

Ascend to New Heights

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Background

Penetrating keratoplasty in patients with keratoconus may provide good long-term visual rehabilitation. There is a relatively low rate of graft failure in this cohort of patients. Graft rejection has been reported to be 5.8–41% with most rejections occurring in the first 2 years. [1-5]. Irregular and high astigmatism may be common after penetrating keratoplasty and contact lens options are needed to provide optimal visual rehabilitation. In cases of graft protrusion with irregular astigmatism, visual rehabilitation options are limited.

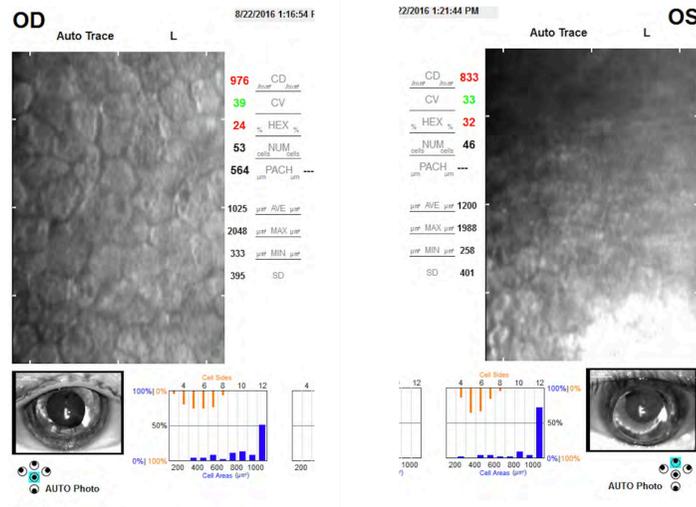


Figure 1. Specular microscopy.

Case Description

A 60-year-old Caucasian male was referred for a scleral lens fitting. Ocular history was significant for two corneal transplants for the right eye and one corneal transplant for the left eye in the 1970s for keratoconus. The left eye experienced episodes of recurrent graft rejection with hydrops present inferotemporally outside of the graft. Corneal edema was resolved at the time of examination. Medical was negative. Ocular history was significant for glaucoma. No systemic medications were taken. Pred acetate 1% daily OS and Timolol qhs OU were used. Of interest, his father had a history of keratoconus and wore scleral lenses in the 1950s. The patient presented wearing a corneal gas permeable contact lens in the right eye. Adequate vision was reported with this lens, however the lens constantly fell off of the eye. Scleral lenses were previously tried, however an adequate fit could not be obtained due to central touch.

Entering vision was 20/20-2 OD (with a corneal gas permeable contact lens) and CF at 3' OS (without correction). Corneal topography of both eyes demonstrated high irregular astigmatism, left eye much greater than the right eye. Intraocular pressure by icare tonometry was 13mmHg OD and 12mmHg OU. Endothelial cell count average cell density was OD 1205 µm, OS 1200 µm. Horizontal visible iris diameter was 12.0mm OU. Slit lamp examination revealed Meibomian gland dysfunction and telangiectasia, left eye greater than right eye with significant inspissated glands left eye. Significant protruding grafts were present OU. Nuclear sclerosis (2+) and Cortical sclerosis (1+) were present OU. The dilated examination was unremarkable. Management options included Ocusoft eyelid cleaner and warm compresses daily OU using a commercial warm compress. Current topical medications were continued. Non-preserved artificial tears were advised to use as needed. The patient was reassured that the subconjunctival hemorrhages will resolve over time and to report any recurrence.

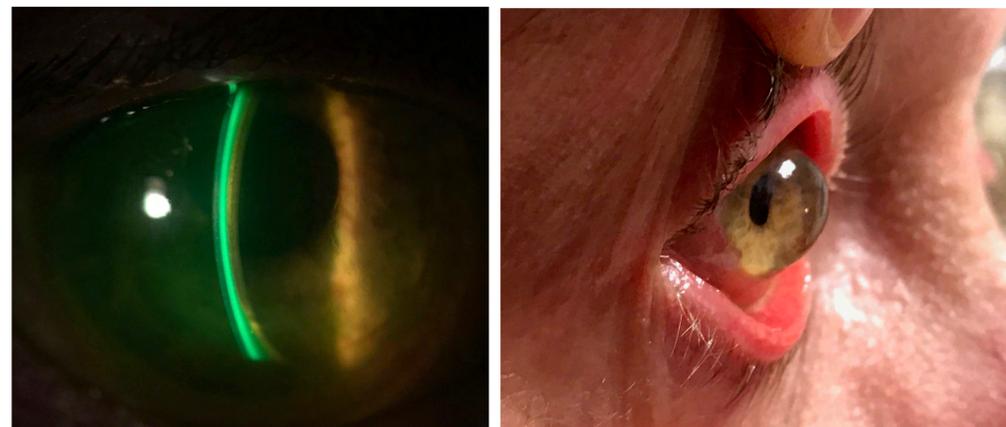


Figure 2a (left). Slit lamp view of scleral lens on eye with sodium fluorescein. Figure 2b (right). Image of protruding graft.

Scleral Lens Fitting

A BostonSight scleral lens fitting was commenced. All lenses exhibited corneal touch. New diagnostic lenses with 400 µm increased clearance for each eye were ordered and both lenses demonstrated central touch. Subsequently, another set of new lenses was ordered with 800 µm increased central clearance for each lens.

Both lenses completely cleared the cornea and limbus without blanching. The patient reported excellent comfort and vision with 20/20 in the right eye and 20/30 in the left eye. Subsequent cataract surgery was performed in the left eye and a new lens was ordered with a +8.25D power change, resulting in 20/20 vision in the left eye. This scleral lens design has been worn successfully in both eyes for over one and a half years, without any episodes of graft rejection in either eye.

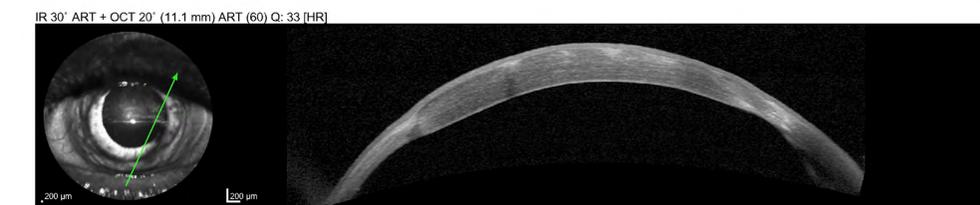


Figure 3. SPECTRALIS® OCT image of protruding graft.

Conclusions

BostonSight SCLERAL is the first scleral lens fitting system based on scleral anatomy and clinical data of approximately 7,000 eyes. This evidence-based design driven by clinical data has both right and left eye anatomical designs. These lenses are customized with central and haptic modification. Additionally, lenses have front surface eccentricity options. This case highlights a novel commercial scleral lens design to provide favorable results.

References:

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2. Fukuoka S, Honda N, Ono K, Mimura T, Usui T, Amano S. Extended long-term results of penetrating keratoplasty for keratoconus. *Cornea.* 2010;29(5):528–30.
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