

Fitting and Troubleshooting a Challenging Toric Orthokeratology Case

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Background

Myopia management is a means of slowing the progression of nearsightedness to reduce lifelong risk of other ocular comorbidities.^{1,2} While multiple options exist for the simple myope, there are limited toric soft multifocal and orthokeratology options.

Purpose

This will discuss a challenging case of a patient with moderate compound myopic astigmatism who elected to pursue orthokeratology.

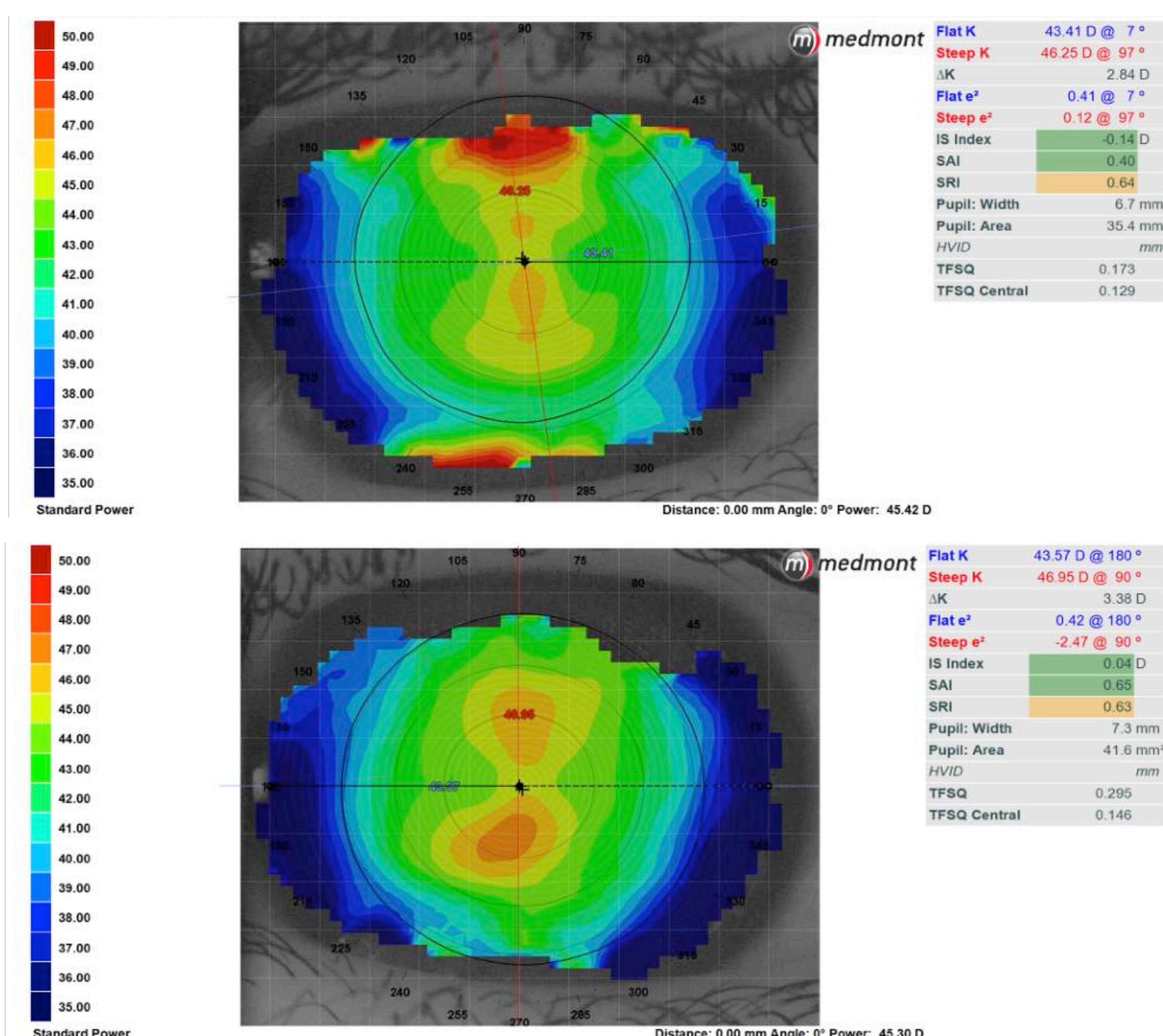
Methods

The patient was a 9 year old male fit in Euclid's Sapphire lens for myopia control. He had a reliable pre-treatment refractive error assessment and was followed with Medmont topography. The patient was followed at 1 day, 1 week and 1, 3 & 6 month intervals with refraction, topography and unaided visual acuities (VA).

Case

Baseline refractive error:
OD: -4.75-2.25x168 (20/20)
OS: -4.75-2.75x180 (20/20)

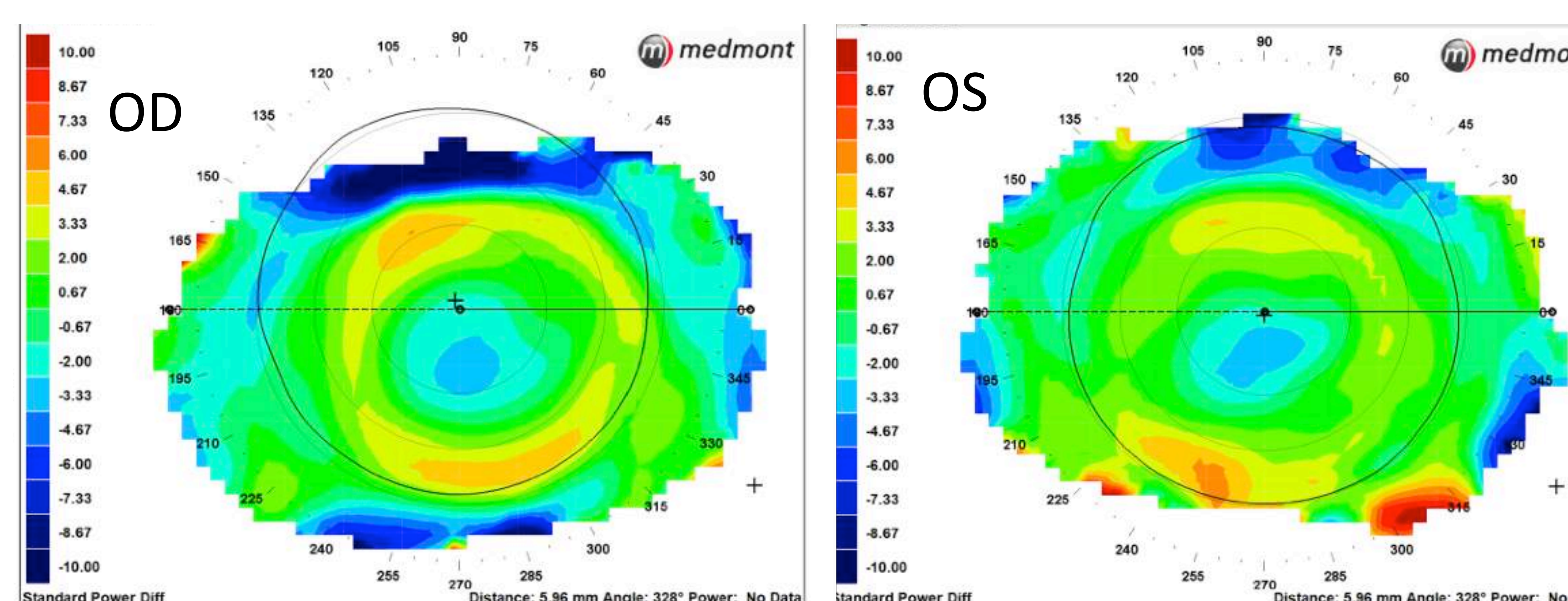
Baseline topography
OD: 2.84DCx007, Δ Elevation = 52 μ m (max chord = 6.6mm)
OS: 3.38DCx180, Δ Elevation = 64 μ m (max chord = 7.4mm)



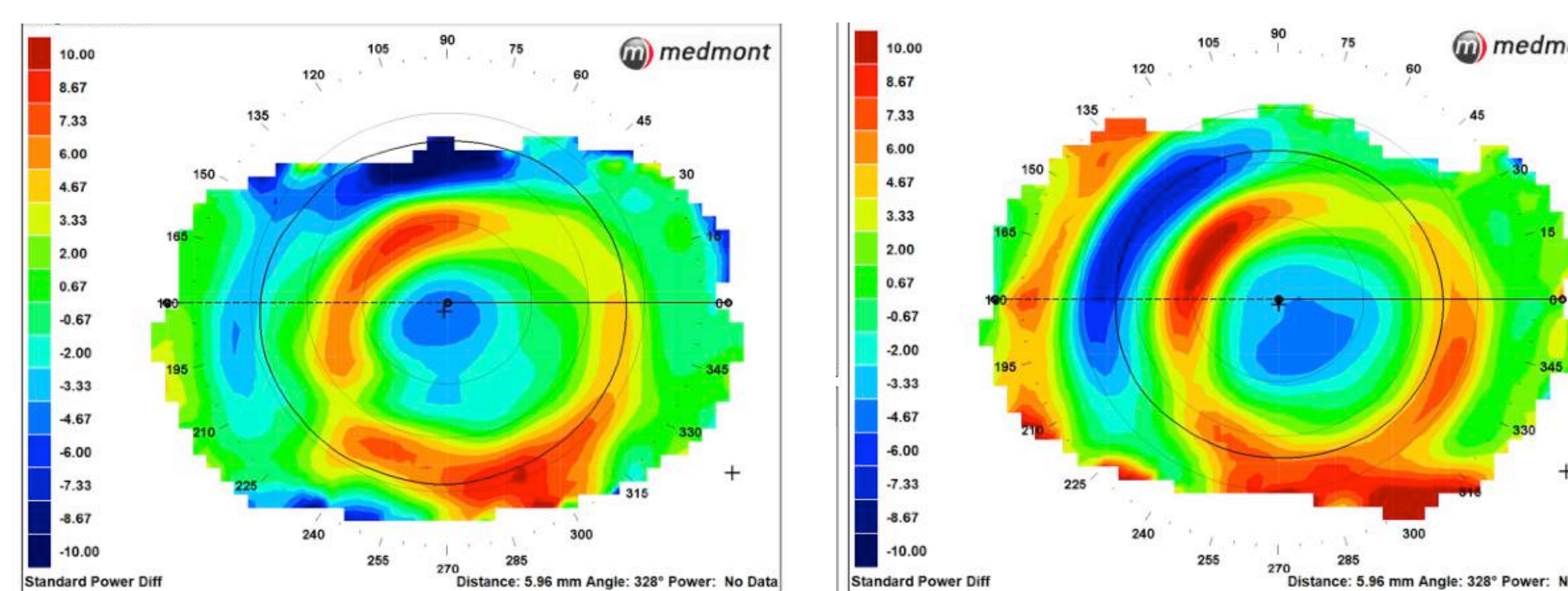
Case

Empirically ordered lens parameters:
OD: BC 9.02mm, Power +0.75DS, OAD 10.6mm, 1.50D toricity
OS: BC 8.87mm, Power +0.75DS, OAD 10.6mm, 1.50D toricity

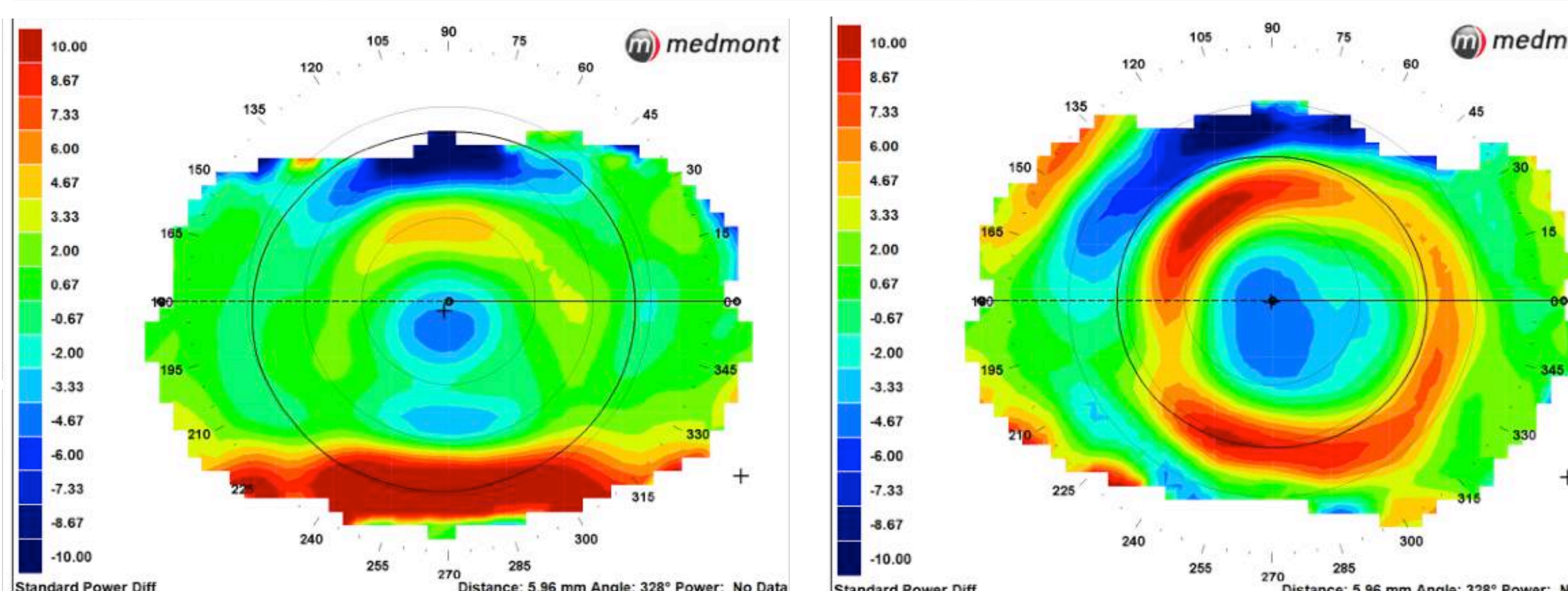
1 day f/u	OD	OS
VA (sc)	20 / 40 ⁻²	20 / 40 ⁻²
MR	-2.25 -0.75 x 180 (20/20)	-2.25 -0.75 x 180 (20/20 ⁻²)
A	Treatment zones centered, satisfactory VAs	
P	Continue treatment, RTC 1 week	



1 month f/u	OD	OS
VA (sc)	20/30 ⁻²	20/20
MR	-2.00 -1.25 x 170 (20/20 ⁻²)	-0.50 -2.50 x 155 (20/20 ⁻²)
A	Treatment zones slightly decentered OS>OD	
P	Flatten alignment curves, RTC for dispense	Flatten alignment curves, enlarge OAD, RTC for dispense

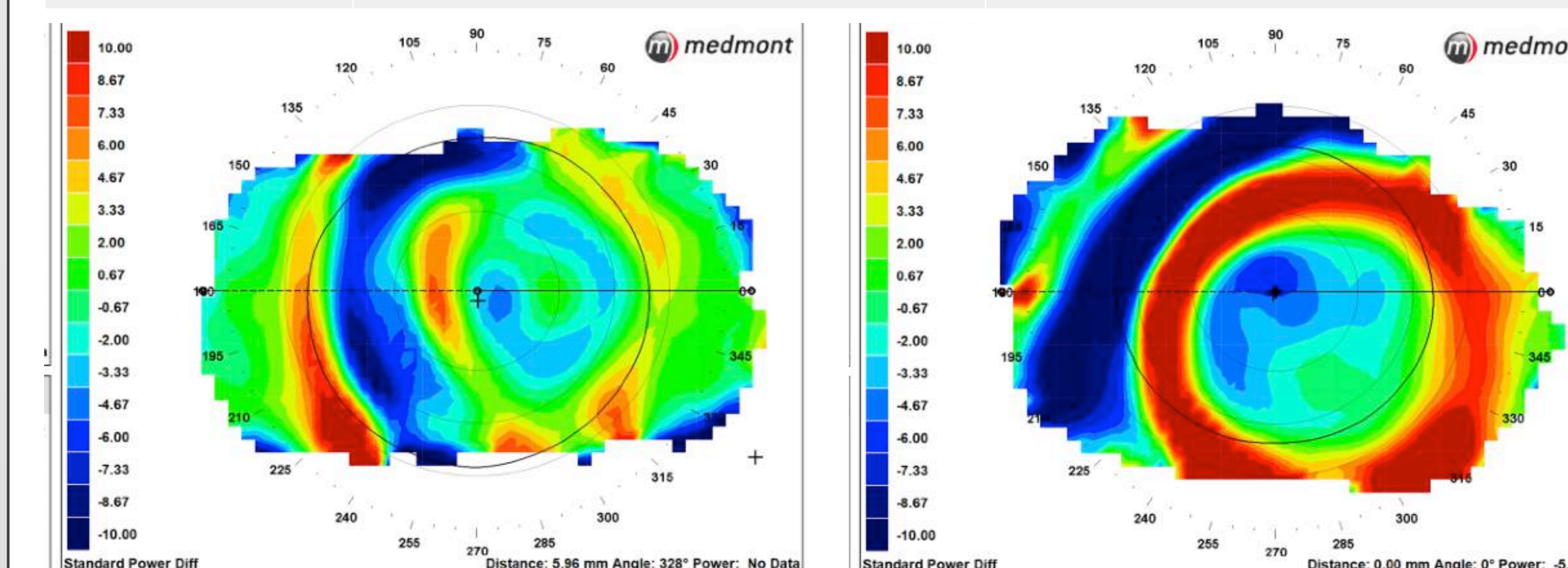


2 month f/u	OD (new lens x 1 wk)	OS (new lens x 1 mo)
VA (sc)	20/30 ⁻²	20/30 ⁻²
MR	-0.75 -0.75 x 130 (20/30 ⁺¹)	-0.25 -0.25 x 015 (20/20 ⁺²)
A	Persistent slightly decentered treatment zone	Centered treatment zone
P	Reduce toricity to 1.00D, RTC for dispense	Continue treatment

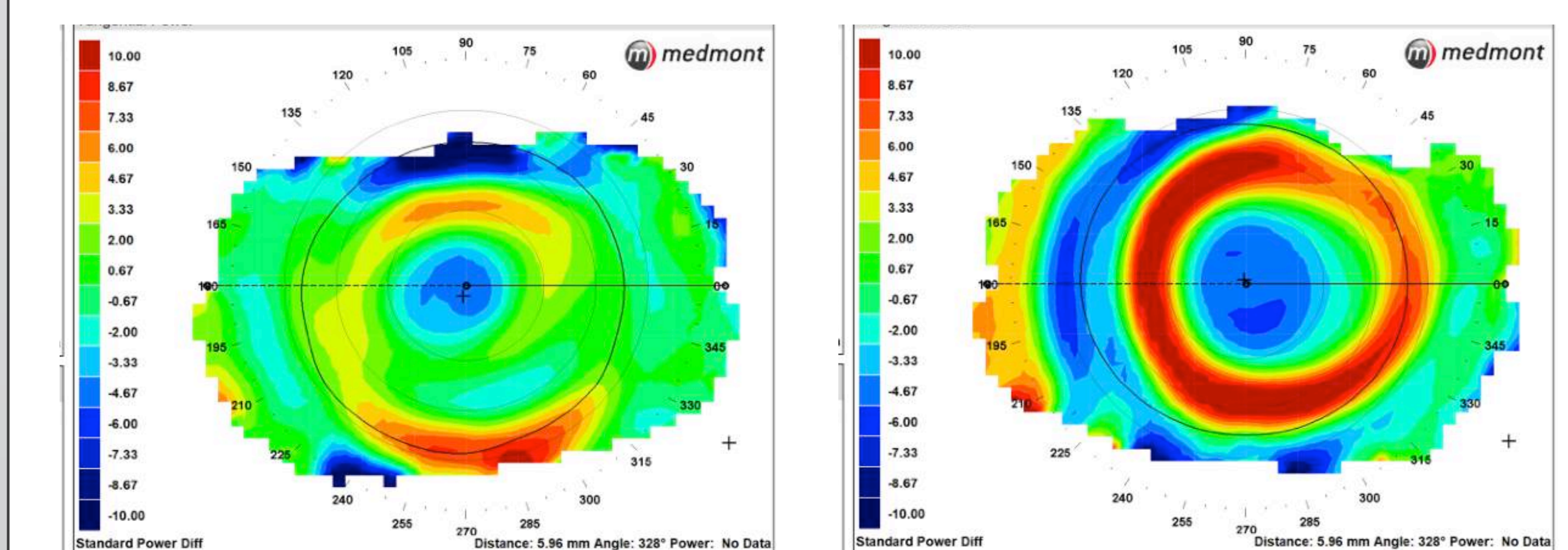


Case

3 month f/u	OD (new lens x 1 mo)	OS (new lens x 2 mos)
VA (sc)	20/50 ⁺²	20/30 ⁺²
MR	Not performed	
A	Centered treatment zone with mild irregularities	Treatment zone decentered I/T, attributed to overnight manual dislocation
P	Enlarge OAD, flatten reverse curve, RTC dispense	Continue treatment, pt education on sleep habits



6 month f/u	OD (new lens x 2 mos)	OS (new lens x 5 mos)
VA (sc)	20/20 ⁻²	20/20 ⁻¹
MR	0.75 -2.00 x 009 (20/20)	-0.25 -0.75 x 013 (20/20)
A	Adequate treatment zones, well centered, satisfactory VAs	
P	Continue treatment, RTC 6 mos	



Discussion

Orthokeratology lens designs exist to accommodate moderate amounts of corneal astigmatism. Larger OADs can help with decentration issues. Practitioners should also consider that decentration could be due to overnight dislocation and should repeat topography at a later date to identify legitimacy of unexpected decentration.

Conclusion

Toric orthokeratology can be an effective and reasonable option for patients with moderate to high corneal astigmatism.³

References

1. E Smith. Eye (Lond). 2014
2. I Flitcroft. Prog Retin Eye Res. 2012
3. C Chen, IOVS. 2013

Disclosures

RA: Travel funds (Euclid Systems Corp), KRR: none, KR: Research (Euclid Systems Corp, Alcon) Consulting, Novartis, Powervision