



The Future
Femto-Lasik & Cornea Center



Intra-corneal Ring Segments implantation By Femtosecond Tunnel Creation

BY

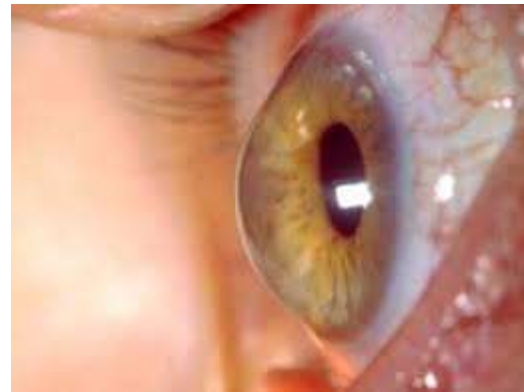
Dr. Amr Mounir

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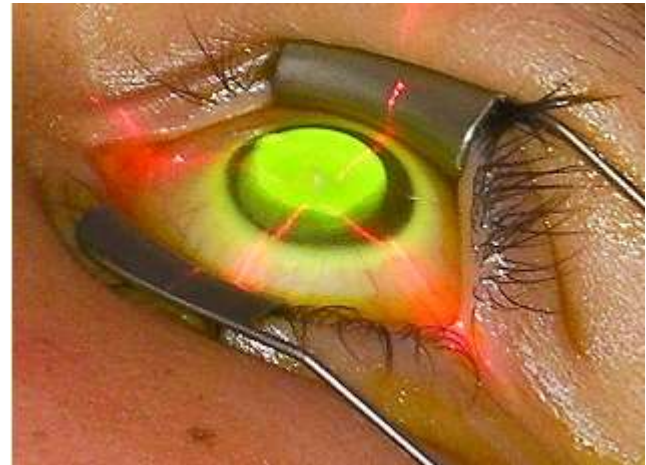
Sohag university

Introduction

Keratoconus is a progressive, noninflammatory, bilateral (but usually asymmetric) ectatic corneal disease.



Treatment modalities include hard contact lens, corneal collagen crosslinking, Intracorneal ring segments and Keratoplasty



Intracorneal Rings

Goals of Rings for Keratoconus

- To improve UCVA
- To improve BCVA
- To decrease HOA
- To increase Contact Lens Tolerance

and Prevent the need for a Corneal Transplant

However with Realistic expectations :
Patients will still be dependant
on visual aids



What can be expected from Rings ?

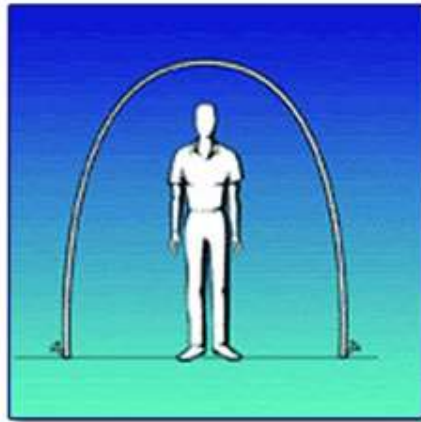
- SE Decreased by a mean of 1.45 to 3.46 D
- CYL Decreased by a mean of 0,24 to 2.88 D
- K readings Decreased by a mean of 1.57 to 5.59 D

Based on the literature data, with more than 100 publications upon Rings' topic!

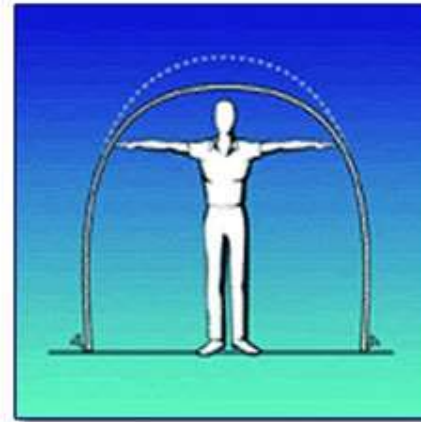
Author	Study type	N	SD	Study duration	Follow-up (months)	Mean change (SD)	Mean change (SD)	Mean change (SD)	Mean change (SD)	Mean change (SD)
Chen et al. 2010	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2011	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
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Chen et al. 2016	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2017	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
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Chen et al. 2019	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2020	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2021	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2022	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2023	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2024	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85
Chen et al. 2025	Prospective clinical trial	100	100	3 months	3	2.15	1.9	1.1	-	1.85

See meta-analysis in literature – Añó et al

Mechanism of action of rings

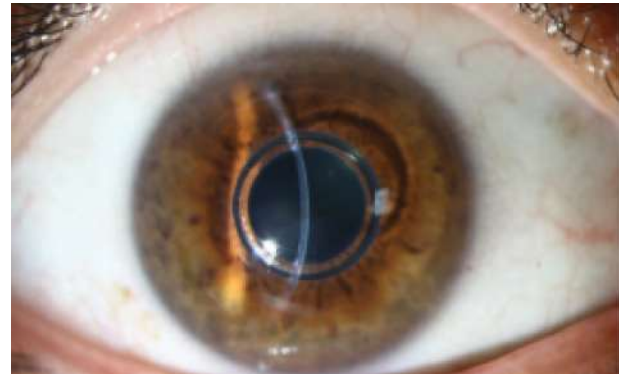
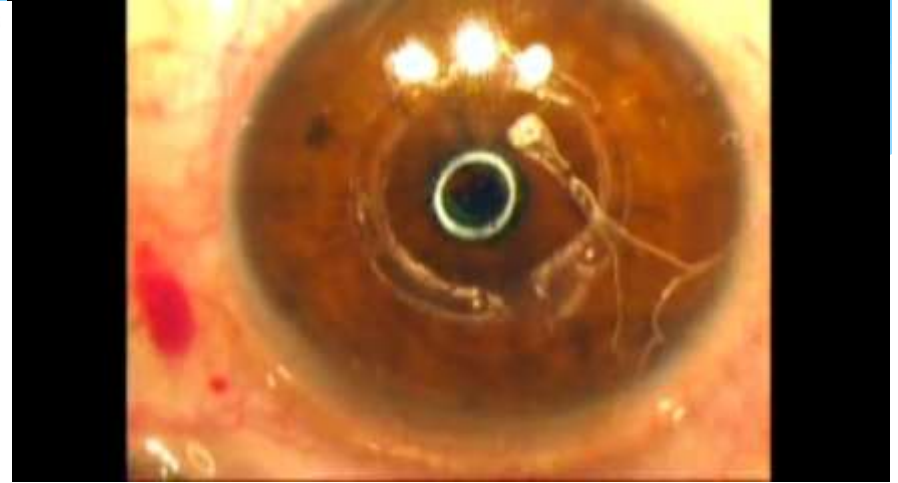


Imagine your cornea as a tent with a curved top.

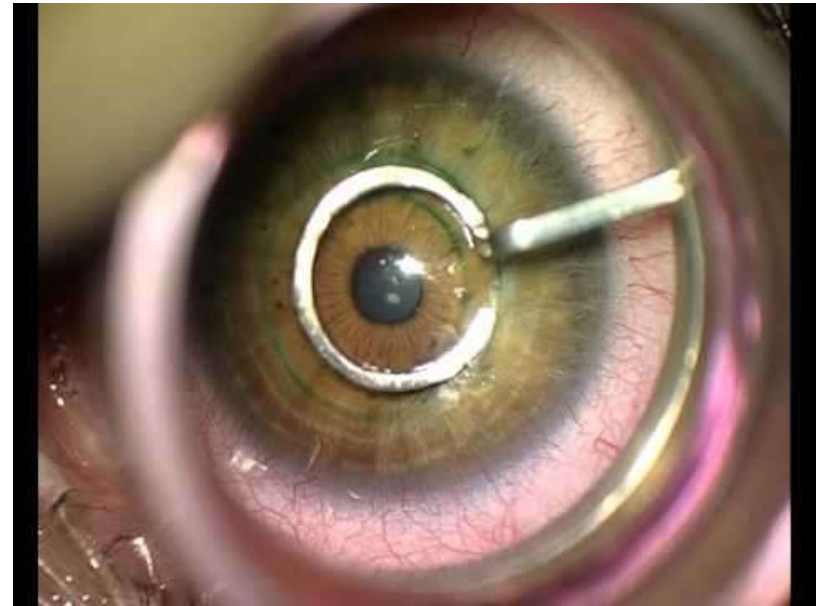


If the sides are pushed out, the top is flattened slightly and the dome shape is restored.

Types of Rings



Methods of implantation of rings



Advantages of Femtosecond Tunnel Creation

- Precise Depth
- Precise Incision site creation
- Easier than manual
- Avoid complications of manual tunnel creation e,g:
Anterior or Posterior corneal perforations ,
epithelial defects, infectious keratitis, asymmetric
segment placement, corneal stromal oedema
around the incision, extension of the incision
towards the central visual axis or the limbus and
persistent incisional gapping

Ideal patient for rings

- High errors.
- Mean Keratometry > 48 Ds
- K Max > 50 Ds
- BCVA < 6/30
- High patient motivation

Rings we use



Parameters which guide us

- Refraction
- Pachymetry
- Steepest K axis
- Cone site
- Nomogram

