



INTRODUCTION

Keratoconus is a corneal ectasia that causes progressive steepening, and thinning, and thus irregular astigmatism. The condition typically presents during teenage or young adult years and at times continues to progress until the patient is in their 30s or early 40s. Specialty lenses, such as gas permeable lenses, possess a greater ability to improve vision in keratoconus patients than spectacles or soft contact lenses.

Presbyopia is an age related refractive error, that typically presents when a patient is in their forties, and continues to progress until they are about 65 years of age. Once a patient's refractive error becomes presbyopic, they will need a different prescription for distance than near. Historically, patients wearing gas permeable lenses would wear reading glasses over their GPs when needing to see at near. This modality can be unfavorable, and require the patient to carry glasses by their side daily, while wearing contact lenses.

Through an awareness of the intersectionality between keratoconus and presbyopia, we can better meet the needs of our patients by fitting multifocal GPs in the case of mild keratoconus.

CASE DESCRIPTION

A 53 year old female with established, stable keratoconus in both eyes presents for a lens refit. She was last fit in GP lenses in 2017, but stopped wearing them due to discomfort, and a lack of clarity at both distance and near. It is important to note that the patient has mild, rather centered nipple cone, and historically has a better BCVA in GPs than glasses.

The patient could appreciate that she had better vision with GPs than with glasses, and for that reason wished to be refit in lenses. She did however verbalize that she was bothered by the idea of wearing reading glasses over her contact lenses.

METHODS

Topographic scans were taken with the Pentacam to measure both the keratometry values as well as the horizontal visible iris diameter. This was considered when empirically designing the initial lenses, fitting mildly flatter to allow good movement and translation of the lens while maintaining lid attachment. The pupil sizes were measured as well in mesopic conditions to determine the appropriate size of the optical zones.

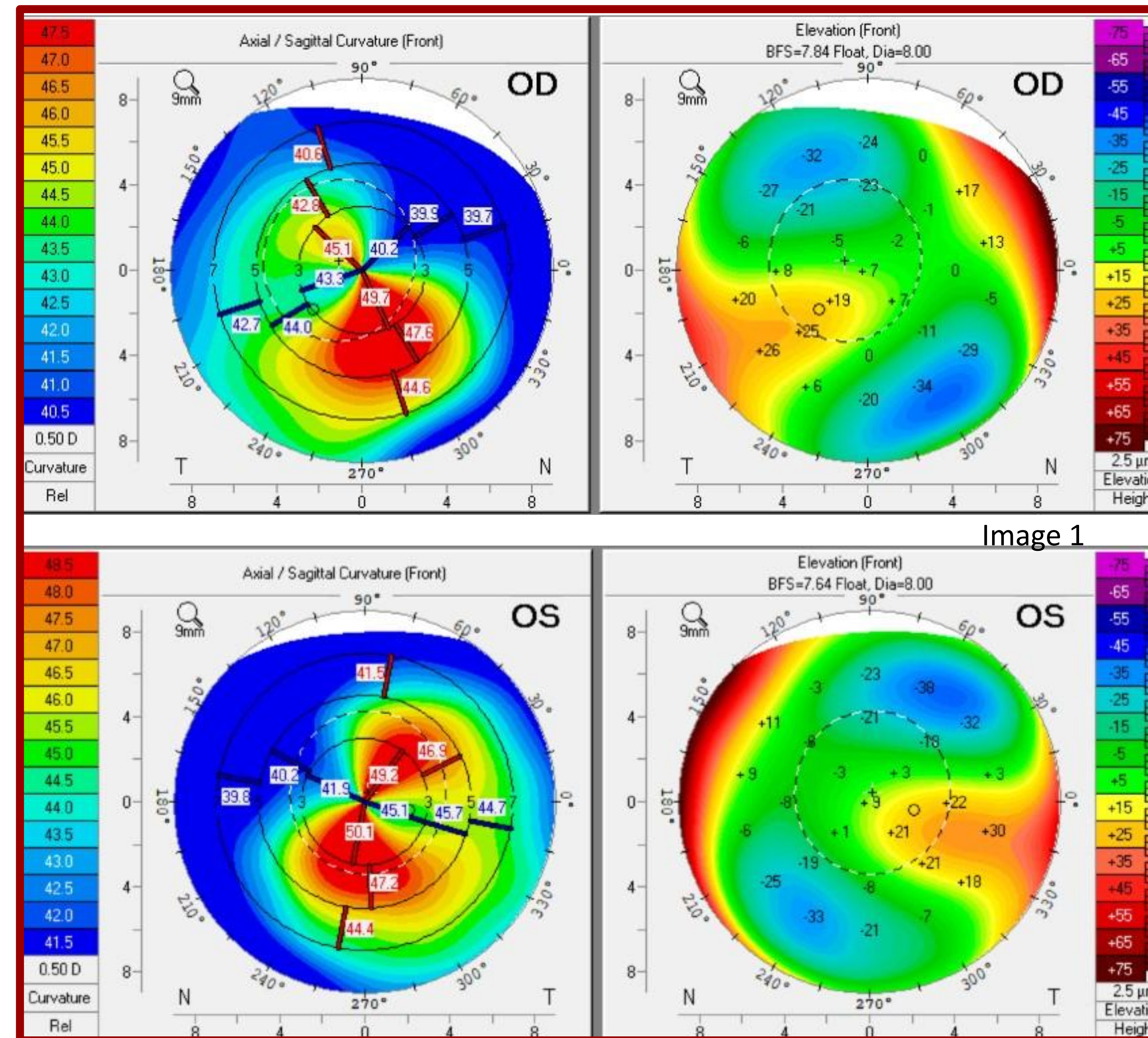


Image 2

Images 1 and 2 show the topography map of the patient, in the right (top) and left eye (bottom). Note that the severity of the condition is mild, with steepest K values of about 49 diopters

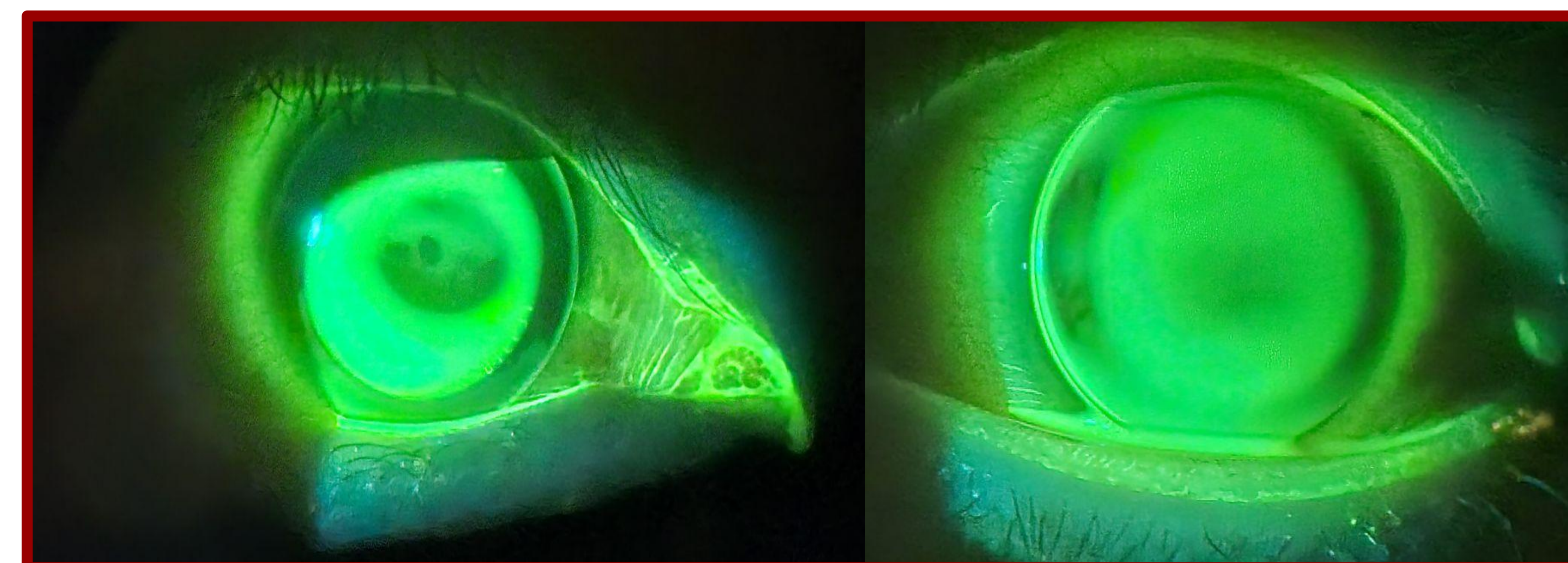


Image 3

Image 4

Image 3 demonstrates the initial lens fit, when fit on K. (The fluorescein pattern shows edge seal off and central bearing)

Image 4 shows the second lens fit, after adjusting lens parameters. (the fluorescein pattern shows desirable "touch with flush" pattern)

RESULTS

Multifocal GP lenses benefit from translation in downward gaze so the patient can benefit from viewing the near power without disruption from the distance optic. The initial lens fit, showed edge seal off and central bearing. This type of fit results in inadequate tear exchange and poor corneal health. To fix this problem the base curve was steepened, the edges were flattened by 1mm, and the optic zone was decreased by 0.3mm.

The refit showed an appropriate touch with flush pattern over the apex of the cone, which confirms adequate tear exchange and appropriate movement. The best corrected vision in the proper fitting lens was 20/25 OU at distance, and 0.4/0.8M at near. The patient was exceedingly pleased with the vision, and no longer relied on readers.

CONCLUSION

Achieving functional best corrected vision is oftentimes only achievable through the use of specialty lenses in the case of keratoconus. Historically, patients with keratoconus who reach presbyopia are forced to use reading glasses in combination with the lenses to see at near. Multifocal GPs work by offering a higher plus zone that patients can translate into, allowing glasses free vision at distance and near. Multifocal GPs have proven to be effective in the case of mild keratoconus like this example.

ACKNOWLEDGEMENT

Thank you to Salus University, Dr.Gidosh, and the Contact Lens/ Cornea Department for allowing clinical experiences that build exposure to specialty lenses.