

Posterior Chamber Phakic IOL implantation after previous Intracorneal Ring Segment Implantation in keratoconus patients



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Keratoconus Treatment: ICRS and Phakic IOL



- **Intracorneal Ring Segments (ICRS)** used to correct irregular astigmatism and corneal higher-order aberrations (HOAs).
- **Phakic IOL:** corrects the residual refractive error.
 - Advantage: safe, effective and predictable procedure. Preserves accommodation
 - Disadvantage: future second procedure with cataract surgery
- **Available articles:** ICRS → ≥ 6 months → Phakic IOL
 - JF Alfonso et al. (JCRS 2011): efficacy index 0.32 after ICRS implantation and 0.88 after IOL
 - TB Ferreira et al. (JRS 2014): final efficacy index 1.06 and safety index 1.40

Material and Methods

Purpose

- Ferrara® rings for KC treatment
- 6 months later:
 - ICL V4C® for residual myopia correction

Evaluated Parameters

- BCVA
- Manifest Refraction
- Endothelial Cell Count
- Biomicroscopy

Spherical IOL Power

- Subjective refraction
- Anterior Chamber Depth
- Keratometric measurements (Scheimpflug tomography)

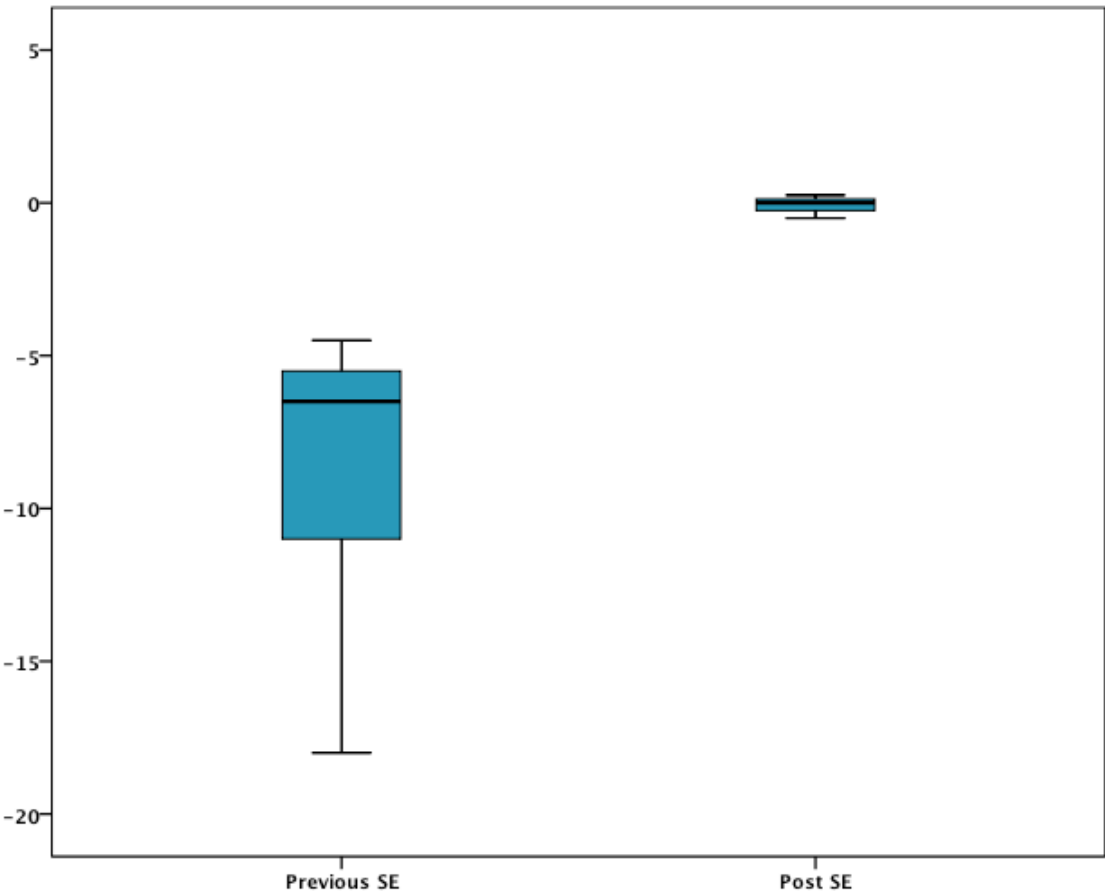
IOL Diameter

- OCT Visante Omni®
- Horizontal and vertical angle-to-angle distance

Results of ICL[®] correction after ICRs with Ferrara rings[®]



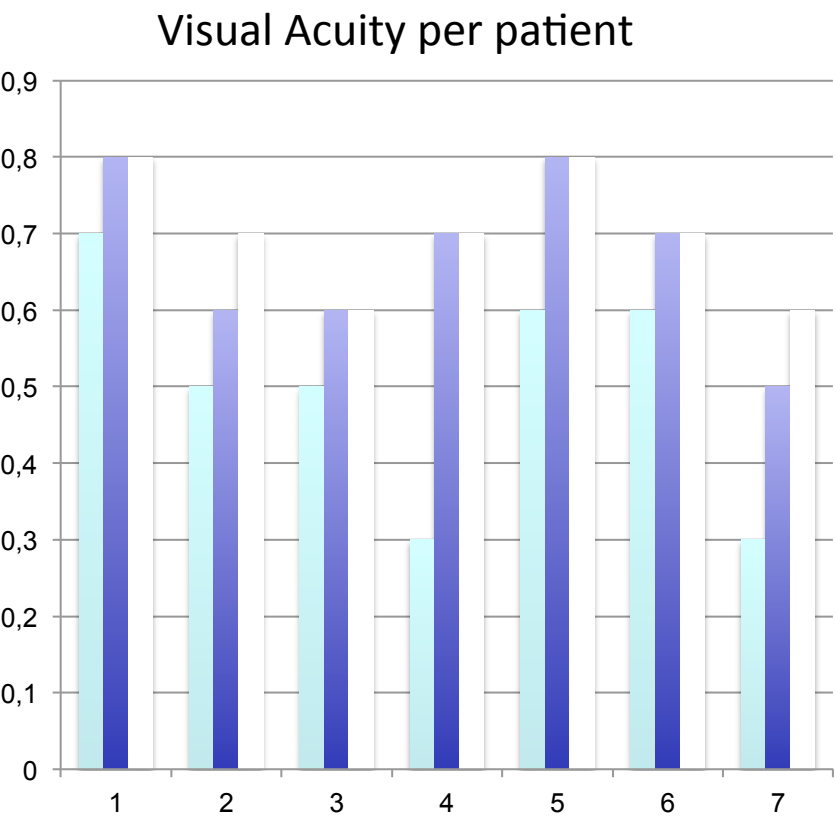
- Included 7 eyes of 5 patients
- Mean age 27 ± 6.3 years



p (paired t-test) = 0.006

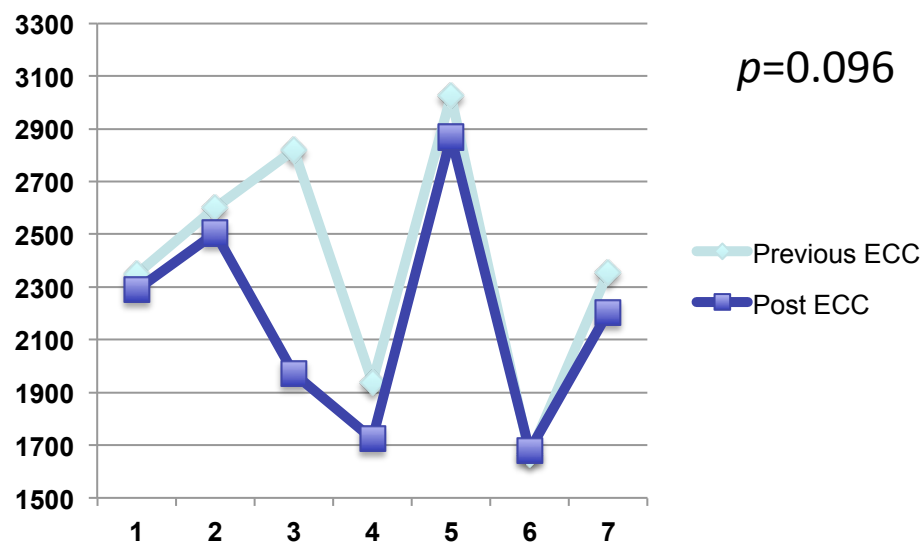
Patient	IOL Size (mm)	IOL Vault (μm)
1	13,2	415
2	13,2	502
3	12,6	389
4	12,6	391
5	13,7	401
6	13,2	456
7	12,6	527
Average ±SD	13,01 ±0,43	440,3 ±55,9

Results of ICL[®] correction after ICRs with Ferrara rings[®]



Previous BCVA
Post UCVA
Post BCVA

Endothelium Cell Count per patient



Safety Index: 1.4 ($p=0.004$)
Efficacy Index: 1,34 ($p=0.007$)

Conclusion

Residual refractive error is common after ICRS implantation for keratoconus.

Loss of accommodation is a problem in correcting refractive error due to younger target group.

Phakic IOLs are an excellent option.

In our group of patients, safety and efficacy index are similar to other reports.

Gain of visual acuity and decrease of spherical equivalent are remarkable.

Average ICL vault of $440,3 \pm 55,9 \mu\text{m}$ is a safe distance to avoid complications.

No significant endothelial count cell loss is noticed.