Stopping a Scleral Lens from Rockin' and Rollin' on a Highly Toric Sclera

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Abstract:

Purpose – When not fit properly, a common scleral lens complication is debris entrapment in the postlens tear reservoir (PLTR). Aligning the scleral haptic with the irregular shape of the sclera is one method to decrease this complication. But, this is a difficult solution to achieve, given that new studies show that most sclerae are highly irregular in shape. Traditionally, we are taught to observe a gentle haptic landing on the sclera in all meridians. This case defies this conventional wisdom.

Methods – This is a case presentation of patient with a highly toric sclera who was successfully fit with an extreme modification of a standard lens design. A patient with Sjogren syndrome and systemic lupus erythematosus was referred by her ophthalmologist for scleral lens evaluation. Upon insertion of trial lenses, we failed with two designs due to the lens haptic vaulting from the conjunctival surface in the vertical meridian. The patient was switched to a Synergeyes VS design to take advantage of the bi-tangential haptic.

Results – The Synergeyes VS was fit with the haptic aligned in the horizontal meridian, but an extreme angle in the vertical meridian, with the "toe" of the haptic just barely maintaining contact with the sclera. Final visual acuity was 20/25+2 OD, 20/20 OS. The patient was able to wear her lenses all day without complaints. However, upon inspection after 8 hours of wear, debris in the PLTR was present. The patient was instructed to remove lenses once during the day.

Conclusions – This oddly appearing scleral lens fit prevented the lens from rocking on the eye and minimized debris entrapment in the PLTR.

Background:

A scleral lens haptic that does not align well with the sclera can produce debris in the post-lens tear reservoir¹, poor comfort, conjunctival hyperemia, and other mechanical complications.

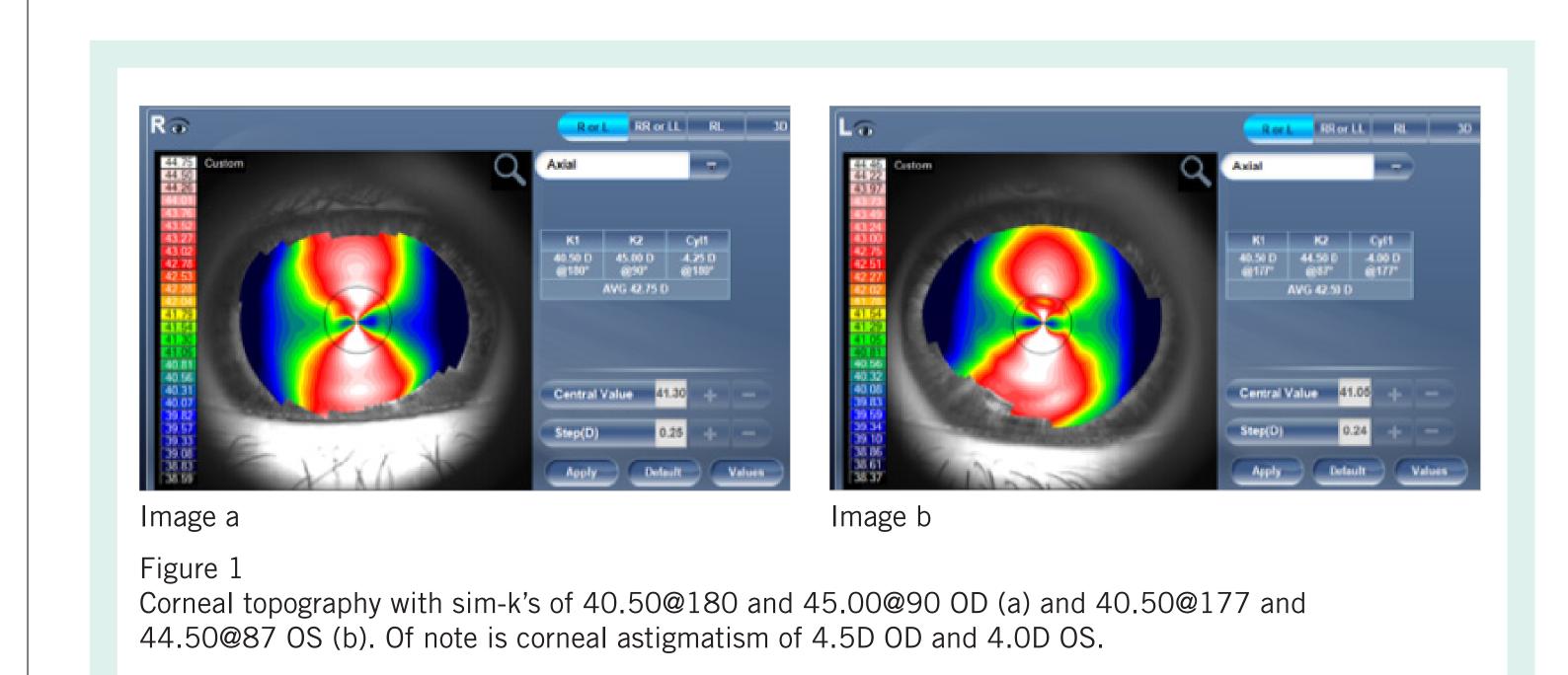
One of the newer scleral lens designs in the US is the SynergEyes VS (SynergEyes, Carlsbad, CA). The SynergEyes VS design allows the evaluator to change the alignment of the haptic to the sclera in two separate meridians. Optical coherence tomography (OCT) can be used to observe the alignment of the haptic in four quadrants, allowing the fitter to manipulate the haptic to fit irregular sclerae.

Aligning the haptic to the irregular scleral shape prevents complications like the above.

Case Description:

A 36 year old white female laboratory technician with a history of Sjogren's syndrome, diagnosed 10 years ago, and systemic lupus erythematosus, diagnosed 4 years ago was sent by her ophthalmologist for scleral lens evaluation. Her chief complaint was severe dry eye OU. She had a history of soft contact lens wear and all four punctae were occluded with silicone punctal plugs.

Entering spectacle-corrected visual acuity was 20/70⁻² OD, 20/100 OS. Spectacle refraction was -6.25-5.25x005 OD, -6.50-5.25x175 OS with no improvement in visual acuity. Of note was the significant refractive astigmatism.



Lens Fitting:

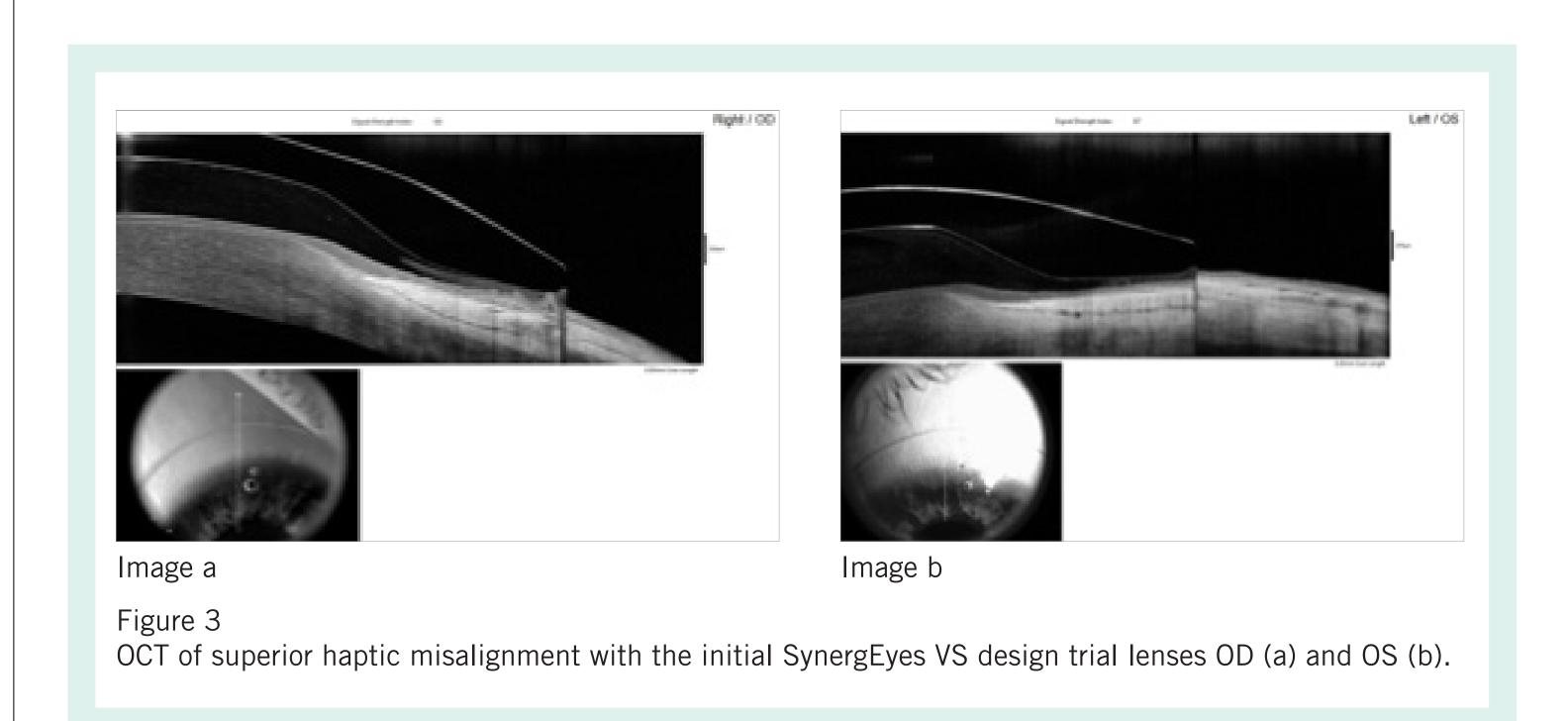
Two alternate design lenses with toric peripheral curves were trialed first. In each of the designs, the haptic was misaligned, vaulting from the scleral surface both superiorly and inferiorly in both eyes.



The patient was refit into the SynergEyes VS (SynergEyes, Carlsbad, CA) scleral lens design. The VS design allows the evaluator to change the alignment of the haptic to the sclera in two separate meridians by varying the angle of the landing zone.

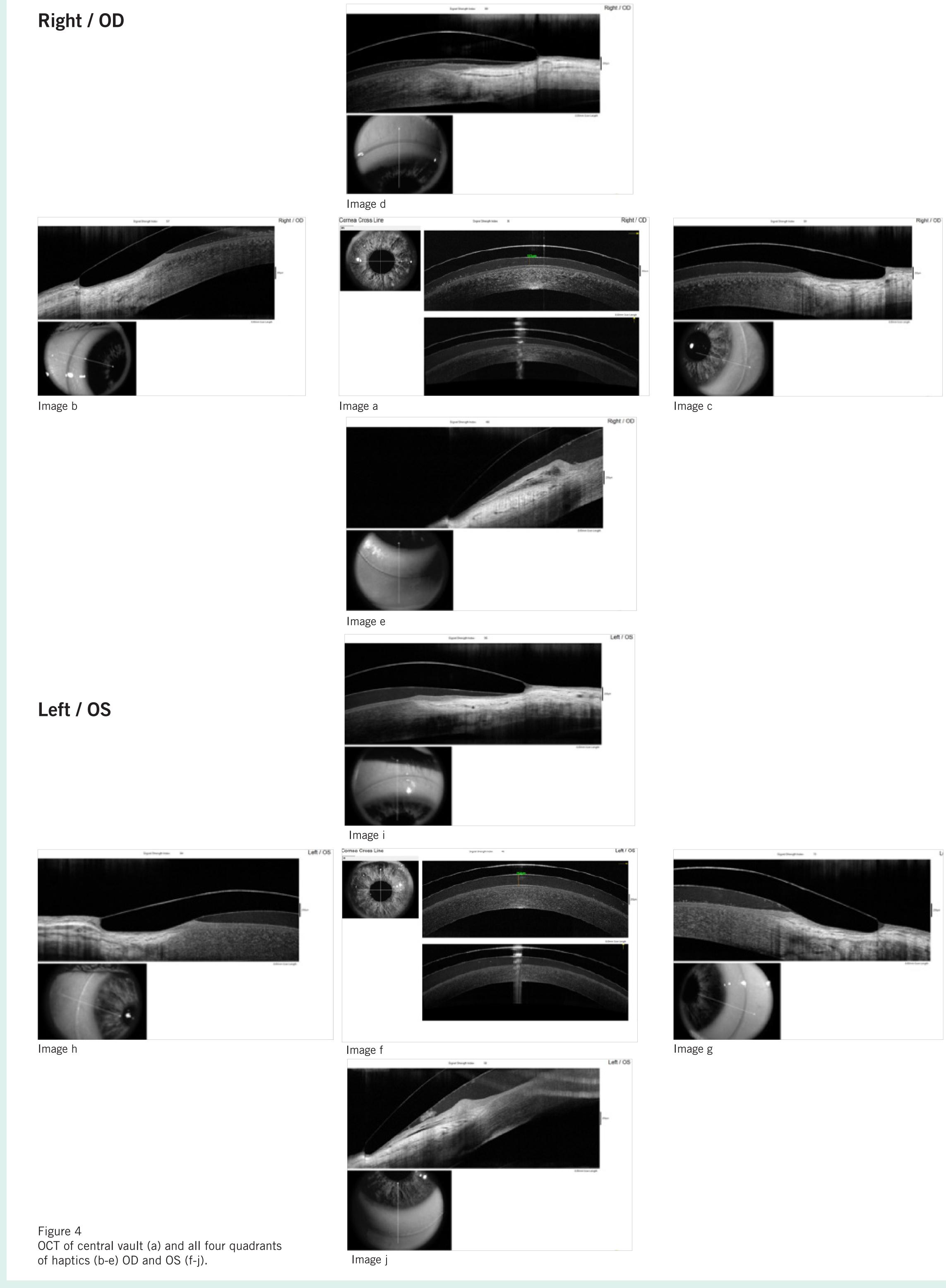
Trial lenses with standard haptics were initially inserted:

OD VS 3400/pl/8.4/16.0/36-42 OS VS 3600/pl/8.4/16.0/36-42



Predictably, the superior and inferior haptics were vaulted from the scleral surface. Lenses with severe haptic toricity were ultimately ordered: VS 3100/8.40/-7.00/16.0/36-50 OD

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After two weeks of wearing these lenses, visual acuity was 20/25 OD, 20/20 OS. The patient was able to wear the lenses for 8 hours with good comfort. There was mild debris formation in the post-lens tear reservoir. The patient was instructed to remove the lenses once during the day.

Conclusions:

Although the gold standard in fitting sclerals is haptic alignment, sometimes this is not possible due to highly irregular sclerae. In this case, there was a large amount of with-the-rule corneal cylinder that translated to a high degree of scleral toricity. Denaeyer, et al, showed that most sclerae are not spherical and, in fact, most have irregular high or low points.² Perfect alignment of the haptic in all meridians is seldom possible without a custom-molded design.

However, the goal of fitting is to minimize rocking of the lens due to haptic misalignment. In this case, we demonstrate an unorthodox method of preventing rocking of the lens by taking advantage of the unique capabilities of the VS lens design. The superior and inferior haptics were designed to fit with extreme "toe down" geometry, equalizing the force against the sclera. If a lens does not rock on the eye, there is minimization of debris formation in the post-lens tear reservoir. As this case took place in Nashville, the country music capital of the US, there was no room for rock and roll.

Sonsino J, Reinoso G, Teller R. Proposed Method to Eliminate Debris in the Scleral Post Lens Tear Reservoir: Case Report. Poster at the GSLS, 2018.
 Denaeyer G, Sanders D, van der Worp E, Jedlicka J, Michaud L, Morrison S. Qualitative Assessment of Scleral Shape Patterns Using a New Widefield Ocular Surface Elevation Topographer: the SSSG Study. JCLRS [Internet]. 16Nov.2017.