Effect of implanting a Sulcoflex IOL in patients with negative dysphotopsia: comparison between clinical results, biometrical data and results of optical modelling

All eyes were implanted with the Seelend MF (Hanita Lenses, Israel) diffractive hydrophilic multifocal IOL.
Results: One year capsulotomy rate was 0.3%, 2-year 1.2%, 3 year 2.8%, and 4 year 2.2%. The mean time to Nd-YAG capsulotomy was 2.9 ± 1.21 years, with a range f 0.98 to 4.44 years. No complications were seen after Nd-YAG capsulotomy. Mean Uncorrected Distance Acuity improved from 0.27 ± 0.23 to −0.02 ± 0.06, $p < 0.0004$. Mean spherical equivalent improved from −0.16D± 0.48D to 0.03D ± 0.19D, $p < 0.14$. Compared to the literature these are low rates of posterior capsulotomies in multifocal IOLs.
Discussion: The haptic and optic design, with 5 degree angulation, and a sharp edged optic, with a ring surrounding the optic may delay development of visually significant posterior capsular opacification in eyes implanted with a hydrophilic diffractive multifocal IOL. Long term development of PCO in these types of lenses still needs to be studied.
Financial Disclosure: Lapid – Alcon, EyeYon, Hanita Lenses, ODAK, Santen, Thea Pharma, Taiho Oncology. Van der Meulen- Alcon, ODAK. No financial interest in the content of this presentation.

Objective evaluation of negative dysphotopsia with Goldman kinetic perimetry

N.Y. Makhotkina, T.T.J.M. Berendschot, R.M.M.A. Nuijts
University Eye Clinic, Maastricht University Medical Center, The Netherlands

Purpose: To compare the extension of peripheral visual field in phakic and pseudophakic patients and to evaluate whether Goldman kinetic perimetry can be used as objective measurement of negative dysphotopsia.
Methods: Prospective and case control study. Kinetic perimetry was performed with V4e and I4e stimuli. Visual fields were assessed in four quadrants: superior temporal, superior nasal, inferior temporal and inferior nasal. In the control group, ten patients were evaluated before and one month after cataract surgery. Biometric and perimetric data of the control group were compared to data of ten patients with negative dysphotopsia. In addition, in five eyes with bothersome negative dysphotopsia, visual field was re-evaluated after treatment with implantation of a supplementary Sulcoflex intraocular lens (Rayner Intraocular Lenses Ltd.) in the ciliary sulcus.
Results: In the control group, the extension of visual field did not change after cataract surgery. Patients with negative dysphotopsia had a significantly shorter axial length (mean difference was 1.7 mm, $p < 0.01$) and higher IOL powers (mean difference was 4.3 D, $p < 0.01$) compared to controls. There was no significant difference in age between cases and controls, as well as in the spherical equivalent, dimensions of anterior and posterior eye chamber and scotopic or photopic pupil diameters. Visual fields in inferior temporal and inferior nasal quadrants were respectively 10 and 6 degrees ($p < 0.05$) smaller in patients with negative dysphotopsia compared to controls. In three patients with negative dysphotopsia, a shadow was drawn in the superior temporal and the inferior temporal quadrants during perimetry and the position of this shadow matched their subjective description of negative dysphotopsia. Visual field changes after Sulcoflex IOL implantation, such as increase of the constricted visual field and resolution or persistence of the shadow, matched the course of negative dysphotopsia after surgery.
Conclusions: We propose that kinetic perimetry can be used for objective evaluation of patients with negative dysphotopsia as these patients had either constricted peripheral visual field or a relative temporal scotoma, corresponding to the position of the shadow. In addition, kinetic perimetry can be used for evaluation of treatment effect of negative dysphotopsia.

Effect of implanting a Sulcoflex IOL in patients with negative dysphotopsia: comparison between clinical results, biometrical data and results of optical modelling

T.T.J.M. Berendschot, N.Y. Makhotkina, V. Dugrain, D. Purchase, R.M.M.A. Nuijts
University Eye Clinic, Maastricht University Medical Center, The Netherlands

Purpose: To predict the effect of supplementary Sulcoflex IOL (Rayner Intraocular Lenses Ltd.) implantation in patients with negative dysphotopsia (ND) using individual biometry and optical modelling.
Methods: A retrospective case study and optical modelling of patient-specific data. Ten eyes of eight patients with ND were treated with implantation of a Sulcoflex IOL. Biometric and perimetric measurements were used for evaluation of the treatment. Pre- and postoperative patient-specific optical models of eyes with ND were constructed in the Zemax OpticStudio Simulation software using non-sequential ray-tracing mode. The rays from a 3D Ganzfeld light source were traced for four different iris apertures and light irradiance was evaluated as a function of degrees of eccentricity relative to the centrum of visual field. Relationship between biometric parameters, ray-tracing data and ND course was evaluated
Results: ND resolved completely in six, partially in two and persisted in two eyes. There was no relationship between ND course and age, IOL power, or individual biometry. Ray-tracing modelling of preoperative data showed a marked decrease in light irradiance between 60 and 70 degrees at the periphery relative to the centre of visual field. The peripheral light irradiance with 1.5 mm pupil diameter significantly increased after Sulcoflex IOL implantation ($p < 0.05$). For larger pupils, no improvement was observed. Although the increase in light irradiance increased with increasing resolution of ND after surgery, it did not reach statistical significance ($p = 0.065$). There was no consistent relationship between light irradiance at the periphery and anterior or posterior chamber dimensions, axial length or IOL power.
Conclusions: Ray-tracing modelling, which combines all biometry results of a given patient, shows encouraging correlation with ND course. This provides an opportunity to predict the effect of supplementary IOL implantation on ND using patient-specific optical models.
Conflict of Interest: Vincent Dugrain and Daniel Purchase are employees of Rayner Intraocular Lenses Ltd.
Additional Disclosures: Rudy M.M.A. Nuijts is a consultant for Alcon, Fort Worth, TX, USA; TheaPharma, Wetteren, Belgium and ASICO, Westmont, IL, USA. He received study grants from Ophtec, Groningen, the Netherlands; HumanOptics, Erlangen, Germany; Gebauer, Cleveland, OH, USA and Alcon. He received lecture fees from Alcon.

Pupil reconstruction by customized artificial iris implantation: a six-year experience

R.M.M.A. Nuijts[1], L. Spekreijse[1], C. Pedrosa[2]
[1]University Eye Clinic, Maastricht University Medical Center, Maastricht, The Netherlands, [2]Hospital Prof. Dr. Fernando Fonseca E.P.E., Lisbon, Portugal

Purpose: To present a customized approach for treatment of congenital and acquired (partial) aniridia with implantation of a foldable artificial iris prosthesis in the ciliary sulcus.
Methods: Retrospective case series analyzing surgical outcomes, complications and functional results.
Results: The foldable silicone iris prosthesis Artificial Iris (HumanOptics, Germany) was implanted in 21 eyes of 20 patients, with a median follow-up of 30 months. In seven cases the iris implant was sutured to the sclera. No intraoperative complications were registered with the exception of an intraocular lens-capsular bag complex subluxation, where a 3-P hydrophobic acrylic IOL was sutured to the artificial iris in the same procedure. Postoperative median anterior chamber depth was