



Surfing Channels over Surfer's Eye

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Abstract

This case highlights methods used to align scleral lenses over conjunctival pingueculae. Vaulting is an example of surmounting peripheral elevations, or irregular conjunctiva. Otherwise, this may result in poor alignment, discomfort, bubbles, lens decentration, compression, impingement, and conjunctival hypertrophy if focal adjustments are not made.

Background

There are several ways to modify a scleral lens to align to elevated obstacles in the landing zone: adjusting the overall diameter to avoid the pingueculae, notch the lens edge to align with the pingueculae, add a vault over the obstacle, and impression-fit the lens to conform to the scleral lens shape and contour.¹

Case Report

Case History:

45-year-old male (MS) with keratoconus, stable OU

Previous contact lens history:

Originally fit with Scleral lenses 4.5 years prior. Despite various modifications unable to obtain a satisfactory end-point due to comfort, MS wanted to try other options.

Previous surgical history:

OS corneal cross linking, OD stability without any surgical procedures

Scleral lens consultation:

Entering visual acuity (VA) was OD 20/20 and OS 20/20-1 with previous contact lenses.

Average wear time was 6 hours per day.

Assessment of previous scleral lens:

17.0 mm diameter scleral lens

The lenses were poorly fitting with minimal central vault and tight haptics.

There was moderate peripheral and limbal punctate epithelial erosions (PEE) in both eyes.

Central clearance ~120 µm in both eyes.

Anterior segment examination showed prominent nasal pingueculae OU, central corneal subepithelial haze with subtle Fleischer's ring OS. All other structures unremarkable. Posterior segment evaluation showed no abnormalities on dilated fundus examination.

Treatment/Management

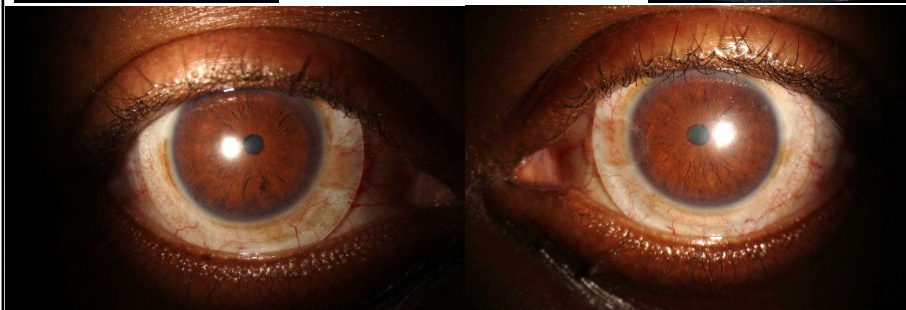
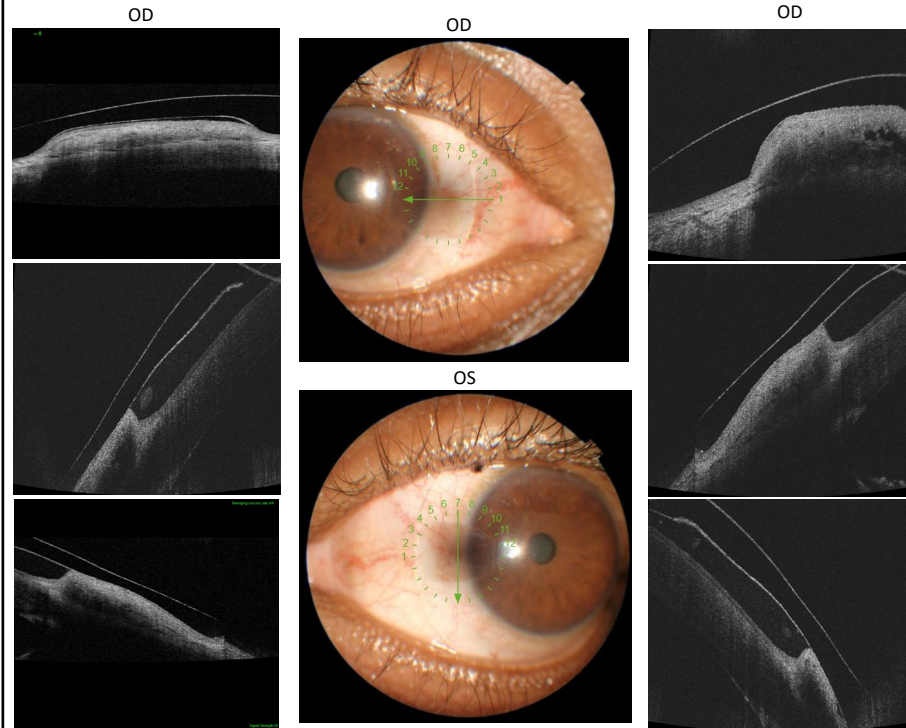
Re-initiated scleral fitting:

MS was evaluated with 19.0mm diameter diagnostic lenses yielding adequate central vault and some mild compression superior/inferior but MS noted increased comfort compared with previous scleral lenses.

Trial lens assessment with 19mm diameter diagnostic lenses:

Central clearance ~350 µm; VA was 20/20 in each eye with -2.00D over refraction. Lenses were ordered with flattening of the haptics to provide better alignment

Images



Treatment/Management Cont'd

On follow-up, added channel: 0-345 degrees at depth of 200 µm with dot at 35 degrees right eye, 180-190 degrees, depth of 200 µm with dots at 120 degrees left eye.

Final channel: 5-350 degrees at depth 380 µm OD, dot location 40 degrees, 170-200 degrees at depth 350 µm OS, dot location 120 degrees. MS noted the lenses provided a significant increase in clarity, comfort, ability to increase wear time, and decrease in bubbles on insertion.



Discussion/Conclusion

The following leads to successful micro-channels/vaults:

1. Measuring horizontal and vertical dimensions to approximate size of vaulting zone in relation to the scleral lens.
2. Measuring elevation of surface obstacles such as pingueculae.
3. Ensuring stability of scleral lens rotation and measure rotational placement of channel.
4. Evaluating the scleral lens with sodium fluorescein and lissamine green dye to better evaluate focal areas of influx, vaulting, and lens-off staining.
5. Measurements can be taken at the slit lamp and marking areas of interest manually; anterior segment OCT can be used for precise measurements used in form fitting.

Conclusion: Modifications can be made within the landing zone to help manage around obstacles. This can aid alignment when a larger diameter lens is desired for the most optimal alignment. This advanced technique can be a rewarding skill to optimize patient comfort and improve focal areas of compression over ocular surface obstacles.

References

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