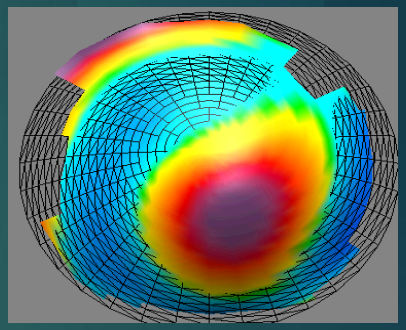
Toric Phakic ICL in Keratoconus Patients: 10-Year Follow-Up

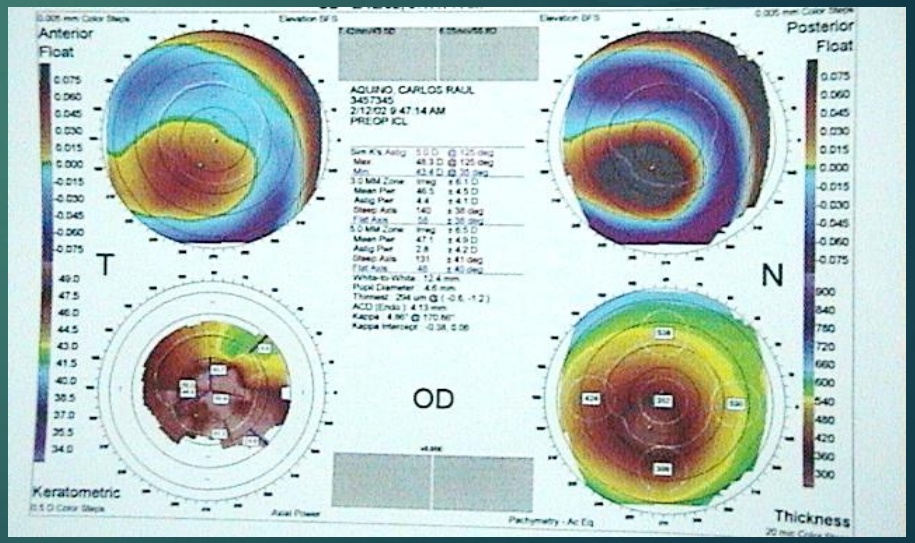
Dr. Juan F. Batlle



Dr. Batlle is a paid consultant for the Staar Surgical Company

Purpose

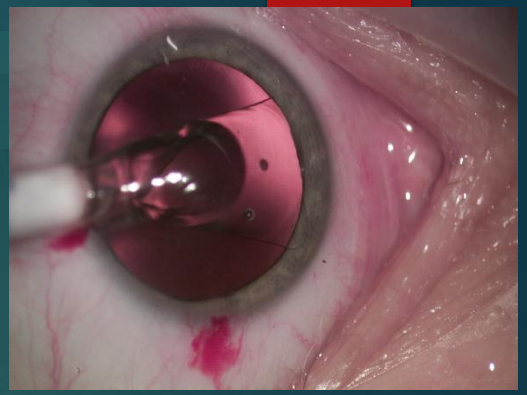
- **To determine the long-term results in visual acuity and refractive stability after ICL implantation in patients with keratoconus.**



Methods

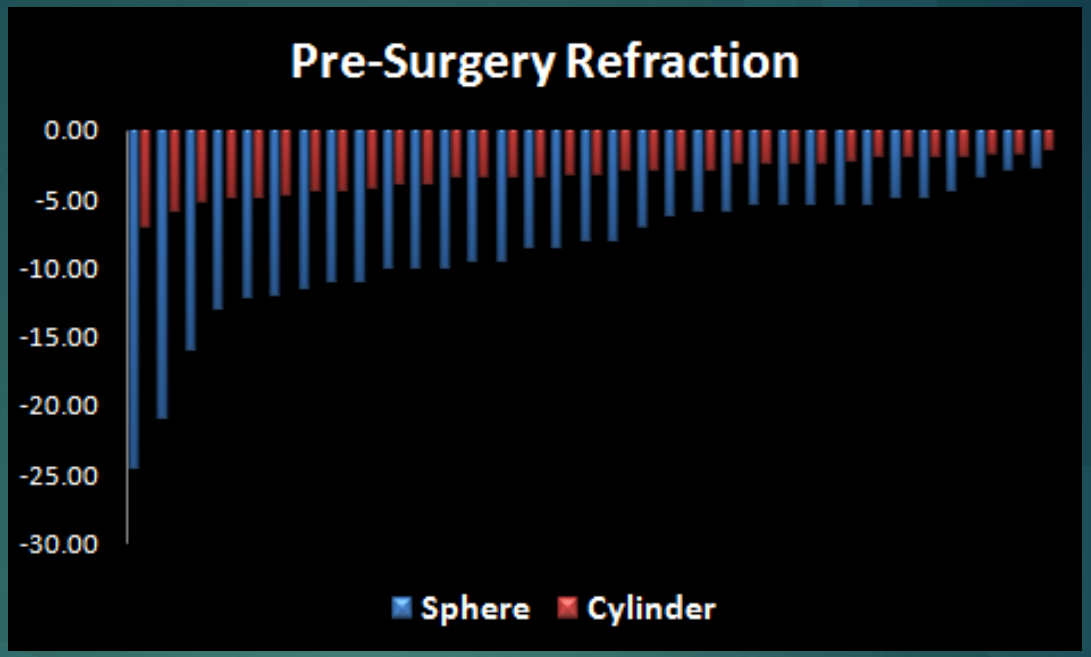
- The patients were carefully selected so that their corneal ectasia was demonstrably stable for at least two years and there was also a limit to the toric correction of 4.5D of cylinder and the myopia which ranged from -3 to -16D.
- Patients with cataracts, glaucoma, Fuchs´ Dystrophy, or retinal pathology were excluded and did not receive ICL implants.
- Fitting of the lens was made initially by white to white measurements, ACD, refraction, K readings, and axial length.
- The anterior chamber depth was measured by the Orbscan in all cases and verified with the Pentacam and IOLMaster instruments. All the patients in the study received laser iridotomies placed at 10:30 and 1:30 usually one week prior to surgery.

Surgical Technique



- All patients received a limbal fiduciary mark at 6 o´clock in the sitting position
- The Dell marker was used to mark the axis under the operating microscope using the 90 degree fiduciary mark
- A 3.2 mm CCI was placed temporally at either 3 or 9 o´clock depending on right or left eye
- The ICL was injected into the anterior chamber and manipulated into the posterior chamber under methycellullose viscoelastic
- Alignment of the axis was accomplished prior to removal of the viscoelastic
- Miochol was injected to constrict the pupil

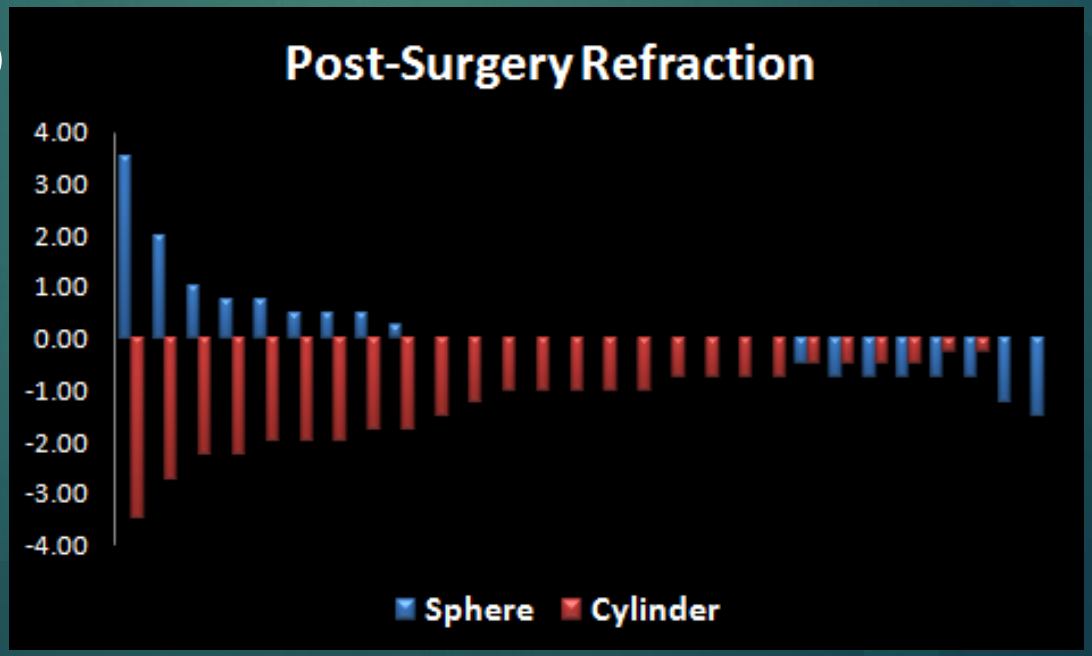
Results



Mean Sphere
-8.81D to -0.10D

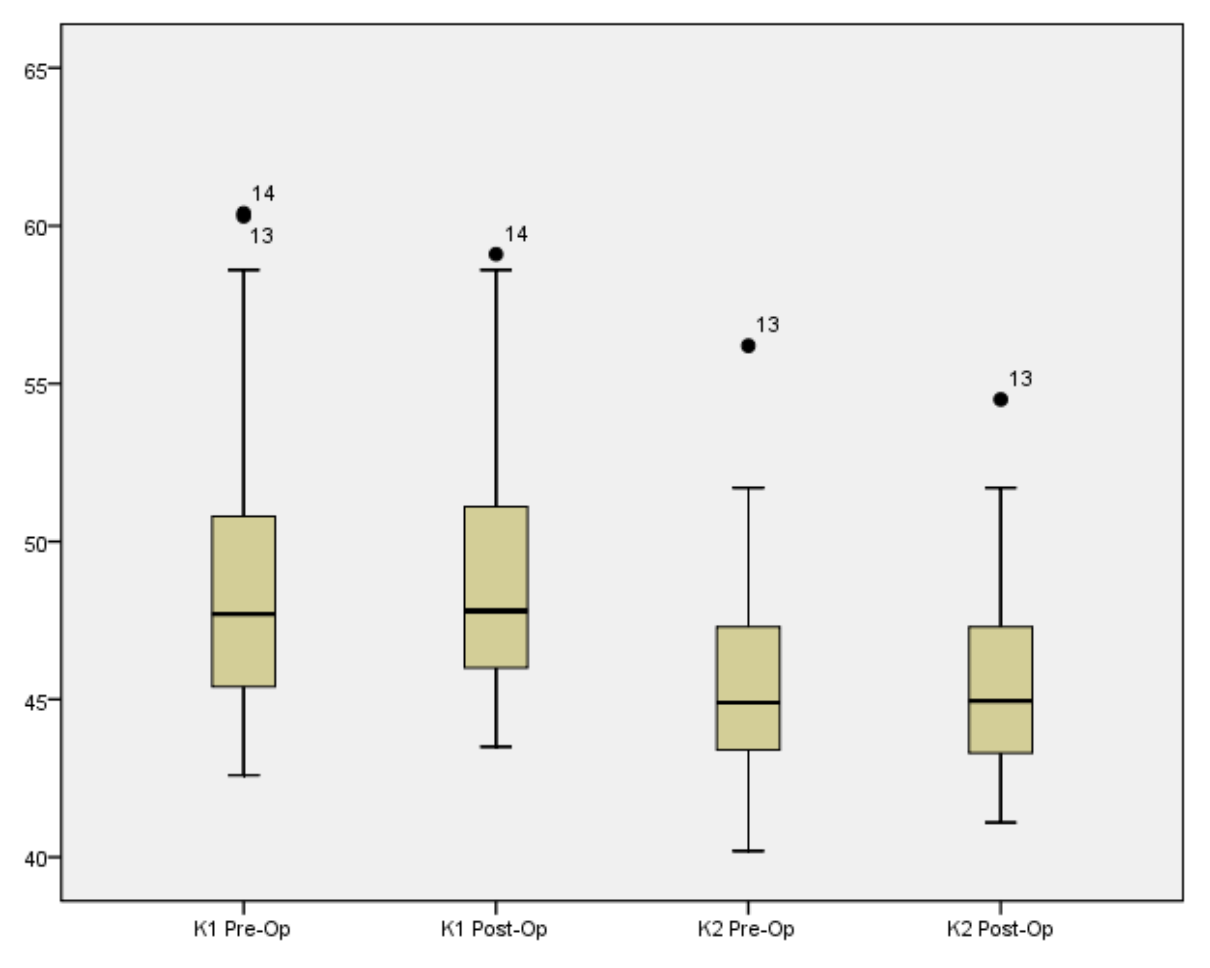
Mean Cylinder
-3.39D to -1.29D

P < o.oo1

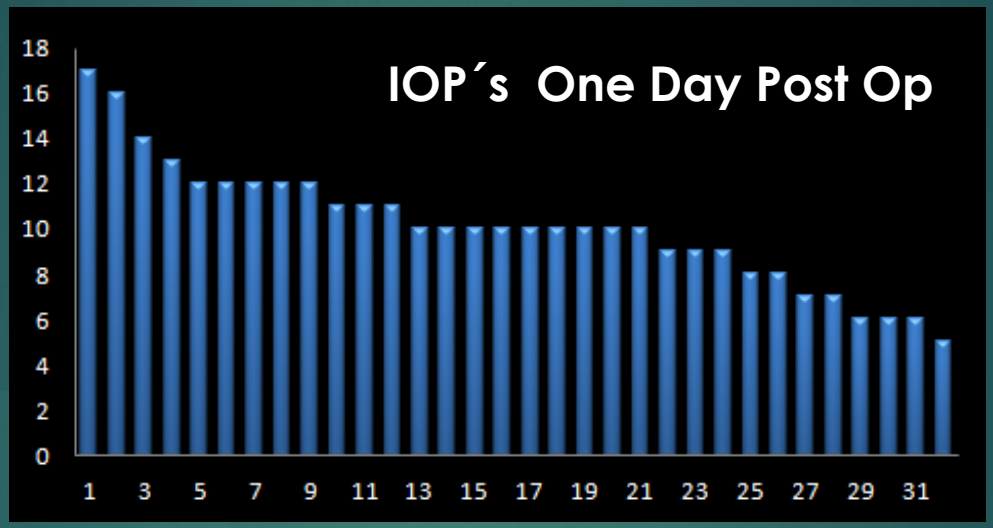


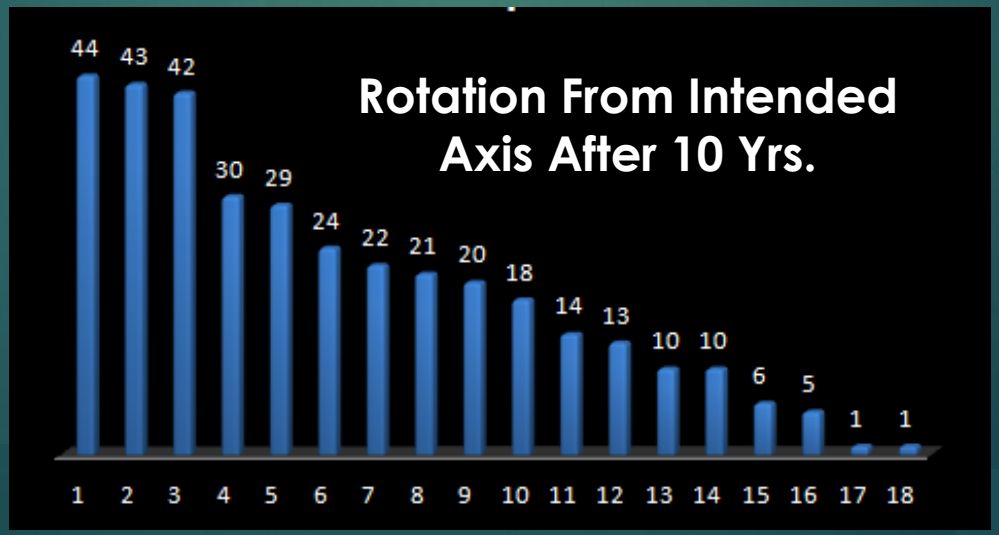
	Pre-Surgery		Post-Surgery		
	Mean	Standard Deviation	Mean	Standard Deviation	t paired test p value
Sphere	-8.81	4.80	0.10	0.98	< 0.001
Cylinder	-3.39	1.32	-1.29	0.83	< 0.001

Minimal Change in Keratometry After Ten Years $p>0.05$



Results


IOP´s One Day Post Op
18
16
14
12
10
8
6
4
2
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31


Rotation From Intended Axis After 10 Yrs.
44 43 42 30 29 24 22 21 20 18 14 13 10 10 6 5 1 1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Results

ICL Axis Displacement	
Mean	20
Standard Deviation	14
Median	19
C1	10
C3	28

Conclusions

This study demonstrates remarkable stability of refraction and visual acuity after ten years of follow-up.

The mean spherical power was reduced from -8.81D to 0.10D, and the cylinder dropped from -3.39D to -1.29D

The keratometry obtained by topographic analysis showed minimal change during the ten-year follow-up and surprisingly the K´s were actually flatter.

The rotation of the ICL was likely due to poor fitting or eye rubbing. In spite of the rotation, the visual acuity was excellent and this is probably a result of the relatively high spherical error compared to the cylindrical error. The mutifocal nature of keratoconus corneas may also account for this phenomenon.