Unilateral Hyperopic Orthokeratology Correction in Patients with Functionally Emmetropic Fellow Eyes

Annie Dong OD; Brandon Merrill OD; Jacquelyn Bongard OD FAAO
UMSL College of Optometry

CASE 1

A 27 year-old female presented for OK fitting OD only. The patient has a history of anisometropia and mild amblyopia OD with patching OS. The patient habitually wore a soft contact lens in the right eye only with a power of +2.25 DS and sought OK correction due to late-day dryness symptoms causing soft contact lens intolerance.

Baseline Manifest Refraction

OD: +2.50-0.50x180	**20/20-**
OS: +0.50-0.75x160	**20/20**

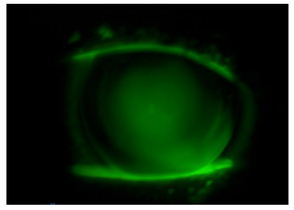

Figure 1: Right eye lens fit

Contact Lens Fitting:

The patient was empirically fit with an OK lens, OD only (See *Table 1*). The lens fit well with adequate centration and reverse "bulls-eye" pattern (See *Figure 1*).

Post OK Treatment:

- Uncorrected VA OD: **20/25**
- Manifest Refraction OD: +0.25 DS
- Corneal topography showed a well centered treatment zone with approximately **1.70 D of hyperopic correction** compared to baseline. (See *Figure 2*)

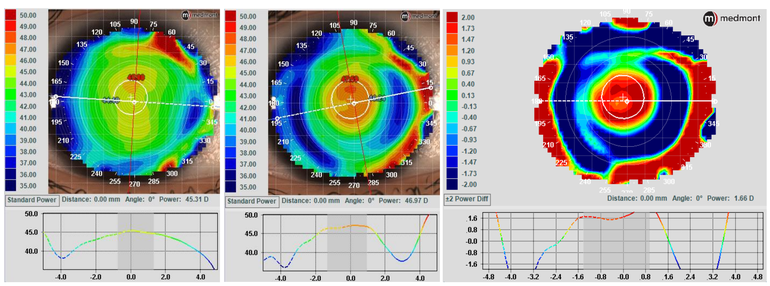

Figure 2: Corneal topography of baseline (left), post OK treatment (middle), and the difference map (right) comparing pre and post OK treatment of the right eye.

OD Lens							
BC	Pwr	Dia	OZD	RCD	AZA	RO	E
7.10	-0.50	10.60	6.00	0.476/0.525	32.37/34.89	7.48/ 7.41	0.64/0.39

Table 1: Lens Parameters – Moonlens Toric Periphery, Material: Boston XO

BACKGROUND

Orthokeratology (OK) uses specialized contact lenses to temporarily reshape the cornea and correct refractive error without daytime wear.[1] While popular for myopia management, OK was originally developed for refractive correction.[1] Hyperopic OK induces central corneal steepening and paracentral compression, creating a plus-powered effect.[2,3] Studies suggest OK may relieve ocular surface dryness, offering an option for patients who are intolerant of soft lenses.[4] These cases highlight two unique monocular hyperopic OK applications for anisometropia (Case 1) and presbyopia (Case 2).

DISCUSSION

These cases demonstrate that hyperopic OK is a practical option for patients requiring monocular plus-power correction due to anisometropia or presbyopia. Despite differences in age and visual demands, each patient achieved stable refractive outcomes, maintained good binocular function, and reported excellent comfort throughout the day without the need for supplemental spectacles.

Notably, both patients transitioned to OK due to soft contact lens–related dryness, and each experienced improved comfort after eliminating daytime lens wear. This supports previous findings that overnight OK can reduce dry eye symptoms compared with soft lens modalities.[4,5] This reinforces the value of OK in situations where corneal or ocular surface sensitivity limits soft lens tolerance.

These two unique cases contribute to growing clinical experience demonstrating that monocular hyperopic OK can be successfully used to address specific refractive needs such as anisometropia and monovision correction.

CONCLUSION

OK offers a creative solution for correcting refractive error, especially in patients with ocular surface dryness or those needing monocular correction. This approach should be considered for individuals with low hyperopia, anisometropia, or presbyopia as a comfortable, non-surgical alternative to glasses or soft lenses.

CASE 2

A 64 year-old female presented for an OK refit OS only for monovision correction of presbyopia due to near vision blur with her habitual OK lens. Prior to OK wear, the patient also had a history of monocular presbyopia correction using a soft contact lens in the left eye but discontinued due to discomfort from dryness.

Baseline Manifest Refraction

OD: Plano DS	**20/20**
OS: +0.25 DS	**20/20**
Add: +2.50	NVA: **20/20**

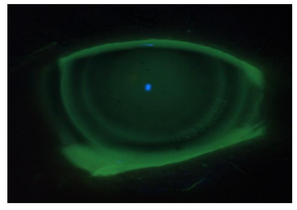

Figure 3: Left eye lens fit

Contact Lens Fitting:

The patient was empirically fit with an OK lens for the left eye (See *Table 2*). The lens fit well with adequate centration and reverse "bulls-eye" pattern (See *Figure 3*).

Post OK Treatment:

- Uncorrected VA OU: **20/20** at distance and near
- Corneal topography showed a well centered treatment zone with approximately **2.00 D of hyperopic correction** compared to baseline at the end of the day. (See *Figure 4*)

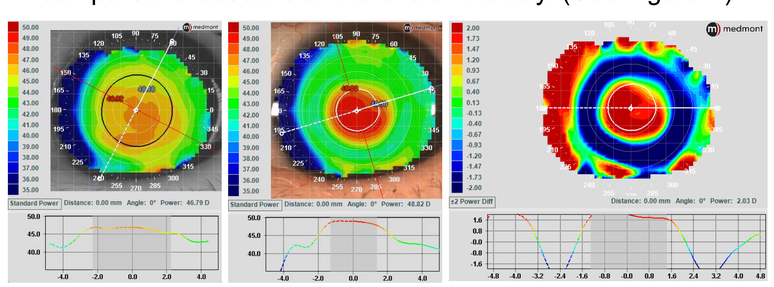

Figure 4: Corneal topography of baseline (left), post OK treatment (middle), and the difference map (right) comparing pre and post OK treatment of the left eye.

OS Lens							
BC	Pwr	Dia	OZD	RCD	AZA	RO	E
6.78	-1.00	10.80	6.00	0.525	35.39	7.21	0.45

Table 2: Lens Parameters – Moonlens, Material: Boston XO

REFERENCES

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