

Background

Fitting scleral lenses on post graft patients is a tricky thing and often a smaller gas permeable lens (GP) is preferred to avoid oxygen issues. But obviously, a scleral lens has many things to offer to these eyes which cannot be achieved with GPs. Better vision, better comfort and better protection of the epithelium. Designing channels in the haptics of the scleral lens increase tear exchange and oxygen delivery and minimizes lens suction.

Case description

A 66 years old male presented with a history of diabetes and post-graft for 20 years. Currently wearing scleral lenses with a lot of discomfort wearing times and a visual acuity (VA) of 20/30. Lens wear has been discontinued for 72 hours to take a scleral profilometry image (Eaglet Eye ESP). After 72 hours no scleral imprint was observed anymore.

Conclusions

The possibility to create two horizontal channels in the haptic of the lens creates a unique possibility to create a scleral lens for post-graft patients without the compromising factors from the past. Utilizing profilometry made the fitting process precise. A second lens was only required to lower the lens SAG as much as possible. Combining a small tear layer with channels in the haptic could be a successful treatment for post-graft patients.

1. Profilometry

With this case Scleral Profilometry is utilized to design scleral lenses with an 18.5mm diameter. This specific lens design can only be designed using Profilometry. Profilometry revealed a steep and highly irregular scleral shape.

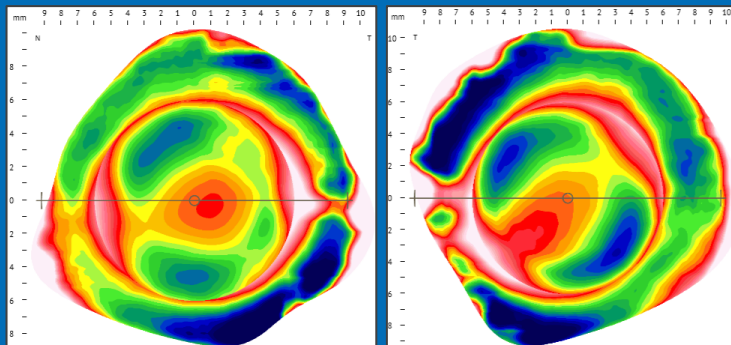


Image 1: Eye Surface Profiler (ESP) Bi-sphere elevation maps, OD and OS.

2. ImageGuided (IG) BostonSight SCLERAL^{IG}

Based on the ESP (Eye Surface Profiler) data a BostonSight SCLERAL^{IG} was ordered with a customized haptic in four quadrants and two SmartChannels™ at the horizontal meridian. The first lens was adjusted to lower the SAG as much as acceptable to maximize oxygen transmission. The final lens gave a VA of 20/25+ and longer wearing times. The final lens has an apical clearance of 150 microns. The condition of the eye improved significantly showing less redness and less stromal thickening.

Lens	
Supplier	BostonSight
Type	SCLERAL ^{IG} (R-5e1 or L-5e1)
Diameter	18,5
SAG	-100
BC	7.9
Haptic 1	↑ 90° +250
Haptic 2	→ 0° +450
Haptic 3	↓ 270° +100
Haptic 4	← 180° +0

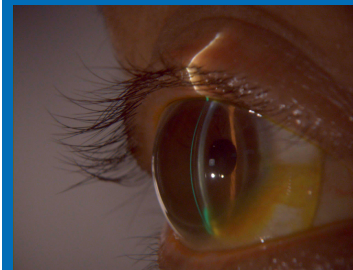


Image 3: Final fitted BostonSight SCLERAL^{IG}. The fluorescein shows the tear entrance through the SmartChannel™.

Image 2: Lens prediction parameters from the First Lens Fit algorithms of the ESP.

3. BostonSight SCLERAL SmartChannel™

SmartChannels are used over decades in the PROSE devices and now are also available for the BostonSight SCLERAL^{IG} lens design. Typically, a SmartChannel is used to get over an obstacle like a pinguecula. In this case it is used to increase tear exchange as well as reducing suction.

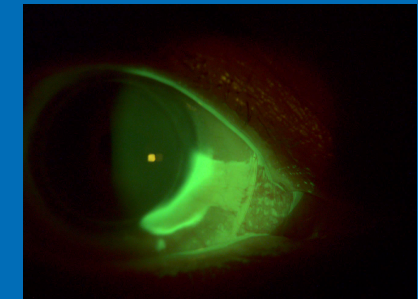


Image 4: The fluorescein shows the tear entrance through the SmartChannel.

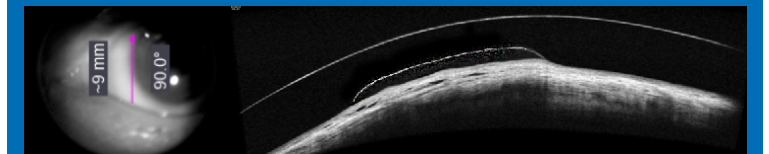


Image 5: Artificially enhanced OCT image showing the SmartChannel.