# **Enhance Success with Scleral Toricity**

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Background: It has been established that scleral shape is not rotationally symmetric or spherical, but rather non-rotationally symmetrical exhibiting an irregular shape [1]. Although corneal and scleral toricity are not associated [2], the sclera, similar to the cornea, may have steep and flat meridians [3]. The flattest curvature is typically observed nasally and the steepest curvature temporally [1]. However, scleral shape varies from patient to patient, each quadrant within an individual eye and from right eye to left eye. Scleral asymmetry starts at the more symmetrical limbus and increases in asymmetry towards the extraocular muscles [4]. Researchers have indicated that measurements by OCT at a 15mm chord demonstrated low toricity [4]. In a different study, scleral toricity was 100 µm on average [5]. Based on this information, some practitioners advise that scleral lens diameters of 15.0mm or less can be rotationally symmetric, and scleral lens diameters greater than 15.0mm may benefit from back surface toricity or quadrant specific designs [4].

An optimal alignment in all meridians on the scleral is essential. Scleral lenses, especially larger diameter lenses, need to land in both principal meridians. Toric, or quadrant specific, landing zones can help to achieve ideal scleral alignment and have numerous advantages. Incorporating back surface toricity can help improve lens decentration, lens distortion [1], reduce excessive debris [1], reduce the formation of air bubbles, decrease conjunctival prolapse, improve localized conjunctival vessel blanching [6-7] and lens impingement [8-9]. In turn, patients will experience improved comfort, increased wearing time, overall satisfaction, better visual quality and enhanced optical correction [10-12], which all lead to long term successful scleral lens wear.

<u>Case Report:</u> A 39 year old Hispanic male was referred for a specialty contact lens fitting for the left eye.

Ocular history was significant for keratoconus in both eyes status post penetrating keratoplasty four times in the right eye.

The right eye then underwent Kpro implantation / glaucoma drainage device and a soft bandage contact lens was worn.

Keratoconus was present in the left eye status post Intacs with irregular astigmatism (Figure 1).

There was no evidence of blanching (Figure 2).

The left eye was intolerant to corneal gas permeable contact lenses, including 11.2 diameter lenses, due to lens dislodgement.

In the left eye, vision was 20/15-2 (Figure 3).

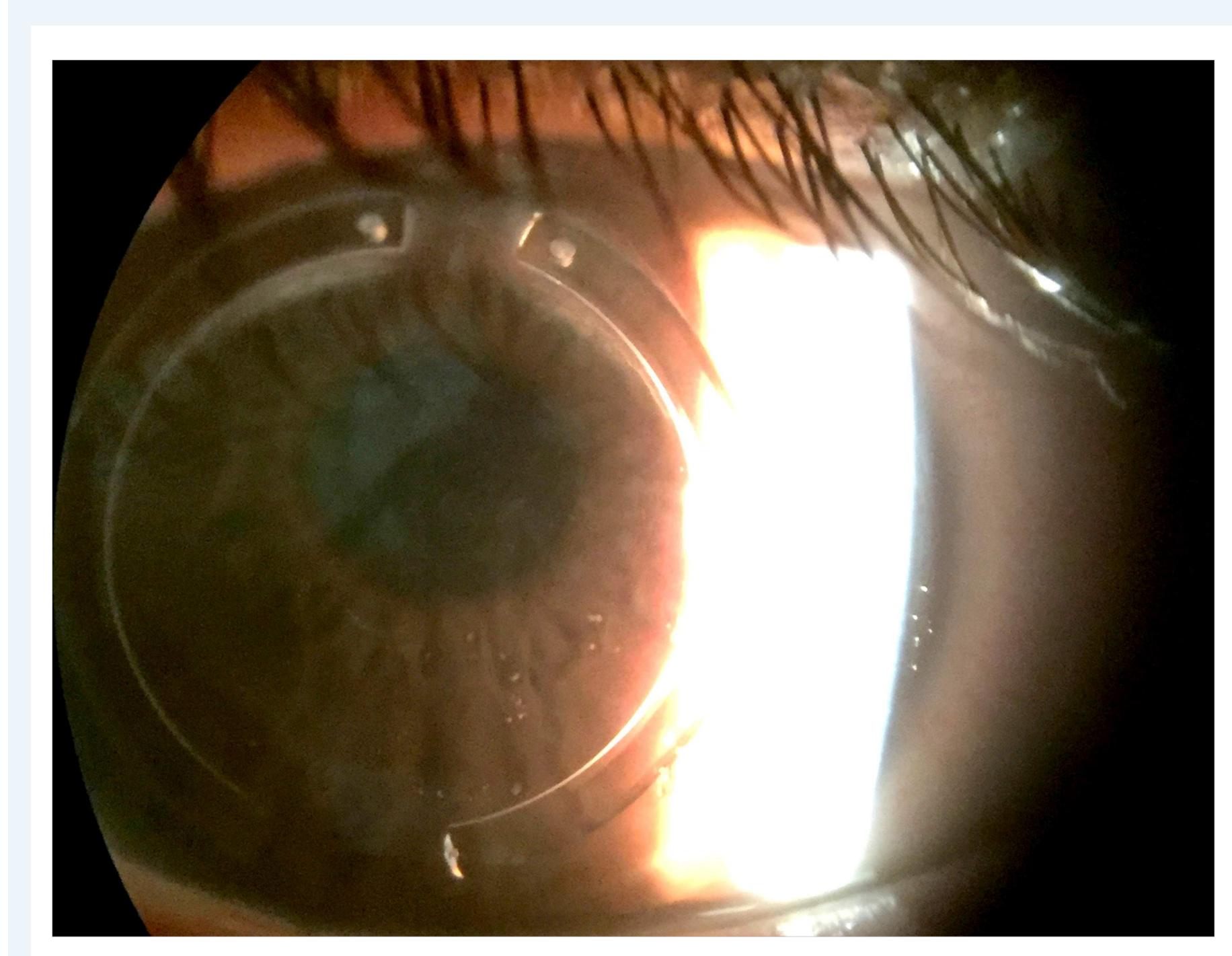


Figure 1
Keratoconus present in the left eye status post Intacs with irregular astigmatism

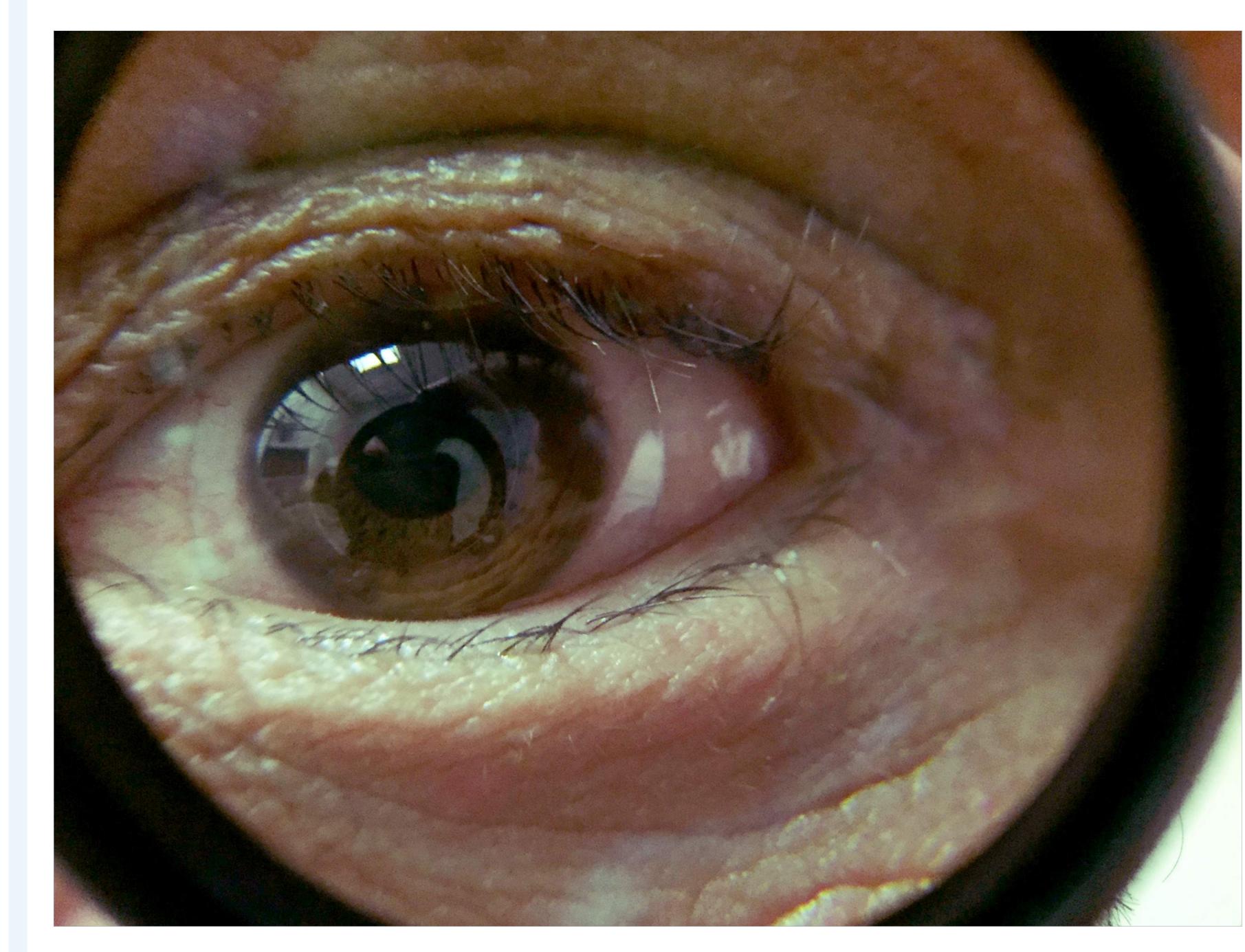


Figure 2
A well fit scleral lens

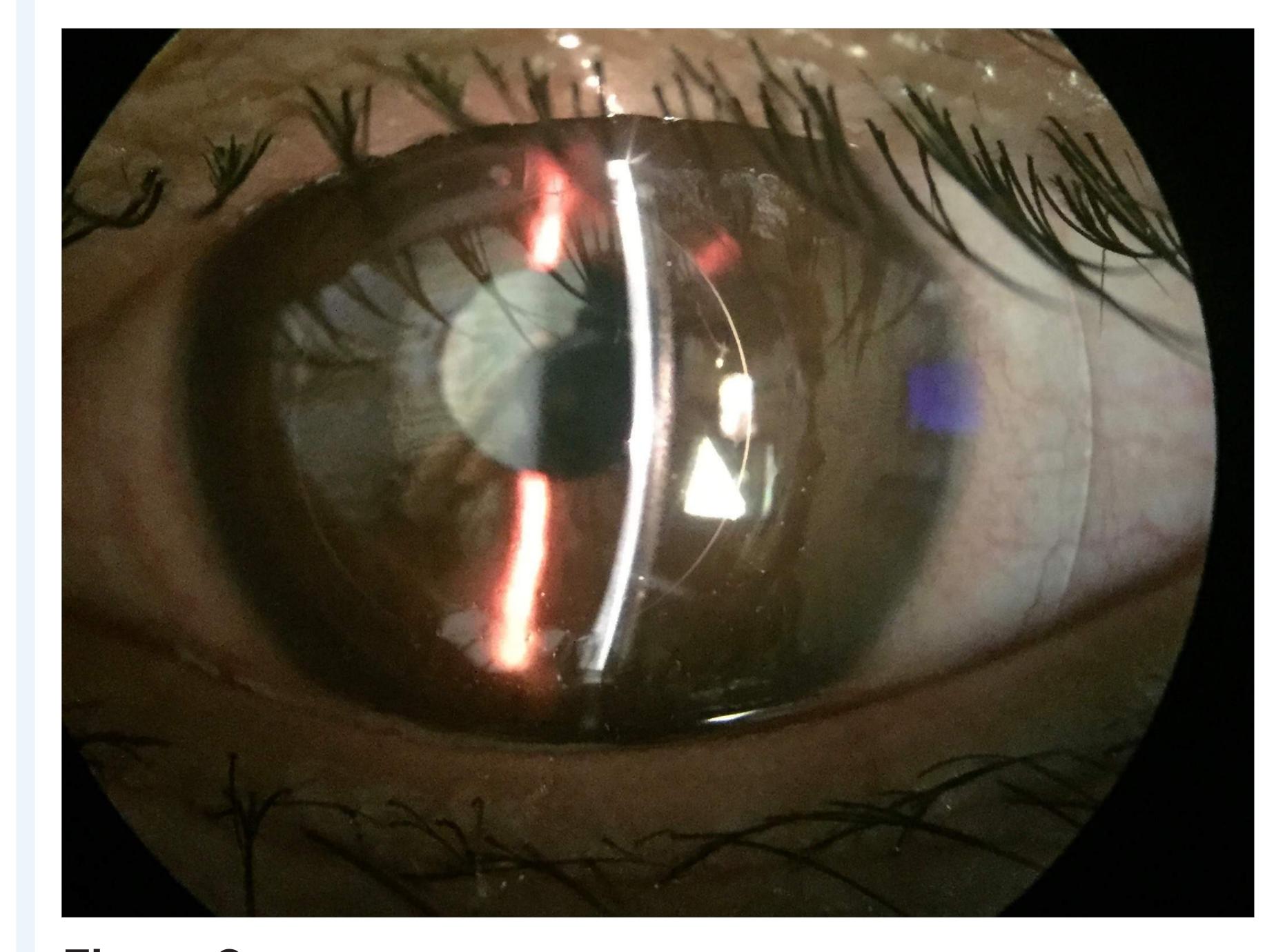


Figure 3
A cross-sectional view of the scleral lens over Intacs

A variety of contact lens options were discussed and the patient was fit with the SynergEyes VS scleral lens. Eyelid hygiene, warm compresses, daytime artificial tears and nighttime lubricant ointment were advised.

## **Lens Fitting:**

## Diagnostic Lens

OS SynergEyes VS / 3600 / 36-42 / 8.4 / pl / 16.0

The initial lens exhibited 225 microns central apical clearance with adequate limbal clearance. There was no evidence of blanching. With a spherical overrefraction of +1.50DS, 20/20-2 vision was obtained for the left eye.

### Ordered Lens:

OS SynergEyes VS / 3600 / 36-42 / 8.4 / +1.50 / 16.0

**Follow Up:** After two weeks, scleral lens application and removal training was performed and the lens was dispensed. When the patient returned two weeks later, average wearing time was 10 hours/day. There were no problems with application or removal of the lens. Hydrogen peroxide solution was used for nightly disinfection and preservative-free saline was used for lens application. Good vision and comfort were experienced. In the left eye, vision was 20/15-2 with no over-refraction.

The lens exhibited 250 microns central apical clearance with adequate limbal clearance. There was no evidence of blanching. After the lens was removed, 1+ meibomian gland dysfunction was present. There was no evidence of corneal staining nor microcystic edema. No conjunctival staining nor an impression ring was present.

#### **Conclusion:**

This case demonstrates the advantages of a lens with scleral toricity. A single scleral lens was fit in order to achieve success.

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