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Reduction of Residual Refractive Cylinder in Scleral Lenses With The Addition of Toric Haptics

By ANDREW J. BIONDO, OD, FSLS

Scleral lenses have solidified their place in the specialty contact lens practice by offering a significant number of advantages over other lens modalities. Their large diameter allows the scleral lens to be extremely comfortable, but may make the high- and hyper-Dk materials susceptible to flexure. This is especially true when utilizing a spherical haptic on a toric scleral surface. Toric landing curves can help a scleral lens to align properly, reducing flexure and the resulting improved vision, comfort and wearability.[1]

History

A 31-year-old female patient was referred for vision correction after penetrating keratoplasty in her left eye 12 months prior. Her history is positive for bilateral keratoconus and is currently corrected with spectacles but not happy with her vision as she is unable to drive at night and has difficulty focusing on the computer at work. She has failed GP lenses in the past because they were too uncomfortable and the vision was unstable. She was prescribed one drop daily of fluoromethalone 0.1% susp in her left eye. Her ocular and systemic history was otherwise unremarkable.

Examination:

- Entering vision (spectacles) was OD: 20/70, OS: 20/50.
- With MR OD: -1.00 -5.00 x 087 20/40 With MR OS: -2.25 -6.75 x 116, 20/40

Pertinent Ocular Health:

- OD: ectasia and mild thinning with 1+ striae
- OS: clear and compact full thickness corneal graft
- Scleral Trials: Atlantis Scleral in Optimum Infinite Blue (X-Cel Specialty Contacts)
- OD: Sag 5000 (+100) Diam: 15.5 Power: -4.25 DS std spherical limbal zone, standard spherical scleral zone 20/20, J1+, 300 micron clearance central
- OS: Sag 4800 (+100) Diam: 15.5 Power: -3.25 DS std spherical limbal zone, standard spherical scleral zone
- 20/20, J1+ 300 micron clearance central
- OU: 20/15, J1+

Follow Up

The patient returned with excellent all-day comfort but had variable vision and glare as the day progressed alleviated by squinting. Acuity was 20/20- OD and 20/25 OS with J1+ OU at near. Examination of the lenses revealed impingement along one oblique axis and slight edge lift along the perpendicular meridian in both eyes. Over-refraction showed 1.25D of astigmatism in both eyes that corresponded to the over-K values, indicating flexure. Slit lamp exam also revealed 1+ fogging of the tear reservoir.

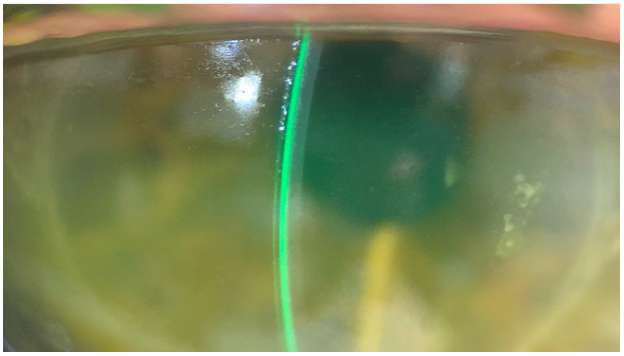


IMAGE COURTESY OF DR. ANDREW J. BIONDO

FIGURE 1. On eye view of the scleral lens.

The lenses were reordered with the same parameters but toricity was added to the haptics. To alleviate the asymmetric landing and reduce the flexure, 150 microns of toricity was added to the edge (3flat/3steep).

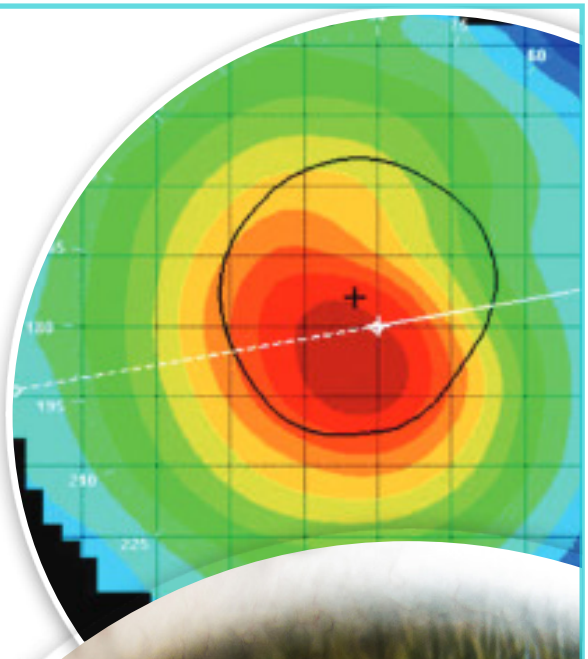
At her second follow-up the patient again reported superb all-day comfort with much better and much more consistent vision at all distances. The haptic was evenly aligned in each quadrant and her vision returned to 20/20 in both eyes and 20/15 binocularly. Over-refraction and over-keratometry showed 0.25D of astigmatism OU. Clinically, no debris was visualized in the tear reservoir.

Summary

This case displayed many of the advantages of a toric landing zone. The patient showed a common pattern of flexure that increases throughout the day as the scleral lens bends around the toricity of the scleral surface. This can degrade comfort and induce astigmatism, reducing the quality of vision by increasing glare and blur. Toric landing zones allow the haptic to conform more appropriately to the curvature of the sclera. This can lead to improved vision, comfort and wear time. ■

Andrew J. Biondo, OD, FSLS, practices at Kirkwood Eye Associates in Missouri. He is also an adjunct clinical professor for the University of Missouri St. Louis College of Optometry. Dr. Biondi has received travel fees and lecture honoraria from X-Cel Specialty Contacts.

Irregular Cornea



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