When Specialty Lenses Fail to Provide Clear Vision

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Case History

A 37-year-old Caucasian female presented to an outside provider on July 14, 2017 with a chief complaint of reduced vision in both eyes that had been present for years.

Entering unaided visual acuity:		Spectacle corrected visual acuity:		
	OD: 20/70	OD:	+6.25 -3.25 x 110	20/60
	OS: 20/70	OS:	+5.50 -3.25 x 070	20/60

Entrance Testing:
- Pupils: PERRL (-) APD
- Unaided distance cover test: 5^intermittent alternating esotropia
- Intraocular pressure GAT: 16 mmHg OU

Anterior/posterior segment evaluation: Unremarkable OU
- Macular OCT: Normal foveal contour, IS/OS junction intact, no edema OU

Additional testing: Topography: Asymmetric bowtie with early crab claw appearance OU

August 31, 2017: Contact lens fit with no history of contact lens wear.

Entering unaided visual acuity:
- OD: 20/70
- OS: 20/70+2

Additional testing: Topography: Irregular astigmatism OU, See Image 1 and 2

September 21, 2017: Contact lens evaluation and additional visual acuity testing. Scleral contact lens parameters below.

	Power	Base Curve	Diameter	Vault	Visual Acuity
OD:	+5.75	7.5 mm	15.8 mm	350 microns	20/40-2
OS:	+5.75	7.5 mm	15.8 mm	300 microns	20/50

Additional testing:

Single letter visual acuity:		Single letter visual acuity with crowding bars:	
	OD: **20/30**	OD:	**20/50+**
	OS: **20/30**	OS:	**20/50**

Review of macular OCT: Normal foveal contour, IS/OS junction intact, no edema OU

Topography

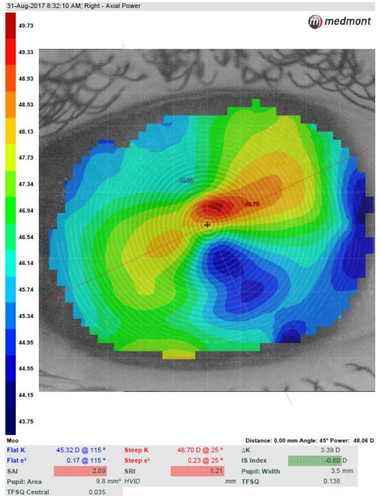

Image 1: Corneal topography axial map OD

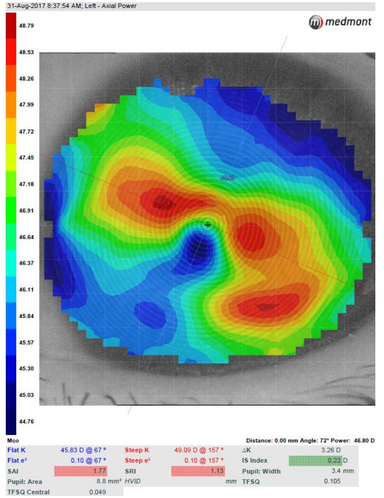

Image 2: Corneal topography axial map OS

Diagnosis & Discussion

This patient was referred to our clinic for a contact lens fit due to their recent diagnosis of pellucid marginal degeneration. Pellucid marginal degeneration falls under the category of non-inflammatory peripheral corneal thinning disorders. Additional diagnoses to consider when diagnosing pellucid marginal degeneration include Terrien's marginal degeneration, Mooren's ulcer, and keratoconus.[1] Proper case history, examination, and corneal topography will assist when making a diagnosis. Pellucid marginal degeneration typically presents in the 2nd to 5th decade of life as bilateral inferior thinning of the cornea. Terrien's marginal degeneration presents as bilateral superior corneal thinning with overlying vascularization in middle aged men. Corneal thinning observed within the lid fissure in elderly men can indicate Mooren's ulcer. Keratoconus is typically noticed at the onset of puberty as a bilateral progressive central corneal thinning.

Diagnosis & Discussion Continued

After reviewing ocular history and corneal topography, it was determined the patient did not have a non-inflammatory corneal thinning disorder. Surface asymmetry index (SAI) values indicated higher than normal asymmetry in corneal power distribution in both eyes.[2] Elevated SAI, the principle meridians not being 90 degrees apart, and reduced best corrected spectacle visual acuity indicates irregular astigmatism. This irregular astigmatism is of unknown etiology (i.e. trauma, surgery, previous contact lens wear). Best corrected visual acuity remained reduced to roughly 20/30 with single letter, which further reduced to 20/50 with crowding bars. The refractive risk factors for this patient to develop isoametropic refractive amblyopia is astigmatism greater than 2.50 diopters and hyperopia greater than 5.00 diopters. Visual therapy with the goal of improving visual acuity and binocularity was discussed with the patient. At this time the patient did not pursue vision therapy.

Treatment & Management

- Based on the irregularity of the corneal astigmatism the patient was fit in scleral contact lenses.
- Following an ideal fit, vision therapy was discussed with the goal of improving vision and binocularity. At this time vision therapy was not pursued.
- A letter was sent back to the referring doctor with examination findings and contact lens parameters.

Conclusion

Specialty lenses provide a significant improvement in patients quality of vision and life. When working with specialty lenses, it is important to keep in mind the expected visual acuity and accurately determine the cause of reduced vision through the lenses.[3]

References:

1. Feder, R. S., & Kshettry, P. (2005). Chapter 78: Noninflammatory Ectatic Disorders. In J. H. Krachmer, E. J. Holland, & M. J. Mannis, *Cornea* (2nd ed., pp. 955-971). Philadelphia: Elsevier Mosby.
2. Wang, M. X. (2007, November 12). *Irregular astigmatism: definition, classification, topographic and clinical presentation.* http://www.wangcataractasik.com/forms/drWang_Irregular_astgmatism.pdf
3. Woo, S. L. (2017). Why can't my patient see well with specialty lenses? Contact Lens Spectrum, 32(9), 15.