

Introduction

For Keratoconus patients with corneal scarring and high irregular astigmatism the best option is often scleral lenses. The lens will vault over the scarred cornea improving comfort and vision. If the lens impinges on something like a pinguecula, which would cause redness and discomfort, adjustments will need to be made to the lens.

Background

43-year-old male, presented with Keratoconus (KC) in the right eye (OD). He was diagnosed 18 months ago when he noticed a reduction in his vision with his spectacles. He purchased a new pair, but this did not improve his vision. The patient was referred to a colleague to fit special contact lenses. The initial fit was a soft lens before moving onto corneal RGP.

For the last few months, he was not been able to tolerate the RGPs and he had developed a corneal ulcer. He was referred to our office for the option of a scleral fit. Initial examination with the slit lamp showed corneal scarring and a pinguecula nasal side. His best-corrected distance VA was OD 20/125 with spectacles +1.00-2.50x60 and OS 20/20 with spectacles -0.50-0.75x25 and he was happy with this option for OS.

Fitting

Profilometry measurements were taken with the ESP (Eye Surface Profiler, Eaglet Eye, The Netherlands). Not only does the ESP give the height data needed to design the scleral lens. Through the *FirstLensFit* Algorithm it will suggest SAG and base curve and it also maps the pinguecula (*Fig 1*) making it possible to establish the exact height and position of the pinguecula, in this case 320 microns, 8.51mm away from the apex. Since the patient is planned to be fitted with a 17mm Zenlens, the edge is going to touch the pinguecula.

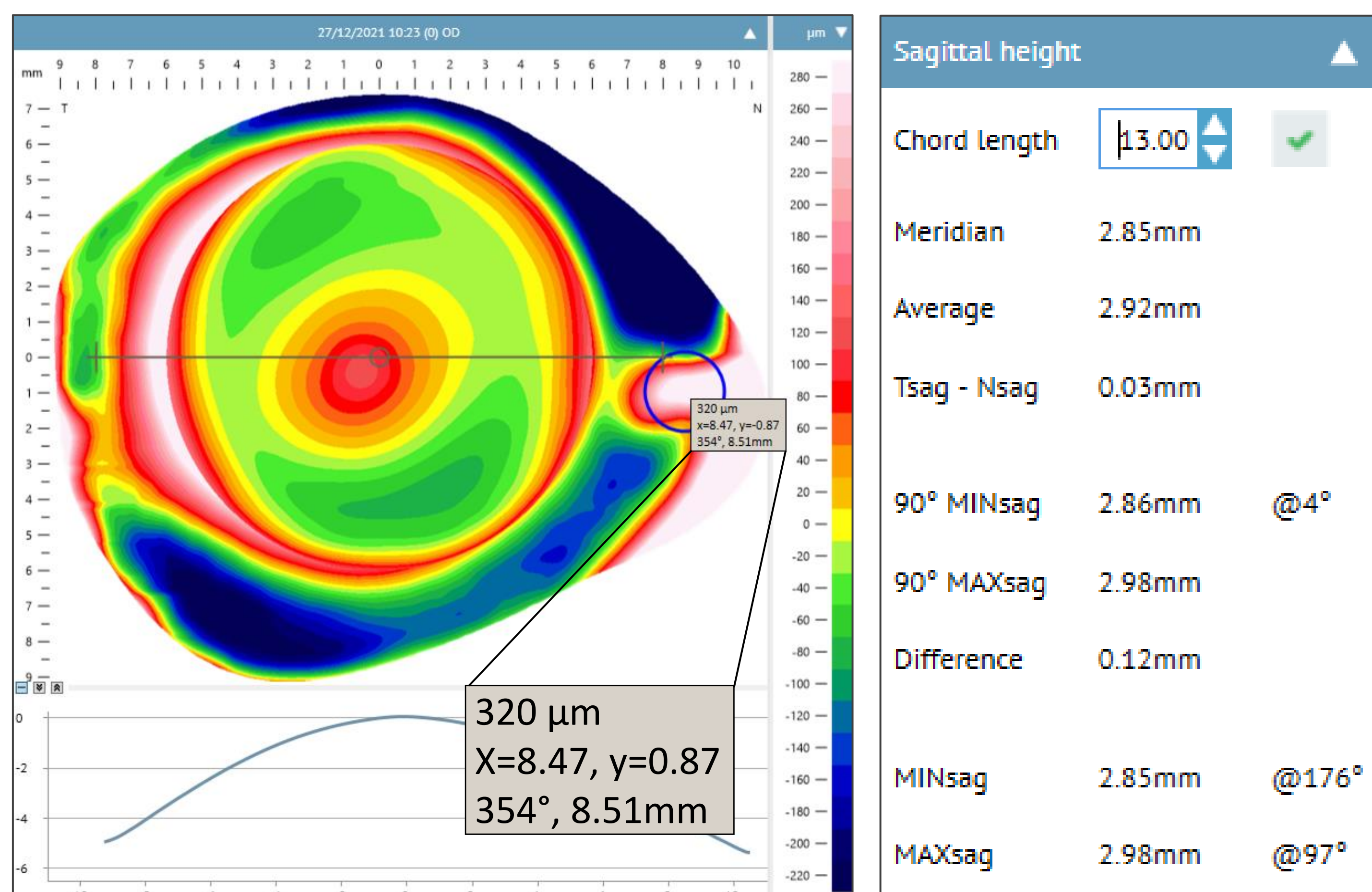


Fig 1 ESP Bisphere elevation map and detailed data of the pinguecula.

Fig 2 Sagittal height data for 13mm chord.

The sclera showed an asymmetric pattern, with 120 microns of toricity at 13 and 350 microns at 15mm chords (*Fig 2*). A 17mm diameter Zenlens® (B+L Specialty Products, UK) diagnostic lens was used for over refraction.

Disclosures:

Karin Brown-Balvert is an employee of Eaglet Eye.
Joana Marta was an employee of Optiforum, a Zenlens distributor in Portugal.

Due to the height difference outside the limbus, the final lens ordered was a 17mm diameter Zenlens® Prolate Bi-Elevation. It was defined based on the ESP *FirstLensFit* calculations (*Fig 3*) and the clinical findings with the diagnostic lens: SAG 4930/5180 BC 7.60 mm, LCC STD APS Flat 3 (H)/STD (V), Power -1.50 with a 2.5mm diameter MicroVault (MV) at 10°, 8.5 mm of decentration and 400 microns of depth.

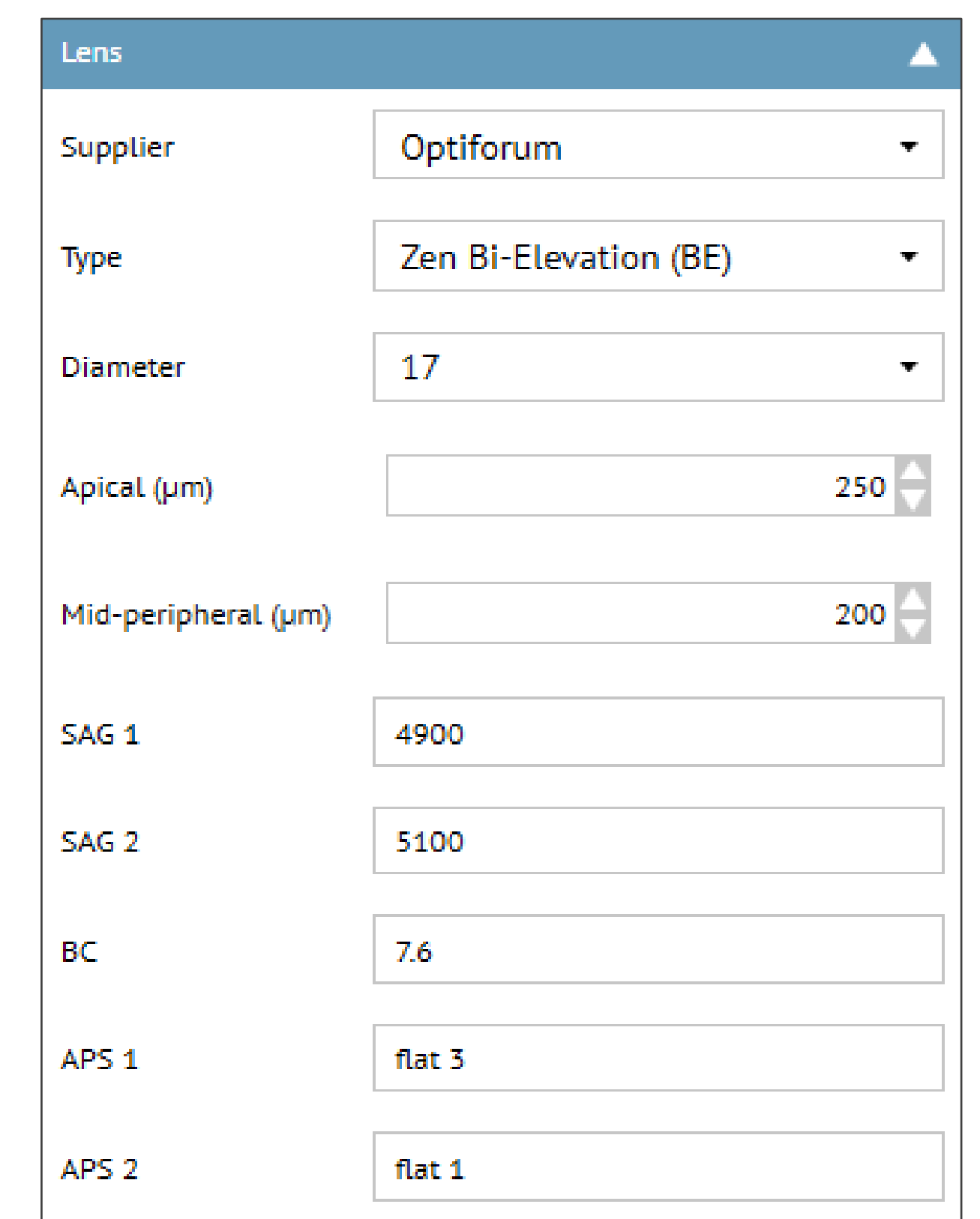


Fig 3 Profilometry based first lens prediction.

Outcome

At the dispense lens visit the VA was 20/25 with no OR. The lens was well centred and showed good clearance horizontally and vertically, the MV was centred, and no adjustments were needed (*Fig 4 & 5*). The landing zone showed good alignment, no blanching or impingement were observed, and the patient reported excellent comfort and tolerance.

The patient was instructed on inserting, removal and maintenance and the lens was prescribed with an increasing wearing time schedule. A follow-up was programmed after 2 weeks and 6 months.

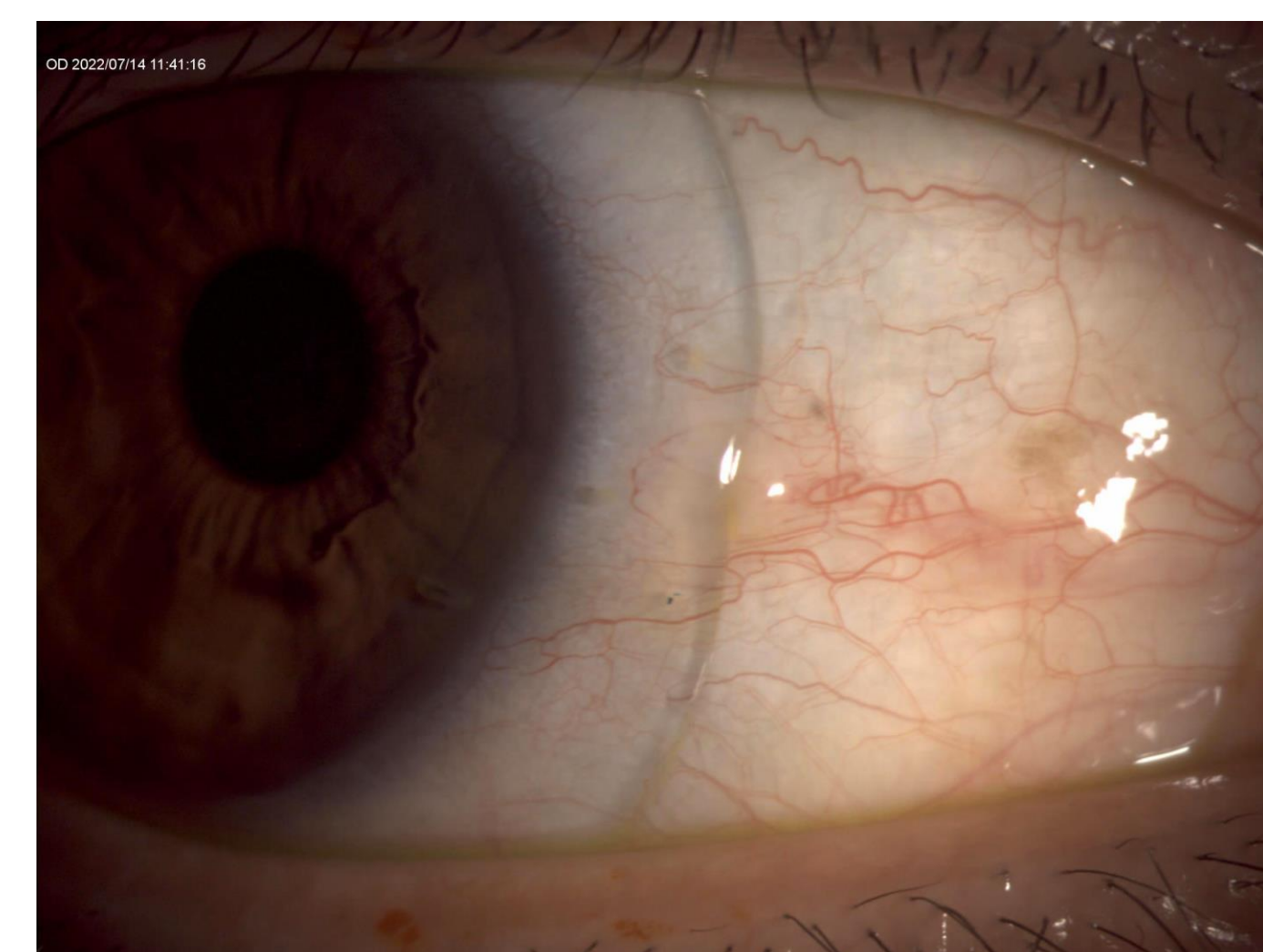


Fig 4 MicroVault™ technology to vault up over obstructions.

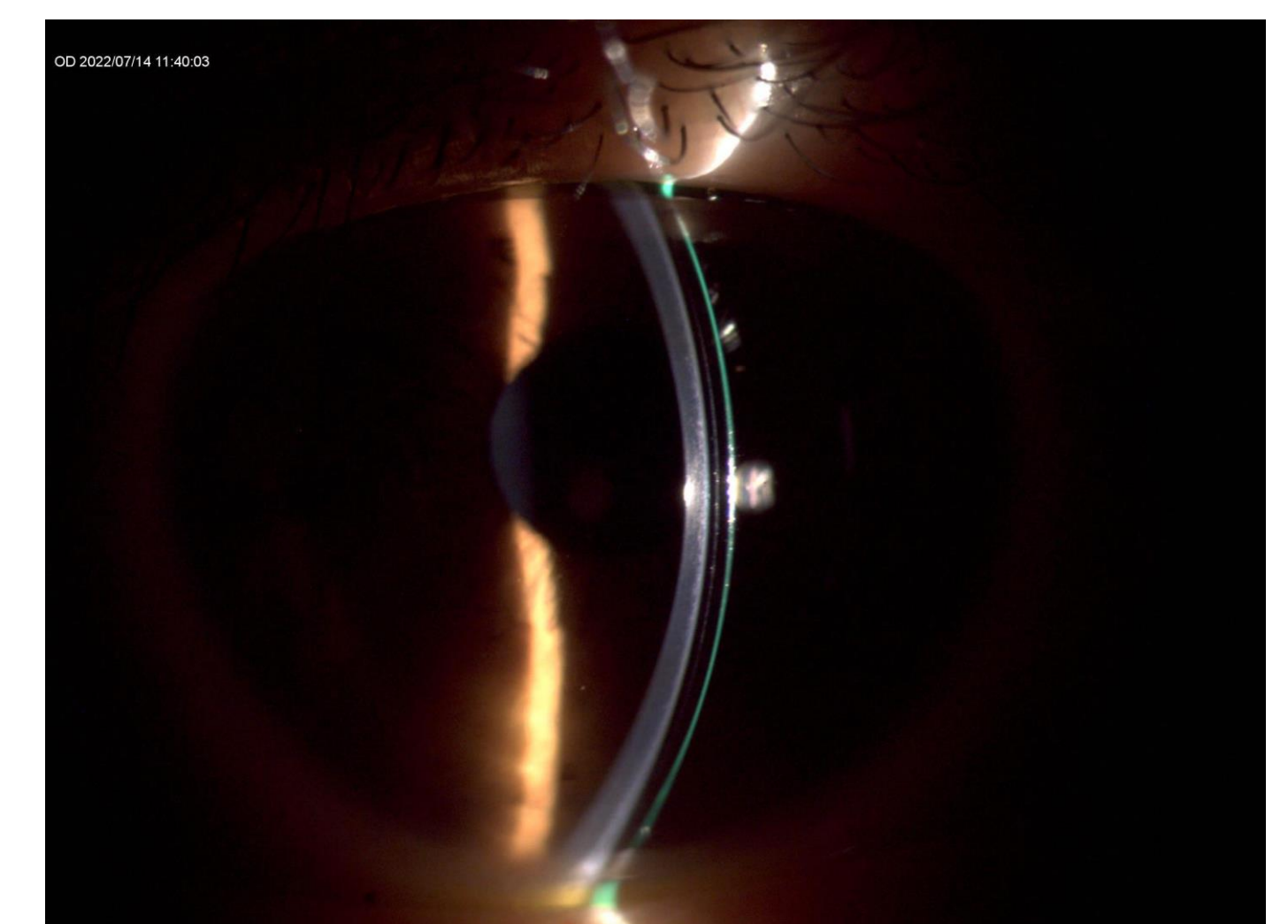


Fig 5 Slit lamp examination showing a symmetric vault.

Follow-up

The patient came to the follow-up appointment having worn the lenses for 5 hours, VA was 20/25 and reported wearing the lenses 8 hours per day comfortably and without any problems with inserting or removing the lens. No conjunctival hyperaemia or corneal staining were observed after lens removal. Follow up appointments were planned every 6 months.

Conclusions

With larger diameter scleral lenses, pingueculas can be hard to fit, but with the improving technology in the labs, and accurate measurements of the scleral surface, it was possible to get a good fitting lens. Profilometry helped to reduce the fitting period remarkably and due to the availability for designing MicroVault, lens decentration was reduced resulting in good comfort and vision. For this KC patient with corneal scarring due to an ulcer and pinguecula on nasal conjunctiva, profilometry was used to take the corneoscleral measurements, resulting in sagittal height maps. The automated algorithm provided information about the vault, the haptics and the position, height and diameter of the pinguecula. With these precise measurements it was possible to get good fitting scleral lens, vaulting the pinguecula which showed no impingement and a good alignment.