A retrospective study on the effect of long term orthokeratology (ortho-k) on ocular biometry

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**Details of any prior presentation of this abstract**

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Abstract (max 300 words; not more than 100 words in each section)

Purpose. To investigate the effect orthokeratology (ortho-k) on changes in ocular biometry including central corneal thickness (CCT), anterior chamber depth (ACD), crystalline lens thickness (CLT), anterior segment length (ASL), vitreous chamber depth (VCD) and axial length (AL) compared to spectacle-wearing controls. The associations of these parameters and their changes with axial elongation were also investigated.

Methods. Data were retrieved from 75 (37 ortho-k; 38 control) out of 78 subjects who had completed a two-year randomized clinical trial using ortho-k for myopia control. These subjects (aged 7-10 years, with myopia ≤ 4.00D and astigmatism ≤1.25D) were randomly assigned to wear ortho-k lenses or single-vision spectacles. CCT, ACD, CLT, ASL, VCD and AL were collected at the baseline and the 6 monthly visits after cycloplegia.

Results. Changes in CLT and ASL were insignificant whereas VCD and AL significantly increased (p < 0.001) in both groups. In the control subjects, CCT remained unchanged whereas ACD increased (p = 0.001). In ortho-k subjects, CCT reduced at the 6-month visit (p < 0.001) and remained unchanged thereafter whilst ACD remained unchanged throughout. Multiple linear regression showed that axial elongation was strongly associated with change in VCD (standardized beta = 0.950, p < 0.001), change in ASL (standardized beta = 0.236, p < 0.001), and the use of ortho-k treatment (standardized beta = -0.081, p < 0.001).

Conclusion. Our results showed that ACD increased in control subjects but not in ortho-k subjects. The reduction in CCT in ortho-k subjects was clinically insignificant to affect the change in other components. CLT and ASL did not change significantly in all subjects. Axial elongation was predominantly affected by the change in VCD and this association was modified by the use of ortho-k.