Background

Open globe injuries make up about 10% of all ocular injuries and more commonly occur in males than females.\(^1,4,6\) Following repair a corneal scar will result and will induce some amount of irregular astigmatism. Luckily there are many choices in contact lens designs when trying to correct a patient’s irregular astigmatism including: scleral lenses, corneal gas permeable lenses, hybrid lenses and even soft toric lenses.

Case Description

A 52 year old white female was referred to the clinic for a contact lens fitting for irregular astigmatism following an injury to her right eye (fell onto a glass bottle) that resulted in a full thickness corneal laceration with iris prolapse requiring an open globe repair in June 2015.

The repair had induced a large amount of irregular astigmatism and anisometropia. The patient complained of blurred vision since having the repair with minimal improvement in visual acuity with her current spectacles. She wanted to proceed with a contact lens fitting for her right eye. She was also interested in pursuing either a soft or corneal gas permeable lens fitting in her left eye after finalizing the scleral lens fit in her right eye.

Visual Acuity with Spectacles:
OD: 20/100 ph 20/60
OS: 20/20

Wearing Rx:
OD: +0.25 -2.50 x 177 (Balance)
OS: ±0.25 -2.50 x 173

Subjective Refraction:
OD: +0.25 -8.00 x 100 20/60
OS: -0.25 -1.50 x 180 20/20

Simulated Keratometry:
OD: 40.95 / 43.31 @ 88
OS: 40.95 / 43.31 @ 88

HVID:
OD: 12.1 mm
OS: 12.6 mm

Slit Lamp Examination:
OD: Full thickness horizontal corneal scar from 10:00 to 3:00 through the visual axis and an iris tear at 3:00.

Contact Lens Fitting

Initial diagnostic scleral lens:
Zenlens Oblate 17.0 Dia / 4800 Sag / 9.70 BC / -2.00 / Std APS / Boston XO

The lens diameter was decreased from 17.0 mm to 16.0 mm to improve lens centration

This lens was well centered

Central vault was 450 microns (right after lens application)

Adequate limbal clearance

No compression, impingement or edge lift 360 degrees

Over-refraction +7.00 sph 20/25/1-2

Second diagnostic scleral lens:
Zenlens Oblate 16.0 Dia / 4400 Sag / 9.50 BC / -2.00 / Std APS / Boston XO

The lens diameter was decreased from 16.0 mm to 15.0 mm to improve lens centration

This lens was well centered

Central vault was 400 microns (right after lens application)

Adequate limbal clearance

No compression, impingement or edge lift 360 degrees

Over-refraction +6.00 sph 20/25/1-2

Initial lens order:
Zenlens Oblate 16.0 Dia / 4400 Sag / 9.50 BC / +4.50 / Std APS / Boston XO

At first dispense:
VA with lens 20/25
Over-refraction +0.50 20/20
Patient extremely happy with vision and comfort
See Figures 3 & 4

Discussion

• Open globe injuries that penetrate the cornea will result in corneal scarring. The scarring will induce a variable amount of irregular corneal astigmatism.\(^1,2\)

• The irregular astigmatism prevents spectacles or traditional soft contact lenses from significantly improving visual acuity.\(^1,2\)

• Traditionally, corneal RGP contact lenses are used to significantly improve visual acuity by neutralizing the irregular astigmatism with the tear layer that is created between the lens and the cornea.\(^1,3,7\)

• However, when there are large differences in corneal elevation, it can make the fitting process with a corneal RGP challenging.\(^1,2\)

• These large differences in elevation can cause an RGP to move excessively and deteriorate which leads to poor patient comfort and unstable vision.\(^1\)

Scleral lenses provide good stability, good patient comfort and good vision.\(^7\)

Conclusions

Although multiple options are available when choosing a contact lens to correct for irregular astigmatism, a scleral lens is a great choice providing the patient with good vision and comfort.

References