

## BACKGROUND

Keratoconus is a progressive corneal disease in which there is stromal thinning leading to protrusion of the cornea causing increased myopia and corneal astigmatism. This results in subjective blur and higher order aberrations. If the corneal thinning reaches a point that risks or leads to perforation or leads to scarring, a corneal transplant is warranted. Corneal transplants can take years to heal and often have varying outcomes. Patients with corneal transplants are also at high risk for further complications such as edema or graft rejection.

## CASE PRESENTATION

A 52-year-old female presents with complaint of halos around lights after 4 hours of scleral lens wear.

**POH:** Keratoconus OD, s/p penetrating keratoplasty and IOL placement OS (2004) **PMH:** allergies, depression, nerve pain  
**Medications:** Lyrica, Singulair, Restasis BID OU, Flarex BID OU

**VA w/ current lenses:** 20/40 OD, 20/80 OS

**IOP:** 5mmHg OD, 8mmHg OS

**SLE:** MGD, severe keratoconus OD; MGD, corneal graft placement with moderate edema and an area of detachment at the level of Decemet’s membrane nasally OS (Photo 1)

**DFE:** trace NS, vitreous clear, macula flat and intact, .5/.5 C/D OD; PC IOL centered and clear, vitreous clear, macula flat and intact, .5/.5 C/D OS

**Ancillary testing:** Pentacam tomography, anterior segment OCT

**Pachymetry:** 300um OD, 590um OS

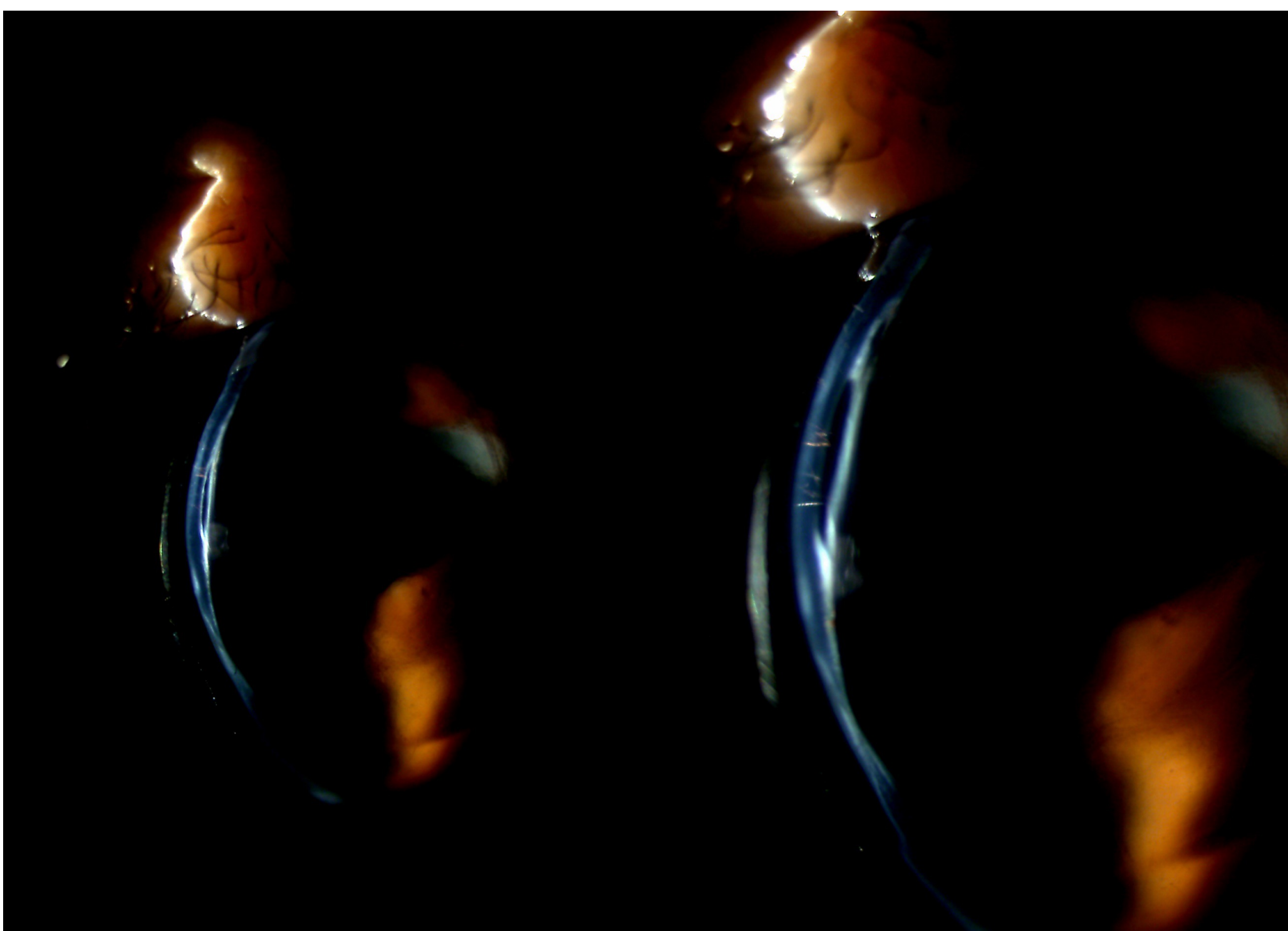


Photo 1. Anterior segment photos highlighting the Decemet’s membrane detachment OS.

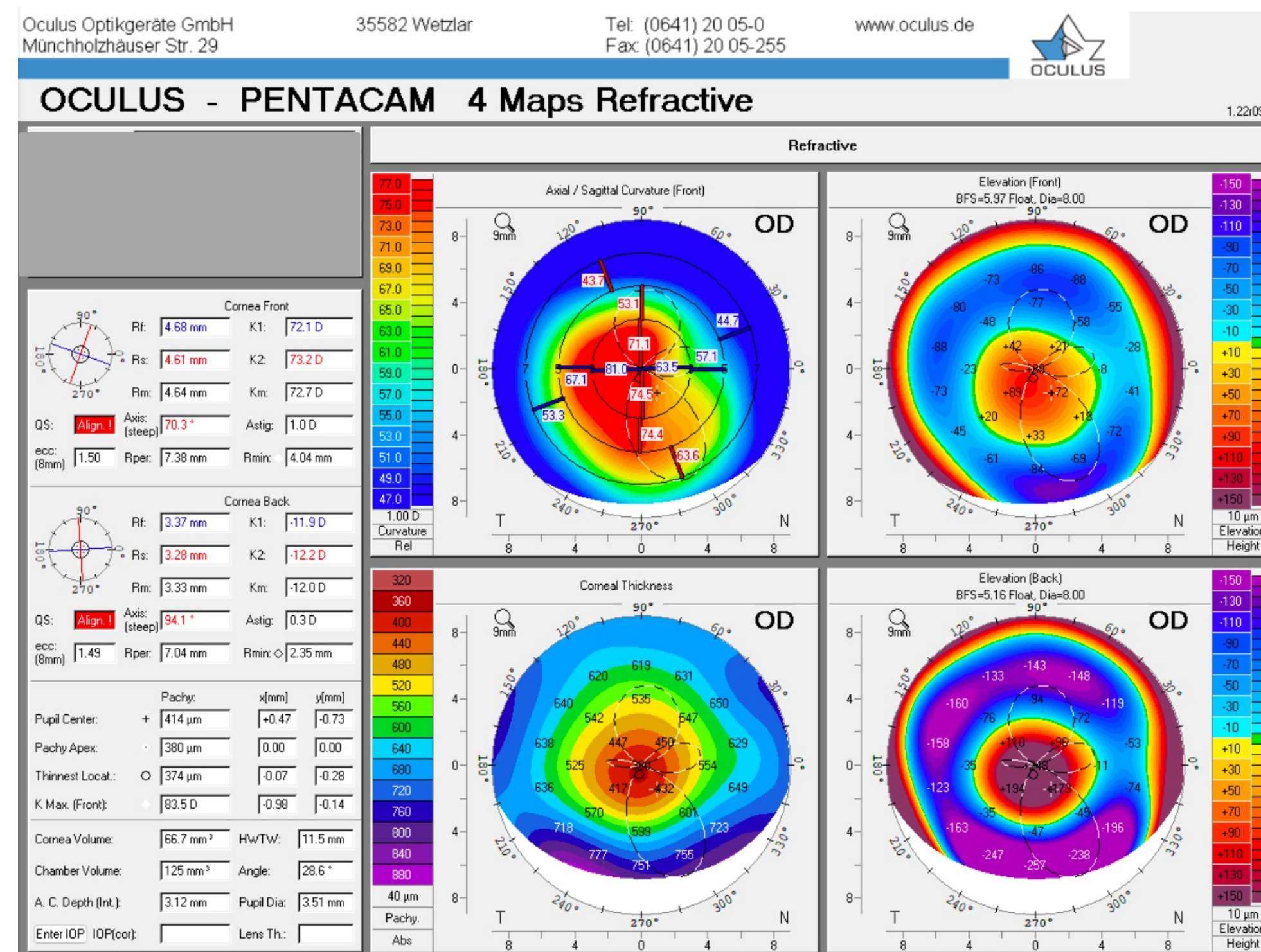


Figure 1. Pentacam tomography scans OD showing posterior corneal steepening

## MANAGEMENT PLAN OD

This patient was fit in a HOA guided scleral lens to provide the best vision possible with her corneal condition. **(Photo 2)** Acuity was able to be restored to 20/20 with the HOA addition to her scleral lens. This eye will be monitored closely as it is not a candidate for cross linking due to pachymetry <400um, and may be at risk for further keratoconus complications such as hydrops.

Lens	SAG	BC	PWR	CT	DIAM
OVITZ Ares	4.975	7.34	-5.25	0.3	15.8

## MANAGEMENT PLAN OS

A detachment in Decemet’s in a corneal graft almost two decades after transplantation is a rare finding and is not documented extensively. It may occur from the pathogenesis of keratoconus or spontaneously from an outside factor such as trauma. Careful evaluation of the graft and imaging are critical in evaluating this condition. This patient was already using a long-term soft steroid to help prevent corneal graft rejection. Due to the inflammation and swelling seen on slit lamp examination, she was switched to Pred Forte QID temporarily and added Muro 128 TID to decrease the corneal swelling. She was referred to her ophthalmologist to obtain an endothelial cell count and further investigation for signs of corneal graft rejection. At her six-month follow-up, the corneal swelling had decreased significantly, the patient was cleared for scleral lens wear for up to 4 hours per day as a caution to not induce another episode of swelling.

Due to the extremely prolate shape of her graft, she was fit in a profilometry derived free form scleral lens with appropriate clearance with special attention to the graft-host junction. Her best corrected visual acuity in this lens was 20/25.

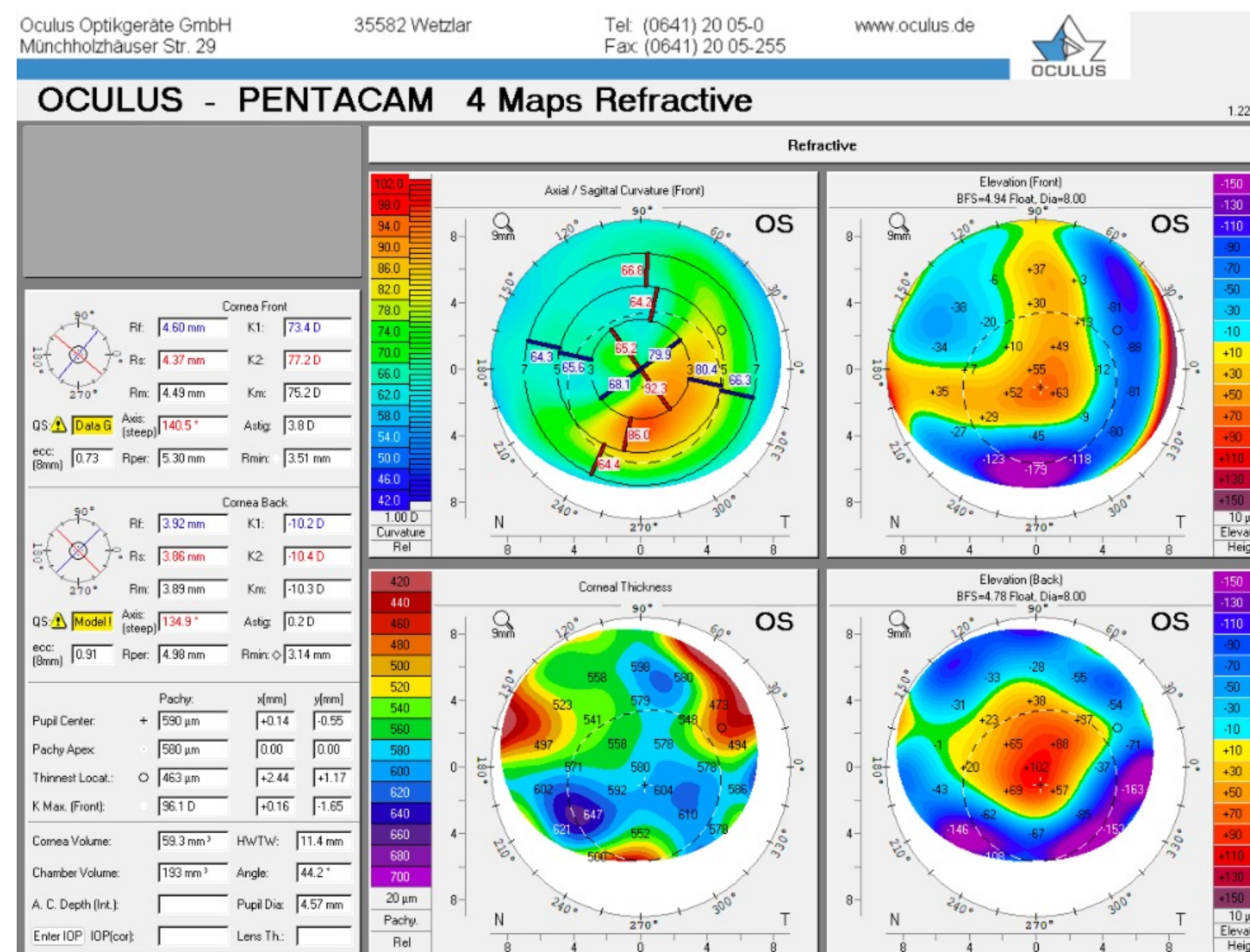


Figure 2. Pentacam tomography OS. Note inferior nasal increased corneal thickness due to DM detachment.

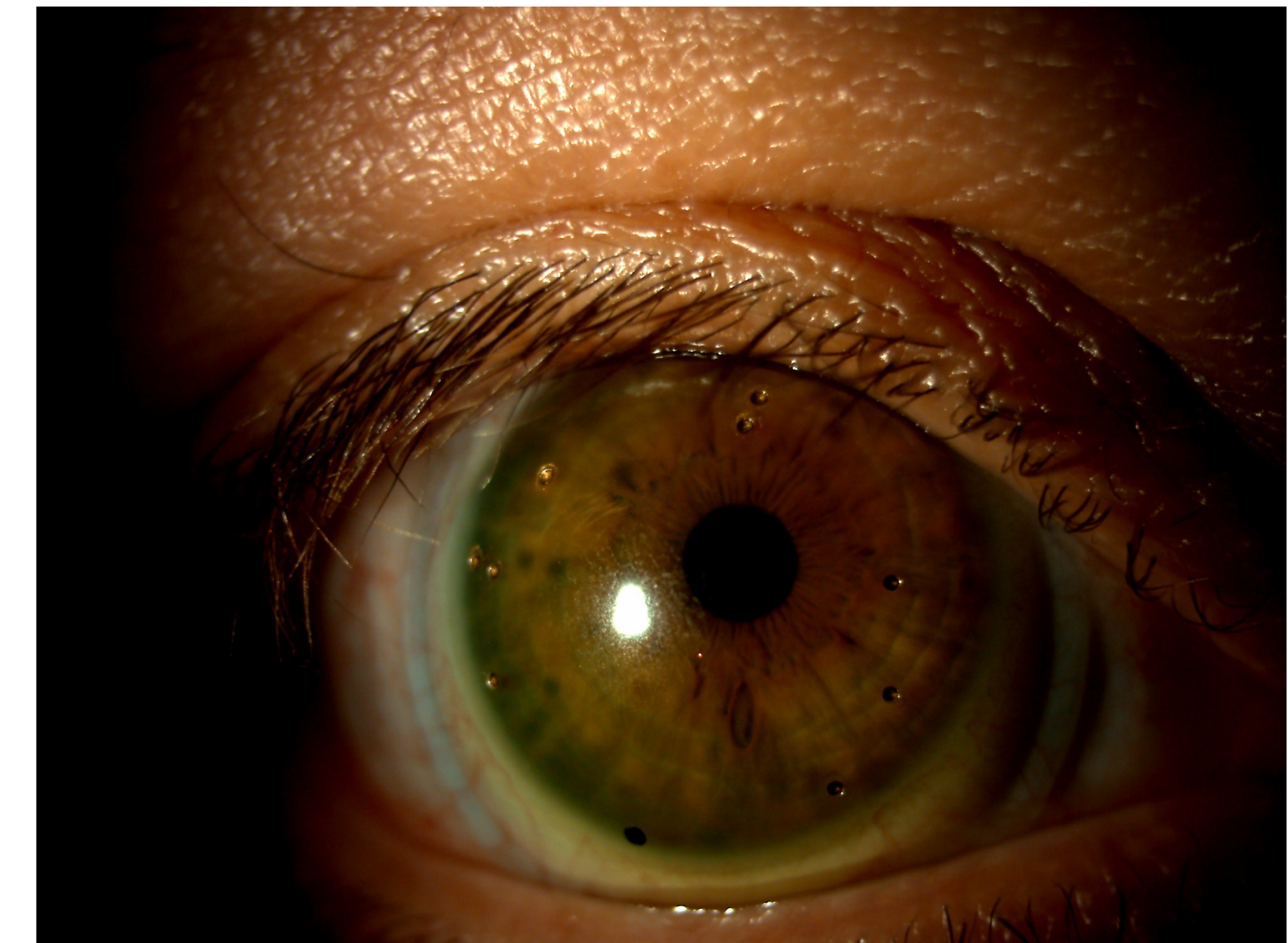


Photo 2. A scleral lens on the eye with markings for HOA measurements.

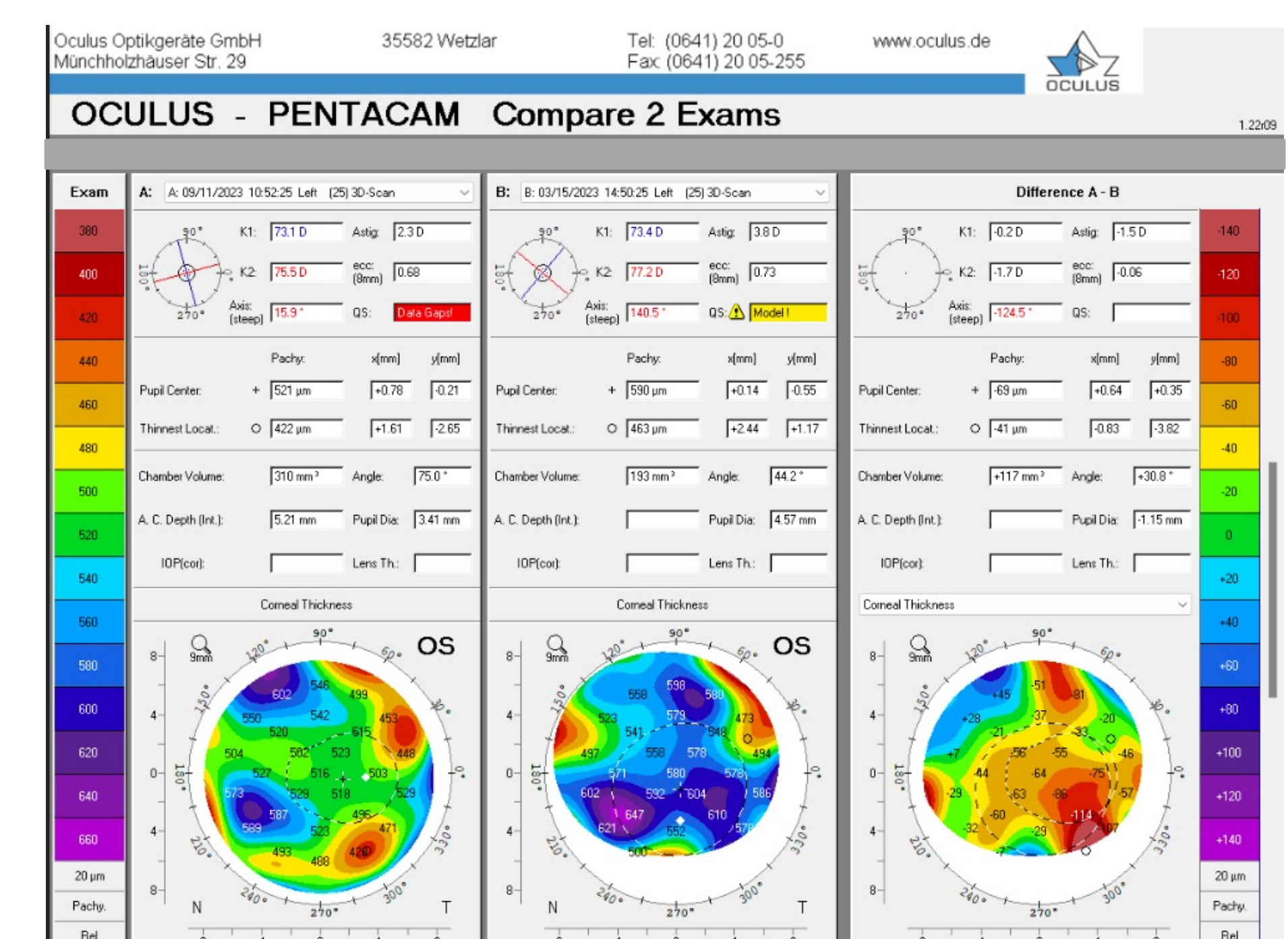
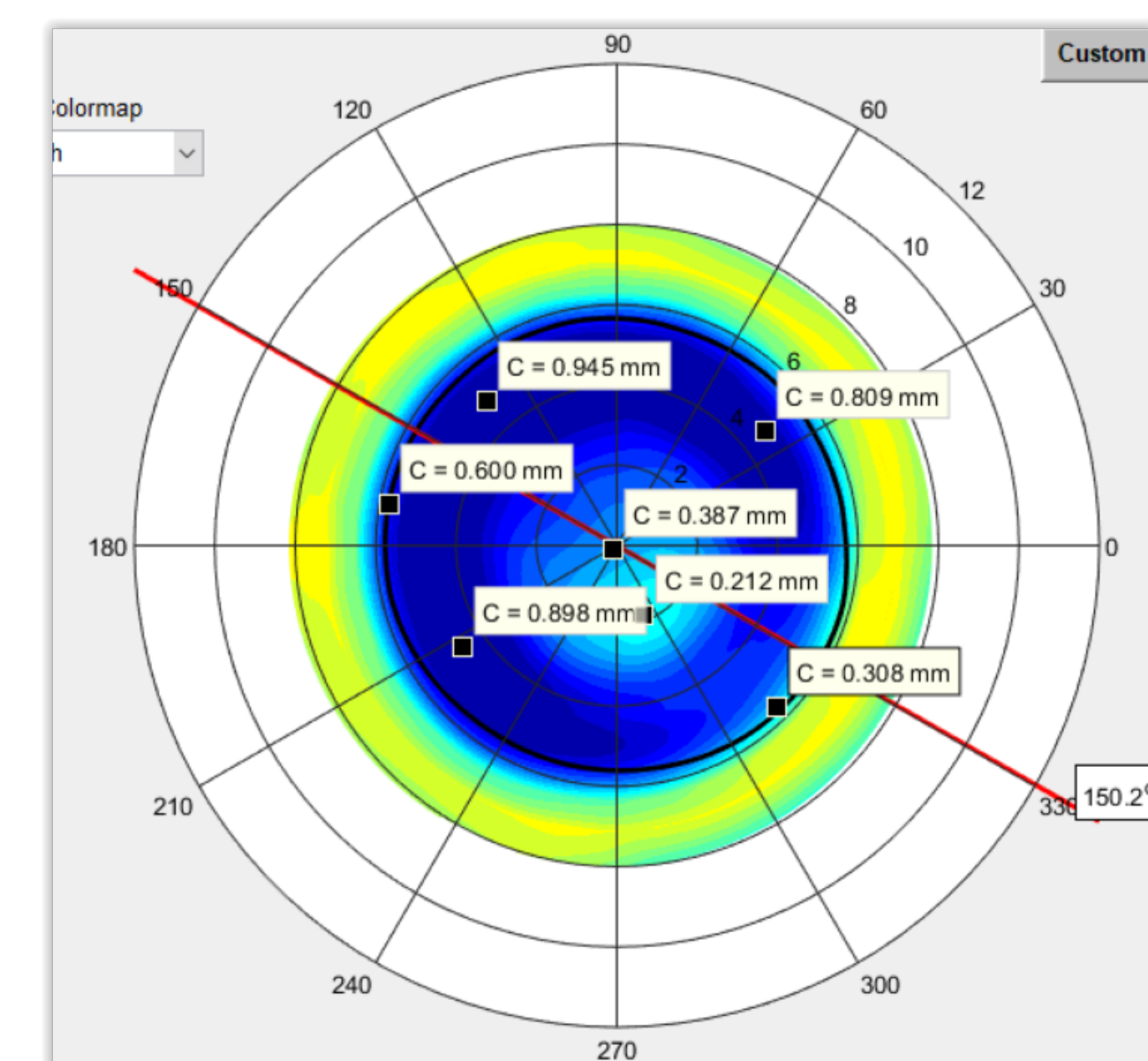
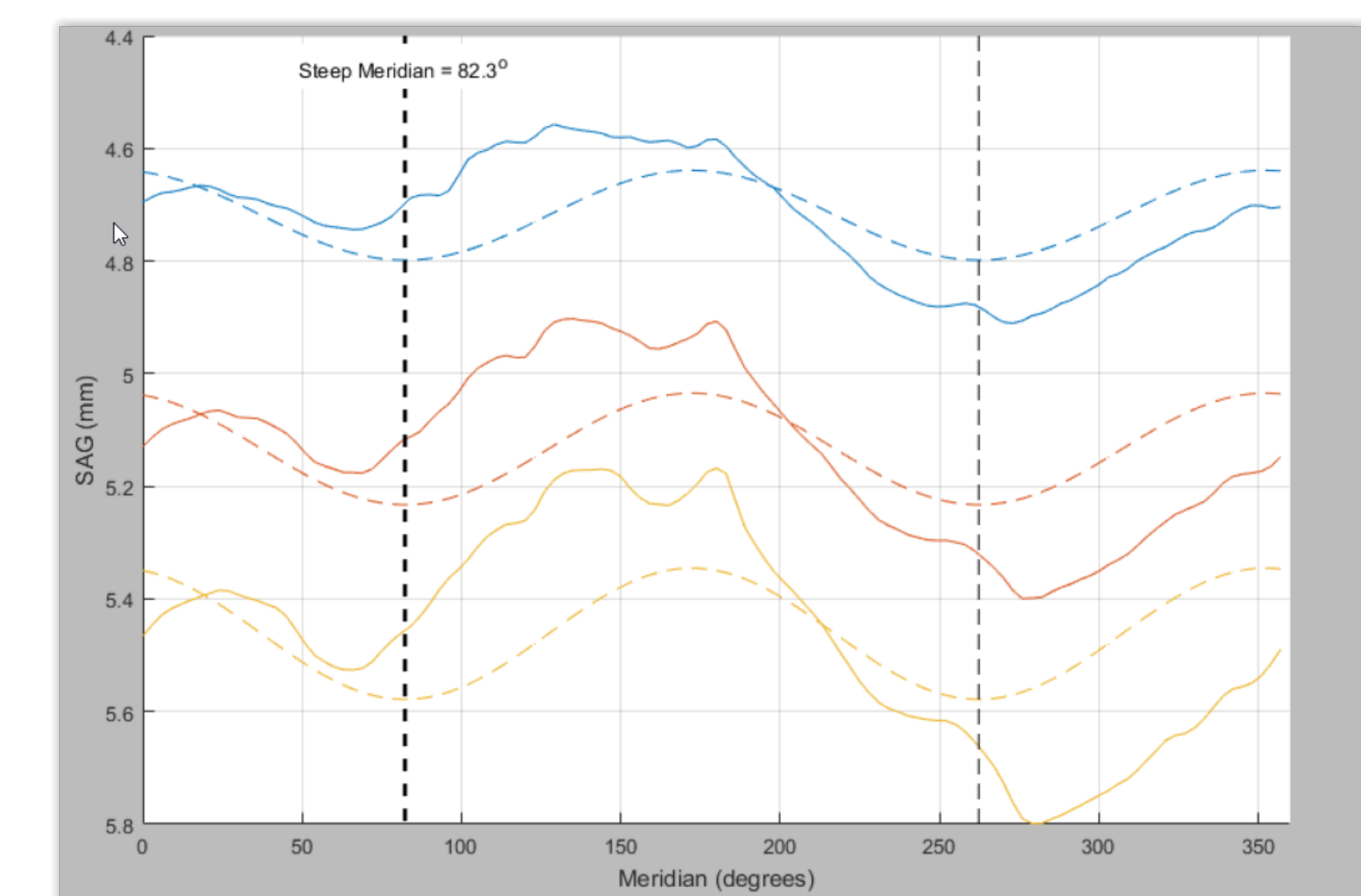


Figure 3. Comparison of corneal thickness at presentation and six month follow up.

## CONCLUSION

Severe keratoconus and corneal transplants can be challenging to manage. This patient’s left eye was extremely prolate in shape after her corneal transplant with max keratometry readings reaching ninety-two diopters. She had experienced issues with comfort and vision when fit with GP lenses, so she was fit in scleral lenses. Vision was greatly improved in the scleral lenses, especially in the right eye with the addition of wavefront technology. The right eye must be watched closely for indications of a need for corneal transplantation such as risk for perforation or unacceptable best corrected visual acuity. The left eye must also be closely monitored for further separation of Decemet’s membrane. The detachment at this time is localized nasally, but if it becomes larger may require more invasive treatment, such as intracameral perfluoropropane (C3F8) injection, which has been found to resolve similar presentations (1). The goal in these cases includes protecting the health of the cornea while providing the patient with the best functional vision possible. Long term immunomodulators, frequent follow-up, and co-management with ophthalmology are critical in achieving these goals.

## REFERENCES

1. D’Souza, S., Solanki, N., Sushma, K. R., Solanki, P. (2017) Late onset Decemet’s membrane detachment 20 years after penetrating keratoplasty. *Indian Journal of Ophthalmology* 65 (7) 621-23.
2. Arnalich-Monitel, F., Barrio, J. L. A., Alio, J. L., (2016) Corneal surgery in keratoconus: which type, which technique, which outcomes? *Eye and Vision*. 3:2

## ACKNOWLEDGEMENTS

Thank you, Valley Contax and Visionary Optics, for the help in designing lenses and providing educational images for this project!