IMPLANTABLE COLLAMER LENSES (ICL) FOR CORRECTION OF HIGH REFRACTIVE ERRORS

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Purpose: For the past 30 years, laser corneal refractive surgery has been used to correct a wide range of refractive errors and has proven to be effective and safe. Various techniques have evolved; however, despite the use of highly optimized and customized laser treatments physical limitations of corneal thickness, curvature, and tissue remodelling limit the indications for a safe corneal refractive procedure. In the absence of any contraindications, pIOL implantation is the preferred approach for young patients with moderate to high refractive errors and in those cases where there is a contraindication to a corneal refractive procedure (e.g. thin corneas). pIOL advantages are preservation of accommodation and potential reversibility of the procedure. In comparison with LASIK for high myopia, pIOLs are highly favorable in terms of patient satisfaction, visual acuity and optical quality. Currently, there are three types of refractive lenses approved for correcting refractive errors: anterior chamber, iris fixated, and posterior chamber. The Implantable Collamer Lens (Visian ICL; Staar Surgical, Nidau, Switzerland) is the most used phakic intraocular lens nowadays. It is a posterior chamber phakic IOL specially designed to be implanted in the posterior chamber behind the iris and in front of the crystaline lens, with the haptic resting on the ciliary sulcus.

Materials and methods: Ongoing prospective nonrandomized observational study started in February 2013. 89 eyes (59 patients) completed 2 year follow up. Preoperative examination and postoperative follow up included measurement of sphere and cylinder refraction, uncorrected (UDVA) and corrected distance visual acuity (CDVA), aberrometry, intraocular pressure (IOP), anterior chamber depth (ACD) and endothelial cell count (ECC). Slit lamp and dilated fundus examination were also performed. The postoperative results at 1 and 2 years were compared to baseline values. Student t-test was used for statistical analysis with 5% significance.

Results: Preoperatively mean sphere was -10,15±3,35D (-16,25 to -5,75), cylinder was -2,63±1,05D (-4,50 to -1,0). There was no significant difference between preoperative CDVA and postoperative UDVA at 1 and 2 years($p>0,05$).40% of patients gained one or more lines of CDVA. At year, mean sphere was -0,25±0,4D (-0,75 to +0,50) and mean cylinder was -0,29±0,6D (-1,00 to +0,75). Mean spherical correction increased at

2 years -0,38±0,6(-1,25 to +0,50) (p=0,09). Mean IOP increased for 1,3mmHg (p>0,05), but returned to baseline values after 3 months. One month postop ECC decreased by 5,1% (p<0.05) and remained stable during the follow up (p<0,05). Changes in average values for coma, trefoil and spherical aberration were not significant for 5mm pupil(p>0,05). There were no intraoperative complications, postoperatively 2 lenses were explanted due to under sizing, and 2 eyes developed anterior lens opacities.

Conclusion: ICL implantation showed excellent refractive and visual results with high predictability and fast visual recovery. Rate of surgical and early postoperative complications was acceptable. Longer follow up and larger series of patients are needed to evaluate late postoperative complications and safety for crystalline lens and corneal endothelium. Lifelong follow up of these patients is mandatory.

Keywords: refractive surgery; implantable collamer lens; phakic intraocular lens; high refractive error.

COMPARISON OF LASER IN SITU KERATOMILEUSIS FLAPS CREATED BY 3 FEMTOSECOND LASER

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Purpose: To evaluate the thickness of laser in situ keratomileusis (LASIK) flaps created by 1 of 3 femtosecond lasers using anterior optical coherence tomography (OCT -Carl Zeiss Meditec AG, Jena Germany) in patients with myopia and myopic astigmatism.

Methods: In this comparative case series, flap creation for bilateral LASIK was performed using an IntraLase (femtosecond group 1), Femto LDV (femtosecond group 2) and VisuMax (femtosecond group 3). We evaluated central flap thickness, mean flap thickness, meridian flap uniformity, difference between the mean central and mid-peripheral flap thickness 2 mm in the horizontal and vertical plane and flap thickness predictability (mean deviation between the achieved and attempted flap thickness). Flap thickness was determined at 10 points. Intended flap thickness was 110 μm. Measurements were taken 3 months postoperatively.

Results: All femtosecond groups comprised 82 eyes. Eyes in femtosecond groups 1 and 3 had relatively even flap configuration. Flaps in femtosecond group 2 had a meniscus shape with the difference between the mean peripheral 108,27±4,6μm and