

Improving Glare and Haloes in Adult Orthokeratology

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BACKGROUND

Haloes and glare are a common side effect of orthokeratology treatment. Common reasons for this to occur include having a small treatment zone relative to pupil size, a decentered treatment zone, or a patient with large pupils. Attempts to rectify this could include increasing the treatment zone diameter, reducing the lens sagittal depth (by reducing sagittal depth of reverse curve and/or flattening alignment curve), or prescribing off-label brimonidine to reduce pupil size.

CASE DESCRIPTION

A 23-year-old female patient with h/o mild dry eye presented for an orthokeratology fit OU in 2021. Manifest refraction was OD -3.00-0.75x180 and OS -2.25-0.25x180, with VA 20/20 OD, OS. Pupil size was 6.3mm OD, 6.2mm OS; increasing to 6.8mm OD and 6.9mm OS in dim light. An empirically designed Emerald Toric OD 8.38/10.6/6.2 (1.0D toric) and Emerald OS 8.54/10.6/6.2 (Euclid Systems, Sterling, VA) gave good results and was worn successfully for >12 months, though the patient did notice haloes and glare at night.

ONE YEAR FOLLOW-UP

At annual evaluation in 2022, the patient had persistent symptoms despite compliance with dry eye therapy. These changes were made:

1. increase posterior optic zone from 6.2mm to 6.6mm OU
2. increase overall lens diameter from 10.6mm to 11.1mm OU
3. flatten first alignment curve 0.05mm OU (standard if increasing OAD to >11.0mm to ensure not too tight)
4. flatten second alignment curve 0.1mm OU (also a standard change when increasing OAD to >11.0mm).

After 1 week of wear, the patient was still experiencing glare and haloes. Examination revealed good lens centration and excellent topographic result, but slit lamp showed mild exacerbation of her dry eye and she noted she had been lax on treatment since starting the new lenses. After 6 more weeks of wear, and with regular use of artificial tears, the glare and haloes improved and she was very happy with the result.

In comparing the maps, you can see the treatment zone size increase with the new lenses (Fig 2).

Figure 1: Topography maps (with 2021 lenses) - symptomatic

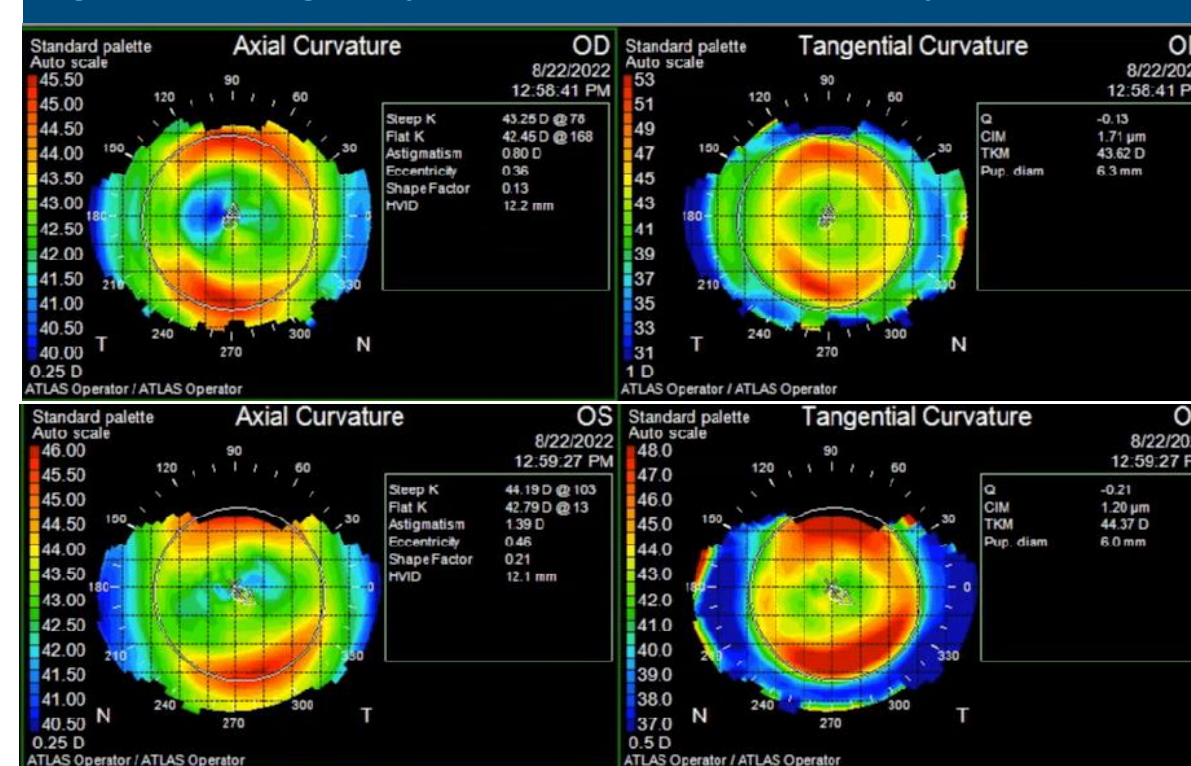
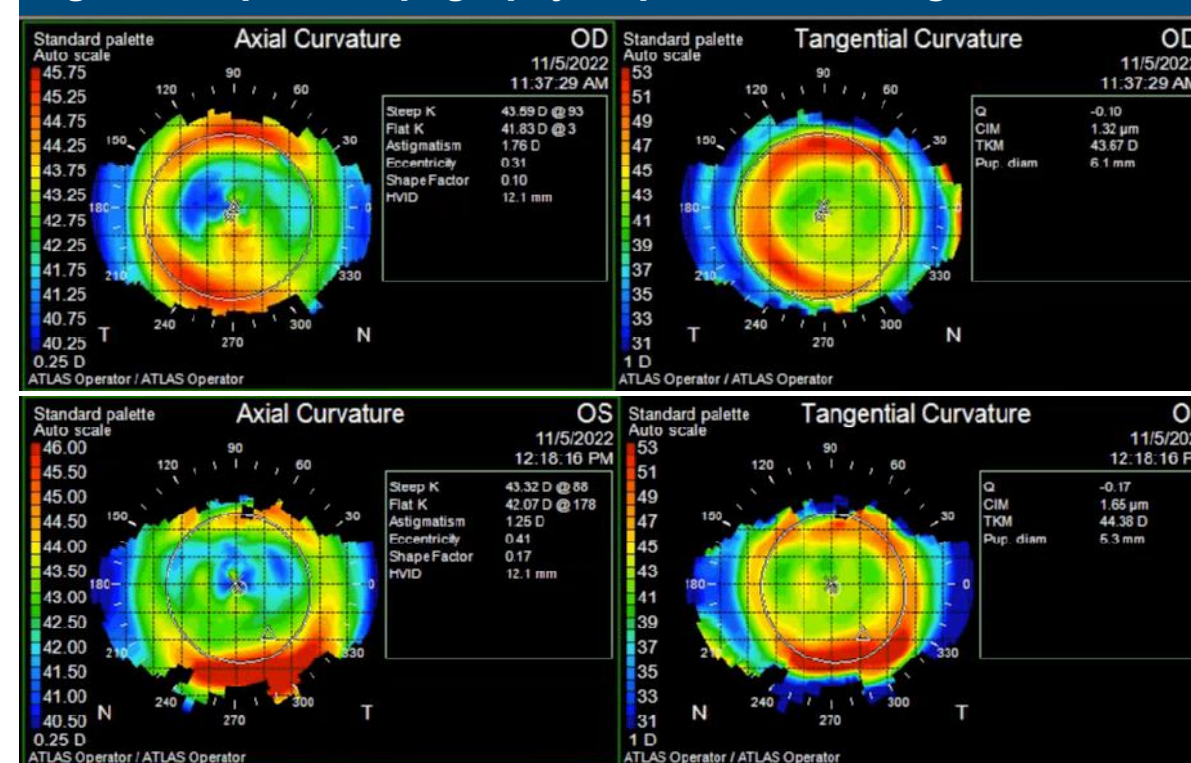


Figure 2: Improved topography maps (2022 re-designed lenses)



CONCLUSIONS

One major challenge to fitting orthokeratology lenses in adults can be subjective symptoms of glare and haloes, especially in patients with larger pupils. Symptoms can be especially bothersome with night driving or in dim illumination. An increase in overall lens diameter paired with an increase in posterior optic zone can improve the treatment zone size and reduce subjective symptoms of glare and haloes. Accompanying alignment curve adjustments compensate for a lens OAD greater than 11.0mm to ensure proper fit without binding.

It is also critical to ensure any underlying dry eye is properly treated in adults who wear orthokeratology lenses to ensure optimal visual outcomes.

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