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Background

Two key hallmarks of multifocal contact lens fitting for all ages are centration and pupil size. This includes pediatric patients, who are fit in center distance lenses for myopia management. Currently, limited fitting parameters are available for center distance soft multifocal contact lenses. Special consideration should be given to those who are on dual treatment modalities with multifocal contact lenses and atropine where new complications may arise.

Case Description

22-year-old Asian female presents for multifocal soft contact lens follow-up in myopia management with complaints of double vision and ghosting. She is currently on a dual treatment plan with 0.05% atropine and multifocal soft contact lenses.

In the last few years, the patient started with atropine treatment, increased from 0.01% to 0.05%, with variable compliance over the years. Multifocal soft contact lenses were then added to move to a dual treatment modality to help with patient compliance and ensure adequate amount of treatment.

Manifest Refraction

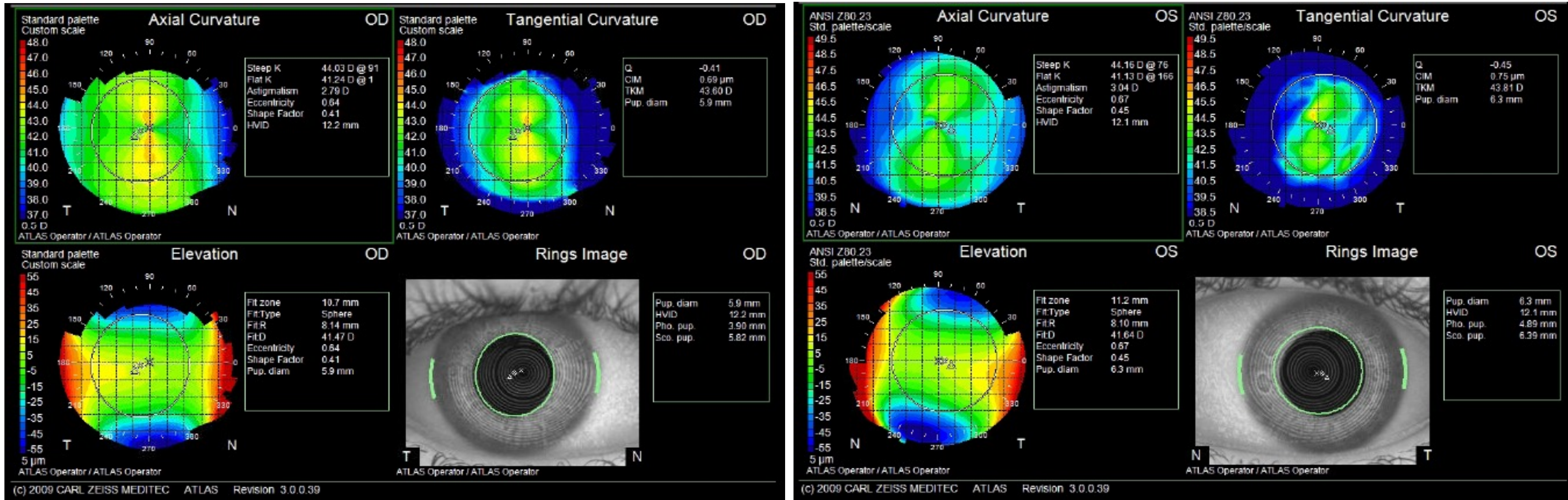
	OD	OS
Entering Visual Acuity with Habitual Contacts	20/20-1	20/20-1
Manifest Refraction	-10.50-3.50X005	-10.00-2.50X155
Spectacle BCVA	20/25	20/25

Phorias

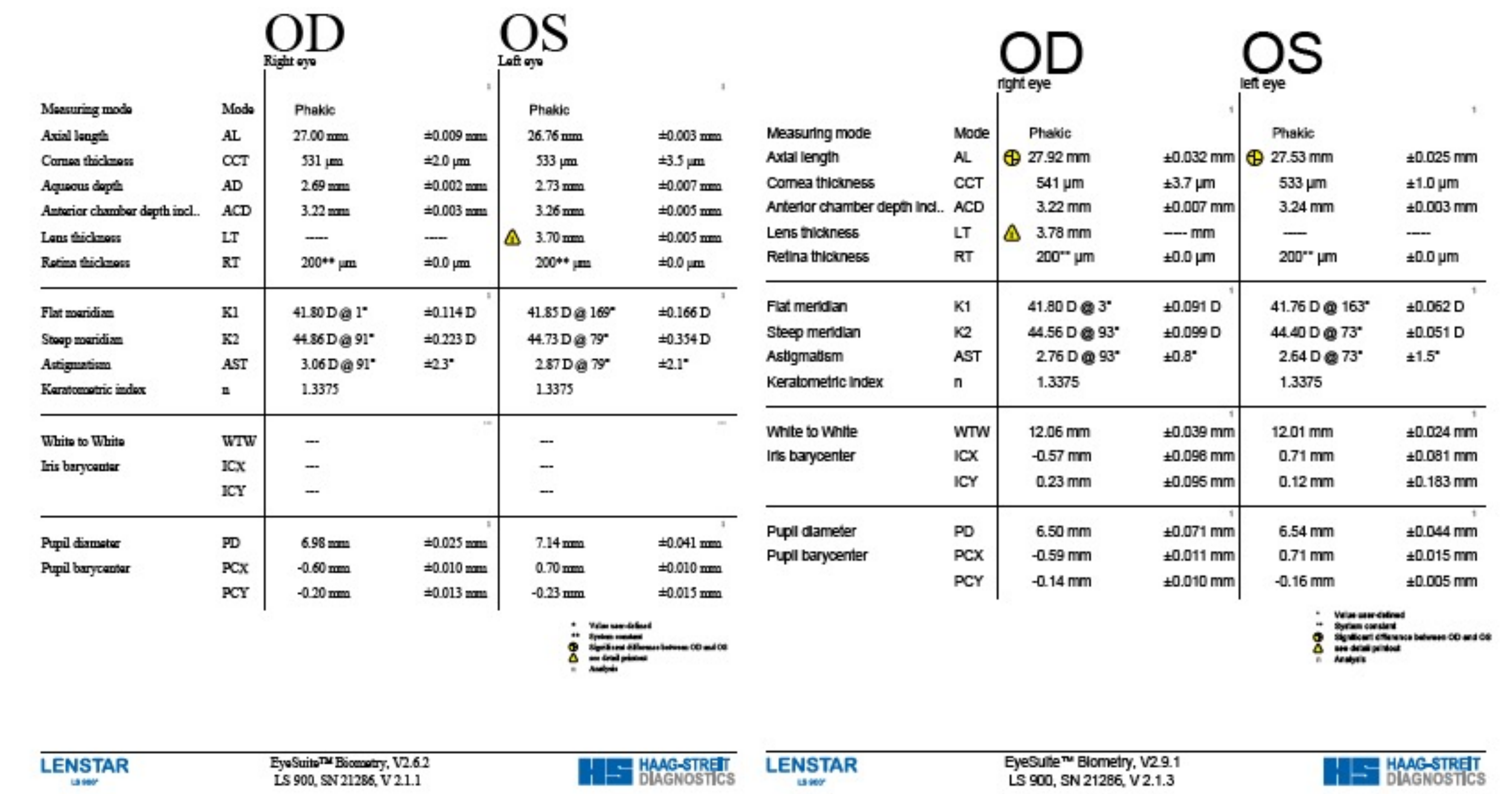
	Horizontal	Vertical
Distance Method: modified thorington	Ortho	Ortho
Near Method: modified thorington	2 PD Exo	Iso

Slit Lamp Examination

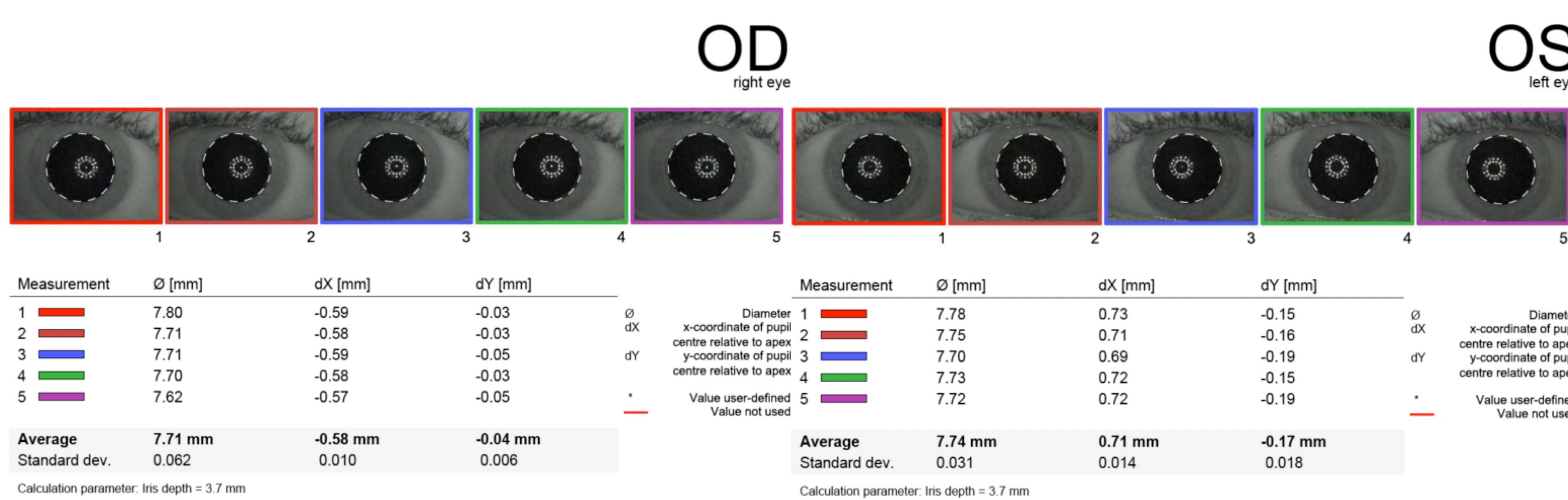
	OD	OS
Angles/PI	Open angle	Open angle
Adnexa	Adnexa normal	Adnexa normal
Eye Lids	Lids normal	Lids normal
Sclera/Conjunctiva	White and Quiet	White and Quiet
Cornea	Normal endothelium, epithelium, stroma, and tear film, (-) NaFl staining	Normal endothelium, epithelium, stroma, and tear film, (-) NaFl staining
Iris	Iris normal	Iris normal
Anterior Chamber	Anterior chamber is deep, no cells, no flare	Anterior chamber is deep, no cells, no flare
Lens	Clear lens capsule, cortex, and nucleus	Clear lens capsule, cortex, and nucleus



Figures 1 and 2: Baseline Corneal Topography and Pupil Size Measurements



Figures 3 and 4: Baseline Biometry Measurements and Biometry Measurements 3 Years Later



Figures 5 and 6: Pupil Size Measurements after Initiation of 0.05% Atropine Treatment

Contact Lens Fitting

Eye	Power	ADD	Brand	Type	Base Curve	Diameter
OD	-10.00-2.75X010	+1.50D	CooperVision	Biofinity Toric Multifocal	8.7	14.50
OS	-9.50-1.75X155	+1.50D	CooperVision	Biofinity Toric Multifocal	8.7	14.50



Figure 7: Slit Lamp Camera Photograph of Habitual Soft Multifocal Lens on Patient's Eye (lens showed identical presentation on OD)

CONCLUSIONS

As more and more children are being fit in multifocal lenses for myopia management, additional considerations need to be made for the differing physiological characteristics when compared to adults, such as pupil size and accommodation. For our patient who was wearing a center distance design with a large pupil size, she was experiencing blur and discomfort that a patient with a smaller pupil size perhaps would not experience in the same lens design[1,2].

To troubleshoot this visual distortion, there are multiple changes to the lens design that can be made to resolve the problem. Trialing a different contact lens brand with a steeper base curve or larger diameter may help to center the lens better on the patient's eye, but limited options are available in the patient's prescription and in a center distance design. When lens parameters and brands are limited based on the patient's prescription, additional customized lens designs can be utilized. For example, when multiple-packaged soft lens brands fail, opting for customizable multifocal gas permeable lenses can be an alternative, although the effectiveness of opting for different lens modalities in myopia management has not been as comprehensively researched[3].

As an adult, additional treatment management for this patient could involve removing one myopia management modality and monitor closely for stability in prescription and axial length.

Moving forward, additional research and innovation is needed to create more effective soft multifocal lens designs for patients with more difficult prescriptions and for patients who need more customized optic zones. Creating more customizable lens designs can potentially help better treat the vast demand for pediatric patients who are part of the myopia epidemic.

REFERENCES

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