

Navigating Extensive Corneal Neovascularization in a Case of PMD: preventing scleral lens discontinuation and reduction in functional vision

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BACKGROUND

Corneal neovascularization (CNV) is a possible complication with scleral lens wear, often caused by hypoxia. Now with higher Dk lens materials, it can also be a result of mechanical stress due to a non-optimal fitting relationship with the ocular surface. Detecting early structural changes and starting treatment is essential to prevent progression of CNV and preserve vision.

Topical steroids are used to reduce inflammation involved in angiogenesis and can help mitigate new vessel formation. However, this is not a permanent solution, so the underlying cause must be managed to prevent development of sight-threatening conditions such as limbal stem cell deficiency.

CASE HISTORY

- 40-year-old white male
- Scleral lens wear ~8 years for pellucid marginal degeneration OU
- Average daily lens wear 10-17 hours, 6-7 days x week
- Occasional non-compliant overnight wear
- Mild peripheral corneal bullae and central edema first noted OS in 2019 with resolution after use of FML BID x 1 week

DISCUSSION

In this case, a topical steroid and lens adjustments were used to limit complications and prevent scleral lens dropout in a patient with CNV.

FML was utilized to inhibit the inflammatory cascade and prevent further vessel growth into the patient's visual axis. Prompt introduction of this treatment reduced the associated edema and haze surrounding the CNV OS.

Differentiation of edge impingement and mid-haptic compression is important for proper lens parameter adjustments. Flattening of the lens edges caused mid-haptic compression and excessive edge lift off. Overtime, this compression resulted in significant conjunctival injection and mechanical strain to the limbal region which led to further CNV. Ultimately, steepening the edges reduced the compression and resolved the conjunctival injection.

With more years of lens wear and above average daily wear time, lenses are more prone to increased settling due to conjunctival laxity. To help assess accurate central and limbal clearance, the patient should wear lenses 4-5+ hours prior to being seen in-office. This will help ensure there is adequate vault remaining after extended lens wear.

CONCLUSIONS

In cases of CNV, non-optimal fitting lenses should be adjusted promptly to limit hypoxic and mechanical strain. Topical steroids should be considered as adjunct therapy to limit vessel growth, resolve edema, and prevent permanent vision loss. Lastly, with long term scleral lens wear, more settling time may be needed to accurately assess lens fit because of increased conjunctival compressibility.

BIBLIOGRAPHY

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EXAM FINDINGS 2022

Date	Pertinent Clinical Findings	Treatment/Management
01/31/22	OS: central CNV with edema, superior nasal peripheral bullae; minimal central and nasal limbal vault	<ul style="list-style-type: none">• Increase central vault 100 µm OS• Switch to higher DK material OU• Begin FML TID OS x 1 month
02/28/22	OU: minimal tear exchange, edge blanching 360 OS: stable CNV, improved edema/bullae; minimal central vault	<ul style="list-style-type: none">• Flatten edges 360 OU• Increase central vault 100 µm OS• Taper FML to BID OS x 1 month
03/28/22	OU: adequate central vault, minimal but acceptable limbal vault, slightly excessive but acceptable edge lift 360 OS: stable CNV and edema	<ul style="list-style-type: none">• Continue with current lenses• Taper FML to QD until completion of bottle OS• Monitor 1 year at CEE

EXAM FINDINGS 2023

Date	Pertinent Clinical Findings	Treatment/Management
08/14/23	OU: moderate conjunctival injection 360 OS>OD; minimal central and limbal clearance, heel down compression 360 with excessive edge lift OS: stable CNV with resolution of haze, new vessel growth superior nasal	<ul style="list-style-type: none">• Increase central vault 200 µm OU• Increase limbal vault 50 µm OU• Steepen edges 360 OU
08/28/23	OU: reduced conjunctival injection; adequate central and limbal vault, no edge blanching 360	<ul style="list-style-type: none">• Assess lenses in 2 weeks following longer wear time
09/18/23	OU: no conjunctival injection; adequate vault and edge alignment 360 following 5+ hours of wear, minimal OR found OS with BCVA of 20/20 OD/OS	<ul style="list-style-type: none">• Order final power adjustment OS• Monitor 1 year at CEE

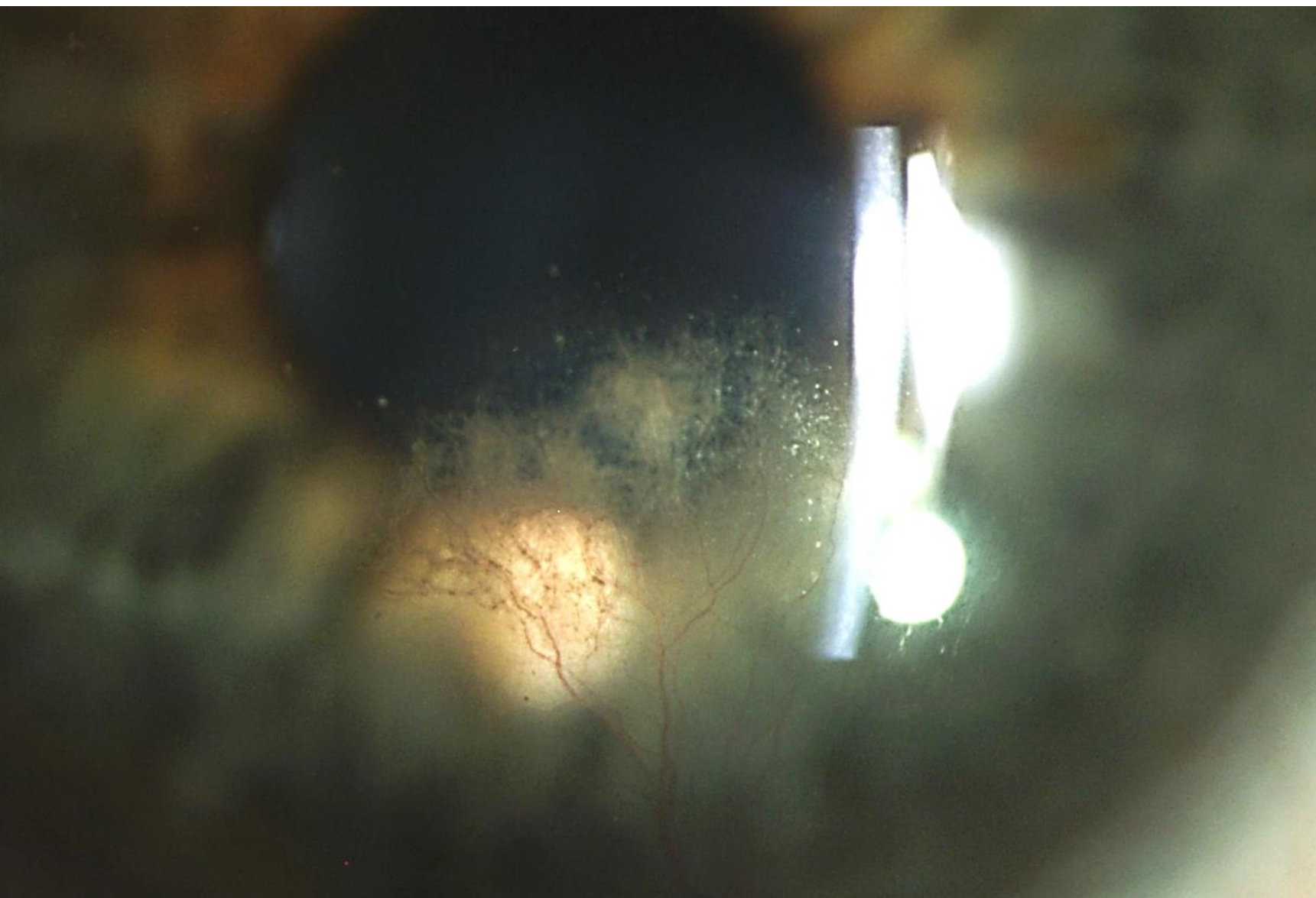


Figure 1. Central CNV OS approaching the visual axis with surrounding sub-epithelial haze - 2022

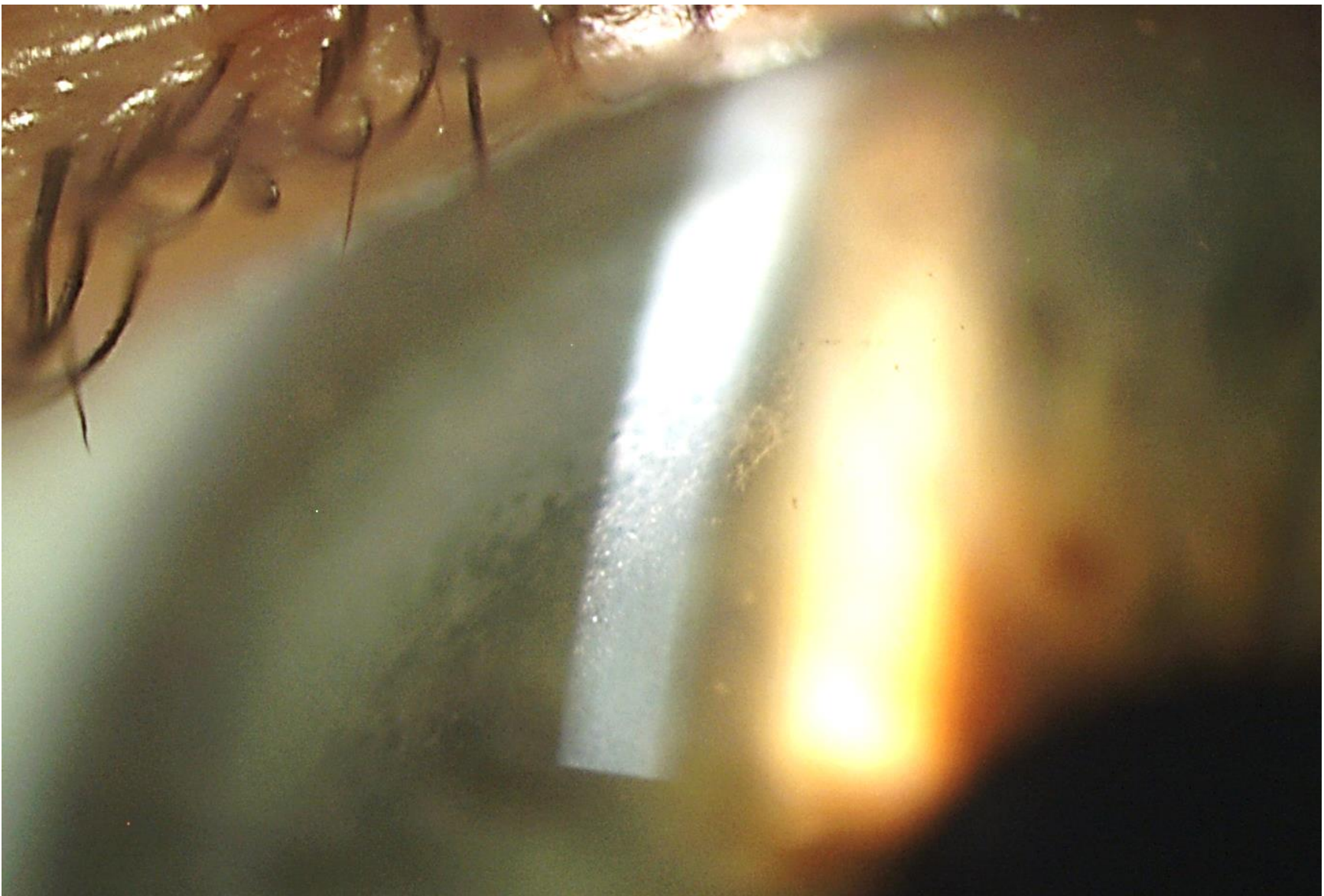


Figure 2. Peripheral bullae/haze superior nasal cornea OS - 2022

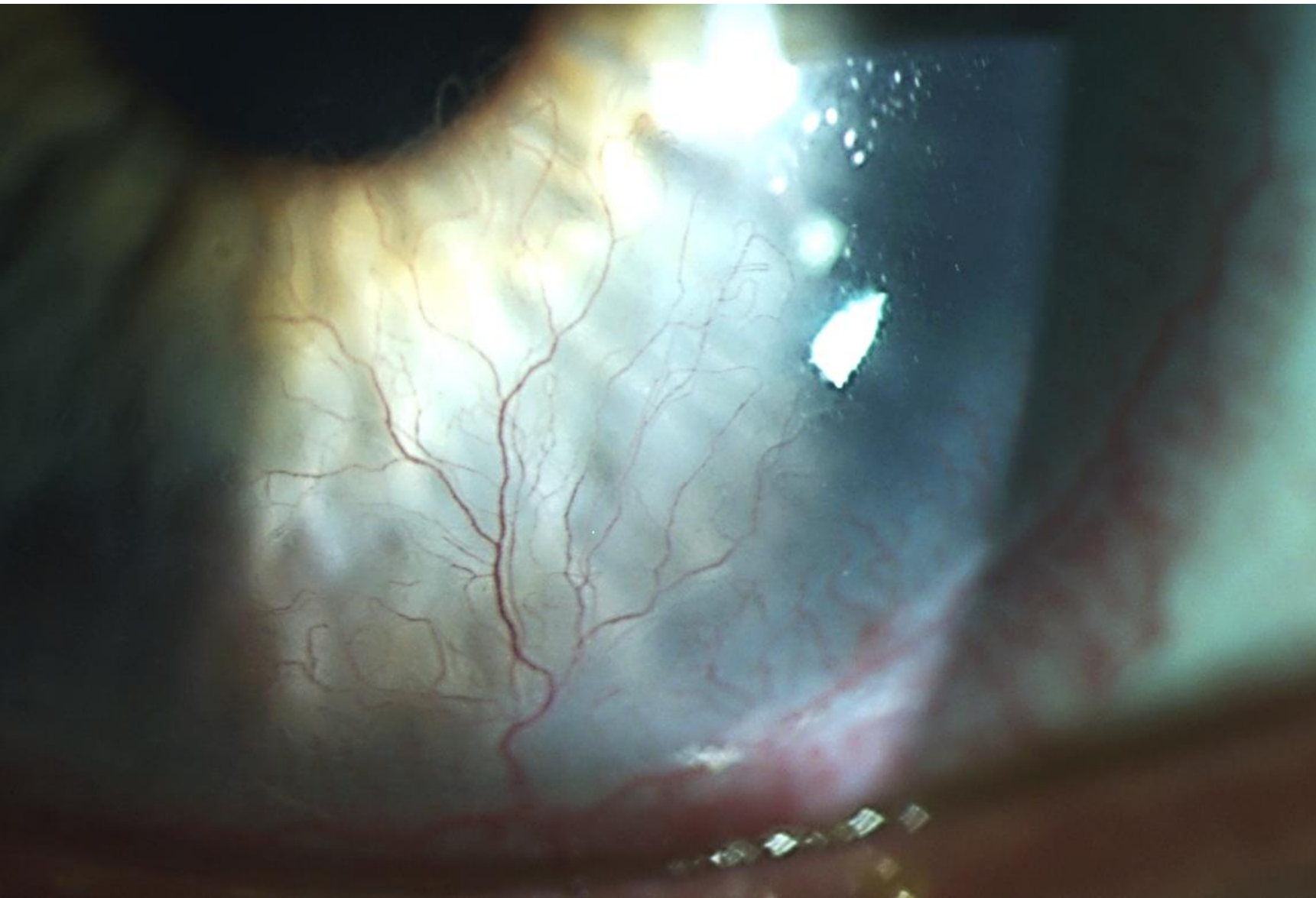


Figure 3. Central CNV OS with resolved underlying haze - 2023

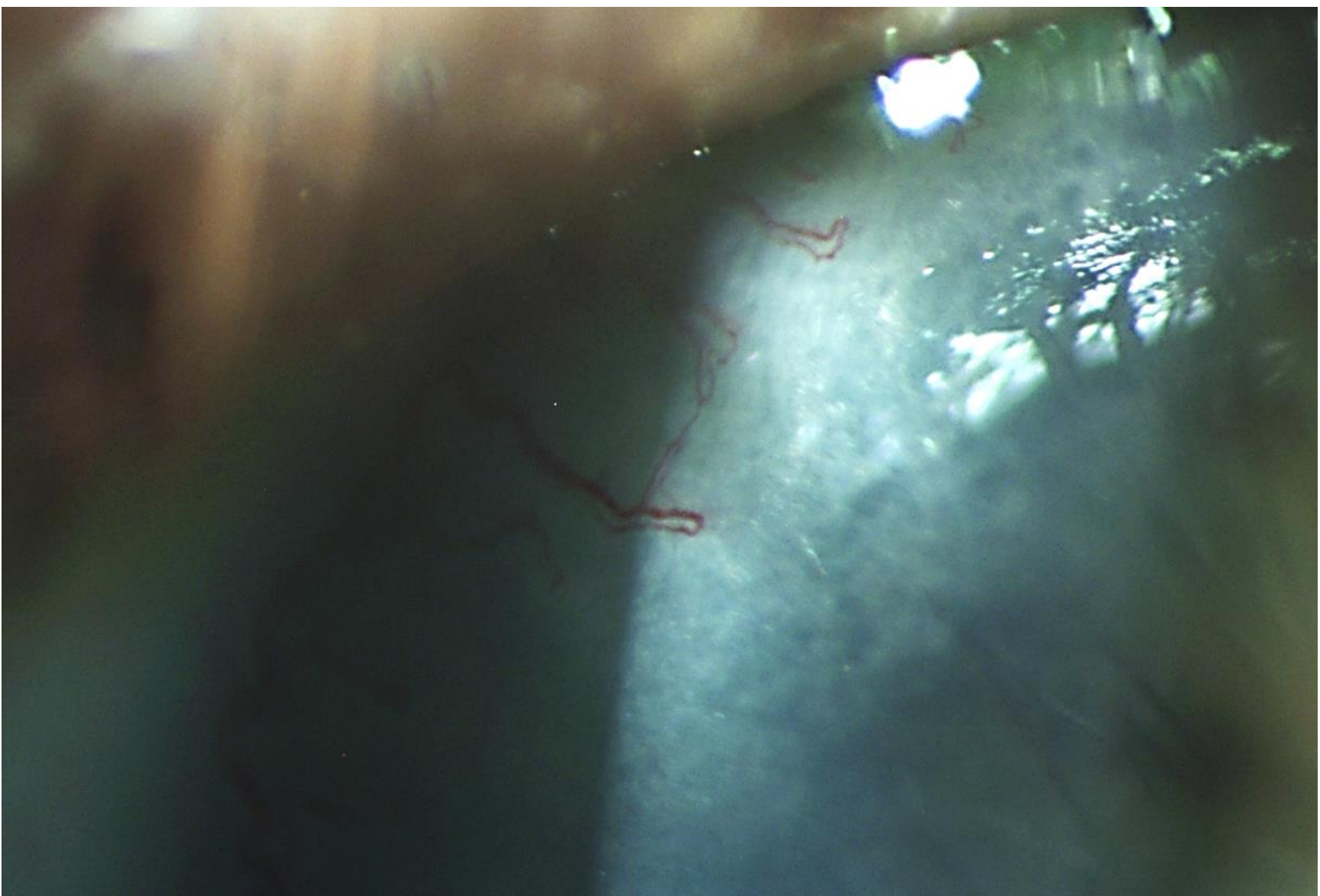


Figure 4. Improved bullae superior nasal cornea OS with new CNV - 2023