

Electronic poster presentations

Cataract Surgery

E-00002

Blue-light exposure in an animal model of uveal melanoma

B.F. Fernandes, S. Di Cesare, S. Maloney, J.-C. Marshall, W. Dawson, M.N. Burnier, Jr.

ABSTRACT (AS SUBMITTED)

Purpose: Uveal melanoma (UM) cells lines, when exposed to blue light in vitro, show a significant increase in proliferation. In order to see if the same effect would be seen in vivo, we investigated the influence of blue-light exposure in an animal model of UM.

Methods: Twenty albino rabbits were injected with 1 million human UM cells (92.1) into the suprachoroidal space of the eye. Animals were immunosuppressed using cyclosporin A throughout the 8 week long experiment. The animals were divided into two groups of 10 animals each. The experimental group was exposed to blue-light, while the control group was protected from blue-light using a yellow-filter. Intraocular tumour growth was evaluated weekly by fundoscopic examination. One animal was sacrificed per week, after the 2nd week, in order to evaluate progression of the disease. The eyes were removed after sacrifice and the proliferation rates of the re-cultured cells obtained from the intraocular tumours were performed using the Sulfordhamine-B assay. The Student's t-test was used to compare results for statistical significance.

Results: Re-cultures of UM cells were establish from 4 and 5 rabbits of the experimental and control group respectively. Cells were re-cultured for a very short period of time (1 passage only) in order to maintain any in vivo cellular changes. The exposure of rabbits to blue light led to an increase in proliferation of the cell lines derived from intraocular tumours compared to the control ($p=0.001$).

Conclusions: There is increasing amount of data suggesting that Blue-light, one of the components of visible light, may influence the progression of UM. Our results warrant further studies to relate the importance of Blue-Light filtering lenses for UM patients.

Cataract Surgery

E-00003

Ultrasound biomicroscopy characterisation of acrylic, silicone, and PMMA intraocular lenses in vitro

S.V. Kulkarni, K.F. Damji, D. Chialant

ABSTRACT (AS SUBMITTED)

Purpose: Anterior segment complications related to a malpositioned intraocular lens (IOL) require accurate identification of the location of IOL optics and haptics in relation to surrounding ocular structures. This study aims to characterize the reflective properties of some commonly used IOLs in vitro.

Methods: Six different types of IOLs, representative of silicone, acrylic and PMMA, single and multipiece, and multifocal were imaged using high-resolution ultrasound biomicroscopy (UBM).

Results: A significant difference in the reflectivity patterns of Silicone, Acrylic and PMMA optics and haptics was noted. Silicone IOLs appeared most distinct with clear anterior and posterior surface echoes and no reverberation from either the optics or haptics. On the other hand, accurate delineation of acrylic optics on the posterior surface was difficult due to weaker, convex reverberation echoes from the anterior surface giving rise to a “tram track” appearance. This doubling of the anterior surface echo was noticed on haptics as well, confirming that this was a property of acrylic regardless of whether the structure imaged was the optic or haptic. PMMA had maximal reflectivity amongst the three groups and showed multiple reverberation echoes off both surfaces of the haptic and optic.

Conclusions: Silicone, Acrylic, and PMMA optics and haptics have distinctive reflectivity patterns with UBM. It appears that the reverberation pattern is related to the acoustic characteristics of the material rather than the part of the IOL being imaged. Prior knowledge of various lens features in vitro with UBM provides information for identification and localisation of intraocular lens optics and haptics in vivo.

Cataract Surgery

E-00004

Comparison of surgically induced astigmatism of superotemporal versus superonasal clear corneal incisions in cataract surgery

J. Lefebvre, M.-J. Fredette

ABSTRACT (AS SUBMITTED)

Purpose: To compare surgically induced corneal astigmatism after cataract surgery using 2,75mm three-steps superotemporal clear corneal incisions (CCI) with superonasal 2,75 mm three-steps CCI.

Methods: This comparative retrospective study was done on 100 randomly selected patients (100 eyes; 47 right eyes and 53 left eyes). All patients had a 2,75 mm three-steps clear corneal sutureless incision cataract surgery with an acrylic foldable intraocular lens. All procedures followed the same standardized protocol by the same surgeon. Only the site of the incision was allowed to vary. The right eye always had a superotemporal incision and left eye a superonasal incision. Astigmatism was measured by an automated keratometer before surgery and four weeks (on average) after the surgery. Surgically induced astigmatism (SIA) was calculated by vectors analysis using the Holladay-Cravy-Koch method.

Results: The mean surgically induced corneal astigmatism was 0,561 diopters (D) +/- 0,389 D in the superotemporal (OD) group and was 0,815 D +/- 0,489 D in the superonasal (OS) group. The difference between the groups was statistically significant ($p > 0,0043$). Decomposition of vectors in the two groups showed that the horizontal components of SIA was statistically higher in the superonasal group 0,387 D +/- 0,435 compared to the superotemporal group 0,223 D +/- 0,326 D ($p < 0,0036$). Comparison of vertical component did not differ significantly between the two groups ($p > 0,05$).

Conclusions: Cataract surgery using superotemporal CCI induced significantly less SIA than superonasal CCI. These findings could suggest that superotemporal incision could be better in both eyes. In order to obtain a lesser amount of SIA, a temporal sitting position could be favourable for right handed surgeon in case of left eye cataract surgery (the opposite for a left handed surgeon).

Cataract Surgery

E-00005

Visual acuity, high-order aberrations and contrast sensitivity after implantation of Acrysof IQ SN60WF or Acrysof Natural SN60AT: a prospective, randomized, double-masked, intra-individual trial

G. Mercille, P. Thompson, A. Assalian

ABSTRACT (AS SUBMITTED)

Purpose: To compare the effects of an aspheric intraocular lens (IOL) (Acrysof IQ Model SN60WF, Alcon Inc.) with those of a spherical IOL design (Acrysof Natural Model SN60AT) on visual acuity, high-order aberrations and contrast sensitivity and to evaluate the impact on quality of vision.

Methods: Thirty-one patients with bilateral cataracts (62 eyes) were enrolled in this study. The first eye was randomized to receive either the "IQ" or the "AT" IOL and 1 month later, the fellow eye received the other IOL. Three months after surgery, we measured uncorrected and best-corrected visual acuity using the Early Treatment Diabetic Retinopathy Study chart. High-order aberrations were measured with the OPD-Scan (Nidek) at pupil diameters of 4, 5 and 6 mm. Mesopic and photopic contrast sensitivity with and without glare was tested at 4 spatial frequencies (3,6,12 and 18 cycles per degree) using the CSV-1000 (VectorVision). A self-administered questionnaire was completed by each patient to evaluate the impact of surgery on the quality of vision.

Results: The mean spherical aberration (Z_4^0) in eyes implanted with the aspherical lens was lower than with the spherical one. At a pupil diameter of 4 mm, the actual mean value was $0.05 \mu\text{m} \pm 0.03$ in the "AT" group and $-0.02 \mu\text{m} \pm 0.03$ in the "IQ" group. For a 5 mm pupil, we obtained $0.15 \mu\text{m} \pm 0.05$ in the "AT" group and $-0.01 \mu\text{m} \pm 0.05$ in the "IQ" group. The difference was even larger with a 6 mm pupil with $0.34 \mu\text{m} \pm 0.11$ in the "AT" group and $-0.02 \mu\text{m} \pm 0.12$ in the "IQ" group. Contrast sensitivity in mesopic condition and without glare was significantly associated with higher log values on average throughout all spatial frequencies ($p < 0.001$). Out of 31 patients, 27 had a lens preference. Eighteen (66.7%) preferred the "IQ" lens and 9 (33.3%) the "AT" lens.

Conclusions: The "IQ" lens (aspherical design) gives a better quality of vision than the "AT" lens (spherical design) by reducing induced spherical aberration. The contrast sensitivity is improved in mesopic condition. Moreover, this is also reflected by a subjective preference in favour of the aspherical lens in a majority of patients.

Cataract Surgery

E-00006

Comparison of outcomes between IOL exchange and IOL suture repositioning for intraocular lens dislocation

J.C. Teichman, S. Vold, S. Masket, A.S. Crandall, G. Condon, I.K. Ahmed

ABSTRACT (AS SUBMITTED)

Purpose: To compare visual outcomes and complications after exchange or suture repositioning for dislocated intraocular lens implants.

Methods: This study was a retrospective chart review of 219 patients who underwent IOL exchange (n = 122) or IOL repositioning by suture-fixation to the sclera or the iris (n = 97), between 1995 and 2007. Data with respect to surgical procedure, etiology of dislocation, IOL location, preoperative and postoperative best-corrected visual acuity (BCVA) and complications were obtained. Snellen visual acuities were converted to logMAR values for statistical analysis.

Results: Mean preoperative BCVA of patients undergoing IOL repositioning was 20/200, which improved to 20/70 postoperatively (p < 0.00001). Mean preoperative BCVA of patients undergoing IOL exchange was 20/300, which improved to 20/80 postoperatively (p < 0.00000001). There was no significant difference in preoperative or postoperative BCVA between the groups. Complications in the repositioning group included elevated IOP (3%), vitreous hemorrhage (3%), choroidal hemorrhage (1%), intraoperative hemorrhage requiring the procedure to be aborted (1%), redislocation (1%), and cystoid macular edema (CME) (1%). Complications encountered in the exchange group were redislocation (6%), vitreous hemorrhage (2%), retinal detachment (2%), choroidal hemorrhage (1%), suprachoroidal hemorrhage (1%), elevated IOP (1%), macular hole (1%), pseudophakic bullous keratopathy (1%), endophthalmitis (1%), and CME (1%).

Conclusions: IOL repositioning with suturing techniques or IOL explantation and exchange for intraocular lens dislocation both provide similar improvement in visual acuity. The complication profiles vary between techniques.

Cataract Surgery

E-00007

Comparison of scleral- and iris-sutured repositioning for intraocular lens dislocation
J.C. Teichman, S. Vold, S. Masket, A.S. Crandall, G. Condon, I.K. Ahmed

ABSTRACT (AS SUBMITTED)

Purpose: To compare visual outcomes and complications after scleral-sutured or iris-sutured IOL repositioning for dislocated intraocular lens implants.

Methods: This study was a retrospective chart review of 96 patients who underwent either iris-sutured (or n = 49) scleral-sutured (n = 47) repositioning between 1999 and 2007. Data with respect to repositioning procedure, etiology of dislocation, IOL location, preoperative and postoperative best-corrected visual acuity (BCVA), and complications were obtained. Snellen visual acuities were converted to logMAR values for statistical analysis.

Results: In the iris-sutured group, IOLs were located in the capsular bag (33%), ciliary sulcus (20%), bag-sulcus (16%), vitreous (6%), and anterior chamber (4%). Mean BCVA preoperatively was 20/160, which improved to 20/70 postoperatively ($p < 0.0001$). Complications included vitreous hemorrhage (6%), choroidal hemorrhage (2%), iris hemorrhage (2%), IOL redislocation (2%), elevated IOP (2%), and cystoid macular edema (2%). In the scleral-sutured group, IOLs were located in the capsular bag (60%), ciliary sulcus (21%), vitreous (9%), and bag-sulcus (6%). Mean BCVA improved from 20/250 preoperatively, to 20/63 postoperatively ($p < 0.01$). The preoperative and postoperative BCVA did not differ significantly between groups. Complications included elevated IOP (4%) and one patient suffered an intraocular hemorrhage intraoperatively that resulted in the procedure being aborted.

Conclusions: Iris-fixated and scleral-fixated suture repositioning techniques for dislocated intraocular lens implants provide similar visual outcomes. The complication profiles differ between the two groups.

Cataract Surgery

E-00059

Targeting of spherical aberration correction in cataract surgery, comparison of 0.00 microns against 0.10 microns
G.H. Beiko, A. Abhayambika

ABSTRACT (AS SUBMITTED)

Purpose: Corneal spherical aberration (SA) has been found to be an average of 0.27-.30 microns in previous studies. Correction of spherical aberration during cataract surgery has been found to be associated with improved contrast sensitivity. Targeting of a specific outcome of ocular spherical aberration of both 0.00 microns and 0.10 microns has been shown to enhance contrast sensitivity. No comparison of the two targets has been reported.

Methods: Prospectively, 40 patients presenting for cataract surgery with a corneal spherical aberration of approximately 0.27 microns were randomly assigned to be implanted with either the AMO Tecnis or Alcon IQ lens; thus, targeting 0.00 microns in the first group and 0.10 microns in the second group. Post-operatively, contrast sensitivity was measured under photopic and mesopic conditions with the Ophtec 6500.

Results: To be presented

Conclusions: To be presented

Cataract Surgery

E-00060

AMO Tecnis Multifocal Acrylic IOL ZMA00 - Initial Experience

A. Abhayambika, G.H. Beiko

ABSTRACT (AS SUBMITTED)

Purpose: The AMO Tecnis Multifocal IOL has been available in a silicone platform for a number of years. Experience has shown this lens to provide superior contrast sensitivity following cataract surgery, with very good near vision, and excellent reading speed. An acrylic platform has recently been released; this platform corrects chromatic aberration in addition to spherical aberration. The purpose of this study is to report initial experience with this lens.

Methods: Patients presenting for cataract surgery with healthy eyes were selected to participate in the study, following full disclosure of the study. Visual acuity, distant corrected distance/intermediate/near visual acuity, complications, contrast sensitivity was measured under photopic and mesopic conditions with the Ophtec 6500 and patient satisfaction were recorded.

Results: These will be presented.

Conclusions: These will be presented.

Cataract Surgery

E-00061

Visiogen Synchrony Accommodating IOL in ARMD

A. Abhayambika, G.H. Beiko

ABSTRACT (AS SUBMITTED)

Purpose: The Visiogen Synchrony Accommodating IOL is currently undergoing investigation with healthy patients with healthy eyes. Patients with any ocular disease have not been studied. The purpose of this study is to present the findings in 20 patients with category 2 and 3 ARMD who were implanted with this lens. Theoretical advantages of a lens that completely fills the lens bag are that it may prevent conversion of dry ARMND to wet ARMD.

Methods: Patients presenting for cataract surgery with category 2 and 3 ARMD were selected to participate in the study, following full disclosure of the study. Visual acuity, distant corrected distance/intermediate/near visual acuity, complications and VF 14 scores were recorded.

Results: These will be presented.

Conclusions: These will be presented.

Cataract Surgery

E-00062

Patients with ReZoom or Tecnis IOLs: comparison of quality of vision

G.H. Beiko

ABSTRACT (AS SUBMITTED)

Purpose: To determine the influence of IOLs on the quality of vision following standard cataract surgery.

Methods: The Tecnis lens has previously been found to have improved contrast sensitivity compared to standard spherical lenses. Patients presenting for cataract surgery were studied. One group of 20 patients received the Tecnis monofocal IOL, and the second group of 20 received the ReZoom refractive multifocal IOL. Patient characteristics were evaluated to ensure comparable groups with respect to age, pupil size, corrected VA and corneal spherical aberration (measured using the Easygraph topography unit). Post-operatively, the photopic and mesopic contrast sensitivity were measured with the Stereo Optical VT 1600X.

Results: Patient groups were found to be comparable. Photopic contrast sensitivity was found to be similar in the two groups. Rezoom patients were found to have significantly decreased mesopic contrast sensitivity only at 2 test points, 3 and 12 cps.

Conclusions: The Rezoom multifocal IOL was found to have contrast sensitivity comparable to a Tecnis lens, suggesting that the ReZoom has an aspheric design, with a negative spherical aberration, similar to the Tecnis lens, under photopic conditions.