

CATARACT SURGERY - NEW TECHNOLOGY

THURSDAY 12 JUNE

Paper #A-00001

Changes in cataract waiting lists over time

Lorne Bellan

Purpose: Governments in Canada have committed \$5.5 Billion to shorten waiting lists. There is little information about changes in waiting lists over time except the perception that they were getting longer.

Methods: Monthly data from the Misericordia Cataract Waiting List Program between 2000 to 2007 was used to examine changes in the length of the waiting list per surgeon over time. The data was analyzed to see if changes in the length of a surgeon's list from month to month appeared to influence his/her threshold for booking surgery.

Results: The overall length of the waiting lists decreased during the study period. Individual surgeon's lists fluctuated markedly. Surgeons were not found to adjust their threshold for booking surgery to maintain the length of their lists.

Conclusions: Committing extra resources to bring down waiting lists is successful. Surgeons do not appear to be manipulating their threshold for booking surgery to maintain the length of their waiting list. Individual surgeon's waiting list lengths are surprisingly dynamic. More study is needed on the variation in length of waiting lists and the longitudinal change over time if all patients are to receive their surgery within recommended benchmark wait times.

CATARACT SURGERY - NEW TECHNOLOGY

THURSDAY 12 JUNE

Paper #A-00002

1.8 mm cataract surgery: clinical results 6 months after coaxial and biaxial MICS and implantation of a new micro-incision IOL

Rosa M. Braga-Mele

Purpose: To evaluate the performance of a new phacoemulsification system which is optimized for biaxial and coaxial microincisional cataract surgery (B-MICS, C-MICS); and to report the 6-month clinical results with a novel intraocular lens (IOL) that can pass through an incision of 1.8 - 1.9 mm.

Methods: Forty adults with senile cataract underwent biaxial or coaxial MICS through incisions of 1.8 - 1.9 mm pre-op. The monocular procedures were performed with the new Stellaris Vision Enhancement System (Bausch & Lomb). A wound-assisted technique (injector tip stays outside the chamber) was used to implant a new acrylic, microincisional IOL (MI60, B&L). Wound length was re-measured post-phaco and post-implantation. Visual acuity (VA), refraction, centration and PCO were assessed at defined intervals through 6 months post-op.

Results: Day 1 uncorrected vision averaged 20/30, and corneal edema was minimal. Wound stretch after phaco was greater with biaxial than coaxial MICS. The Stellaris was easy to use, and responsiveness of the vacuum and flow/vacuum pump modules prevented chamber instability. In fact, the same machine settings for standard coaxial phaco were used for C-MICS. There was increased cutting efficiency, possibly by optimizing cavitation ahead of the tip and extremely stable chambers due to optimized fluidic control. Injection of the MI60 produced minimal wound stretch. VA and refractive stability were excellent; decentration was minimal; and PCO was low over the optic.

Conclusions: The Stellaris is an easy-to-use device for performing biaxial and coaxial MICS, with multiple settings available for minimizing thermal load, maximizing cutting efficiency and stabilizing the chamber. The MI60 passed through 1.8 - 1.9 mm incisions and showed outstanding intraocular stability.

CATARACT SURGERY - NEW TECHNOLOGY

THURSDAY 12 JUNE

Paper #A-00003

A new approach to customizing phaco surgery

Donald Nixon

Purpose: To evaluate the power usage, chamber stability and surgical efficiency of the new-generation Signature Phaco System linked to Pentacam Grading.

Methods: This is a surgeon assessment of the advantages of using an objective and reproducible preoperative grading of the cataract using Pentacam technology to preprogram the Signature Phaco System with the Fusion Fluidics Dual Pump System in patients undergoing cataract surgery and intraocular lens implantation. One hundred (100) consecutive patients were graded and had surgery with no change in parameters. A subsequent one hundred (100) patients were graded and adjustments were made preoperatively in fluidics and Phaco power to reflect the cataract grade. Parameters assessed included effective phaco time (EPT), foot pedal time (FPT), BSS usage, needle time to remove the cataract. Evaluations of the two populations were carried out.

Results: There was a statistically significant advantage in using the preoperative grading and adjusting the parameters settings to fit the nucleus characteristics. In the mid grades 2+ to 3+ (63%) where standard or default Phaco settings tend to be set for there was no significant advantage however with the extremes of cataract grades adjustment of Phaco parameters improves overall performance. The AMO Signature system is well designed to make these adjustment either preoperatively or "on the fly" and this may improve the performance of all surgeons no matter what volume they do. Higher and lower grades of cataracts were emulsified and aspirated with less EPT, BSS and total needle time if preoperative adjustments are made based on the Pentacam grading system. In addition the Fusion Fluidics Pump effectively aspirated the cataract segments and maintained stable chambers at occlusion break. The system is easy to use, with a one-step, one-hand cassette, fast prime, intuitive touch screen, intelligent help, wireless remote, and a surgical media center video overlay and teaching tool.

Conclusions: The AMO Signature System is ideally suited to Custom Phaco with the addition of preoperatively grading using the Pentacam cataract grading software. It shows improvements in the use of vacuum to achieve effective nuclear cleavage and reduce ultrasound usage and needle time. It offers all surgeons no matter what their volume a linked technology to improve surgical outcomes.

CATARACT SURGERY - NEW TECHNOLOGY

THURSDAY 12 JUNE

Paper #A-00004

What are techniques for using and removing high-viscosity OVDs in cataract surgery with premium IOLs?

Rosa Braga-Mele

Purpose: To evaluate the effects of a high molecular weight, high-viscosity, viscoadaptive OVD (Healon5) in cataract surgery in normal eyes with multifocal IOL implantation.

Methods: Healon5 has been primarily used in complicated cases such as floppy iris syndrome and small pupils. In this study, Healon5 was used in a series of 25 patients with normal eyes who underwent cataract surgery with multifocal or accommodating IOLs. The "Burp and Wiggle" technique was used to remove the OVD.

Results: In every case, Healon5 facilitated a smooth capsulorhexis of the size and shape ideal for multifocal IOL implantation. On the first day postoperative, the corneas were clear and white, with rapid recovery of visual acuity and good contrast sensitivity. Patient satisfaction was high. Additional data and case examples will be presented, along with detailed techniques for removing high-viscosity OVDs from the chamber before and after lens implantation.

Conclusions: Using Healon5 reduces capsulorhexis tears and protects the corneal endothelium and other structures of the eye during cataract extraction and IOL implantation. Given the high expectations of premium IOL patients, a high-viscosity OVD provides greater assurance of rapid visual recovery and an optimal refractive outcome.

CATARACT SURGERY - NEW TECHNOLOGY

THURSDAY 12 JUNE

Paper #A-00005

Capsular membrane suture fixation of sulcus IOLs

Howard Gimbel

Purpose: To describe a new surgical technique called capsule membrane suture fixation for secondary surgery of dislocated sulcus IOLs or correction of aphakia.

Methods: Using surgical and slit lamp footage, capsule membrane suture fixation will be described in the repositioning of sulcus IOLs and suture fixation of an IOL to the capsule remnant in the correction of aphakia.

Results: Six eyes, including a bilateral case will report excellent capsule fixation, stability and centration after suturing IOL haptics to capsule bag remnants.

Conclusions: In the absence of in-bag IOL placement, capsule membrane suture fixation is an excellent alternative for achieving capsule fixation of an IOL.

CATARACT SURGERY - NEW TECHNOLOGY

THURSDAY 12 JUNE

Paper #A-00006

Risk factors for acute endophthalmitis after cataract surgery: a population-based study

Wendy Hatch, Geta Cernat, David Wong, Robert Devenyi, Chaim Bell

Purpose: We identified and tested for potential risks for acute suspected endophthalmitis after cataract surgery using population-based administrative data from over 440,000 consecutive cataract surgeries in Ontario from April 1, 2002 to March 31, 2006.

Methods: Data from the Ministry of Health and Long-Term Care Ontario Health Insurance Plan (MOHLTC-OHIP) physician claims database and the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) from April 1, 2002 to March 31, 2006 were linked using an encrypted unique identifier at the individual level. We identified consecutive physician billing claims for the procedures of cataract surgery, vitrectomy and vitreous aspiration or injection, air or fluid exchange, dislocated lens extraction, and anterior vitrectomy. Acute suspected endophthalmitis was defined as vitrectomy or vitreous injection or aspiration procedures not in combination with air/fluid exchange or dislocated lens extraction, performed 1 to 14 days after cataract surgery. We calculated overall rates of endophthalmitis, and rates grouped by patient demographics, surgical facility, urban or rural residence, season, year, and by the additional procedure of anterior vitrectomy performed on the same day as the cataract surgery.

Results: There were 617 endophthalmitis cases out of 442,177 cataract surgeries over the four years. The overall unadjusted and adjusted rates of acute suspected endophthalmitis were 1.4 per 1,000 cataract surgeries. Men had higher rates than women (1.70 vs 1.19 per 1,000, $p < 0.0001$) with an adjusted odds ratio of 1.4 (95% CI 1.2 to 1.65). The oldest age group (85+) had the highest rate (2.18 per 1,000) and the youngest group (20-64) had the second highest rate (1.76 per 1,000). Patients who had anterior vitrectomy had significantly higher odds of developing endophthalmitis (adjusted odds ratio 9.56, 95% CI 6.43 -14.2).

Conclusions: Our population-based analysis can be used when setting benchmarks for quality improvement initiatives in other jurisdictions, as well as in our own, and can assist clinicians in educating their patients regarding the risks associated with cataract surgery. Future work is required to address the higher rate of endophthalmitis in men, those on whom anterior vitrectomy is performed, and the oldest and youngest groups of cataract surgery patients.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00009

Monovision spectacle independence using the Softport AO platform

James E. McDonald

Purpose: To show the way the aspheric monofocal IOL preserves the highest quality of vision in patients with cataracts.

Methods: To explain the use of the aspheric monofocal IOL in the context of how it relates to the neurocognitive system as well as the process of patient selection evaluation treatment and outcomes in relation to the system.

Results: The aspheric monofocal IOL is successfully used to create predictable post op spectacle independence.

Conclusions: The use of the aspheric monovision lens yields predictable results and preserves the highest quality of vision.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00010

Near visual acuity in patients with bilateral implantation of the SynchronyDual optic IOL

George H. Beiko, Archana Abhayambika

Purpose: To determine the near visual acuity in patients implanted bilaterally with the SynchronyDual optic accommodating IOL, following standard cataract surgery.

Methods: Patients were implanted with bilateral SynchronyDual optic accommodating IOLs. The second lens was implanted 1 year following the first implantation. Visual function was measured.

Results: 20 patients with bilateral implantation were studied. Two year results will be presented, including distance, intermediate and near visual acuity. Complications will also be reviewed.

Conclusions: To be presented.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00012

Does the Tecnis/Rezoom combination give greater spectacle independence than the pure Restor or Rezoom application?

Christoph Kranemann

Purpose: To determine the role of the Tecnis/Rezoom multifocal combination in achieving spectacle independence.

Methods: A group of patients was prospectively evaluated using the Tecnis/Rezoom (T/R) multifocal combination and compared to case-matched pure Restor/Restor (R/R) or Rezoom/Rezoom (Rz/Rz) patients with a minimum follow-up of one month. Their uncorrected distance, intermediate and near acuity as well as reading speed with a 3.5 mm pupil were evaluated. They were scored for degree of spectacle independence and incidence of significant side effects and overall satisfaction.

Results: There were 15 patients each in the Tecnis/Rezoom and Restor/Restor groups and 5 in the Rezoom/Rezoom group. The mean binocular uncorrected distance vision was 20/23 in the T/R group, 20/25 in the Rz/Rz group and 20/30 in the R/R group ($p=0.001$). The mean binocular uncorrected intermediate acuity was J 2.12 for the T/R group, J 2.20 for the Rz/Rz group and 3.96 for the R/R group ($p<0.001$). The mean binocular uncorrected near acuity was J 1.1 in the T/R group, J 2.36 in the Rz/Rz group and J 1.3 in the R/R group ($p<0.001$). The reading speed was 180 words per minute (wpm) for the T/R group, 115 wpm for the Rz/Rz group and 160 wpm for the R/R group. One hundred percent of the Tecnis/Rezoom patients, 88% of the Restor patients and 70% of the Rezoom patients did not wear spectacles for daily activities. The overall satisfaction was significantly higher in the Tecnis/Rezoom combination, but there was no statistically significant difference between the other two groups. No significant difference in the occurrence of side effects between any of the groups.

Conclusions: In this pilot study a significantly greater degree of spectacle-independence and patient satisfaction could be achieved with a mix/match combination of Tecnis/Rezoom multifocal lenses. It outperformed the other two groups in all categories. Side effects were comparable and clinically acceptable. Such combination would deserve further study and comparison to other combinations of multifocal lenses.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00013

Vision and patient outcomes in presbyopic population with bilateral implantation of ReSTOR aspheric multifocal IOL

John F. Blaylock, Zhaomin Si, Sandi Aitchison, Cheryl Prescott

Purpose: To evaluate the performance of the AcrySof SN6AD3 ReSTOR multifocal intraocular lens (mIOL) after bilateral implantation in a presbyopic population by determining visual functions and subjective outcomes.

Methods: Thirty patients with bilateral implantation of the AcrySof SN6AD3 ReSTOR mIOL for cataract or ametropia were prospectively studied. Distance, intermediate and near visual acuity (VA), and contrast sensitivity were assessed preoperatively and 1, 3 and 6 months postoperatively. The National Eye Institute Refractive Error Quality of Life Instrument (NEI-RQL) and a postoperative patient satisfaction questionnaire designed for mIOL's were answered by patients. Comparison between the pre-op and post-op outcome was statistically analyzed using a paired-sample t test.

Results: Postoperatively, 91.0% of eyes were within ± 1.00 diopter of manifest refraction spherical equivalent. The mean uncorrected (UC) vs best distance-corrected (BDC), UC intermediate vs BDC intermediate and UC near vs BDC near VA were binocularly 20/25 vs 20/20, 20/40 vs 20/43 and 20/26 vs 20/23, respectively. Overall NEI-RQL scores of expectations, activity limitations, dependence on correction, appearance and satisfaction were significantly higher postoperatively ($p < 0.05$). Nine percent and 18.2% of patients occasionally used glasses for near and intermediate tasks, respectively. On a scale of 0 to 5 for postoperative vision problems or difficulty, the average scores ≤ 1 (no to minimal) included distorted near and distance vision, color and depth perception, cooking, social and recreation activities. The average scores ≥ 2 (moderate and severe) included blurred vision at near and distance, night vision, halos, glare, computer usage and shopping.

Conclusions: The ReSTOR aspheric multifocal IOL had good vision correction and improved vision-related quality of life in a presbyopic population. Night vision problems and photopic symptoms were reported by some patients.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00014

Subjective patient reported quality of vision after bilateral implantation of the AcrySof Toric natural IOL: preliminary results

Pierre Faber, I. Ahmed, D. Belliveau, J. Blaylock, H. Climenhaga, J. Gohill, A. Gregoire, S. Herzig, F. Law, J. Ma, D. Meyer, M. Podtetenev, G. Rocha, A. Slomovic, R. Stein

Purpose: As cataract surgery has evolved the ability of the surgeon to provide patients with functional uncorrected vision has increased. New intraocular lens options now allow for the correction of astigmatism. Patient satisfaction after implantation with a toric lens is an important consideration in evaluating this new modality. A multicentre study was designed to investigate the performance of the AcrySof Toric IOL; this study included assessment of the patient's subjective quality of vision.

Methods: A prospective 15 centre study was prepared, with a planned total enrollment of 225 patients (450 eyes). As part of the patient assessments a Subjective Patient Reported Quality of Vision Questionnaire was administered preoperatively and again at three and six months postoperatively. Preliminary results from a subset of patients who have completed their 3 month visit are reported here. Changes in survey responses were evaluated with a Wilcoxon sign-rank test with a p value of 0.05.

Results: Preoperative and 3 month survey Results: were available from 39 patients who had bilateral AcrySof Toric IOL implants. Preoperatively, all patients were dependent on spectacles or contact lenses for distance vision. At three months, complete spectacle freedom was reported by 87% of patients, with an additional 10% who reported infrequent use. Satisfaction with vision postoperatively was statistically significantly better than preoperatively (8.8 postop vs. 3.5 preop on a 10 point scale, with 10 being completely satisfied ($p < 0.05$). The incidence and severity of both glare and halos were statistically significantly lower for the postoperative group ($p < 0.05$).

Conclusions: Patient satisfaction with the AcrySof Toric IOL was high. All patients reported a reduction in glare and halos postoperatively and a high percentage of patients did not require spectacles for distance vision. The AcrySof Toric IOL appears to be a safe and effective way to treat astigmatism in cataract patients.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00015

Visual function after implantation of bilateral AcrySof Toric natural IOL: preliminary results

Jit Gohill, I. Ahmed, D. Belliveau, J. Blaylock, H. Climenhaga, P. Faber, A. Gregoire, S. Herzig, F. Law, J. Ma, D. Meyer, M. Podtetenev, G. Rocha, A. Slomovic, R. Stein

Purpose: The goal for cataract surgery is the restoration of functional vision without the need for additional correction. Residual postoperative astigmatism following traditional cataract surgery is one reason additional correction is needed. Astigmatic correcting intraocular lenses offer additional benefit in cataract patients and can help achieve improved visual acuity and spectacle independence. A multicentre study was designed to evaluate the clinical performance of the AcrySof Toric IOL in terms of visual acuity, rotational stability of the implanted IOL and spectacle freedom.

Methods: A prospective 15 centre study was prepared, with a planned total enrollment of 225 patients (450 eyes). As part of the patient assessments, visual acuity and refractive data were collected postoperatively, along with lens position data to allow calculation of lens rotation. Preliminary results from a subset of patients who have completed their 3 month visit are reported here. Changes in lens position were assessed using a repeated measures ANOVA with a p value of 0.05.

Results: To date, 68 patients (136 eyes), with a mean age of 68.5 years (range 42-91 years), of which 73% are female, have been implanted bilaterally. Binocular unaided visual acuity at 3 months was 20/30 or better in 91% of patients, with all patients having a best corrected acuity of 20/30 or better. Average corneal astigmatism preoperatively was (2.06 ±0.8) D, while average refractive astigmatism at 3 months was (0.68±0.6) D. Rotation data were available for 62 eyes at 3 months. Lens rotation over time was not statistically significant (p=0.36). The mean absolute rotation at 3 months was 2.60 with a maximum rotation of 13 degrees in one eye. At 3 months, spectacle freedom was reported by 87% of patients, with an additional 10% who reported rare use.

Conclusions: The AcrySof Toric IOL demonstrated an ability to correct astigmatism with a high degree of success. Rotational stability was excellent and there was a demonstrated reduction in refractive astigmatism. The AcrySof Toric IOL appears to be a safe and effective way to treat astigmatism in cataract patients.

CATARACT SURGERY - PREMIUM IOLS

SATURDAY 14 JUNE

Paper #A-00016

Staged implantation of refractive IOLs: optimizing patient satisfaction and outcomes

George H. Beiko, Archana Abhayambika

Purpose: To determine whether a staged implantation approach to premium lens selection provides greater patients satisfaction. Staged implantation approach involves patient feedback in order to determine the selection of the second IOL based upon the patient's experiences with the first eye implantation.

Methods: Multicentre, non-randomized clinical registry of bilateral implantation of refractive IOLs. Standard small-incision phacoemulsification extraction was performed in all eyes. ReZoom or Tecnis multifocal IOLs were implanted in the first (dominant) eyes of all subjects. One to four weeks after the first IOL implantation (or after LRI or laser enhancement of the first eye, if required), a ReZoom, ReStor, Crystalens, or monofocal aspheric IOL was implanted in the fellow eye, depending on the patient's lifestyle needs and experience with the first eye. Primary endpoints were patient satisfaction and spectacle independence six months after second eye implantation. Bilateral uncorrected near, intermediate, and distance visual acuity and best-corrected distance acuity was measured at all visits.

Results: Three-month data will be presented.

Conclusions: To be presented

CATARACT CONTROVERSIES

SATURDAY 14 JUNE

Paper #A-00017

Yag capsulotomy rate for the Tecnis Z9000 lens compares favourably after 4 year follow-up

Christoph Kranemann

Purpose: To determine the Yag capsulotomy rate in patients who underwent cataract surgery with the implantation of the Tecnis Z9000 monofocal IOL.

Methods: A group of consecutive patients was retrospectively evaluated for the rate of Yag capsulotomies with a mean follow-up of 56 months.

Results: A total of 1096 consecutive patients were included in the analysis. Ninety-two patients were lost to follow-up. In twelve patients the capsulorhexis did not completely overlap the lens optic and they were withdrawn from the study. 8/992 of the remaining patients required Yag capsulotomy during the study period for a rate of 1/500 per year. There were no complications post-capsulotomy.

Conclusions: The Tecnis Z9000 lens has a low Yag capsulotomy rate that compares most favourably with the published rates for other lens types.

CATARACT CONTROVERSIES

SATURDAY 14 JUNE

Paper #A-00018

Clinical evaluation of an investigational 1-piece hydrophobic acrylic monofocal IOL

Donald Nixon

Purpose: Evaluate the safety and efficacy of a hydrophobic acrylic 1-piece (AMO) investigational lens in patients undergoing uncomplicated phacoemulsification. The lens has a 360-degree uninterrupted barrier edge designed to minimize lens epithelial cell migration onto the posterior capsule, a frosted edge to minimize edge glare and a "Tri-Fix" 3-point fixation for stability.

Methods: Multicentre, unilateral, open-label, evaluation of 123 patients. Follow-up was 2 years. Main outcomes were visual acuity, occurrence of optical/visual symptoms (e.g. halos, glare), incidence of postoperative complications and adverse events. Results compared to FDA multicentre study of 123 patients with 12 month results. The FDA Grid for posterior chamber IOLs was used as a historical control.

Results: The FDA study at 12 months showed 100% of all subjects achieved BCDVA of 20/40 or better and 82.9% achieved BCDVA of 20/20 or better. Moreover, 91.5% of subjects were 20/40 or better at distance UCVA. No lens complications have been reported to date. At 2 years, 100% achieved BCDVA of 20/40 or better, and 88.2% (15/17) achieved 20/20 or better.

Conclusions: This hydrophobic acrylic 1-piece IOL has a novel surface treatment designed to reduce the surface tackiness of the acrylic material and aid in unfolding the one-piece lens. The 1-piece acrylic lens provides excellent visual outcomes, refractive stability and safety. Two year results are comparable to the FDA study results.

CATARACT CONTROVERSIES

SATURDAY 14 JUNE

Paper #A-00019

Eradication and cleanup of lens substance and LECs: providing stable and long-term fixation of “specialized” IOLs in the capsular bag

David J. Apple

Purpose: Various “specialized” accommodative IOL designs have been introduced; most require placement in the capsular bag. Such lenses require superb optical clarity and cannot tolerate even small amounts of in-the-bag proliferation of LECs and their derivatives. This study will determine if present means of evacuating lens material and LECs from the capsular bag are sufficient to prevent such complications as PCO and fibrosis long after implantation.

Methods: 500 cadaver eyes post-ECCE and lens insertion accessioned from eye banks and logged into the data-bank at the David J. Apple Center were examined and photographed using Miyake-Apple technique. The lens styles were separated and catalogued according to manufacturer and model number. Eyes were evaluated with special reference to PCO and post-operative proliferation of LECs. The overall status of the lens capsular bag was tabulated and ranked according to the degree of these factors.

Results: Examination of the capsular bags of the 500 eyes revealed 3 levels of intracapsular LEC activity after ECCE. These included 1) quiescent (mummified) cells (40%) that appear no longer capable of causing problematic proliferation, 2) some cells (50%) are difficult to evaluate, many do appear capable of unwanted proliferation, and 3) (10%) where viable, mitotic, actively proliferating cells are present. There were no examples of complete clean-up and no areas where the score within the capsular bag was 0, regardless of the IOL type. This indicates that complete cleanup of the capsular bag in this large series of cases was more difficult to achieve than previously assumed.

Conclusions: The degree of cell proliferation in virtually all of the capsular bags was higher than expected. “Specialized” IOLs, including refractive designs, will fail in an unacceptable number of cases. Patients will only achieve optically superb results when better means of assuring total clean up and clarity of the capsular bag can be assured. Chemical/pharmacological or other such agents to remove LECs may be useful.

CATARACT CONTROVERSIES

SATURDAY 14 JUNE

Paper #A-00020

Can the new EYESI cataract module assess surgical proficiency through virtual reality simulation?

Tran Le, Feisal Adatia, Wai-Ching Lam

Purpose: There is a strong need for a standardized tool that can objectively assess whether an ophthalmology trainee or an international medical graduate seeking qualification possesses the necessary dexterity and technical skills to safely operate on patients. This study seeks to investigate the potential use of the EYESI virtual reality surgical simulator as an evaluation tool, by: (1) evaluating the correlation between surgical experience and simulator performance, and (2) assessing users' subjective experiences with the simulator.

Methods: Medical students, ophthalmology residents and ophthalmologists performed a 20-minute cataract surgery module on the EYESI simulator at the 2007 COS Annual Meeting. The module consisted of a practice trial in forceps training, followed by 3 scored tasks: cataract forceps (level 2), anti-tremor (level 3), and capsulorhexis (level 4). Subjects completed 3 trials in each of the scored tasks. Following the surgical simulator tasks, subjects then filled out an exit questionnaire.

Results: The 41 subjects included in the study were sorted into 3 groups of different surgical experience: Group A, 17 subjects with no cataract surgery experience; Group B, 11 subjects with experience of 500 or less cataract surgeries; and Group C, 13 subjects with experience of greater than 500 cataract surgeries. The mean total scores for each group respectively were 88, 142, and 157 (out of 300). Group A's mean score was significantly lower than both group B and C ($p < 0.05$). Interestingly, when the 3 tasks were analyzed separately, Group A's performances were significantly lower than Group B and C ($p < 0.05$) in the cataract forceps and anti-tremor tasks. However, there were no statistically significant differences among the 3 groups in the capsulorhexis task. Based on the exit questionnaire, 70% of the subjects agreed that the EYESI VR simulator mimics intraocular surgery while 28% were undecided and 2% disagreed. However, 94% of the subjects agreed that residency training programs would benefit from using the EYESI simulator while 6% were undecided.

Conclusions: The EYESI VR simulator is able to discriminate between novices and experts. However, due to the small sample size, the study is unable to demonstrate a statistically significant gradient effect of experience on simulator performance. Ongoing collaboration with other universities is aimed at resolving this and expanding the database of simulator performance scores of surgeons and trainees at different levels of experience. Thus, the EYESI simulator has great application potential to be used as an objective tool to assess surgical proficiency.

CATARACT CONTROVERSIES

SATURDAY 14 JUNE

Paper #A-00021

A clinical pathologic and laboratory study of modern hydrophobic acrylic IOLs: analysis of vacuoles “glistening” formation in the lens’s optic

David J. Apple

Purpose: Glistenings were first described in 1994, after the introduction of hydrophobic acrylic IOLs. In most cases, decreases in VA are not sufficient to warrant explanation. This case study will describe the cause of vacuoles as determined in a laboratory setting, and serve as an update on this complication.

Methods: A study of modern hydrophobic acrylic IOLs. Our patient data base and in-vitro analysis of various hydrophobic IOLs from various manufacturers were analyzed by techniques at various temperatures.

Results: We classify vacuoles as ranging from 1-4. High power microscopy confirmed the morphology of these lesions as described previously. They can be made to appear and disappear by changing the temperature in the aqueous solution from room temperature to 37 degrees C. We did not find glistenings when examining the new AMO 1-piece hydrophobic acrylic design. Glistenings can be enlisted with the various AcrySof lenses.

Conclusions: Ophthalmologists should be aware of this unusual, but potentially visually devastating, complication of IOLs. Intralenticular glistenings must be considered when diagnosing opacification of hydrophobic acrylic IOLs. Physician intervention should be on a case-by-case basis. To date we have not seen this complication and the AMO Hydrophobic designs including the Sensar and the more modern lens common in the market.

CATARACT CONTROVERSIES

SATURDAY 14 JUNE

Paper #A-0022

Assessment of the zonule in pseudo-exfoliation by ultrasound biomicroscopy

Charles J. Pavlin

Purpose: Cataract surgery in pseudoexfoliation is associated with an increased incidence of complications secondary to zonular weakness. Ultrasound biomicroscopic (UBM) assessment was performed in pseudo-exfoliation prior to cataract surgery to determine if imaging could detect signs of an abnormal zonule.

Methods: 60 cases of pseudo-exfoliation were referred for ultrasound biomicroscopic assessment. Ultrasound biomicroscopic examinations were performed in a radial fashion perpendicular to the zonular plane 360 degrees. Zonular abnormalities detected were compared to the appearance of normal zonules.

Results: 24 patients were deemed to have a normal appearance to the zonule on imaging, 36 patients were deemed to have zonular abnormalities. The zonule was disrupted on UBM in 6 patients. Zonular disruption occurred in a distinct way with central breaks with irregular remnants remaining on the lens. Zonular abnormalities in the absence of disruption included elongation, irregularity, and an appearance of thickening and reduplication.

Conclusions: Ultrasound biomicroscopy can image zonular abnormalities in pseudo-exfoliation. Zonular abnormalities are common and range from mild irregularity to frank disruption. This information is potentially helpful in planning cataract surgery.