

Visual Rehabilitation with a Scleral Contact Lens in a Patient with Keratoconus

Abstract

Background: Scleral contact lenses have been used to improve vision in patients with keratoconus when spectacle lenses, soft contact lenses, and corneal rigid gas permeable contact lenses are no longer adequate.

Case Presentation: 47-year-old male first presented to the office in 2011 for a comprehensive exam complaining of blurry vision at all distances. Exam revealed keratoconus worse in the right eye than the left. The patient was fitted with scleral contact lenses and has been following up yearly or bi-yearly for a new lens fitting. The patient was most recently fitted with an Ampleye scleral contact lens for the first time after complaining of decreased vision in previous brands.

Conclusion: This case illustrates the ability to adjust various lens parameters to obtain improved vision and optimal patient comfort.

Introduction

- Scleral contact lenses have become a valuable tool when it comes to managing a variety of anterior segment conditions and diseases. Scleral contact lenses vault over the cornea and land on the sclera. This vault is filled fluid that helps to mask the irregularities of the cornea. The scleral landing zone helps provide a more comfortable fit for the patient. The ability to adjust various aspects of the lens fit as well as incorporate prescriptions that would be outside of normal parameters, scleral lenses have become particularly important in managing keratoconus.
 - This case shows how scleral lenses can vastly improve vision in moderate to advanced keratoconus where spectacle lenses are no longer adequate.
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Case Presentation

Patient demographics:

- Age: 47
- Sex: Male
- Unremarkable systemic history
- Relevant ocular history: previously diagnosed with keratoconus OD > OS

Baseline exam findings:

- Uncorrected VA: OD 20/600, OS 20/600
- Manifest refraction:

- OD: -18.25 -8.75 x 045
 - OS: -5.75 -8.50 x 020
- Best spectacle-corrected VA: OD 20/400, OS 20/150
- Slit-lamp: Stromal thinning OD > OS, stromal scarring OD > OS
- Keratometry:
 - OD: 68.00 @ 160, 81.00 @ 079
 - OS: 47.75 @ 130, 53.00 @ 040
- Prior CL history: scleral gas permeable contact lenses

Scleral lens fitting 7/2025:

- Fitting method: diagnostic
- Trial lens parameters:
 - Brand: Ampleye
 - Diameter: 16.50 mm
 - Sagittal depth: OD 5200 µm, OS 4600 µm
 - Base curve/power: OD 7.34mm/-12.00 D, OS 8.04mm/-6.00 D
 - Over-refraction:
 - OD: +2.00 -4.75 x 144 VA: 20/150
 - OS: +0.50 -2.00 x 062 VA: 20/70
- Fit adjustments:
 - Central vault: decrease by 50 µm OD, increase by 50 µm OS
 - Landing zone: decrease one step 360 OD and OS

Scleral lens follow up 8/2025:

- Patient reported blurry vision OD and clear vision OS, as well as good comfort OD and OS.
- Lens parameters:
 - Brand: Ampleye
 - Diameter: 16.50 mm
 - Sagittal depth: OD 5200 µm, OS 4600 µm
 - Base curve/power: OD 7.34mm/-10.00 -4.50 x 174, OS 8.04mm/-5.50 -2.00 x 062
 - Over-refraction:
 - OD: +2.25 -3.25 x 112 VA: 20/150
 - OS: +0.75 DS VA: 20/60
- Fit adjustments:
 - Central vault: increase by 50 µm OD, increase by 150 µm OS
 - Limbal zone: decrease one step 360 OD and OS
 - Landing zone: increase one step 360 OD and OS

Continued management:

- Adjusted scleral lenses were ordered for patient following the 8/2025 follow up. The patient will return to clinic for pick up and evaluation of new lenses once they arrive in office.

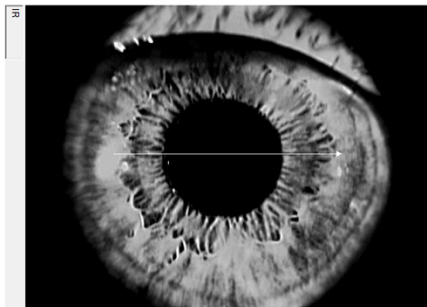
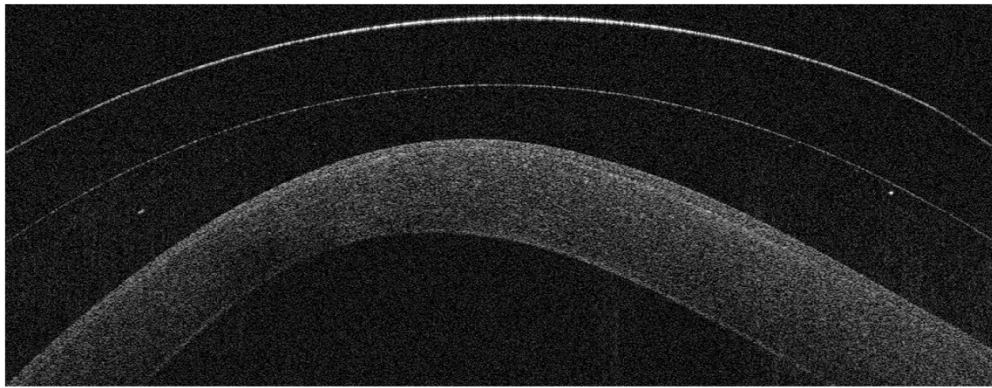
Discussion and Conclusion

- As demonstrated in this case, scleral contact lenses represent a safe, effective, and non-surgical option that can substantially improve both visual function and quality of life in patients with moderate to advanced keratoconus. Careful customization of lens fit is key to maximizing outcomes and minimizing complications.

Cornea Line

Signal Strength Index 41

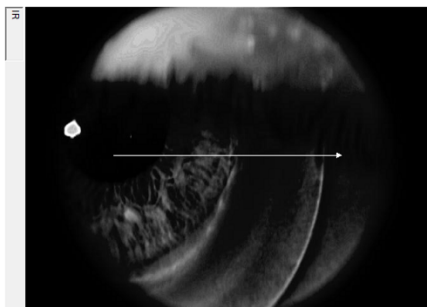
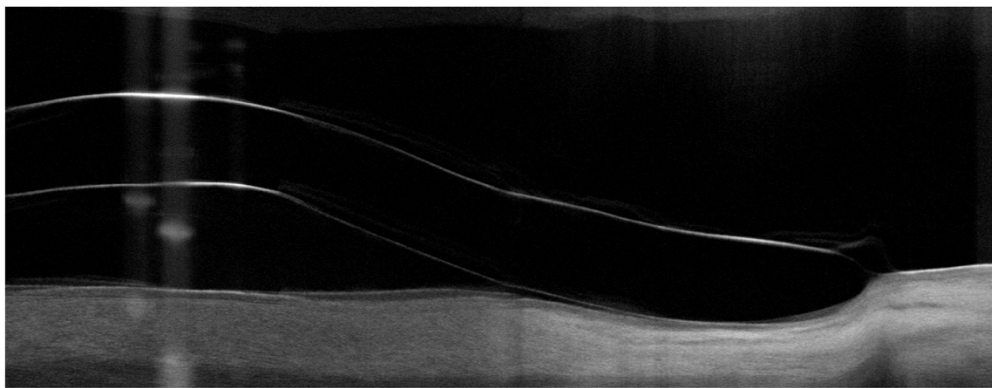
Right / OD



Cornea Line

Signal Strength Index 71

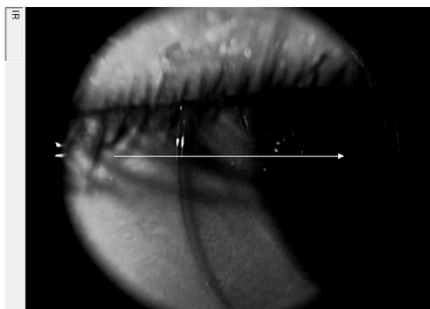
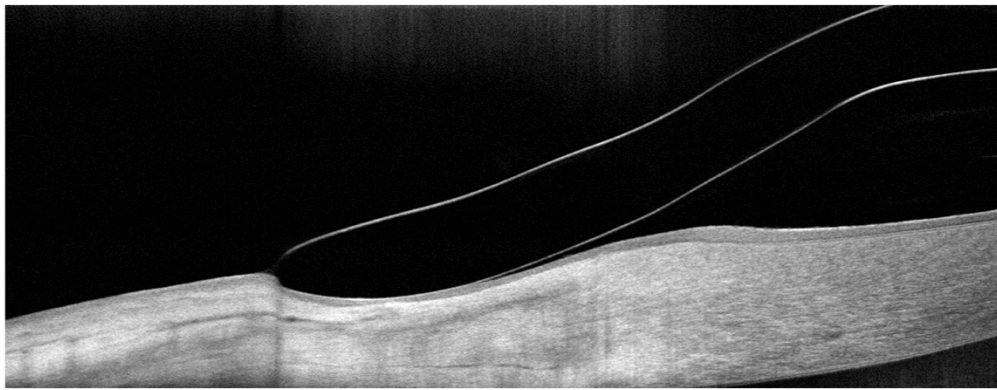
Right / OD



Cornea Line

Signal Strength Index 68

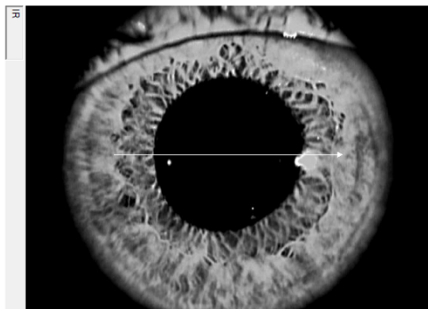
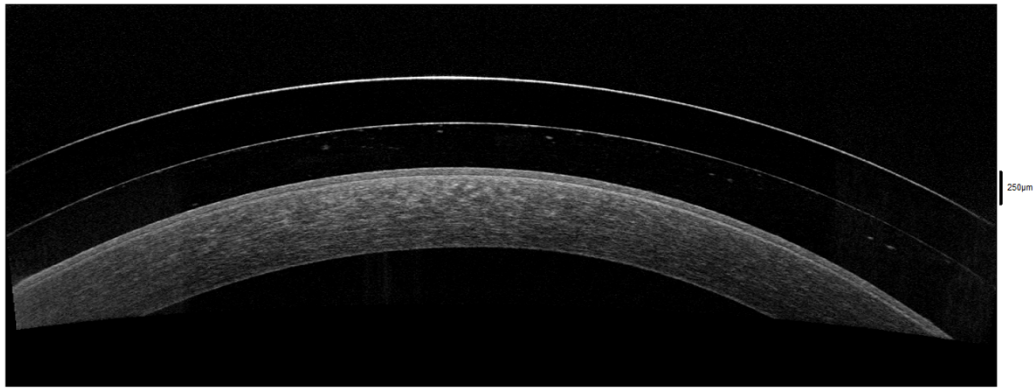
Right / OD



Cornea Line

Signal Strength Index 32

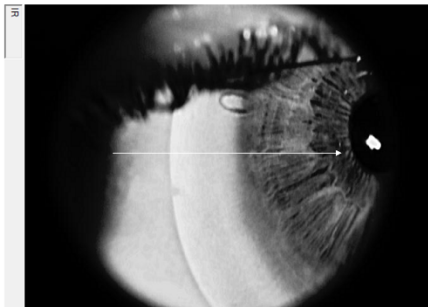
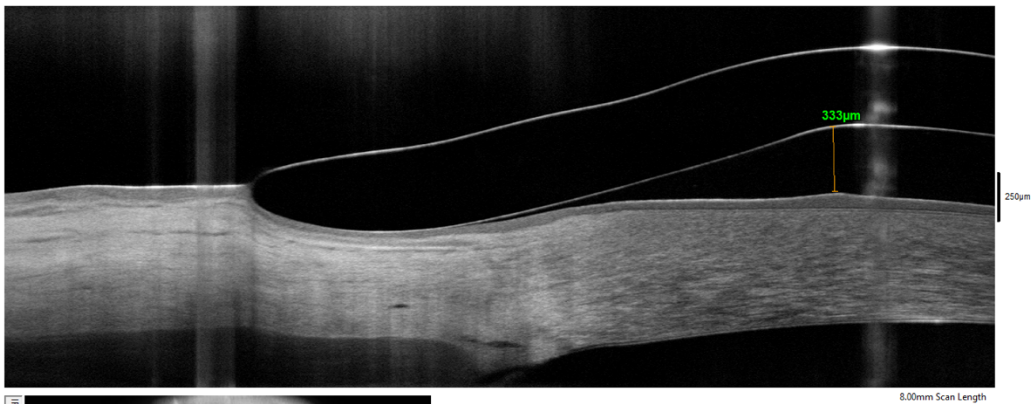
Left / OS



Cornea Line

Signal Strength Index 88

Left / OS



Cornea Line

Signal Strength Index 88

Left / OS

