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## INTRODUCTION

When fit appropriately, scleral lens wear results in less edema than physiological hypoxic swelling of the cornea [1,2]. A low-DK lens material, excessive negative pressure under the lens, and lens-cornea touch may result in hypoxic corneal compromise. Important risk factors can also make a patient more susceptible to this complication. These include low endothelial cell count in cases such as Fuch's Endothelial Dystrophy or post-graft corneas. Limbal compromise, such as Limbal Stem Cell Deficiency, may also pre-dispose a patient to corneal hypoxia and edema with scleral lens wear. It has been demonstrated by computational modeling that in hypoxic conditions, metabolic support from the limbus spares the most peripheral region of the cornea from edema [3]. In contrast, our case displays an incidence of scleral lens-induced microcystic edema adjacent to the limbus with sparing of the central cornea.

## CASE DETAILS

A 32-year-old female presents with complaints of dry eye OU. Medical history includes Marfan syndrome, psoriatic arthritis, and hypertension. The patient is status post scleral-fixed IOL implantation after bilateral lens subluxation at age 7. Rigid gas-permeable lenses were worn for 11 years, and a bilateral upper lid ptosis repair was performed at age 19. The patient suffers from dry eye syndrome, Limbal Stem Cell Deficiency OU and intermittent alternating exotropia. Scleral contact lens fitting was initiated as a dry eye treatment. During the fitting process, microcystic edema was observed in 360 degrees of the peripheral cornea OU despite adequate clearance of the entire cornea and limbus according to lens manufacturer recommendations. Anterior segment OCT and pachymetric imaging revealed that the limbal area alone was affected. These findings were reversible upon lens removal.

## CONTACT LENS PARAMETERS

Eye	Lens	Power	Base Curve	Diameter	Material	Center Thickness
OD	Blanchard OneFit A	+0.62 SPH	8.0	14.70	Optimum Infinite (Dk 180)	250 microns
OS	Blanchard OneFit A	+0.87 SPH	7.9	14.70	Optimum Infinite (Dk 180)	250 microns

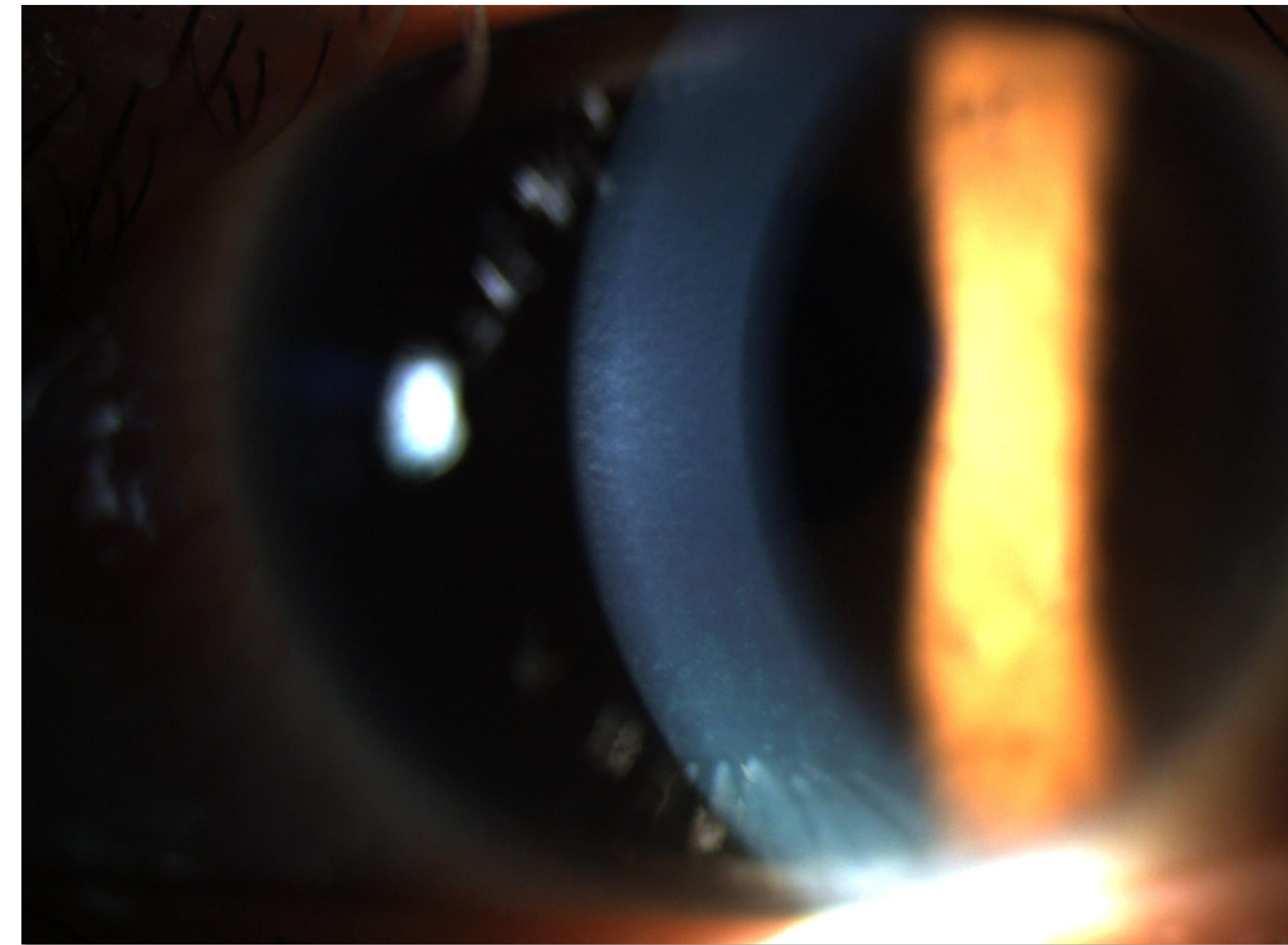


Fig 1. Corneal whorl pattern characteristic of Limbal Stem Cell Deficiency

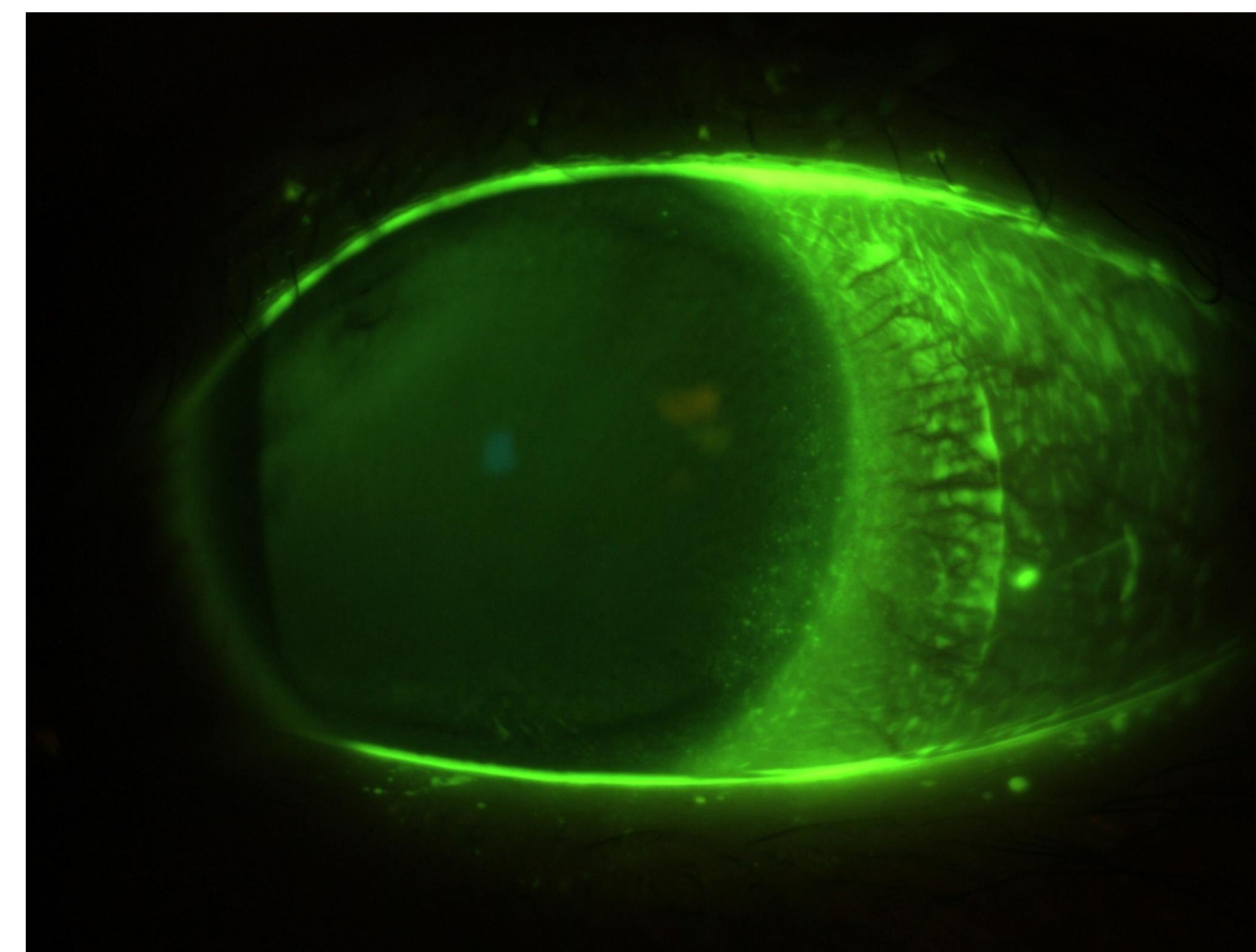


Fig 2. Limbal Microcystic Edema as observed after lens removal with Fluorescein Sodium

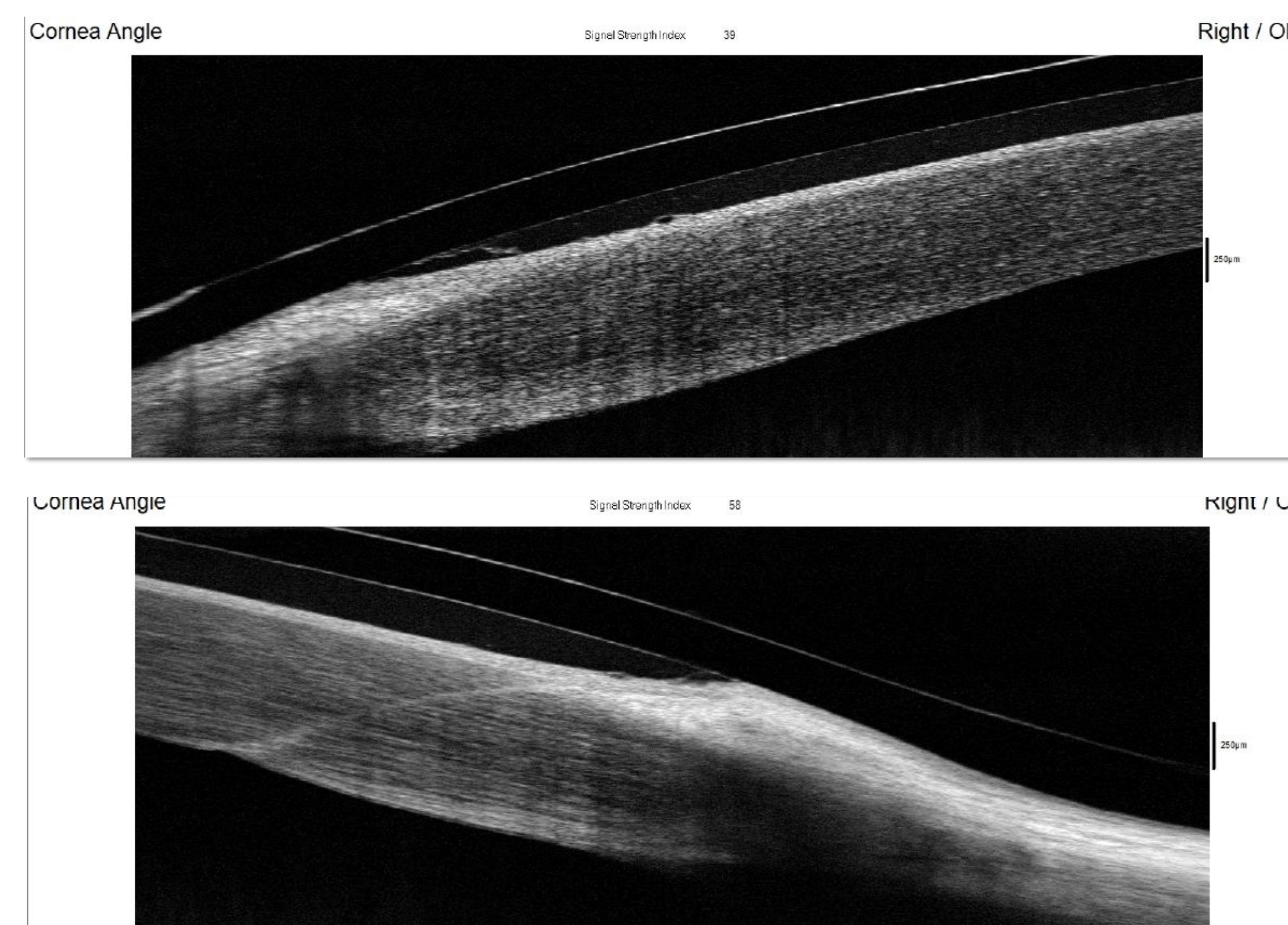


Fig 3. Microcysts in the presence of adequate limbal clearance, as observed with anterior segment OCT

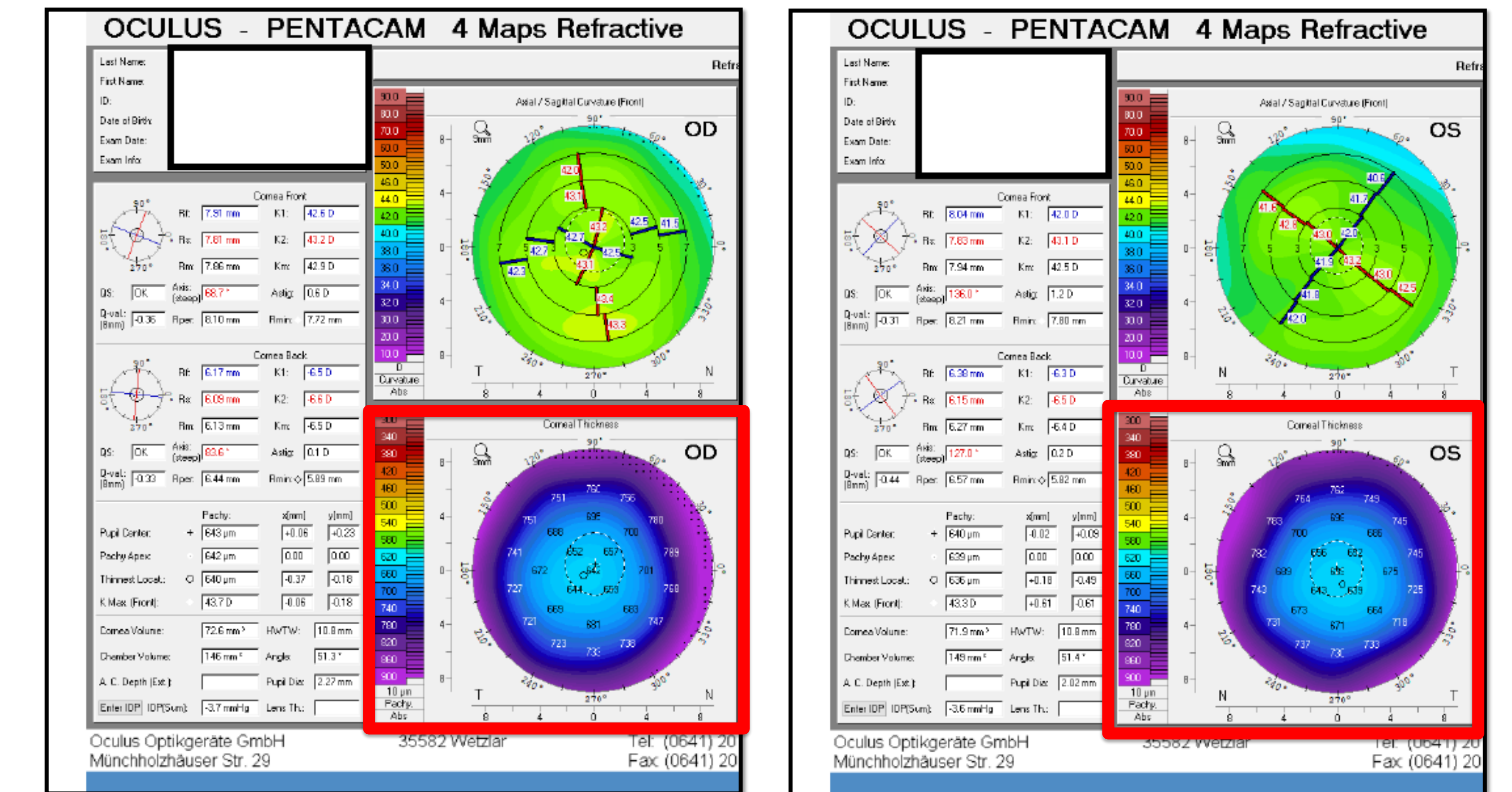


Fig 4. Limbal edema sparing central cornea as evidenced by pachymetry map, obtained using Pentacam® tomography

## CONCLUSIONS

Hypoxic complications of scleral lens wear may be avoided by ensuring appropriate vault of the entire cornea and limbus. **However, in our case limbal microcystic edema occurred despite appropriate lens fit.** This complication warrants further study. The existence of hypoxia and resultant edema only in the limbal region of this patient's corneas suggests that this location lacks adequate metabolic support.

Our patient's comorbidity of Limbal Stem Cell Deficiency seems a likely culprit for this deficit. Suction force under the lens is also a possible contributor to this unique complication. During the fitting process, our patient complained of persistent tightness and suction upon removal of the lens. Progressive flattening of edges failed to resolve the issue. Perhaps Marfan Syndrome, a collagen-vascular disease, affects the morphology of the sclera and its interaction with the lens edge, resulting in lens suction.

**Practitioners should expect the unexpected** when fitting scleral lenses for patients with complex ocular and medical history, and look carefully for risk factors pre-disposing them to hypoxic complications. When scleral lens wear is warranted in patients with these risk factors, it is important to watch these patients closely to ensure that scleral lens wear remains safe and beneficial to their ocular health.

## REFERENCES

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