

# A Cautionary Tale: Visual Rehabilitation with Scleral Lens in a Case of Post-Lasik Ectasia with Form Fruste Keratoconus in the Fellow Eye

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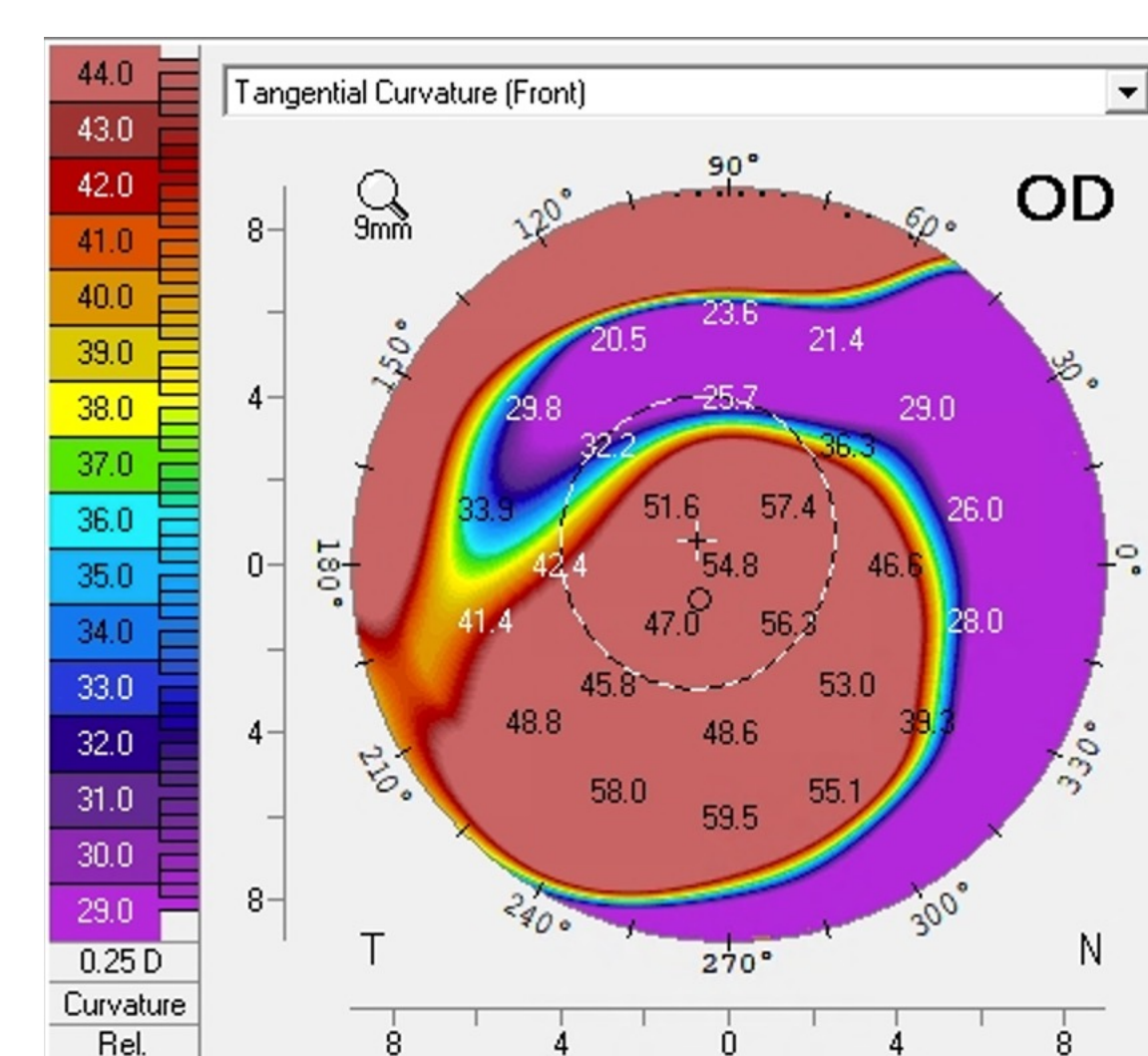


## Background

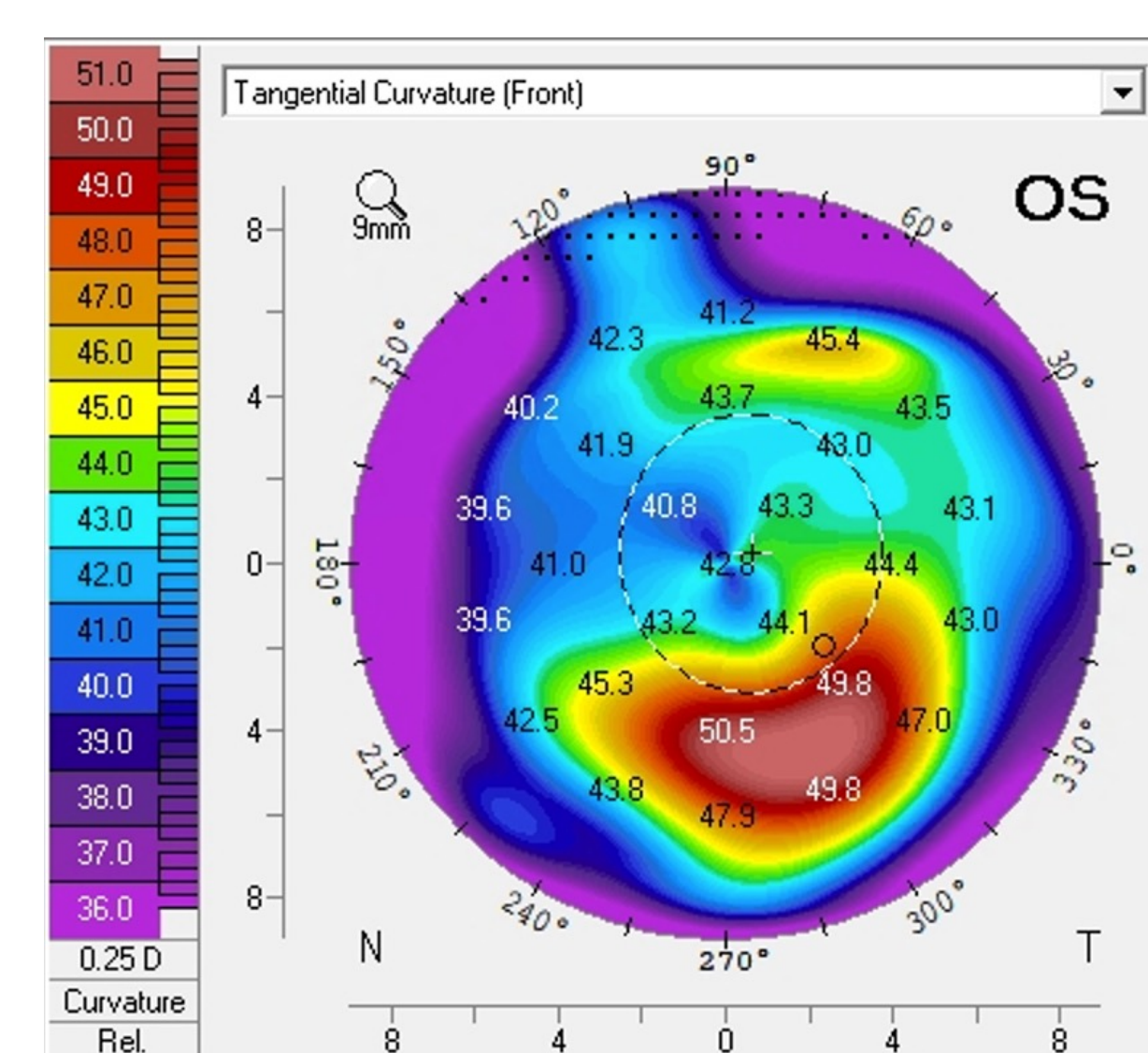
- **Corneal ectasia:** one of the most devastating postoperative complications of Laser In situ Keratomileusis (LASIK).
  - Occurs when the posterior stroma behind the LASIK flap fails to support the structure of the cornea, leading to corneal protrusion and thinning<sup>1</sup>
- Patients often suffer from poor best corrected visual acuity (BCVA), loss of contrast sensitivity and perception of higher-order aberrations, such as glare and halos<sup>2</sup>
- **Risk factors** for post-LASIK ectasia<sup>2</sup>:
  - Abnormal pre-operative topography
  - Low residue stromal bed thickness
  - Young age
  - Low pre-operative corneal thickness
  - High myopia
- **Form fruste keratoconus:** a type of subclinical keratoconus that is diagnosed by topographical signs only<sup>3</sup> → a major risk factor for the development of post-LASIK ectasia.

## Case Description – Patient MW

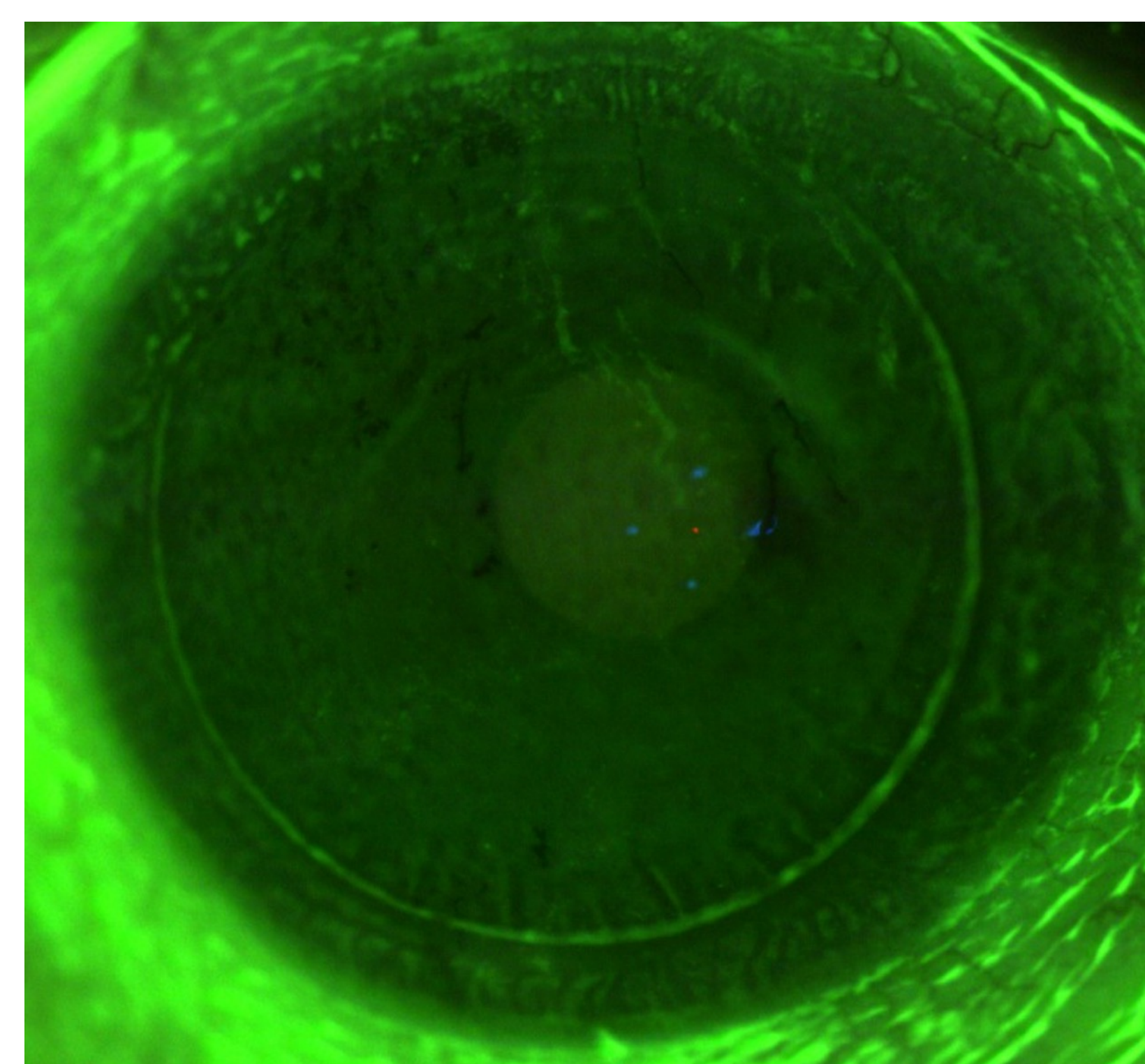
- 69-year-old Caucasian female presented for specialty contact lens consult, referred by a local optometrist.
- **Ocular history:** LASIK OD only in 2001, diagnosis of post-LASIK ectasia OD in 2008
  - Unsuccessful with gas permeable lenses in the past
- **Chief complaint:** constant blurred vision OD without correction at distance and with +2.50 readers at near
- **Subjective refraction and BCVA:**
  - OD -4.75-5.75x068 20/80 (PH 20/50-)
  - OS +1.00-2.00x106 20/20-
- **Topography**
  - OD steepening and elevation of the central-inferior cornea involving the visual axis (Figure 1)
    - Total deviation value **flagged red** on Belin/Ambrosio Enhanced Ectasia Display (Figure 2)
  - OS steepening and elevation of the inferior cornea below the visual axis (Figure 3)
    - Total deviation value **flagged yellow** on Belin/Ambrosio Enhanced Ectasia Display (Figure 4)
- **Slit lamp examination of cornea**
  - OD: well-defined LASIK scar, apical thinning and striae centrally (Figure 5)
  - OS: unremarkable



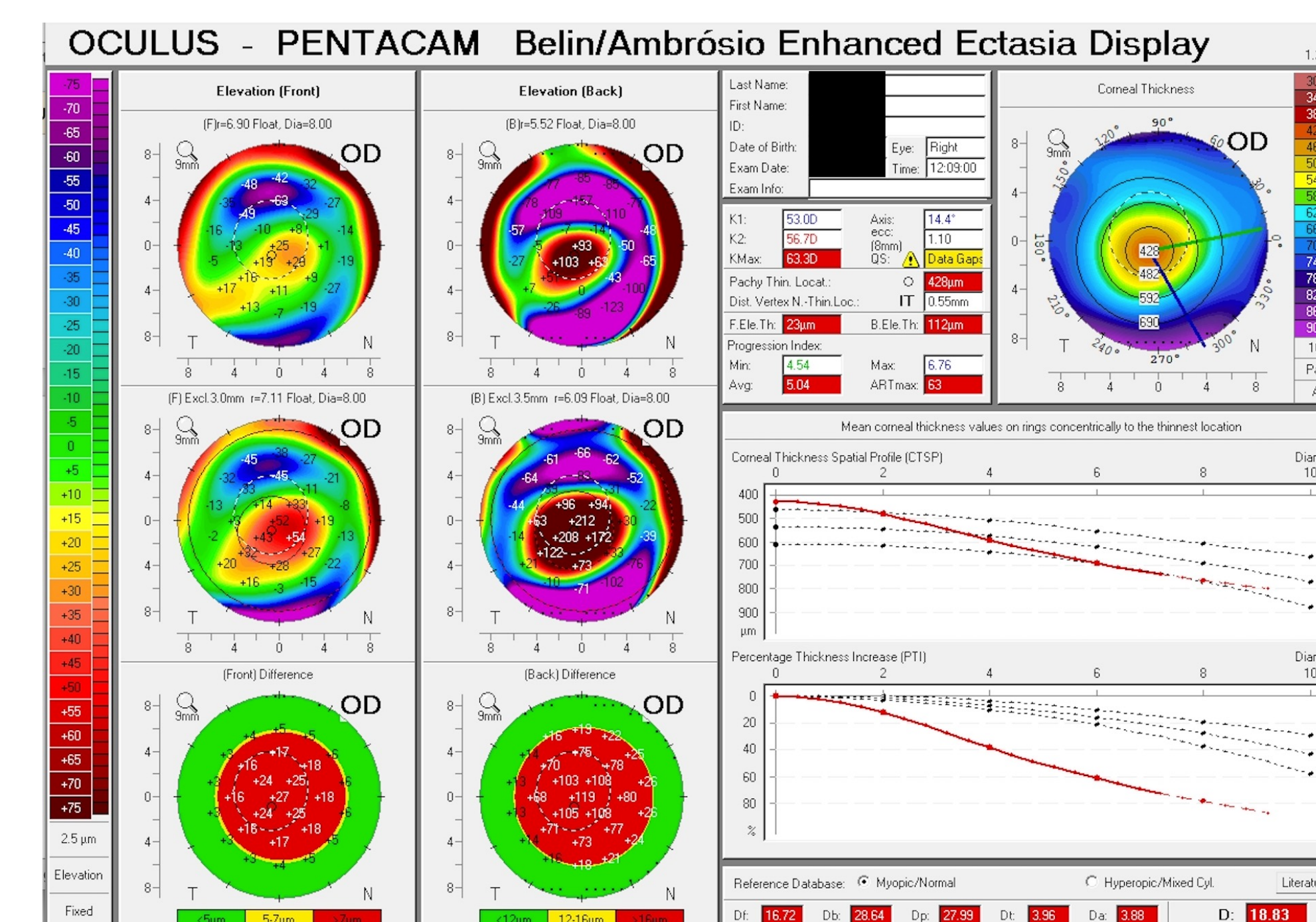
**Figure 1:** Topography of right eye at initial consultation visit



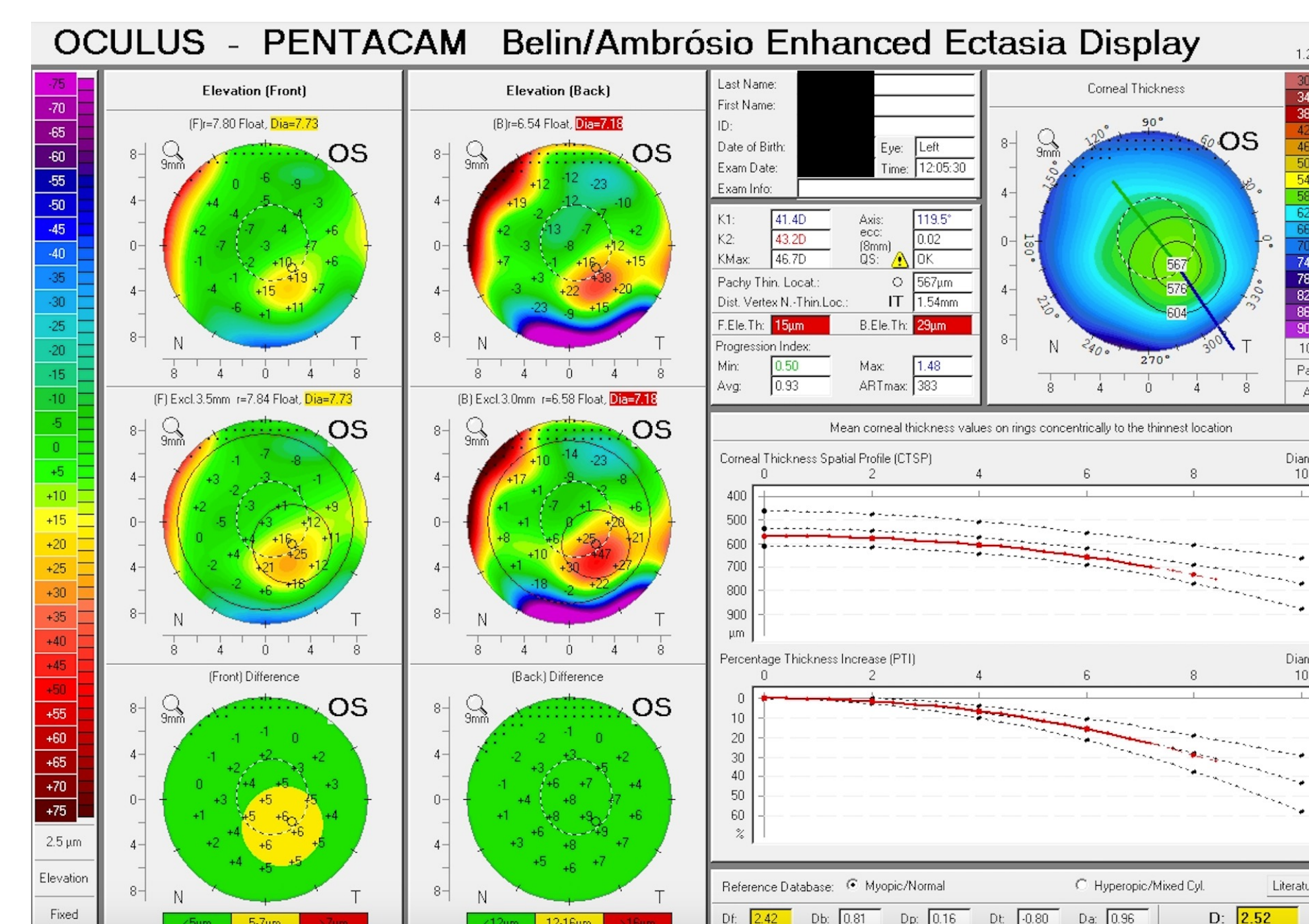
**Figure 3:** Topography of left eye at initial consultation visit



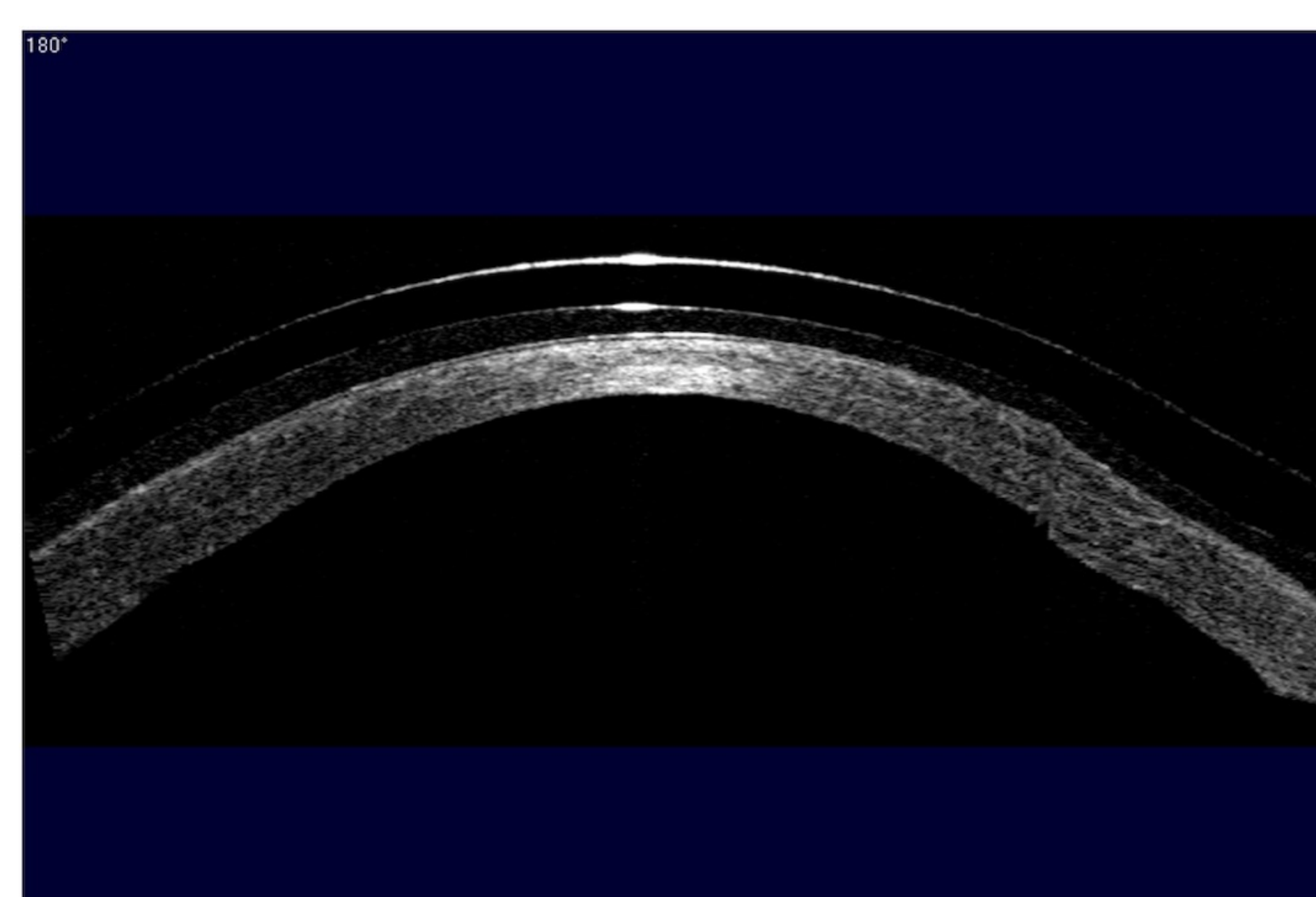
**Figure 5:** fluoro-image of right eye showing a well-defined LASIK scar



**Figure 2:** Belin/Ambrosio Enhanced Ectasia Display of right eye at initial consultation visit



**Figure 4:** Belin/Ambrosio Enhanced Ectasia Display of left eye at initial consultation visit



**Figure 6:** AS-OCT of right eye wearing a scleral lens at the final follow-up: central clearance of 200 µm after 4 hours of wear

## Management

- Based on the topography, the patient was diagnosed with **form fruste keratoconus OS** with unclear timeline of onset, since previous exam records were not available.
- Zenlens bi-elevation scleral lens OD, empirically fitted with Eaglet
  - **Final lens parameters:** 4960/5310 / 7.01 / -3.25 / 17.0 / APS steep 4 / LCD +150 / Boston XO / 0.35
  - **Final lens assessment:**
    - BCVA OD: 20/40+
    - Excellent fitting relationship (Figure 6): central clearance of 200 µm after 4 hours of wear, good mid-peripheral and limbal clearance 360, edges aligned 360
    - Patient reported clear and comfortable vision all day OD
- Will **repeat topography** every 6 months to monitor for any progression of ectasia OD and form fruste keratoconus OS
  - The patient preferred deferring crosslinking referral OD until demonstrated progression

## Discussions

- Given the severe consequences of post-LASIK ectasia, it is important to **identify for risk factors** before surgery.
- Patients should be screened carefully before LASIK for any signs of **form fruste keratoconus** on corneal topography
  - **Belin-Ambrosio Enhanced Ectasia Display** can be used to aid screening
- When post-LASIK ectasia is present, scleral lenses are an effective tool for visual rehabilitation.

## References

1. Giri P, Azar DT. Risk profiles of ectasia after keratorefractive surgery. *Curr Opin Ophthalmol*. 2017 Jul;28(4):337-342.
2. Melki SA, Azar DT. LASIK complications: etiology, management, and prevention. *Surv Ophthalmol*. 2001 Sep-Oct;46(2):95-116.
3. Bamdad S, Sedaghat MR, Yasemi M, Vahedi A. Sensitivity and Specificity of Belin Ambrosio Enhanced Ectasia Display in Early Diagnosis of Keratoconus. *J Ophthalmol*. 2020 Dec 9;2020:7625659.

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