

# Axial Length in Keratoconus: Does It Matter?

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## INTRODUCTION

On average, keratoconic eyes have longer axial length compared to emmetropic eyes due to longer vitreous measurement<sup>1</sup>. However, to have a keratoconus patient with an extremely long eyeball is considered a rare occurrence. It is well known that, axial length of more than 26.00mm is considered long eyeball that associated with axial myopia. The longest ocular axial length is recorded by a Maltese Caucasian with a 38.34mm eyeball<sup>2</sup>. We are herein to describe a case of keratoconus patient with an extreme axial length.

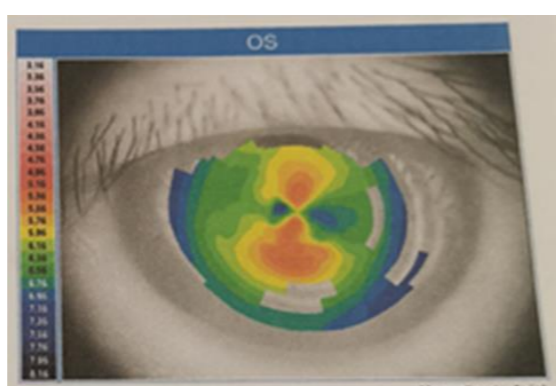
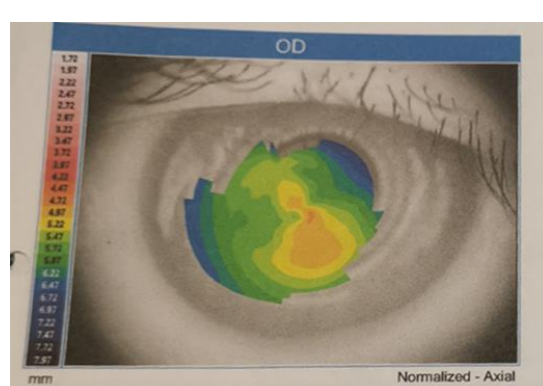
## CASE REPORT

A 46-year-old Malay lady was referred to our Contact Lens Clinic in August 2017 for contact lens evaluation and consultation. Her first myopic glasses was made when she was 7-year-old and 8 years later was changed to soft contact lenses. Her latest soft contact lens power was -28.00D bilaterally. She also had a previous history of chemical injury of hydrogen peroxide contact lens disinfecting solution. Her other medical history was unremarkable with no underlying medical problem.

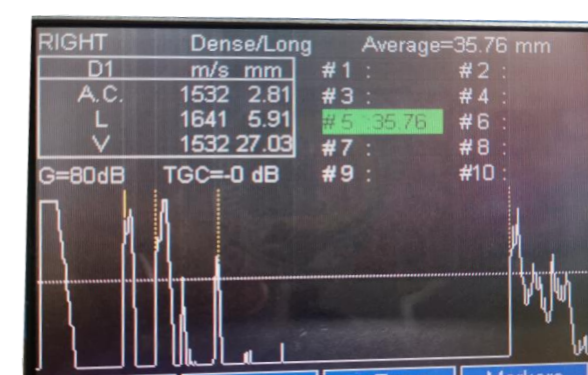
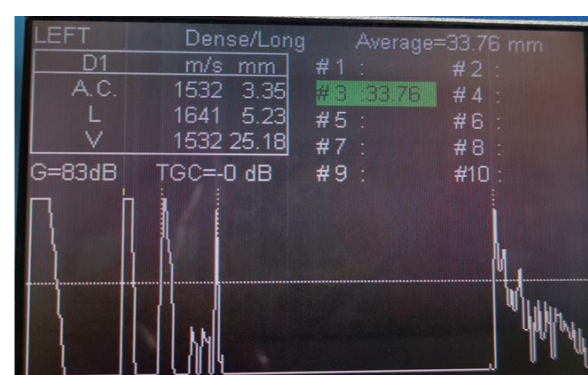
Her unaided vision was 1/60 (PH 3/60) RE and 2/60 (PH 6/60) LE. Retinoscopy reflex was so poor bilaterally. Her manifest refraction was RE -35.00 (3/60) and LE -32.00D (4/60). Slit lamp examination revealed a bilateral Ocular Surface Disease (OSD) with extensive corneal neovascularization and also old herpetic scarring on LE. The cornea was extremely dry. Lens, pupil and other anterior eye anatomy was normal. Her bilateral fundus gave a tessellated myopic appearance with tilted optic disc and peripapillary atrophy (PPA). Optic disc ratio was 0.4 – 0.5 bilaterally.

Corneal topography was done and BE was compatible with keratoconus with apical curvature (AK) RE 65.86D and LE 66.56D. Keratoconus probability index (Kpi) was higher on LE (85%) compared to RE (77%).

Due to the condition of the cornea, we fitted her BE with semi-scleral Rose K XL contact lenses. The optimum parameter for RE was 6.6/14.6/-30.00D (VA 6/30) with an increase edge lift of 1.0mm and for LE 6.6/14.6/-25.00D (VA 6/21) with an increase edge lift of 1.5mm. However, we reduced the power for RE since the maximum power for the Rose K XL was -26.00D. Vision with the contact lens during delivery was RE 6/60 (PH 6/30) and LE 6/60 (PH 6/18). Over-refraction was done with the findings of RE -8.00/-1.00 x 180 (6/24) and LE -3.75 D (6/15). This power was prescribed for glasses to be worn over the contact lenses. A-scan biometry using immersion technique was performed later to reveal a bilateral extremely long eyeball of RE 35.7mm and LE 33.76mm.



Corneal topography colour mapping. BE compatible with keratoconus. LE was more severe than RE.



The axial length difference was 2 mm between RE and LE

## DISCUSSION & CONCLUSION

The patient has high irregular myopic astigmatism from the keratoconus and also axial myopia from the extremely long eyeball. Combining this two, obviously will give a very high myopic refractive error that is difficult to correct with glasses alone. In keratoconus patient semi-scleral or scleral contact lenses will act as a tear reservoir and also a new refractive surface to the cornea thus giving a good vision to the patient. However, in this case vision cannot be restored beyond 6/15 even though a combination of semi-scleral contact lenses and glasses has been used. Looking at the axial length measurement there is a probability that the patient already has amblyopia due to under correction of refractive error and also from axial myopic anisometropia. In conclusion, axial length measurement in keratoconus patient is essential especially in cases where optimal vision cannot be achieved with contact lenses correction alone. The axial length information can be the basis of sub-optimal vision in keratoconus correction and would assist the practitioner to explain

## REFERENCES

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