Co-Management in Scleral Lens Fitting for Complex Corneal Graft Profiles

Grace Liao, OD, FAAO, FSLS; Brianna Ryff, OD, FAAO, FSLS; Elizabeth Escobedo, OD, FAAO, FSLS
Robert Fintelmann, MD, FACS

Abstract

Keratoconus remains one of the most common indications for keratoplasty. While corneal transplants may be beneficial in creating a more regular surface to improve optical quality, the mid peripheral profile, where the graft-host-junction resides, may be unpredictable. With the inherent tendency for larger diameter scleral lenses to decenter inferior temporally due to the angle of extraocular muscle insertion, this can present some additional challenges in achieving adequate fluid reservoir over localized aspects of proud corneal grafts while maintaining alignment of the scleral landing zone. As such, if continuous scleral lens modifications are unable to achieve a desired lens fit, co-management with a corneal specialist may be helpful in altering the mid-peripheral corneal profile for improved scleral lens fit results.

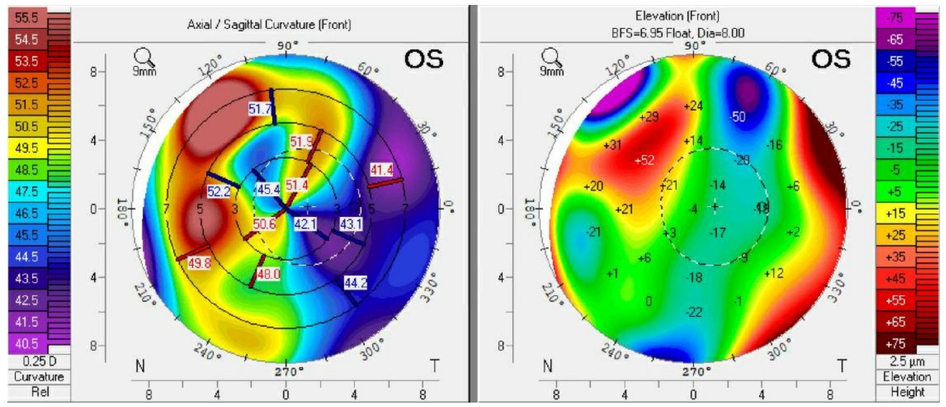
Case Presentation

A 35-year-old Hispanic male with a history of progressive keratoconus (KCN) presented for a scleral contact lens re-fit for both eyes.

The patient's best corrected visual acuity with a scleral lens was 20/25+2 OD and 20/50+2 OS. Due to the progressive nature of his KCN and reduced best-corrected vision, the patient was referred for a corneal crosslinking (CXL) consultation OD and deep anterior lamellar keratoplasty (DALK) consultation OS. The patient opted to first pursue the DALK OS, and then complete the CXL OD after his transplant had healed.

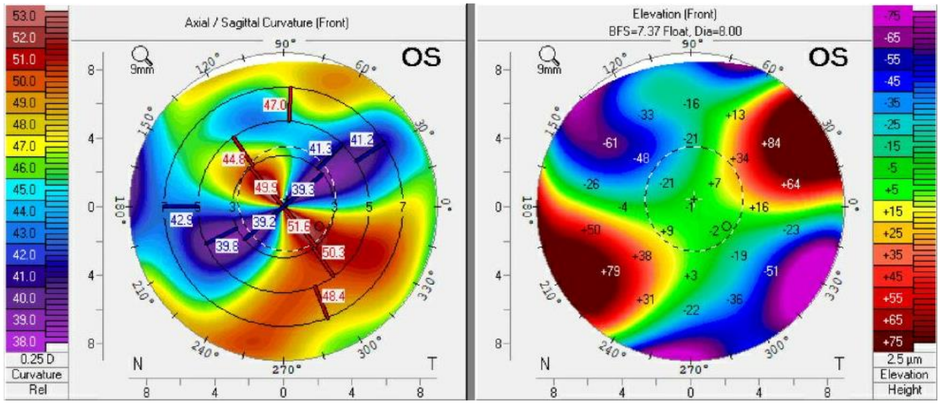
Five months s/p DALK OS, the patient was cleared for a scleral lens re-fit OS. At this time, topography and a slit lamp evaluation revealed a localized area of superior nasal elevation at the graft-host junction OS (see figure 1). Multiple scleral lens modifications were attempted, however modifications were unsuccessful in clearing the graft-host junction over the superior nasal elevation without compromising the adjacent scleral landing zone. The patient was subsequently referred to a corneal specialist for a corneal graft revision consultation.

Figure 1



Corneal tomography status-post deep anterior lamellar keratoplasty OS demonstrating a localized area of severe superior nasal steepening with a corresponding area of elevation along the graft-host junction. Multiple scleral lens modifications were attempted, however were unable to clear the elevated area and maintain good scleral landing zone alignment in the adjacent area

Figure 2



Corneal tomography status-post interrupted suture placement along the superior-nasal aspect of the graft-host junction OS. Anterior elevation and sagittal curvature maps demonstrate relative superior nasal flattening with decreased localized elevation along the graft-host junction where interrupted sutures were placed.

Follow Up Presentation

A consultation with the ophthalmologist revealed that interrupted sutures could be re-inserted into the area of localized superior nasal elevation to decrease the height of the graft-host junction and improve approximation of the junction. The patient agreed with the plan, and had five interrupted sutures placed in the corresponding superior nasal junction.

Following the placement of interrupted sutures to better approximate the superior nasal aspect of the graft-host junction, the elevation differential improved (see figure 2). The scleral lens fit OS improved both in its fluid reservoir distribution and landing zone alignment, and the patient subjectively experienced an improvement in vision and comfort.

Conclusion

Irregular corneas remain one of the most common indications for scleral lenses. With the continued advancements in scleral lens designs, practitioners now have more options than ever to incorporate scleral lens modifications to fit even the most challenging corneas. However, large irregularities in elevation differential across corneal transplants may still present practitioners with challenges even with recent scleral lens design advancements. In such cases, it can be beneficial in pursuing a team-approach with the corneal surgeon to achieve an optimized scleral lens fit.

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