

Case Report:

Scleral fit on post Radial Keratotomy eye

Tom Arnold OD, FSLs

Dr. Tom Arnold has a private group practice in Sugar Land, Texas. With a long-standing interest in specialty contact lenses, he is a Fellow of the Scleral Lens Education Society and was one of three winners of the photo contest at the 2017 Global Specialty Lens Symposium. He has been a consultant for and spoken on behalf of Blanchard Lab, Bausch + Lomb Specialty Vision Products, Boston Sight Sclerals, EyePrint Prosthetics and AccuLens. Dr. Arnold is adjunct faculty at the University of Houston College of Optometry.



Introduction

A 45-year-old woman presents for a contact lens evaluation. She had undergone radial keratotomy twenty years before. Her chief complaints were poor night vision, especially when driving, starburst and reading in conditions of low light and dry eyes. Her current spectacle refraction: Right eye S plano, Left eye S-0.75 C-0.25 x 103 addition +1.00. Corrected visual acuity RE 20/25 (logMAR 0.1) and LE 20/30 (logMAR 0.18).

Profilometry Measurement

Profilometry directly measures 3D sagittal height, and creates a bi-sphere elevation map which shows where data is more elevated or depressed.

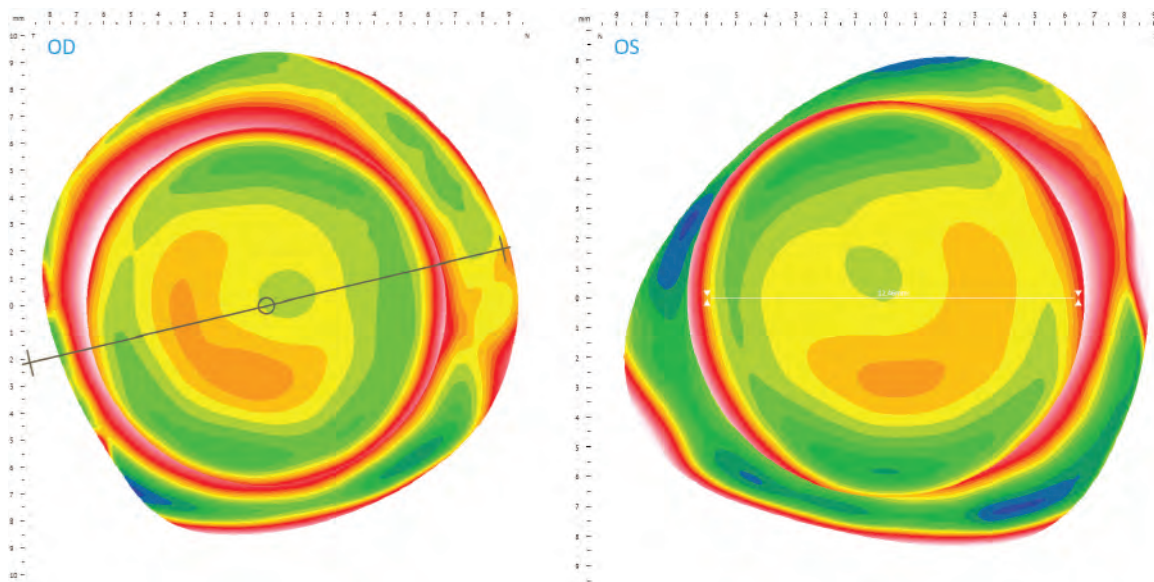


Figure 1

Lens Fit and Order

Based on elevation maps from the Pentacam (Oculus, Wetzlar, GE) and scleral mapping from the Eye Surface Profiler (ESP) (Eaglet-Eye, Houten, NL). Trial lenses were selected using the first lens fit algorithms provided by the ESP to determine edge toricity and sagittal height of the lens.

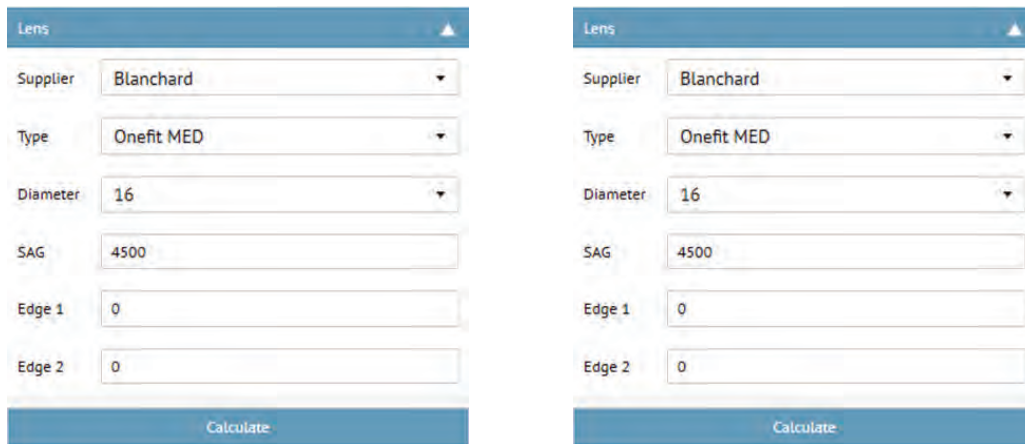


Figure 2

The algorithms predict for both eyes a SAG 4500 and spherical landing zone (Edge) with the standard peripheral shape. The predictive algorithm of the Onefit MED (Blanchard, Manchester (NH), USA) allows a scleral SAG toricity of 150 microns before recommending a toric fit. This is in accordance with the lab recommendations. Both eyes show 130 and 150 microns of scleral SAG toricity.

Sagittal height OD			Sagittal height OS		
Fix rotation	<input checked="" type="checkbox"/>		Fix rotation	<input checked="" type="checkbox"/>	
Chord length	<input type="text" value="16.00"/>	<input checked="" type="checkbox"/>	Chord length	<input type="text" value="16.00"/>	<input checked="" type="checkbox"/>
360°	4.27mm	36.3°	360°	4.23mm	39.5°
MINsag	4.19mm	@103.0°	MINsag	4.15mm	@61.0°
MAXsag	4.34mm	@65.0°	MAXsag	4.28mm	@179.0°

Figure 3

The following trial lenses were selected from the diagnostic set:

Blanchard Onefit Med

RE: 16mm / Sag 4500 / plano / toric haptic -75/-75

LE: 16mm/ sag 4600 / -0.50 / toric haptic +75/-75

After examining the trial lenses at the slit-lamp after settling for approximately 30 minutes, modifications were made. CCR was included to create a better uniform tear layer in the mid-periphery. Used CCR values are 110. CCR introduces a reduction in the total SAG of the lens. The CCR number has to be compensated in the ordered SAG.

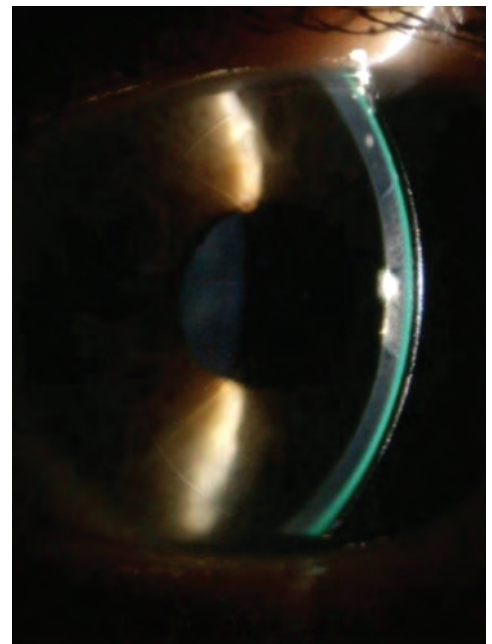


Figure 4

Final Order

RE: 16 mm SAG 4700 / CCR 110 / S-2.37 / toric haptic std / -100

LE: 16 mm SAG 4750 / CCR 110 / S-1.87 / toric haptic +75/-75

The final order shows a nice combination of the use of technology as well as the practitioner customizing the fit reducing the number of trials and dispensed lenses. In this case the final SAG has been updated due to the inclusion of the oblate CCR requiring an update of 150 microns of SAG. The edge (landing zone) has been ordered with toricity aiming for a sealed fit which helps to achieve better centration where lab recommendations are aiming for a near-sealed fit.

Conclusion

Fitting an oblate cornea with scarring can be challenging. The Eye Surface Profiler can help to select the initial trial lenses which are close enough to the final RX so that multiple trials are avoided. Thus, chair time is reduced and the patient experience is enhanced.

Final Visit

The final visit of the initial fitting period was six weeks later. Patient had no complaints and had increased her average wearing time to 14 hours per day.

Measurements of central vault were recorded with the Zeiss Cirrus OCT. They were RE 176 micron and LE 211 micron. These values are well within the recommended range for adequate oxygenation and optimum visual acuity. The patient was released for another six months.

