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Clinical, tomographic, and topometric outcomes of progressive thickness intracorneal ring segment implantations in duck-type keratoconus

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INDIAN JOURNAL OF OPHTHALMOLOGY

← View Journal Impact

Volume: 70 Issue: 8 Page: 2939-2945

DOI: 10.4103/ijo.IJO_2770_21

Published

AUG 2022

Indexed

2022-08-01

Document Type

Article

Abstract

Purpose: To evaluate the visual, refractive, tomographic, and topometric outcomes of progressive thickness intracorneal ring segment (PT-ICRS) implantation in duck-type keratoconus. Methods: This retrospective study included eyes with oval (duck-type) keratoconus treated with PT-ICRS implantation. After the femtosecond laser tunnel creation, one PT-ICRS (Keraring AS 5 with 160 degrees arc length) was implanted along the ectatic, inferior half of the cornea. Data of uncorrected and corrected distance visual acuity (UDVA and CDVA), refraction, asphericity (Q value), and keratometry (K) were compared pre- and postoperatively. Additionally, changes in the topometric indices of corneal irregularity were also evaluated after PT-ICRS implantation. Results: Thirty-one eyes of 30 patients were included in the study with a mean follow-up time of 9.06 months (ranging between 6 and 18 months). UDVA improved from 0.85 +/- 0.36 to 0.27 +/- 0.14 logMAR (P = 0.001), and CDVA improved from 0.37 +/- 0.22 to 0.13 +/- 0.11 logMAR (P = 0.001). The mean spherical error decreased from -3.66 +/- 2.60 to -1.60 +/- 1.42 D (P = 0.001), and the mean cylindrical error decreased from -4.91 +/- 2.65 to -1.41 +/- 1.31 D (P = 0.001). All topographic parameters measured from the anterior cornea demonstrated statistically significant improvements after PT-ICRS implantation (P = 0.001). K mean, K maximum, corneal astigmatism, and Q value showed a significant decrease. Besides the index of height asymmetry, all topometric indices were significantly reduced after PT-ICRS implantation. There were no loss of lines and no complications.

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Conclusion: PT-ICRS implantation in duck-type keratoconus is an effective and safe treatment. This intervention improves the visual acuity, refractive error, topographical, and topometric parameters significantly by decreasing both eccentricity and steepness of the cone.

Keywords

Author Keywords: [Asymmetry](#); [duck type](#); [intracorneal ring segment](#); [keratoconus](#); [progressive thickness](#)
Keywords Plus: [FEMTOSECOND LASER](#); [CORNEAL](#); [INDEXES](#)

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INDIAN JOURNAL OF OPHTHALMOLOGY

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ISSN 0301-4738

eISSN 1998-3689

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