



RK 2 WAYS: TWO SPECIALTY CONTACT LENS FITS IN POST-RADIAL KERATOTOMY PATIENTS



MARK EAVES/ KENTUCKY COLLEGE OF OPTOMETRY / MARKEAVES@UPIKE.EDU

SAMANTHA MYERS, OD, FAAO/ KENTUCKY COLLEGE OF OPTOMETRY / SAMANTHAMYERS@UPIKE.EDU JESSICA WALTER, OD. / KENTUCKY COLLEGE OF OPTOMETRY / JESSICAWALTER@UPIKE.EDU



Abstract

Radial Keratotomy (RK), an obsolete surgical technique used to correct myopia, can result in complications such as irregular astigmatism. This case report highlights two post-operative RK patients fit with two different types of specialty contact lenses to correct residual astigmatism.

Case Report: Patient A

A 61-year-old Caucasian male presented to clinic with a chief complaint of light sensitivity in both eyes. He habitually wore hybrid contact lenses and had an ocular history positive for bilateral RK surgery 37 years prior. His entering visual acuities in his habitual hybrid lenses were OD: 20/20, OS: 20/25⁺³, OU: 20/20. His habitual hybrids exhibited central bearing in both eyes. Upon lens removal, there was significant central corneal staining in both eyes. Corneal topography revealed bilateral irregular astigmatism.

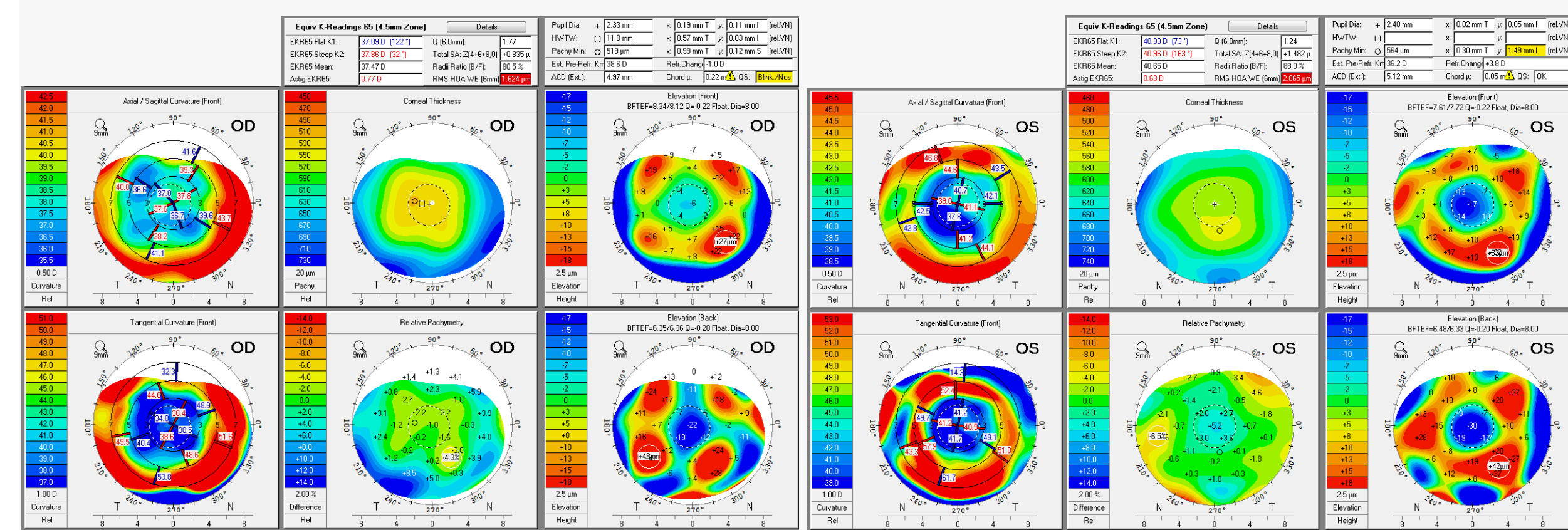


Figure 1: Patient A corneal topography revealing bilateral irregular astigmatism

Patient A	OD	OS
Initial Trial Lens Parameters	Ultra Health FC, Vault: 255, SC: 8.1, Diam: 14.5, Power: -3.50 D	Ultra Health FC, Vault: 205, SC: 8.1, Diam: 14.5, Power: -2.50 D
Final Lens Parameters	Ultra Health FC, Vault: 205, SC: 8.1, Diam: 14.5, Power: +4.00 D	Ultra Health FC, Vault: 155, SC: 8.1, Diam: 14.5, Power: +6.00 D

	Trial Fit	Dispense	Follow Up
Visual Acuity with CLs	Over-Refracton OD: +6.00 DS 20/15 ⁻² OS: +6.75 DS 20/20 ⁻²	Over-Refracton OD: plano 20/20 OS: +0.50-1.00x087 20/20	Over-Refracton OD: plano 20/20 OS: +0.50-1.00x087 20/20 patient not symptomatic
Fit Evaluation	OD centered, 190 microns of central clearance (unsettled), engagement of landing zone OS centered, 170 microns of central clearance (unsettled), engagement of landing zone	OD Centered, 150 microns of central clearance (unsettled), engagement of landing zone OS Centered, 140 microns of central clearance (unsettled), engagement of landing zone	OD Centered, 90 microns of central clearance (settled), engagement of landing zone OS Centered, 80 microns of central clearance (settled), engagement of landing zone
Plan	Order lenses with 50 microns shallower sagittal depth OU and incorporate over-refraction OU	Lenses dispensed; RTC in 1 week wearing new hybrid lenses for follow up	Lenses finalized. Monitor in 6 months.

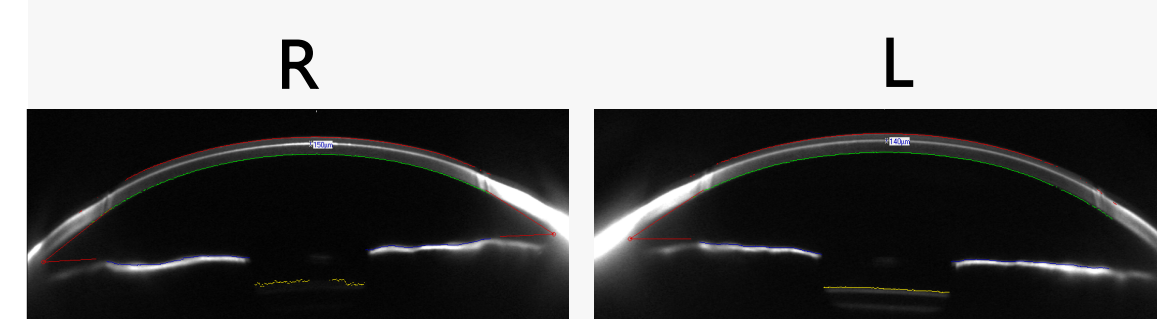


Figure 2: Patient A unsettled clearance of 150 microns OD and 140 microns OS at dispense visit.

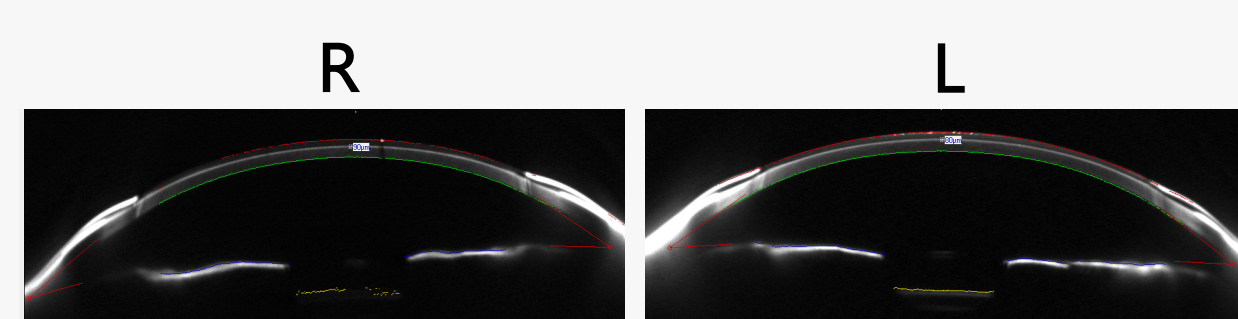


Figure 3: Patient A settled clearance of 90 microns OD at follow up visit 3 and clearance of 80 microns OS at follow up visit.

Case Report: Patient B

A 59-year-old Caucasian female presented to clinic with a chief complaint of blurry vision in both eyes at distance and near that did not improve with spectacles. She additionally had symptoms of dryness and redness in both eyes. Ocular history was positive for bilateral RK surgery 27 years prior. Her entering spectacle-corrected visual acuities were OD: 20/30⁺¹, OS: 20/50⁻², OU: 20/30⁻². Corneal topography revealed bilateral irregular astigmatism. Visual acuity did not improve with refraction.

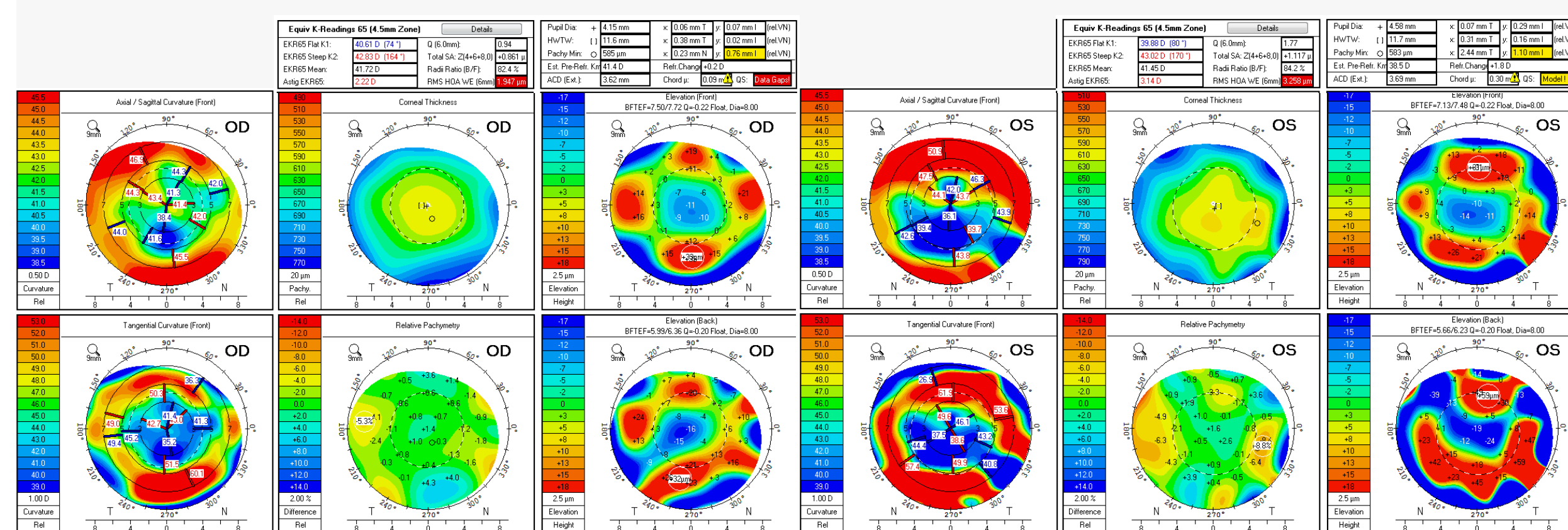


Figure 4: Patient B corneal topography revealing bilateral irregular astigmatism.

Patient B	OD	OS
Diagnostic Lens Parameters	Ampleye Scleral, BC 8.04mm, Power plano, Diam 15.5mm, Sag 3800, PCZ std, SLZ Toric 5.00	Ampleye Scleral, BC 8.04mm, Power plano, Diam 15.5mm, Sag 3800, PCZ std, SLZ Toric 5.00
Final Lens Parameters	Ampleye w/aberration control, Optimum Extra, BC 8.04, Power -1.25DS, Diam 15.5, CT 0.30, Sag 3800, PCZ -4.00, SLZ Toric 5.00	Ampleye w/aberration control, Optimum Extra, BC 8.04, Power -2.00DS, Diam 15.5, CT 0.30, Sag 3800, PCZ -4.00, SLZ Toric 5.00

Patient B	Diagnostic Fit	Dispense	Follow Up
Visual Acuity with CLs	Over-Refracton OD: -1.25 DS 20/20 OS: -1.50-1.00x010 20/25	Over-Refracton OD: plano 20/20 OS: +0.50-1.50x180 20/25	Over-Refracton OD: 20/25 ⁺² OS: 20/25 ⁻¹ Over-Refracton OD: pl-0.75x180 20/20 ⁻² OS: +0.50-1.50x180 20/20 ⁻²
Fit Evaluation	OD Central clearance: 450um Limbal clearance: 50um Edges: aligned Centration: centered OS Central clearance: 450um Limbal clearance: 50um Edges: aligned Centration: centered	OD Central clearance: 400um Limbal clearance: 50um Edges: aligned Centration: slightly inferior OS Central clearance: 300um Limbal clearance: 50um Edges: aligned Centration: centered	OD Central clearance: 300um Limbal clearance: 50um Edges: aligned Centration: centered OS Central clearance: 200um Limbal clearance: 50um Edges: aligned Centration: centered
Plan	Order lenses with 100um shallower sagittal depth (-4 PCZ) and incorporate spherical equivalent over-refraction in both eyes	Lenses dispensed. Return in 1-2 weeks for CL follow up wearing lenses.	Patient satisfied with comfort and vision. Finalized lenses. Follow up in 6 months.

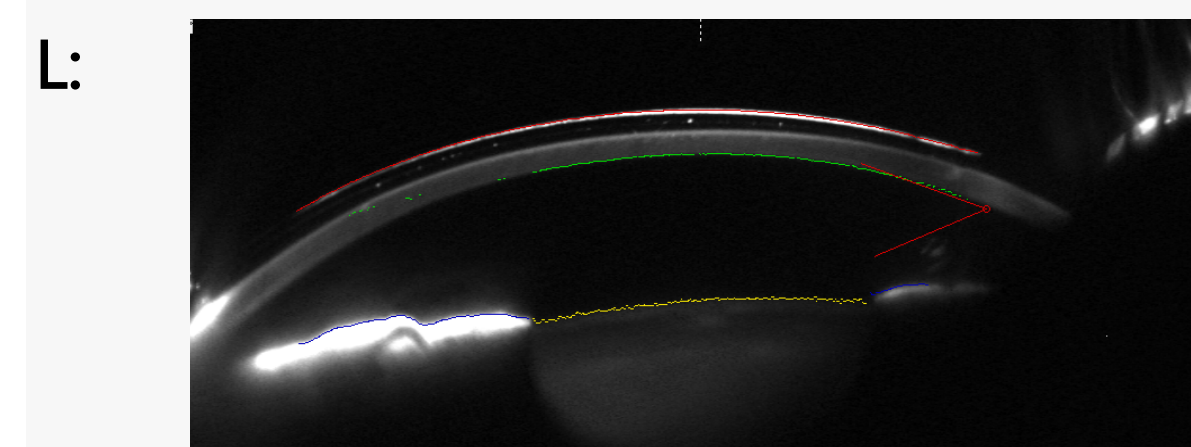
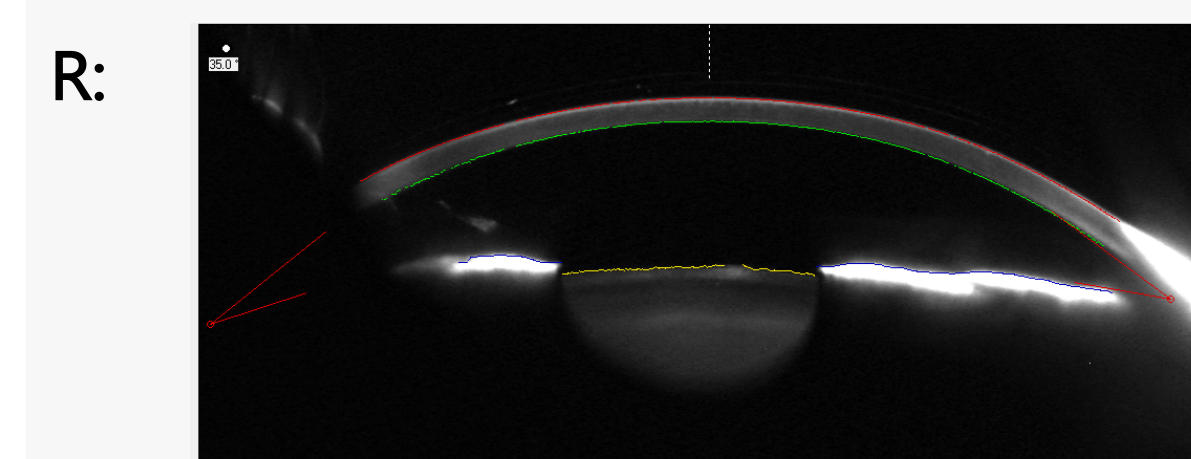


Figure 5: Patient B: Pentacam Scheimpflug images at last follow up demonstrating adequate and even corneal clearance on right eye (above) and left eye (below).

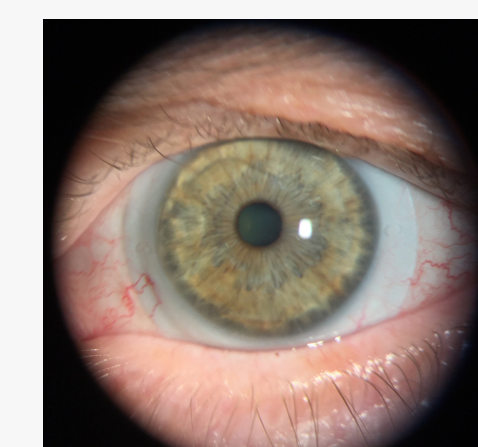
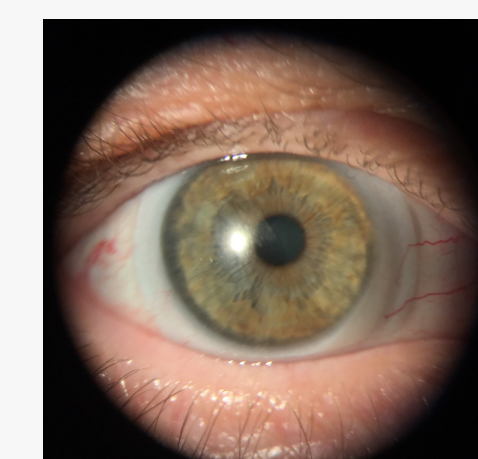


Figure 6: Patient B: Anterior segment photos of final scleral lenses on the right eye (above) and left eye (below).

Discussion

Many patients received RK surgery to correct their myopia in the 1970s through the 1990s. With the progression of refractive surgery, RK has since become an outdated practice and the long-term effects of the procedure are now evident. Complications associated with RK range from visual disturbances such as glare and diurnal fluctuations in acuity to irregular corneal curvature and incisional neovascularization. When spectacle correction and soft contact lenses are unable to provide adequate visual acuities for affected patients, specialty contact lenses are indicated. Because RK weakens the structural integrity of cornea, making it more susceptible to neovascularization, it is critical to choose the right specialty lens for an RK patient and achieve an ideal fit to maintain ocular health. Both scleral and hybrid lenses provide customizable parameters to ensure optimal corneal vault, adequate tear exchange, and superior optics that neutralize irregular astigmatism and higher order aberrations. By choosing the Ultra Health FC hybrid lens for Patient A, we were able to provide better tear exchange and a low vault to increase oxygen supply to the cornea to prevent neovascularization. For Patient B, an Ampleye scleral lens was fit with a high dK material, low center thickness, and low vault to achieve the same goal of minimizing the risk of neovascularization. The patients highlighted here provide examples of both fitting methodologies and demonstrate how to achieve excellent visual results while maintaining optimal ocular health.

Conclusion

It is important to consider that a patient who has undergone corneal refractive surgery, such as RK, may experience impairment in their visual function from associated complications. Understanding these potential complications and their symptoms will allow the clinician to select a specialty lens design to fit the patient's needs, comfort level, and lifestyle. The results of this case series highlight the use of scleral and hybrid contact lenses for refractive correction in patients with post-surgical corneal abnormalities.

References

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