1 gtt qid Fluorometholone acetate 0.1%: 1 gtt every other day x 10d
4	Parameters above with <i>3 additional fenestrations</i> (4 total – 1 fenestration within each channel)	<ul style="list-style-type: none"> Adequate fit Minimal resistance noted with lens removal Injection noted after <i>12 hours a lens wear</i> 	Further decrease in lens suction by increasing the number of fenestrations	<ul style="list-style-type: none"> Cromolyn sodium 4%: 1 gtt qid

Significant lens changes are italicized.

Visual acuity of 20/20 was obtained in each eye with minimal over-refraction.

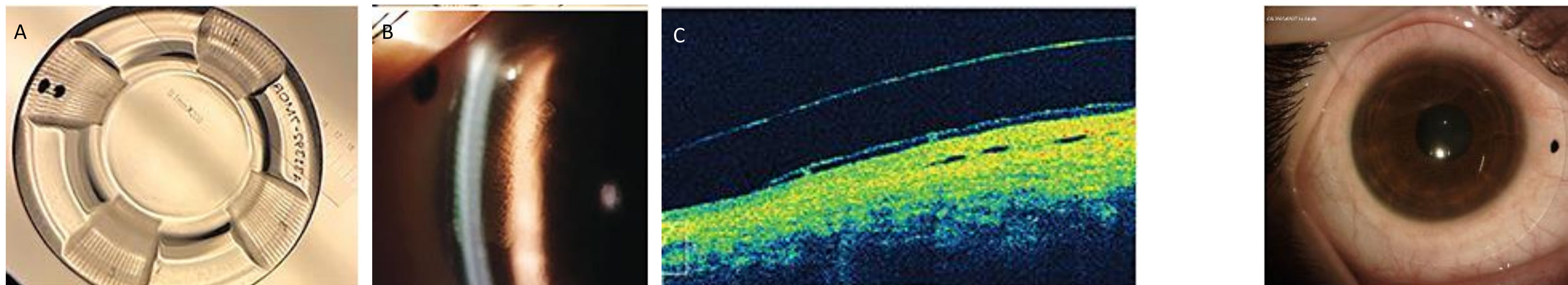


Figure 1. (Lens #2) An 18.0mm diameter scleral lens with four milled channels in each major meridian as viewed under magnification (A), slit lamp (B), and anterior segment OCT (C).



Figure 2. (Lens #2) on eye in office shortly after insertion.



Figure 3. (Lens #2) Images taken on patient's cell phone show diffuse grade 3+ conjunctival injection in the right eye (A) and grade 1+ conjunctival injection in the left eye (B) with scleral lens wear after approximately 3 hours of wear.



Figure 4. (Lens #4 – FINAL) Images taken on patient's cell phone show minimal conjunctival injection in the right eye (A) and the left eye (B) with scleral lens wear after approximately 10 hours of wear.



Figure 5. (Lens #4 - FINAL) 18.0mm scleral lens with four milled channels in each major meridian and four fenestrations.

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