



STAAR's archives

Long-term clinical results of posterior chamber phakic intraocular lens implantation to correct myopia. Lee JS. Clin Experiment Ophthalmol. 2015 Dec 12. doi: 10.1111/ceo.12691. [Epub ahead of print]

PURPOSE: To evaluate the long-term clinical outcomes of Implantable Collamer Lens (ICL, V4 model) implantation for moderate to high myopia with large number of patients with a follow-up of at least 5 years and up to 9 years.

Sample Description

- A total of 281 eyes of 145 myopic patients, aged between 22 to 41, were included in this retrospective observational study.
- Preoperative manifest spherical equivalent ranged from -4.00 to -15.25 D, whereas cylinder did between 0.00 and 3.75 D.

Methods

- The V4 ICL model was implanted and the target was emmetropia.
- ICL mean power was -12.48 ± 2.25 (Range -5.50 D to -20.50 D)
- Two peripheral iridotomies were performed before surgery with Nd:YAG laser, and the ICL was inserted through a 3-mm clear corneal incision.
- The postoperative follow-up period was at least 5 years (mean 87 ± 18.9 months, range 61 to 110 months).
- The follow-up assessments were: uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), refraction, subjective vault, slit-lamp biomicroscopic and funduscopy examination, endothelial cell density and intraocular pressure (IOP).

Inclusion criteria
20 years or older
Corrected distance visual acuity of 6/9 or better
Stable refraction
Anterior chamber depth deeper than 2.8 mm
Endothelial cell density greater than 2000 cell/mm ²
No history of ocular or neuro ophthalmic disease

Table 1. Inclusion Criteria

What were the results?

Parameter	Mean \pm standard deviation				
	Preop	1 year	3 years	5 years	Last visit
LogMAR *UDVA	1.52 \pm 0.32	-0.07 \pm 0.16	-0.06 \pm 0.18	-0.04 \pm 0.14	0.02 \pm 0.19
LogMAR* CDVA	0.02 \pm 0.04	-0.15 \pm 0.10	-0.15 \pm 0.09	-0.14 \pm 0.07	-0.12 \pm 0.13
Vault	N/A	2.4 \pm 0.6	2.3 \pm 0.8	2.2 \pm 1.0	2.0 \pm 0.7
Spherical equivalent	-8.74 \pm 2.27	-0.29 \pm 0.34	-0.43 \pm 0.55	-0.59 \pm 0.51	-0.58 \pm 0.72
Endothelial Cell Loss	2898 \pm 404	2835 \pm 337	2794 \pm 245	2726 \pm 227	2712 \pm 369

Table 2. Preoperative parameters and changes during the follow-up

- The efficacy index and safety index at the last follow-up visit were 1.04 ± 0.32 and 1.20 ± 0.26 , respectively.
- At last visit 50% of eyes had no change in CDVA, 26% gained one line, 18% gained two or more lines, 4% lost one line, and 2% lost two lines.
- The level of predictability at the end of the follow-up was 70% of eyes within ± 0.50 D and 87% of eyes within ± 1.00 D of the attempted spherical equivalent.
- The mean endothelial cell density decreased significantly from preoperative to postoperative values (ANOVA, $P = 0.02$) (Table 2). The percentage of endothelial cell loss was $(7.8 \pm 8.3)\%$ at last visit.
- 6 eyes (2.1 %) developed asymptomatic anterior subcapsular cataracts that had not required cataract surgery by the last visit.
- 2 eyes (2.7%) had increased IOP due to larger size of IOL (pupillary block induced by high vault) and underwent lens exchange.

Author's conclusions

- In the present study, the incidence of cataract formation appears to be lower (2.1%) than that in previous studies, possibly due to younger patient age (30.31 ± 4.5 years) and less preoperative spherical equivalent despite long-term observation.
- ICL implantation is an effective and safe surgical option for correcting moderate to high myopia with stable and predictable refractive results over the long term (based on the maximum follow-up time of this study: 9 years). Slight myopic shift was observed possibly because of the biometric changes in myopia or the decrease in vault.



STAAR's take-home messages

- ◇ Other long-term studies (more than 3 years) evaluated the visual and refractive outcomes of ICL implantation for myopia¹⁻³.
- ◇ All of them concluded that the implantation of ICLs is safe and effective, and provides predictable and stable refractive results in the treatment of moderate to high myopia during the respective follow-up periods (4 years, 5 years and 8 years, respectively), suggesting its long-term viability as a surgical option for the treatment of such eyes.
- ◇ According to this long-term study (up to 9 years), 2.1 % of eyes developed asymptomatic ASCO that did not require surgery and 0.7 % of eyes required lens exchange due to elevated IOP secondary to inadequate lens length.

References

1. Kamiya K, Shimizu K, Igarashi A, Hikita F, Komatsu M. Arch Ophthalmol 2009; 127: 845–50.
2. Alfonso JF, Baamonde B, Fernández-Vega L, Fernandes P, González-Méijome JM, Montés-Micó R. J Cataract Refract Surg 2011; 37: 873–80.
3. Igarashi A, Shimizu K, Kamiya K. Am J Ophthalmol 2014; 157: 532–9.

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STAAR's archives

Changes in stereoacuity following implantable Collamer lens implantation in patients with myopia.

Khokhar S. Indian J Ophthalmol. 2015 Oct;63(10):788-90. doi: 10.4103/0301-4738.171510.

PURPOSE: To evaluate the impact of Implantable Collamer Lens (ICL) implantation on stereoacuity in myopes in a retrospective case series.

Brief summary

Methods:

- 95 eyes of 48 patients previously implanted with ICL were recruited in this study.
- Distance and near stereoacuity were measured before surgery and at 4 weeks postoperatively.
- Distance Randot stereotest was administered while wearing polarizing glasses by trained masked optometrists at 3 m for distance stereopsis. Near stereoacuity was measured using the TNO test and was administered at 40 cm using red, green anaglyphic filters.
- Mean age of the patients was (23.7 ± 3.7) years.
- Mean uncorrected distance visual acuity (UDVA) was (1.28 ± 0.37) logMAR* (median: 1.3; range: 0.3–1.8), and median best-corrected distance visual acuity (BDVA) was 0.18 logMAR* (range: 0–0.6).
- The mean spherical error was -9.9 ± 5.5 D (range: -1 to -19), and the mean cylindrical error was -1.11 ± 1.7 D (range: -6 to 0 D). The average spherical equivalent of the population was -10.49 ± 5.69 D (range: -2.75 to -21 D).

Results:

- There was a significant improvement in both UDVA and BDVA postsurgery.
- There was a significant improvement in stereoacuity for both near ($P = 0.001$) and distance ($P = 0.0005$).
- Improvement of stereoacuity among stereoblind subjects was 83% and 36% for near and distance, respectively.

Author's conclusions:

- ICL implantation aids in improving stereoacuity postoperatively. It may be utilized as a therapeutic procedure for poor stereopsis preoperatively in certain sportspeople, e.g. in athletes, shooters, car racers. Near stereopsis may be more amenable to the treatment than distance stereoacuity.
- Enhanced stereoacuity postsurgery could be due to the greater retinal magnification of images (11–47%) at intraocular plane versus that at the spectacle plane.

***Equivalence between Visual Acuity Scales**

Decimal	Snellen	LogMAR
0.1	6/60	1
0.5	6/12	0.30
1.0	6/6	0.00
1.25	6/5	-0.10

Educational message:

Stereopsis is the ability to perceive depth and objects in a three-dimensional (3D) space. It is the finest element of binocular vision which develops in an infant at around 4 months of birth. Normal levels of stereoacuity have been related to a better performance on motor skills tasks such as judging distances, hand-eye coordination, etc¹.

High refractive errors, thus, are an important cause of diminished stereopsis due to blurred vision despite best correction.

References

1. O'Connor AR, Invest Ophthalmol Vis Sci. 2010 Apr;51(4):2019-23. doi: 10.1167/iops.09-4434. Epub 2009 Nov 20.

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