Angel Eyes

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Background: Corneal ectasia after refractive surgery can impair vision with increasing myopia, irregular astigmatism and loss of uncorrected and/or best-corrected visual acuity. Steepening of the cornea and central and paracentral corneal thinning may also be present [1]. Ectasia may occur one week to many years after surgery [2,3]. The Ectasia Risk Score System is a cumulative score system to evaluate for corneal ectasia and includes abnormal topography, corneal thickness less than 450 microns and manifest refraction spherical equivalent (MRSE)> -14 D and age less than 22 years old [4]. In the 1990s, refractive surgery including LASIK and the risk of iatrogenic cornea ectasia prompted the development of corneal tomography, thus revolutionizing the detection of subclinical keratoconus and corneal ectasia.

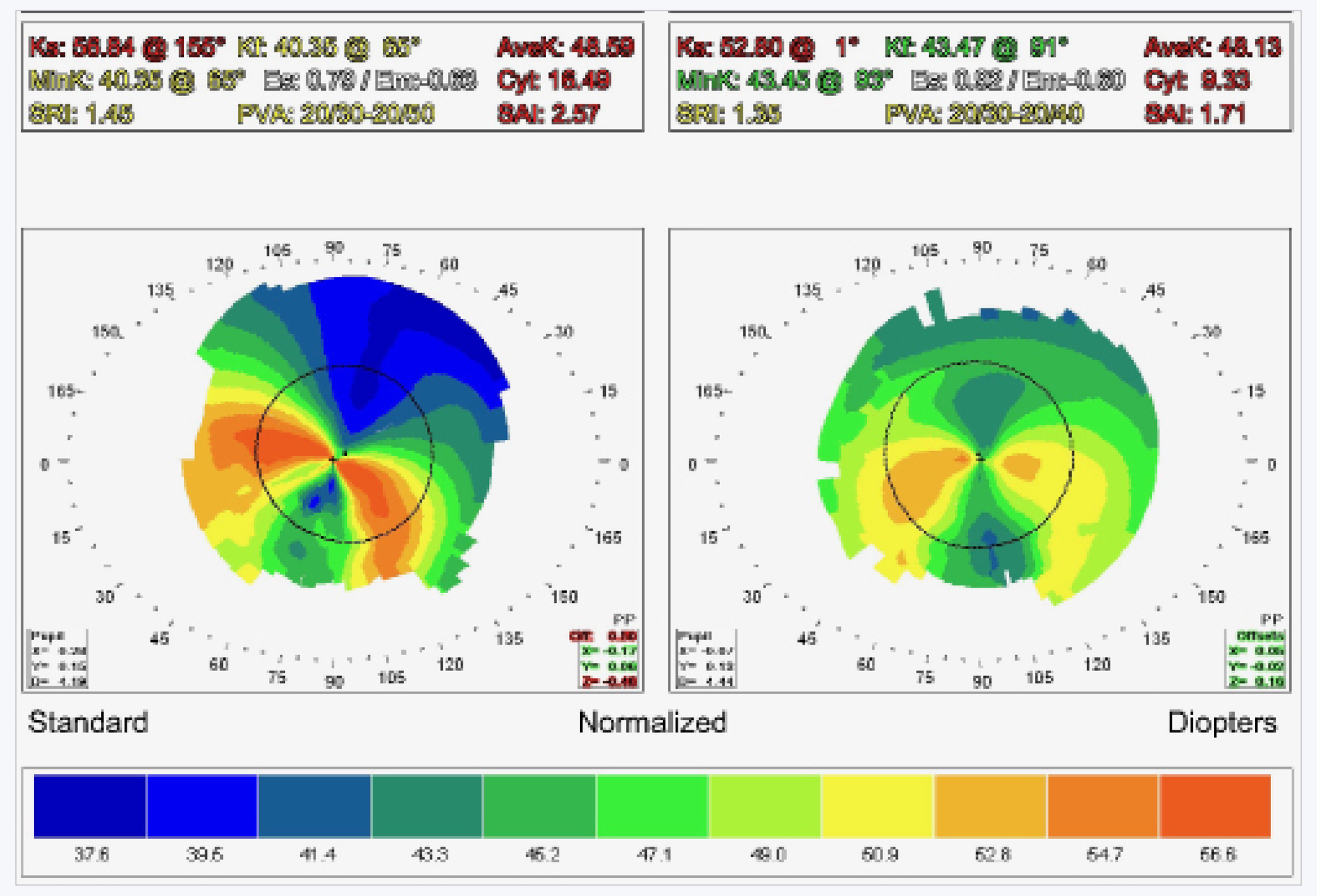

Figure 1: Corneal topography demonstrating irregular astigmatism.

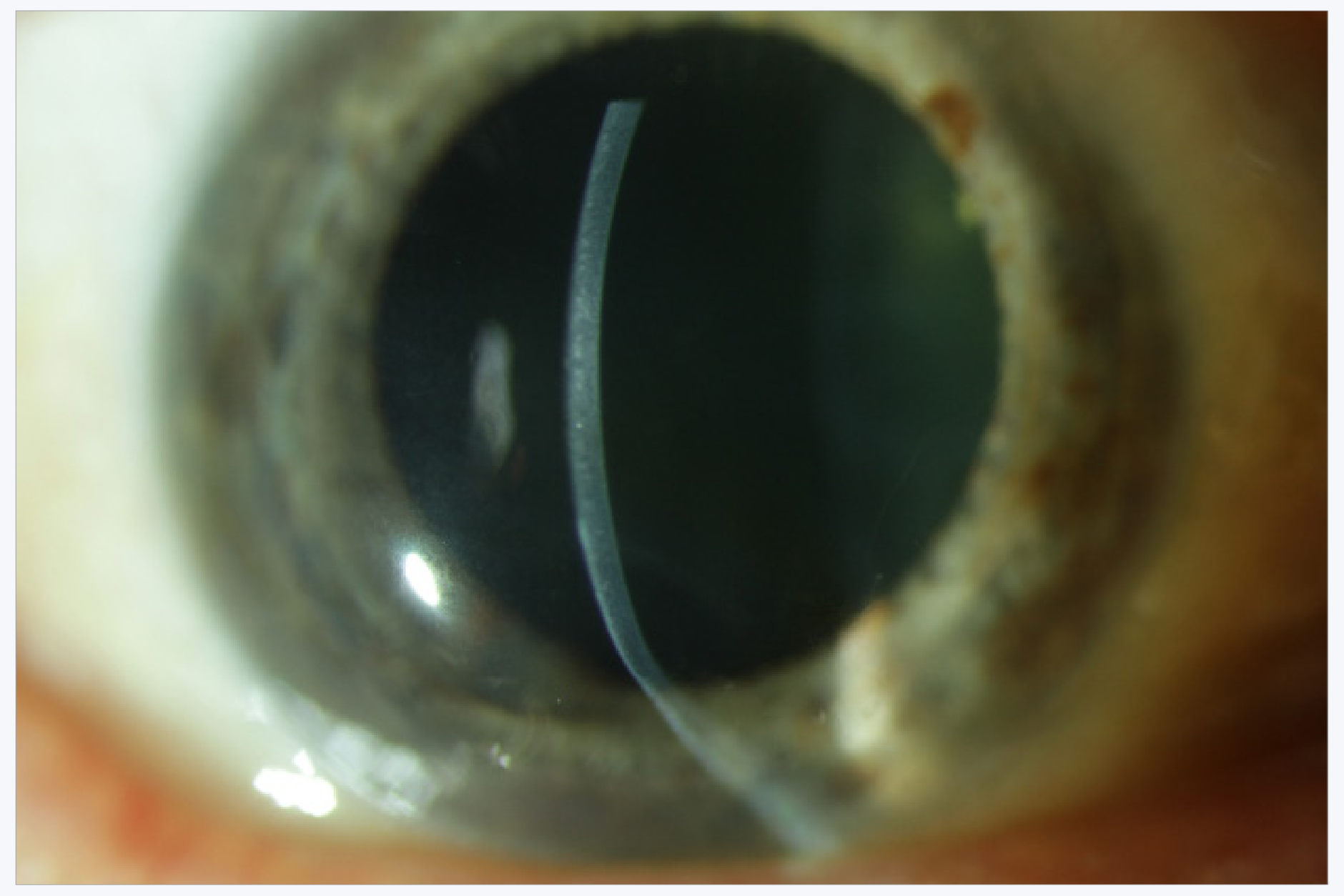

Figure 2: Inferior corneal thinning.

Case Description: This case describes a 55-year old male with pellucid marginal degeneration corneal ectasia of both eyes status post LASIK. He was intolerant to corneal gas permeable contact lenses and had multiple red eyes from subconjunctival hemorrhages due to difficulty removing hybrid contact lenses. At the time of presentation, he was not wearing the left lens due to trouble with lens removal. There was no significant medical history and no medications were taken. Ocular history was significant for corneal ectasia status post LASIK with revision OU. Preservative free artificial tears were used five times a day, along with a cooling gel mask.
Entering vision was 20/30 OD (with contact lens) and 20/150 OS (pin hole to 20/50) without correction. Corneal topography of both eyes demonstrated irregular astigmatism with a pellucid-like appearance. Refraction OD -6.00+1.00x150 20/30-2, OS -6.00+2.50x010 20/40+2. Intraocular pressure by Icare Tonometry were 18mmHg OU. Horizontal visible iris diameter was 11.9mm OU. Slit lamp examination revealed ocular rosacea with Meibomian gland dysfunction and telangiectasia OU. Subconjunctival hemorrhages were present OU, temporally OD and nasally OS. Inferior corneal staining was present OU, right eye more than the left eye. Faint LASIK scars were present OU. Moderate inferior thinning was present OD. A corneal scar was present OS. The dilated examination was unremarkable. Management options included Avenova eyelid cleaner, warm compresses 5 daily OU and HydroEye Omega fatty acids. Non-preserved artificial tears were continued with the option to consider additional treatment options in the future if needed. The patient was reassured that the subconjunctival hemorrhages will resolve over time and to report any recurrence.

Scleral Lens Fitting: Both eyes were fit with SynergEyes VS Scleral Lens 3600 / 36-42 / 8.4 / plano / 16.0. After settling, the right lens demonstrated 175 microns central apical clearance with 1+ superior and inferior blanching. Lens awareness was present.
The left lens has 250 microns central apical clearance, adequate limbal clearance without blanching. Good comfort was obtained. Over-refraction was +4.25DS each eye, OD 20/15-1, OS 20/15+2. A new right diagnostic lens was applied. SynergEyes VS 3800 / 36-42 / 8.4 / plano / 16.0. The right lens demonstrated 300 microns central apical clearance, adequate limbal clearance with mild superior blanching. This new lens was more comfortable than the prior right lens. Over-refraction was +4.25DS with 20/15 vision. Initial scleral lenses ordered, application and removal training was done and new lenses were dispensed. The See Green Lens Inserter by Dalsey Adaptives was helpful for lens application.

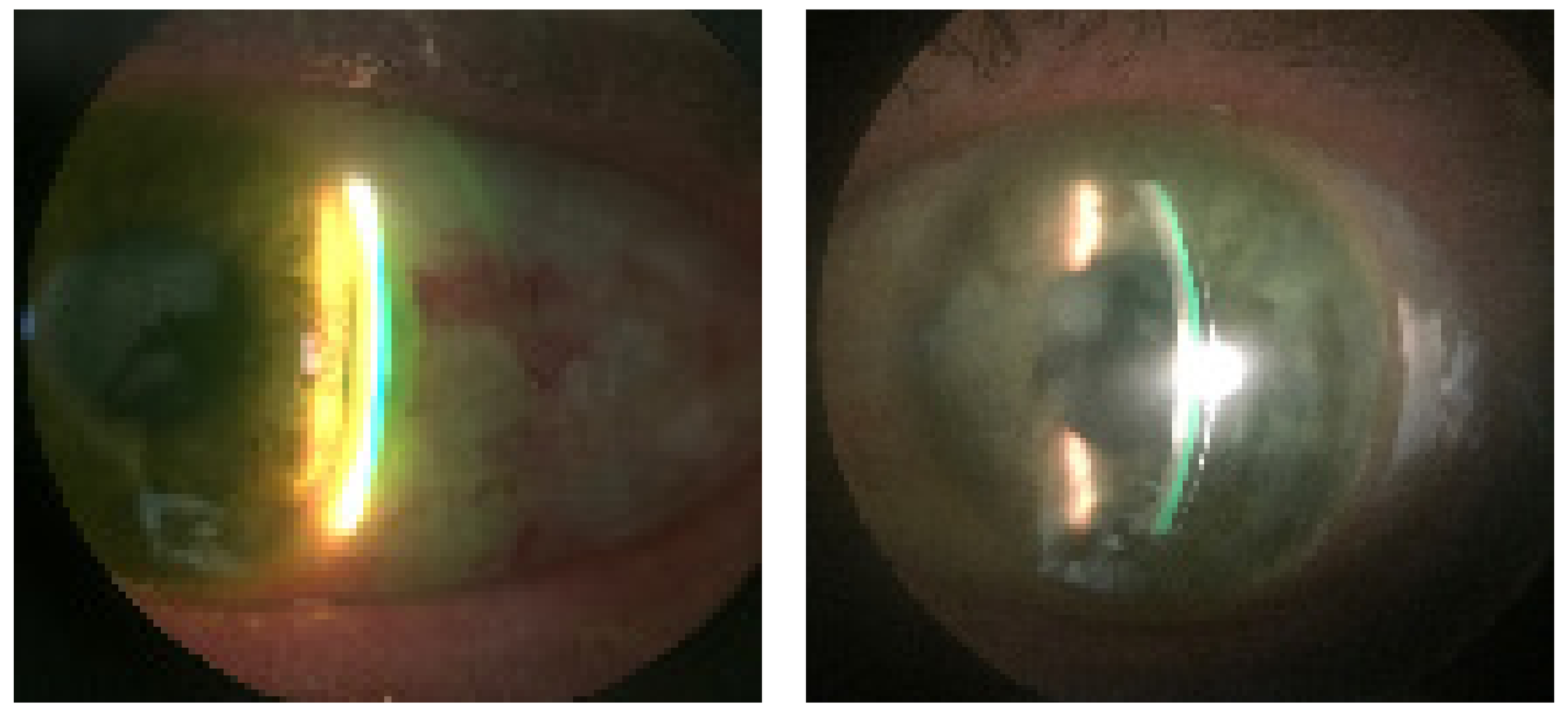

Figure 4

Lens Fitting: Both eyes were fitted with SynergEyes VS™ Scleral Lens 3600 / 36-42 / 8.4 / plano / 16.0

Right Eye Diagnostic Lens: SynergEyes VS™ Scleral Lens 3800 / 36-42 / 8.4 / plano / 16.0

Lenses Ordered: **OD**: SynergEyes VS 3700 / 36-42 / 8.4 / +4.50 / 16.0 **OS**: SynergEyes VS 3600 / 36-42 / 8.4 / +4.50 / 16.0

Follow Up: At the aftercare appointment, subjective vision was great "I have never seen so well in my entire life," comfort was excellent. Vision was 20/15-1 in each eye, with better than 20/15 vision binocularly. Average wearing time was 14 hours/day, Clear Care hydrogen peroxide solution was used for disinfection. Both lenses demonstrated 200 microns central apical clearance, adequate limbal clearance with trace superior blanching of the right eye and no blanching left eye. After lens removal, no corneal nor conjunctival staining was present in either eye.

Conclusion: Research has demonstrated that the shape of the limbus and para-limbal sclera are linear, or straight, rather than curved [5]. Toricity in the sclera can be present irrespective of corneal toricity [6]. Scleral lenses designed with toric peripheries offer several advantages such as lens decentration, lens distortion [7], air bubble formation, localized conjunctival vessel blanching [7,8], lens impingement [9,10], conjunctival prolapse, and post lens reservoir debris [6]. Toric landing zones may provide improved comfort, increased wearing time, overall satisfaction, better visual quality, and enhanced optical correction [10-12]. With this scleral lens design, alignment distributes weight more evenly over the sclera, providing excellent comfort ratings [13]. The design also incorporates a linear landing zone to distribute forces more evenly across the sclera. Studies of this lens design have demonstrated comfortable wearing time, minimal mid-day removal and less filming and fogging [13].

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