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Diffraction add-on IOL: first results

Farvili E., Kermani O., Schmiedt K., Foerster A., Oberheide U., Gerten G.
Augenlinik am Neumarkt, Köln

Objective: Evaluation of a new type of diffractive multifocal IOL as additional lens for sulcus based implantation.

Methods: In a prospective study 49 eyes of 25 patients underwent cataract surgery. Patients with additional diseases, which might interfere with multifocal or sulcus based lenses like e.g. AMD, uveitis or glaucoma were excluded prior to the study. After phakoemulsification a monofocal lens was implanted in the capsular bag and an additional diffractive multifocal lens (Humanoptics MS 714 PB diff) was placed in the sulcus. This add on lens (a 3-piece, foldable silicone lens with angled PMMA haptics) is specially designed for sulcus implantation. The diameter of the optic is 7mm with a central diffractive optic with 3.5mm in diameter leading to a near addition of +3 dpt. The implanted monofocal IOL was an aspheric, blue light protective foldable silicone lens. All patients had complete ophthalmic postoperative examinations on day one, after one week, one month and three months.

Results: Three months postop the median of the best corrected visual acuity (BSCVA) was 1.0 (LogMar 0.03±0.05), the median of the uncorrected visual acuity (UCVA) 0.8 (LogMar 0.14±0.13). The average SEQ was 0.09±0.63dpt. The monocular near UCVA was 0.63 (LogMar 0.21±0.18) for a reading distance of 40 cm with EDTRS-chart, binocular 0.8 (LogMar 0.08±0.10). The median of the UCVA for intermediary distance of 1m was 0.8 (LogMar 0.21±0.20). All patients achieved a binocular near UCVA of 0.5 /J5 allowing them to read newspapers (8pt letter size). The mean distance between both IOLs was 550±220 µm. No complications associated with the sulcus IOL like loss of iris pigment, cell proliferation between the IOLs or iris capture occurred.

Conclusions: The additional implantation of a diffractive sulcus IOL is a safe and effective method for the improvement of near visual acuity after monofocal IOL implantation.