

Utilizing Scheimpflug Image Difference Mapping to Show Improvements with Scleral Lens Wear in Refractory Nodular Keratitis

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Introduction

Scleral lens wear is shown in literature to improve corneal scarring and facilitate healing of epithelial defects.¹⁻³ We present an improvement of nodular keratitis secondary to exposure keratopathy after 1 month of lens wear, with continued improvement expected in further months.

Background

- 43yo F presents with exposure keratopathy from a sling repair of a congenital ptosis at age 1.
- Uncorrected OD: 20/50
- OD incomplete lid closure, keratinized margin with telangiectasias. Hyperemic conjunctiva
- Cornea with anterior stromal scarring and thickened epithelium. Raised nodules nasally/temporally.

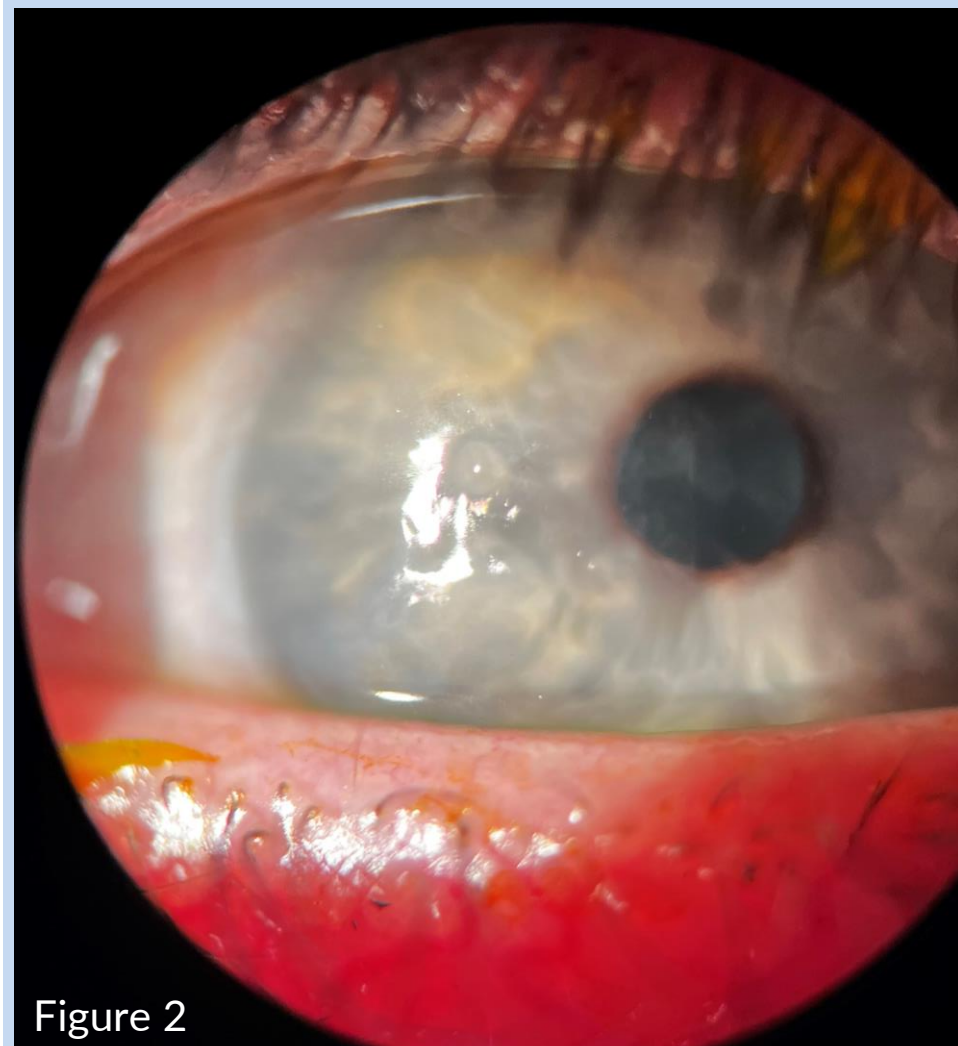


Figure 2

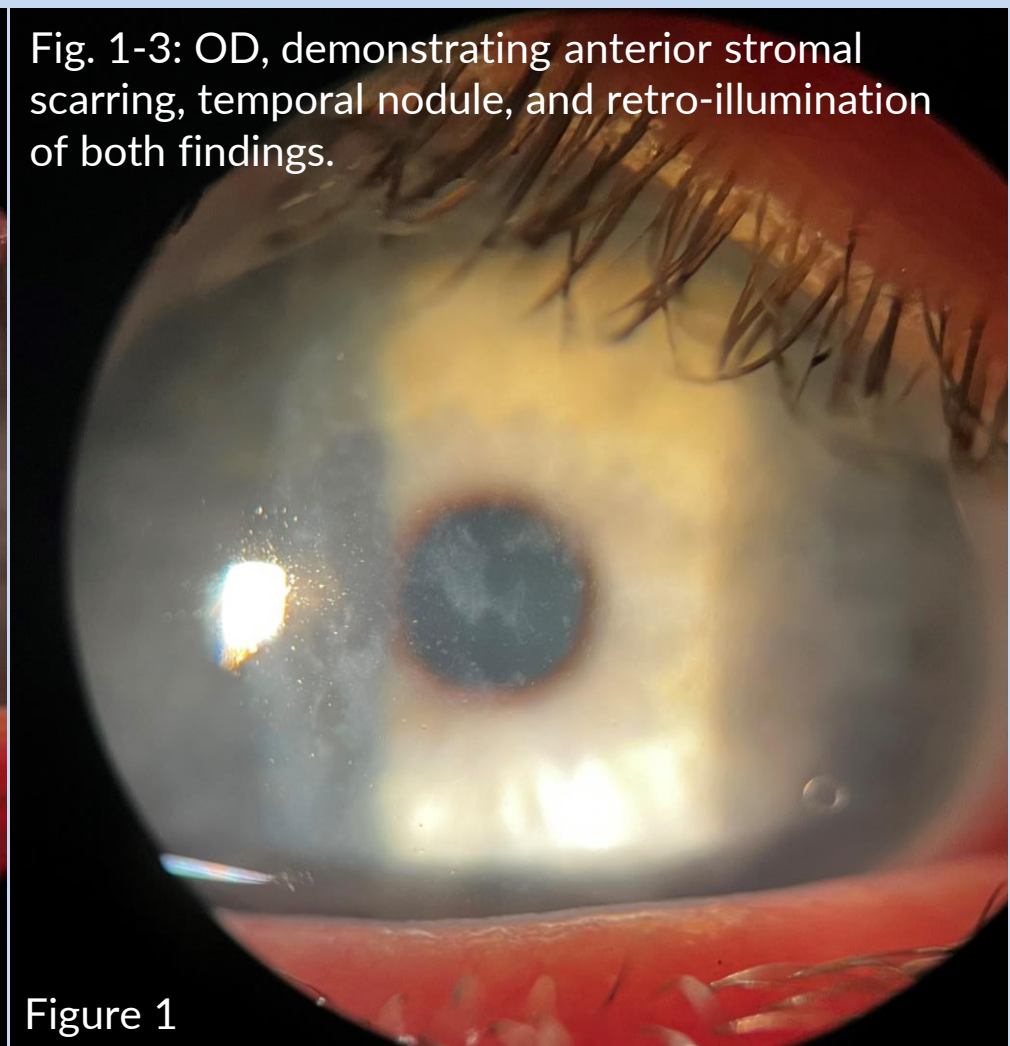


Fig. 1-3: OD, demonstrating anterior stromal scarring, temporal nodule, and retro-illumination of both findings.

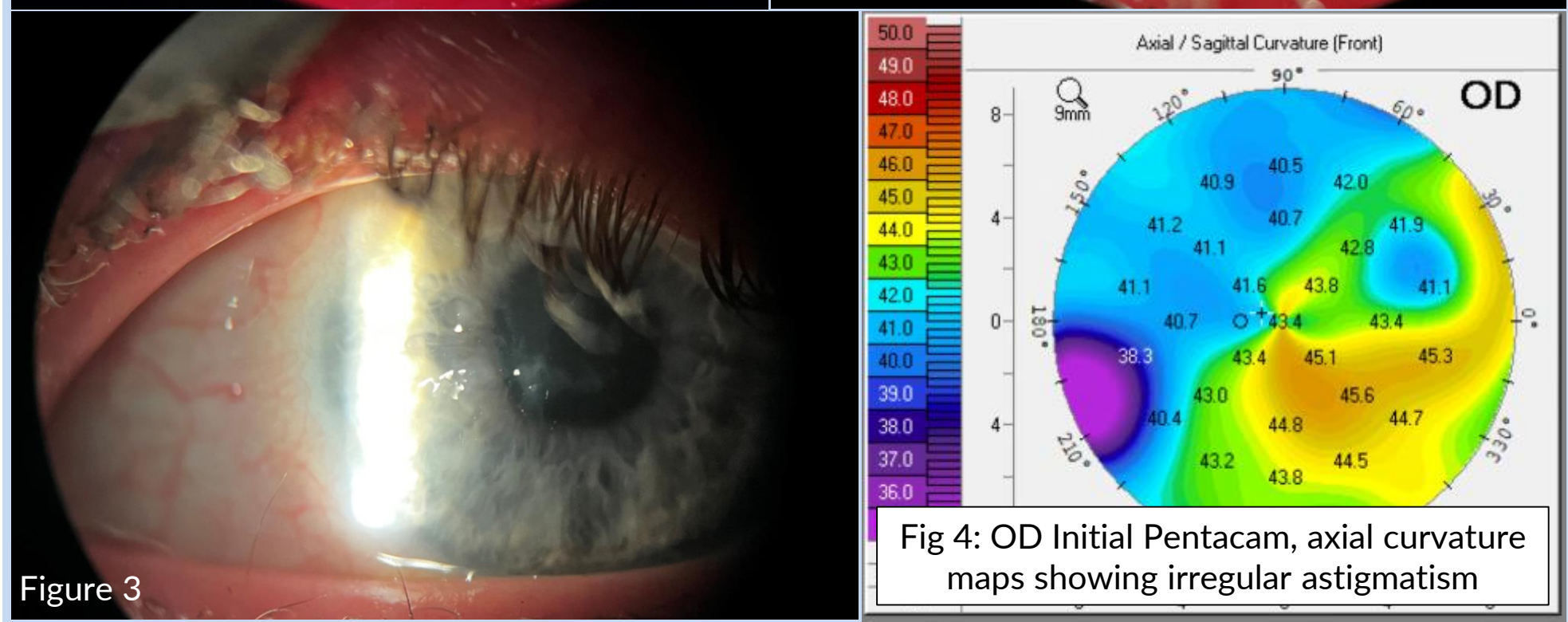


Fig 4: OD Initial Pentacam, axial curvature maps showing irregular astigmatism

Connecting Imaging to Observations Single Scheimpflug

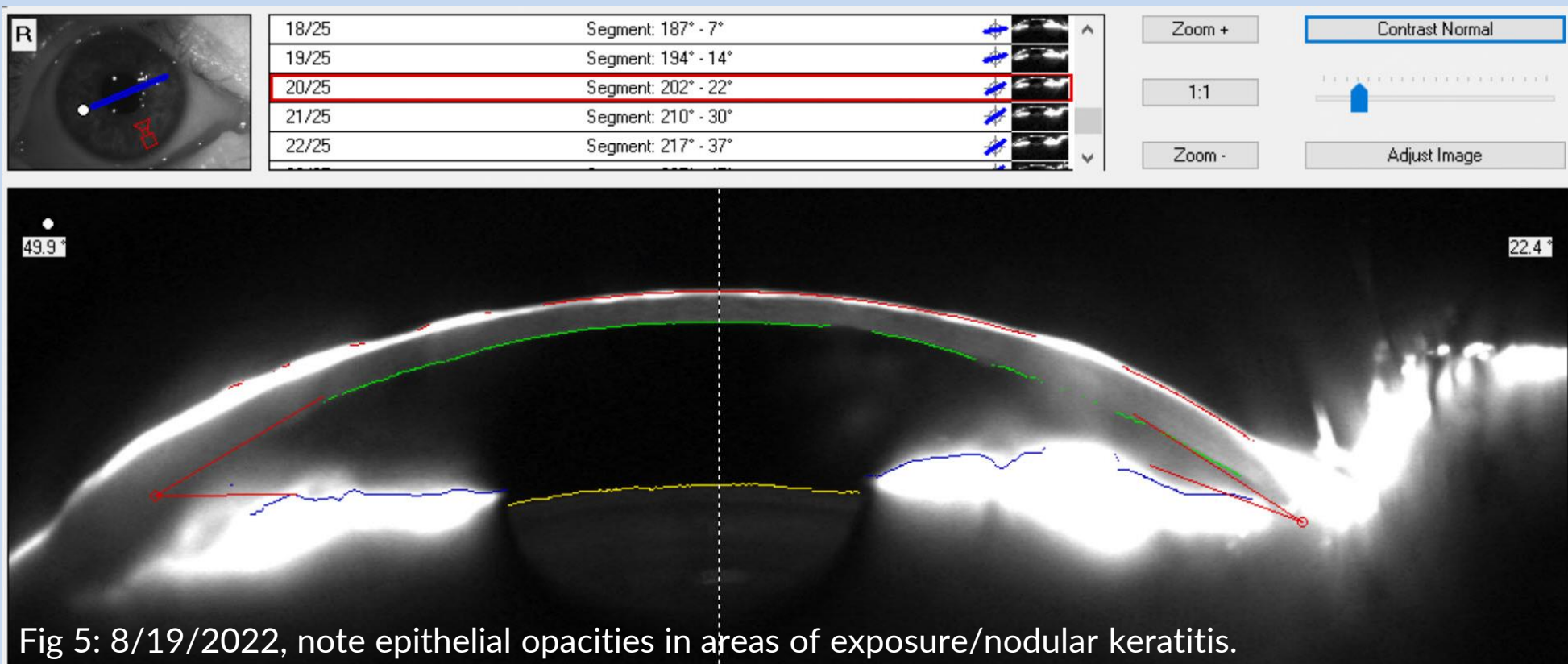


Fig 5: 8/19/2022, note epithelial opacities in areas of exposure/nodular keratitis.

Difference mapping – ~1 month of scleral wear 15.8mm dia – BC 42.00 – +1.00 – toric scleral landing

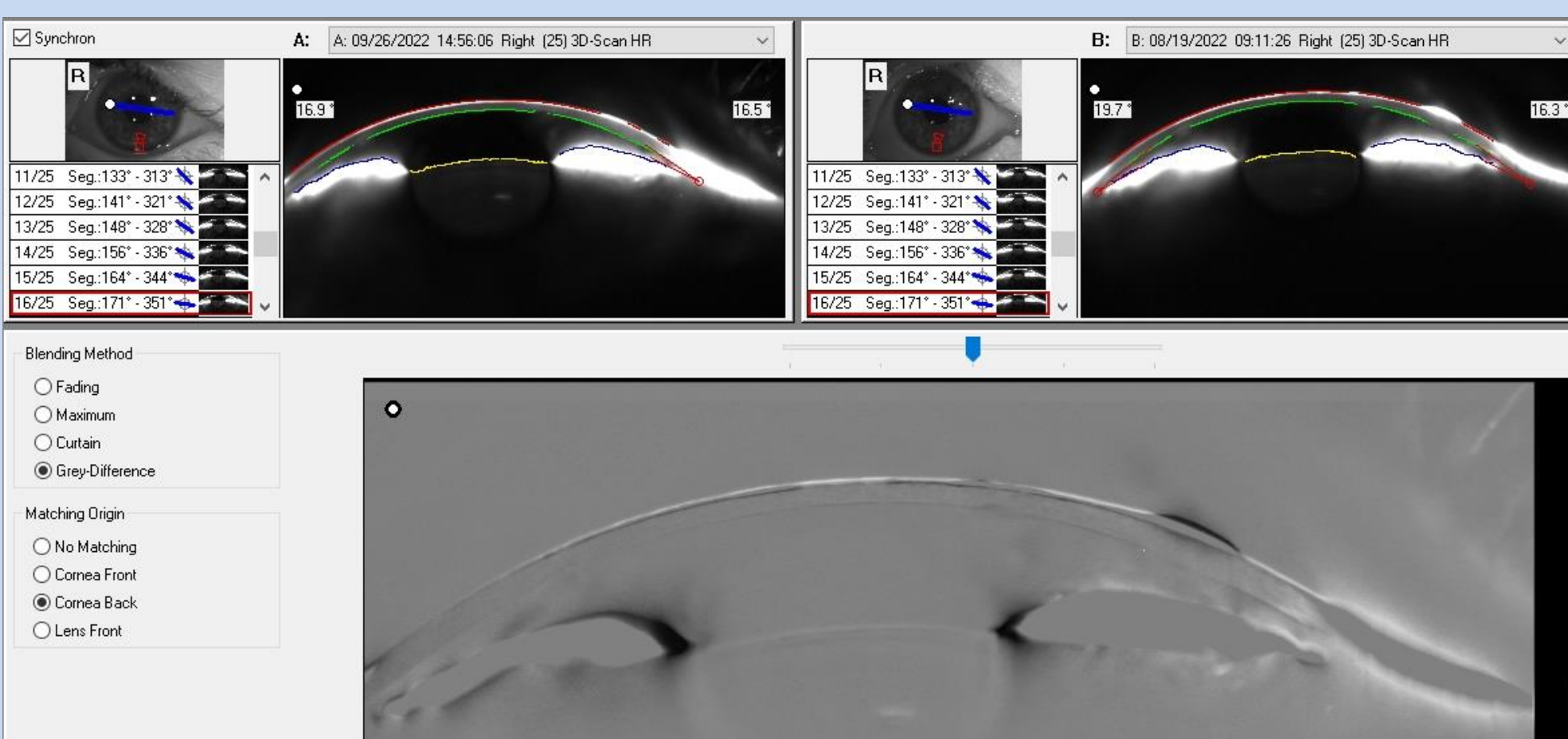


Fig 6: Difference mapping comparing the Scheimpflug image at 171-351 degrees before and after 1 month of scleral lens wear. Epithelial opacities are seen hyperreflective (above). Grey-difference mapping is used (below) to showcase epithelial nodule healing.

- Vision improvement to 20/25.
- Subjectively feeling less tired and more comfortable with appearance of eye.



Fig 7: OD before lens application.

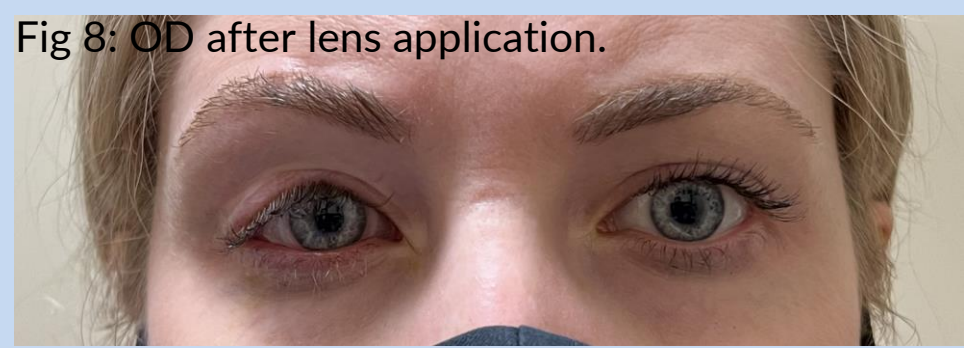


Fig 8: OD after lens application.

Discussion

Pentacam (OCULUS, Wetzlar, Germany) imaging is used in conjunction with signs and symptoms to monitor the healing process. Along with improved vision and ocular surface protection, this case demonstrates the healing properties of the tear chamber in scleral lens wear, improving the patient's corneal irregularity.

Serial Pentacam, often used to monitor corneal ectasias and keratoconus, can be used in this setting to observe long term corneal healing, in a more precise way than slit lamp photography and in the absence of additional specialized epithelial thickness mapping. Corneal densitometry has been proposed as an objective way of following scar improvement.⁴

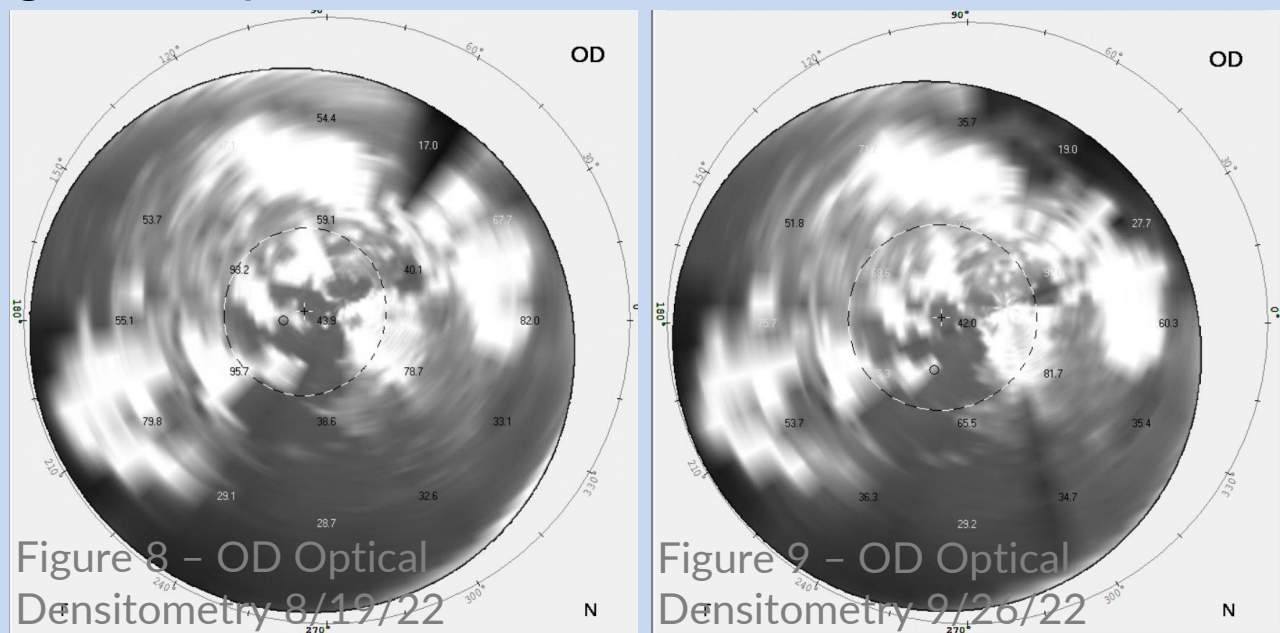


Figure 8 – OD Optical Densitometry 8/19/22

Figure 9 – OD Optical Densitometry 9/26/22

An unintended outcome of lens wear was adjusting the patient's lid appearance. In case of severe ptosis, high-vault scleral lenses have been shown serving as a ptosis crutch.⁵ Though our patient's causative etiology was ptosis repair causing lagophthalmos, she appreciated how lens wear added symmetry to her eyelids and prevented her from having to attempt to close or blink the right eye.

Highlights

- Scleral lenses have vision, protective, and healing properties and should be an early intervention in chronic exposure where lid therapy and lubrication are not enough.
- Optical densitometry comparison using Scheimpflug image difference mapping can be used to monitor epithelial changes after scleral lens wear.
- Scleral lenses used as a "lid crutch" in setting of reduced lid function and preferential eyelid closure.

References

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