Case Report:

Double Trouble with a scleral lens fit

Reinier Stortelder

Reinier Stortelder is an optometrist with a degree from the University of Applied Sciences Utrecht in the Netherlands. He has more than 10 years of experience fitting contact lenses with a focus on scleral lenses, orthokeratology and soft specialty lenses in private practice. He also gained experience in corneal and refractive surgery with his focus on the preoperative imaging devices.
Reinier has lectured internationally on specialty contact lenses. Currently he is employed by Eaglet Eye in the Netherlands and has his main focus on research in ocular shape and its implications for fitting all types of contact lenses. He is both working closely with practitioners and with lens manufacturers in the pursuit of optimal lens solutions for healthy and more challenging eyes.

Introduction

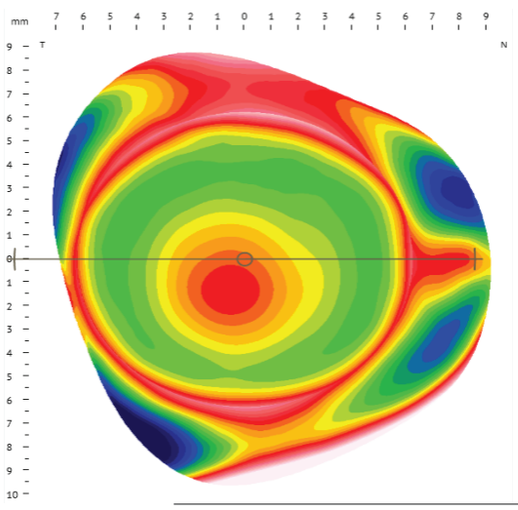
Scleral lenses are large diameter gas permeable lenses that by definition vault over the entire cornea and rest on the sclera / conjunctiva. Fitting sclerals requires considerable skills and experience.
The fitting process of scleral lenses can be broken up into three elements:

1. Vaulting the central cornea
2. Clearing the limbus
3. Aligning the sclera

Steps 1 and 2 are fairly straightforward in most cases, but aligning the landing zone of the scleral lens to the sclera absorbs the most time. Optimal alignment is essential to achieving comfort for the lens wearer. There is also a need to create the right amount of sealing, avoiding excessive tear exchange that can lead to debris buildup while also avoiding excessive compression / blanching.

Toric Landing Zone

Recent advances in measuring the ocular profile have shown that even for smaller diameter scleral lenses, the majority of cases require a toric posterior landing zone. Corneo-scleral topography can identify toric scleral surfaces and it can also quantify the amount of asymmetry allowing the practitioner to make an informed decision on the toric scleral lens.



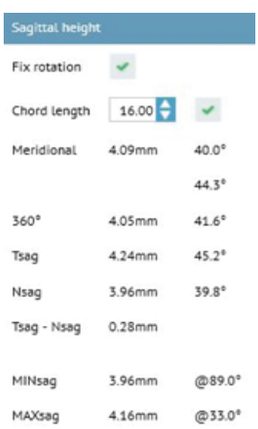


Figure 1 (left) and Figure 2 (right)

Figure 1 shows an elevation map of the cornea and sclera. The cornea shows a symmetric shape, indicating low toricity. However, on the scleral surface, there is an elevated vertical meridian, indicating a significant against-the-rule toricity.

In Figure 2, the difference between MAXsag and MINsag of 200 microns specifies the amount of scleral toricity in height. Fitting software allows the selection of the correct scleral lens with a toric back surface landing zone.

Second Obstacle

For the scleral fit on this eye, there is a second complicating factor in the form of a pinguecula. Pingueculae are benign growths on the conjunctiva. They can cause the scleral lens to shift or impinge on the location of the pinguecula. The best solution can be a micro-vault with a customized edge vault. To incorporate this edge vault, the exact measured location, diameter and height are needed.

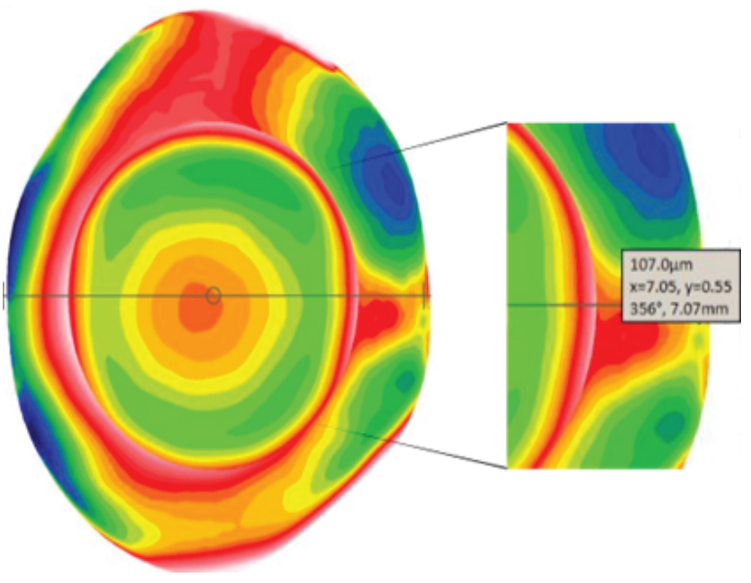


Figure 3

This particular pinguecula (Figure 3) is 107 microns at its central, highest point and is located 7.07mm from the apex at 356°. The diameter of the pinguecula is 1.4mm. Fitting software can communicate the measured values to the lens manufacturer.

Conclusion

Combined solution

Combining these two surface features of scleral toricity and a pinguecula in a scleral lens design can be a real challenge when they cannot be measured. Corneo-scleral topography can quantify surface asymmetries and potentially save chair time when fitting a scleral lens.