

CASE STUDY

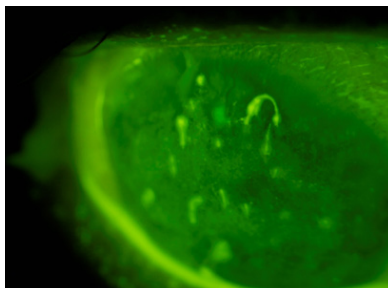
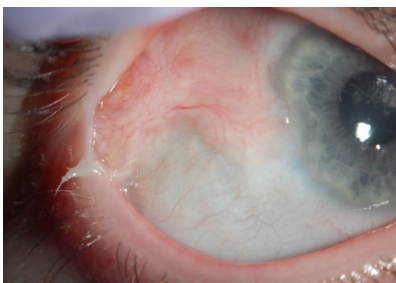
FITTING A HIGHLY TORIC AND ASYMMETRIC OCULAR SURFACE USING CURRENT LATHE TECHNOLOGY

BACKGROUND

A 25-year-old female with history of severe aqueous deficiency dry eye and filamentary keratitis following numerous ocular reconstruction surgeries since infancy for excision of benign neoplasm of lacrimal gland and coloboma of lid repair presented for a scleral lens consultation. The patient complained of ocular discomfort and poor vision, recalcitrant to all prior therapies including periodic amniotic membranes.

ODsc: 20/150 (PH 20/60)

OSsc: 20/30-2 (PH 20/25+2)



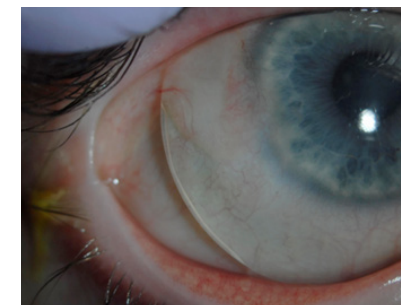
PLAN

Improve vision, comfort, and support the ocular surface with a scleral lens. To fit around the temporal conjunctival obstacle, the diameter of the lens must be either small enough to avoid the anatomical obstacle entirely (and likely necessitating a notch) or be large enough to cover the obstacle. A larger diameter design was pursued to fit over the anatomical obstacle and allow better coverage of the desiccated ocular surface.

TRIAL LENS SELECTION

- 18.5mm/2.88 sag/8.0 BC/+0.25 sph/0.35mm bitoric
- VA: 20/80+2
- Over-refraction: +3.00 sphere; 20/40-2

The initial trial lens was applied and demonstrated a poor fit. Necessary adjustments to obtain an optimal fit were implemented with utilization of thorough slit lamp evaluation and implementation of PROSE customizations.



DR. BITA ASGHARI
PROSE Provider

Dr. Bitra Asghari joined BostonSight in August 2017 and is a PROSE Provider and Associate Director of Clinical Education. She was nominated as a Top Doctor by the National Keratoconus Foundation (NKCF) in 2018 and was awarded Young OD of the Year by Women in Optometry's Theia Awards in 2021.

There was notable compression overlying the temporal elevated conjunctiva with associated inferior temporal edge lift. Mild edge lift was also noted nasally, inferiorly, and superiorly. The apical vault was also over 500 microns and demonstrated inferior decentration as evident by the inferior tear prism.

Two scleral lenses were designed. The highly irregular ocular surface and focal significant inferior temporal edge lift necessitated at least 1 mm of steepening. To achieve this in this oblique meridian, an 8-meridian toric design was pursued. Sagittal depth was reduced by 300 microns and additional haptic adjustments were made to address areas of edge lift.

LENS DESIGN #1

- 18.5mm/2.58 sag/ 8.0 BC/ +3.25 sph/ 8-meridian 1.12mm toric (steepest meridian at 7:30)
- VA: 20/40-2, without improvement with over-refraction

Residual compression over the temporal elevated conjunctiva was evident. Centration of the lens greatly improved. There was adequate and improved corneal clearance, with resolution of the inferior tear prism. Residual inferior temporal edge lift was noted.

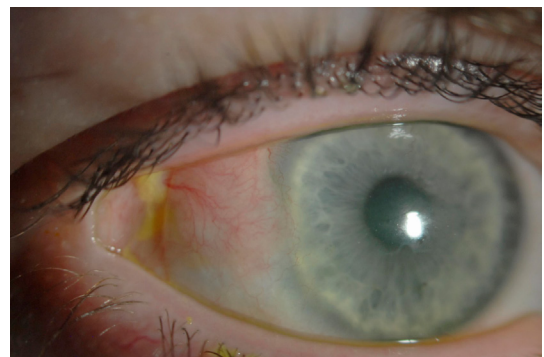
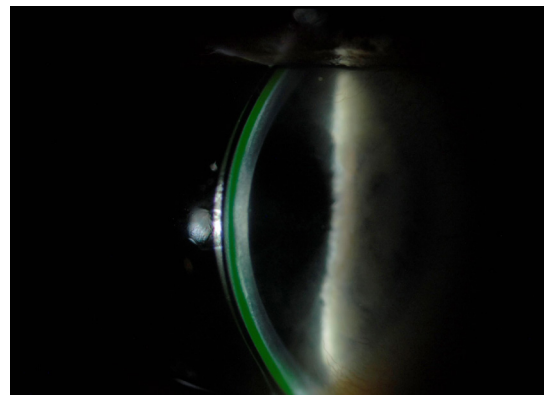
LENS DESIGN #2

- 18.5mm/2.88 sag/8.0 BC/+3.25 sph/ 8-meridian 1.32mm toric (steepest meridian at 7:30 (see diagram)/ custom temporal channel (135 - 190[^], 250 microns of depth)
- VA: 20/30-1, without improvement with over-refraction
- A channel was added to the temporal aspect and the inferior temporal edge was steepened.

RESULTS

The patient continued with daily scleral lens wear, with significant improvement in comfort and vision, with resolution of filamentary keratitis.

Given the highly toric and asymmetric nature of the ocular surface, necessary lens adjustments could only be achieved with access to lathe technology. With appropriate lathe technology, the range and customization of fitting is boundless.



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