

Custom Soft Lenses for Pellucid Marginal Degeneration: A Case Report

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Introduction

Scleral lenses have gained popularity in the recent decade and have been proven to be a successful treatment option for corneal ectasia. While scleral lenses can provide ideal optics and comfort for some individuals, they can be uncomfortable for others even when an optimal fit is obtained. Custom soft contact lenses (SCL) should not be ruled out for correcting patients with corneal ectasia and can be a desirable lens option for some individuals.

Case Report

ML is a 53-year-old Caucasian female with pellucid marginal degeneration who has a history of discomfort with custom scleral lenses designed from profilometry. She was recently fit into a custom soft toric lens for her right eye and wears a scleral on her left eye.

ML presented to our clinic complaining of unstable vision out of her right eye through her custom SCL. She reported that if she used her finger to move the lens up, that her vision improved significantly. In her left eye, ML experienced lens discomfort and fogging of the post-lens tear reservoir with her scleral lens causing her to reapply the lens several times a day. Entering acuities were 20/30+1 and 20/20-1 for the right and left eyes, respectively.

Based on ML's complaints the right lens was re-ordered incorporating an over-refraction and a larger optic zone diameter (OZD) to account for the slight inferior position of the lens.

ML continued to experience discomfort and fogging of the post-lens tear reservoir for her left lens despite significant troubleshooting including switching to a higher viscous filling solution, lens design modifications, adding a Hydra-PEG lens coating, and the use of ocular antihistamines. Ultimately, ML asked if her left eye could also be fit into a SCL. A new larger diameter (17.0 mm) quarterly replacement custom soft scleral lens with fenestrations was diagnostically fitted for her left eye. ML reported good initial comfort and had a BCVA of 20/30 with over-refraction.

Pellucid Marginal Degeneration

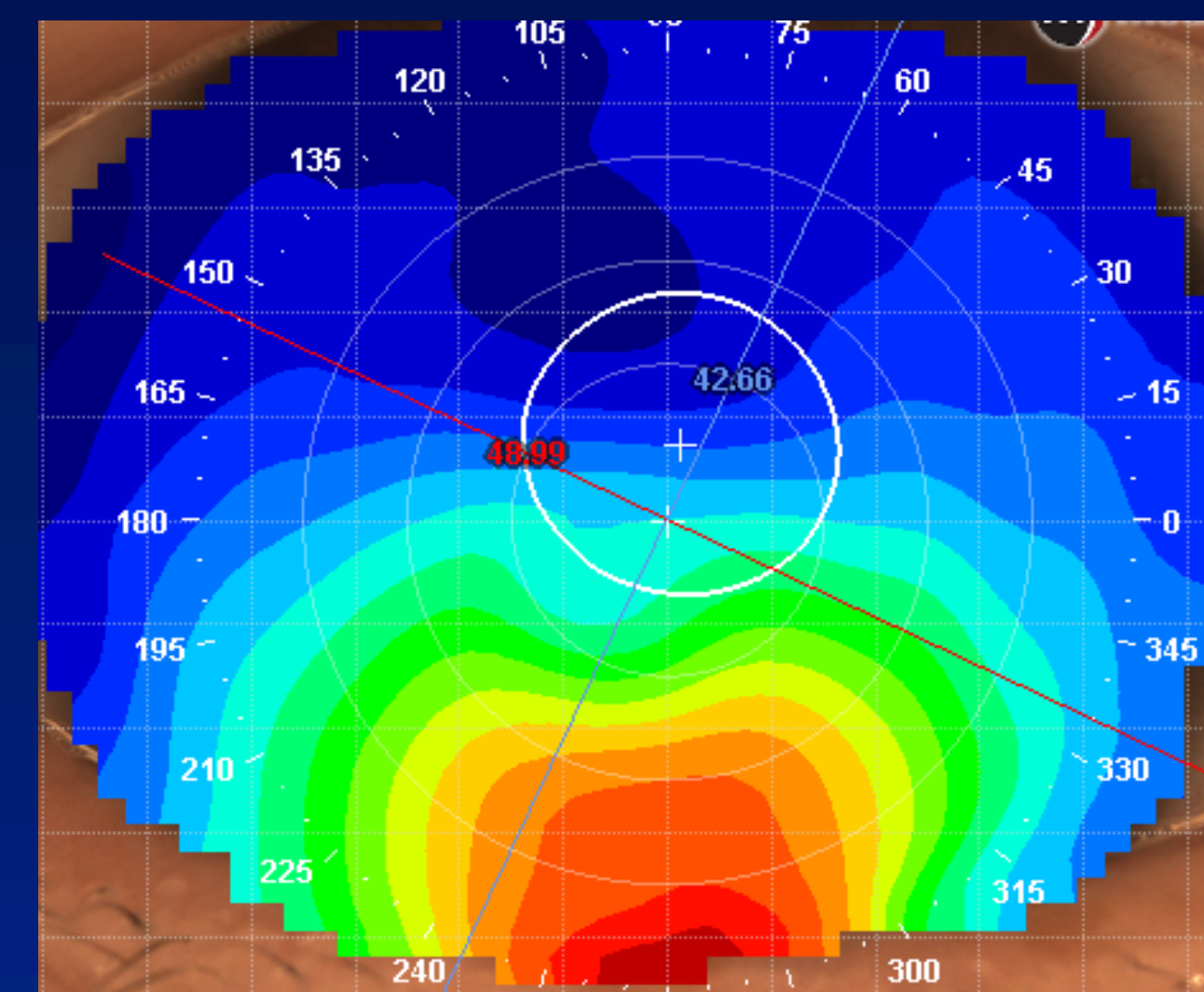


Figure 1. Axial Topography Display
Ks: 42.66@065/ 48.99@155
Corneal astigmatism: 6.33 D

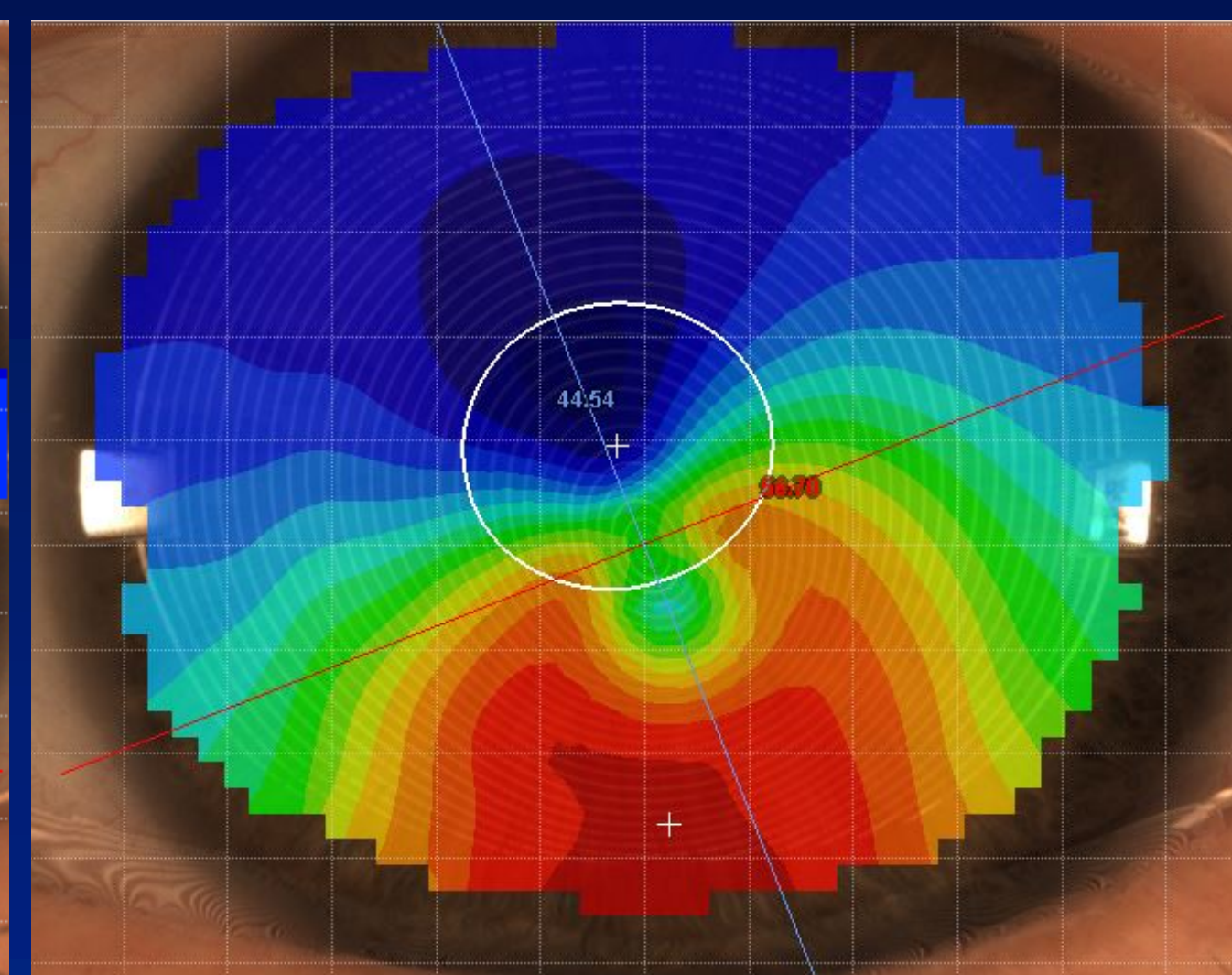


Figure 2. Axial Topography Display
Ks: 44.54@112/ 56.70@022
Corneal astigmatism: 12.16 D

Pellucid Marginal Degeneration (PMD) is a progressive corneal ectasia that classically presents in the 2nd to 3rd decade of life. The corneal topography findings commonly include a “crab claw” or “kissing doves” appearance on axial display maps.

ML's left eye shown in Figure 2 displays a more topographically advanced presentation of PMD than her right eye shown in Figure 1.

Custom Soft Contact Lenses

Custom SCL for irregular corneas are designed with a greater center thickness to help mask astigmatism. ML's left eye has greater than 12 diopters of irregular corneal astigmatism. This irregularity is depicted by the distortion of central corneal mires in Figure 3.

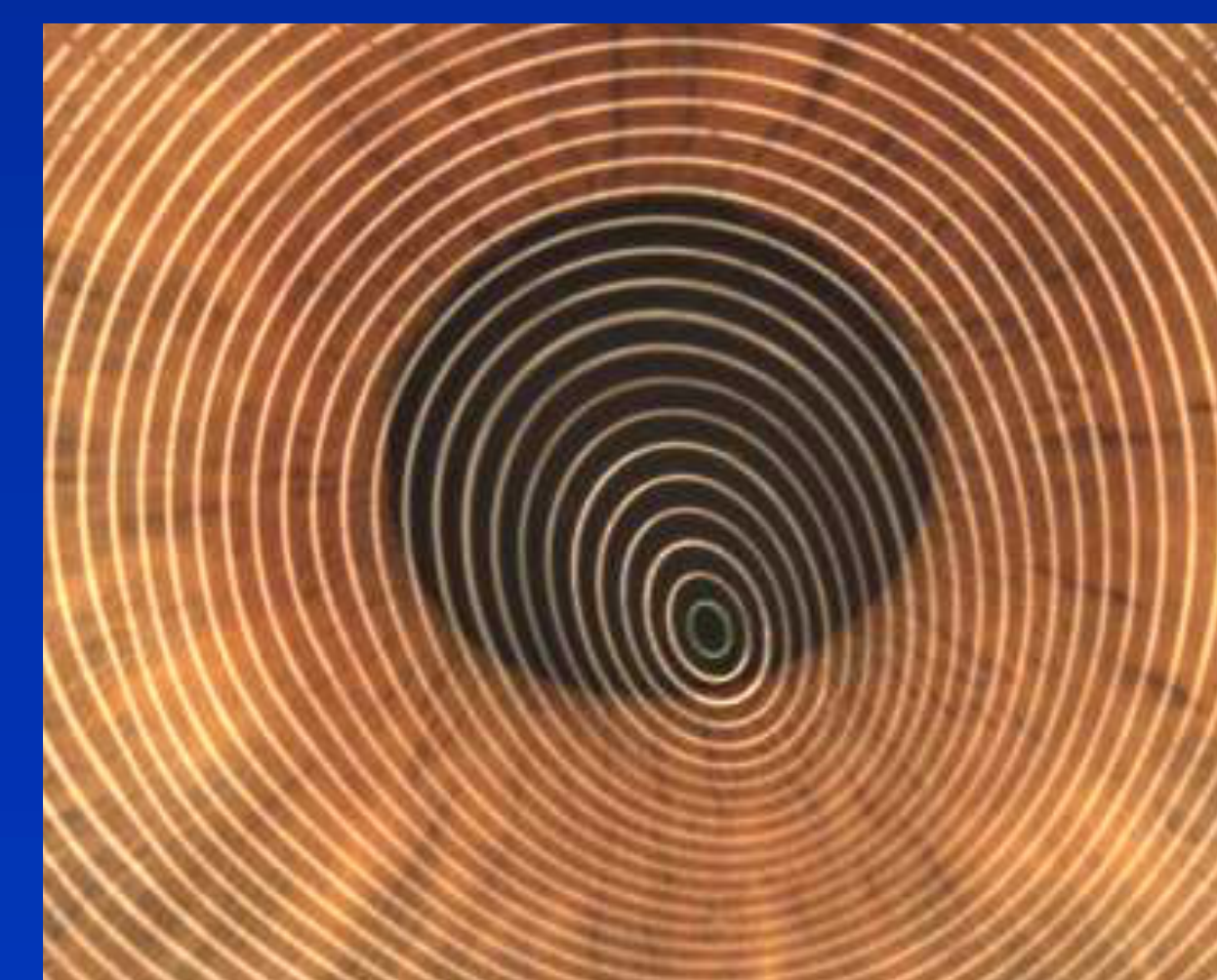


Figure 3. Topography imaging illustrating distorted corneal mires of ML's left eye.

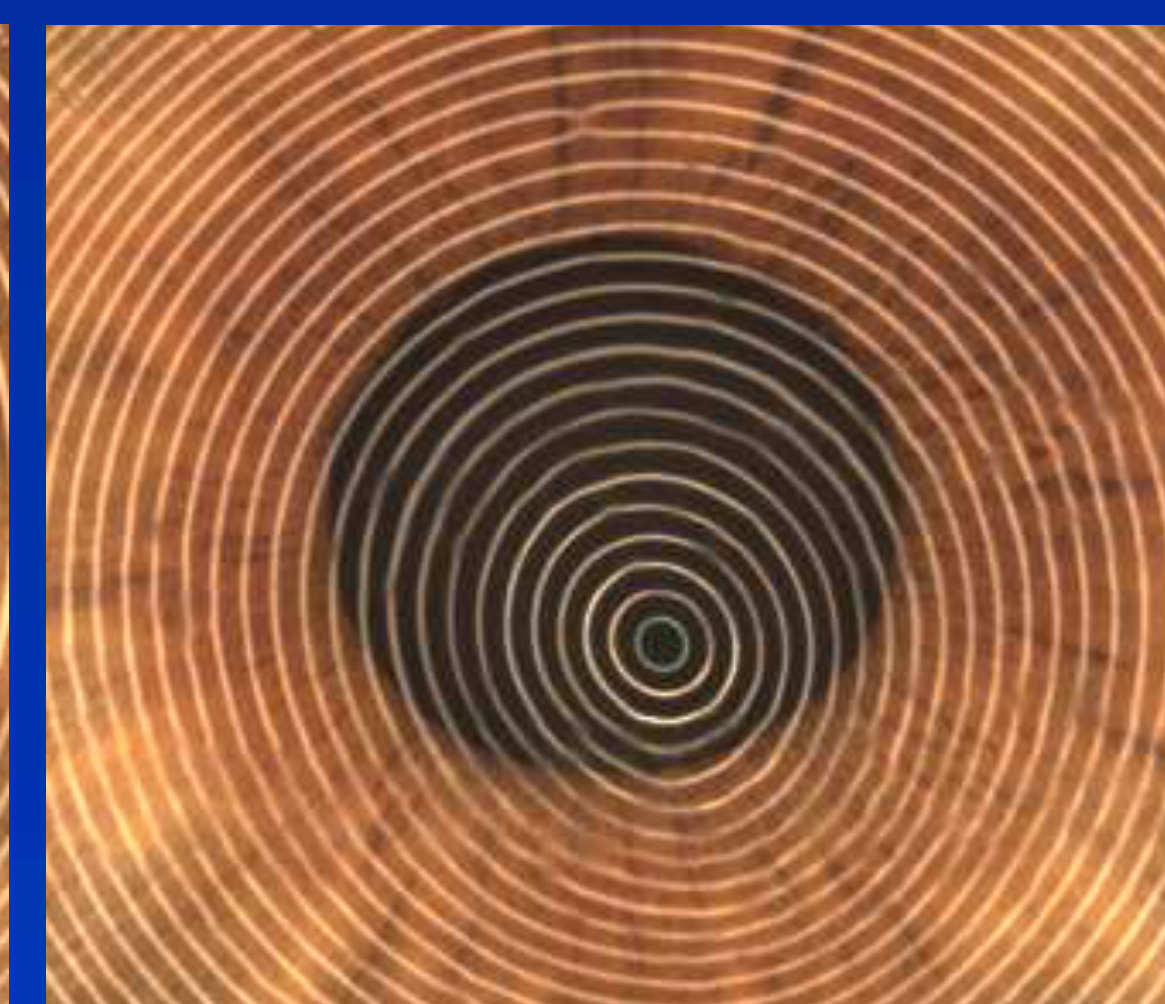


Figure 4. Topography performed over the custom soft lens illustrating less distorted mires of ML's left eye.

- The optic zone of the custom soft right lens is visible in Figure 5. The optic zone of this lens is large enough to adequately cover the visual axis.
- ML was very happy with the comfort and vision out of her left lens.

Right eye: SoFlex Eni-Eye Soft K/ Base Curve: 7.90 mm/ Lens Power: -0.75- 3.25x 119/ OZD: 10.0 mm/ Diameter: 14.8 mm/ Material: Contamac Definitive; **BCVA:** 20/20

Left eye: SoFlex Eni-Eye Soft K Semi-Scleral/ Base Curve: 8.00 mm/ Lens Power: -8.00 -1.25 x115/ Diameter: 17.0 mm/ Center Thickness: 0.50 mm/ Material: Contamac Definitive; **BCVA:** 20/20



Figure 5. ML's right eye is pictured here wearing her final custom soft lens.

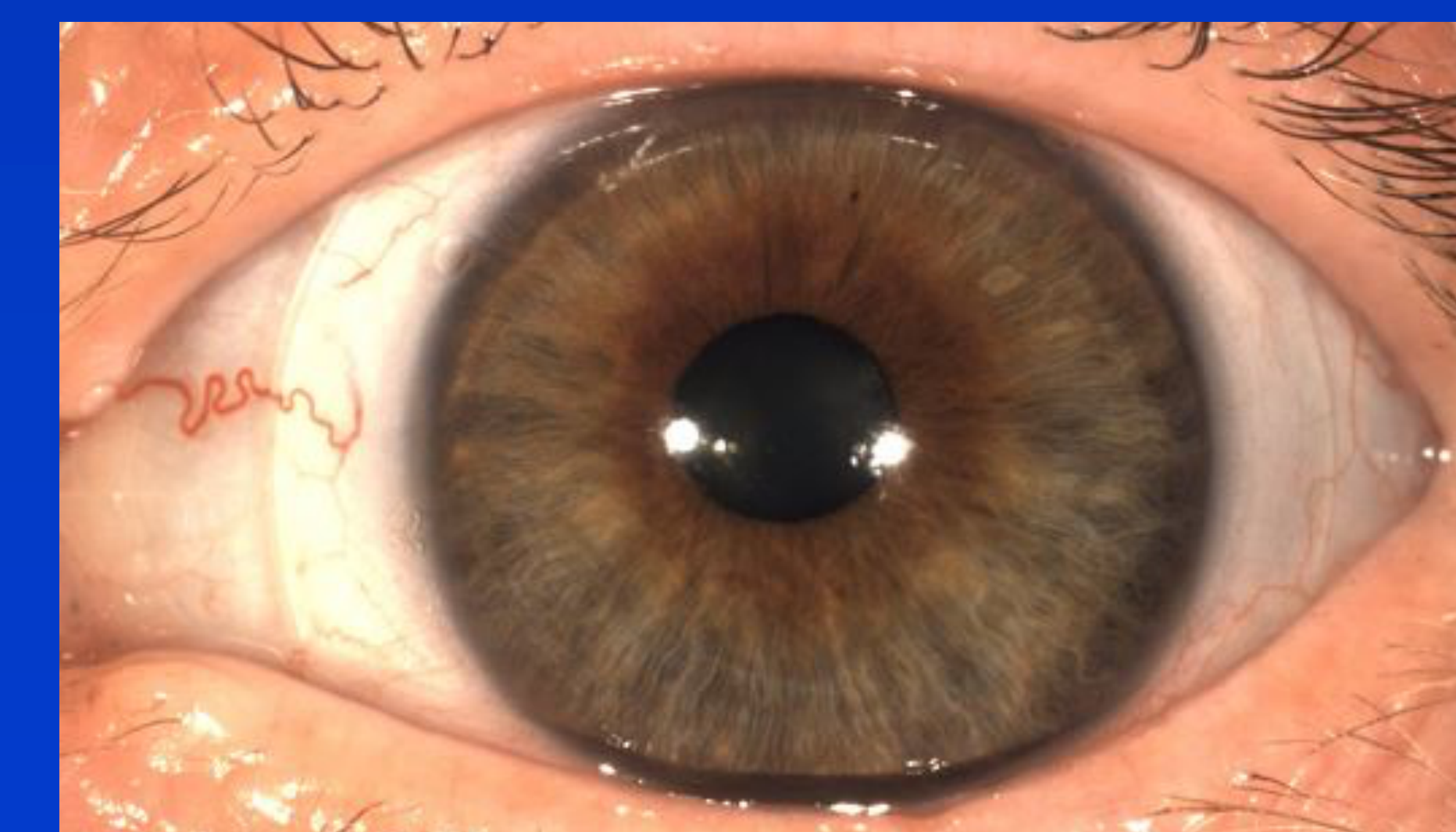


Figure 6. This photo displays ML's finalized custom soft lens for her left eye.

Conclusion

Custom soft contact lenses are a viable option for patients with corneal irregularities. A greater center thickness of a soft lens can mask significant amounts of irregular astigmatism and provide patients both suitable vision and comfort. In this case, custom soft lenses were able to provide the same acuity as her habitual scleral lenses while improving her comfort and ease of care.

The novel soft lens used in this case for the patient's left eye pictured in Figure 6 and Figure 7 was designed to mimic a traditional scleral but in a silicone hydrogel material for better comfort. The larger diameter (17.0 mm) and increased lens thickness (0.50 mm) allows for the upper lid to induce lens movement and tear exchange with every blink. This tear exchange is vital to delivering oxygen to the cornea. If tear exchange was not achieved, hypoxia would likely result considering the greater lens thickness and subsequent lower Dk/t value.¹

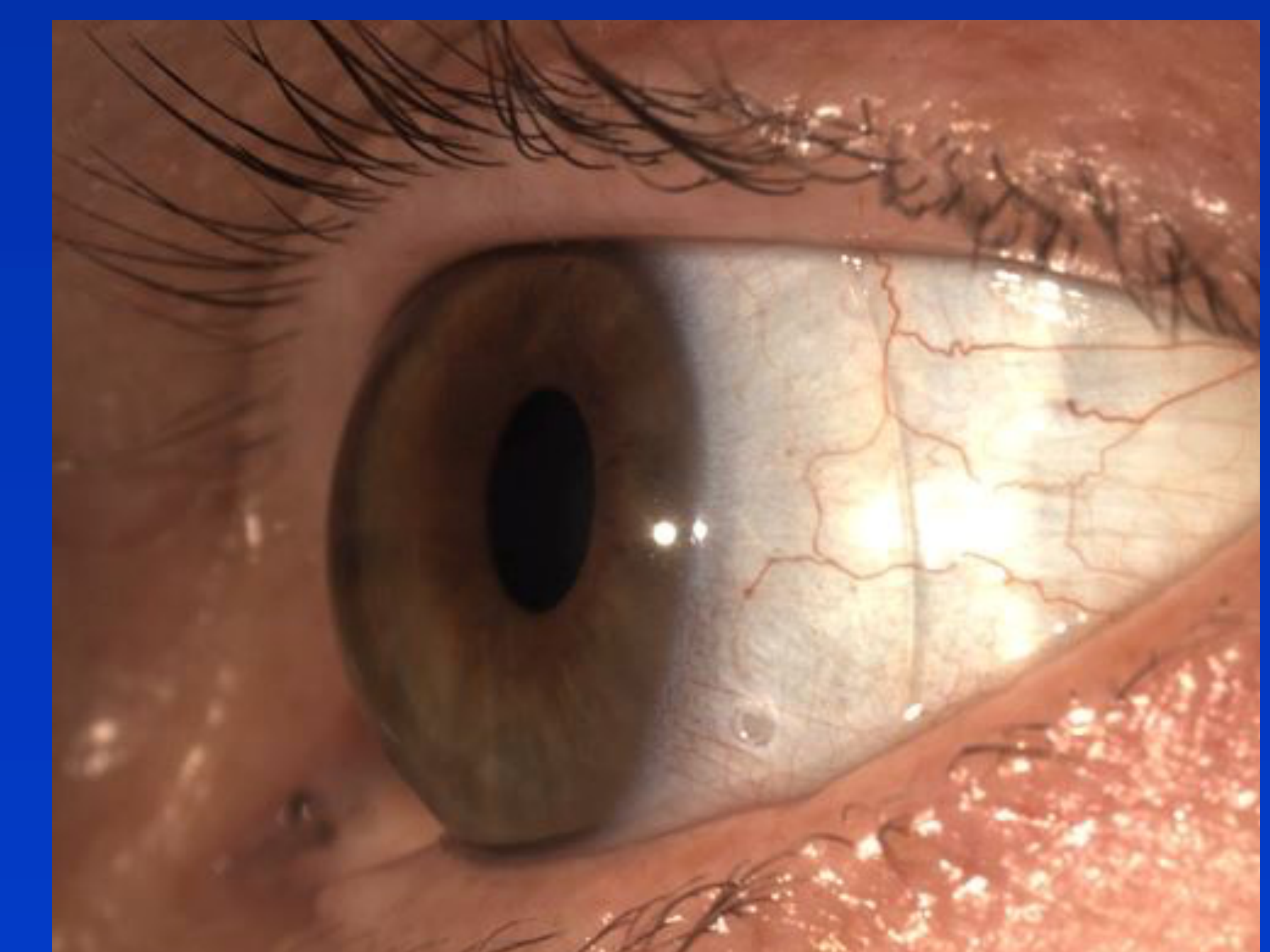


Figure 7. Temporal view of the large diameter custom soft lens on the left eye. Note the fenestration.

Reference

1. Andrzejewski, Tiffany. “Managing Irregular Corneas With Soft Lenses.” *Review of Cornea and Contact Lenses*, 15 Feb. 2020, www.reviewofcontactlenses.com/article/managing-irregular-corneas-with-soft-lenses.